

Perfecting Pill Popping

With the aging of the population and the proliferation of new medications, it is not surprising that researchers are trying to design better, easier, and safer ways for people to take their medications.

Target's New Pill Bottle

Perhaps the best-known recent effort is the ClearRX system, a new pill bottle format launched by Target stores last May. Developed by graphic designer Deborah Adler and industrial designer Klaus Rosburg, the new pill bottle went through several versions as they learned that usability issues affected not only those who ultimately take the pills, but also the pharmacists who must dispense them.

The final design includes several usability enhancements over traditional bottles. In particular:

- ⊙ The bottle stands on its cap and has two flat sides rather than being cylindrical. This provides more space for labeling, reduces wasted paper, and allows for larger, more readable, type sizes. The name of the medication appears in big letters on the top of the bottle, so it is easier to spot at a glance from above which is the correct bottle.
- ⊙ The most important information — how often and how much medication to take — appears at the top of the label, yet the larger printed surface still provides plenty of space for the pharmacy to make its branding noticeable.
- ⊙ Detailed medication information is slotted into a groove in the bottle, so it can easily be retrieved and referred to at any time.
- ⊙ Adler recommended using the phrase “take daily” instead of “once a day” because “once” means eleven in Spanish.

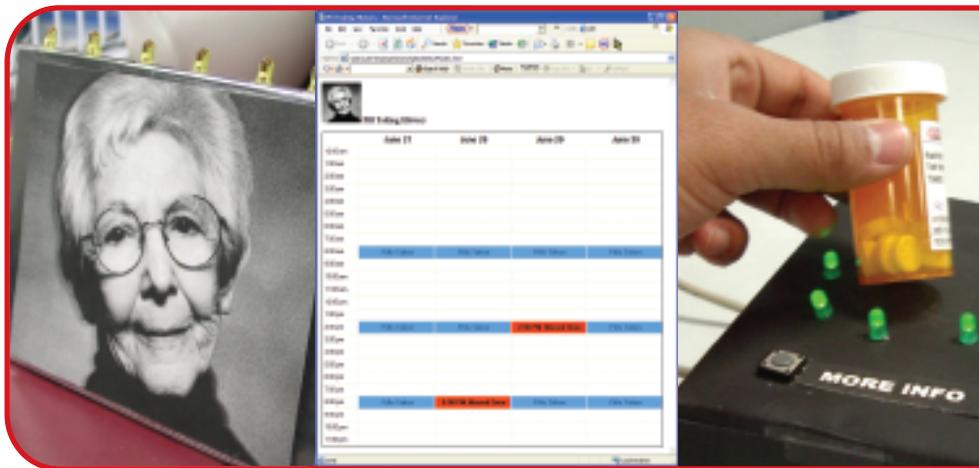
The SimPill

South Africa's Dr. David Green developed a battery-charged pill bottle that uses wireless technology to track whether people have taken their pills on time, and prods them to do so if they have forgotten.

Each bottle is programmed with time tolerances during which the bottle must be opened. If it is, a message is sent to a central server which merely stores this data. If the bottle is not opened during the prescribed time, an SMS text message can be sent to either the patient or a caregiver

stand if they have not done so within a reasonable length of time.

If the medication has not been taken by voice message and/or by flashing lights on a specially designed picture frame at the caregivers' locations. The caregivers can



reminding them that it is time to take the medication. If time continues to go by with no response, the system can be programmed to take a series of increasingly serious steps, such as calling emergency services.

Context-Aware Pill Bottle and Medication Monitor

One major problem with this approach is that merely having opened the bottle does not necessarily mean that the medication was taken, nor that the correct dose was taken. These are problems that also remained unresolved in an experiment by University of Calgary researchers Anand Agarawala, Saul Greenberg, and Geoffrey Ho.

Their two-part Context-Aware Pill Bottle and Medication Monitor system consists of a pill bottle with an attached RFID (radio frequency identification device) tag and a stand. When it is time to take the medication, lights flash on the stand, providing visual cues to the patients. It can also deliver an oral message reminding the patients to take their medication and how much they are supposed to take. The system assumes that the patients are taking the medication. It reminds them to put the bottle back on the

touch the frame, which lets them send a voicemail messages reminding the patients to take their medications.

The researchers note that their device still has not solved all the problems. In particular:

- ⊙ Removing the bottle from the stand and later replacing it does not necessarily mean that the patient actually took the pills or the correct amount.
- ⊙ The stand is a wired device, and thus awkward to move around the house. If the patient is not in the same room as the stand, he or she may miss the warnings.
- ⊙ As currently designed, it would also require multiple stands for multiple medications. Given the large number of medications taken by many seniors these days, this is not very practical.
- ⊙ Patients may resent the intrusions of the device or the caregivers. If they unplug it, it won't work.

As researcher Saul Greenberg points out, “This project was just an experiment, meant to explore limitations of context aware devices in even a conceptually simple application.” Clearly nothing is “simple” when there is human interaction involved. **UX**

—Tema Frank