Chapter XIV

Estimation of Amounts of Waste Generated from Healthcare Facilities

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INTRODUCTION

In response to government and public pressures, the healthcare industry has in the past few years directed a significant effort toward the proper and safe management of its medical waste streams. Medical waste is classified as a biohazardous waste, which according to a study published by the United States Agency for Toxic Substances and Disease Registry (1990), may result in human infection and transfer of disease. This includes injury and infection with the Hepatitis B Virus (HVB) and the Human Immunodeficiency Virus (HIV), by janitorial and laundry workers, nurses, emergency medical personnel, and refuse workers who may come into contact with medical waste. In a recent survey conducted in the United States and Japan, and reported by the World Heath Organization (WHO) (1994), it was found that injuries by sharps constitute about 1% to 2% per annum for nurses and maintenance workers and 18% per annum for outside waste management workers. In Japan, the survey indicated that injuries by sharps constitute about 67% for in-hospital waste handlers and 44% for outside waste management workers. In order to reduce the risks associated with medical waste, proper management mechanisms should be adopted by healthcare facilities to protect the health of the staff within the medical facility, waste collectors/workers, and the public once the waste has left the facility for final disposal. These mechanisms include waste identification, segregation, storage, and treatment. However, and as a first step in the implementation of a waste management system, the management of a medical facility should conduct an audit of the generated waste streams. The purpose of this audit is to specify the locations of the waste generation points and types and amounts of generated waste. Accurate estimates of medical waste amounts provide the management of a healthcare facility the tools for:

- Predicting the cost of operating its medical waste management system in relation to the fees for waste transport, treatment and disposal.

- Improving environmental performance by monitoring the amounts of gener-ated waste from each medical activity, and undertaking the proper measures to enforce waste quantity minimization.

Nationally, determination of amounts of medical waste generated by various medical facilities will provide governmental authorities with the information for:

- Planning the medical waste transport system and routes to the final treatment facilities and disposal sites.
- Planning the locations and capacities of the medical waste treatment facilities and disposal sites.

The objectives of this chapter are twofold:

- To describe a methodology that may be adopted by the management of a healthcare facility to conduct a waste generation survey and to estimate the quantity of generated medical waste; and
- To present a methodology that may be utilized by governmental authorities to estimate the quantity of medical waste generated on the local and regional levels, including correlation with various demographic and healthcare quality indicators.

The information provided in this chapter is based on experiences and lessons learned by the author as the director of a national project aimed at establishing an integrated medical waste management plan for Syria (SET, 1999)[1].

BACKGROUND

Prior to describing the methodology for estimating medical waste amounts, it is important to define some of the terminology, which will be used throughout this chapter, and to present a review of the literature addressing issues on waste generation surveys for healthcare facilities.

Definitions

In its draft regional guidelines for the safe management of healthcare waste (WHO/UNEP, 1997), the World Health Organization has adopted the following definitions:

Medical activities: any practices related to the diagnosis, monitoring, treat-ment, or prevention of disease or alleviation of handicap in humans or animals. These include emergency services, nursing, dental, veterinary, pharmaceutical or similar practices, investigation, teaching and research, or the collection of blood for transfusion.

Medical waste: the total waste streams arising from medical activities, which consists wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, or syringes, needles or other sharp instruments, being waste which unless rendered safe, may prove hazardous or infectious to any person coming into contact with it.

Healthcare or medical facilities: the sites carrying out all kinds of medical activities as defined above. These include, but not limited to, hospitals, healthcare centers, medical and dental clinics, laboratories, blood banks, pharmacies, etc.

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