

Study uses smartphone technology to promote pulmonary rehab at home

October 7 2015, by Bob Shepard

Harold Ridgeway is a type 'A' kind of guy. "I had my first heart attack when I was 50," recalled the retired businessman.

He is the type who often worked 16 hours a day during a career owning steel fabricating plants. He made a good living; but the heart attacks, bypass surgeries and ultimately chronic obstructive pulmonary disease—or COPD—caused by 45 years of smoking, have taken their toll.

"I was diagnosed with COPD a few years ago," said Ridgeway, who is now 76. "I end up in UAB Hospital at least once a year. Something will happen where I can't breathe."

Most COPD patients experience frequent exacerbations of their disease that may require hospitalization, says Surya Bhatt, M.D., a pulmonologist at the University of Alabama at Birmingham. And about 20 percent of patients—one in five—will find themselves readmitted to a hospital within 30 days with continued symptoms.

"Hospital readmission is a big problem for patients with COPD," said Bhatt, an assistant professor in the Division of Pulmonary, Allergy and Critical Care Medicine, part of the Department of Medicine. "Their quality of life goes down, their lung function declines, and many times it does not return to their previous baseline. They are left with considerable limitations in their ability to walk or to do things around the house."

Bhatt says evidence shows that pulmonary rehabilitation—exercises designed to improve lung function—can help reduce that readmission rate. The trick is getting patients to undertake rehab.

"There are a limited number of pulmonary rehabilitation centers in Alabama, and for many patients, the time and expense of going to rehab is prohibitive," Bhatt said. "We have to remember that many of these patients are quite debilitated. Some of them can barely get from bed to bathroom."

So Bhatt, along with exercise physiologist Greg Sanders and respiratory therapist Erica Anderson, hit on the idea of taking rehab to the patient. They devised a research study using smartphone technology to link a rehabbing patient at home with a trained medical professional in their office on UAB's campus. The two-way interaction provided encouragement, incentive and safety.

"We prepared an exercise prescription based on the patient's ability and resources," Sanders said. "Patients were given a smartphone with certain applications that allowed us to use the phone's camera to observe them as they exercised while we also monitored their health status by measuring parameters such as blood pressure, [heart rate](#) and oxygen saturation."

For some, the level of exercise was as simple as walking in the home using a chair or table for balance while others had a more vigorous workout. Harold Ridgeway, who has a well-appointed workout room, was one of those. He and the other 13 study subjects worked out under Sanders' watchful gaze for an hour a day, three days a week, for three months. Ridgeway says Sanders was part safety monitor, part task master and part cheerleader.

"I'd call him up and turn on the video function," he said. "He'd check my heart rate and other factors, and then I'd start in with the workout. He'd

ask questions about how I was feeling and whether I was having any problems. And with him watching, you can't quit like you could if you were doing it on your own."

Bhatt is encouraged by the results of the study, funded by the UAB Health System. None of the 14 patients required readmission to a hospital within the first 30 days following discharge from hospital, an improvement over the expected rate of 20 percent. All showed significant improvement in their ability to engage in everyday functions. Bhatt hopes to expand the study—known as the COPD: Get With It Program—and enroll more subjects in the future.

"There are about 12 million [patients](#) in the United States who have been diagnosed with COPD and another 12 million who are undiagnosed," Bhatt said. "About two-thirds of the health care costs of COPD result from hospitalizations, so reducing the number of readmissions could produce a tremendous cost savings."

Ridgeway responded well to the program. He has continued working out since the conclusion of the study and has increased the frequency and intensity of his workouts.

"I can go longer, I can walk longer, I can exercise longer," he said. "I can do things outside. I've got some horses and I can still ride. I just feel better. I probably feel a lot younger than my 76 years."

When asked what is next for Harold Ridgeway, he just smiles. "I don't know," he said. "Maybe I can make 90."

Provided by University of Alabama at Birmingham

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