

Management of “SHARPS” Wastes in Manila Hospitals (Part 3) Off-Site Management of Hazardous Healthcare Wastes in Six Tertiary Hospitals in South Manila, Philippines

Paulo Ma. N. Pagkatipunan

Department of Ophthalmology and Visual Sciences, College of Medicine and Philippine General Hospital, University of the Philippines Manila

ABSTRACT

Objective. The aim of this study was to determine if the collection, treatment and final disposal of hospital hazardous wastes conform to the rules and regulations and standards set by the Philippine Government and the World Health Organization (WHO).

Methods. Three private and three government tertiary hospitals located in South Manila were randomly chosen and the companies that provides them with hospital waste disposal services were asked to participate in the study to validate their conformity to the national and international hazardous waste disposal standards. Validation was done through the use of observer checklists and photographs.

Results. Results of the study showed that there were four companies who services 6 selected hospitals included in the study. All of these conformed to the standards of the World Health Organization, and to the rules and regulations as set by the Philippine government. All of the companies conformed as to standards for Legal Permits, Off-Site Transport, Personal Protective Devices and Off-Site Waste Disposal.

Conclusion. All of the companies servicing the 6 selected hospitals conformed to the standards set by WHO and the Philippine government.

Key Words: *hospital wastes, sharps wastes, off-site transport of hazardous wastes, off-site disposal of hazardous wastes, hospital waste management*

Introduction

Hospitals are considered the bastion of healthcare. They are institutions for alleviating suffering and curing of the sick. In performing this vital function, they inevitably produce hazardous wastes.

Healthcare wastes do not stay within the confines of the hospital and will need to be treated prior to final disposal so that the public and the environment will be protected. Because of the hazardous nature of these kinds of wastes, disposal should include special procedures or steps in addition to those used for disposal of domestic waste. The systematic treatment and disposal of hazardous wastes outside the hospital premises are called “off-site processes.”¹

Short of minimizing the production of hazardous wastes, hospitals should make sure that the wastes leaving its premises should be disposed of in accordance with existing local regulations. This is in line with the “polluter pays” principle¹ which states that those responsible for producing wastes should be held accountable for it up to its final disposal; and those who do not comply should “pay.”

There are several healthcare waste disposal processes approved in the Philippines.⁴ Healthcare wastes should undergo waste treatment either inside the hospital or in an accredited treatment facility, then transported to a healthcare waste facility, then finally disposed either in a landfill (for hospitals producing huge amounts of wastes), a safe burial site or concrete vault (for hospitals with minimal wastes and located in far-flung areas in 5th-6th class municipalities).

The World Health Organization (WHO) and the Department of Health (DOH) of the Philippines have set up standards regarding these off-site processes.^{1,4} These were divided into off-site transport vehicles and off-site final disposal. The off-site transport vehicles should be leak-proof and enclosed for security purposes. The off-site disposal site requirements were divided into the reportorial requirements and the physical structure of the final disposal site, which includes sealing of the base for control of leachate and a mechanism for spreading of wastes. The details of the harmonized requirements of the WHO and the DOH were then made into a checklist which became the tool for this study.

The objective of this study was to determine if the collection, treatment and final disposal of hazardous wastes by the study hospitals conformed to the rules and regulations set by the Philippine Government and the World Health Organization (WHO) standards.

Corresponding author: Paulo Maria N. Pagkatipunan, MD, MHA, DPA, DrPH
Department of Ophthalmology and Visual Sciences
Philippine General Hospital
University of the Philippines Manila
Taft Avenue, Ermita, Manila 1000 Philippines
Telephone: +632 5548400 local EHRO
Fax No.: +632 5233140
Email: paulomnp@yahoo.com

Methods

The Manila Bay area, located south of Manila, hosts the Bay Area Hospitals consisting of seven hospitals (four private and three public hospitals). These hospitals were the subjects of two previous published articles.*¹ One each of the public and private hospitals refused participation in the study even when anonymity and confidentiality of results were assured. One public hospital near the bay area was chosen at random to even out the number of hospitals to three private and three public hospitals.

Of the three private hospitals, two were run by religious orders; of the three government hospitals, two were under the national government, while one is under a city government.

These hospitals consigned private companies to take care of the off-site process disposal of their hazardous wastes. This study determined if these private companies were conforming to the national and international regulations regarding final disposal of hazardous wastes. Validation was done through the use of observer checklists and photographs.

The off-site processes were followed consecutively by the investigator from the point of loading the hospital wastes to the transport vehicles up to off-loading to the final site of disposal. The study documented the conformity to the requirements of the transport vehicles, the personal protective devices (PPDs) of staff transporting the wastes and staff handling wastes at the final site of disposal, and the final disposal site itself.

Tool Development

Two checklists were developed using as reference the regulatory standards of the Department of Health (DOH)²⁻⁶ and the Department of Environment and Natural Resources (DENR).⁷⁻¹¹ These two agencies directly oversee the management of hazardous wastes. In addition, WHO guidelines¹ were also used in the crafting of the tool. The two checklists include: (1) a checklist for Offsite Transport (Table 1); and (2) a checklist for Offsite Disposal (Table 2).

The Offsite Transport is divided into three parts:

- (1) Reportorial requirements/certificates of compliance by these companies to government regulations;
- (2) The physical requirements of the transport vehicle transporting the hazardous waste of the hospital to its final site for disposal;
- (3) The Personal Protective Device (PPD) requirements of the staff handling the waste.

The Offsite Disposal is divided into two parts:

- (1) Reportorial requirements/certificates of compliance by these companies to government regulations;
- (2) The physical requirements of the site for final disposal.

Table 1. Off-Site Transport Checklist.

Off-Site Transport	Present	Absent	Remarks
Permits			
Registration from EMB Central Office as health care waste transporter			
Transport permit from DENR-EMB Regional Office			
Transport Vehicle			
Bulkhead between the cabin and the driver			
Load secure in transport			
Internal finish allows easy and thorough cleaning			
Round internal angles			
Cleaning equipment			
Empty plastic bags			
Name/address on vehicle			
Signage of Hazardous Materials			
Protective Clothing			
Coveralls			
Industrial aprons			
Leg protectors/industrial boots			
Disposable/heavy-duty gloves			
Helmets			
Face masks			
Eye protectors			

Table 2. Off-Site Disposal Checklist

Off-Site Disposal	Present	Absent	Remarks
Permits			
Environmental Compliance Certificate			
Registration as TSD Facility			
Permit to Operate (from Regional Office)			
Certificate of Product Registration (for the equipment)			
Certificate of Technical Evaluation (for equipment from NRL-EAMC)			
Notice to Proceed (for controlled dump facility)			
Technology Approval (for non-burn technology)			
Concrete vault			
Properly marked: "caution: hazardous waste/sharps disposal area – unauthorized persons keep out"			
Watertight and at least 1.5m above groundwater			
Security fence around the site 1m x 1m x 1m depth			

*Acta Medica Philippina Volume 44 No. 1 and Acta Medica Philippina Volume 48 No. 1.

Results and Discussion

There were four hazardous waste management companies servicing the six hospitals in the study. Company A serviced two private hospitals; Company B serviced one private hospital and one public hospital; Company C serviced one government hospital; and Company D serviced one public hospital.

The off-site systems include legal permits, the off-site transport, the personal protective devices of its personnel and the off-site disposal facilities. The first three are discussed as a whole, meaning, all the waste disposal companies have conformed to the standards set by the DENR and the DOH. The Off-Site Disposal is discussed one company at a time for their unique features.

Legal Permits. All the companies were registered in the “List of Registered Treatment/Storage/Disposal (TSD) Facilities for Hazardous Wastes” by the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB) as of the time of investigation.

Off-Site Transport. The off-site transport of all the companies conformed to the standards set by the DENR and DOH (Table 1). There was separation of the bulkhead between the cabin and the driver (Figure 1); the load is secure in transport because all were closed vehicles (Figure 2) where there are rounded internal edges/corners (Figure 3) making cleaning thorough. There were empty plastic bags beside the driver. The exteriors of the companies’ vehicles were painted with the name of the company (Figure 4) with a signage for hazardous materials.

Personal Protective Devices. The Personal Protective Devices of those handling the wastes conformed to the recommendations cited (Table 1). The workers were wearing coveralls with gloves and boots (Figure 5). The finish of the coveralls is such that it replaces the need for industrial aprons. The workers also were wearing protective masks and caps (Figure 6) which are optional PPDs.



Figure 1. An Off-site transport vehicle (Company C) with separation of the bulkhead between the cabin and the driver.



Figure 2. An Off-site transport closed vehicle (Company A).



Figure 3. An Off-site transport vehicle with rounded internal edges/corners (Company B).



Figure 4. An Off-site Transport vehicle’s exterior painted with the name of company (Company C).



Figure 5. Personnel wearing coveralls, gloves and boots (Company C).

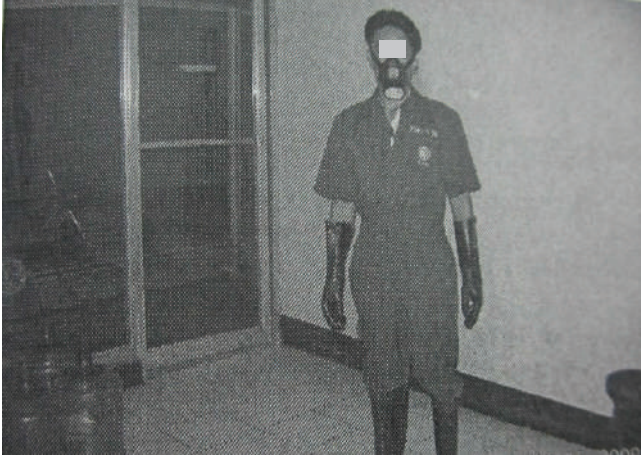


Figure 6. Personnel wearing protective mask and cap (Company B).

Off-Site Waste Disposal (Table 2)

All of the hospitals had their wastes treated in the same facility who collected their wastes. All of their waste treatment methods (thermal [autoclave and hydroclave] and irradiation [microwave]) were approved by the DOH. Other methods approved by the DOH are chemical methods, biological methods, encapsulation and inertization.

All of the healthcare wastes were brought to a landfill approved by the DENR for such purposes.

Company A (Figure 7) provided autoclave technology (Figure 8) to disinfect hospital wastes. Autoclave is disinfection using high temperature, high pressure air to kill bacteria and viruses. After autoclaving the hazardous wastes, wastes were brought to a designated waste disposal facility, a sanitary landfill in Tarlac, an area 107 kilometers north of Manila City. The entire autoclaving facility was located within the Metropolitan Manila area.

Company B (Figure 9) used microwave disinfection technology and was located within the Metropolitan Manila area. Microwave technology uses electrical waves for one hour to disinfect the hospital wastes (Figure 10). Company B used the same final disposal facility as Company A.

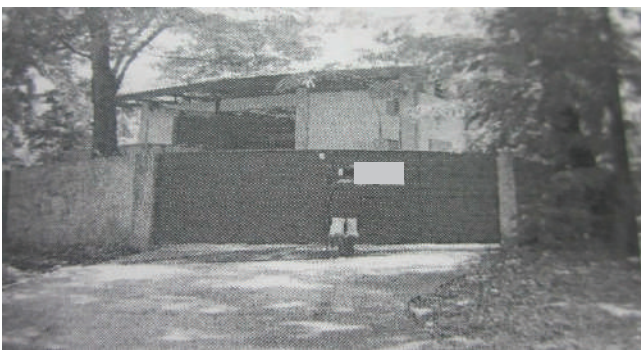


Figure 7. Entrance to the Compound of an Offsite Facility (Company A).

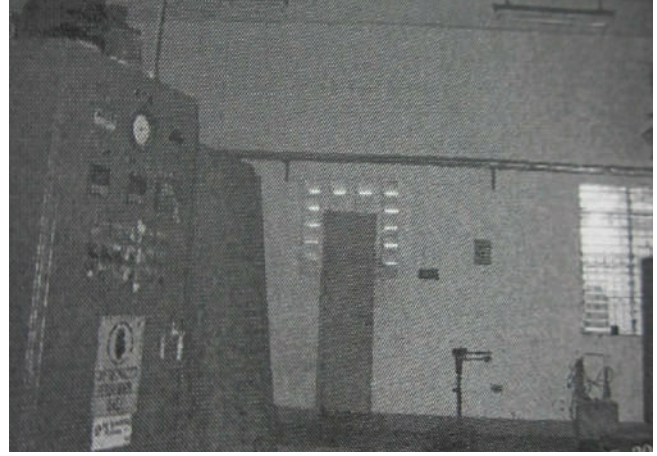


Figure 8. Treatment Facility (Company A).



Figure 9. Entrance to the Compound of an Offsite Facility (Company B).



Figure 10. Sample Microwaved Waste (Company B).

Company C was located 30 kilometers south of Manila and had its own double-lined, secure landfill (Figure 11) which was the final repository of the treated, solidified wastes. The company had physico-chemical treatment facility (Figure 12), solvent recovery, solidification and stabilization, and steam sterilization of hazardous wastes using the hydroclave system. This was the only company with its own landfill for dumping stored wastes. The hydroclave system uses “non-burn” technology of steam to treat hazardous wastes. This consists of highly pressurized water for 2 hours for disinfection.

Company D introduced the incinerator for treatment of hazardous wastes in 1991. After the full implementation of the Clean Air Act in 2003, it downgraded its services to a transporter of hazardous wastes from hospitals and laboratories (Figure 13). After collection, the wastes were then placed in **Company A** where these were treated and dumped in the final destination as stated in above.

Conclusion

The contracted companies of the study hospitals have all passed the requirements mandated by the Department of Health and Department of Environment and Natural Resources and the requirements set by the World Health Organization for the off-site transport and off-site disposal of hazardous wastes.

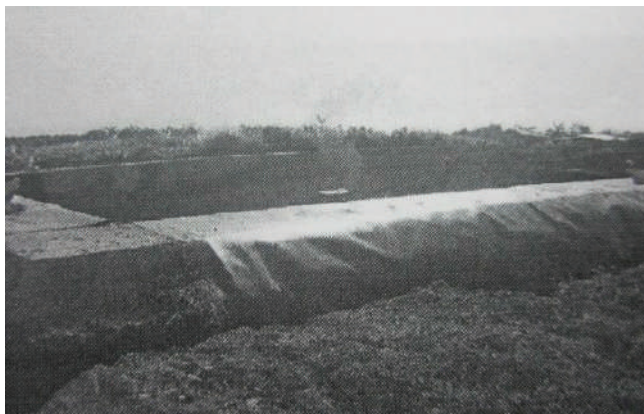


Figure 11. Controlled Landfill (Company C).



Figure 12. Treatment Facility (Company C).

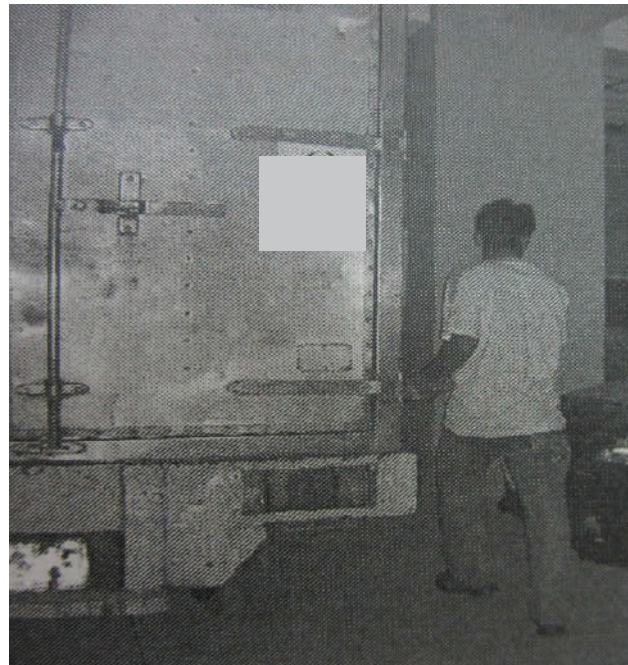


Figure 13. Off-site Transport (Company D).

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