



## A Novel Home Pharmacy Cabinet. Will it be Applicable?

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### Abstract

**Background:** There are different concerns raised about medication handling in the community, for example proper environmental conditions, repackaging, labelling, out of reach of children, medication cabinet organization, home storage, and medication expiration dates.

**Aim:** Highlighting the current situation of traditional home pharmacy cabinet and its drawbacks, and proposed improvements to be done to overcome such storage problems. Besides, we will mention the best ways for safe disposal of medication products.

**Discussion:** Home pharmacy cabinets are done from basic materials like plastic or wood. At the same time, it does not provide a secure and controlled place for medication storage. The consequences are increased medication errors, deterioration of drug products, and accidental children access. Cabinets made from plastic material (PVC) and insulated by asbestos, or fiberglass can provide a good durability, and will controlled storage environment. Different cooling systems can be installed for maintaining required storage temperature with cost effective prices. Community pharmacy disposal box can be distributed on regular bases for safe disposal of expired medications.

**Conclusion:** The home pharmacy cabinet may provide an appropriate, secure, temperature, and access controlled home storage environment. Thereby, we can minimize unintentional kid access to medications, protect on-shelf medication integrity, and provide a well-organized storage mean. Environmental contamination can be reduced by disposal boxes provided by community pharmacists.

**Keywords:** Pharmacy Cabinet; Medications; Storage; Stability; Traditional; Novel; Requirements

### Introduction

It is reasonable to assume that there are concerns with drug storage at home. There are concerns about proper environmental conditions, repackaging, labelling, out of reach of children, medication cabinet organization, and expiration dates [1,2]. The most of incidents that result in emergency room visits are caused by unsupervised ingestions by children who have access to drugs on their own [3].

A cross-sectional survey conducted in 267 households showed that the prevalence of households with inadequate storage was 76.0%. Problems with storage include direct exposure to sunlight in 10.9% of households, the presence of dust in 23.6%, and storage within reach of children in 76.0%. Moreover, medications no longer used are usually disposed of into the environment in 92.1% of households [4].

The number of medications taken regularly is closely related to older age, which is the age that is associated with a rise in the incidence of chronic diseases [5]. The use of a large number of prescriptions in the household raises the risk of administration errors, allergic reactions, drug interactions, and the use of expired medications [6].

Medication disposal in the household waste and sewage system is very common. This leads to a chance of chemical pollution if drug leftovers are not properly processed [7]. In the United States, traces of drugs were found in a large volumes of drinking water [8].

### Traditional home pharmacy cabinet

The traditional home pharmacy is mainly constructed from plastic material, or white wood. It does not provide a controlled storage environment, and does not have adequate shelves for proper medication organization. Moreover, it may lack access control means, like a key, or a lock. Usually many people install the cabinet in the bathrooms or kitchens which are the worst two places in the house for drug storage.



Figure 1

### Traditional home pharmacy cabinet

The emerging medication problems as a result includes: Increase medication errors due to improper medication organization. Deterioration of drug products due to bad storage conditions either from elevated temperatures, humidity, or both. Accidental children access to drugs due to lack of access control means, and non-appropriate cabinet location.

From the aforementioned points we are aiming to make use of simple tools to the best to provide proper, safe, temperature, and access controlled home medication storage, and a simple way to dispose expired or unnecessary medications.

### Novel home pharmacy cabinet

A home pharmacy cabinet made of simple materials, and divided into different shelves can provide an organized storage mean for different family members medications. Also, it can provide a special labelled shelf for over-the-counter drugs, and supplements.

The cabinet can be made from plastic material (PVC) that provide a good durability. The cabinet will be divided into two parts. The first part for drugs require storage under 4°C. The second part for those medications that require storage below 15 or 25°C. Insulation of the cabinet can be performed by making an internal layer of insulating materials like asbestos, or fiberglass to provide a controlled environment storage. A cooling system will be installed in the cabinet to provide the required storage temperature from 2 - 8°C or below 15°C. The cooling system will be an eco-friendly and cheap one based on dichlorodifluoromethane (R-12) refrigerant [9]. The temperature will be thermostatically controlled either by digital or analog means. A door key or a lock will be installed to maintain access control.



Figure 2

### Novel home pharmacy cabinet

Another option can be provided for the cabinet for its cost reduction, is that we can replace the cooling and thermostatically

controlled system with a simple ice pockets located behind the cabinet. Small ice bags can be placed in the pockets to provide a cooling source for the cabinet environment and changed periodically. Temperature monitoring can be provided by a digital or analog manually placed thermometer inside the cabinet.

The novel cabinet will provide different parts and shelves suitable for storage of medicinal products at vast temperature conditions (range from 2 to 25°C). Also, it will be divided into different parts for different dosage forms like solid dosage forms, liquids, suspensions, sachets, suppositories, ampoules, biological products like insulin, and parenteral preparations like saline, and glucose.

### Disposal of medicines

We can dispose expired or unnecessary medications by placing them in a provided community pharmacy disposal box. This disposal boxes are distributed to customers. Community pharmacy representative will pass periodically to collect the disposals, and provide the customer a new empty disposal box. The disposal box can be constructed from white wood or plastic material. The inner surface of the box will be coated with shock absorber sponge to avoid breakage of glass medication bottles during transportation. The disposal box should be access controlled by a key or a lock.

For disposal of liquid dosage forms, a better way can be followed:

- Pour the medication into a resealable plastic bag.
- Mix inedible material with the medication like cat litter, or used coffee grounds.
- Place the bag in an opaque container so it's not visible.
- Take the container out with your regular trash, or place it in the pharmacy disposal box.

This service can be provided by hospitals, or drug distribution centers instead of community pharmacy. By this mean we can guarantee safe drug disposal and prevention of environmental chemical pollution.

### Conclusion

The simple home pharmacy cabinet that can provide a proper, and safe home medication storage environment. Besides, it can provide a temperature, and access control. By this mean we can avoid accidental children reach, decrease medication errors, pre-

serve on-shelf dosage from integrity, and provide a well-organized storage mean. Disposal boxes supplied by community pharmacies can provide a good choice for drug disposal instead of trashes of sewage system to avoid environmental pollution.

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