

Using Technology to Measure Adherence of Complicated Medication Regimens



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ABSTRAC

Our client would like to monitor his patient's medication adherence. replaced by a smaller and cheaper unit. Texas Instruments microprocessor. This circuit is a prototype that will be new medication box that attaches to a diravit powered by a patient's routine of taking medications on time. We have purchased a alarm to the unit to then monitor how this reminder would affect the hopes of ensuring proper adherence. Future work includes adding an to a computer to be read by the client to review with the patient in compartment is accessed by the patient. This log file could be exported day. This device would record the time and date of when a specific medication box that allows his patients to take pills up to four times a He would prefer to have a device that can be attached to a standard

Motivation

- Physicians lack the ability to record a patient's medication adherence
- Patients may display an 'ideal patient' attitude
- Forgetfulness is the number one cause of nonadherence
- 75% of elderly patients take their medications incorrectly

Current solutions

MEMS (Medication Event Monitoring System)

- o Recorded with micro-electronic circuit
- o Time-stamped medication events sent to computer
- o Single vial, doesn't apply to medication box



E-Pill MD.2

- o Monitored Automatic Medication Dispenser
- o Stores 3-4 weeks of medications
- Support Center manitoring o Built-in Alarm via Light or Sound
- o Internet Connection Required for Logging

PROBLEM SPEC

FUTURE WORK

Improvements on our design must be done in the following areas to

ensure that our design is safe for clinical use.

- Device must accurately obtain data regarding patient's adherence of their medication
- Lightweight and durable
- An alarm to alert patient
- Normal use should not interfere with recording Total prototype cost may not exceed \$500
- Must consume a low power amount





FINAL DESIGN

friendly manner

Expand the pill box dimensions (7 x 4 pill box)

Enhance code to log date and time

Design Concentration

Housing to hide circuitry from patient

Materials

Alarm system for research purposes and patient assistance

Computer program should allow the data to be retrieved in a user

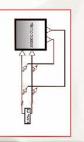
Develop sleeping function to increase the efficiency of microcontroller

- Single switch in each compartment
- Plate prevents interference between medication and circuitry
- Uses switch matrix technology
- Data gathered using Texas Instruments MSP430 Microcontroller
- o Program developed in C
- Includes algorithm to overcome error caused by "switch bounce"

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- Current configuration: 2x2 matrix of
- o Design can be scaled up or down



Accurate and reliable readings

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VIASYS Healthcare

REFERENC

"Medication Reminder". http://www.epill.com

