

STAYIN' ALIVE

Digital Doctoring

Web-enabled monitoring devices promise better health. **BY STAN BERNARD, M.D., MBA**

Many of the 60 million Americans who troll the Net in search of health-related information are bored or simply frustrated with "just the facts": They want the Web to help manage their health and that of their loved ones. A new generation of "care sites" addresses those demands. These Websites offer sophisticated monitoring devices, tailored treatment plans, personalized Webpages that store individuals' health-care data, and regular interaction with health-care professionals who monitor and/or manage their health.

Internet-based devices that measure and monitor user health and vitals plug into these Websites. The devices range in complexity from simple blood pressure cuffs to implantable pacemakers.

Web-based health devices can supplement—and, in some cases, replace—traditional monitoring equipment or routine medical exams. The benefits are multifold: Web health care is convenient; it encourages real-time patient feedback; it provides online tracking information to enhance treatment plans; and it facilitates cost-effective patient monitoring.

Those who stand to benefit greatly are the more than 100 million Americans with chronic health conditions such as asthma, diabetes, and heart disease. The majority of Baby Boomers will experience one or more chronic illnesses during their lifetime. And chronic illnesses are costly, comprising nearly 70 percent of personal health-care expenditures in this country. The good news is that the Internet can be used to decrease the burden of chronic illnesses. Here is a sample of Web-enabled devices that will help manage users' health. ■

STAN BERNARD (SBERNARDMD@AOL.COM) IS PRESIDENT OF BERNARD ASSOCIATES, AN EHEALTH BUSINESS CONSULTING FIRM BASED IN NESHANIC STATION, N. J. HE TEACHES EHEALTH AT THE WHARTON SCHOOL OF BUSINESS AT THE UNIVERSITY OF PENNSYLVANIA.

STAYINALIVE@BUSINESS2.COM

AirWatch Asthma Monitor

Maker: LifeChart.com

www.lifechart.com

Partners: Nokia, Johnson & Johnson, MedicalLogic/Medscape

Price: Monitor costs less than \$100; service costs \$9.95/month.

Availability: Since December 1999

Target users: Moderate and severe asthmatics

Description: Users breathe into the AirWatch Asthma Monitor, which records data for two key asthma parameters. The monitor automatically uploads the data via modem to LifeChart.com, which graphs the data to highlight asthma triggers and trends for that patient. Both patient and their authorized health-care professional can access the data on a secure Website.

Pros: The AirWatch monitor is easy to use and provides regular feedback to enhance compliance with treatment. It is clinically proven to reduce emergency room visits by 97 percent and will soon integrate data into MedicalLogic's online medical record.

Cons: The AirWatch device is more costly than standard asthma monitors; and patients remain dependent upon their own health-care professional for monitoring.

Prognosis: AirWatch successfully captures, displays, and accesses pertinent health-care data. The AirWatch system will now be applied to other conditions, including diabetes and hypertension.



Online Medicine Cabinet

Maker: Andersen Consulting

www.ac.com/services/tech/tech_medcab.html

Price: estimated \$1,000 to \$1,500

Availability: Estimated 2002

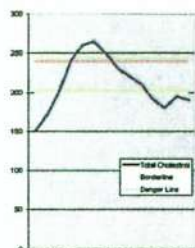
Target users: Participants in clinical trials; patients with chronic conditions, particularly elderly patients with multiple diseases and prescription medications.

Description: The Online Medicine Cabinet (OMC) is a smart appliance for the bathroom that continuously monitors patients' needs and delivers appropriate, individualized services. The device integrates technologies such as smart labels, face recognition, voice synthesis, and flat panel displays. It also responds to individual household members by displaying personalized health reminders, such as doctor's appointments or medication alerts and by alerting patients when they choose the wrong medication. The Online Medicine Cabinet also can monitor multiple health parameters (vital signs, blood pressure, cholesterol levels, glucose levels, etc.) and forward results to the Web for viewing by health-care professionals.

Pros: One OMC per home conveniently provides a variety of health services, including personalized feedback for several users on a variety of conditions.

Cons: The cabinet is large and costly and there is little or no data to suggest it will improve users' health.

Prognosis: This clever concept will evolve dramatically as technology advances; the product has yet to be clinically tested.



send to doctor

BioScanner 2000

Maker: Polymer Technology Systems

www.impacthealth.com

Price: \$199.95

Availability: Since January 2000

Target users: Patients with Type II (or Non-Insulin Dependent) Diabetes.

Description: The BioScanner 2000 is designed to be a comprehensive blood-testing system for diabetics, who often have multiple associated conditions such as elevated cholesterol and kidney disease. With a single finger stick, this device can measure blood indicators for both diabetes (glucose, ketones) and high cholesterol (total cholesterol, HDL or "good cholesterol," and triglycerides). The results can be sent through a built-in data port to a personal computer for uploading to a patient's personal Webpage.

Pros: The single BioScanner measures multiple diabetes blood indicators. The system provides immediate feedback to patients on their progress in diabetes management, and includes a personal patient Webpage for managing diabetes and related conditions.

Cons: The BioScanner is more expensive than standard glucose meters and the Internet linkage is not user-friendly.

Prognosis: The BioScanner is a good way to kill several birds with one stone, although wireless capability would be more convenient for diabetic patients who need to test their blood glucose several times daily. Other measures, including kidney disease tests and LDL ("bad cholesterol") tests, are in clinical testing.



Burn Rate

This gizmo counts your calories as you burn

Now that everything from bagged apples to bottled water comes labeled with calorie content, it's easy to tally your intake. Counting the calories burned as you type, ambulate, and perhaps swim through your day, however, is a bit more complex. Online, there are charts and calorie calculators that estimate average burn-rates during activities from typing and weightlifting to dealing cards and making whoopee, but these ballpark estimates often don't factor in weight, age, basal metabolic rate, and level of exertion.

The CT1 Personal Calorie Tracker claims to fill those gaps. Worn on the waist like a pager, it measures body movement throughout the day via an accelerometer, a chip that measures vertical, horizontal, and lateral motion. The display shows calories ticking off, and the pager drops into a docking station that uploads the data to your personalized Website, where it factors in your age, weight, and activity level and charts your caloric burn rate in increments throughout the day.

Sounds great, but does it work? I took it out for a spin (and a run and a swim...) and here's what I found: A 30-minute run at an 8-minute-mile clip burned 367 calories, according to the CT1. Compared to several online calorie calculators, the count is right on. (The treadmill estimated 460 calories but didn't factor in age, weight, or gender.) But don't take my unscientific word for it; clinical studies have shown the accelerometer to provide statistically acceptable energy expenditure measurements on a zero-grade treadmill.

For anything other than running, however, the CT1 vastly undercounted. In one 24-hour period, a 40-minute jog, two hours of in-line skating, and an hour of vigorous weightlifting totaled just 2,321 calories—a candy bar's worth more than the 2,000 calories an average person burns in a day. (For most women, it's closer to 1,500 calories.) A half-hour, 1.5 kilometer swim tallied a measly 119 calories, versus the 250–317 range of most estimates. (And I wasn't a very streamlined swimmer after stuffing the thing into three waterlight sandwich baggies and tucking it into my suit.)

Granted, the CT1 I tested is still in beta. (In October, it will be sold with the BC1 Body Composition Analyzer, a desktop appliance that measures your body fat composition and hydration.) The launch version of the CT1 promises better accuracy by telling you "flag" the time intervals when you're swimming, biking, or doing any of the 100 activities for which the algorithm will adjust your burn rate. But you'll still look like a geek in the gym with a "pager" clipped to your sweaty spandex.

—Kim Cross



CT1 Personal Calorie Tracker

Maker: Stayhealthy,

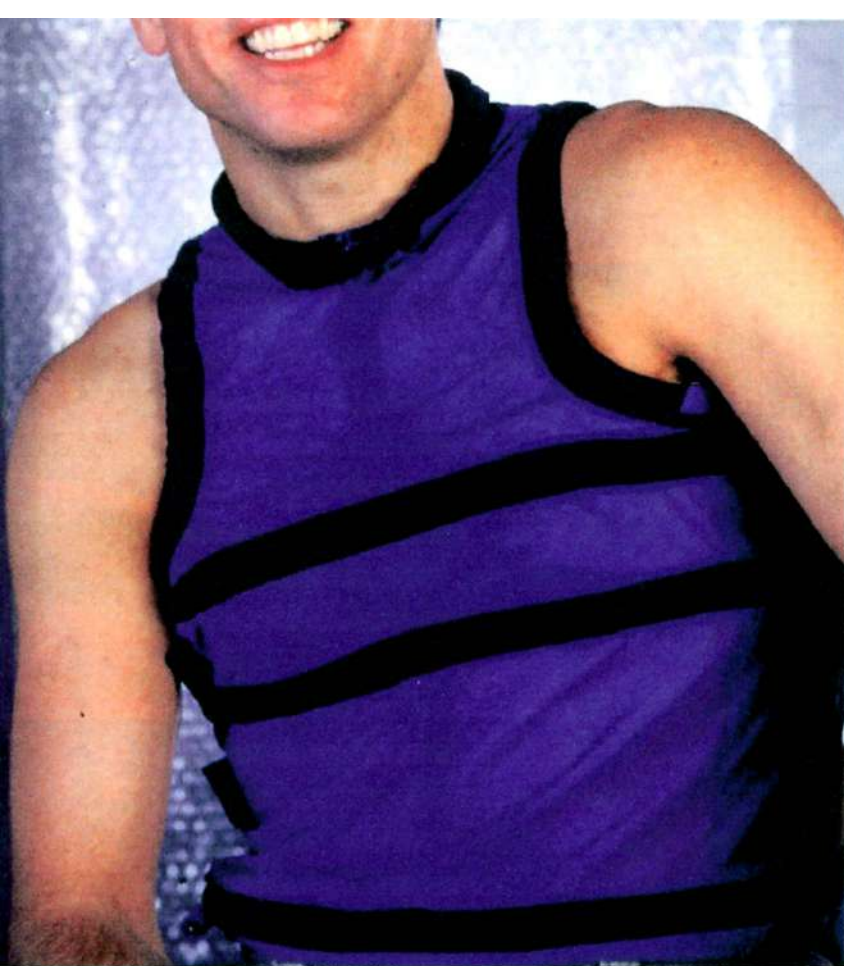
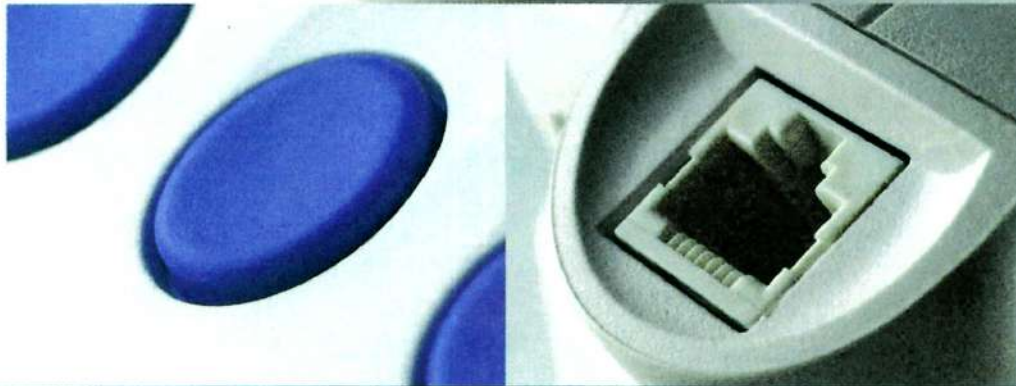
www.stayhealthy.com

Price: \$330 for CT1, BC1 Body Composition Analyzer, and a year subscription to the service

Availability: October 2000

Target users: Anyone counting calories

GET A LIFE

**LifeShirt****Maker:** LifeShirt.com**Price:** Monitoring costs have not been determined at this time. Equipment, including LifeShirt, PDA, and software application, costs \$500 (in some cases, the equipment is included with the monitoring costs).**Availability:** To be determined. Product is still under review by the FDA.**Target users:** Individuals suffering from sleep disorders; patients with respiratory or cardiac conditions; cancer patients treated for pain management.**Description:** The LifeShirt system centers on a form-fitting, hand-washable vest fitted with six different types of sensors that continuously monitor more than 40 physical indicators based on heart activity and breathing patterns. Data is stored in a PDA device attached to the user's belt and is regularly uploaded via the Web or a secure line to the LifeShirt.com data center. Medical professionals and staff technicians analyze the data 24/7. With proper security clearance, consumers and their physicians have instant access to the data via the Web.**Pros:** The LifeShirt provides for comfortable, ambulatory, cost-effective, and non-invasive regular monitoring of vital signs. Its methodology is based upon extensive clinical tests.**Cons:** It is difficult to obtain insurance reimbursement for conditions other than sleep disorders.**Prognosis:** The LifeShirt is a convenient, practical, and cost-effective device for assessing sleep disorders, and a promising, if untested, approach to additional health conditions.**Health Buddy****Maker:** Health Hero Network
www.healthhero.com**Partners:** EDS, Confer, among others**Price:** \$30 per month for the device and service**Availability:** Since May 1999**Target users:** Patients with chronic diseases, such as heart disease and diabetes**Description:** Health Hero offers a two-way, Net-based communications service and appliance to aid daily communication between health-care providers and patients at home. Care providers can access the secure Web-based network, which has tools for managing patients with chronic conditions and for communicating with patients via the Health Buddy device. The appliance connects to a phone line and allows patients to automatically receive health-care information and to respond to daily queries from health-care professionals. It also features a universal port that connects to various home-monitoring devices, including blood glucose meters.**Pros:** With its highly legible screen, easy-to-use buttons, and automated data feeds, Health Buddy is well designed for use by elderly patients and enhances compliance to treatment.**Cons:** The price does not include the cost of professional monitoring.**Prognosis:** Health Buddy is among the most user-friendly devices designed to provide daily support to patients with chronic conditions.

GET A LIFE

AlereNet System

Maker: Alere Medical

www.alere.com

Price: \$140 per month with regular nurse interaction; \$75 per month without Alere Medical nurse interaction.

Availability: Since 1997

Target users: Patients with moderate to severe heart failure

Description: Patients step on digital scales and use simple

DayLink Monitors devices to answer questions about symptoms each day. The monitor sends patient-diagnostic data via modem to a Web-based database for review by nurses, physicians, and other appropriate health-care professionals.

Pros: The AlereNet system boasts demonstrated clinical results and greater than 80 percent reduction in hospitalizations. The system improves patient compliance with treatment and enhances utilization of nursing time.

Cons: Heart-failure devices should also measure blood glucose and other parameters because patients with heart failure usually live with multiple co-morbid conditions that should be monitored.

Prognosis: A proven system for managing heart failure patients that offers the option of nurse monitoring.



“Want to see your competition quaking in their boots? Focus your e-business strategy on _____ . NOW.”

On September 25-28, come to Anaheim and fill in the blanks.

Get all your e-business answers at iEB — the world's largest and leading e-business event, featuring Gartner analysis and thousands of cutting-edge products. Register online at www.iebexpo.com or call 1.888.248.0036.

Gartner
insight for the
connected

ADVANSTAR
COMMUNICATIONS

e

Internet &
e-Business
Conference
& Exposition

BUSINESS2.0

Clarify

A Nortel Networks Company

COMMERCE
ONE.

JDE
EDWARDS

Informix
SOFTWARE

intel

IRON
SIDE

OPEN
TEXT
CORPORATION

PEOPLE
Soft

SA