

New implanted sensor could reduce heart failure admissions

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The CardioMEMS device is shown next to a penny for scale.

Unexpected trips to the hospital are inconvenient and worrisome for anyone, but for congestive heart failure sufferers, they can be all too frequent. In a rural state like West Virginia, distance can be a factor. Cardiologists at WVU Healthcare's Ruby Memorial Hospital are now only the fourth group of doctors in the nation to implant a new tiny, wireless monitoring sensor to help doctors and patients manage heart failure while eliminating the need for frequent surprise hospital visits.

The CardioMEMS HF System is the first and only FDA-approved [heart failure](#) monitoring device that has been proven to significantly reduce hospital admissions when used by physicians to manage the condition. The technology features a sensor that is implanted through a catheter into the pulmonary artery (PA) to directly measure PA pressure.

Increased PA pressures appear before weight and blood pressure changes, which are often used as indirect measures of worsening heart failure.

According to the Centers for Disease Control and Prevention, more than 5.1 million Americans have heart failure, which occurs when the heart is unable to pump enough blood to meet the body's demands. Patients with heart failure are frequently hospitalized, have a reduced quality of life, and face a higher risk of death. CardioMEMS allows patients to transmit daily sensor readings from their homes to their healthcare providers, allowing for personalized management to reduce the likelihood of hospitalization. The sensor is designed to last the lifetime of the patient and doesn't require batteries, and there is no pain or sensation for the patient during the readings.

"All the patient has to do is lie back on a special pad," explained Bradford E. Warden, M.D., director of the WVU Heart Institute and chief of the WVU School of Medicine Section of Cardiology. "Radio waves are then transmitted to an external electronic system, and the device measures pressure in the pulmonary artery. It lets us notice any pressure changes three or four weeks before the patient develops pulmonary edema (fluid in the lungs) from exacerbated [congestive heart failure](#). It gives us a chance to get pulmonary edema under control by adjusting medications while keeping the patient out of the hospital and in the comfort of his or her own home."



Bradford Warden, M.D., (right) director of the WVU Heart Institute and chief of the WVU School of Medicine Section of Cardiology, and Wissam Gharib, M.D., director of the WVU Healthcare Cardiac Catheterization Labs and Care Units, implant the CardioMEMS device.

In addition to being only the fourth facility nationally to do the procedure, WVU Healthcare is the first institution to be certified to perform it, and Dr. Warden is the nation's first certified individual practitioner.

Richard Uchic of Thomas, W.Va., is the first WVU Healthcare heart patient to receive the CardioMEMS implant. In the past, the 72-year-old Tucker County resident would make frequent trips to Morgantown or neighboring Garrett County, Md., for treatment of sudden heart failure symptoms.

"The last time, I was having shortness of breath," explained Uchic. "I have to go over to Oakland (Md.) if I need to see someone in a hurry. This monitor will help the doctor decide if I should take more of my diuretic or other medications, and it should save me a trip to the hospital."

As use of the sensor increases, there is great potential for hospitals to see less of frequent heart failure patients like Uchic. Data from a clinical trial showed that the CardioMEMS technology reduces heart failure hospital admissions by up to 37 percent. According to the American Heart Association (AHA), the estimated direct and indirect cost of heart failure in the U.S. in 2012 was \$31 billion. That number is expected to more than double by 2030.

The WVU Healthcare Heart Failure Program, led by Robert Hull, M.D., has earned national recognition by cutting hospital re-admissions, improving efficiency in patient care, and developing strategies to improve the patient experience.

In just its third year of existence, it has been named to the Target HF Honor Roll of the AHA Get With the Guidelines Gold Plus Award, an honor that reflects the program's commitment to AHA standards.

WVU Healthcare was chosen to pioneer the procedure as one of 16 institutions designated "sites of excellence" by St. Jude Medical, manufacturers of the CardioMEMS HF System.

CardioMEMS is approved by the U.S. Food and Drug Administration (FDA) for commercial use in the U.S.

Provided by WVU Healthcare

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