

Introduction

- Without advance notice, on March 24, 1986, the GSX waste handling company informed eight Boston, Massachusetts, hospitals that it would no longer pick up any of their hospital wastes because the area landfills would no longer accept them. For two of these hospitals, GSX did not even handle their “red bag” waste (44).
- Approximately 1,400 bags of medical waste were discovered at a warehouse by the New York City Fire Department when it responded to a fire November 24, 1986. Subsequently, the Energy Combustion Corporation and its president were indicted by the Brooklyn District Attorney’s Office for allegedly covering up this illegal dumping. The company had submitted documents to the New York State Department of Environmental Conservation stating that the wastes had been incinerated (21).
- Twelve children in Indianapolis, Indiana, played with vials of blood, two of which were infected with AIDS, that they found in a trash bin outside an HMO medical office in June 1987. It was legal for the health clinic to dispose of the wastes in the open dumpster (27).
- Five employees of the Los Angeles County-USC Medical Center filed a \$50 million lawsuit against the county after a pipe in the basement of the facility burst on July 9, 1987, and dumped possibly contaminated blood and fluids on workers. The California Occupational Safety and Health Administration has received other complaints concerning the adequacy of protection provided for employees handling medical wastes at the Center (56).
- A garbage slick nearly a mile long along the shore in Ocean County, New Jersey, on May 23, 1988, marked the first slick of the season. Needles, syringes, and empty prescription bottles with New York addresses washed upon the shore (31). New Jersey beaches closed several times last season due to such incidents. More recently, on July 6-7, 1988, 10 miles of Long Island beaches closed when medical wastes washed ashore. Throughout the summer of 1988, beaches from Maine to the Gulf of Mexico, along the Great Lakes, and elsewhere in the Nation experienced washups of medical wastes.

Recent incidents such as these have drawn attention to issues surrounding the handling, treatment, and disposal of medical wastes. Medical wastes are all the types of wastes produced by hospitals, clinics, doctor offices, and other medical and research facilities. ¹These wastes include infectious or “red bag” hospital wastes, hazardous (including radioactive) wastes, and any other general wastes. ²The Environmental Protection Agency reports that approximately 3.2 million tons of medical wastes from hospitals are generated each year, which is about 2 percent of the total municipal solid waste stream. ³Currently, most generators of medical waste designate between 10 to 15 percent of it as infectious.

Most of the non-infectious medical waste is landfilled, while most infectious waste from hospitals is incinerated. For infectious waste management, an American Hospital Association survey reported in 1983 that approximately 67 percent of U. S. hospitals use on-site incinerators, 16 percent use only autoclave (i.e., sterilization) systems and then landfill, and approximately another 15 percent use off-site treatment (9,62). The degree of risks posed by medical wastes is not known. Proper handling, treatment, and disposal of these wastes are believed to result in minimal health and environmental risks. Yet, incidents of careless or illegal disposal may pose health risks and aesthetic problems and certainly help create public apprehension over current medical waste management practices.

¹This would also include wastes from research laboratories, biotechnology firms, veterinary hospitals, funeral homes, nursing homes, etc. Most of the public and regulatory attention has been focused on hospital waste disposal; however, other sources of biomedical wastes may be equally significant. Although this paper will also tend to focus on hospitals and larger sources of medical wastes, given that there is more readily available information on these facilities, the need for assessing the importance of smaller generators of biomedical wastes is recognized.

²The terms medical wastes, hospital wastes, infectious wastes, and biomedical wastes often are used interchangeably. An attempt is made here to use these terms more precisely, i.e., the term medical wastes refers to all types of wastes produced by a hospital or any type of facility; hospital wastes refers to all wastes produced by a hospital; infectious wastes refers to that portion of a medical wastestream which has the potential to transmit disease; and biomedical wastes are the subset of medical waste which is biological in origin (e. g., blood, body fluids, tissue, etc.).

³Estimates range from 2.1 to 4.8 million tons per year. As will be discussed below, these figures do not include medical wastes from clinics, laboratories, and other sources. It is likely, therefore, that medical wastes comprise a somewhat higher—although still relatively small—percentage of the total municipal solid wastestream.

Just as the types of incidents listed above raise public concern, considerations of liability and worker safety lead some operators of municipal solid waste landfills and incinerators to ban or refuse to take any medical wastes. A number of States have banned all unsterilized infectious waste from municipal landfills.⁴ In addition, the State of Pennsylvania has imposed a one-year moratorium on the construction of any commercial medical waste incinerators.⁵ In other areas, localities as well have considered bans or moratoriums on hospital waste incinerators.⁶ In this general context, many hospitals, medical facilities, and other institutions across the country face increasingly difficult waste management problems.

The situation is complicated by an uncertain and incongruous regulatory climate. Inconsistencies exist in the Federal guidelines for States regarding definitions and management options suggested for medical/infectious waste.⁷ Currently, no Federal regulations exist that comprehensively address the *handling, transportation*, treatment, and disposal of medical waste. This would change either if the issue of medical wastes remains part of the current reauthorization effort for the Resource Conservation and Recovery Act (RCRA)⁸ or if any of a num-

ber of bills introduced in Congress relating to medical waste issues (see discussion below) pass.

Meanwhile, the States have largely been left on their own to devise medical waste management programs. This means important variation frequently exists between States, as well as between local requirements and those of a State. For example, 26 States classify infectious wastes as special wastes, 13 still classify them as hazardous wastes, and 12 classify them as non-hazardous wastes (4).⁹ Thirty-nine States have some type of regulations concerning infectious waste, at least 5 more States expect to regulate these wastes within the year; and at least 25 States expect changes to their existing regulations by next year (4).¹⁰

The purpose of this paper is to assess the adequacy of current medical waste disposal practices; the potential risks from such practices; the need for additional research and databases; and the possible need for Federal requirements for the handling, treatment, storage, and disposal of medical wastes and future cost and capacity factors as new regulations are updated. The paper is divided into five chapters:

1. Defining and Characterizing Medical Wastes;
2. Handling Medical Wastes and Potential Occupational Risks;
3. Current Technologies, Treatment, and Disposal Issues;
4. Regulatory Authority and Current Practices; and
5. Managing Medical Wastes—Institutional and Policy Issues.¹¹

⁴In some areas, if medical wastes of any sort are accepted, an inspection fee in addition to the tipping fee is charged. For example, the town of Brookhaven, New York, banned University Hospital's waste three times in a 6-month period due to alleged contamination problems. The agreement reached between the town and the hospital requires the hospital to pay \$15 per compacted load for inspection of the wastes and reserves the town's right to ban the hospital's waste if there are future violations (24).

⁵The Pennsylvania Department of Environmental Conservation had lifted a moratorium on permitting hospital incinerators in February 1988. In July the State legislature imposed a one-year moratorium on permitting new commercial hospital incinerators. The current moratorium will be lifted when the Department completes a comprehensive plan for medical wastes which is due July 13, 1989. Other States (e. g., Delaware) have or are considering similar moratoriums.

⁶Although the exact number of such landfill refusals or bans are not known, discussions with a number of individuals across the country involved with medical waste management indicate that these practices are not uncommon and appear to be increasing in frequency. E.g., references 23 and 28.

⁷As will be discussed below, the Environmental Protection Agency, Centers for Disease Control, and other Federal agencies have issued different guidelines for infectious and medical waste management.

⁸42 U.S. C. 6901 et seq.

⁹Note that the survey includes the District of Columbia; for this reason, figures add up to 51. See below for further discussion of this aspect of the definitional issue. Under RCRA, there are two general categories of wastes, each of which is subject to different regulatory requirements. These are hazardous wastes regulated according to Subtitle C, and solid (non-hazardous) wastes regulated according to Subtitle D. In addition, there is a third, non-statutory category of "special wastes" for those wastes that appear to be in a gray area between these two categories and for which special regulatory programs will be established.

¹⁰Compare results of slightly older survey, reported earlier in 1988 by the National Solid Waste Management Association (51).

¹¹Specific, basic information is often lacking or at present not available to OTA on a number of important topics, and these areas are noted below.