

Improving Subject Compliance with Smart Pill Bottles

By Norman M. Goldfarb

According to the American Heart Association, 12% of patients never fill their prescriptions, 12% fill them but do not take them, and 29% start taking them but stop prematurely. Only 47% take them all.¹ Compliance by subjects in clinical trials can be much higher, but there are reports of average compliance rates in some trials of only 43% to 78%.^{2,3}

One approach to addressing this compliance problem is to give subjects “smart” pill containers that help them take pills on time and correctly.⁴ Some of these devices upload data about when the container has been opened, and provide reporting and analysis functionality. The smart pill containers described below perform some or all of these functions.

CerePak

CerePak is a blister pack that records when pills are removed. Subjects can also answer questions printed on the packaging by pressing “buttons.” The data is uploaded through RFID to a reader attached to a computer. The product is customized to hold up to 32 pills.



Company:	MeadWestVaco
Product:	CeraPak
Alerts user:	Beeps
Instructions:	Printed on packaging
Records & transmits data:	Records openings of individual blisters. Upload data by placing package on reader connected to computer.
Cost:	\$75 for package; \$250 for reader
Website:	www.meadwestvaco.com

eCAP

eCAP is a closure (cap) that fits standard pill bottles. eCAP beeps and flashes to remind subjects to take their medicine. It records openings and transmits them through RFID to a reader. The reader is attached to a computer, where the data can be viewed on a calendar. Med-ic ECM, a sister product, uses blister packs instead of bottles.



Company:	Information Mediary Corporation (IMC)
Product:	eCap
Alerts user:	Beeeps & flashing light
Instructions:	No
Records & transmits data:	Records openings. Upload data by placing closure on reader connected to computer.
Cost:	\$7-15 for cap; \$300-500 for reader
Website:	www.informationmediary.com

e-pill Multi-Alarm PLUS Pill Timer Pillbox

e-pill Multi-Alarm PLUS Pill Timer Pillbox is a 7-compartment pillbox that uses manual switches to set alarm times. e-pill offers a broad range of "medication reminders," including the CADEX Medication Reminder Watch, which can be used with regular drug packaging such as blister packs.



Company:	e-pill
Product:	e-pill Multi-Alarm PLUS Pill Timer Pillbox
Alerts user:	Beeeps
Instructions:	No
Records & transmits data:	No
Cost:	\$59.95
Website:	www.epill.com

GlowCap

GlowCap is a closure that fits standard pill bottles. It flashes to remind subjects to take their medicine. A companion nightlight also flashes. Both are connected wirelessly to a modem, which connects through a standard telephone line to a computer at the manufacturer. The alert schedule can be changed by calling the manufacturer.



Company:	Vitality
Product:	GlowCap
Alerts user:	Flashing light
Instructions:	No
Records & transmits data:	No
Cost:	TBD (not yet on market)
Website:	www.rxvitality.com

MedSignals

MedSignals is a 4-compartment pillbox that beeps to alert subjects to take their medication and identifies the correct bin with a flashing light. It records data on bin openings and uploads it over a phone line.



Company:	MedSignals
Product:	MedSignals
Alerts user:	Beeps; flashing light identifies correct bin
Instructions:	Verbal and on screen
Records & transmits data:	Records openings. Upload data over phone line.
Cost:	\$199
Website:	www.medsignals.com

MEMS 6 TrackCap

MEMS 6 Track Cap records bottle openings. An LCD display shows number of openings and time since last opening. To upload data, place bottle on the reader.



Company:	AARDEX Group
Product:	MEMS 6 TrackCap and Reader
Alerts user:	No
Instructions:	No
Records & transmits data:	Records openings. To upload data, place bottle on Reader, which is connected to a computer.
Cost:	\$107 for TrackCap; \$365 for Reader
Website:	www.aardexgroup.com

Rex

Rex is an integrated container. The subject pushes a button to hear recorded instructions. Recordings can be computer-generated text-to-speech or human voice via microphone.



Company:	MedivoxRx Techno-logies
Product:	Rex
Alerts user:	No
Instructions:	Verbal
Records & transmits data:	No
Cost:	\$5/container
Website:	www.rxtalks.com

SIMpill

SIMpill attaches to the side of a standard pill bottle. It detects when the bottle is opened and transmits a cell phone message to a central computer. If a timely message is not received, the computer sends a reminder message.



Company:	SIMpill
Product:	SIMpill
Alerts user:	If bottle not opened in medication window, sends message, which can be cell-phone text, pre-recorded voice, or email.
Instructions:	Not normally, but see alert features.
Records & transmits data:	Detects openings and sends real-time cell phone message to central computer.
Cost:	\$99 plus \$29/month
Website:	www.simpill.com

References

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3. "Medication Compliance as a Feature in Drug Development", H. Kastrissios and T.F. Blaschke, Annual Review Pharmacology & Toxicology, 1997
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