

Forget your medicine? This device won't let you

March 26 2010, By Jim Doyle

Just what the doctor ordered: Annoying little gizmos that help remind you when you fail to take your medicines. The stuff of science fiction? Maybe not.

Here's a [Wi-Fi](#) pill bottle cap that glows and pulses with an amber light when it's time to open your pill vial, plays an insistent ring-tone melody when you miss the appointed hour, and triggers an automated reminder by phone call or [text message](#) if you're two hours late.

GlowCaps, which are linked to the Internet, can also send weekly e-mails to remote caregivers, provide data to doctors' offices and advise when prescriptions should be refilled.

Express Scripts, the St. Louis pharmaceutical manager, is partnering with Vitality Inc., a Boston-based developer and supplier of these devices. Next month, the two firms will begin a new phase of product development to assess the commercial applications of this technology.

Express Scripts, which pioneered home delivery for prescription medicines, is the first large pharmaceutical benefits manager to experiment with GlowCaps.

If successful, GlowCaps could help contain [medical costs](#) by addressing a fundamental point in medicine delivery _ making sure the patient actually follows a doctor's prescription, which would produce healthier outcomes.

"Therapy adherence is a really tough problem," said Bob Nease, chief scientist at Express Scripts, which has pioneered home delivery for prescription medicines. "There are all types of reasons why people don't take their medication."

Why so much fuss?

When people fail to take their medicine in a timely fashion, the result is an additional \$100 billion in [health-care costs](#) each year, according to studies.

Researchers say some people decline to take medicine for cost reasons, or they have doubts about the drugs' side effects or question whether the pills will actually work.

Others have difficulty finding the time to refill their prescriptions. And there are those patients who simply get caught up in the here and now and forget to dip into their pill vials.

That's a potentially dangerous habit for millions of people with chronic illnesses or conditions such as high blood pressure, diabetes, hypertension, high cholesterol and asthma. It also results in health insurers paying for medicines even when patients have difficulty following their physician's orders and do not fully benefit from a drug therapy.

It's too early to tell whether there's a significant market for GlowCaps. Some people may find these persnickety gadgets intrusive.

\$100 APIECE

While Express Scripts is still assessing the viability of GlowCaps, the devices are available through the Internet. The retail cost is about \$100

apiece on Amazon.com (for the high-tech cap and related services).

Express Scripts executives say the caps will benefit their clients, which include health insurers, HMOs and large-scale employers who worry about wasted dollars and are searching for ways to lower the health care costs.

"They're all sensitive to the issue that they're spending money on prescription drugs," Nease said, "and they want to be sure that people are taking their medication as prescribed."

He acknowledged that prompting patients to take their pills on time could also boost pharmaceutical sales.

Whether the GlowCaps are fully commercialized depends, in part, on the findings of Express Scripts' research program, which will begin in the next few weeks. Some patients who are being invited to voluntarily enroll in the program have taken their medication as prescribed, while others have not.

Bruce Roberts, executive director of the National Community Pharmacists Association in Alexandria, Va., said the best way to ensure that patients take their meds is an in-person "consultation with a clinically trained pharmacist." But, he added, "clearly there are tools (ie., GlowCaps) and programs that can further patient adherence and they should be used as a supplement."

Vitality invented the GlowCap, which is basically a screw-on cap for a standard plastic medicine bottle _ but with sensor and transmitter chips embedded inside. The cap works in tandem with a night light (with a built-in wireless radio receiver and transmitter) that's plugged into a nearby wall socket.

Using a computer, the patient or caregiver can program when pills need to be taken. At the appointed hour, a blue light on the pill cap turns amber and begins to pulse, followed over the next two hours by a series of melodic alerts.

'IMPORTANT TO BE SUBTLE'

GlowCaps are designed to be helpful, not annoying, said David Rose, CEO of Vitality. The caps' ring-tone melody is an arpeggio that "starts off being subtle and nice, but becomes more insistent," said Rose, who teaches at MIT's Media Lab. "We wanted it to be iconic, memorable, and not too obnoxious. If you're creating a device that aims to change a daily behavior, then it's important to be subtle."

GlowCaps also provide data on when a bottle is opened and closed, allowing health benefit providers a better idea of why a patient falls off track.

"The glow caps give you information every single day," Rose said. "We have a dashboard that shows us who's taking their medication ... what time they were supposed to take their medication, how late they were, who's their doctor and what other medication they are taking."

People tend to go through cycles of being more or less in adherence to their prescriptions, which makes it more difficult to determine to what extent GlowCaps are changing patients' behavior. So researchers studying the caps' effectiveness have designed a "predictive model" that, based on such factors as age, sex, and other drugs a customer has been prescribed, assesses whether an individual has a high risk of nonadherence.

The GlowCaps system is designed to bring doctors and others into the mix by providing what behavioral economists call "social incentives."

Patients who are participating in the program receive weekly e-mails about their drug-taking performance and have the option of having these e-mails sent to a friend, family member or doctor.

Rose said the reports will help patients modify their behavior.

"One of the ways to curtail the health care cost in America is to get people to follow their doctors orders," he said. "It is useful to have nudges that are working toward your self-interest."

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