



**Hospital waste management in Greece: Current situation, perspectives and proposals**  
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**Abstract**

The implementation of an effective management system regarding the hospital care waste (HCW) is always of paramount significance due to the infectious and toxic burdens risks which are related to the human health situation and well being. This paper investigates (a) the advances in the treatment methods of hospital waste management (b) the current worldwide legislative status and guidelines (c) the perspectives and proposals for the Greek health system, especially in hospitals and (d) feasibility aspects from the HCW analysis in the University Regional General Hospital of Patras.

*Keywords: hospital waste management, HCW treatment technologies, circular economy, green materials, process efficiency*

**1. Introduction**

In an extensive literature review we analyze the conventional practices in all categories of the hospital wastes, including radioactive and wastewater treatment.

The rise in incidence of such maladies makes the possibility of infection of personal handling these waste and risk to public health resulting from the transport of infectious waste. Moreover, environmental nuisance may also arise due to foul odor, flies, cockroaches, rodents, and vermin as well as contamination of underground aquifers by untreated medical waste in landfills. Thus, there is growing awareness worldwide of the need to impose stricter controls on the handling and disposal of wastes generated by health care facilities.

**2. Legislation and guidelines**

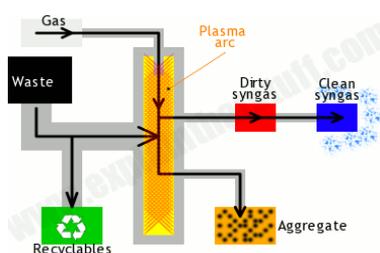
1. World Health Organization
2. International Committee of the Red Cross
3. Directives 75/442/EEC , 91/156/EEC, 2000/76/EC, 2006/12/EC , corresponding Decisions and latests amendments
4. European Waste List (EWL)
5. European and International Indicators and Good Waste Management principles

**3. Clustering and Classification of HCW**

Based on the international literature the Directives and the , 75-90% of Healthcare Waste (HCW) are considered non-hazardous (that is similar to household waste) approximately, while the remaining 10-25% are considered dangerous, with the possibility of causing contamination to anyone who is exposed to them. Healthcare Waste (HCW) and by-products cover a diverse range of materials, as the following list illustrates [ *Infectious , pathological , Chemical , Pharmaceutical , Cytotoxic and cytostatic , Radioactive , Non- hazardous or general waste* ]

**4 Advances in HCW technologies and WtE potential**

- Well known technologies, such as incineration and sterilization, using different principles, are examined and compared to the other methods of pyrolysis, plasma gasification and vitrification, from the perspective of the recent developments and the new technology advances. Besides, the new legislation guidelines regarding the circular economy, WtE and potential challenges are to be investigated for certain categories of HCW disposals.



(a)

Figure 1. Plasma technology and WtE potential

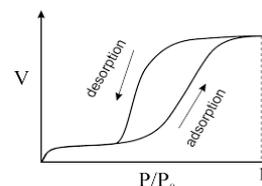
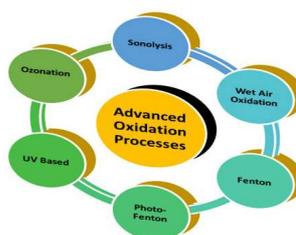


Figure 2. (a) Advanced oxidation processes classification  
(b) The sorption hysteresis loop

**5. Conclusions**

Optimizing solutions to environmental issues in the health care industry requires holistic approaches that incorporate not only health care facilities but also the supply chain and end-of-life disposal strategies in a LCA analysis. Indeed, since health care wastes risk management complexity, there is an apparent need for a conceptual framework to adopt and harmonise the National corresponding Law, based on the functionality and the key characteristics of the new technologies and the latest advances .

**6. References**

- Fig. 1. Source: [<https://www.explainthatstuff.com/plasma-arc-recycling.html>]  
Fig.2 [(a) Source: Mishra N. S, Reddy R, Kuila A, Rani A, Mukherjee P, Nawaz A, Pichiah S. A Review on Advanced Oxidation Processes for Effective Water Treatment. *Curr World Environ* 2017;12(3).], (b) [Source: Aravossis, Kapsalis. CRC Press, Taylor and Francis Group, 383-420, ISBN10 1138705853, ISBN13 9781138705852 2018]