UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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QUESTIONNAIRE ON HOSPITAL WASTES MANAGEMENT

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I. Definition/Classification of Medical Waste

1. Is there a definition or medical waste in your country?

Yes.

2. If yes, specify the definition.

Currently, there is no single Federal definition of medical waste in the United States (U.S.). While several Federal agencies (Department of Transportation, Occupational Safety and Health Administration, United States Postal Service) regulate the management of medical waste, they do not provide a definition for medical waste. The regulation of medical waste is currently being accomplished primarily at the state level. States have varying definitions of medical waste but most state definitions closely resemble the definition used by the U.S. Environmental Protection Agency (EPA) during its 2-year Demonstration Program.

In November, 1988, the U.S. Congress enacted the Medical Waste Tracking Act, requiring EPA to establish a Demonstration Program to track medical waste, and provide information to Congress on medical waste sources and management. Under the Medical

Waste Tracking Act, Congress provided EPA with the following specific definition of medical waste:

> waste" means any solid waste which is generated in the diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. The term does not include any hazardous waste identified or titled under Subtitle C [of the Resource Conservation and Recovery Act] or any household waste as defined in regulations under Subtitle C.

Congress also required EPA to list the types of medical waste that would be subject to the Demonstration Program's requirements. EPA listed seven categories of medical waste which were designated Regulated Medical Wastes. Table 1 provides a description of these wastes. Recently, EPA reexamined the list of Regulated Medical Waste to determine if the list accurately identified the waste types or categories that pose a significant potential risk to human health or the environment if exposure were to occur. As a result of this assessment, EPA is also considering two new waste types on the basis of their potential hazards. These waste types are cytotoxic wastes and low-level radioactive wastes, as defined below:

- Cytotoxic Wastes -- Seven cytotoxic drugs are listed as hazardous under the Resource Conservation and Recovery Act due to toxicity and ability to cause mutagenic and teratogenic effects when discarded or spilled. These include: melphalin, streptozotocin, uracil mustard, daunomycin, chlorambucil, mitomycin C, and cyclophosphamide (40 Code of Federal Regulations §261.33). Cytotoxic drugs are considered hazardous when discarded or spilled. However, there are more than 50 Food and Drug Administration-approved cytotoxic drugs that are similar in structure and mechanism to those listed as hazardous wastes.

- Low-level Radioactive Wastes -- Wastes containing low-level radiation from medical procedures to visualize and monitor the function of animal and human body organs and systems, and to treat conditions or diseases requiring the destruction of diseased or malfunctioning cells, tissues, or organs.

II. Epidemiological Significance

1. Have there been any reported cases of infection caused by improperly managed medical waste?

Yes

Table 1. Definition of Waste Types

WASTE TYPE	DEFINITION

Isolation Wastes

Biological waste and discarded materials contaminated with blood, excretion, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

Cultures and Stocks

Cultures and stocks of infectious agents and associated biologicals, including cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

Sharps

Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and coverslips.

Human Blood and Blood Products

(1) Liquid waste human blood; (2) products of blood; (3) items saturated and/or dripping with human blood; or (4) items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.

Animal Waste

Contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals, or testing of pharmaceuticals.

Unused Sharps

The following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

2. If yes, specify the type of diseases (Hepatitis B, Human Immunodeficiency Virus, Cholera, etc.) and the circumstances under which infection took place (hospital, transportation, general public)?

According to the Agency for Toxic Substances Disease Registry (reference is provided on the following page) the scientific literature reports only one case of infection possibly

associated with the management of medical waste sharps. In this case, a hospital housekeeper developed staphylococcal bacteremia and endocarditis following a needle injury. Estimates have been made, however, of the number of persons infected with the Human Immunodeficiency Virus and Hepatitis B Virus. It is important to note that the following are probability estimates based on reported surveys or studies. Therefore, an estimate of "less than one" means that the probability is very low. These estimates are as follows:

1. A maximum of 1-4 cases of acquired immunodeficiency syndrome cases per year are estimated to occur in health care workers as a result of contact with medical waste sharps. This number is expected to increase as the numbers of patients having the human immunodeficiency virus increases. This estimate is the total of cases estimated for each of the following occupations: physicians, licensed practical nurses, laboratory workers, hospital engineers, emergency medical personnel, dentists, dental assistants, registered nurses, and refuse workers.

2. A maximum of approximately 162-321 hepatitis B infections and 81-160 hepatitis B disease cases are estimated to occur annually as a result of contact with medical wastes.

3. In non-hospital employees, the estimated numbers of cases of hepatitis B infections by occupational category are as follows: registered nurses, 36-65; licensed practical nurses, 20-31; emergency medical personnel, 24; refuse workers, 1-15; dental assistants, 5-8; physicians, 1-3; and dentists, less than 1. Approximately half of these cases would be expected to result in disease.

4. For hospital employees, the estimated numbers of hepatitis B infections expected to occur annually are as follows: janitorial and laundry workers, 23-91; registered nurses, 20-36; hospital engineers, 24; laboratory workers, 2-15; licensed practical nurses, 6-9; and physicians, dentists, and interns, less than 1. Approximately half of these cases would be expected to result in disease.

3. Do you have any references on the epidemiological significance of medical waste? If so, please attach.

The information provided above for the questions on epidemiological significance was taken from the following document (A copy of the executive summary of this document is included as Attachment 6).

Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Public Health Service. 1990. The Public Health Implications of Medical Waste: A Report to Congress.

4. Please summarize the problems caused by medical waste in your country.

During the summers of 1987 and 1988, medical wastes, including needles, syringes, bandages, and vials, washed ashore on beaches along the Eastern Seaboard. Concern over the potential health hazards associated with these wastes forced beaches in many of the affected areas to close, resulting in billions of dollars in lost tourist revenues. In addition to the beach wash-ups, there were other reports of medical waste mismanagement including disposal in open dumpsters and other illegal or unsafe practices, creating additional concern for public safety.

Costs

In the First Interim Report to Congress, EPA estimated the annual compliance costs of the 2-year Demonstration Program at about $12 million. The results of this preliminary study indicated that the two major generators -- physicians' offices and hospitals -- together accounted for over one-sixth of total compliance costs. EPA also estimated that all generators, including hospitals and physicians' offices, accounted for about 70 percent of the total costs of the tracking rule, with the remaining costs divided between transporters and disposers.

The appearance of wastes on Long Island (New York) beaches led to a dramatic decrease in beach attendance and tourism in general at the time the Medical Waste Tracking Act was enacted. In 1987, the estimated annual beach attendance was about 17.6 million people. In 1988, this figure decreased to 12.1 million, the lowest in 20 years. In 1987, the estimated total number of tourists (including beachgoers) was about 25.5 million people. In 1988, this figure decreased by 18 percent (a reduction of about 4.6 million tourists - note that non-beach tourists increased slightly), from 25.5 to 20.9 million.

The beach wash-ups of 1988 caused a significant decline in the recreational fishing industry. The New York State Department of Environmental Conservation reported a 25 to 50 percent reduction in anglers fishing on party boats, resulting in a total loss to New York and New Jersey of about $1.4 billion. This includes a loss in consumer surplus (the benefit to the recreational fishermen) of $280 million, and a reduction in direct expenditures (lost revenues to local businesses and communities) of $560 million. With the multiplier effect, the total loss is roughly $1.4 billion, with an accompanying decline in employment of roughly 20,000 jobs.

A study of the economic impact on the Long Island seafood industry found that dockside prices declined 30-40 percent for some key species landed by New York commercial fishermen and that annual sales for selected seafood retailers declined by about 17 percent in 1989. A second report estimated the economic impact on the commercial fisheries of New York at $26.9 million. This report cited public fear of contaminated waters, aggravated by the appearance of medical waste, as the primary reason for this decline in the seafood industry.

Health Risks

When medical wastes are managed properly, the risks to human health and the environment is relatively low. However, due to the possibility of infection (especially of Human Immunodeficiency Virus and Hepatitis B) even this low risk level is cause for concern and has led to continued concern by the general public and State and Federal agencies.

The Agency for Toxic Substances and Disease Registry estimated that the potential Human Immunodeficiency Virus infection rate <1 infection was expected annually from exposure to medical waste for the occupational subgroups: physicians, licensed practical nurses, laboratory workers, hospital engineers, emergency medical personnel, dentists, and refuse workers. The Agency for Toxic Substances and Disease Registry estimates that contact with medical waste accounts for between 0.05 and 0.1 percent of Hepatitis B Virus infections and of hepatitis B clinical cases occurring annually in the United States respectively.

Based on the epidemiologic data analyzed in the report, the Agency for Toxic Substances and Disease Registry reached a number of conclusions on the health effects of medical waste. The primary conclusion reached by that agency was that the general public's health is not likely to be adversely affected by medical waste generated in the traditional health care setting. Two principal opportunities for the general public to contact medical waste could occur from medical waste generated in the home setting and from discarded items from illicit intravenous drug users improperly discarded equipment.

On the other hand, the Agency for Toxic Substances and Disease Registry concluded that occupational health concerns do exist for all health care workers including janitorial and laundry workers, nurses, emergency medical personnel, and refuse workers, based on estimates of the number of medical waste related Human Immunodeficiency Virus and Hepatitis B Virus infections and disease cases.

Management Problems

The potential danger of medical waste necessitates proper handling, treatment and disposal. Various Federal, State and independent organizations have developed detailed guidelines and regulations on these areas. However, these procedures are not always followed, which could lead to unnecessary incidents of infection from medical waste.

The EPA has learned from surveying representatives from States regulating medical waste, that instances of mismanagement still exist. The introduction of legislation at the State level, however, has heightened awareness and lessened instances of mismanagement.

Aesthetic Concerns

The general public has an inherent aversion to the sight of medical waste. This concern effected beach closings. The Agency for Toxic Substances and Disease Registry data suggests a minimal health risk from beach wash-ups of medical waste, yet the public abhorrence of medical waste requires communities to quickly remove any wastes which wash-up on the beaches and dispose of them out of the public view.

III. Treatment and Disposal

1. How is medical waste treated and disposed of in the U.S.?

Various options exist for the disposal of medical waste. Listed below are the most common options for hospitals in the U.S. Each state, however, may have certain restrictions concerning the disposal of medical waste. Generators and transporters of medical waste must obey the regulations in their state.

Currently, forty-seven states[1] require that medical waste be adequately treated prior to disposal. Two states have proposed treatment requirements and one recommends treatment through policy guidelines. Treatment is defined in different ways; it is commonly set out as a performance standard that generally requires altering the physical, chemical, or biological nature or characteristics of the waste to render it non-infectious or incapable of causing or transmitting disease. The majority of states specify the types of treatment that are generally acceptable (i.e., steam or chemical disinfection, other approved methods).

Once medical waste is treated, most states view it as solid waste and allow it to be landfilled. Some states require that a landfill must be approved to manage treated medical waste (e.g., Pennsylvania). Additional requirements apply to the disposal of sharps and liquid medical waste. Sharps may require special treatment and/or packaging prior to landfilling. For example, in California sharps must be incinerated (i.e., destroyed) or rendered non-infectious and encased in a solid or semi solid material prior to landfilling. Such requirements are typical among the states. Liquid medical waste, in most cases, can be discharged to a sewer system connected to a publicly owned treatment works provided that any such discharge is in compliance with the general and specific Federal pretreatment requirements as well as any applicable local discharge restrictions. Liquid wastes are often banned from landfill disposal under state medical waste and general solid waste rules. Some states do, however, allow liquids to be landfilled following treatment.

- Chemical Disinfection. Encapsulation. and Grinding: Microbial inactivation by chemical agents is usually employed as an on-site treatment technology. It is either used alone, in combination with mechanical destruction, or with substances used to encapsulate wastes. Chemical treatment is used in small clinics and doctor's offices to treat medical wastes prior to disposal in the trash. Wastes such as tongue depressors,

[1] The term "states," as used here, includes Puerto Rico and the District of Columbia.

throat swabs and syringes are added during the work day to a container of chemical solution which renders the waste noninfectious. At the end of the day, the liquid is disposed in the sanitary sewer and the solids are disposed in the trash.

A combination chemical disinfection/encapsulation system involves the use of a special sharps disposal container that includes a dry antimicrobial agent. Once the container is filled with waste, water is added along with a catalyst. An exothermic reaction occurs, generating enough heat to inactivate microorganisms and forming a polymer that encapsulates the waste inside the container.

Other materials have been proposed to encapsulate medical wastes after chemical treatment, including buff dental stone and polysaccharide gel. Tests performed on these containers revealed that they do not survive compaction In addition, the encapsulation material adds to the weight of the waste stream, thereby increasing disposal costs.

Combination chemical/mechanical systems render the waste both unrecognizable and noninfectious. The chemical agent most commonly used in such devices is a dilution of sodium hypochlorite (common household bleach). Bleach is inexpensive to use and is therefore the most commonly used chemical microbial agent for medical waste treatment systems. Chemical disinfection is appropriate for all medical wastes except large or recognizable body parts, animal carcasses, radioactive wastes, and cytotoxic wastes.

- Steam Autoclaving: Steam autoclaving is widely used in the United States for medical waste treatment. This process, which combines the effects of heat, increased pressure and moisture to inactivate microorganisms, has been used for sterilizing medical instruments and treating medical waste in laboratories and hospitals for many years. It is appropriate for all medical wastes except large or recognizable body parts, bulk blood, animal carcasses, radioactive wastes and cytotoxic wastes.

- Gamma Irradiation: Gamma irradiation inactivates microorganisms by hydrolyzing water molecules within the microorganisms, inactivating the organisms and making it impossible for them to reproduce. Gamma irradiation is used in the sterilization of heat-sensitive disposable medical supplies. It was used at one facility in the United States for several months, but is not currently being used.

  Gamma irradiation is appropriate for all medical wastes except large or recognizable body parts, animal carcasses, radioactive wastes, and cytotoxic wastes. The end product is treated, shredded solid waste that may be disposed in a sanitary landfill. There is no residual liquid or gaseous waste produced.

- Microwave Irradiation: Two types of microwave irradiation treatment systems are used to treat medical waste in the U.S. Bench-top microwave ovens are used to treat small quantities of medical waste generated in clinical or research laboratories, and special purpose microwave treatment devices developed specifically for medical

waste treatment are used in large tertiary care hospitals or commercial waste treatment facilities. The special purpose devices incorporate a destruction process with antimicrobial activity. The waste is subject to grinding, steam spraying, and microwaving all in the same unit. Microwaving is appropriate for all medical wastes except large or recognizable body parts, animal carcasses, large metal items, radioactive wastes, and cytotoxic wastes.

- Radio Frequency Irradiation: Also known as dielectric heating, radio frequency irradiation involves heating the waste to a desired temperature by exposing it to high strength, low frequency short-wave radio frequency radiation. The heated waste is then stored to maintain the elevated temperature for four hours. The end product may be disposed in a sanitary landfill or recycled as refuse-derived fuel.

  There are only a few facilities currently offering this treatment technology in the United States. Customers must segregate infectious wastes from all other wastes, and only the infectious waste portion is subjected to this treatment technology. Radio frequency irradiation is appropriate for all medical wastes except large or recognizable body parts, animal carcasses, large metal items, radioactive wastes, and cytotoxic wastes.

- Incineration: Incineration of medical waste solids can significantly reduce the quantity of medical waste that must be disposed in landfills, thus reducing the risk to waste disposal workers and the general public. It should only be used when the incinerator units are in good working condition, are retrofitted with pollution control devices, and are properly operated and maintained. Trends we have observed in the U.S. show that older medical waste incinerator units are consistently maintained in poor condition and ash quality is poor (there are many intact items in the ash). The destruction efficiency of the incineration process is still under evaluation.

- Sewer Disposal for Liquid Wastes: Sewer disposal is one way to reduce the amount of medical waste that must be transported off site for treatment or disposal. It is commonly used for blood and body fluids, ground pathological tissues, dialysate, and some laboratory fluids. Disposal of liquid medical waste in sewer systems should only be followed when the sewage is treated at a treatment facility to render the waste noninfectious.

- Landfilling: Landfilling is used in the United States for the final disposal of many types of solid medical waste, including treated glassware, containerized sharps, boxed animal carcasses, packaged blood-soaked materials, incinerator ash, and treated, boxed cultures and stocks. Open dumping is prohibited in the United States, due to the risk of exposure to humans and animals in vicinity of the dumping site as well as the potential contamination of water and air from the waste. Only sanitary landfills, which include liners and covers, are used for the disposal of medical waste.

2. Are there any guidelines or regulations particular to the incineration of medical

waste?

EPA is currently drafting new source performance standards for new medical waste incinerators and guidelines for existing incinerators. These new regulations and guidelines will establish the emission and operating standards for incinerators that burn medical waste. The new source performance standards will specify numerical emission limitations for such substances as hydrochloric acid, metals, and dioxins. The standards must not be less stringent than the emission control achieved in practice by the best controlled similar unit. The emission guidelines for existing medical waste incinerators are being designed to prevent significant deterioration. EPA is also developing a model state program for the training and certification of medical waste incinerator operators. The draft rules and guidelines are expected to be proposed in 1993 with final rules in 1994.

3. What handling practices are used in the U.S.?

Medical waste handling practices are designed to protect individuals from the potential for infection with disease-carrying pathogens transmitted via medical waste. For such a pathogen to enter an individual, replicate, and cause harm, there must be a sufficient quantity and virulence of a pathogenic organism; a portal of entry, including inhalation, direct contact, or oral transmission; and a susceptible host. Proper handling practices seek to prevent a portal of entry, thereby minimizing the possibility of infection.

The handling practices typically used by medical waste generators and transporters are those recommended or required by a range of Federal and state agencies and private organizations, including the EPA, the Occupational Safety and Health Administration, the Centers for Disease Control, the National Institutes of Health, and the Department of Transportation. These handling practices are somewhat standard throughout the country because they are implemented in response to Federal regulations or guidance. Treatment and disposal practices for many of the waste types, however, are presently governed only by state laws, and therefore vary depending on the state in which the waste is treated and disposed (cytotoxic wastes and low-level radioactive wastes are the exceptions; they are governed at the Federal level). The majority of states require that medical wastes be treated by thermal or chemical inactivation prior to disposal in a landfill, but a few states allow untreated wastes to be disposed in landfills. An overview of the typical handling practices is provided below:

- Isolation Wastes: Isolation wastes are contained in closed, leak-resistant containers labeled with a fluorescent biohazard symbol or color-coded by red bags or red containers. If the wastes could puncture the primary container, then a secondary container is also used. For fluids in quantities greater than 20 cubic centimeters, containers that are tightly lidded and stoppered are used. Containers used to transport isolation wastes off site are also rigid and strong enough not to tear or burst under normal conditions, and accompanied by shipping papers. If isolation wastes are mailed to treatment and disposal facilities, the packaging includes absorbent

materials.

In some states isolation wastes are incinerated; in others they are landfilled.

- Cultures and Stocks: Cultures and stocks are contained in closed, leak-resistant containers labeled with a fluorescent biohazard symbol or color-coded by red bags or red containers. If the wastes could puncture the primary container, then a secondary container is also used. For fluids in quantities greater than 20 cubic centimeters, containers that are tightly lidded and stoppered are used. Containers used to transport waste cultures and stocks off site are also rigid and strong enough not to tear or burst under normal conditions, and accompanied by shipping papers. If cultures and stocks are mailed to treatment and disposal facilities, the packaging includes absorbent materials.

  Depending on the state in which the waste is located, the waste is either landfilled, autoclaved and then incinerated (to reduce its volume and render it unrecognizable), or just incinerated.

- Sharps (used and unused): Sharps are placed in closed, puncture-resistant, leak-proof, labeled and color-coded containers. During use, sharps containers are easily accessible, maintained upright, and not overfilled. When transported, if leaking is possible, containers are placed in a secondary closable, leak-proof container labeled with the fluorescent biohazard symbol, or color-coded by red bags or containers.

  In some states the sharps wastes are landfilled; in others they are incinerated. In states where landfilling is conducted, sharps wastes are not compacted prior to landfilling as the wastes often contain residual fluids.

  Containers used to transport sharps wastes off site are also rigid and strong enough not to tear or burst under normal conditions, and sometimes accompanied by shipping papers. Sharps containers with less than 50 milliliters of liquid are sometimes mailed to treatment and disposal facilities. Mailed sharps are packaged in secondary containers that are water-tight, and must be accompanied by a tracking form.

- Human Blood and Blood Products: Human blood and blood products are contained in closed, leak-resistant containers labeled with a fluorescent biohazard symbol or color-coded by red bags or red containers. If the wastes could puncture the primary container, then a secondary container is also used. For fluids in quantities greater than 20 cubic centimeters, containers that are tightly lidded and stoppered are used. Containers used to transport wastes off site are also rigid and strong enough not to tear or burst under normal conditions, and accompanied by shipping papers. If wastes are mailed to treatment and disposal facilities, the packaging includes absorbent materials.

  In many states, blood and blood products are poured down the sanitary sewer. In other states, they are packaged in cardboard boxes (for secondary containment) and

incinerated or landfilled in a sanitary landfill.

- Animal Wastes: Animal wastes are contained in closed, leak-resistant containers labeled with a fluorescent biohazard symbol or color-coded by red bags or red containers. If the wastes could puncture the primary container, then a secondary container is also used. For fluids in quantities greater than 20 cubic centimeters, containers that are tightly lidded and stoppered are used. Containers used to transport wastes off site are also rigid and strong enough not to tear or burst under normal conditions, and accompanied by shipping papers.

  In some states where isolation wastes in veterinary settings are regulated, such wastes are packaged in rigid containers and stored until transported for off-site treatment or incinerated on site. Animal carcasses are also wrapped in plastic and refrigerated or frozen until they are transported for disposal in a crematorium or medical waste incinerator. Carcasses suspected of being rabid are often incinerated or buried on site (if law allows). Noninfectious carcasses are sometimes placed in a cardboard box and cremated, shipped to a rendering plant, or otherwise disposed of.

- Cytotoxic Wastes: Wastes are packaged, labeled, tracked as hazardous waste, and disposed of in a hazardous waste landfill or incinerated in a hazardous waste incinerator, per Resource Conservation and Recovery Regulations (40 Code of Federal Regulations, Sections 261-268).

- Low-Level Radioactive Waste: Handling of radioactive waste is conducted in accordance with the Nuclear Regulatory Commission regulations. Volatile low-level radioactive waste is stored only in certain areas and containers. Decay-in-storage is conducted under certain provisions. Byproduct materials are manifested prior to transport or disposal. Before being disposed, wastes are classified based on waste characteristics, described, packaged in rigid, leak-resistant, puncture-resistant, moisture-impervious containers, strong enough not to tear or burst under normal conditions, and sealed to prevent leakage. Packaged wastes are labeled as "radioactive material". Sewer disposal is used with some restrictions. At specified low concentrations, low-level radioactive waste is handled according to its other characteristics (e.g., hazardous, medical, or solid waste).

Many types of medical waste are segregated not only from the general waste stream but also from other medical wastes in order to provide additional protection to health care workers and waste management personnel. For example, medical practitioners typically segregate and manage sharps separately from all other wastes, to avoid injury to housekeeping staff and waste management workers. Waste fluids from dialysis are usually segregated and placed in a red bag prior to collection to minimize potential employee exposure to contaminated fluids.

In some medical facilities, cultures and stocks are segregated and boxed prior to incineration. Pathological wastes typically are segregated from the rest of the medical waste stream and handled separately. Segregation is especially important in developing

countries because landfilling is more commonly used. Mixed medical wastes containing sharps and fluids could present a risk of injury and infection to landfill scavengers or children playing around waste sites.

2. Who is responsible for hospital wastes?

Any health care provider who generates a medical waste is responsible for its treatment and/or disposal. Since hospitals generate large amounts of waste, they are responsible for its safe treatment and disposal. Some hospitals dispose of their waste on-site through incineration, however, many hospital incinerators are old and do not meet new clean air standards. Therefore, more and more hospitals are sending their waste off-site for disposal, either to a sanitary landfill or to a publicly or privately owned incinerator. In either case, it is still the generator who has the ultimate responsibility to see to it that the waste is properly disposed.

3. If private contractors take care of such wastes, are there any problems?

Transporters of medical waste are usually well-established waste haulers and there have been few problems to report. Some states (15) require the tracking of medical waste through the use of shipping papers, as a means of ensuring wastes reach their ultimate destination.

The U.S. Department of Transportation regulates the interstate shipment of regulated medical waste. Prior to interstate shipment, such wastes must be packaged in rigid, leak-resistant, moisture impervious containers, strong enough not to tear or burst under normal conditions, sealed to prevent leakage, and puncture-resistant. Shipping papers must accompany each shipment, and by 1994, packages must be marked with identifying information as well as meet certain tests such as drop tests and leakproofness tests.

4. Are there any programs for the collection of needles outside of hospitals?

Certain local communities have begun programs for needle collection. For example, throughout the State of Washington, sharps containers are being distributed to home users of needles and syringes. Full containers are exchanged by residents at local pharmacies. The used sharps are then transported and disposed of by a licensed transporter. The city of San Francisco operates a needle exchange program in which syringe users, whether for legitimate diabetic treatment or for illicit drug use, can exchange used syringes for new ones at no charge.

In addition, the U.S. Postal Service allows the mailing of used needles, syringes, and unused, discarded sharps in the U.S. Mail. Special sharps mail-in services provide customers with containers, packaging instructions, mailing labels, and tracking forms. When the containers are full, they are mailed through the U.S. Mail to either the mail-in

service company or directly to a treatment or disposal facility.

LIST OF ATTACHMENTS

1. U.S. Environmental Protection Agency. 1990. Disposal Tips for Home Health Care. EPA/530-SW-90-014B.

2. U.S. Environmental Protection Agency. 1990. Handle with Care - How to Throw Out Used Insulin Syringes and Lancets at Home. EPA/530-SW-90-089.

3. U.S. Environmental Protection Agency. September 1989. Managing and Tracking Medical Wastes - A Guide to the Federal Program for Generators. EPA/530-SW-89-021.

4. U.S. Environmental Protection Agency. September 1989. Managing and Tracking Medical Wastes - A Guide to the Federal Program for Treatment, Destruction, and Disposal Facilities. EPA/530-SW-89-023.

5. U.S. Environmental Protection Agency. September 1989. Managing and Tracking Medical Wastes - A Guide to the Federal Program for Transporters. EPA/530-SW-89-022.

6. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Public Health Service. 1990. The Public Health Implications of Medical Waste: A Report to Congress, Executive Summary.

7. U.S. Congress, Office of Technology Assessment. September 1990. Finding the Rx for Managing Medical Wastes. OTA-O-459 (Washington, DC: U.S. Government Printing Office, September 1990).

8. U.S. Environmental Protection Agency. May 1990. Medical Waste Management in the United States - First Interim Report to Congress. EPA/530-SW-90-051A.

9. U.S. Environmental Protection Agency. December 1990. Medical Waste Management in the United States - Second Interim Report to Congress. EPA/530-SW-90-087A.

10. The Council of State Governments. 1992. Model Guidelines for State Medical Waste Management. Prepared under a grant from U.S. EPA, Office of Solid Waste. Council of State Governments, Lexington, Kentucky.

ATTACHMENT 1

DISPOSAL TIPS FOR HOME HEALTH CARE

ATTACHMENT 2

HANDIE WITH CARE - HOW TO THROW OUT
USED INSULIN SYRINGES AND LANCETS AT HOME

ATTACHMENT 3

MANAGING AND TRACKING MEDICAL WASTES
A GUIDE TO THE FEDERAL PROGRAM FOR GENERATORS

ATTACHMENT 4

MANAGING AND TRACKING MEDICAL WASTES
A GUIDE TO THE FEDERAL PROGRAM FOR TREATMENT,
DESTRUCTION, AND DISPOSAL FACILITIES

ATTACHMENT 5

MANAGING AND TRACKING MEDICAL WASTES
A GUIDE TO THE FEDERAL PROGRAM FOR TRANSPORTERS

ATTACHMENT 6

THE PUBLIC HEALTH IMPLICATIONS OF MEDICAL WASTE:
A REPORT TO CONGRESS, EXECUTIVE SUMMARY

ATTACHMENT 7

FINDING THE RX FOR MANAGING MEDICAL WASTES

ATTACHMENT 8

MEDICAL WASTE MANAGEMENT IN THE UNITED STATES
FIRST INTERIM REPORT TO CONGRESS

ATTACHMENT 9

MEDICAL WASTE MANAGEMENT IN THE UNITED STATES
SECOND INTERIM REPORT TO CONGRESS

ATTACHMENT 10

MODEL GUIDELINES FOR STATE MEDICAL WASTE MANAGEMENT

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