



Segregation & Management of Bio Medical Waste in Ayurveda Hospital as per BMWM Rules 2016

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ABSTRACT

The waste generated in a health care setup is termed as Bio-Medical Waste. Its Management becomes necessary & important owing to the risk it poses to the environment if not handled properly. It is important to identify, segregate and dispose Bio Medical Waste. The Bio-Medical Waste generated in an Ayurveda Hospital is totally different from the waste generated from an Allopathy Hospital. BMWM rules 2016 emphasis on safe segregation, collection, storage & disposal of Bio Medical Waste. Owing to the type of waste generated in an Ayurveda Hospital it becomes important to analyse, segregate & safely dispose the same inculcating BMWM rules 2016. *Panchakarma* Treatment forms the integral part of Ayurveda, hence it necessary to understand the waste generated, segregation and its disposal. The waste generated during various treatment is critically analysed and the use of various colour coded bags to be used for the same is identified.

Key Words *Bio-medical waste, Ayurveda, Panchakarma, BMWM rules 2016*

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INTRODUCTION

Waste is any substance which is discarded after primary use, or is worthless, defective and of no use ¹. As a result of increasing population the waste generation has also increased, managing this waste and treating them is a challenging task. The waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining there to or in the production or testing of biological or in health camps is termed as bio-medical waste . Any facility wherein treatment, disposal of bio-medical

waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities is known as Bio-Medical Waste Treatment and Disposal Facility ².

Need of biomedical waste management-

Proper biomedical waste management is the mainstay of hospital cleanliness, hospital hygiene and maintenance activities. Appropriate hospital waste management system is an essential component of quality assurance in hospitals. The need of biomedical wastes with regards to health



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aspects is mainly due to its capacity to produce injuries and infections. Injuries from sharps lead to infections to all categories of hospital personnel and waste handler. Poor waste management practices leads to infections in patients.

Risk of air, water and soil pollution directly due to waste, or due to defective incineration emissions and ash is high, which can act as precursor for various disorders especially communicable disorders, which has been mentioned as *Aupasargika Vyadhis* in Ayurveda. Acharya Charaka³ clearly describes diseases occurring due to variation in *Udaka, Vayu, Desha* and *Kala*, and say “*Adharma*” as the main causative factors. Where the violation of ethical responsibility of waste management can be considered.

Wastes generated in Hospital –

Waste generated from the healthcare facility is classified as ⁴-

- General Waste
- Bio Medical Waste
- Other Wastes

General waste - General waste consists of all the waste other than bio-medical waste and which has

not been in contact with any hazardous or infectious, chemical or biological secretions and does not includes any waste sharps. Which are segregated as dry and wet waste and treated accordingly.

Example - News paper, paper and card boxes (dry waste), Packaging materials (dry waste), empty tablet containers, empty pet bottles of *Kashayam* / oil, empty cans, Food Containers after emptying residual food, Organic / Bio-degradable waste - mostly food waste (wet waste)...etc

Other waste – Other wastes consist of used electronic wastes, used batteries, and radio-active wastes which are not covered under biomedical wastes.

Bio Medical Waste - The waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining there to or in the production or testing of biological or in health camps.

Identification and classification of Bio-Medical Wastes in Ayurveda Hospital is given in Table 1.

Table 1 Identification of Bio-Medical Waste generated in Ayurveda Hospital

Sl.No	Panchakarma Procedure	Waste Generated
1.	<i>Vamana</i>	Liquid waste
2.	<i>Virechana</i>	Liquid waste containing faeces
3.	<i>Nasya</i>	Liquid waste
4.	<i>Basti</i>	Liquid waste, Disposable <i>Basti Yantra</i> , Rubber Catheters
5.	<i>Rakta Mokshana (Jalouka</i> and other sterile methods)	Blood, Sharp Needles / Lancets and Blood soaked cotton, leech
6.	<i>Shirodhara / Shiro Basti / Taila Parisheka / Janu Basti / Kati Basti</i>	Oil, Black gram dough and oil soaked cotton, <i>Shirobasti Patta</i>
7.	<i>Abhyanga</i>	Oil soaked cotton or Cora cloth
8.	<i>Kashaya Parisheka / Nadi Sweda</i>	Liquid waste
9.	<i>Tarpana</i>	Ghee, Ghee soaked cotton, Black gram dough



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10.	<i>Patra Pinda Sweda</i>	Cora Cloth, Leaves mixed with Lemon, Coconut Shavings,
11.	<i>Shastika Shali Pinda Sweda</i>	Cora Cloth, Cooked brown rice
12.	<i>Kukkutanda Sweda</i>	Crumbled Egg
13.	<i>Churna Pinda Sweda / Udwartana / Upanaha / Lepas / Bidalaka</i>	Cora Cloth, <i>Churna</i> (medicine powders)
14.	Others	Containers of oil / <i>Kashayas</i> , Expired Medicines, Glass bottles, Gloves.
15.	<i>Yoni Pichu</i>	Oil soaked cotton

Categorization of Bio-Medical Waste & their Management as per BMW Rules 2016 is given in Table 2.

Table 2 Categorization of Bio-Medical Waste & their Management as per BMW Rules 2016

Sl. No.	Category	Treatment and Disposable Methods
1	Yellow Category (Yellow Plastic Bag)	
	Human Anatomical Waste, Animal Anatomical Waste, Soiled Waste, Expired or Discarded Medicines including antibiotics.	Incineration or Plasma Pyrolysis or deep burial All other discarded medicines shall be either sent back to manufacturer or disposed by incineration
	Chemical Solid Waste, Discarded Linen, mattresses contaminated with blood/body fluid, Microbiology, Bio-technology and other clinical Lab waste	Disposed of by incineration or Plasma Pyrolysis or Encapsulation Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis shredding or mutilation or combination of sterilization and shredding Pre-treat to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or WHO guidelines thereafter for Incineration
	Chemical Liquid Waste: discarded Formalin, liquid from laboratories and floor washings, cleaning, etc.	Pre-treat to sterilize with non-chlorinated chemicals on-site
2	Red Category (Red Plastic Bag)	
	Contaminated Waste (Recyclable) Wastes generated from disposable items.	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding.
3	White Category (White Puncture proof containers)	
	Sharps must always be kept in puncture-proof containers to avoid injuries and infection to the workers handling them.	Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete (Sharp Pit); combination of shredding cum autoclaving.
4	Glassware & Metallic Body Implants (Carton box with blue sticker)	
		Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.

Categorization of Bio-Medical Waste in Ayurveda and Panchakarma Hospitals and their Disposal Methods is discussed in Table 3.



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Table 3 Categorization of Bio-Medical Waste in Ayurveda and *Panchakarma* Hospitals and their Disposal Methods

Sl. No.	Panchakarma Procedure	Waste Generated	Disposal methods
1.	<i>Vamana</i>	Liquid waste	Treat with 2% hypochlorite solution. Discard in drain after 2-3hrs
2.	<i>Virechana</i>	Liquid waste containing faeces	Drain. When bed pan is used treat with 2% hypochlorite solution. Discard in drain after 2-3hrs
3.	<i>Nasya</i>	Liquid waste	Treat with 2% hypochlorite solution. Discard in drain after 2-3hrs
4.	<i>Basti / Uttara Basti</i>	Liquid waste, Plastic <i>Vasti Yantra</i> (Single use / Disposable), Rubber catheters, Gloves	Liquid - Drain. When bed pan is used treat with 2% hypochlorite solution. Discard in drain after 2-3hrs Disposable <i>Basti Yantra</i> , Rubber Catheters, Gloves – Red bag
5.	<i>Rakta Mokshana (Jalouka and other Bloodletting methods)</i>	Blood, Sharp Needles, Lancets and Blood soaked cotton / gauze	Blood is treated with 2% hypochlorite solution. Discard in drain after 2hrs Sharp Needles, Lancets – White Puncture Proof Container Blood soaked cotton / gauze- Yellow bag
6.	<i>Shirodhara / Shiro Basti / Taila Parisheka / Janu Basti / Kati Basti</i>	Oil, Black gram dough and soaked cotton	Oil – Given to patient for daily application / Sold / Given to local garage to use as lubricants / furnace as fuel. Black gram dough - Manure / General Waste Soaked cotton - Yellow bag
7.	<i>Abyanga</i>	Oil soaked cotton or cora cloth	Yellow bag
8.	<i>Kashayas</i> (decoctions) and liquids other than <i>Taila</i> (oils) used for <i>Dhara, Abvanga</i> (a type of fomentation technique like sitz bath) & <i>Prakshalana</i> .	Liquid waste	Treat with 2% hypochlorite solution. Discard in drain after 2-3hrs
9.	<i>Tarpana</i>	Ghee, Ghee soaked cotton	Ghee - Sold / Given to local garage to use as lubricants / furnace as fuel. Ghee soaked cotton - Yellow bag
10.	<i>Patra Pinda Sweda</i>	Cora Cloth, Leaves mixed with Lemon, Coconut Shavings.	Cloth - Yellow bag Leaves – Manure or Whole <i>Pottali</i> - Yellow bag
11.	<i>Shastika Shali Pinda Sweda</i>	Cora Cloth, Cooked brown rice	Rice – General waste/ Piggery
12.	<i>Kukkutanda Sweda</i>	Crumbled Egg	Cloth - Yellow bag Crumbled Egg – Manure or Whole <i>Pottali</i> - Yellow bag
13.	<i>Churna Pinda Sweda/ Udwartana/ Upanaha/ Lepas</i>	Cora Cloth, <i>Churna</i>	Cloth - Yellow bag <i>Churna</i> – Manure Whole <i>Pottali</i> - Yellow bag
14.	Others	Containers of oil / <i>Kashayas</i> , Expired Medicines, Gloves.	Containers of oil/ <i>Kashayas</i> , - General waste / Black Bag – Not Bio Medical Waste. Expired Medicines - Herbal medicines are used as manures / land fills Gloves – Red bag



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NOTE: In case glass bottles are used or generated as waste, the same has to be disinfected (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling in a carton box on which a Blue sticker is pasted.

Preparation of Hypochlorite Solution: 400 ml of 5% concentration of commercially available Hypochlorite solution Chlorine to be mixed with 600ml of water to get 2% Hypochlorite Solution.

DISCUSSION

Considering the guidelines of BMWM Rules 2016, predominantly designed for an Allopathy Hospital set up, Brainstorming was done among like-minded doctors to categorize and segregate various types of waste generated in an Ayurveda Hospital. Once done, further analysis was done whether it was infectious in the actual sense as per BMWM Rules. Efforts to understand and minimize the actual bio medical waste was planned. On closer observation it was understood that most of the waste generated during *Panchakarma* procedures belong to the category of food waste or non-infectious waste. Further, safe way of disposal of the waste was discussed that would reduce the burden on the eco system was minimised.

One challenge faced among Ayurveda Hospitals situated in cities is the place for setting up compost for disposal of waste (leaves, lemon, coconut, rice, etc left over or after completion of particular

treatment procedure) categorised for manure. It is debatable whether the same can be disposed of after proper segregation as wet waste to Municipal Corporation. In certain Ayurveda Hospitals innovative methods are adopted for preparation of compost in drums or big plastic pipes kept on terrace or available space. Many Ayurveda Hospitals finding no alternative dispose them in Yellow bags as infected waste.

CONCLUSION

The amount of Bio Medical Waste generated by a health care setup is posing challenges for safe disposal all over the globe. The place available for deep burial or construction of concrete for disposal of waste is proving expensive. The incinerators used for disposing Bio Medical Waste pose threat for air pollution & disposal of incinerated ash is another major head ache. Considering these, if Ayurvedic Hospitals plan for proper segregation of the generated Hospital Waste, most of them can be used as manure and very less goes to the category of Infectious / Hazardous Bio Medical Waste. This would help in minimizing the environmental pollution. Ayurveda Practitioners need to strictly identify and segregate the hospital waste as General Waste, Bio Medical Waste & Other waste. Only then they will be able to implement BMWM Rules 2016 in an ethical & safe manner.



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