

# MANAGEMENT OF HEALTHCARE WASTE

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## ***Abstract:***

Healthcare waste (HCW) is defined as the total waste stream from a healthcare facility .Most of it (75-90%) is similar to domestic waste and is known as healthcare general waste and is made of paper, plastic packaging, food preparation, etc. that haven't been in contact with patients. But a smaller proportion (10-25%) is hazardous waste that requires special treatment . If these two categories of wastes are not separated properly then the entire volume of healthcare waste is considered as infectious and hazardous to human health and can result in disease and injury so it is necessary to set up a safe and integrated management system.

***Keywords:*** Healthcare Waste, management, Environmental hazards, disposal.

## ***Introduction:***

Major sources of healthcare wastes are hospitals, clinics, laboratories, blood banks and mortuaries while minor sources are pharmacies, physician's office, dental clinics etc. (Prasad and Amarnath,2010). Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area. Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area, hospital acquired infections, transfusion transferred diseases, rising incidence of Hepatitis B, and HIV, increasing land and water pollution lead to increasing possibility of catching many diseases. Air pollution due to emission of hazardous gases by incinerator such as Furan, Dioxin, Hydrochloric acid etc. have compelled the authorities to think seriously about hospital waste and the diseases transmitted through improper disposal of hospital waste.

A biomedical waste handling and management rule was introduced in 1998. The rules are applicable to every institution generating hospital waste which includes hospitals, nursing home, dispensary, veterinary institution, animal houses, pathological lab, blood bank etc. An advance in medical facilities with the introduction of sophisticated instruments has increased the waste generation per patient in health care units (Radha,2009). The waste is increasing day by day due to advances in scientific knowledge and has impact on human lives (Rao and Garg,1994).The hazardous nature of healthcare waste is due to one or more of the following characteristics:

- It contains infectious agents.
- It contains sharps.
- It contains hazardous chemicals or pharmaceuticals.
- It is genotoxic.
- It is radioactive.

## ***Risks Associated with healthcare waste***

All individuals exposed to healthcare waste are potentially at risk of being injured and infected. They includes:

- Medical Staff such as doctors, nurses, sanitary staff and hospital maintenance personnels ;
- In and out-patients receiving treatment in healthcare facilities as well as their visitors;

- Workers in support services linked to healthcare facilities such as laundries, waste handling and transportation services;
- Workers in waste disposal facilities, including scavengers;
- The general public and more specially the children playing with the items they can find in the waste outside the healthcare facilities when it is directly accessible to them.

Waste management and treatment options should first protect the healthcare workers and the population and minimise indirect impacts from environmental exposures to HCW.

### *Types of Healthcare Wastes*

- **Infectious Waste:** the wastes which contain pathogens in sufficient concentration or quantity that could cause diseases . It is hazardous e.g. culture and stocks of infectious agents from laboratories, waste from surgery, waste origination from infectious patients.
- **Sharps :** Waste material which could cause the person handling it, a cut or puncture of skin e.g. needles, broken glass, saws, nail, blades and scalpels .
- **Pharmaceutical Waste :** This includes pharmaceutical products, drugs and chemicals that have been return from wards, have been spilled, are outdated or contaminated.
- **Chemical Waste:** This comprises discarded solid, liquid and gaseous chemicals e.g. cleaning, housekeeping and disinfecting product,
- **Radioactive Waste:** It includes solid , liquid, nd gaseous waste that is contaminated with radionuclides generated from in-vitro analysis of body tissues and fluid, in-vivo body organ imaging and tumor localization and therapeutic procedures.
- **Genotoxic/Cytotoxic Waste :** Genotoxic waste derives from drugs generally used in oncology or radiotherapy units that have a high hazardous mutagenic or cytotoxic drugs or chemicals should be considered as genotoxic. In specialized cancer hospitals, their proper treatment or disposal raises serious safety problems.

### *Hazards from Infectious Waste and Sharps*

Infectious waste may contain any of a great variety of pathogenic microorganisms. Pathogens in infectious waste may enter the human body by a number of routes:

- Through a puncture, abrasion, or cut in the skin;
- Though the mucous membranes;
- By inhalation;
- By ingestion.

### *Hazards from Chemical and Pharmaceutical Waste*

Many of the chemicals and pharmaceuticals used in healthcare establishments are hazardous. They may cause intoxication, either by acute or by chronic exposure, and injuries, including burns .Intoxication can result from absorption of a chemical or pharmaceutical through the skin or the mucous membranes, or from inhalation or ingestion. Injuries to the skin, the eyes or the mucous membranes of the airways can be caused by the contact with flammable, corrosive, or reactive chemicals. The most common injuries are burns.

### *Hazards from Genotoxic Waste*

The main pathways of exposure are inhalation of dust or aerosols, Absorption through the skin, ingestion of food accidentally contaminated with cytotoxic drugs, chemicals, or waste, and ingestion as a result of bad practice, such as mouth pipetting. Many cytotoxic drugs are extremely irritant and have harmful local

effects after direct contact with skin or eyes. They may also cause dizziness, nausea, headache, or dermatitis.

### ***Hazards from Radioactive Waste***

The type of disease caused by radioactive waste is determined by the type and exposure. It can range from headache, dizziness, and vomiting to much more serious problems. Some of these wastes are also genotoxic.

### ***Healthcare Waste management***

Based on Bio-medical Waste Rules 1998, notified under the Environment Protection Act by the Ministry of Environment and Forest (Government of India).

1. **Segregation of wastes :** Segregation is the essence of waste management and should be done at the source of generation of Bio-medical waste e.g. all patient care activity area, diagnostic services area, operation theaters, labor rooms, treatment rooms etc. The responsibility of segregation should be with the generation of biomedical waste i.e. doctors, nurses, technicians etc.( medical and paramedical personnel ). The biomedical waste should be segregated as per categories mentioned in the rules.
2. **Collection of Bio-medical waste:** Collection of Bio-medical waste should be done as per Biomedical ( Management and Handling ) Rules. At ordinary room temperature the collected waste should not be store for not, more than 24 hours.
3. **Transportation of waste treatment and disposal sites:** Within hospital, waste routes must be designated to avoid the passage of waste through patient care areas. Separate time should be earmarked for transportation of bio-medical waste to reduce chances of it's mixing with general waste. Hazardous bio-medical waste needing transport to a long distance should be kept in containers and should have proper labels. The transport is done through vehicles specially constructed for the purpose having fully enclosed body.
4. **Treatment of hospital wastes:** Hospital wastes should be disinfected so that it is no longer the source of infection. The volume of the waste should be reduced. Healthcare wastes should be recycled.
5. **Safety measures:** Precautions and appropriate safety measures should be taken while doing therapeutic and diagnostic activities and while handling the waste.
6. **Training:** All the medical professionals must be made aware of Bio-medical Waste (Management and Handling) Rules 1998. Training should be conducted to all categories of staff in appropriate language in acceptable manner.
7. **Measures for wastes minimization:** As far as possible, purchase of reusable items made of glass and metal should be encouraged. Select non PVC plastic items. Establish effective and sound recycling policy for plastic recycling.

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