

## **GREEN PHARMACY - RECOMMENDATIONS FOR PHARMACY PRACTICE IMPROVEMENT**

**Marina Odalović, Ivana Tadić, Dragana Lakić**

University of Belgrade – Faculty of Pharmacy, Department of Social Pharmacy and Pharmaceutical Legislation, Belgrade, Serbia

Drug residues isolated from environment, such as soil and water, pose a direct threat to human and animal health, and appropriate regulations have been adopted at the European Union level to reduce and control pollution caused by drugs (1, 2). Accordingly, numerous professional debates have been initiated related to pharmacists' professional responsibility. As a result, international professional associations of pharmacists have made recommendations for taking specific professional activities to protect the environment from the harmful effects of drugs, which will directly contribute to the implementation of adopted regulations (2, 3).

Among the most important recommendations for improving pharmaceutical practice to contribute to green pharmacy are as follows: (i) taking actions to increase the public awareness on the prudent use of medicines and pharmaceutical waste collection, (ii) developing guidelines and information materials for healthcare professionals on the prudent use of pharmaceuticals, (iii) exploring the inclusion of environmental aspects for pharmaceuticals posing a risk to or via the environment in the pharmacy education and continuous professional development programs, (iv) developing and ensuring compliance with environmental quality standards for pharmaceuticals as a measure to promote greener manufacturing, (v) ensuring appropriate funding of pharmacy-led disposal and collection schemes for medicines, (vi) reducing pharmaceutical waste caused by leftover medicines by ensuring that systems are in place that encourage the prescription and dispensing of quantities of certain risk medicines in package sizes matching the duration of treatment, (vii) supporting the development of environmentally friendly practices and sustainability policies in pharmacies.

There are numerous examples of good practices in European countries in pharmaceutical waste management. Among them are numerous examples of programs to improve citizens' awareness of the importance of returning unused or expired drugs to pharmacies, i.e. on dangers to the environment and public health if medicines are disposed with communal waste. In addition, there are many examples of good organization of pharmaceutical waste management, which emphasize the importance of cooperation between different stakeholders (i.e. pharmacies, pharmaceutical industries, distributors) and support of municipalities and national government.

Adherence to adopted regulations for pharmaceutical waste management, and the recommendations of professional associations to improve pharmaceutical practice in the light of green pharmacy, with examples of good practice from developed countries, represents the basis of the pharmacists' professional responsibility in the context of environmental protection from drug pollution.

### **References**

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2. European Commission (EC) Communication. European Union Strategic Approach to Pharmaceuticals in the Environment. Brussels: EC; 2019.
3. Pharmaceutical Group of European Union (PGEU). Best Practice Paper on Green and Sustainable Pharmacy in Europe. PGEU; 2021.

# **„ZELENA” FARMACIJA - PREPORUKE ZA UNAPREĐENJE FARMACEUTSKE PRAKSE**

**Marina Odalović, Ivana Tadić, Dragana Lakić**

Univerzitet u Beogradu – Farmaceutski fakultet, Katedra za socijalnu farmaciju i farmaceutsko zakonodavstvo, Beograd, Srbija

Ostaci lekova izolovani iz životne sredine, kao što su zemljište i voda, predstavljaju direktnu pretnju zdravlju ljudi i životinja, te su na nivou Evropske unije doneti odgovarajući propisi radi smanjenja i kontrole zagađenja uzrokovanog lekovima (1, 2). U skladu sa navedenom situacijom pokrenute su brojne debate na temu profesionalne odgovornosti farmaceuta, a kao rezultat stručnih diskusija, međunarodna strukovna udruženja farmaceuta donela su preporuke za preduzimanje konkretnih profesionalnih aktivnosti sa ciljem zaštite životne sredine od zagađenja lekovima, koje će direktno doprineti implementaciji usvojenih propisa (2, 3).

Među najznačajnim preporukama za unapređenje farmaceutske prakse radi doprinosa „zelenoj” farmaciji navodi se sledeće: (i) sprovođenje aktivnosti sa ciljem povećanja svesti javnosti o značaju upotrebe lekova sa oprezom, kao i o prikupljanju i vraćanju u apoteku lekova sa isteklim rokom i neupotrebljenih lekova, (ii) izrada smernica i promotivnih materijala za zdravstvene radnike o racionalnoj upotrebi lekova, (iii) izučavanje nastavnih sadržaja sa temama iz oblasti rizika od upotrebe lekova za životnu sredinu u toku studija i programa kontinuirane edukacije, (iv) obezbeđenje odgovarajućih finansijskih sredstava za prikupljanje i odlaganje lekova na nivou apoteke, (v) usklađenost sa propisima za zaštitu životne sredine, kao mera za promovisanje „zelenije” proizvodnje lekova, (vi) smanjenje nastanka farmaceutske otpada uzrokovano neupotrebljenim lekovima kroz podsticanje mera za propisivanja i izdavanje lekova u količini ograničenoj na period trajanja lečenja, (vii) podrška razvoju ekološki prihvatljivih praksi i pratećih propisa u apotekama (3).

U zemljama Evropske unije danas postoje brojni primeri dobrih praksi u prikupljanju i pravilnom rukovanju farmaceutskim otpadom. Među njima su brojni primeri programa za unapređenje svesti građana o značaju vraćanja lekovima sa isteklim rokom ili neupotrebljenih lekova u apoteke, tj. o opasnostima po životnu sredinu i javno zdravlje ukoliko se lekovi odlažu sa komunalnim otpadom. Pored toga, dosta je primera dobre organizacije procesa rukovanja farmaceutskim otpadom gde se ističe značaj saradnje različitih interesnih strana, tj. apoteka, farmaceutske industrije, distributera, kao i podrška lokalne samouprave i državne uprave.

Poštovanje nacionalnih propisa za rukovanje farmaceutskim otpadom i preporuka profesionalnih udruženja za unapređenje farmaceutske prakse u svetlu „zelene” farmacije, imajući u vidu primere dobrih praksi iz razvijenih zemalja, predstavlja okosnicu profesionalne odgovornosti farmaceuta u kontekstu zaštite životne sredine od zagađenja lekovima.

## **Literatura**

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