

## Response of Health Personnel on Medical Waste At Upazilla Health Complexes under Dhaka Division in Bangladesh

MAA Polan<sup>1</sup>, NA Nomann<sup>2</sup>, CM Jan<sup>3</sup>, T Saito<sup>4</sup>, MM Zaki<sup>5</sup>, A Taleb<sup>6</sup>

### Abstract

*This cross sectional study was conducted among health personnel working in 7 Upazilla Health Complexes and support staff without medical background but concerned with waste management. A total of six respondents (doctors, nurses and & support staff, 2 each) from each Upazilla with average bed occupancy >10/day and where there are > 10 health personnel in position were selected. The objective of this study was to assess the health personnel whether they can identify the waste in the Health Complexes. The present study interviewed 42 respondents of which one third each were doctors, nurses, and support staff. In response to a question on type of waste generated at the Health Complex, 19.0% said infectious waste, 16.7% said pharmaceutical waste, 21.4% said pathological & anatomical waste, 23.8% said sharp waste and 19.0% said pressurized container. From response about different medical wastes, it shows that respondents know better about hazards of sharp waste and liquid waste. However, about other types of wastes like infectious waste, pathological waste, pharmacological waste, chemical waste, heavy metal waste, pressurized container and highly infectious waste the level of knowledge is rather poor or had no knowledge. Further study should be conducted on the issue with larger sample size and greater logistic support to reveal more generalized picture of country situation.*

**Key words:** Waste management, different type of wastes.

### Introduction

Medical waste from health facilities poses a major threat to people, health personnel and environment as well.

1. Dr. Md. Ali Akbor Polan, BDS, MPH, Doctoral Fellow  
Division of Clinical Cariology and Endodontology  
Department of Oral Rehabilitation, School of Dentistry  
Health Sciences University of Hokkaido, Japan
2. Dr. Nahid Al Nomann, BDS, Doctoral Fellow  
Division of Clinical Cariology and Endodontology  
Department of Oral Rehabilitation, School of Dentistry  
Health Sciences University of Hokkaido, Japan
3. Dr. Chowdhury Moin Jan, BDS, PhD (Japan)  
Associate Professor and Head,  
Department of Conservative Dentistry & Endodontics  
MARKS Dental College & Hospital, Dhaka
4. Dr. Takashi Saito, DDS, PhD  
Professor and Head,  
Division of Clinical Cariology and Endodontology  
Department of Oral Rehabilitation, School of Dentistry  
Health Sciences University of Hokkaido, Japan
5. Dr. Md. Mahbub Zaki, BDS, MCPS  
Consultant, BSMMU, Dhaka
6. Dr. Asma Taleb, BDS, MPH  
Assistant Professor and Head,  
Department of Dental Public Health  
MARKS Dental College & Hospital, Dhaka

### Address of Correspondence:

Mohammad Al Akbor Polan, BDS, MPH  
Division of Clinical Cariology and Endodontology  
Department of Oral Rehabilitation, School of Dentistry  
Health Sciences University of Hokkaido  
1757 Tobetsu, Hokkaido 061-0293, Japan  
Phone & Fax: +81-133-23-1423  
E-mail: Polan@hoku-iryu-u.ac.jp

Unlike the ordinary household waste, medical wastes are highly infectious and hazardous. Healthcare establishments generate a huge quantity of general and medical wastes. About 3,500 metric tons of garbage is generated per day in the Dhaka city, 200 tons of which are generated by the healthcare establishments, and 20% of which are infectious wastes<sup>1</sup>. Most healthcare facilities dispose their wastes to the dustbins along with general wastes. Some even earn by selling used syringes and other healthcare wastes. There is a lack of awareness, concern, and knowledge of appropriate handling and disposal methods of hospital wastes at all levels<sup>2</sup>. Medical wastes are produced as a result of diagnosis and treatment of disease and also from research activity. According to World Health Organization there are 10 categories of health care wastes<sup>3</sup>. They are as follows: Infectious waste: infectious waste include discarded materials or equipment, used for the diagnosis, treatment and prevention of disease that has been in contact with body fluids such as dressings, swabs, nappies, blood bag etc. This category also includes liquid waste such as faeces, urine, blood or sputum. Pathological and anatomical waste: pathological waste consists in organs, tissues, body parts or fluids such as blood. Amputated healthy body parts are also considered as infectious waste. Hazardous pharmaceutical waste: pharmaceutical waste includes expired, unused, spilt and contaminated pharmaceutical products, drugs and vaccines. Hazardous chemical waste: chemical waste consists of

discarded chemicals that are generated during disinfecting procedures or cleaning processes. They may be toxic, corrosive or flammable waste with a high content of heavy metals: wastes with high contents of heavy metals are cadmium, mercury etc. and there compounds of pressurized containers: full or emptied containers or aerosol cans with pressurized liquids, gas or powdered materials. Sharps waste: sharps are items that can cause cuts or puncture wounds and needle prick injuries, if they are infected they can spread infection. Highly infectious waste: highly infectious waste consists in microbial cultures and stocks of highly infectious agents from Medical Analysis Laboratories. Genotoxic/cytotoxic waste & radioactive waste: these are the radioactive or cytotoxic substances.

If medical waste is not disposed correctly it becomes a serious threat to the environment. It not only poses a threat to the employees working in the facility, but also to the residents of surroundings. Infectious diseases waste can cause serious diseases like Hepatitis, AIDS etc. If waste containing plastics are burnt, dioxin is produced, which can cause cancer, birth defects and hearing defects in infants<sup>4,5</sup>.

Legal provisions recognizing needs to improve health-care waste practices through national legislation. Government formulated the Medical Waste Management Regulations, as a part of the Bangladesh Environment Conservation Act, 1995. Government of Bangladesh is a signatory to the Millennium Development Goals (MDGs) agenda 21 where there is a strong focus on waste management issues. The MDGs emphasize the need for effective control of the generation, storage, treatment, recycling and reuse, transport, recovery and disposal of hazardous wastes which is of paramount importance for proper health and environmental protection. Despite these provisions, Bangladesh currently does not have an organized health waste management system<sup>6, 7</sup>.

Not many researches were conducted in Bangladesh to assess the scenario of health care waste management and people's understanding about the issue. This study unveiled the level of awareness among managers of health care facility and the health personnel which would help the policy makers to pinpoint and prioritize intervention need in combating the dreadful issue. In this context, the objective of this study was to assess their knowledge whether the health personnel can identify wastes in Health Complexes.

### Materials & Methods

This was a cross-sectional study and it was conducted at Sreepur, Kapasia, Kaligonj, Shivaloya, Saturaia, Savar

and Dhamrai Upazilla Health Complexes. The study population was health personnel working in Upazilla Health Complexes and support staff without medical background but concerned with waste management. The data were collected from March 2009 to July 2009. Health personnel were selected purposively considering feasibility and convenience of the researcher. 6 (six) respondents concerned with waste management (doctors, nurses and support staff) from each of the above Upazillas were recruited (6X7=42) for assessment.

### The inclusion Criteria of health care facility were:

- \* Provides health care that has the potential to generate medical wastes which include Labour and OT facility, Diagnostic centre dealing with invasive blood and other investigations.
  - \* Upazilla health complexes with average bed occupancy >10/day
  - \* Having > 10 health personnel working
  - \* Willingness of the UHFPO to participate
- And the inclusion Criteria of interviewee:
- \* Health personnel working in the facility for more than 2 years
  - \* Nursing staff working in the field for more than 2 years
  - \* Support staff (ward boy or sweeper) working in the field for more than 2 years.
  - \* The persons who were not willing to participate were excluded from this study.

Data were collected by using semi-structured questionnaire for interview and a checklist for facility assessment. In depth interview was conducted by the researcher at the selected health complexes among the recruited health personnel upon their consent and convenience. A checklist was prepared based on international best practice and WHO guideline to assess the waste management of the health complexes. Assessment was conducted by the researcher himself. Data collected by both questionnaire interview and checklist for facility assessment were sorted and coded. Then, the data were entered into the SPSS template. After screening and cleaning data analysis was done. Level of knowledge was assessed by coding. All the correct answers of the respondents regarding knowledge about medical waste were marked as 1 and for non response and incorrect answers were marked as 0.

### Results

Among the respondents 33.3 % were doctors and 33.3% were nurses and another one third was support staff (ward boys or sweepers) (Fig 1). In response to the

question on type of waste generated at the Health Complex, 19.0% said infectious waste, 16.7% said pharmaceutical waste, 21.4% said pathological & anatomical waste, 23.8% said sharp waste and 19.0% said pressurised container (Fig 2). Regarding the distribution of response about different medical wastes, respondents know better about hazards of sharp waste and liquid waste. However, among other types of wastes, infectious waste, pathological waste, pharmacological waste, chemical waste, heavy metal waste, pressurized container and highly infectious waste, the level of knowledge is rather poor or had no knowledge (Table 1). Most of the respondents reported lack of awareness among health personnel is the number one problem to manage the medical wastes at the Health Complex than lack of budget and other logistics. The percentage of the respondents was 47.6, regarding lack of awareness among the health personnel (Table 2). Most of the respondents suggested for adequate training (71.4%) to overcome the problem of managing medical wastes at the health complexes, followed by awareness of health personnel (66%) (Table-3).

### Discussion

Medical wastes from health facilities pose a major threat to people, health personnel and environment as well. Unlike the ordinary household waste, medical wastes are highly infectious and hazardous. Healthcare establishments generate a huge quantity of general and medical wastes. About 3,500 metric tons of garbage is generated per day in Dhaka city, 200 tons of which are generated by the healthcare establishments, and 20% of which are infectious wastes.<sup>1</sup> Most healthcare facilities dispose their wastes to the dustbins along with general wastes. Some even earn by selling used syringes and other healthcare wastes. There is a lack of awareness, concern, and knowledge of appropriate handling and disposal methods of hospital wastes at all levels<sup>2</sup>.

Awareness among the health personnel and the personnel associated with healthcare waste management is essential to minimize their risk and also to save the environment and general people from the hazardous medical wastes. Not many researches were conducted in Bangladesh to assess the scenario of health care waste management and people's understanding about the issue. The present study investigated level of knowledge and practice of personnel working in Sreepur, Kapasia, Kaligonj, Shivaloya, Sauria, Savar & Dhamrai upazilla health complexes concerned with waste management.

Six managers and persons concerned with waste management and disposal from each of the above Upazillas were recruited for the study.

The study interviewed 42 respondents. In this study among the respondents 33.3 % were doctors, 33.3% were nurses and another one third was ward boys or sweepers (Fig 1). In response to the question on type of waste generated at health complex, 19.0% said infectious waste, 16.7% said pharmaceutical waste, 21.4% said pathological & anatomical waste, 23.8% said sharp waste and 19.0% said pressurised container.

The diseases transmitted by hospital wastes are alarming in Bangladesh. There is evidence of hepatitis B infection among 10 percent of children and 30 percent adults. About 5 per cent of the total population in Bangladesh is thought to suffer from chronic hepatitis B infection. Although cases of HIV/AIDS are low in Bangladesh in comparison to neighbouring countries, nevertheless the numbers are rising.<sup>9</sup>

It is noted here that much of the clinical wastes like, syringes, needles, saline drips, discarded foods, gauze, vials, and ampoules are collected by women and children who re-sell those despite of deadly health risks. It is estimated that hospital wastes account for a very small fraction, notably, only about 1 percent of the total solid wastes generated in Bangladesh. In a report from the World Bank, only 10-25 percent of the hospital wastes are infectious or hazardous. The amount of such hazardous waste is quite small in figure and until recently this is not handled properly. Mixing with the domestic solid wastes, the total waste stream becomes potentially hazardous<sup>10,11</sup> particularly the sharp wastes are of greatest concern.

A survey by PRISM an NGO working on Hospital waste management reveals that there is no proper and systematic management of this waste except a few private facilities that segregate their infectious wastes. All the health facilities surveyed by them dispose of their domestic waste at the same site as the civic waste. Some cleaners were found to be engaged to mishandle the generated wastes. They segregated the used sharps instrument, saline bags, blood bags and test tubes from the kitchen and non-hazardous wastes for reuse.<sup>8</sup>

About different medical wastes, respondents know better about hazards of sharp waste and liquid waste. However, among other types of wastes Infectious waste, Pathological waste, Pharmacological waste, Chemical waste, Heavy metal waste, Pressurized container and highly infectious waste the level of knowledge is rather poor or had no knowledge.

Available literature suggests that some steps should be taken for minimisation of hospital wastes. According to best practice, before any clear improvement can be made in medical waste management, consistent and scientifically based definitions must be established as to what is meant by medical waste and its components, and what the goals are. Plans and policies should be laid down for this purpose. Then the waste should be segregated. Imposing segregated practices within hospitals to separate biological and chemical hazardous waste will result in a clean solid waste stream, which can be recycled easily. If proper segregation is achieved through training, clear standards, and tough enforcement, then resources can be turned to the management of small portion of the waste stream needing special treatment. New emphasis should be put on the reduction of waste, workers' safety should be ensured through education, training and proper personal protective equipment.

The lack of manpower and also the lack of awareness among the managers regarding hospital waste and its potential have been identified by the respondents in the study as a major factor for the hindrance in the sector. Most of the respondents mentioned to overcome the problem for managing medical waste at the health complexes, adequate training should be provided than the awareness of health personnel, adequate staffing and other logistics. More than 70% of the respondents mentioned about adequate training.

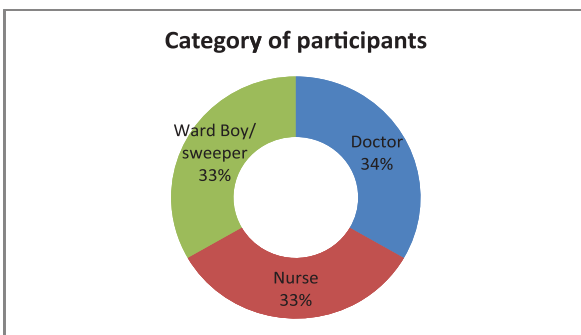


Figure 1: Type of personnel interviewed

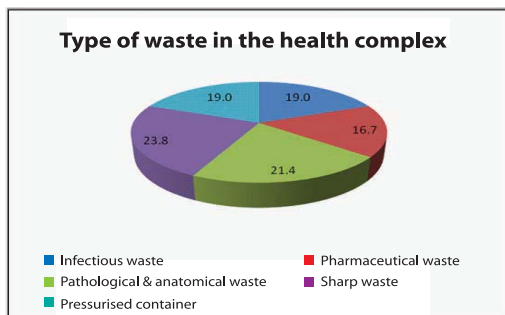


Figure 2: Response regarding type of waste in the health complex

Table 1: Level of response about different medical waste (n=42)

Different medical wastes	Excellent		Good		Fair		Poor		No Knowledge	
	f	%	f	%	f	%	f	%	f	%
Infectious waste	5	11.9	9	21.4	7	16.7	9	21.4	12	28.6
Pathological waste	4	9.5	11	26.2	4	9.5	11	26.2	12	28.6
Pharmacological waste	3	7.1	13	31.0	2	4.8	10	23.8	14	33.3
Chemical waste	2	4.8	9	21.4	7	16.7	15	35.7	9	21.4
Heavy metal waste	4	9.5	11	26.2	9	21.4	8	19.0	10	23.8
Pressurized container	7	16.7	5	11.9	8	19.0	16	38.1	6	14.3
Sharp waste	13	31.0	15	35.7	7	16.7	5	11.9	2	4.8
Highly infectious waste	7	16.7	3	7.1	2	4.8	14	33.3	16	38.1
Liquid waste	10	23.8	9	21.4	11	26.2	7	16.7	5	11.9

Table 2: Distribution of problems faced by THC in managing medical waste (n=42)

*Problems faced	Frequency	Percentage	Rank
Lack of awareness among health personnel	20	47.6	1
Lack of budget	12	28.6	2
No facility available	9	21.4	3
Lack of manpower	15	35.7	4
No guideline is available	10	23.8	5
NO legislation	5	11.9	6

\*Multiple responses

Table 3: Distribution of the Recommendations made for managing medical waste (n=42)

*Recommendations	Frequency	Percentage	Rank
Adequate training should be provided	30	71.4	1
Awareness of health personnel should be raised	28	66.7	2
Adequate staffing should be done	22	52.4	3
Allocation of budget should be made	23	54.8	4
Standard guideline should be formulated	10	23.8	5
Adequate facility should be made available	19	45.2	6
Legislation should be made	5	11.9	7

\*Multiple responses

### Conclusion

In general, doctors were found to know more about medical wastes and its hazards than nurses and support staff. However, their knowledge doesn't seem to differ much between nurses and support staff. About different medical wastes, respondents know better about hazards of sharp waste and liquid waste. Regarding level of knowledge about hazards of medical wastes, respondents know better about hazards of sharp waste, and regarding infectious, pathological and high risk medical wastes their knowledge level is very poor. Most of the respondents opined that awareness of the manager is due to lack of his knowledge, another major factor identified as route of all other factors is the lack of manpower. Further study should be conducted on the issue with larger sample size and greater logistic support to reveal more generalized picture of country situation.



**References**

1. Lawson A. 2003. UN tackles Dhaka's medical waste. (BBC correspondent in Dhaka), [[http://news.bbc.co.uk/1/hi/world/south\\_asia/3180972.stm](http://news.bbc.co.uk/1/hi/world/south_asia/3180972.stm)], (Last updated: 10 October 2003, GMT 15:16).
2. Akter N, Kazi NM, Chowdhury AMR. Medical waste disposal in Bangladesh with special reference to Dhaka city and environmental evaluation. Dhaka: Bangladesh Rural Advancement Committee, 1998
3. WHO : Healthcare Waste (2008) [hcwaste@who.int](mailto:hcwaste@who.int)
4. Culikova H, Polansky J, Benckov V. Hospital wastes--the current and future treatment and disposal trends. *Cent Euro J Public Health*, 1995;3:199-201.
5. U.S. Environmental Protection Agency. 40 CFR, pt. 22 and 259. Standards for the tracking and management of medical waste: interim final rule and request for comments. *Federal Register*, 1989; 54:56.
6. Nessa K, Quaiyum, M.A., Khuda, Waste Management in Healthcare Facilities: A Review, ICDDR,B Working Paper No. 144
7. Akter, N, Hussain, Z, Trankler, J , Parkpian, P, Hospital Waste Management and It's Probable Health Effect: A Lesson Learned From Bangladesh, *Indian J. Environ. Health*. Apr 2002. Vol. 44, no. 2, pp. 124-137.
8. Survey report on hospital waste management in Dhaka city, WSP and PRISM Bangladesh, May 2005.
9. Waste Concern, Presentation on clinical waste management, Workshop on effective options for biomedical waste management, August 31, 2003, Dhaka, Bangladesh
10. World Bank. 2003. Health Facility Waste Management Study in Bangladesh. Dhaka: World Bank Plc.
11. WHO. 2001. Health-care Waste Management: Rapid Assessment Tool for Country Level. World Health Organization: Geneva