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Wired Up at Home to Monitor Illnesses

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By Milt Freudenheim

As an aging population threatens to overwhelm the nation's hospitals and doctors, thousands of seriously ill patients are relying on computerized health trackers to help keep them safe at home.

Rachel Hofstad, 94, of Rochester, Minn., has one hooked up in her bedroom. A retired teacher with chronic lung disease, Ms. Hofstad is one of 200 patients in a randomized trial of a home monitoring system being conducted by doctors at the Mayo Clinic.

The device is about the size of a coffee maker. "First thing in the morning," she said, "a light comes on and a beeper sounds."

She touches a screen to log in and is cued to slip on a blood pressure cuff and push a button. Her pressure and pulse readings are displayed. Next, she slides a forefinger into a sensor that measures blood oxygen. Then she checks her weight on a scale linked to the machine.

"The machine tells me I'm well," she said. On the other hand, a pattern of "yes" replies to questions like "Are you coughing more than usual today?" will alert a nurse to contact her.

Researchers say devices like these can help motivate elderly patients with chronic conditions like heart or lung disease, advanced diabetes or depression to follow advice from their doctors and nurses and to take part in their own care.

Big multinational companies including G.E., Phillips, Intel, Honeywell and Bosch are stepping up their commitment in what some experts call "telehealth"; last month AT&T said it would offer a diabetes monitor accessible by phone to some of its 1.2 million employees, retirees and their dependents.

While the goal of home monitoring is to avert costly visits to hospitals, studies so far have shown mixed results. Earlier versions of the technology did not demonstrate savings in Medicare studies, and just last week in *The New England Journal of Medicine*, Yale researchers reported disappointing results from a study of high-risk heart patients who had monitoring devices in their homes.

Still, Dr. Douglas L. Wood, a cardiologist and health policy expert at the Mayo Clinic, said he expected remote monitoring to develop rapidly. "It is amazing to see how quickly older people are taking up the technology," he said.

Advocates for in-home care, like Dr. Steven H. Landers, head of the Cleveland Clinic's home health care unit, say it is often less costly and produces better health results than occasional checkups and repeated hospital stays. In a *New England Journal* article last month, Dr. Landers listed forces driving health care into the home: the aging population, "epidemics" of chronic diseases, technological advances, health care consumerism and rapidly escalating health costs.

He added that "health care organizations that do not adapt to the home care imperative risk becoming irrelevant."

The paper in last week's New England Journal, by Dr. Sarwat I. Chaudhry, an assistant professor at the Yale School of Medicine, and colleagues said a six-month study found no significant differences in health status between patients who were monitored at home and a control group receiving the usual care.

But Dr. Gregory J. Hanson, a Mayo geriatrician who is running the trial in which Ms. Hofstad is enrolled, said there were many types of monitoring systems and devices that might vary in effectiveness.

Using daily reports from patients at home is "a different way to practice," he said. The average age of patients in the Mayo trial is 80, and most have been in a hospital frequently.

"We are learning how to interact with the patient and tie in with their primary care provider," Dr. Hanson said, "so everyone is on the same page."

Eric Dishman, head of digital health strategy for Intel, which has a different system, noted that the monitoring system in the Yale study relied on the patients to phone in their daily results. Many failed to do so. A number of other monitoring systems transmit the patient's information automatically. Some systems provide personalized feedback that helps keep the patient in the loop.

Mr. Dishman said he hoped that large-scale pilot projects under the new health law would "prove out the best options" in home monitoring. Intel and G.E. Healthcare are putting up \$125 million each in a venture to develop new telehealth systems.

"We found our home care patients will tell things to those telehealth units that they hesitate to tell the nurse," said Bridget Gallagher, a senior vice president at Jewish Home Lifecare in New York. "Sometimes they don't tell a nurse or a family member about a fall," she said. "They are scared they will be told, 'You can't stay in your home.'"

In one of the largest programs, more than 48,000 veterans are participating in home monitoring. The Department of Veterans Affairs said hospital admissions were reduced by 19 percent in a 2007 study of 17,025 patients using home monitors.

The department plans to have 92,000 patients on home monitoring by 2012, said Dr. Adam Darkins, its chief consultant on coordinating care for veterans.

Alere Inc., a health management company based in Waltham, Mass., has 90,000 patients using its home monitoring devices, including 45,000 who are taking blood thinner drugs, said Dr. Gordon Norman, the company's chief innovation officer.

One of them is Michael L. Johnson, 72, a retired lieutenant colonel who commanded Army medical units in Vietnam and who has congestive heart failure. He checks his own blood at home instead of driving to a V.A. lab. He e-mails the results to Alere, which relays them to his doctor.

National health systems in Europe and Japan are ahead of the United States in home health monitoring, industry experts say, but the gap may narrow as pressure builds to slow the increases in Medicare costs. For one thing, the Obama administration plans to cut back on generous payments to insurance companies for the nearly 11 million members of Medicare Advantage health plans.

Advocates say telehealth, if carefully focused, could help reduce costs for the 5 percent of patients in the United States who account for most of the spending. OptumHealth, a unit of UnitedHealth Group, is already monitoring more than 12,000 home-based Medicare heart patients and 7,000 more in private employer health plans. They weigh themselves twice a day and answer health status questions on a keypad.

Humana plans to sign up 2,000 high-risk elderly congestive heart failure patients next year in a study using a monitoring device from Intel like the ones in the Mayo Clinic trial.

Aetna has completed a trial using the Intel device with 330 Medicare members who have heart problems. It is getting ready to report results in a peer-reviewed journal, said Dr. Randall Krakauer, an Aetna national medical director. The stakes are high: 68,000 Aetna Medicare members have high blood pressure.

One physician who says he is cautious about telehealth is Dr. Daniel Einhorn, medical director of the Scripps Whittier Diabetes Institute in La Jolla, Calif., and president of the American Association of Clinical Endocrinologists.

Even though WellDoc, which makes devices for AT&T, has said its monitoring system significantly reduced A1C, a blood sugar indicator, in a yearlong randomized trial of patients with Type 2 diabetes, Dr. Einhorn said he would wait to read the final report in a peer-reviewed journal. Treating diabetes “depends entirely on multiple details,” he said. “We need to know: Are there patterns of glucose levels, the patient’s age, medications, other medical problems?”

Dr. Suzanne Clough, a diabetes specialist who is a founder of WellDoc, said she agreed that “a physician needs to know a lot about the individual.”

“A phone message cannot replace that,” she said. But it can “provide additional information, insight and contextualized data.”