

Health Care Waste Management

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ABSTRACT

This paper deals with health care waste management. It outlines the types of health care waste relating of pathological waste, chemical waste and hazards from health care waste. This paper makes a special note on management of hazardous healthcare waste, waste handling procedure, waste minimization methods, segregation of health care waste, recycling and reuse of health care waste and health care waste treatment. This paper sheds light on prevention and control of risk to the health workers consequent upon handling health care waste. This paper concludes with some interesting findings.

KEYWORDS: Healthcare activities, Management of Hazardous Healthcare Waste, Waste handling Procedure, Waste minimization Methods, Segregation of Health care Waste, Recycling and reuse of Health care Waste

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Introduction

Healthcare waste can be defined as any waste produced by healthcare activities. It may also be known as medical waste, hospital waste or infectious waste. The major sources include hospitals, Health Posts, emergency medical care services, healthcare centres and dispensaries, obstetric and maternity clinics, outpatient clinics, and the like. Other sources are dental clinics, psychiatric hospitals, cosmetic ear-piercing and tattoo parlours, and illegal drug users. Healthcare waste can be put into one of two broad categories; non-hazardous 'general waste' and hazardous 'healthcare risk waste'.

Between 75 per cent and 90 per cent of the waste produced in healthcare establishments is general waste. This includes papers, packaging materials, dust and the like. This can be disposed of in the same way as other non-hazardous wastes, but only if is not contaminated by contact with hazardous wastes. The remaining 10–25% of waste is hazardous and could be composed of sharps such as needles, lancets, etc., syringes, blood or body fluid, contaminated surgical instruments, delivery bowls used gauzes and gloves, plasters, etc. It may also contain expired drugs, lab reagents and other chemicals. The main concern here should be on managing the hazardous wastes in a safe way. However, one should not ignore non-hazardous wastes, because poor handling and segregation can lead to them being contaminated with hazardous materials.

One can categorise hazardous healthcare waste into: Infectious waste: waste that may contain pathogens. This

includes used dressings, swabs and other materials or equipment that have been in contact with infected patients or excreta. It also includes liquid waste such as faeces, urine, blood and other body secretions.

Pathological Waste

Human tissues including placentas, body parts, blood and foetuses. Anatomical waste is a sub-group of pathological waste and consists of recognisable body parts. Sharps: needles, infusion sets, scalpels, blades and broken glass. Pharmaceutical waste: expired or no longer needed pharmaceuticals; items contaminated by or containing pharmaceuticals bottles, and boxes. Genotoxic waste: substances with genotoxic properties meaning they can cause genetic damage such as certain drugs and genotoxic chemicals.

Chemical Waste

Wastes containing chemical substances such as laboratory reagents, film developer, disinfectants that are expired or no longer needed, and solvents. Waste with high content of heavy metals: includes batteries, broken thermometers, blood-pressure gauges, etc. Pressurised containers: gas cylinders, gas cartridges and aerosol cans. Radioactive waste: containing radioactive substances from radiotherapy or laboratory research.

Public Health Importance of Healthcare Waste

Healthcare waste is varied in type and the amount produced is increasing each year. Moreover, if there is little or no

segregation of non-hazardous and hazardous waste, it is inevitable that the general waste component will become contaminated and must then be regarded as hazardous. Everyone in the community is potentially at risk from exposure to healthcare waste, including people within the healthcare establishment and those who may be exposed to it as a result of poor management of the waste.

Hazards from Infectious Waste

Infectious wastes may contain a variety of pathogenic microorganisms. The route of entry into the body for microorganisms may be through a puncture, abrasion or cut in the skin, possibly caused by sharps contaminated with pathogens. Entry may also be through the mucous membranes such as eye, mouth or nose, by inhalation, or by ingestion. There is a particular concern about infection with human immunodeficiency virus (HIV) and hepatitis viruses B (HBV) and C via healthcare waste. These viruses are generally transmitted through needle stick injuries contaminated by human blood. Needle stick injuries are piercing wounds usually caused by the point of a needle but also by other sharp objects. To avoid the risk of HBV, it is recommended that all personnel handling healthcare waste should be immunized. Unfortunately, no vaccine is yet available against hepatitis C.

Management of Hazardous Healthcare Waste

The aim of healthcare waste management is to contain infectious waste and reduce risks to public health. The steps to achieve this goal include waste minimisation, identification and segregation, recycling, adequate packaging, handling and storage, and proper treatment and disposal.

Waste Handling

There are a number of basic guidelines for waste handling. All healthcare waste should be segregated and placed into waste bins by the person generating the waste at the point where waste is generated. All specific healthcare waste segregation, packaging and labelling needs to be explained to the medical and supporting staff. Information should be displayed in charts on the walls of each room. Carts and recyclable containers used for transport of healthcare waste should be disinfected after each use. Sanitary staff and sweepers must wear proper protective clothing at all times when handling infectious waste including face masks, aprons, boots, and heavy duty gloves, as required.

Waste Minimization

Waste minimisation is the first and most important step in any waste management plan. Minimising the amount of waste produced will help the environment by reducing the amount of waste to be disposed of or burned in incinerators, and consequently reduces air pollution. For effective waste minimisation, the health worker should always bear in mind that the materials and supplies purchased should create no or minimal waste. However, it is important to note that minimising waste should never be carried out if it compromises patient care or creates any other risk of infection.

Segregation of Healthcare Waste

Segregation is the process of separating different categories of waste. Healthcare waste is usually segregated into colour-coded waste bags or bins. This should take place at the source when the waste is created. The health workers should

follow the guidelines for segregation of waste so that the different types of waste are kept separate and each can be handled safely and economically. Healthcare facilities should provide coloured waste receptacles specifically for each category of waste. The colour-coding system aims to ensure immediate, easy and clear identification and segregation of the waste which the health workers are handling or going to treat.

Based on the type of hazards involved, a different colour code and type of container is assigned and should be used as follows:

Black: all bins or bags containing non-hazardous healthcare waste.

Yellow: any kind of container filled with any type of infectious healthcare waste, including yellow safety boxes for sharps.

Red: any kind of container filled with heavy metal or effluent.

White: any container or bin filled with drug vials, ampoules or glass bottles for glass recycling or reuse.

One should also note that in a resource-limited Health Post, red containers can be omitted and heavy metals and other effluents can be handled as any other infectious waste using yellow containers. However, please don't forget that heavy metals and other effluents should not be incinerated in final disposal sites.

Recycling and Reuse of Healthcare Waste

Reuse means using the same item again and again without changing its physical form or appearance. Recycling of waste requires processing of some sort, usually in another location, to create a new and different product.

Reuse of some healthcare waste such as glassware is possible but only after cleaning and disinfection. Items should be immersed in a 0.5% chlorine solution for 10 minutes and carefully washed with a brush and soap, rinsed and dried before use. During the disinfection process, the health workers should always protect their hands with appropriate gloves. It is also recommended that the health workers autoclave the glassware at 121°C for at least 30 minutes after washing to ensure complete sterilisation/disinfection. Only unbroken glassware should be reused; if it is broken it will be sharp waste and must be disposed of. Materials such as non-contaminated glass and plastic items can be recycled. Recycling may increase the segregation criteria and require more effort on individual's part because separate containers are needed for materials to be recycled.

Use of Safety Boxes

The health workers should always collect sharp wastes immediately after use in a safety box. This helps you avoid injuries. Methods of healthcare waste treatment and disposal

Steam Sterilization

Steam sterilisation is one of the most common methods of treatment of waste. It uses saturated steam within a pressurised vessel called an autoclave at a temperature that is high enough to kill pathogenic microorganisms. Contaminated items or waste should be sterilised for 30 minutes at 121°C at a pressure of 106 kPa. The health

workers should note carefully that the timing should start only after it has reached the necessary temperature and pressure.

Incineration

Incinerators convert combustible materials into ashes or residues. Gases are ventilated through the chimney stack into the outer air. If the incinerator is properly designed, maintained and operated, it serves the purpose of destroying infectious microorganisms in the waste. In the context of waste management, incineration means more than just burning. It means controlled and managed burning, usually at high temperature. A waste incinerator needs to reach very high temperatures in order to completely destroy needles and syringes. This type of high temperature incinerator is unlikely to be available to you but other options for burning can be used at Health Post level. With the help of others in your community, the health workers may be able to build a low temperature incinerator, also known as a protected hearth.

If a brick-built incinerator is not available, the health workers may be able to burn the waste in a converted metal drum or barrel. To do this, the health workers will need a metal drum with both ends removed to make a cylindrical container. The health workers will also need four bricks and two rigid metal screens that are large enough to cover the open ends of the drum. The health workers will need to place the drum in a fenced area away from the Health Post buildings. Place the bricks on the ground, with spaces between them and a metal screen or grate on top. Place the open base of the drum on the metal screen and put another screen on top. The metal screens are to allow air to flow around the burning waste so the fire gets hotter, and to reduce the amount of ashes flying out of the top. Put the safety box or other waste with some paper, dry leaves, or small sticks into the drum and sprinkle them with a small amount of kerosene. Put paper under the drum, between the bricks, and set light to it so the flames rise through the metal screen.

Final Disposal: Burial Pits

Burial pits are acceptable for some wastes but ideally, there should be separate pits for general healthcare wastes and for hazardous healthcare waste. The general waste could be transported to community refuse pits, if there are any. Burial pits for hazardous waste should be properly fenced to prevent access by people or animals. They should not be used, however, in areas with a high groundwater table. The bottom of the pit should be at least 1.5 m higher than the groundwater table for disposal of solid waste. One should make sure that the final disposal of hazardous waste by reputable waste handlers is performed according to applicable central and local regulations.

Sharps Pit

A sharps pit is a particular type of burial pit that should be used only for the final disposal of needles and other sharps. Safety boxes should be incinerated to sterilise the contents before carefully collecting the residue for disposal in the sharps pit. A properly constructed sharps pit should have a cover at the surface and be lined with cement to make it watertight in order to avoid contamination of groundwater and soil. It must have a fence around it. For a Health Post, the pit need not be large and can take many years to fill.

Anatomical Waste and Placentas

The visual impact of anatomical wastes especially for observable body parts is very sensitive and may alarm the

general public. The wastes are also a health hazard. Therefore, it is mandatory to properly contain anatomical wastes based on the local custom or cultures of the society. Special care and sensitivity is needed when considering the appropriate disposal of fetuses from stillbirths. One should make sure, while considering the local contexts, that the method chosen should not contaminate the environment. Anatomical waste and placentas need a special placenta pit. The placenta pit should also be used for blood, vomit and other bodily secretions. This burial pit should be sited inside the Health Post compound and dug down to at least 1 m deep. The pit should be fenced and locked. The waste should be collected in a plastic or galvanised metal container with a tight-fitting cover and immediately transported to the pit using dedicated trolleys or carts. The waste should be covered with a layer of soil immediately after disposal into the pit. Due to cultural conditions, and the low temperature incinerators present in Health Posts, one should avoid using incinerators for anatomical waste. One should wear heavy-duty gloves while handling and transporting the waste. Wash and dry the gloves after use.

Prevention and Control of Risks to Healthcare Workers

All healthcare workers, including the waste handlers and maintenance workers, should be instructed to use personal protective equipment such as gloves while working in contaminated areas and with contaminated materials, and to wash their hands thoroughly after removing the gloves. The workers should be aware of the fact that other people may not have followed the correct procedures while disposing of gloves, blades or needles; therefore, they need to be careful when handling all healthcare waste bags and containers. People working in healthcare facilities may get accidental injuries because they are in a hurry to help their patients, or in an emergency, or simply due to ignorance or not being able to practise what they know.

Keep desks and countertops free from sharps. Discard needles and other sharps into safety boxes, never into waste bins or plastic bags. Never try to recap needles i.e. use once and dispose of immediately. Regularly review the rules for safe disposal and collection of sharps or other hazardous materials. The any healthcare worker should always examine and handle soiled linens and similar items as if they were hazardous. Workers should receive periodic instruction at least once a year to keep them aware of the specific hazards of healthcare waste. Workers should take appropriate measures to limit further contagion from waste by practising universal precautions of self-protection from exposure to infectious wastes.

Conclusion:

Healthcare waste is any waste produced in a healthcare facility and is also known as medical waste, hospital waste or infectious waste. It includes hazardous and non-hazardous waste. Health hazards from pathogens are the major concern in waste from Health Posts. Waste minimisation is the first and most important step in healthcare waste management. Healthcare waste must be segregated into different categories and colour-coded containers used for storage. Safety boxes are important devices for safe collection of sharps. A sharps pit is also required for final disposal.

Personnel involved in handling and storage of healthcare waste should be trained in correct procedures and provided with the necessary PPE to protect their health.

References

- [1] BMGF (2015). Building demand for sanitation - a 2015 portfolio update and overview - Water, sanitation, and hygiene strategy, June 2015. Bill & Melinda Gates Foundation, Seattle, Washington, USA
- [2] A B SuSanA (2008). Towards more sustainable sanitation solutions - SuSanA Vision Document. Sustainable Sanitation Alliance (SuSanA)
- [3] a b Tilley, E., Ulrich, L., Lüthi, C., Reymond, Ph. and Zurbrügg, C. (2014). Compendium of Sanitation Systems and Technologies. 2nd Revised Edition. Swiss Federal Institute of Aquatic Science and Technology (Eawag), Duebendorf, Switzerland.
- [4] Russel, K. (2013). Mobile sanitation services for dense urban slums - Various documents on results from research grant. Stanford University, USA
- [5] IWA (2005). Sanitation 21 - Simple approaches to complex sanitation. International Water Association (IWA), London, UK
- [6] Lüthi, C., Panesar, A., Schütze, T., Norström, A., McConville, J., Parkinson, J., Saywell, D., Ingle, R. (2011). Sustainable sanitation in cities: a framework for action. Sustainable Sanitation Alliance (SuSanA), International Forum on Urbanism (IFoU), Papiroz Publishing House, ISBN 978-90-814088-4-4
- [7] Duttie, Marsha (January 1990). "NM State greywater advice". New Mexico State University. Retrieved 23 January 2010.
- [8] Harvey, P.A.; Baghri, S.; Reed, R.A. (2002). Emergency sanitation: assessment and programme design. Loughborough, UK: WEDC
- [9] WEDC technical briefs
- [10] Oxfam (2001). Guidelines for public health promotion in emergencies. Oxford, UK: Oxfam.
- [11] Oxfam resources site <http://oxfam.org.uk/resources/learning/> including briefs on UD and composting toilets in emergencies The Sphere handbook www.sphereproject.org
- [12] Wisner, B.; Adams, J. (2002). Environmental health in emergencies and disasters: a practical guide. Geneva, Switzerland, WHO. WHO technical notes for emergencies 13 & 14

