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## **CURRENT PROBLEMS OF WASTE DISPOSAL OF TREATMENT AND PREVENTIVE INSTITUTIONS (LITERATURE REVIEW)**

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### **Abstract**

The organization of a system for handling hospital waste has special features due to the relevance of the potential risk of interacting with it and the polymorphism of this type of waste. This is reflected in such regulatory documents as “Sanitary rules, norms and hygiene standards for the design, construction and operation of treatment and prevention institutions” (SanQva N No. 0020-22) and “Sanitary rules and norms for the collection, storage and utilization of waste in medical institutions of the Republic of Uzbekistan” (SanPiN No. 0317-15 of the Republic of Uzbekistan). Subject to the recommendations of sanitary rules and norms, the need to use thermal processing technology for hospital waste is introduced only for waste of classes B and V, which have an epidemiological hazard and are contaminated with biological fluids of patients. At the same time, the problem of the level of their necessary sanitation arises, that is, it is necessary to determine whether disinfection of such waste is sufficient or whether sterilization or complete replacement of the waste substrate should be used [4,7].

It is necessary to separately emphasize the high epidemiological risk that hospital waste poses to the environment for people professionally associated with waste, for certain social strata of society, since currently this type of waste is included in the composition of solid household waste and is disposed of in landfills, landfills and waste loading stations. However, even now, without introducing



epidemiological safety in the collection and storage of waste, chemical disinfection of class B and V waste is carried out at the place of its formation. They are not completely sanitized, but their microbial saturation is significantly reduced compared to solid waste. In addition, healthcare workers should collect sharps, punctures, and cutting objects in sealed containers, which reduces the risk of transmitting infections such as hepatitis C and B, and HIV [1,10]. DPM (treatment and prevention institutions) waste is characterized by its specificity, its polymorphism, as well as the presence of bacterial contamination (class B and V waste), toxicity (class G waste) and radioactivity (class D waste). Class B waste is any biological fluids released from patients during treatment and diagnostic processes, DPM waste containing microorganisms of pathogenicity classes 3-4. Class V waste is epidemiologically extremely dangerous waste contaminated with microorganisms of pathogenicity classes 1-2, as well as waste from specialized institutions related to the treatment and diagnosis of tuberculosis. The organization of a waste management system at all stages of medical waste disposal, especially during their transportation, neutralization, and utilization, requires full compliance with the requirements of environmental protection, as well as sanitary and hygienic legislation [2, 13]. Regardless of their specialization and capacity, the activities of all types of medical waste facilities generate waste of different levels of hazard and fractional composition, therefore, each of them must have a system for collecting, temporary storing, and transporting waste.

More than 80% of waste generated by medical waste facilities in the Russian Federation is currently disposed of only in landfills, which requires large transportation costs and leads to pollution of large areas of land [3, 12]. In many countries of the world, complex thermal methods for the disposal and neutralization of medical waste are now widely used. Thus, in most countries of the European Union, the centralized incineration method is widely used for the processing of waste generated in the healthcare system. In the Russian Federation, there are currently 750 medical waste neutralization facilities. The following technologies were considered at the international congress on waste management "WasteTech-2001": sterilization in an autoclave (steam sterilization), waste incineration using special devices - incinerators, chemical disinfection,



microwave disinfection, laser disinfection, and the use of plasma technologies [4, 11]. Since 2009, the European Union has set strict limits on waste incineration. The norms introduced in Europe prohibit the use of small furnaces for waste incineration. Waste must be incinerated within 24 hours of being brought to the incinerator. The waste incinerator must be equipped with devices for determining the temperature and carbon and oxygen content. The temperature of the combustion chamber must not be less than 8500C, and the temperature in the incinerator chamber must not be less than 1200 degrees. A device for cleaning the gases emitted from such chambers must be provided, the composition of these gases must be as follows: dioxins <0.1 nanograms/m<sup>3</sup>; carbon monoxide <50 mg/m<sup>3</sup>; cadmium <0.05 mg/m<sup>3</sup>; mercury <0.05 mg/m<sup>3</sup>; other heavy metals (lead, mercury) <0.5 mg/m<sup>3</sup> [5, 13].

In addition to incineration, low-temperature and chemical methods of disinfection are used to neutralize waste of classes B and V contaminated with pathogens in DPM. Chemical disinfection of DPM waste is carried out at the place of waste generation, using the specified disinfection means. Gruzdeva O.A., Gvelesiani G. A., Yakovleva Ye.N. According to the information provided by, the indicated method has several disadvantages, namely: it is very expensive, since the disinfectants used to neutralize waste require 40-60% of the annual disinfectants allocated for DPM, it worsens the working conditions of treatment, dressing and other rooms where medical workers constantly work and directly use disinfectants, this method does not always lead to the death of microorganisms, and this is mainly due to the poor absorption of the disinfectant into the waste, in addition, in recent years there has been information about the release of hospital strains of microorganisms in large quantities even from disinfected dressing materials [6, 8, 9]. In recent years, studies have shown that it is more advisable to use a physical method, namely a thermal method, for the neutralization of class B and V waste discharged from hospitals.

This is primarily explained by the availability of all conditions for the use of the thermal method in developed countries. However, currently in St. Petersburg there is no unified system for the collection, storage, and transportation of hospital waste. This situation leads to the mixing of solid household waste



generated by the population with hospital waste and industrial waste [7, 14]. The classification of all waste generated in the healthcare system into classes is considered to be quite conditional. According to the level of their epidemiological, toxicological and radiation hazard, hospital waste is divided into five classes, which are: Class A - epidemiologically safe waste, similar in composition to household waste. Class B - epidemiologically hazardous waste. Class V - epidemiologically extremely hazardous waste. G - toxicologically hazardous waste, belonging to hazard classes 1-4. Class D waste - radioactive waste. The most common chemical elements in the composition of DPM waste are: Carbon 20.9% Ar = 10.4% (ash) Hydrogen 2.65% Oxygen 14.14% Wr = 48.94% (moisture) Nitrogen 0.83% Sulfur 0.08% VI = 76.2% Chlorine 2.08% The most important issue in choosing a method for decontamination of medical waste is its effectiveness and safety. Currently, the most widespread method in the Russian Federation is chemical disinfection of medical waste. In accordance with the recommendations of the World Health Organization, the country is moving towards a hardware method for decontamination of medical waste [1, 5, 8, 17]. The country is growing in the number of specialized, automated equipment. The technologies of automated equipment registered in Russia can be divided into four main groups: processing of medical waste with saturated steam under high pressure; exposure to waste with ultrahigh frequency; chemical disinfection with grinding and neutralization with wet steam. In accordance with the existing recommendations for traditional chemical methods of disinfection, the effectiveness of chemical disinfectants is evaluated in relation to pathogens specific to the medical organization, taking into account the specialization of the hospital [9, 14, 15, 16, 18].

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