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Report to the Chairman, Subcommittee on Regulation, Business Opportunities and Energy, Committee on Small Business, House of Representatives

May 1989

INFECTIOUS WASTE

Federal Health Care Facilities' Handling and Disposal Practices

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Human Resources Division

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The Honorable Ron Wyden
Chairman, Subcommittee on Regulation,
Business Opportunities and Energy
Committee on Small Business
House of Representatives

Dear Mr. Chairman:

In your August 12, 1988, letter, you expressed concern about the management of infectious waste by public and private health care facilities. You noted that your concern was based on (1) increased public health and environmental risks posed by careless or illegal disposal practices in recent years and (2) experts' views that such risks will likely intensify in future years. You requested that we obtain information on federal facilities' waste management policies and procedures, including the reasons for any differences in these procedures. You also asked us to comment on whether the procedures might pose public health or environmental risks.

On December 22, 1988, we briefed your staff on the results of our field work; as requested, we are providing this report to summarize the information we obtained.

Background

The federal government operates hundreds of health care facilities that generate medical waste. The Department of Veterans Affairs (VA), the Department of Defense, and the Indian Health Service (IHS) operate the largest federal health care systems, consisting of 172, 168, and 43 hospitals, respectively. In addition, these agencies operate hundreds of other health care facilities, including outpatient clinics and research laboratories. These facilities (1) served an average of 64,000 inpatients a day during fiscal year 1988 and (2) had over 73 million outpatient visits in that year. Although it operates only one hospital, the National Institutes of Health (NIH) has hundreds of laboratories and animal care facilities engaged in biomedical research involving microorganisms, tissue cultures, and animal waste. Other federal agencies, including the Alcohol, Drug Abuse, and Mental Health Administration and the Health Resources and Services Administration, operate health care or research facilities that generate medical waste.

Objectives, Scope, and Methodology

In response to your request, we obtained information on

- what types of medical waste are considered infectious;
- how infectious waste is handled and stored;
- what treatment and disposal methods are used;
- what training is provided to waste generators and handlers, including efforts to protect the workers; and
- how infectious waste disposal processes are monitored.

At the federal level, we obtained information from the Department of Defense; VA; IHS; NIH; the Alcohol, Drug Abuse, and Mental Health Administration; and the Health Resources and Services Administration. We also obtained information from the Environmental Protection Agency (EPA) and the Centers for Disease Control (CDC), which provide guidance to federal agencies and others on identifying, handling, transporting, storing, treating, and disposing of infectious waste. We reviewed standards of the Joint Commission on Accreditation of Healthcare Organizations as they relate to infection control.

The information we obtained from each agency included (1) definitions of the types of waste the agency considered infectious, (2) the agency's policies and procedures for handling and disposing of the waste, and (3) specific responsibility within the agency for developing a waste management plan and for assuring compliance.

We visited eight hospitals, three free-standing outpatient clinics, and one free-standing laboratory. We selected these on the basis of the information obtained from the above agencies. All eight hospitals operated onsite outpatient clinics and clinical laboratories, and several had research laboratories. Four of the facilities were operated by VA, three by IHS, four by the Navy, and one by NIH. The facilities we visited are listed in appendix I. As agreed with your office, we are providing a more detailed discussion regarding the agencies and facilities we visited in appendixes II through V.

During the site visits, we interviewed officials and reviewed pertinent waste management documents. We did not obtain information on the full range of the facilities' infection control practices—the policies and procedures that health care facilities establish to prevent infection in patients and health care staff.[1] Rather, we focused on their policies for

[1]In separate congressionally requested studies, we are evaluating VA and Department of Defense hospital infection control programs.

management of infectious material from the point in the service delivery process when it was considered to be waste. We did not fully review facilities' implementation of these policies. Nor did we include the handling of chemical or radioactive waste in our review. We reviewed infectious waste regulations proposed or issued by the states in which the facilities we visited are located. Our review was carried out between October 1988 and March 1989 in accordance with generally accepted government auditing standards.

Results in Brief

The 12 facilities we visited had established policies and procedures for handling, treating, and disposing of the medical waste federal and state agencies required or recommended be classified as infectious. Although the facilities' procedures varied widely, they were generally consistent with these requirements and guidelines. Major differences involved (1) how facilities defined what medical waste should be considered infectious and segregated from other medical waste, (2) how infectious wastes were stored and treated before disposal, and (3) how much training employees received. The facilities' size and scope of services, along with the existing treatment capacity, appeared to be primary factors that may explain the differences. Because the 12 facilities we visited had policies and procedures generally consistent with EPA recommendations and these procedures provided for EPA acceptable treatment methods before disposal, we believe the facilities' procedures, if properly implemented, should result in infectious waste management practices that pose no public health or environmental risks.

What Waste Is Considered Infectious?

In a guidance manual issued in May 1986, EPA defined infectious waste as "waste capable of producing an infectious disease." The EPA definition required that, for waste to be considered infectious, there must be a susceptible host, there must be a portal of entry into the host's body, and the waste must contain sufficient disease-producing organisms so that exposure to it could result in an infectious disease. EPA recommended that several items be designated as infectious, including cultures and stocks of infectious agents and associated biologicals; human blood and blood products; pathological waste (human body parts, tissues, and organs); contaminated sharps (e.g., syringes, needles, and glass); waste from areas where patients with infectious diseases have been isolated for treatment; and contaminated animal carcasses, body parts, and bedding. In addition, EPA suggested that contaminated equipment, wastes from surgery and autopsy, miscellaneous laboratory

wastes, and dialysis unit wastes be evaluated by officials at facilities to determine whether they should be classified as infectious.[2]

CDC, in its guidelines relating to infection control—generally referred to as universal precautions—uses four general categories of waste to be classified as infectious. These are microbiology laboratory wastes, blood and blood products, pathology waste, and sharps. CDC guidelines do not address contaminated animal wastes; contaminated laboratory wastes; contaminated equipment; or surgery, autopsy, or dialysis unit wastes. The CDC guidelines are intended to protect health care workers.

Officials at each of the agencies we visited said they expected their facilities to comply with EPA's guidelines and any applicable state regulations. The 12 facilities we visited were in six states—Maryland, Massachusetts, New Mexico, North Carolina, Rhode Island, and Virginia. Maryland, North Carolina, and Rhode Island have regulations in effect with varying requirements. Their definitions of infectious waste, although worded somewhat differently, were consistent with EPA and CDC guidelines.[3] New Mexico and Virginia published draft regulations in September and October 1988, respectively, but these had not been finalized as of April 1989.

NIH was the only agency we reviewed that had established written requirements on what waste its facilities should classify as infectious; the other agencies left this to the discretion of their individual facilities.[4] Accordingly, there were differences in how the facilities we visited defined infectious waste. Some facilities categorized as infectious all waste from some locations, such as operating rooms and patient rooms, while others classified specific waste items as infectious. In spite of these differences, all facilities generally were in accord with EPA guidelines. All of the facilities (if they had such waste) classified blood and blood products, pathological waste, sharps, microbiological waste,[5] and

[2]The Medical Waste Tracking Act of 1988 (42 U.S.C. 6992-6992k), which established a demonstration medical waste tracking program in New York, New Jersey, Connecticut, and states contiguous to the Great Lakes, also provided for essentially the same EPA-recommended categories of waste to be regulated as infectious.

[3]Massachusetts has infectious waste regulations in effect, but they do not apply to federal facilities.

[4]In April 1989, after the time of our visits, the Navy published requirements for classifying waste as infectious.

[5]Four did not classify unused vaccine as infectious.

patient care supplies[6] from surgery, autopsy, and dialysis units as infectious as recommended or suggested by EPA.

There were some minor exceptions. Of the eight facilities that had waste from patients in isolation, all except two classified all such waste as infectious. One of these latter two facilities classified as infectious only waste from patients in certain types of isolation, such as those isolated due to respiratory diseases. The other classified as infectious isolation patient supplies if the supplies were contaminated with body fluids. Of the five facilities that had animals used in research, four classified carcasses and bedding as infectious, and the fifth, while not classifying animal waste as infectious, handled it as if it were. That is, animal waste was placed in special containers and incinerated.

The two facilities with the most comprehensive definition of infectious waste were the NIH clinical center and campus and the Cherokee IHS hospital. Existing capacity to incinerate the waste and, in the case of NIH, previous problems with untreated medical waste shipped to a local landfill were the reasons for their more comprehensive classifications.

How Is Infectious Waste Handled and Stored?

EPA recommends that infectious waste be segregated from the general waste at the point of generation and that it be placed directly into containers that are clearly identifiable and distinguishable from general waste. EPA suggests that liquid infectious waste be placed in capped or tightly stoppered bottles or flasks, that solid or semi-solid wastes be placed in distinctly colored (usually red or orange) or specially marked plastic bags, and that sharps be placed directly into impervious, rigid, and puncture-resistant containers. For the handling and transport of infectious waste, EPA recommends that plastic bags be placed in rigid or semi-rigid containers or be doubled-bagged, and be hand-loaded into dumpsters or on to trucks.

North Carolina's regulations have no specific requirements for the handling and storing of infectious waste. Maryland and Rhode Island infectious waste regulations specify the thickness of the packaging used for infectious waste. Only Rhode Island specifies that the bags be red or orange. Maryland and Rhode Island require that sharps be placed in impervious or puncture-resistant containers.

[6]One facility classifies these items as infectious only if they are contaminated with body fluids.

EPA recommends that storage times for infectious waste be as short as possible and that storage areas be specially designated for infectious waste, have limited access to unauthorized personnel, and be located near the treatment site. States can set storage requirements based on time and temperature. For example, Rhode Island allows infectious waste to be stored up to 9 days in a refrigerator and up to 90 days in a freezer. Rhode Island also requires that storage areas have limited access.

As recommended by EPA, (1) all of the facilities we visited segregated infectious waste at the source, (2) all the facilities used disposable puncture-resistant containers, (3) other solid infectious waste was placed in red or orange biohazard bags or specially marked biohazard boxes, and (4) the bags were collected at least once daily[7] and, except for waste to be sterilized, were taken to special storage areas separate from other waste. However, not all stored the waste in places where access was limited. For example, at one facility the storage area was in a corridor between two sections of the facility which, we were advised, was seldom used. However, we observed numerous staff and visitors using the corridor. At another facility the waste, after being double-bagged and boxed for contractor pick-up, was stored in the basement away from the public but was not kept in an area designated specially for infectious waste. Rather, it was stored immediately behind the desks of two copying machine operators. This waste was picked up once a week by a contract waste hauler.

What Treatment and Disposal Methods Are Used?

EPA recommends four techniques for treating infectious waste before disposal, depending on the type of waste involved: steam sterilization (autoclaving), incineration, thermal inactivation (dry heat), and chemical disinfection. EPA recognizes that other treatment methods may be effective, including irradiation and gas/vapor sterilization. EPA recommends that treated liquids and ground-up solids be discharged to the sewer system (if approved by state and local governments) and treated solids and incinerator ash be disposed of at local landfills. EPA also recommends that body parts be rendered unrecognizable before disposal in landfills. The three states we visited that had infectious waste regulations that relate to federal facilities essentially adopted the EPA-recommended treatment and disposal methods.

[7]This does not apply to the Navy Environmental and Preventive Medicine Unit, which accumulated 10 to 15 pounds of infectious waste per week. This waste was stored in a refrigerator in the laboratory and was steam sterilized and disposed of in the general trash twice per week. This is consistent with EPA guidelines.

All of the facilities we visited treated and disposed of their infectious waste in accordance with the methods recommended by EPA and applicable state requirements. Eight of the 12 facilities treated solid infectious waste on site before hauling it to a landfill. Five operated incinerators; four of these facilities also steam sterilized some categories of waste before incineration. The other three steam sterilized waste before disposal.

Four of the 12 facilities relied on private firms to treat and dispose of their infectious waste. Three facilities contracted directly with private firms to transport their infectious waste to incinerators operated by the contractors.[8] The waste at these facilities was bagged, placed in boxes, and sealed before pick-up by contractors. A fourth facility hauled its waste to another facility, where it was consolidated with other waste and removed by a contractor. Since our visit, this latter facility began having its infectious waste picked up by a contractor for treatment and disposal.

Blood was disposed of differently by the 12 facilities. Four facilities poured untreated bulk blood down the drain.[9] Four facilities sterilized the blood—two then incinerated it and two disposed of it directly in a landfill. Three facilities incinerated the blood without prior treatment. The other facility did not have bulk blood to dispose of and sent its blood samples to another facility for analysis.

What Training Is Received?

EPA recommends that facilities provide waste management training for all employees who generate or handle infectious waste regardless of their role or type of work. Such training should include refresher courses to maintain awareness of the potential hazards posed by infectious wastes, but EPA does not specify how much training should be provided. None of the state regulations contained requirements for the training of infectious waste generators, and only Maryland required that infectious waste handlers be instructed on proper waste management techniques.

All the facilities we visited offered training in the handling of infectious waste, both to health care staff and waste handlers. The scope and duration of the training varied greatly—from a segment of a 1-hour training

[8]Since our visits, one of these facilities has installed a large autoclave, which became operational on March 1, 1989. Since then, infectious waste has been sterilized and disposed of in a landfill.

[9]This is allowable under EPA guidelines provided that secondary treatment is available.

program to a more extensive 1-week training program. These differences appeared to be reflective, at least in part, of the size and complexity of the facilities. All of the facilities also had periodic refresher programs as well as special programs dealing with specific diseases, such as acquired immune deficiency syndrome (AIDS) or hepatitis. As a safety precaution, all the facilities made hepatitis B vaccinations available to both health care workers and waste handlers.

How Are Infectious Waste Disposal Processes Monitored?

EPA guidelines do not contain specific recommendations regarding the monitoring of the overall infectious waste disposal process. There was no state and local monitoring of the 12 facilities we visited except for inspections of incinerators at four facilities. Only IHS and NIH had agency monitoring programs. IHS area offices inspected facilities, including their infectious waste management practices, every 2 years. In 1985 NIH implemented an internal monitoring program that included two specific segments relevant to infectious waste handling and disposal. One of these segments has been conducted twice and the other three times. Although most of the facilities we visited did not have formal internal monitoring programs, we were advised by officials at six facilities that waste disposal was monitored as part of their day-to-day responsibilities.

As agreed with your office, we did not obtain official agency comments on this report. However, we discussed its contents with Navy, NIH, IHS, and VA officials and incorporated their comments where appropriate.

Unless you publicly announce its contents earlier, we plan no further distribution of this report for 30 days. At that time, we will send copies to interested congressional committees and the Secretaries of Defense, Health and Human Services, and Veterans Affairs. We will also make copies available to others on request. Major contributors to this report are listed in appendix VI.

Sincerely yours,

Edward a Densmore

for David P. Baine
Director of Federal Health Care
Delivery Issues

Contents

Abbreviations

AIDS	acquired immune deficiency syndrome
CDC	Centers for Disease Control
EPA	Environmental Protection Agency
IHS	Indian Health Service
NIH	National Institutes of Health
VA	Department of Veterans Affairs

Facilities Visited During Review

Indian Health Service	Albuquerque IHS Hospital, Albuquerque, NM Cherokee IHS Hospital, Cherokee, NC Isleta Health Center, Isleta, NM
National Institutes of Health	Clinical Center and main campus, Bethesda, MD
Department of the Navy	Newport Naval Hospital, Newport, RI Portsmouth Naval Hospital, Portsmouth, VA Quantico Naval Medical Clinic, Quantico, VA Navy Environmental & Preventive Medicine Unit, Norfolk, VA
Department of Veterans Affairs	Albuquerque Medical Center, Albuquerque, NM Asheville Medical Center, Asheville, NC Boston Medical Center, Boston, MA Boston Outpatient Clinic, Boston, MA

Indian Health Service

The Indian Health Service (IHS), an agency within the Public Health Service, Department of Health and Human Services, operates 43 hospitals, 65 health centers, and numerous other outpatient clinics. In addition, it contracts with Indian tribes to operate 6 hospitals, 70 health centers, and other health clinics. During fiscal year 1988 IHS-operated facilities treated about 76,000 inpatients and had about 2.3 million outpatient visits.

IHS headquarters does not provide written guidelines for handling and disposing of infectious waste by its facilities, according to IHS officials, because of the wide range of health care facilities they operate, area offices are more cognizant of state and local requirements, and specific guidance could not be developed to include all the possible circumstances. Each facility is expected to comply with relevant state and local regulations and use Environmental Protection Agency (EPA), Centers for Disease Control (CDC), and Joint Commission on Accreditation of Healthcare Organizations guidelines to develop a waste handling plan. IHS does not maintain data on the quantity of infectious waste generated by its facilities or on the cost of disposing of it.

We visited IHS hospitals in Albuquerque, New Mexico, and Cherokee, North Carolina. In addition, we visited the Isleta Health Center, which operates as a satellite of the Albuquerque IHS Hospital. Following, based on interviews with facility officials, our observations during site visits, and our review of the facilities' written procedures, are the specific procedures required by the facilities we visited.

Albuquerque Hospital

The IHS hospital in Albuquerque, New Mexico, is a 26-bed facility that in fiscal year 1988 had an average daily patient load of 15, had 56,000 outpatient visits, and performed 354,000 diagnostic tests. Associated with the hospital are five satellite facilities—two free-standing health centers and three clinics.

Officials at the Albuquerque hospital define infectious waste as anything contaminated by body secretions. This definition, based on CDC's guidelines, is in accord with EPA guidelines. Materials considered to be infectious include all material from isolation rooms, blood, cultures, vaccines and disposable laboratory supplies, body tissue, sharps, discarded equipment, and patient care supplies contaminated with blood. The facility does not have pathological waste except teeth and tissue from

dilation and curette procedures, waste from the production of biologicals, animals and animal bedding, or patient care supplies from a surgical suite, autopsy, or dialysis unit. Patient care supplies from the general ward and outpatient area are not classified as infectious unless contaminated with blood.

According to the hospital's written procedures and hospital officials, infectious waste is to be segregated at the point of origin. Most infectious waste is placed in red bags and taken by housekeeping—or, in some cases, laboratory—personnel to the autoclave at least twice daily. Large, puncture-resistant sharps containers are located in the diagnostic laboratory and nurses' station. Small containers are used in other areas. When full, the small containers are placed in the large containers. When a large container is full, a nurse caps it and asks the housekeeping staff to remove it. The only blood disposed of is specimens, which are disposed of in the same manner as other infectious waste.

The autoclave is in a closed area behind the hospital. Infectious waste is stored in yellow covered trash cans until it is autoclaved. Autoclaved material is then compacted and taken by the city to the municipal landfill along with the facility's noninfectious waste.

Orientation training for new staff is provided by supervisors. The hospital's safety committee annually reviews infection control and safety measures with infectious waste generators and handlers. Attendance at these refresher courses is mandatory. In addition, nurses must, and other employees may, attend monthly programs on AIDS. Hepatitis B vaccinations are offered free to waste generators and waste handlers.

There has been no state or local monitoring of the hospital's infectious waste disposal program. The IHS area office performs biennial environmental health reviews and follow-up reviews in intervening years. The April 1987 review found what we believe to be minor infectious waste problems, such as infectious waste being stored in a storage closet within a clinical area. In addition, supervisors are responsible for monitoring their areas.

Hospital officials estimate that 200 to 300 pounds of infectious waste is generated weekly by the hospital and its affiliated clinics. They do not maintain data on the cost of disposing of infectious waste. The autoclave, which was purchased in 1984 for $14,400, is inspected quarterly by the manufacturer.

Cherokee Hospital

The IHS hospital in Cherokee, North Carolina, is a 32-bed facility that in fiscal year 1988 had an average daily patient load of 15, had 62,000 outpatient visits, and performed about 174,000 diagnostic tests. The hospital has one satellite clinic.

The hospital defines infectious waste as any material thought to be possibly contaminated with moist body substances and therefore capable of transmitting disease. Because the hospital has sufficient incinerator capacity, all waste from the obstetrics, general medicine and surgery, emergency, outpatient, dental, community health, physical therapy, radiology, and laboratory areas is handled as though it were infectious waste. Thus, all categories of waste recommended or suggested by EPA to be classified as infectious are so classified by the Cherokee facility. The facility does not have pathological waste, animals, or patient care supplies from an operating room, autopsy, or dialysis unit.

All nonpaper waste, including blood, from the laboratory is collected in red biohazard bags and taken daily by housekeeping staff to the incinerator. Waste from patient rooms is collected in clear plastic bags and, when removed, the bags are placed inside a red biohazard bag by housekeeping staff and taken to the incinerator. Used sharps are placed in puncture-resistant containers, which, when full, are placed in red biohazard bags by the housekeeping staff. The infectious waste is stored in a fenced, locked area until it is incinerated. The incinerator ashes are taken to a tribe-operated landfill.

New health care, housekeeping, and maintenance employees attend orientation sessions offered each quarter. These sessions cover infection control rules. The health care staff also must attend annual infection control training, which includes updates on the facility's policies. The facility's departments also have in-service training for their staff. Hepatitis B vaccinations are offered free to all health care staff and waste handlers.

The only state or local monitoring of infection control in the past 4 years has been two state inspections of the incinerator. The state recommended some improvements to the incinerator, and a contract for these improvements has been awarded. The hospital recently received a report on the last Joint Commission on Accreditation of Healthcare Organizations inspection. There were no deficiencies related to infection control.

The biennial environmental health survey by the IHS area office was being conducted during our visit. We were informed by the inspector that there were no deficiencies relating to infection control.

Hospital officials estimate they incinerate 200 pounds of infectious waste per week. The only cost information available was for incinerator fuel, which was $80 per week.

Isleta Health Center

The IHS health center in Isleta, New Mexico, provides outpatient health services 5 days per week. It has about 1,200 visits per month. Only minor diagnostic tests are performed at the center; more sophisticated analyses of specimens are performed at the Albuquerque IHS hospital.

The center defines infectious waste as any specimen that could infect a noninfected person, e.g., body secretions or dirty dressings. Since Isleta is an ambulatory care facility, it does not have many of the categories of waste often classified as infectious. At Isleta, materials considered to be infectious are sharps, patient supplies in contact with a body fluid, and culture dishes not sent to Albuquerque IHS hospital for analysis. These categories of infectious waste meet EPA guidelines.

Infectious waste is segregated from noninfectious waste at the source. Red bags—used for the infectious waste—are located in the central screening room and the pharmacy. Nurses close the bags when full and take them to a storage closet. A puncture-resistant sharps container is located in the central screening room. Sharps used in patient treatment rooms are carried to the central screening room and placed in the sharps container. When the container is full, the nurses place it in a red bag and take it to a storage closet. We noted, however, that the storage closet is also used for storing housekeeping supplies. There is no blood to be disposed of. Each workday, housekeeping personnel from the Albuquerque IHS hospital take the red bags to the hospital, where they are autoclaved and sent to the landfill with the hospital's red bag waste.

Training programs for health care staff and waste handlers regarding the handling of infectious waste are offered through the Albuquerque IHS hospital. Nurses attend a weekly training program at the hospital that may cover infectious waste disposal. Hepatitis B vaccinations are recommended for staff dealing with blood serums and are available to others who ask for them.

Monitoring of the clinic's handling of infectious waste disposal is done by the hospital's infection control committee and safety officer. It is also included in the area office's biennial environmental health inspections. The most recent of those inspections found only minor deficiencies related to infectious waste disposal, such as uncovered trash cans in examination rooms.

The clinic did not have information available on the quantity of infectious waste disposed of or the cost of disposing of it.

National Institutes of Health

The National Institutes of Health (NIH) is the principal biomedical research arm of the Department of Health and Human Services and is an agency of the Public Health Service. NIH, located on a 305-acre campus in Bethesda, Maryland, comprises 13 research institutes that support nearly 3,000 research laboratories and animal care facilities engaged in biomedical research involving microorganisms, tissue cultures, and animals. The major research facility at NIH is a 540-bed clinical center which, during fiscal year 1988, had an average inpatient census of 324 and about 325,000 outpatient visits.

NIH has developed written policies and procedures on waste management. The guidance provides detailed descriptions of what is considered hazardous waste (asbestos, chemical, radioactive, and medical pathological waste) and instructions on how it is to be handled. It clearly describes policies and procedures and defines responsibilities. Waste disposal procedures are also described on a waste management "calendar" and posters designed to be displayed in work areas. NIH personnel can also rely on the NIH Isolation Guidelines, which were based on CDC universal precautions guidelines, and the joint CDC-NIH published Biosafety in Microbiological and Biomedical Laboratories for guidance in the handling and collection of infectious waste.

To avoid speculation as to whether a particular waste is truly infectious, NIH does not use the term "infectious waste." Rather, NIH uses the term "medical pathological waste," which it defines as waste containing or contaminated with potentially infectious agents or minimally contaminated with toxic materials. NIH includes all of the EPA classifications of infectious waste except discarded contaminated equipment in its definition of medical pathological waste but does decontaminate such equipment before disposal.

Examples of material NIH includes as medical pathological waste are potentially contaminated animal bedding; all animal carcasses except those containing radioactive materials;[1] clinical specimens (urine, feces, blood); wastes from surgical or autopsy suites; disposable clothing, towels, and similar materials potentially contaminated with infectious agents; semi-solid media containing trace toxic or carcinogenic material; disposable glass and plastic labware; and all syringes and needles not contaminated with radioactive materials.[1] NIH considers all medical

[1] NIH has developed separate policies and procedures for the handling and disposal of radioactive materials.

wastes generated by patients at the clinical center as medical pathological waste even though it recognizes that much of this waste does not meet its definition. NIH officials stated that it is much easier to include all patient wastes rather than try to sort out the nonmedical pathological waste material. This practice is facilitated by the presence of an abundant waste treatment capacity provided by three large incinerators located on the NIH campus.

All medical pathological waste is segregated at the point of origin and is placed in hard cardboard boxes lined with plastic bags. These boxes, termed "burn boxes," are located at the point of waste generation (for example, in the clinical center a burn box is placed outside patients' rooms, and waste from the patients' rooms goes into these boxes). The bags and boxes are sealed, and the boxes labeled with the date and point of origin.

All needles, syringes, and scalpels, whether or not used for patient care, are placed in puncture-resistant plastic containers immediately after use. When these containers are three-fourths full, they are placed in burn boxes and incinerated. Glass from the laboratories contaminated with body fluids is autoclaved before disposal. Glassware not used for patient care and known to be noncontaminated is disposed of in the general trash.

Each day, clinical center housekeeping staff collect the boxes on handcarts, transport them to the freight elevator lobby area, and place them on large trailers. Clinical center staff periodically haul these trailers through an underground tunnel to the incinerator area. Burn boxes from buildings other than the clinical center are taken to the buildings' loading docks by laboratory staff and are picked up and taken to the incinerator area by Environmental Protection Branch contract staff. Incinerators are operated Monday through Friday.

Research laboratories have the option to autoclave medical pathological waste and dispose of it in the general trash. Most of the laboratories in the clinical center incinerate the waste. Other laboratories autoclave then discharge liquid waste into the sewer and dispose of other waste in general trash. Treated body fluids may be poured down the drain. General trash is picked up by a contractor and taken to the local landfill.

NIH requires new clinical center housekeeping employees to attend training programs on waste handling and disposal. They must have 40 hours of classroom instruction before beginning normal work duties. General

and chemical waste disposal is contracted out, and the contractors are expected to provide training for their employees. Incinerator operators also receive training. Although encouraged, training for waste generators at the NIH research laboratories is not mandatory. Several programs are offered by NIH's Occupational Safety and Health Branch, Division of Safety.

The state of Maryland requires NIH to obtain a permit to operate its incinerators and reserves the right to inspect the incinerators. Additionally, local landfill operators reserve the right to inspect the general trash as it is brought to the landfill and to refuse any trash that they deem infectious wastes. In 1988, the state began a program to monitor the transportation and disposal of special medical wastes within state borders. This program requires NIH to obtain a Maryland identification number as a special medical waste generator. Any vehicles it uses to haul special medical wastes from off-site locations to its incinerators must be certified by the state and their drivers registered with the state. A manifest system has been implemented to track the movement of the special medical waste from the point of generation to the point of disposal.

NIH has implemented an internal environmental regulatory compliance and quality control monitoring program, which includes two specific audit programs relevant to infectious waste handling and disposal. Since establishment of the program in 1985, one of these audit programs has been conducted twice and the other has been conducted three times.

NIH officials estimated that about 1,760 tons of medical pathological waste are generated annually by NIH and that it costs about $1.4 million per year, or about 40 cents per pound, to handle, treat, and dispose of this waste.

Department of the Navy

The Navy health care facilities include 36 hospitals, 220 medical clinics, and 163 dental clinics. During fiscal year 1988, the Navy hospitals had an average daily inpatient census of 2,711, and all Navy facilities had over 10.2 million outpatient visits.

The Department of Defense allows each of its components—the Army, Air Force, and Navy—to establish their own policies, procedures, and guidelines regarding the handling of medical infectious waste. The Army and Air Force have broad infectious waste policies. The Navy issued a medical waste management policy in April 1989.

The Navy policy provides guidance for the proper management of infectious waste, including handling, storage, packaging, transporting, treatment, and disposal methods for all its medical and dental treatment facilities. Infectious waste is defined in the policy statement as waste that contains pathogens in sufficient numbers and with sufficient virulence to cause infectious disease in susceptible hosts exposed to the waste. It defines the following types of waste as infectious: medical waste from isolation rooms, cultures and stocks of etiologic (infectious) agents, blood and blood products, pathological wastes, sharps, surgery and autopsy wastes, contaminated laboratory waste, discarded biologicals, and contaminated animal carcasses, body parts, and bedding. The only category of waste recommended or suggested by EPA but not classified as infectious by this Navy policy is contaminated equipment. It also states that facilities are to comply with existing state and local regulations. The policy cites EPA and CDC guidelines as references.

The Navy has issued policy statements on the disposal of infectious waste by ships at sea. These statements provide that under normal circumstances, infectious waste is to be autoclaved and incinerated aboard ship if such a capability exists or retained on board until it can be transferred to a shore facility for disposal in accordance with any applicable local, state, or federal requirements. If retention of potentially infectious wastes would endanger the health or safety of crewmembers, create an unacceptable nuisance condition, or compromise combat readiness, the material may be dumped overboard if properly packaged and weighted so it will sink. However, under no circumstances is infectious waste to be dumped overboard within 50 miles of land.

The individual facilities are responsible for handling and disposing of their own infectious waste. At the time of our review, the Navy did not require its facilities to collect or maintain data on the volume or cost associated with the disposal of infectious waste. Under the new policy,

the Navy medical facilities are required to maintain data on the amounts of infectious waste generated and the means of disposing of it. All the Navy facilities we visited had written policies and procedures for handling infectious waste. Following, based on our observations during site visits, interviews with facility officials, and our review of the facilities' written procedures, are the specific procedures required by the naval facilities we visited.

Navy Environmental and Preventive Medicine Unit

This naval facility, which is located in Norfolk, Virginia, consists of two laboratories that deal with air and water quality and public health microbiology testing. The small amount of infectious waste generated by the laboratories is separated at the point of origin, placed in red biohazard bags, and refrigerated until autoclaved. An autoclave is located in one of the laboratories and is used twice a week to dispose of the laboratories' infectious waste. Contaminated sharps are placed in puncture-resistant containers. Blood and the sharps containers are handled the same as other infectious waste. After autoclaving, the waste is disposed of in a municipal landfill with general waste.

All laboratory technicians are given an orientation course, and training courses are offered where the handling and disposal of infectious waste are covered. Hepatitis B vaccinations are required for all active duty laboratory workers and offered free to all other laboratory workers.

Monitoring of the infection control program in the laboratories is the responsibility of the Navy Environmental Health Center in Norfolk.

The unit estimates that it collects 10 to 15 pounds of infectious waste per week. Information is not available on the cost of disposing of this waste.

Newport Naval Hospital

The Navy's Newport hospital, located in Newport, Rhode Island, is a 106-bed facility that has about 160,000 outpatient visits and performs about 480,000 diagnostic tests per year. It had 36 inpatients at the time of our visit. The hospital also has an outpatient clinic in South Weymouth, Massachusetts.

The hospital's definition of infectious waste is basically the same as recommended by EPA. The hospital does not have animals and animal bedding, dialysis waste, or discarded equipment. Patient care supplies, such

as gloves and bandages, are not considered infectious unless contaminated by blood.

Infectious waste is segregated at the point of origin and, except for sharps and waste generated by the diagnostic laboratory, is placed in red biohazard bags and taken to a basement corridor, where it is stored in covered carts. The waste is double-bagged and boxed daily by housekeeping staff and stored in a freezer provided by a contractor. Infectious waste from the diagnostic laboratory is handled the same as other infectious waste except that laboratory personnel rather than housekeeping staff box it. Full sharps containers, which are puncture-resistant, are taken by health care staff to the laboratory, where laboratory personnel put them in the infectious waste boxes. The waste is picked up by a contractor once a week. The contractor transports the waste to its incinerator in Lawrence, Massachusetts, for incineration.

Both health care staff and housekeeping staff attend orientation courses when hired. Mandatory refresher courses that address the handling of infectious waste are provided annually. In addition, universal precaution courses that inform the staff about hepatitis and AIDS are also available. The hospital offers free hepatitis B vaccine to all health care and housekeeping staff.

Monitoring of the hospital's infectious waste program is done by hospital staff during their daily activities.

The contractor is paid $35 for each box removed. In fiscal year 1988, about 960 boxes were removed, which would have cost about $33,600. The contractor provides the bags and boxes. The contractor also provides the freezer unit, for which he is paid an additional $275 per month.

Portsmouth Naval Hospital

The Portsmouth Naval Hospital, in Portsmouth, Virginia, is a 501-bed facility that had over 487,000 outpatient visits during fiscal year 1987 and an average inpatient census of 368. The Portsmouth hospital defines infectious waste as waste originating from the diagnosis and treatment of people with documented or suspected infectious diseases. The hospital basically uses EPA's definition of infectious waste and uses five broad categories, which include microbiological waste, blood and blood products, pathological waste, contaminated sharps, and isolation waste.

Infectious waste is segregated in red bags at the point of origin. Corpsmen are responsible for removing the red bags from the rooms and placing them in burn boxes. The boxes are then labeled and carried outside to the hospital's loading dock and placed in a refrigerated trailer. Patients' body fluids are treated as infectious in accordance with CDC's universal precautions. Bulk blood is poured down the drain to a sanitary sewer. Sharps are placed in puncture-resistant containers, which are removed when almost full, then sealed and boxed for transport and incineration. When the refrigerated trailer is full, it is taken to a contractor's facility about 15 miles away, where the waste is incinerated.

All health care workers receive a general orientation course when hired, and training courses are given monthly that involve the handling of infectious waste. Refresher courses are offered on an ongoing basis. Special programs offered include annual AIDS sessions and lectures on universal precautions that include hepatitis B and AIDS. In addition, hepatitis B vaccinations are offered free to all workers and are mandatory for all health care staff.

There is little if any state or local monitoring performed on a regular basis. The Portsmouth hospital does periodically perform in-house monitoring of its infectious waste handling operation.

Before May 1988, the hospital had disposed of its infectious waste by on-site incineration, but because the facility failed to fully meet Virginia pollution requirements, the incinerator was shut down. From that time until March 1989, the facility contracted for infectious waste disposal services. During the first quarter of fiscal year 1989, the contract provided for the contractor to be paid a fixed fee of $12,800, or $4,267 per month, for the removal of an estimated 40,000 pounds of infectious waste. At the time of our visit, the hospital had plans to install an autoclave capable of sterilizing all the hospital's infectious waste. We were later informed that the hospital began using the autoclave on March 1, 1989, and from now on infectious waste, after treatment, will be buried in a municipal landfill.

Quantico Naval Medical Clinic

The Quantico Naval Medical Clinic, located at the Marine Corps Base in Quantico, Virginia, including its three satellite units, handles about 120,000 outpatient visits annually. In addition, it performs an estimated 15,000 to 20,000 diagnostic tests per month. The Quantico clinic defines infectious waste as waste that in all probability contains pathogenic

agents that because of their type, concentration, and quantity, may cause disease in a person exposed to these agents. To the extent it has such waste, the clinic classifies its waste as infectious as recommended by EPA. The clinic does not have isolation waste, pathological waste, animals and bedding, patient care supplies from a surgical suite, autopsy, dialysis unit, or general ward.

The Quantico clinic segregates infectious waste at the source. Infectious waste, including blood, is collected in red biohazard bags, which are placed in boxes when full and refrigerated in the clinic's walk-in freezer. Sharps are placed in puncture-resistant containers, which are sealed and placed in boxes when full. At the time our visit the waste, estimated to average 30 boxes per week weighing 20 pounds each, was being taken to the Bethesda, Maryland, Naval Hospital, where it was consolidated with infectious waste from that hospital and other area facilities. We were later advised by Navy officials that the Quantico clinic discontinued taking its infectious waste to Bethesda because of changes in Maryland's medical waste regulations. Now, the DeWitt Army Hospital's waste handling contractor picks up and disposes of Quantico's infectious waste.

During fiscal year 1988, the Bethesda hospital contracted with three firms on a rotating basis to pick up, transport, and incinerate the waste. The cost to dispose of the waste ranged from $4.67 to $5.40 per box. In fiscal year 1989, the Bethesda hospital is paying $18,500 per month regardless of the amount of infectious waste generated.

Both patient care staff and laboratory workers attend orientation courses when hired and receive annual training on infection control and infectious waste handling and disposal. Special programs, which include hepatitis B and AIDS reviews, are also offered. Hepatitis B vaccinations are offered free to all health care and housekeeping staff.

The clinic has no special Navy or internal monitoring of its infectious waste disposal. The facility uses a designated officer to monitor, on a biweekly basis, overall facility operations, including infectious waste handling and disposal.

Department of Veterans Affairs

The Department of Veterans Affairs (VA) operates 172 hospitals and 61 independent or satellite outpatient clinics. All 172 hospitals provide inpatient care and outpatient services, 119 provide nursing home care, and 16 provide domiciliary care. VA also operates one independent domiciliary. During fiscal year 1988 VA treated about 1.1 million inpatients and had over 21.5 million outpatient visits.

VA's policy requires that its health care facilities incinerate medical waste or get permission to use some other disposal method. Other than this, VA has not established mandatory infectious waste disposal policies and procedures for its facilities to follow. On September 30, 1988, VA's Department of Medicine and Surgery distributed to its facilities a Handbook for the Development of a VA Health Care Facility Waste Management Plan. This handbook provides guidelines for defining, handling, and disposing of infectious waste that are in accord with EPA guidelines. VA does not require its facilities to follow it. The manual, which uses the term "dangerous biological waste" for infectious waste, recommends that the following be classified as dangerous biological waste: isolation waste, cultures and stocks of infection agents and associated biologicals, human blood and blood products, pathological wastes, contaminated sharps, wastes from surgery and autopsy, miscellaneous laboratory wastes, dialysis unit wastes, and contaminated equipment.

VA headquarters does not routinely monitor the manner in which its facilities carry out their waste disposal responsibilities. However, on January 8, 1988, VA's Office of Inspector General reported on the results of a review of allegations of improprieties at the VA medical center in Little Rock, Arkansas, including an allegation that infectious waste was being handled improperly. The Inspector General reported that infectious wastes were not always properly identified, packaged, and treated because medical center policy was not entirely consistent with EPA guidelines and because personnel were unaware of, or overlooked, pertinent criteria.

The auditors observed laboratory personnel placing noninfectious waste in bags that should contain only infectious waste. One cart to be used only for transporting infectious waste contained red, yellow, and clear bags, and another contained all clear bags.

On one occasion they observed that trash fell onto the floor of a corridor from a trash cart being taken to the trash dumpster. Contents of

crushed clear bags, including blood, glass vials, and plastic tubes containing blood, were spilled. The cart contained crushed red and yellow bags and a crushed box containing discarded needles.

On another occasion they observed at least nine red infectious waste bags that had been compacted and placed in the trash dumpster for disposal in a landfill. On yet another occasion they observed a dumpster containing crushed red, yellow, and clear bags and needle boxes. Many of the clear bags contained blood and urine. Blood and other fluids were on the floor of the dumpster.

All of the VA facilities we visited had written policies and procedures for handling infectious waste. Following, based on our observations during site visits, interviews with facility officials, and our review of the facilities' written procedures, are the specific procedures required by the facilities we visited. VA does not maintain agencywide data on the quantity of infectious waste generated or the cost of disposing of it.

Albuquerque Medical Center

VA's medical center in Albuquerque, New Mexico, is a 512-bed hospital that in fiscal year 1988 had an average daily inpatient census of 311, had 196,000 outpatient visits, and performed 1.3 million diagnostic tests.

Albuquerque Medical Center's definition of infectious waste is based on EPA and CDC guidelines. Waste from isolation patients is considered infectious for respiratory, contact, or strict isolation patients (nurses may request red bags for other patients if they desire). Since the medical center has only minute quantities of vaccine, it is disposed of in the general trash. Contaminated broken glass is not classified as infectious, but the microbiology laboratory does incinerate its broken glass and thus it is handled the same as if it were classified as infectious. Blood-soaked patient care supplies in the general ward and outpatient clinics are placed in special purpose plastic bags, sealed, and disposed of in general waste.

Infectious waste, other than sharps, is placed in red bags at the point of generation. There is a red bag in a central location in the intensive care unit if nurses feel an item should be disposed of as infectious waste. Sharps are placed in puncture-resistant containers.

Hospital officials advised us that microbiology waste and blood specimens from the diagnostic laboratory are autoclaved. When we visited

the hospital, however, the only material being autoclaved was blood. Autoclaved material, red bags, and sharps containers are picked up daily by housekeeping staff and taken to a dumpster in the back of the hospital. The dumpster is red and is marked "Infectious Waste Only." Engineering staff then take the dumpsters by forklift to the incinerator.

Both health care staff and waste handlers attend orientation courses when hired, annual training on infectious waste handling, and periodic universal precautions, hepatitis B, and AIDS reviews. Hepatitis B vaccinations are offered free to all employees.

The only state and local monitoring of the facility's infectious waste disposal was a city inspection of the incinerator when it was installed in 1983. The state of New Mexico has draft regulations on infectious waste disposal, but these had not been finalized at the time of our visit.

There has been no independent VA or internal hospital monitoring of infectious waste disposal. The infection control practitioner makes rounds of the wards two times per week and also notes any problems in the course of daily activities.

The facility estimates that it burns 1,200 pounds of infectious waste per day at a cost of 6.4 cents per pound. The estimate includes fuel and labor.

Asheville Medical Center

VA's medical center in Asheville, North Carolina, is a 535-bed hospital and 82-bed nursing home that in fiscal year 1988 had an average inpatient census of 315 and 78 nursing home patients, had 88,000 outpatient visits, and performed 1.2 million diagnostic tests.

Asheville Medical Center's definition of infectious waste is based on EPA guidelines. Wastes from patients in isolation and patient care supplies are classified as infectious only if contaminated with body fluids. Also, although animal carcasses and bedding and contaminated equipment are not considered infectious, they are disposed of as though they were. That is, animals and small contaminated equipment are incinerated. Large equipment is disinfected and placed in a landfill. In addition, vaccine is not considered infectious waste since any unused vaccine is returned to the manufacturer.

Infectious waste is segregated at the point of origin. The intensive care unit, isolation rooms, and special procedures rooms always have closed

trash cans with red bags. In other areas, nurses request a garbage can and red bag from housekeeping if they feel it will be needed. On the general ward, if a red-bag can has not been requested, but the nurse feels some patient waste should be considered infectious (for example, an especially bloody bandage), the nurse will take the item to the red-bag can in the storage room used for infectious waste.

Once the infectious waste, including blood, is segregated into the red bags, the bags are removed by housekeeping staff and taken to a storage room on the ward. The storage room contains a covered red garbage can on wheels that is lined with a red bag. Housekeeping staff tie and tape this second red bag when it is full and transport it to the basement storage room. Housekeeping staff then take the bags to the incinerator. No blood is to be dumped down the sink. Used transfusion blood bags are sent back to the laboratory, which then sends them to the incinerator. The diagnostic laboratory also segregates infectious waste at origin and places it in tan bags labeled with the red biohazard symbol. This material is removed daily by housekeeping staff, placed in red bags, and incinerated.

Material and cultures exposed to tuberculosis are autoclaved first in the laboratory and then incinerated. Sharps are placed in puncture-resistant containers located on the wall of every patient room, on nurses' carts, and at several locations in the laboratory. When the containers are two-thirds full, they are taped shut, marked with a red label, and taken by housekeeping staff to the red-bag garbage can described above. The containers are then incinerated.

Research animals are brought by research personnel to the incinerator. Housekeeping staff are not involved in their disposal. Ash from the incinerator is sent to a municipal landfill.

Newly hired health care staff and waste handlers are given a course on universal precautions and 1-1/2 hours of instruction on infection control. Nursing staff have mandatory yearly reviews on infection control. Specialized training related to AIDS is also provided. Hepatitis B vaccinations are offered free to all employees.

The only monitoring by the state of North Carolina has been of the incinerator on a 3-year cycle. There has been no independent VA or internal hospital monitoring. The infection control practitioner makes quarterly inspections of the nursing units. In addition, the safety officer makes a monthly inspection of all units.

In the month before our visit, the Asheville Medical Center incinerated 2,115 bags and boxes of infectious waste. About half was VA waste, and the other half was waste incinerated for other facilities. To determine a reimbursement rate for waste incinerated for others, Asheville estimated its incineration cost, including fuel, labor, and depreciation on the incinerator, at $2.75 per container. Asheville does not perform tests of the emissions from the incinerator.

Boston Medical Center

VA's medical center in Boston, Massachusetts, is a 616-bed hospital that in fiscal year 1988 had an average daily inpatient census of 343 and about 159,000 outpatient visits. The medical center has a satellite clinic in Lowell, Massachusetts, that had about 26,000 outpatient visits in fiscal year 1988. Since October 1, 1988, the medical center has been given administrative responsibility for the Boston Outpatient Clinic.

The Boston Medical Center classifies waste as infectious as recommended by EPA except for unused vaccines. Also, microbiological supplies and patient care supplies in the outpatient clinic and general ward are classified as infectious if contaminated by body fluids.

All items from the operating room, isolation ward, autopsy, and dialysis wards are considered infectious waste. Material is placed in red bags in the trash can in the patients' rooms. These bags are picked up by the housekeeping staff and taken to a utility room on the ward, which has a large red container. Incinerator operators pick up the waste from the room using a closed cart and take it to the incinerator. In other patient areas, items that are considered potentially infectious are bagged and taken to the utility room by the health care staff. There is only one wastebasket in the general ward patient rooms, and that is for general trash.

All specimens, cultures, and supplies in contact with infectious material are autoclaved. After autoclaving they are no longer considered infectious and are disposed of in the general trash. Puncture-resistant sharps containers are located in patient rooms and are incinerated when full. Glass items are autoclaved and disposed of in the general trash since glass adversely affects the incinerator's lining. Equipment contaminated with infectious material is decontaminated by washing with detergent and put in the general trash. Blood may be poured down the sink. If it is a specimen, however, the blood is autoclaved with other cultures and specimens.

For training, newly hired nurses attend an orientation program. In addition, annual in-service reviews (about 2 hours long) include discussion of infectious waste disposal. Informal presentations are also held on the wards. Waste handlers are trained by the Building Management Service and also attend yearly in-service reviews. Hepatitis B vaccinations are offered free to all waste generators and waste handlers.

We were informed that incinerator emissions are monitored "daily" by the state. A state inspector passes by the medical center on his way to work. Anytime he feels there is too much smoke he stops at the hospital. There is no other state, city, or VA monitoring of the medical center's waste disposal. There are no formal internal audits relating to the treatment and disposal of infectious waste.

The medical center did not have data available on the amount of infectious waste generated or the cost of disposal.

Boston Outpatient Clinic

VA's Boston Outpatient Clinic, located on Court Street, had about 195,000 outpatient visits in fiscal year 1988. It performs about 132,000 diagnostic tests per year. The clinic was independent, and thus not under the administrative jurisdiction of other VA facilities until October 1, 1988, when it was placed under the jurisdiction of VA's Boston Medical Center. An alcohol and drug outpatient clinic on Lincoln Street is associated with the Court Street clinic. The only infectious waste from the Lincoln Street clinic—sharps—is sent to the Court Street clinic for disposal.

The Boston Outpatient Clinic does not have isolation waste, pathological waste, animals and bedding, or patient care supplies from surgery, autopsy, dialysis unit, or general ward. Other than these items, the clinic's definition of infectious waste is the same as recommended by EPA except for vaccine. Unused vaccine is dumped down the sink. The vials that held the vaccine, however, are handled as though they were infectious. In addition, although cultures are considered infectious, since the culture specimens are sent to the Boston Medical Center, there is no waste.

Bulk blood is poured down the sink. Sharps are collected in puncture-resistant containers and, when full, taken to the diagnostic laboratory, where the containers, together with waste from the laboratory, are bagged and boxed by laboratory personnel. Other infectious wastes are

placed in biohazard bags at the point of generation, taken to the basement by housekeeping personnel, and stored in plastic carts. This waste is double-bagged and sealed in boxes. The closed boxes are stored in the basement until picked up by a contractor each Friday. The contractor incinerates the waste and deposits the ash in a landfill.

The area in which the boxes are stored is immediately behind the desks of two employees. Our tour took place the day before the scheduled contractor pickup. We noted no observable odor but did note general trash (coffee cups, etc.) in the infectious waste bags.

Service chiefs provide training to their staff on the handling of sharps and other infectious waste. There have been 26 sessions in the past 2 years for all staff on universal precautions, AIDS, and hepatitis B. Hepatitis B vaccinations are offered free to all health care staff. Waste handling is contracted out through the General Services Administration, which handles all training.

The clinic has no formal internal monitoring of infectious waste disposal. In the course of their daily activities, the infection control practitioner and the safety officer watch for problems. There is no state, city, or agency monitoring.

The outpatient clinic's fiscal year 1989 contract to remove and incinerate the clinic's infectious waste provides for the contractor to provide the bags and boxes and to be paid $31.95 per box. The estimated quantity is 10 boxes per week, or 520 per year. Although the boxes are rated to hold 80 pounds, the actual weight would probably be less.

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