DH is taking part in a clinical trial to treat stroke victims with a chemical found in bat saliva; it can be used up to nine hours after the stroke—an important benefit in a rural area.

A new way to app-raise seniors' health

Using "apps," applications created for smartphones, it's possible to count calories, interpret a baby's cry, or whistle for a dog. Now, DMS researchers are developing an app to monitor the health of senior citizens.

The standard way to evaluate physical and mental well-being is through surveys. But self-evaluations are subject to bias from patients' imperfect memories and from their desire to give favorable responses, says epidemiologist Ethan Berke, M.D. So he set out to create a better way.

It runs on Android phones and was 80% accurate in a pilot.

In 2005, while at the University of Washington, Berke teamed up with Tanzeem Choudhury, Ph.D., a specialist in designing machines that measure physical and social behaviors. Their first attempt resulted in a fanny pack filled with sensors and batteries. By 2009, Berke and Choudhury, by then both at DMS, had developed a less obtrusive device—a two-inch-by-two-inch mobile sensor—that they tested in a pilot study.

Sensors: For 10 days, eight residents of a local retirement community wore sensors clipped to their waists. The sensors recorded subjects' activity level, including the time they spent walking or running, as well as their social interactions, including the number of conversations they engaged in and the pitch and volume of the participants' voices (the actual conversations were not recorded). Then the researchers compared the data gathered by the sensors to the subjects' responses on surveys of their physical and mental health.

Social: The results, published in the *Annals of Family Medicine*, were compelling. On measures of social and mental well-being, the data from the sensors correlated closely with the survey results. Subjects who spent the most time talking to others—as measured by the sensors—reported on the surveys being happier and more socially connected.

On measures of physical activity, the sensor data didn't correlate quite as closely with the survey results. A likely explanation, Berke says, is that subjects had trouble recalling past physical activity.

But with the general relationship established, Berke and Choudhury began seeking a way to incorporate the sensors into smartphones. With help from Dartmouth computer scientist Andrew Campbell, Ph.D., they created an app called BeWell that monitors physical activity, voice acoustics, and sleep patterns. It runs on Android phones and gives real-time "well-being scores." The app proved 80% accurate in a pilot study. Before making it available to the public, Berke plans to test it on 100 older adults at a health center in Manchester, N.H.

Avert: He envisions a day when the app can help avert physical and mental health problems. Often, he says, patients are given mental-health surveys only after they show symptoms of severe depression. "If people were wearing these devices, we might have the ability to detect changes in mental-health status," he says, "which could result in earlier diagnosis and . . . treatment."

Christianna L. Lewis

MARK WASHBURN

Berke hopes his phone app will safeguard seniors.

Home truth

Too many older adults with serious mental illness reside in nursing homes when they could be living in less-restrictive settings. So suggests a study by members of the DMS Department of Psychiatry, published in the *Journal of Aging and Social Policy*. "The appropriateness of nursing homes for individuals with serious mental illness remains a controversial issue in long-term care policy," they wrote, "more than a decade since [a landmark Supreme Court decision], which affirmed the rights of persons with disabilities to live in their communities."

Motion potion

Getting adolescents off the couch and in motion may have lasting benefits not just for their waistlines but also for their brains. In a study conducted by a DMS neuroscientist and two students, rats that exercised regularly during adolescence demonstrated better memory function in adulthood than rats that had not. They also had higher levels of an important protein called brain-derived neurotrophic factor. "Exercising during adolescence may capitalize on the peak of neural plasticity that occurs during this developmental stage," the researchers wrote in the journal *Neuroscience*, "and lead to more durable effects on cognitive function compared to exercising during adulthood." ■