

Medicine Caddy Trade Study Report and Recommendations

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1. Document History

Table 1

| Version | Prepared | Description |
|---------|----------|-----------------|
| 1.0 | 3/27/02 | Initial version |

2. Purpose of Document

This report documents the trade study investigating the options for a medicine caddy. It describes some existing products / devices, discusses the requirements for an ILSA medicine caddy and make some recommendations.

3. Background

There is a wide range of options for pill boxes, medicine caddies and medicine dispensers. The options range from low cost pill boxes to high end medicine dispensers. Pill boxes can range from simple single compartment boxes that mix all pills together to multi-day pill boxes that contain up to 4 different compartments per day for an entire week. Some of the pillboxes include timers that emit an alarm when it is time to take the next medication. High-end medicine dispensers act like vending machines, dispensing a given amount of medicine at a given time of the day. Some devices take back the medicine if it is not taken within a certain amount of time. Below are some descriptions of some representative options.



A common pill box form is the 7 day box. This box has 7 separate opening compartments, one for each day of the week. Similar units are available in most drugstores.



The above pill box helps people that take many medications at different times throughout the day. Each day has 4 different compartments. The compartments are small and difficult to open. This type of pill box is also available in drugstores.



Epill (www.epill.com) markets a pill bottle cover that has a settable alarm to remind a client to take their medication. This cover fits only one size of pill bottle.



This is a prototype medicine caddy developed by BII. It gives an X10 message corresponding to which medicine bottle has been removed. With this type of caddy it is important that the client return the correct bottle to the correct location after they have taken the medication.



This multi-compartment box from Sharper image (www.sharperimage.com) has a built in clock with alarms. It also records if a dosage was missed.



There are a number of multi-day pill boxes that include some sort of clock with settable alarms. A client or caregiver can load an entire weeks of medications into the box. The above box from Med-Time (www.epill.com) can generate up to 4 alarms per day. When the alarm sounds the client opens a small door and has access to only the current compartment of pills. Opening the door silences the alarm.



This dispenser from Sharper Image (www.sharperimage.com) has a timer and LCD display to give reminders for up to a week's worth of doses. If a dose is missed it is recorded and locked up after a set time period.



This higher end medication dispenser from Epill (www.epill.com) will dispense up to four doses of medications a day over a week. It gives an audible and text based reminders with instructions for taking the medication. The medication is taken from an easy opening drawer. The audible alarm continues until the medication is taken.



The high end MD2 dispenser from Interactive Medical Developments (www.imd2.com) can hold a month's worth of medication dispensed up to 6 times per day. Voice reminders and instructions, such as "take with food", as well as a flashing light and text display tell the client when it is time to take medications. The MD2 connects to a phone line and will alert a caregiver if medication is not taken or if the dispenser is low on medications. Caregivers can also check on the client's medication compliance history on an online web page.

The MD2 dispenses medication in small cups. The dispenser also allows a pre-release of medication when the client is going to be away for a period of time. The MD2+ system includes an emergency remote call button that will alert a caregiver if pushed.

4. Requirements

The requirements listed below for a medicine caddy for the ILSA program are based on a range of inputs from home health care specialists, nurses and researchers and potential clients:

4.1 *ILSA Communication*

The device must be able to communicate with ILSA or lend itself to adding a sensor to detect when a medication is taken. Multiple sensors could be used to determine which particular medicine or compartment is accessed but researchers tell us that just knowing that the client is taking some medication satisfies most of the need.

4.2 *Easy to open*

Some of the boxes have small doors with small latches that must be opened to get at the medication. Since arthritis can be a problem for many of ILSA's potential clients our research tells us that the device must be easy to open.

4.3 *Easy to use*

Since is targeted at an older population of clients and even caregivers, they are on average not highly technical. They do not want solutions that are difficult to operate such as those that require some form of programming or alarm setting. Our experts tell us simple is best.

4.4 *Can hold up to 10 original pill bottles*

Research tells us that our target clients can be taking as many as 13 different medications or more, so any device must accommodate a larger number of bottles if the client chooses to store the medications in their original bottles.

4.4.1 Different sized bottles

Medication bottles come in a wide range of sizes and the device should accommodate as many sized bottles as possible.

4.4.2 Must be able to read labels

Clients must be able to see the labels of the bottles or containers without pulling each bottle out of the caddy. It is possible to add labels to the device but most likely clients will want to easily see the original bottle labels.

4.5 *Can hold 7*4 containers for 1 week of pills*

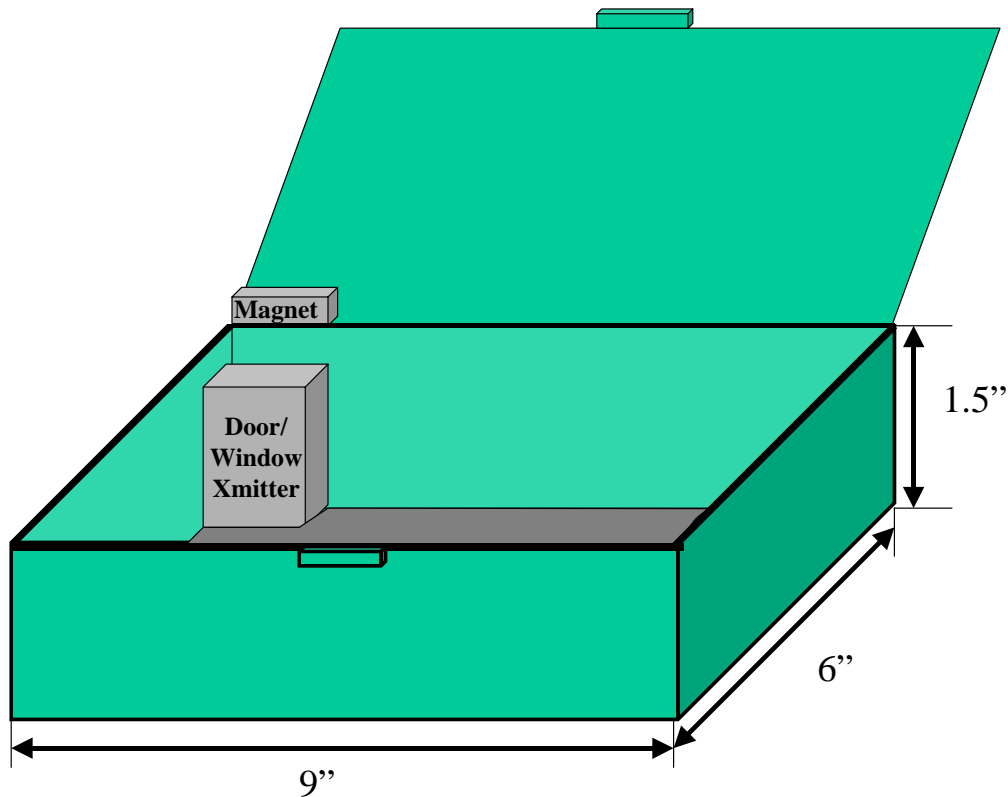
Many clients, who take multiple doses of multiple medications daily, organize their medications by time of day. Many client or caregivers organize a full week's or even a couple of weeks of medications in advance. The ILSA device should accommodate this type of organization.

4.6 *Spill proof*

The contents of the containers or compartments should not spill easily. Spilling and mixing up the medication organization can be a big problem.

5. Proposed Initial Design

The initial design for the ILSA medicine caddy will be flexible to accommodate as many of the above requirements as possible. For an initial prototype, ILSA will go with a simple large single compartment box with an instrumented cover. The device will use an ADEMCO ultra-small door/window sensor to detect when the cover is open.



The box must be large enough to hold medications either in their original bottles or in some other type of organizer. The inside of the box will be able to hold at least 28 smaller containers for weekly pill organization methods. The inside dimension of the box should be at least 6 x 9 x 1.5 inches deep.

It should have an easy open latch and see through cover and/or sides. A box of this size will be portable but the ILSA system will not be able to monitor the sensor outside of the home.

6. Proposed Advanced Design

A second generation of the medicine caddy will have improved features that utilize two way communications with the ILSA system. This design will include a light and audible alarm used to alert the

client when it is time to take a medication. These alarms can also be used to remind the client to close the door of the box if it is left open.

7. Longer Rang Solutions

A longer-range solution for the ILSA medicine caddy involves interfacing with one of the commercially available medicine dispensers. The dispenser could provide a useful client interface including a display to give reminders and other information to the client.