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Дата надходження рукопису 13.01.2015

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UDK 339.138:628.4.046(083.13)(477)

DOI: 10.15587/2313-8416.2015.37867

## MARKETING ASPECTS OF DEVELOPMENT OF MEDICAL WASTE MANAGEMENT IN HEALTH CARE INSTITUTIONS IN UKRAINE

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*The concept of marketing approach to medical waste management in health care is suggested.*

*The goal of research was to study the state of marketing activities of health care institutions on medical waste management and development trends of resolution of outstanding issues.*

**Methods.** *The methods, which were used in the research, are the methods of mathematical statistics, social studies and scientific knowledge.*

**Results.** *Environmental marketing institutions of healthcare means perfectly safe for the environment provision of health services. The main directions of environmental marketing concept in health care institutions is the acceptance generally binding legal standards of Use Resources, strict control the formation and licensing of medical waste; economic incentives for workers, aimed at minimizing their interest in the volumes of medical waste; financing of R & D relative to the development of new waste and sound technologies; develop a system of taxes and penalties for polluting the environment and so on.*

**Conclusions.** *As a result of the implementation of marketing strategies for managing medical waste of healthcare institutions are obtained strategic, social, environmental and economic benefits*

**Keywords:** *medical waste, marketing concept, medical waste management, healthcare institution*

*Досліджені актуальні завдання маркетингової спрямованості закладів охорони здоров'я, обґрунтована необхідність впровадження концепції маркетингового підходу до управління відходами закладів охорони здоров'я, проведено аналіз негативного впливу на здоров'я мешканців регіону та стан довкілля, досліджено переваги, отримані медичним закладом введення внаслідок її впровадження*

**Ключові слова:** *медичні відходи, маркетингова концепція, управління медичними відходами, заклад охорони здоров'я*

## 1. Introduction

The rapid development of the market economy is accompanied by growth of volumes of provided services, including the health care. This leads to the increasing of medical waste which causes some direct and indirect risks of the environment pollution as well as the emergence of infectious and noninfectious diseases among the population. Thus, according to the World Health Organization (WHO) each year worldwide due to unsafe handling of medical waste registers from 8 to 16 million infection cases with hepatitis B, 2,3 to 4,7 million cases of infection with hepatitis C and from 80000 to 160000 cases of HIV infection [1–7].

## 2. Formulation of Problems

In Ukraine it is accumulated 8.12 million tons of waste [2–3, 7–10], while in health care institutions in 2011–2012 formed 3632302,553 kg of medical waste, of which 3553418 kg belong to group epidemiologically hazardous waste «A» that are closer in composition to the solid domestic waste; 74103,253 kg – epidemiologically hazardous waste group «B», 400 kg – extremely epidemiologically hazardous waste group «B», 3411,3 kg – toxicologically hazardous waste group «G»; 970 kg – radioactive waste group «D» [3, 4, 9, 10].

According to the Institute for Ecological Hygiene and Toxicology Ukraine for one bed-place today accounts for 416 kg of waste per year [1, 4, 6–8, 10], as in the Kharkov region in 2012 at medical centers in the regional and the city are formed more than 23 tons of medical waste in the district centers - more than 50 tons [8, 10]. In Kiev 1 month health care institutions accumulates about 1700 tons of medical waste, of which 40 tons and 32 tons of hazardous especially dangerous [2–4, 10]. In the Odessa region, in which at present operates 942 health care institutions estimated amount of waste is 120 tons per year [2, 4, 7, 10].

The purpose of research was to examine the state of health care institutions marketing activities in medical waste management and to develop solutions of the identified problems.

The methods, which used in research, include methods of mathematical statistics, social research and scientific knowledge.

## 3. Literature review

Waste management situation is complicated by the fact that medical waste tend to intensive growth in their number, and presence in the health care waste the infected material makes them on the first place by the degree of epidemiological risk. Thus, each hospital bed creates an average of 0.8–1.2 kg of solid hazardous wastes (used syringes, systems, bags from under the blood, dressings, etc.) per day [1, 2, 4, 5, 7–10]. The waste in the absence of a system of safe collection, storage, transport and collecting, storage, transportation and disposal is a major source of dangerous infections both in HCF and beyond. Researches are shown that the medical waste (90 %) utilized as ordinary household waste at local landfills excluding the class of dangers. Because of this, medical waste pollute the

atmosphere, soil, air, which considerably effect on health of people and leads to cardiovascular and oncological diseases, degenerative changes, allergies, hormonal dysfunction, changes in the immune and endocrine systems, reduced life expectancy and the birth of children with various congenital abnormalities. As compared with 2009 today the overall level of morbidity increased by 1.2 % of disease of the digestive system – 2.2 %, diseases of the hematopoiesis – 3.0 % [2–3]. In polluted areas also increases the level of allergic diseases and nervous and mental disorders. Among the population living in these areas, there is increasing of number of respiratory diseases (12 %), nervous system (29 %), hemopoietic system (37 %), tuberculosis (45 %) and hypertension (67 %), many of these diseases (approximately 40 %) related to environmental impact [2]. In addition, waste is a source of infections with parenteral route of transmission confirming cases of infection with hepatitis B and HIV as medical personnel and ordinary citizens.

Despite the urgency and high social significance of the problem, today the issue of medical waste management is not yet resolved and become ever more important.

## 4. Directions of implementing the concept environmental marketing in health care institutions

Researches revealed existence of significant contradictions between entrepreneurial activity and environmental protection are carried out. To reduce these contradictions may be made due to deliberately marketing activity of health care institutions concerning medical waste handling.

The medical wastes include expired, counterfeit medicines seized and used disposable syringes and systems, bandages, gloves, clothing medical personnel, x-films contaminated waste power supply, contaminated blood, organs cut off and other waste collected in hospitals, clinics, hospices, clinics, research institutes and medical direction medical schools, veterinary hospitals, pharmacies, health and sanitation facilities, clinical laboratories, areas of blood transfusion and emergency medical care and so on. WHO refers the medical waste to a group of dangerous wastes and recommends creation of special institutions for processing of them [10, 11]. This causes the relevance of marketing research in the area of medical waste management.

Marketing orientation of health care institutions should be focused on long-term activity to determine the needs of the medical services market and specific customers and on the organization of activities to include specific needs ensuring proper quality of customer service.

The concept of marketing approach to medical waste management means that the health care institutions in the provision of health services and the recycling of waste makes some minimal environmental damage. At the same time recycling of medical waste implies their final placing in the original or processed form in the environment.

According to the results of our investigation of the process of handling medical waste, today dominates a health care institutions method of processing as disposal it at solid waste landfill (Fig. 1).

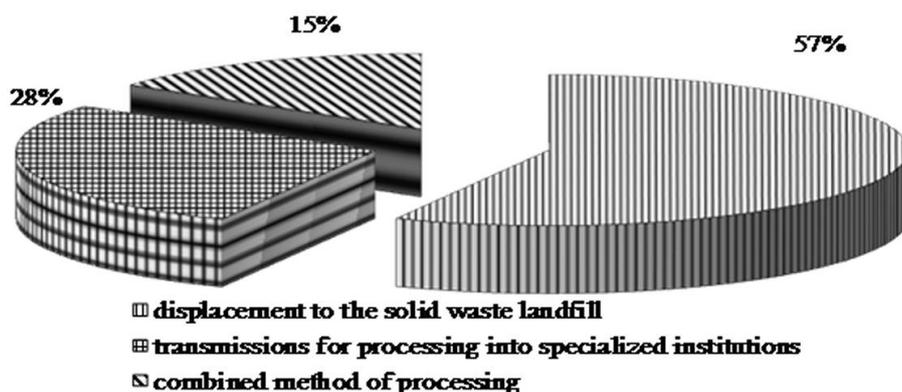


Fig. 1. Approaches to recycling that are used by domestic health care institutions

However, with instillation of medical waste pathogens dangerous diseases eventually get into the ground water or infect the air through gas emission during decomposition and combustion of contaminated medical waste in the open areas provokes spread of infections, significant air pollution and deterioration of health of the inhabitants of the region (Table 1) [1, 4, 8].

Table 1

Emissions that formed by the combustion of waste

Component	Concentration, g/m <sup>3</sup>		Toxicity index *	
	Average	Maximum	Average	Maximum
Toluene	1,86	6,0	3100	6000
Chlorinated (HCl)	0,385	0,648	1925	3215
Acetone	0,7	0,8	2000	2285
Benzene	1,32	3,0	880	2000
Nitric oxide	0,14	0,16	1647	1882
Carbon monoxide	0,5	2,5	100	500
Solids	–	0,056	–	373
Fluorinated (HF)	0,0037	0,005	185	250
Dioxin sulfur	0,018	0,095	36	190

\* – toxicity index is defined as the ratio of the concentration to the maximum permissible concentration of component

Statistics show that children who live in conditions of high air pollution are at greater risk of disease: 79 % – diseases of the musculoskeletal system, 76 % – cardiovascular diseases, 60 % – diseases of the nervous system, 50 % – infectious diseases, 44 % – allergic rhinitis, 26 % – tumors, 17 % – respiratory diseases, 14 % – ENT diseases [3–4, 9].

In addition to the negative impact on the environment of the region and the health of its residents, medical waste may be the fault of the majority of infections occurs in the territories of health care institutions. Reasons infected medical waste identified during the study are inadequate ventilation system and methods of waste disposal, lack of separate collection of medical waste and methods of treatment; poor state storage, recycling or disposal of medical waste and the operation of existing treatment facilities, their overload and in some regions – full manual output, low culture handling medical waste, breach design of technological regimes, financial difficulties, which limit the ability

of health care institutions with respect to implementation of environmental activities and more.

Important problem of the treatment of medical waste is also a lack in most hospitals, out-patient facilities and institutions of maternity and childhood ordered space to collect and temporarily store containers of medical waste, developed standards for waste management and modern approaches and techniques for their utilization. Environmental marketing

health care institutions means that provision of medical services and placement of medical waste generated are absolutely safe for the environment.

### 5. Approbation of results of research

The analysis of the literature shows that currently the key areas of environmental marketing concept of health care institutions are:

- adoption of mandatory legal standards of use resources;
- strict control and licensing the formation of medical waste;
- economic incentives for employees aimed at their interest of minimizing the volumes of medical waste;
- financing of R&D relative to the development of new wasteless and sound technologies;
- development of the system of taxes and fines for environmental pollution and so on.

As a result of implementation of the marketing strategy rational management of medical waste health care institutions may obtain strategic, social, environmental and economic benefits.

The strategic advantages include: attractive image of health care institutions; update types of medical services; labor productivity growth of health care institutions staff; health care institutions staff involvement in the process of environmental and labor practices; creativity and willingness to solve problems that arise in the health care institutions of medical waste management; no conflict with public authorities, public groups and «green» to the medical waste generated in health care institutions; implementation of environmental requirements without unnecessary tension.

Environmental benefits are to protect the environment from pollution medical waste and improving the environmental situation at the macro, meso- and micro levels. The economic benefits are shown in:

- reducing costs (savings due to a reduction in consumption of energy and other resources, re-utilization, reduced rates of payment for resources, fines and amounts of compensation for environmental damage caused);
- income growth (increase in the provision of services through innovation and less high levels of

competition, increased demand for services that are less polluting).

Social benefits create conditions for safe service delivery of health care institutions and care about the health of the population.

## 6. Conclusions

It was investigated the state of medical waste management of Ukraine. It was suggested the concept of marketing approach to waste management of health facilities. It was identified some advantages that accrue health facility due to the introduction of the concept of marketing management of medical waste.

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*Рекомендовано до публікації д-р мед. наук, професор Сердюк О. І.  
Дата надходження рукопису 14.01.2015*

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