



Development of a Home Use Medication Organizer to Improve Patient Adherence to Medication Regimens

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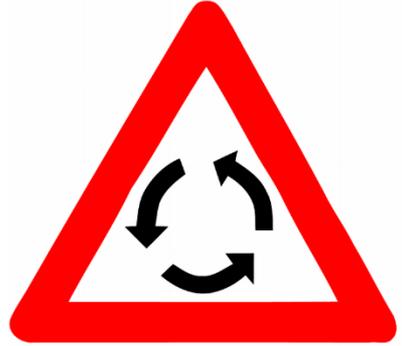
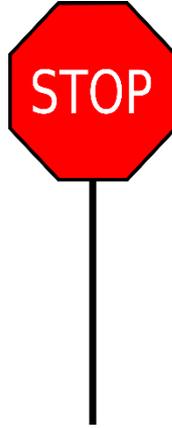
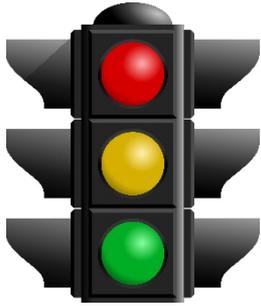
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Disclosures

- I have no conflicts of interest to disclose related to this presentation.

Objectives

- Describe usability testing as a method to improve the design of medication organizers
- Summarize the strengths and weaknesses of a user-centered design process



- **Usability**
 - How effectively, efficiently and satisfactorily a user can interact with a user interface.
- **Usability evaluation or assessment**
 - A variety of techniques for measuring usability.
- **User-Centered Design (UCD)**
 - An approach to designing a product or service (e.g. user interface design), in which the end user is placed in the center of the process.

Usability Testing

- A range of test and evaluation methods such as automated evaluations, inspection evaluations, operational evaluations, and human performance testing.
- Users perform a variety of tasks with a prototype while observers note what each user does and says and performance data are recorded.

Why Usability Testing

- User experience
- Improve health outcomes
- Safety
- Reliability



Problem – Medication Non-adherence

- Over 50% of individuals who are prescribed a medication not taking them as prescribed.
- The cost of medication non-adherence = \$100 billion each year
- People with non-adherence are 5 times more likely to be readmitted to the hospital or die



- People with
 - Complex medication regimes for single problems
 - Multiple chronic illnesses
 - Cognitive decline
 - Mental illness

Solutions



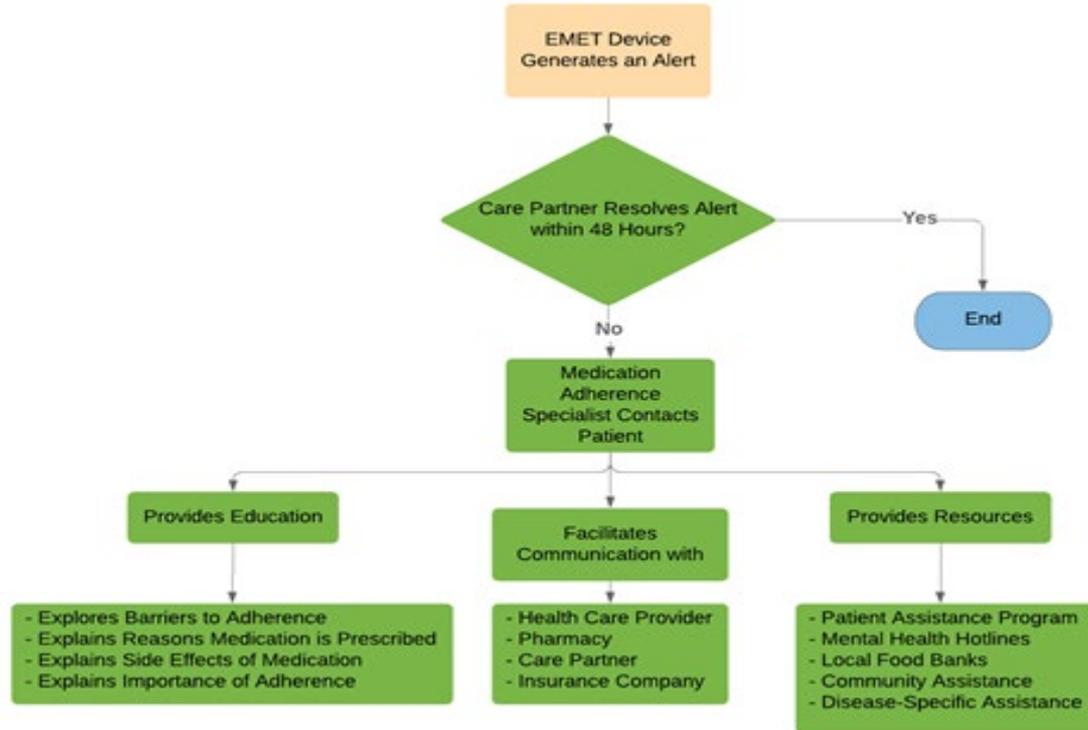
- Simple to use
- Help independent living
- Reduce strain on health partner



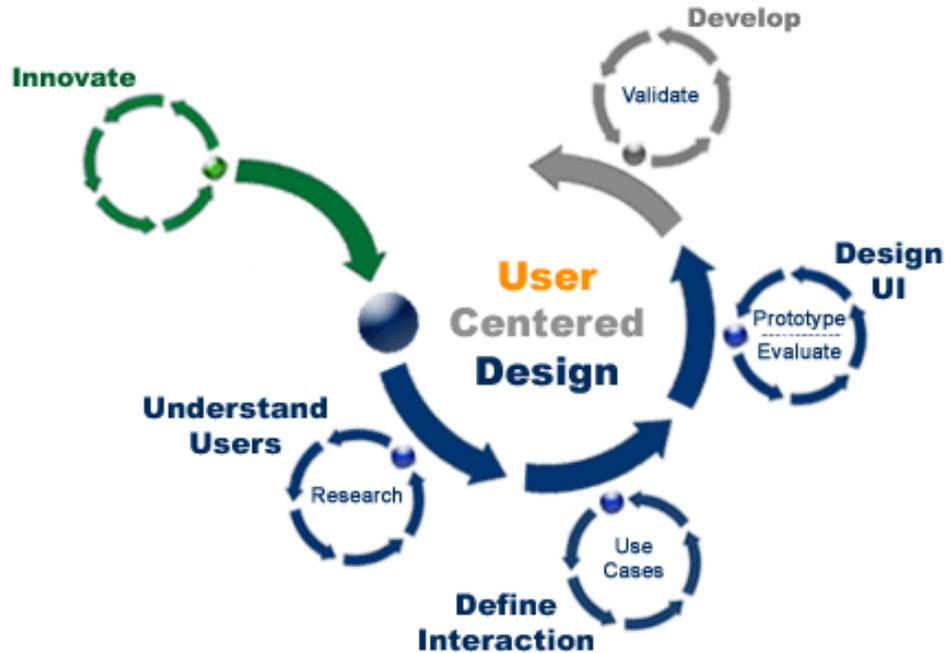
Our Solution

- **Every Medication Every Time E.M.E.T.**
 - Medication organizer with digital camera
 - Alerts to patient and care partner
 - Assistance from a medication adherence specialist

Our Vision for Smart Device



User-Centered Design



- Descriptive study to evaluate the medication following usability testing guidelines
 - Convenience sampling with a group of 45 older adults from Osher Lifelong Learning Institute
 - Two user meetings
 - Participants were given scenarios so they could interact with devices and alert system as though they were using them at home.
 - Participants completed the SUS after using the device.

Process



Using Prototypes



(photo permission obtained from participants)

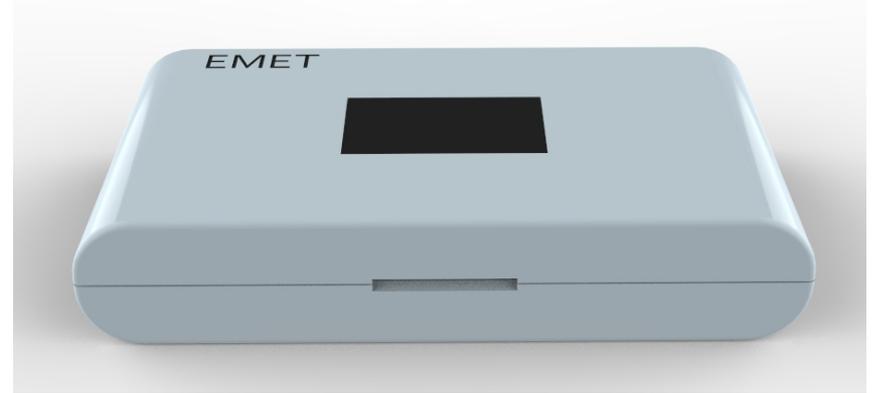
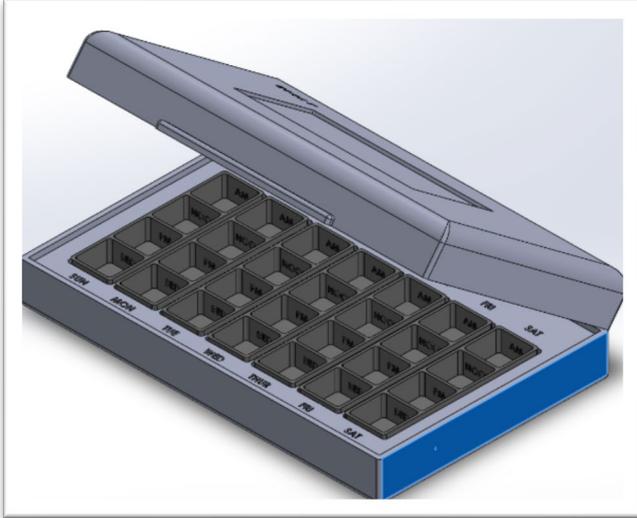
- Participants
 - 78% white
 - 16% African American
 - 4% Asian American
 - 2% were Hispanic
- Of the initial 45 participants, 37 completed the entire usability study.

- The first user meeting showed the usability scores from the SUS to be in the low 70%
 - Changes were made based on user input
 - Size
 - Bins – size, shape, pill release
 - More flexibility in reports from software
- Results from the second user meeting showed an improve usability score of 86% for the device and alert system
 - See video

Discussion

- More development will be needed to make the device ready for field testing.
- The aim of future studies will be to place devices with individuals who have a history of non-adherence to improve their chronic illness—hypertension and type ii diabetes.

Device



Alert Software

Sept. 12, 2016

Janet Henderson

ID: 1234567

AM Status

All medications appear taken as placed Set as new baseline

Noon Status

Check for possible medication addition Set as new baseline

Evening Status

Meds have been removed. Set as new baseline

Bedtime Status

Meds were not taken on time. Set as new baseline

Appearance Version

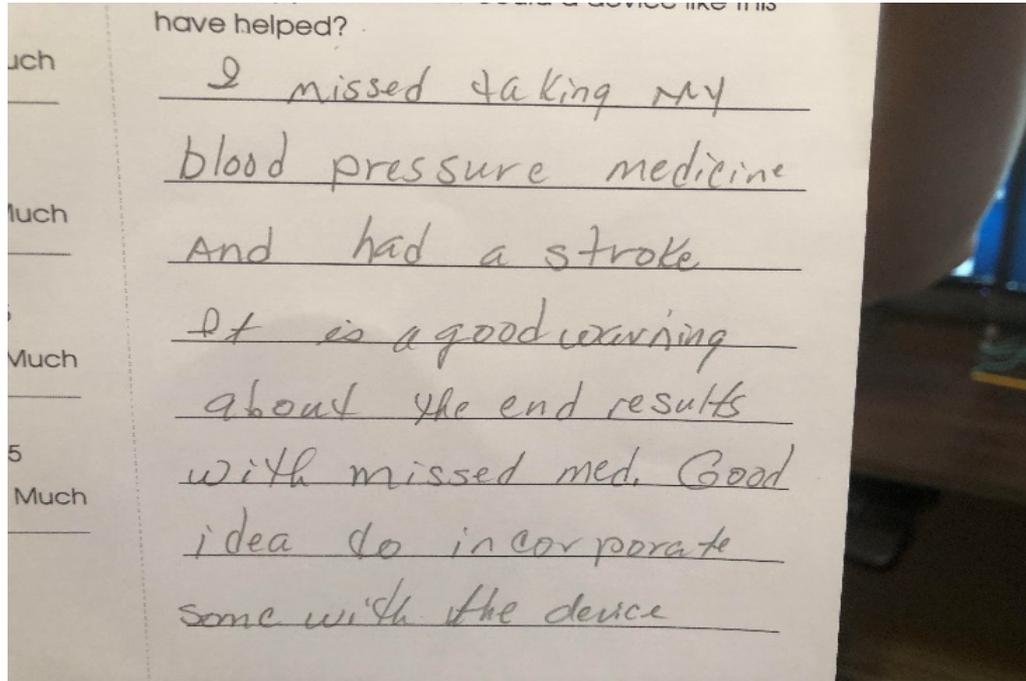
Patient Name: Test Patient
EMET. Every Med Every Time
Oct 2018

Monthly Report

	Sun	Mon	Tues	Wed	Thur	Fri	Sat
30	1	2	3	4	5	6	
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	31	1	2	3	
4	5	6	7	8	9	10	

Calendar Color Legend

- Medications Taken On Time
- Medications Not Taken On Time
- Fewer Medications Taken Than Normal
- More Medications Taken Than Normal



Conclusions

- Usability testing is a necessary part of emerging technology
- Researchers conduct usability studies in the early part of health information technology design

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