

Management of consumers' pharmaceutical waste in a pharmacy setting - Part I

The management of pharmaceutical waste is increasingly becoming of great concern to our society since no official program currently exists. This study proposes a management plan for consumer's pharmaceutical waste in a pharmacy setting in Malta. It involves disposing of unwanted solid dosage-forms in their original packaging in waste containers which will be installed in front of pharmacies, and returning hazardous medicines and other dosage-forms directly to the pharmacist to reduce hazards from mixing incompatible products.

Key words

Pharmaceutical waste management; pharmacy; consumers; waste containers.

Introduction

Ever since joining the European Union, Malta has been trying extensively to conform to European standards as requested by legislation. Improvements have been registered in several sectors; however the research in the management of waste pharmaceuticals has so far remained lacking.¹

Aims

This report draws findings of a scientific study that has been undertaken by the authors and aims to provide a programme and a guidance proposal plan for the management and disposal of pharmaceutical waste produced by consumers. The process of designing and implementing a successful pharmaceutical waste management program, being highly

interdisciplinary, has to be acceptable for pharmacies, competent authorities and consumers alike.²

Educational programs

Educational programs should be set up to educate consumers on the threats resulting from the irresponsible disposal of pharmaceutical waste. The proposed programs should educate users on new, well thought-out and science-founded procedures.³ The benefits should be highlighted to encourage people to make an effort to abide by these guidelines.

Such educational programs include:

- Promoting the campaign on television programs including waste management 'spots' on TV;
- Advertisements on published media;
- Distribution of leaflets from community pharmacies;
- Other advertising materials including banners and posters.

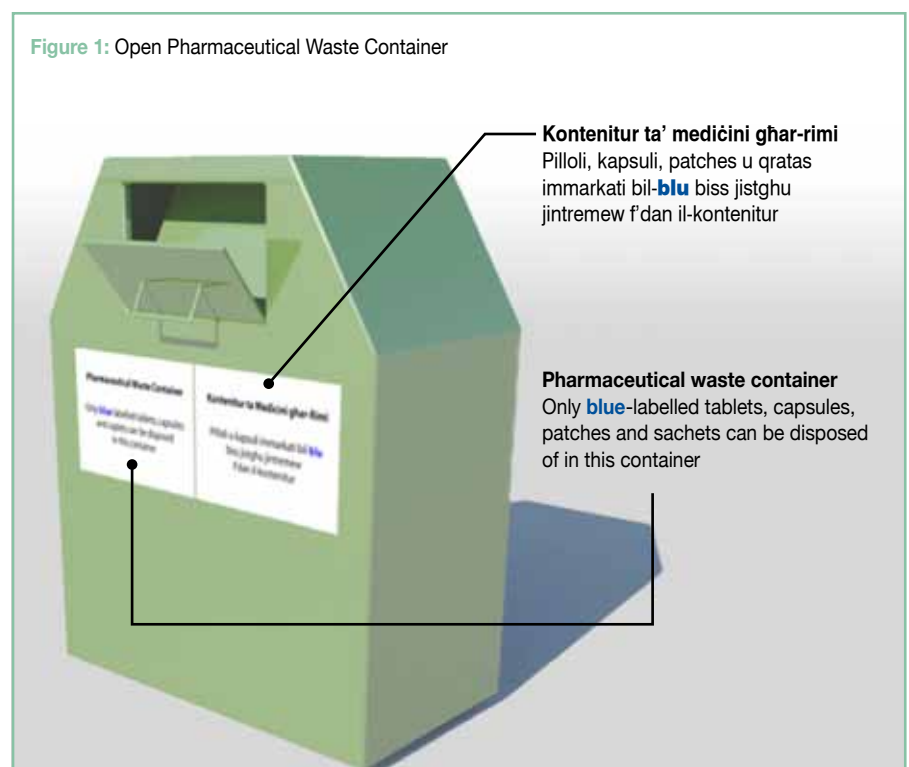
Consumers' pharmaceutical waste

Examples of consumers' pharmaceutical waste include:

- Expired medicines in households;
- Medicines discontinued by manufacturers due to a negative risk-benefit ratio;
- Medicines not consumed by patients;
- Medicines discontinued because the doctor prescribed new medication;
- Medicines of deceased patients.

Since pharmaceutical waste production in nursing homes is significantly higher than in households, this scheme is not applicable. In this setting, clinical waste is also produced and thus nursing homes should contract a private waste management company to manage their pharmaceutical and clinical waste. Hospitals have their in-house waste management procedures.

Figure 1: Open Pharmaceutical Waste Container



Household waste medicines are found in various dosage forms; the most common being tablets, capsules, caplets, syrups, suspensions, inhalers, suppositories, pessaries, creams, ointments, sprays, drops, powder for oral constitution and patches.⁴

Syringes are not included in this scheme. Yellow UN approved containers should be distributed to frequent syringe users from healthcare centres. When the yellow bin is full, consumers should return the bin to the centre and they are given an empty one. The bins are then collected from the healthcare centres by waste carriers.

Hazardous waste

Section 4(2) of the Waste Management Act of 2001 defines Hazardous Waste as having certain properties which can be harmful to human health and the environment. "These properties are corrosive, explosive, toxic, flammable, oxidizing, irritant, harmful, carcinogenic, infectious, teratogenic, mutagenic and ecotoxic."⁵

Medicines may have a range of hazardous properties, but only those with one of the hazardous properties denoted by "H codes" will be classified as a hazardous waste.⁵ Other medicines are not hazardous within the meaning of the legislation, but they are hazardous if released in the environment.

Hazardous medicines

The European Waste Catalogue⁵ lists wastes from human healthcare in Chapter 18. Medicines consisting of or containing dangerous substances together with cytotoxic and cytostatic medicines are considered to be hazardous. Hazardous medicines include chemotherapeutic agents, antivirals, hormones and some bioengineered medicines.⁶ Most of the medicines available in community pharmacies are fairly inert and pose no particular danger to staff or waste carriers who collect the waste. This is because most medicines are individually packed tablets or capsules. The packaging provides

Table 1: Hazardous medicines available in pharmacies (Source: Malta Medicines List)
This table is only a summary of the full version which is part of the scientific study entitled 'Waste Management in Pharmacy'

Anti-acne preparations		
Active ingredient	Trade Name	Formulation
Clindamycin 10mg/ml	Dalacin T	Topical solution
Isotretinoin 10mg, 20mg	Decutan	Capsule, Soft
Anti-bacterials for systemic use		
Clavulanic Acid 125mg; Amoxicillin 500mg	Augmentin-Duo 500mg/125mg	Film-Coated Tablet
Cefaclor 500mg	Ceclor	MR tablets
Antibiotics and chemotherapeutics for dermatological use		
Retampulin	Altargo	Ointment
Mupirocin 2% w/w	Bactroban	Topical ointment
Intestinal anti-inflammatory and anti-infective agents		
Mesalazine 400mg	Pentacol	Gastro Resistant Tablet
Sulfasalazine 500mg	Salazopyrin	Suppositories
Anti-gout preparation		
Allopurinol 100mg	Allopurinol	Tablet
Colchicine 500mcg	Colchicine	Tablet
Anti-neoplastic agents		
Methotrexate 2.5mg	Methotrexate	Film-Coated Tablet
Imatinib 100mg	Imatinib	Tablets
Endocrine therapy		
Letrozole 2.5mg	Femara	Tablet
Tamoxifen 20mg	Nolvadex D	Film-Coated Tablet
Ophthalmologicals		
Tobramycin 3mg/ml	Tobrex	Eye Drops, Solution
Aciclovir 3% w/w	Zovirax	Eye Ointment
Sex hormones and modulators of the genital system		
Estradiol 25mcg	Vagifem	Vaginal Tablet
Ethinylestradiol 0.03mg, Drospirenone 3mg	Yasmin	Film-Coated Tablet
Thyroid therapy		
Levothyroxine Sodium 100mcg	Eltroxin	Tablet
Carbimazole 5mg	NeoMercazole 5	Tablet

satisfactory protection for anyone handling the container. However if the solid formulation is altered by, for example, being crushed, they could pose a risk. Blister packaging also protects against mixing incompatible products and they do not pose a risk to the environment provided that they are incinerated properly.²

Pharmacies should develop a list of hazardous medicines that are found in the pharmacy, including medicines

available from the Pharmacy of Your Choice (POYC Scheme) so as to be aware of any risks involved during collection.

Table 1 is a short template of a list of medicines available in pharmacies which are considered to be hazardous, that was compiled as part of the scientific study undertaken. This list should be modified according to what is available at each respective pharmacy. [cont in issue 4/11](#)