

THE ENVIRONMENT PROTECTION BY SELECTIVE COLLECTION OF HAZARDOUS WASTE

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Abstract

Infectious wastes can be very dangerous if they are handled by people who do not realize their dangers. The management of medical waste is of great importance due to its potential environmental hazards and public health risks. In the medical cabinet, it was necessary to select infectious waste and to conclude contracts with specialized companies in the collection of infectious waste. Thus, these wastes are taken to specialized places and specialized environments, and the workers collecting them use protective equipment. The importance of selective collection of hazardous waste is to prevent environmental contamination and damage to health. Also, it is important that hazardous and non-hazardous waste does not interfere. Collecting is done in different color devices: yellow for dangerous medical and black for non-hazardous. For infectious waste, use the "Biohazard" icon.

Key words: medical waste, infectious waste, biological hazard

INTRODUCTION

In the past few years, public concern over the disposal of medical waste has markedly increased (Rutala, 1992). The management of medical waste is of great importance due to its potential environmental hazards and public health risks (Tsakona, 2007).

In the past medical waste was often mixed with municipal solid waste and disposed of in residential waste landfills or improper treatment facilities in Romania (Schiopu, 2010). In recent years, many efforts have been made by environmental regulatory agencies and waste generators to better manage the waste from healthcare facilities. Medical waste incineration is identified as the most preferred disposal method (Singh, 2007). Faced with increased regulations over toxic air emissions, all existing small incineration facilities that do not have air pollution control devices will cease operation in the next few years. Large-scale medical waste incinerators would be responsible for the treatment of medical waste generated by most healthcare facilities in Romania. It is important to point out that there is a great potential to emit air toxic pollutants from such incinerators if improperly operated and managed, because medical waste typically contains a variety of plastic materials such as polyvinyl chloride. Waste minimization and recycling, control of toxic air emissions at medical waste incinerators, and alternative treatment methods

to incineration are regarded to be the major challenges in the future (Jang, 2006; LaGrega, 2010).

The biggest producers of hazardous medical waste are hospitals that do not implement existing legislation, due to the lack of education and funds. Information on quantities, type and flow of medical waste are inadequate, as is sanitary control (Marinković, 2008; Al-Emad, 2011).

MATERIAL AND METHOD

Hazardous waste has to go through a process from generator to processor, which consists of the following steps: selection, collection, packaging, transport and disposal of waste. There are legal regulations on the approval of technical rules for the management of waste resulting from medical activities and the methodology for collecting data on waste resulting from medical activities (Mato, 1999; Mohamed, 2009; Patil, 2005).

Dangerous medical waste according to the World Health Organization may be classified as waste-shavings (needles, catheters, needle syringes, loops, scalpel blades, pipettes), anatomopathological waste (fragments of human organs, organic liquids, biopsy material), infectious waste (which came in contact with biological products and bacteria, viruses, parasites), acids, bases, halogenated solvents, other types of solvents, organic and inorganic chemicals, cytotoxic and cytostatic drugs, amalgam waste from dental treatments (Demirbas, 2011).

Medical staff is responsible for collecting and selecting hazardous waste from non-hazardous waste resulting from medical operations (Askarian, 2004; Yong, 2009).

RESULTS AND DISCUSSION

Packaging and selective collection of hazardous waste to non-hazardous waste has both the specific elimination role and the protection of staff handling containers and packaging (Rada, 2013; LaGrega, 2010).

The transport of hazardous medical waste must be carried out in accordance with the legislation in force, under strict safety and packaging conditions (Rada, 2014; Hassett, 1994; Da Silva, 2005).

We are constantly pursuing the improvement of the different types of services offered to the clients as well as the continuous improvement of our employees in order to offer technical solutions regarding the waste collection and incineration processes (Cherubini, 2009; Sabbas, 2003; Hjelmar, 1996).

CONCLUSIONS

We propose an integrated approach to medical waste management based on a hierarchical structure from the point of generation to its disposal. Priority is given to the reduction of the amounts and potential for harm.

Preferred methods should be the least harmful for human health and the environment.

The authors believe that incineration is the most appropriate method, a number of small incinerators would be the most economical solution.

REFERENCES

1. Al-Emad A.A., 2011, Assessment of medical waste management in the main hospitals in Yemen/Évaluation de la gestion des déchets médicaux dans les principaux hôpitaux du Yémen. *Eastern Mediterranean Health Journal*, 17.10, 730
2. Askarian M.M., 2004, Results of a hospital waste survey in private hospitals in Fars province, Iran. *Waste management*, 24.4, pp.347-352
3. Cherubini F.S., 2009, Life cycle assessment (LCA) of waste management strategies: Landfilling, sorting plant and incineration. *Energy*, 34.12, pp. 2116-2123
4. Da Silva C.E., 2005, Medical wastes management in the south of Brazil. *Waste management*, 25.6, pp.600-605
5. Demirbas A., 2011, Waste management, waste resource facilities and waste conversion processes. *Energy Conversion and Management*, 52.2, pp.1280-1287
6. Hassett J.J., 1994, Hazardous waste transport management system. U.S. Patent No. 5, 347, 274, (13 Sep. 1994)
7. Hjelmar O., 1996, Disposal strategies for municipal solid waste incineration residues. *Journal of hazardous materials*, 47.1-3, pp.345-368
8. Jang Y.C. e., 2006, Medical waste management in Korea. *Journal of environmental management*, 80.2, pp.107-115
9. LaGrega M.D., 2010, Hazardous waste management. Waveland Press
10. Marinković N. e., 2008, Management of hazardous medical waste in Croatia. *Waste management*, 28.6, pp.1049-1056
11. Mato R.R., 1999, Critical review of industrial and medical waste practices in Dar es Salaam City. *Resources, Conservation and Recycling*, 25.3, pp.271-287
12. Mohamed L.F.T., 2009, Hazardous healthcare waste management in the Kingdom of Bahrain. *Waste management*, 29.8, pp.2404-2409
13. Patil G.V., 2005, Biomedical solid waste management in an Indian hospital: a case study. *Waste management*, 25.6, pp.592-599
14. Rada E.C., 2013, Web-GIS oriented systems viability for municipal solid waste selective collection optimization in developed and transient economies. *Waste management*, 33.4, pp.785-792
15. Rada E.C., 2014, Selective collection as a pretreatment for indirect solid recovered fuel generation. *Waste Management*, 34.2, pp.291-297
16. Rutala W.A., 1992, Medical waste. *Infection Control & Hospital Epidemiology*, 13.01, pp.38-48
17. Sabbas T. e., 2003, Management of municipal solid waste incineration residues. *Waste management*, 23.1, pp.61-88

18. Schiopu A.M. a., 2010, Municipal solid waste landfilling and treatment of resulting liquid effluents. *Environmental Engineering & Management Journal (EEMJ)*, 9.7
19. Singh S. a., 2007, Toxic environmental releases from medical waste incineration: a review. *Environmental monitoring and assessment*, 132.1-3, pp.67-81
20. Tsakona M.E., 2007, Hospital waste management and toxicity evaluation: a case study. *Waste management*, 27.7, pp.912-920
21. Yong Z. e., 2009, Medical waste management in China: a case study of Nanjing. *Waste management*, 29.4, pp.1376-1382
22. Yong Z. et al., 2009, Medical waste management in China: a case study of Nanjing. *Waste management*, 29.4, pp.1376-1382