

GUIDELINES ON THE PROPER DISPOSAL OF UNUSED MEDICATIONS

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CHAPTER 1: INTRODUCTION

Expenditure on medication contributes to a substantial proportion of the hospital budget. An approximate sum of RM 62 million had been set aside for medications in the 2016 UMMC budget. Thus, unused or unwanted medications contribute to economic wastage (1, 2). Improper disposal of these unused medicinal products also has adverse consequences on the environment and public health (3, 4).

There are multiple reasons for households to possess unused medications, which include the medications that had passed the expiry date, the patient's condition had improved, a change in medical treatment, the patient had died, non-adherence to treatment, hoarding of medications, etc. There are also several routes for these unused medications to gain entry into the environment; such as through disposal as household waste that will be taken to landfills or through flushing medications into toilets or drains that ends up in the sewage system, resulting in possible contamination of surface water (4). Management of these active pharmaceutical ingredients in the environment is both challenging and potentially costly (5). It is thus highly desirable to reduce the risk of releasing these unwanted medicinal products into the environment, which may pose harm not only to the environment but also to public health.

While there are international and national guidelines on the safe management of healthcare wastes, these tend to be at the organizational level (7, 8). Information concerning the proper disposal of unused or unwanted medications in the household is still scarce (9) and the recommendations equivocal (6). Several agencies advocate throwing of unused medications in the household garbage (mixed with kitty litter or coffee grounds to make them unpalatable), flushing them down the toilet, or pouring them down the drain to avoid misuse/abuse or accidental ingestion of unused medications by other household members and pets. In developed countries like the

United States of America (USA), the United Kingdom (UK) and Australia, there are community-based medicine “take-back” programmes, which experts believe to be the safest and most environmentally protective way to dispose of unused or unwanted medications, but this is not the most convenient or readily available option to the majority of patients (10). Thus, it is important for us to create pathways that are both environmentally friendly as well as user friendly for our community-dwelling patients.

1.1 Definitions

The terms used throughout this article are as defined below:

1.1.1 Unused medication

Medication that had passed its expiry date, contaminated and deemed unsafe to be used, or no longer needed by the patients.

1.1.2 Expired medication

Medication which had passed the “used-by” date stated on the medication bottle, packaging or label written by the pharmacy personnel before being given to the patient and medication which was not kept within the required cold chain environment stated on the product packaging.

1.1.3 Returned medication

All medications and medication related items returned to the outpatient pharmacy of University of Malaya Medical Centre.

1.1.4 Discarded medication

Medication which needed disposal through incineration.

Unused medications are a waste of resources and a risk to environment

Don't keep medications "just in case"

Collect or buy medications only when you need them

How to reduce unused medications?



Let's preserve our environment for the future generation!



CHAPTER 2: WHAT ARE THE CONSEQUENCES OF UNUSED MEDICATIONS ON THE ENVIRONMENT

2.1 Introduction

The impact of medication waste which contaminates the environment may pose a larger threat to all living organisms living on the planet compared to common household waste.

2.2 Types of medication wastes

When a medication is no longer suitable or safe to be used, it has turned into waste. Medications contain active ingredients (otherwise known as chemicals). When unused medications are discarded into the landfill or sewage, these active ingredients may eventually leak into surface water and contaminate the environment.

What is the impact of unused medications?

On **PEOPLE/ANIMALS**:
Health hazard due to accidental ingestion



On the **ECONOMY**:
Waste of public resources



Unused medications



On our **PLANET**:
Risk of global warming and contaminated water

Return unused medications before they cause harm or waste resources!



Why is safe disposal of unused medications important?



Do not pour it down drain!



Do not toss it in the toilet!



Do not throw it in the garbage!

Waste water treatment does not remove medication residue in sewerage.

Discarded medications may end up in landfills and appear in surface water.



Preserve our environment from contamination with medication residue



CHAPTER 3: THE PATIENTS', PRESCRIBERS' AND PHARMACISTS' ROLES IN REDUCING EXCESS MEDICATIONS AT HOME

Patients may possess unused medications for many reasons including resolution of their illness, side effects from medications, poor compliance to treatment regime, death of a family member, expired medications, contaminated medications, change of treatment by their doctor, change in their medical condition or keeping medications “just in case” or for possible future consumption. Patients who are older and with multiple chronic conditions may be more likely to experience polypharmacy where they are prescribed five or more types of medications and possess unused medications due to all the reasons listed above. The prescriber and patient are both important parties in reducing the amount of unused medications in the patient’s possession.

3.1 Patients’ Role

From the patient’s point of view, there are several steps that they can take to reduce the amount of unused medications in their house. The instructions to the patient are listed below

1. Set a time every month or every two months to check your stock of existing medications for expiry date, condition and amount left.
2. Do not keep unused medications in the home as there can be a risk of accidental poisoning of vulnerable parties such as children, persons with dementia, persons with visual impairment and pets.
3. Do not share your unused medications with other persons without a doctor’s instruction.
4. Bring medications which are expired, spoilt, or not required anymore to the nearest pharmacy or healthcare facility that is willing to accept the unused medications for safe disposal.

5. Always bring a list of medications, dosages and amount left with you to your doctor's visits. Discuss with your doctor whether all the medications are still required based on your recent medical condition and blood test results.
6. Collect only the amount of medication that you require from the pharmacy, while taking into account what you have left in stock at home.

3.2 Prescribers' Role

The following are recommendations for the prescriber to help reduce amount of unused medications the patient may have.

1. Check the adherence of patients to their medication regime every visit.
2. Check for side effects or adverse events experienced by patients.
3. Conduct a medication review every 4 to 6 months, especially for those with multiple medical conditions who experience polypharmacy.
4. Prescribe only the amount of medications that the patient requires.
5. Counsel patients on reasons for adherence to their medication regimes.
6. Counsel patients not to stockpile medications at home for various reasons including wastage, risk of accidental poisoning of vulnerable persons such as children, persons with dementia or visual impairment and pets.

3.3 Pharmacists' Role

Pharmacists are also responsible in helping to reduce the amount of unused medications patients possess. Pharmacists should ask patients whether they need all the medications to be dispensed in the first place or whether they have sufficient supply at home. If there is enough supplies to last for 2 months, then the pharmacist should not dispense more so as to avoid over stocking.

Campaigns and awareness posters can be created to suit different healthcare settings and for waiting areas in the clinic and pharmacy. The following are examples of posters we used in our public awareness campaign in our hospital.

Are you experiencing unwanted effects from your medications?



Allergy



Drowsiness, Headaches,
“Not feeling better”



Seek medical attention as soon as possible

Return your unused medications to a pharmacy



Don't store medications “just in case”



CHAPTER 4: THE CORRECT STORAGE CONDITIONS FOR MEDICATIONS

4.1 Preventive measures

Properly stored medications will not only ensure medications do not turn bad, their efficacy can be assured too. It is recommended that the patient checks the instructions printed on the manufacturer's packaging on the correct methods to store the medication prior to opening as well as after opening.

4.2 Appropriate storage condition

4.2.1 Store in a cool dry place

Medication should be stored in a location away from sunlight, below 25°C. It is also not advisable to keep medication in the bathroom as the humidity in the bathroom is high.

4.2.2 Store between 2 to 8°C for items that require refrigeration

The most appropriate location to store medications that require refrigeration is in the centre of a fridge. It is not advisable to place the medications at the fridge's door or in the vegetable compartment, as the temperature in these areas are not ideal.

If a medication requires freezing, it will state specifically on the package that it needs to be stored <0 degree Celsius. This medication can then be stored in a freezer.

4.2.3 Protect from light

Certain medications which need to be protected from light are usually packed into an amber bottle (brown bottle) or packaging that can avoid medication from being exposed to light. These medications should be kept in the original packaging and should not be repacked into another container.

4.3 Do not keep medication in the car

Keeping medication in any compartment of a car is not appropriate. The temperature in a car when parked outdoors is often >40 degree Celsius. In these high temperatures, the efficacy of the medication may be affected.

How do you avoid medication wastage?

Store medications according to instructions



Check your medications monthly for the amount and expiry

Return unused medications to a pharmacy as soon as you can



CHAPTER 5: HOW DO WE AVOID HAVING EXPIRED MEDICATIONS?

Everyone plays an important role in reducing the amount of expired or unused medications.

5.1 Check the expiry date of medications

Patients should cultivate a good habit of checking the expiry date of medications once purchased or collected from pharmacies. Sometimes, it can be a challenge to read and interpret the expiry dates provided by the manufacturers, as the print is usually small.

5.2 First in first out (FIFO)

Whenever patients collect their new supply of medications, it is advisable to store medications that have a later expiry date “behind” medications that have a shorter expiry date. This ensures that stocks with an earlier expiry date will be used up first.

5.3 Do not overstock

It is advisable to keep sufficient medication for everyday use. However, it is unadvisable to stock excessive amounts of medications as Medications prescribed by doctors may change due to a change in your condition.

CHAPTER 6: EXPIRED/UNUSED MEDICATIONS – WHAT DO WE DO WITH THEM?

6.1 The correct methods on the disposal of unused/expired medications

Expired or unused medications need to be disposed of correctly, so as not to harm the environment. The disposal method depends on the dosage form of the medication, as shown in Table 6.1.

Table 6.1: Method of safe disposal of the different dosage forms (of medications)

No.	Dosage forms	Method of safe disposal
1.	Tablet / capsule	Incineration
2.	Suppository / pessary	Incineration
3.	Liquid / mixture / syrup	Incineration
4.	Cream / ointment / gel / paste	Incineration
5.	Eye / ear / nasal drops	Incineration
6.	Patch	Incineration
7.	Prefilled injection with or without needle / vial / ampoule	Incineration
8.	Non-metered dose inhaler / nasal spray	Incineration
9.	Metered dose inhaler / nasal spray	Normal waste in the garbage
10.	Implant	Incineration

How do you dispose medications safely?



Tablets/capsules



Syrups/mixtures



Creams/ointments



Injections



Dry powder inhalers



Eye/nose drops

Return these medications to a pharmacy, and they will send your unused medications for incineration.



Pressurized medications such as metered dose inhalers cannot be incinerated.

These medications can be thrown as normal waste in the garbage.



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6.2 Return of expired and unused medications to a pharmacy

Since 1971, Sweden has had a formal programme of returning drugs to a pharmacy for incineration and proper disposal (11). As a consequence of this program, 85% of the general public in Sweden believed that returning unused medications to a pharmacy was better than throwing them in the garbage (2%) or flushing them down the drain (1%); and 43% reported returning unused medications to a pharmacy for disposal (11).

In 2010, the Pharmaceutical Services Division, Ministry of Health Malaysia (MOH) implemented the “Return Your Medicines Program”, where patients can return their unused or excess medicines for safe disposal (12).

Figure 6.1: Flow of how unused medications are returned to the pharmacy and sent for incineration.



Patients return unused medications to the pharmacy



Unused medications send for incineration



CHAPTER 7: CONCLUSION

Safe disposal of unused or expired medication is crucial to reduce the risk of contamination of the environment and surface water and the possibility of the residual chemicals entering the food chain. It is also important to reduce the stockpiling of unused medications in the household which can lead to accidental ingestion by vulnerable persons including children, persons with dementia and visual impairment and also pets. Apart from contamination of the environment, medication wastage is also a great waste of financial resources for a particular individual as well as health care system.

The different parties involved all play a vital role in the reduction of wastage of medications; the patient, the prescriber, the pharmacist, the organization that dispenses and accepts back the medications for safe disposal and the government in terms of policies and regulations as outlined above.

This set of guidelines were developed in the hope that it can reduce the amount of unused/wasted medications and to reduce the inappropriate disposal of these medications.

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