Management of "SHARPS" Wastes in Manila Hospitals (Part 1)

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ABSTRACT

Background. Sharps waste is a special kind of health care waste that needs to undergo certain processes before its final disposal. These processes are guided by international policies, national laws and memoranda, the implementation of which is under the jurisdiction of certain agencies.

Objectives. This study was designed to document the health care sector's adherence to proper waste management practices, especially for hazardous sharps waste. It specifically documented the adherence to government regulations of six tertiary hospitals in the Manila and Pasay City areas. The study was undertaken to identify if these six hospitals adhere to the guidelines set by the World Health Organization as adapted by the Department of Health (DOH) and Department of Environment and Natural Resources (DENR). The first specific objective is to document if these hospitals are complying with the documentary requirements of such regulations as required by law. The second specific objective is to document the presence of facilities and resources in the hospital that will ensure proper implementation of regulations regarding sharps waste disposal.

Methods. The study was conducted in six tertiary hospitals, three of which are government/public and three are private hospitals. An observation checklist was constructed to identify in a detailed manner if the said hospitals were adhering to the standards set by the government. This checklist was validated by photographs for documentation. Specific areas, people and equipment of interest were earmarked for observation. Nurses stations and the laboratory for example, were singled out due to the high volume of sharps waste produced and temporarily stored in these areas. Chart reviews were also done to check if permits and policies were in place to oversee proper hospital waste management.

Results. The study showed that all six hospitals were not strictly adhering to all the prescribed requirements by the Department of Environment and Natural Resources and the Department of Health.

Conclusion. Even with rules and policies in place, it has been documented that all of the study hospitals have not been adhering to documentary requirements. Furthermore, the facilities and resources needed for waste management in the hospital are not available.

Recommendation. The responsible agencies should closely monitor the sharps waste management practices of hospitals to ensure safety and protect the health of health care workers, patients, their companions and visitors.

Key Words: waste, solid waste management, infectious waste, hazardous waste, sharps waste, solid waste, health care waste

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Introduction

Health care institutions have the mandate to cure the sick and alleviate their suffering. But in so doing, they inadvertently and ironically produce one of the most dangerous kinds of waste that become hazardous to one's health. The largest of these health care institutions are the hospitals and consequently, their daily operations produce the biggest amount of hazardous wastes. It has been estimated that 75% to 90% of wastes produced by health care institutions are considered domestic wastes which are comparable to household wastes. The remaining 10 to 25% are considered hazardous wastes. The latter have been categorized by the World Health Organization and is summarized in Table 1.[1]

Of all the hazardous wastes, the sharps waste is one that can cause the most acute form of illness. If one gets pricked by an infected needle for example, one can get instantly infected. Are hospitals providing the environment for proper disposal of sharps waste? This is our research question. Specific objectives of this paper are to document if the study hospitals are complying with the documentary requirements of such regulations as required by law, and to document the presence of facilities and resources required in the hospitals that will ensure proper implementation of regulations regarding sharps waste disposal.

The significance of studying sharps wastes is many-fold. Many viruses and bacteria that cause illness and disease may gain access to the blood stream. The skin poses as a resistant barrier for the entry of a great majority of these pathologic micro-organisms. These microbes, in turn, are found in great numbers in health care wastes. A combination therefore of pathologic bacteria and its gaining access to the

Table 1. Categories of Health Care Waste

Waste Category	Description and Examples
Infectious Waste	Waste suspected to contain pathogens eg. laboratory cultures; waste from isolation wards; tissues (swabs), materials and equipment that have been in contact with infected patients; excreta
Pathological Waste	Human tissues or fluids eg. body parts; blood and other body fluids; fetuses
Sharps	Sharp waste eg. needles; infusion sets; scalpels; Knives; blades; broken glass
Pharmaceutical Waste	Waste containing pharmaceuticals eg. pharmaceuticals that are expired or are no longer needed; items contaminated by or containing pharmaceuticals (bottles, boxes)
Genotoxic Waste	Waste containing substances with genotoxic properties eg. waste containing cytostatic drugs (often used in cancer therapy); genotoxic chemicals
Chemical Waste	Waste containing chemical substances eg. laboratory reagents; film developer; disinfectants that are expired or no longer needed; solvents
Wastes with high content of heavy metals	Batteries; broken thermometers; blood-pressure gauges; etc.
Pressurized Containers	Gas cylinders: gas cartridges; aerosol cans
Radioactive Waste	Waste containing radioactive substances eg. unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources

*Source: Safe Management of Wastes from Health-Care Activities, WHO, 1999

blood stream is very devastating, and can be outright deadly.

There have been several reported cases of infections caused by contact with health-care wastes. One classic case is a hospital housekeeper in the USA who developed staphylococcal bacteremia and endocarditis after a needle injury.[1] It has been cited in the same study that in June of 1994, 39 cases of HIV infection were recognized by the Centers for Disease Control and Prevention as occupational infections with the following pathways for infection: (1) 32 from hypodermic needle injuries; (2) one for blade injury; (3) one for glass injury (broken glass from a tube containing infected blood; (4) one from contact with a non-sharp infectious item, and (5) four from exposure of skin or mucous membranes to infected blood. By June of 1996, the cumulative recognized cases of occupational HIV infection had risen to 51. All cases were nurses, medical doctors or laboratory assistants.

Methods

It has to be emphasized that all heads of hospitals in the study have been quite hesitant in allowing their hospital to be studied. It has taken a lot of political and social clout to assure them of strict confidentiality in the results of the study, that is, the names of the hospitals would not be divulged. Six tertiary hospitals have been selected randomly in the Manila and Pasay City areas. Three are public hospitals and three are private hospitals.

Hospital A is the largest general hospital in the Philippines. It is a public hospital with a charity bed capacity of 1000. Hospital B is a hospital that has been relocated and renamed several times. It has an authorized charity bed capacity of 450. It is directly under the Department of Health. Hospital C is the only hospital of the three public hospitals that is under the local government. It was built in 1977 as a 50-bed hospital which was rehabilitated in 2007 into a 300 bed hospital. Hospital D is a private hospital and is the first ISO 9001:2000 Certified hospital in the Manila area. It has an authorized bed capacity of 300. It has been giving health service for over 50 years. Hospital E is part of a chain of more than 500 health care institutions worldwide operated by a religious order. Hospital F is the oldest hospital in the Philippines with more than 430 years of service to the Philippines. It has a bed capacity of 231.

The method of data collection was mainly observation focused on the Rules and Policies, Management Systems and Facilities and Resources.

Development of the Study Tool

An Observation Checklist was constructed for all observations that were done (Appendix 1). All items in the observation checklist were validated with photographs for documentation (except for Hospital F which repeatedly refused to have pictures taken). These observations were done and photographs were taken randomly and candidly.

The checklist is divided into 6 parts: (1) Rules and Policies; (2) the Management Systems; (3) personal protective devices (PPDs); (4) sharps container; (5) transport and (6) storage facilities.

The Rules and Policies pertain to the regulatory documents as required by Philippine Law as stated in the DENR-DOH Joint Administrative Order (AO) Series 2005 (Policies and Guidelines on Effective and Proper Handling, Collection, Transport, Treatment, Storage, Collection and Disposal of Health Care Wastes).[2] These include the permits from the Department of Environment and Natural Resources for the disposal of hazardous wastes, the Environmental Compliance Certificate[3] from the Hazardous Waste Generator's Registration[2] and License to Operate[4] as a hospital from the Department of Health. Part of these policies is to form a Committee on Waste Management, with designation of its members, individual job descriptions of

Appendix 1

HOSPITAL X			
	PRESENT	**ABSENT**	**REMARKS**
Rules and Policies			
Permits:			
From DENR-EMB			
- Env'tal Compliance Cert.			
- Hazardous Waste Generator's Registration			
From DOH			
- license to operate			
Committee on Waste Management			
Designation of members			
Job description of each member			
Guidelines on Sharps Waste Management			
Management System			
Training of stakeholders			
Information dissemination via pamphlets/IEC materials			
meetings			
Facilities and Resources			
Personal Protective Devices (PPDs)			
Coveralls (obligatory)			
Industrial aprons (obligatory)			
Leg protectors/industrial boots (obligatory)			
Disposable gloves/heavy duty gloves (obligatory)			
Helmets (optional)			
Face masks (optional)			
Eye protectors (optional)			
Immunization			
Sharps Waste and Containers			
Puncture-proof			
Fitted with cover			
Rigid			
Impermeable			
Tamper proof (difficult to open or break)			
Labeled *"SHARPS"*			
Dispose when ¾ full			
Collected daily			
On-site Transport			
Wheeled trolleys/containers/carts			
Easy to load and unload			
No sharp edges			
Easy to clean			
Daily cleaning			
On-Site Storage Facilities			
Impermeable flooring, good drainage and easy to clean			
Water supply nearby			
Easy access to staff			
locked			
Easy access to waste collection vehicle			
protection from the sun			
Inaccessible to animals, insects and birds			
Good lighting			
At least passive ventilation			
Not close to food stores/preparation areas			
Close to supply of cleaning equipment/PPDs			

members and written Guidelines for Waste Management including sharps waste.[5]

The Management Systems which include training of stakeholders, information dissemination via pamphlets/IEC materials and holding of meetings was culled from the DOH Circular informing the staff and personnel about the proper waste management.[6,7] They are checked through review of documents of trainings and meetings.

The Health Care Waste Management Manual of the Department of Health,[8] (which is an updated version of the Hospital Waste Management Manual[9]) and the Safe Management of Wastes from Health-Care Activities[1] are the sources for the requirements regarding Personal Protective Devices (PPDs), sharps containers, equipment for transport and storage facilities. Specific provisions for the segregation of wastes in the hospital, which includes sharps wastes, can be seen in the Ecological Solid Waste Management Act of 2000[10] and the DOH Memo No. 1-A, series of 2001.[11]

Results

All six hospitals in the study have contracted companies to do their janitorial services. And all these companies are required to provide the Personal Protective Devices(PPDs) to each member of the janitorial staff.

Hospital A

Hospital A has a designated *person* in charge for hospital waste management. Admittedly, the Waste Management Committee is NOT active so that even though there are Guidelines on sharps waste management, they are not widely disseminated. It was also observed that the personnel handling the wastes, the janitorial staff, were not wearing any of the required four PPDs.- gloves, industrial aprons, boots and coveralls (Figure 1). It was also observed that most of the nurses stations used the non-puncture proof, commercially available, uncovered drinking water containers as sharps waste containers. Syringe needles are capped. Containers are disposed whenever they are full. The equipment used for transport are wheeled trolleys which are easy to load and unload and easy to clean on a daily basis. They, however, have sharp edges (Figure 2). The storage facility of Hospital A has impermeable flooring and has good drainage. Water supply is readily available for easy cleaning. It is locked but is easily accessible to the staff and waste collection vehicles. However, it is not an enclosed structure and therefore, is not protected from the sun and animals, insects and birds. It allows passive ventilation because it is an open structure bounded only by gates. Good lighting, either artificial or natural is available. It is way outside the hospital grounds and therefore, not close to food preparation areas. It is close to cleaning equipment and to PPDs of the employees because it is near the rest areas of the janitorial staff (Figure 3).

Figure 1. Personal Protective Device of personnel, Hospital A

Figure 2. Equipment for Transport, Hospital A

Figure 3. Storage facility, Hospital A

Hospital B

Hospital B has a Committee on Waste Management, with Guidelines on sharps waste management and specific individual job descriptions. But there are no committee meetings, and information dissemination is confined to Orientation Meetings of new employees. It was also observed that the personnel handling the wastes, the janitorial staff, are wearing only two (boots and the gloves) of the required four PPDs. Face masks and caps are also worn (Figure 4).The sharps waste containers are uncovered and labeled "*sharps* ". They are the impermeable kind and therefore, puncture-proof to sharps. Needles are capped. Containers are collected whenever they are full to the brim (Figure 5). Wastes are transported via wheeled carts and are easy to load and unload but have sharp edges where waste plastic containers can be punctured. They are cleaned daily (Figure 6). The on-site storage facility of Hospital B has impermeable flooring, good drainage and available water supply for easy cleaning. It is locked but is easily accessible to staff and waste collection vehicles. The facility is enclosed and is protected from the sun and animals, insects and birds but has windows which allow passive ventilation. Good lighting is also provided. It is at the back of the hospital and is far from the food preparation areas. However, it is not close to cleaning equipment and to PPDs of the employees (Figure 7).

Hospital C

Hospital C has a Committee on Waste Management, with designated members but it does not include the specific individual job descriptions. There are no existing Guidelines on sharps waste management. The committee holds meetings once a month but information dissemination is confined to orientation meetings of new employees. It was observed that the janitorial staff wore gloves but not the required industrial type. Face masks are occasionally used. The nurses stations used permeable, non-puncture proof, unlabeled and uncovered water containers that are collected when these are full (Figure 9). The laboratory has puncture-proof containers which are labeled "*sharps"* (Figure 10). The needles are capped. On-site transport is via wheeled trolleys which are easy to load and unload and easy to clean. They have sharp edges but are cleaned daily. The on-site storage facility of Hospital C is located inside the hospital building on the ground floor. It has impermeable flooring and not near any water supply but lacks good drainage. It is locked but is easily accessible to the staff. Waste collection vehicles however, have to wait outside and the wastes are brought outside. It is an enclosed structure and is protected from the sun and animals, insects and birds. It has no windows but good lighting is provided. It is not close to food preparation areas but neither is it close to cleaning equipment and to PPDs of the employees (Figure 11).

Figure 4. Personal Protective Devices, Hospital B

Figure 5. Sharps waste container at nurses' station, Hospital B

Figure 6. Equipment for Transport, Hospital B

Figure 7. On-Site storage facility, Hospital B

Figure 8. Personal Protective Device, Hospital C

Figure 9. Sharps waste container, Nurses' station, Hospital C

Figure 10. Sharps waste container, laboratory, Hospital C

Figure 11. Inside the Storage facility, Hospital C

Hospital D

The hospital has all the required documentary permits from the Department of Environment and Natural Resources (DENR) and the Department of Health (DOH) in the **Rules and Policies** and **Management Systems**. This means that in the Rules and Policies, there are permits from the DENR which are the Environmental Compliance Certificate and the Hazardous Waste Generator's Registration and from the DOH which is the License to Operate. They also have documentary evidences that they have a Committee on Waste Management with designation and individual job descriptions of members. There is a specific guideline pertaining to sharps waste management. The Management Systems are also in place which means that there are documentary evidences that regular meetings are being held by the committee and that they are involved in the training of stakeholders and information dissemination regarding sharps waste management via IEC materials and/or

pamphlets (Figure 12). It was observed that the janitorial staff only wore protective boots and gloves, and occasionally wore face masks (Figure 13). Nurses stations were using both the impermeable and permeable kinds of sharps containers which were uncovered (Figure 14). Wastes are collected every other day (M-W-F), and are disposed when the containers are full. The laboratory containers for sharps are permeable (Figure 15). The needles are capped. The equipment for transport are wheeled trolleys with no sharp edges (Figure 16). The on-site storage facility of the hospital has good lighting, impermeable flooring and has good drainage. Water supply is available and is locked but easily accessible to staff and waste collection vehicles. It is located near the parking lot and is not close to food preparation areas. It is not close to cleaning equipment and to PPDs of the employees (Figure 17).

Hospital E

The hospital has all the required permits and evidence of the existence of a Committee on Waste Management with designation of members and individual job descriptions of its members. It has existing specific guideline pertaining to sharps waste management and documentary evidences of regular committee meetings and involvement in the training of stakeholders and information dissemination regarding sharps waste management via IEC materials and/or pamphlets. It was observed that the janitorial staff wore aprons and gloves. They also used face masks, and when interviewed, admitted to being immunized. The Sharps Waste Containers in the nurses stations (Figure 18) and in the laboratories (Figure 19) are the impermeable kind and are puncture-proof to sharps. Some though, are not fitted with cover, and therefore not tamper proof. Some are also not labeled "*sharps*". The needles are capped. They are collected and disposed when full. There are two kinds of on-site transport of sharps waste in Hospital E. One for inside the hospital grounds for collection from the nurses stations and the laboratories, and one for outside the hospital where the wastes are transferred and brought to the on-site storage. Inside the hospital, the wheeled trolleys (Figure 20) are easy to load and unload and easy to clean. They have no sharp edges and are cleaned daily. Outside the hospital, the wheeled carts (Figure 21) are not easy to load and unload because of the walls of the cart. And they have sharp edges where waste plastic containers can be punctured. They are also cleaned daily. The on-site storage facility of Hospital E has impermeable flooring and has good drainage. Water supply is nearby that is why it is easy to clean. It is locked but is easily accessible to staff and waste collection vehicles. It is an enclosed structure but has no roof. Good lighting is provided. It is outside the hospital and therefore, not close to food preparation areas. It is far from cleaning equipment and to PPDs of the employees.

Figure 12. IEC Materials, Hospital D

Figure 13. Personal Protective Device, Hospital D

Figure 14. Sharps waste container in the nurses' station, Hospital D

Figure 15. Sharps waste container in the laboratory, Hospital D

Figure 16. Transport, Hospital D

Figure 17. Storage facility, Hospital D

Figure 18. Sharps waste container, nurses' station, Hospital E

Figure 19. Sharps waste container, laboratory, Hospital E

Figure 20. Transport, Hospital E

Figure 21. Transport and storage facility, Hospital E

Hospital F

This hospital was observed by the researcher but he was repeatedly refused permission to take photographs. All the documentary permits from the DENR and the DOH in the **Rules and Policies** and **Management Systems** are in order and have been secured. They also have documentary evidences that Committee on Waste Management exists with designation of members and individual job descriptions of its members. There is a Specific Guideline pertaining to sharps waste management. There are documentary evidences that regular meetings are being held by the committee and that they are involved in the training of stakeholders and information dissemination regarding sharps waste management via IEC materials and/or pamphlets. It was observed that the janitorial staff wore boots and gloves, and occasionally wore face masks. Nurses stations are using uncovered and unlabeled impermeable and permeable sharps waste containers. These are collected and disposed when full. The equipment for transport are wheeled trolleys that have no sharp edges and are cleaned daily. The on-site storage facility of this hospital has impermeable flooring, good drainage and readily available water supply making it easy to clean. It is locked but is easily accessible to staff and waste collection vehicles. It is an enclosed structure with windows which allow passive ventilation. Good lighting is provided. It is near the parking lot and not close to food preparation areas but is also far from cleaning equipment and to PPDs of the employees.

Discussion

The results of the study revealed discrepancies in what is required and what has been provided for by the observed hospitals. These discrepancies can be gleaned from the summary of results in Table 2.

The Department of Environment and Natural Resources – Environment Management Bureau (DENR-EMB) and the Department of Health have issued Joint Administrative Order Series of 2005[2] which requires submission of permits in the form of Environmental Compliance Certificate and the Hazardous Waste Generator's Registration (to be submitted to DENR-EMB) and the License to Operate (to be submitted to the DOH). These documents provide guidelines to generators of health care waste on the proper handling, collection, transport, treatment, storage and disposal of such wastes. The public hospitals observed in this study did not have the permits required by the DENR-EMB while their private counterparts adhered to both agencies' requirements. Without such permits, important questions are brought to the fore on how the public hospitals were guided in their implementation of hospital waste management policies and how they were allowed to operate in the first place without such permits. The main problem appears to lie with the government agencies involved. Having issued a joint memorandum, both seem to be remiss in their duty to monitor and make sure that there is strict compliance with these said regulations. This joint responsibility should also redound to resources being pooled together in the implementation of regulatory mandates.

Hand-in-hand with the strict implementation, there should be corresponding penalties to those hospitals who do not comply. For the law to have teeth, there should be punishments as controlling mechanisms. Warnings are well and good but the main bite of the law is withdrawal of the hospital's license to operate and/or withdrawal of PhilHealth benefits.

This study shows that both government and private hospitals are in fact supportive of and recognize the need for an efficient waste management system by providing

Table 2. Summary of Findings in the Observation Checklist

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	Hospital F
Waste Management System	(+) permits of DENR/DOH -Committee inactive (-) Information dissemination	(+) permits of DENR/DOH (+)Committee (-) Information dissemination	(+) permits of DENR/DOH (+)Committee (-) Information dissemination	(+) permits of DENR/DOH (+)Committee (+) Information dissemination	(+) permits of DENR/DOH (+)Committee (+) Information dissemination	(+) permits of DENR/DOH (+)Committee (+) Information dissemination
Sharps waste and Container	-permeable -collected when full -needles capped	-impermeable -collected when full -needles capped	-permeable -collected when full -needles are capped	-permeable -collected when full -needles are capped	-impermeable -collected when full -needles are capped	-permeable -collected when full -needles are capped
Personal Protective Devices (PPDs)	none	-gloves -boots	-gloves (wrong kind)	-gloves -boots	-none	-gloves -boots
On-Site Transport	-with sharp edges	-with sharp edges	-with sharp edges	-no sharp edges and clean	-2 kinds: 1 is with sharp edges	-no sharp edges and clean
On-Site Waste Storage	-open air -easy to clean -accessible	-closed air -easy to clean -accessible	-closed air -easy to clean -accessible	-closed air -easy to clean -accessible	-open air -easy to clean -accessible	-closed air -easy to clean -accessible

facilities and resources. But the problem lies in the fact that they failed to provide either the right amount (quantity) and kind (quality) of facilities and resources that are required. Therefore, the process of segregation[7], collection, storage and protective personal devices did not conform to those recommended by the DOH. All the transport equipment of the public hospitals have sharp edges which should not be present because they can tear and rip plastic waste containers. All storage containers of sharps have no cover and therefore, may be prone to spillage of contents when accidentally dislodged or bumped. Some nurses stations and laboratory areas use commercial drinking water containers which can be punctured by the sharps waste. All of the sharps waste containers contain the capped/sheathed syringe needles. The recommendation is that needles should not be capped after using because capping poses the greatest risk of needle puncture.[1,3] The janitorial staff act as the waste collectors in the hospital and therefore, it is mandatory for them to be properly protected. The recommendation is that they should wear aprons, industrial gloves and boots and coveralls. All of the hospitals studied did not comply with these requirements completely. The hospital storage areas of the general hazardous wastes (which include the sharps wastes) are easy to clean and are accessible to personnel and garbage collectors but some hospitals have open air facilities which render them susceptible to vermin and bird infestation which promotes the spread of diseases.

Lastly, the waste management system of the hospitals failed to use their mandate of implementing guidelines for waste segregation, collection and storage. This study found out that in one government hospital, the Waste Management Committee is made up of only one person. Training of stakeholders should periodically be done not only during orientation of new employees. IEC materials should also be actively given out, disseminated and posted as reminders.

In an age where there is an increasing awareness and knowledge of disease etiologies, there is a need to be constantly protected from exposure to the various occupational health hazards. It is therefore imperative that hospital waste management be given the careful and detailed attention it deserves from government and hospital administrators who should always take into consideration the welfare and protection of hospital employees, patients and their companions/visitors.

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