

потреби, підібрати безрецептурний препарат для симптоматичного лікування, надати хворому належну інформацію про ЛЗ або виявити загрозливі симптоми, які вимагають негайного звернення до лікаря.

При впровадженні стандартів належних практик у сучасну діяльність аптек особливого значення набуває питання розвитку персоналу. Забезпечення якості ЛЗ та належної фармацевтичної допомоги у процесі роздрібної реалізації передбачає відповідні вимоги до працівників та потребує висококваліфікованих професійних знань, умінь і навичок. Вітчизняні фахівці наголошують на актуальності поліпшення професіоналізму й компетентності персоналу аптечних закладів та приділяють значну увагу проблемам освіти та підвищення кваліфікації фахівців фармації.

**Висновки.** Введення стандартів GPP в Україні значно поліпшить якість обслуговування населення, але водночас вимагає підвищення професіоналізму персоналу аптечних закладів, яке стане можливим за умов перегляду підходів до навчання спеціалістів. Для кожного фармацевтичного працівника повсякденною нормою має стати привітне звернення, ввічливість та бажання покращити стан здоров'я пацієнта, що сприятиме підвищенню авторитету фахівця та довіри до його порад.

**INTRODUCTION OF ECOLOGICAL MANAGEMENT SYSTEMS  
AT PHARMACEUTICAL ENTERPRISES OF UKRAINE  
IN THE CONTEXT OF EUROPEAN ENVIRONMENTAL INITIATIVES**

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**Introduction.** Global trends, in particular, increasing population and aging, increasing morbidity and consumption of pharmaceuticals for therapy, as well as increasing pharmaceutical production lead to a new global problem - environmental

pollution by pharmaceutical residues, which negatively affects the structure and functioning of the ecosystem. The problem is relevant due to the lack of a single internationally recognized system of regulatory regulation of activities related to pharmaceutical pollution and combating its consequences.

**Target.** Goal. Review of legislative environmental initiatives of the European Union (EU), trends in the pharmaceutical market and analysis of the implementation of environmental management systems (EMS) in accordance with the requirements of international standards in pharmaceutical companies in Ukraine.

**Materials and methods.** The study used data from the official websites of pharmaceutical companies, reports and orders of government agencies on the production and supply of medicines to the population, as well as legislative initiatives related to environmental protection in the European region, including: Report on the implementation of the Association Agreement between Ukraine and The European Union, the European Atomic Energy Community and their Member States in the field of environmental policy, the European Union's Strategic Approach to Pharmaceuticals in the Environment, the Pharmaceutical Strategy for Europe, etc.

The research methodology is based on the principles of interdisciplinary scientific system approach, comparative analysis and generalization of statistical data.

**Results and conclusions.** According to the obtained results and conclusions studies have shown that there are more than 3000 medicines (drugs) in the European market. Over the past three decades, sales and the range of original active pharmaceutical ingredients have increased significantly. Remains of more than 700 drugs (of which more than 140 are transformation products) have been found in the environment. The information about 16 medicines and their detection in many places around the world is confirmed, namely: diclofenac (for pain and inflammation); carbamazepine (an anti-epileptic); ibuprofen (for pain and inflammation); sulphamethazole (an antibiotic); naproxen (for pain and inflammation); trimethoprim (an antibiotic); paracetamol (for pain); clofibric acid (from the lipid lowering drug); ciprofloxacin (an antibiotic); ofloxacin (an antibiotic); norfloxacin (an antibiotic);

acetylsalicylic acid (aspirin, a pain killer); as well as the sex hormonally active substances, estrone, 17 $\beta$ -estradiol, 17 $\alpha$ -ethinyl estradiol and estriol.

Ukraine is an active participant in international cooperation in the field of environmental protection, is a party to most international conventions, guided in its activities by the principles of international law. Within the framework of the European Union Water Initiative Plus Project for the Eastern Partnership countries (EUWI +), a Screening Monitoring of the Dnieper River Basin (2020) was conducted and it was revealed:

- 440 compounds of pollutants (according to the results of screening for 65691 organic matter from the database NORMAN SusDat) (<https://www.norman-network.com/nds/susdat/>);
- 161 compound contaminants (high concentrations of herbicides: terbuthylazine, nicosulfuron, fipronil and carbendazim fungicide, compounds identified with the highest FOA (frequency of manifestation), belonging to the group of pharmaceutical substances: carbamazepine (antidepressant), fropinavir, lopi antifungal total drug) and diclofenac (anti-inflammatory drug) according to the results of screening SW LC-HR-MS for 2332 substances and their derivatives. 19 compounds were detected in more than 10% of sampling points with at least one measurement that exceeds the ecotoxicity threshold and therefore gives grounds to expand the list of pollutants specific to the Dnieper river basin (Dnieper RBSPs).

The results of screening of pollutants in the three largest river basins of Ukraine (Dniester, Dnieper, Seversky Donets) revealed common pollutants: the pharmaceutical drug antidepressant carbamazepine, the herbicide terbuthylazine, as well as excess concentrations of copper and zinc.

Chemical pollution of surface waters significantly increases the risks of damage to ecosystems and further increase in morbidity.

According to the Law of Ukraine "On Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the period up to 2030" dated 28.02.2019 №

2697-VIII (effective from 01.01.2020) to ensure Ukraine's entry into international and European markets, measures must be taken, ensuring compliance with international standards for environmental management; accelerating informatization in the field of environmental protection and use of natural resources. It also emphasizes the need to "stimulate the implementation of environmental management systems (EMS) in enterprises while improving the environmental performance of products, in particular, through international certification and labeling systems."

In Ukraine, 113 licensees operate in the sphere of economic activity in the production of basic pharmaceutical products and medicines (at 208 places of activity). According to our analysis of information on the official websites of pharmaceutical manufacturers in Ukraine, only a third of them have experience in the certification of management systems, in particular: 35% - quality management systems in accordance with ISO 9001; 12% - environmental management systems in accordance with ISO 14001; less than 10% - food safety management systems according to ISO 22000, quality management systems for the production of medical devices according to ISO 13485; and only isolated cases of implementation of management systems in accordance with the requirements of ISO 45001 (labor protection and safety), ISO 50001 (energy management), ISO / IEC 27001 (information security), etc. It is also worth noting that the vast majority of companies that have certified one management system also have certificates for one or more other management systems. It should be noted that the analysis covers only those market participants who have published information about the certification of their systems on official websites.

In the context of the EU strategy on the environment and according to the Association Agreement between Ukraine and the EU, and according to the Law of Ukraine "On Basic Principles (Strategy) of State Environmental Policy of Ukraine until 2030" Ukraine is obliged to gradually approximate its legislation to the EU. Ukraine needs to form a single regulatory and information space with the EU.

It can be stated that domestic pharmaceutical companies should soon adopt appropriate development strategies and implement / improve CEM in order to comply with international standards in the field of environmental management and environmental labeling, as well as improve the environmental performance of their products. Such a development strategy may not be in line with the economic goals of private organizations, but it is extremely important on a global scale and reflects the interests of the state and society.