

# The super-fast MRI scan that could revolutionize heart failure diagnosis

September 21 2022

---



Credit: CC0 Public Domain

Researchers at the University of East Anglia have developed cutting-edge technology to diagnose patients with heart failure in record time.

The state-of-the-art technology uses [magnetic resonance](#) imaging (MRI) to create detailed 4D flow images of the heart.

But unlike a standard MRI scan, which can take up to 20 minutes or more, the new 4D heart MRI scan takes just eight minutes.

The results provide a precise image of the heart valves and [blood flow](#) inside the heart, helping doctors determine the best course of treatment for [patients](#).

Cardiology patients at the Norfolk and Norwich University Hospital (NNUH) were the first to trial the new technology. And the team hope their work could revolutionize the speed at which [heart failure](#) is diagnosed, benefitting hospitals and patients world-wide.

Lead researcher Dr. Pankaj Garg, from UEA's Norwich Medical School and an Honorary Consultant Cardiologist at NNUH, said: "Heart failure is a dreadful condition resulting from rising pressures inside the heart. The best method to diagnose heart failure is by invasive assessment, which is not preferred as it has risks.

"An ultrasound scan of the heart called echocardiography is routinely used to measure the peak velocity of blood flow through the mitral valve of the heart. However, this method can be unreliable.

"We have been researching one of the most cutting-edge methods of flow assessment inside the heart called 4D flow MRI.

"In 4D flow MRI, we can look at the flow in three directions over time—the fourth dimension."

Ph.D. student Hosamadin Assadi, also from UEA's Norwich Medical School, said: "This new technology is revolutionizing how patients with heart disease are diagnosed. However, it takes up to 20 minutes to carry out a 4D flow MRI and we know that patients do not like having long MRI scans.

"So, we collaborated with General Electrics Healthcare to investigate the reliability of a new technique that uses super-fast methods to scan the flow in the heart, called Kat-ARC.

"We found that this halves the scanning time—and takes around eight minutes.

"We have also shown how this non-invasive imaging technique can measure the peak velocity of blood flow in the heart accurately and precisely."

The team tested the new technology with 50 patients at the Norfolk and Norwich University Hospital and at the Sheffield Teaching Hospitals NHS Foundation Trust in Sheffield.

Patients with suspected heart failure were assessed using the new Kat-ARC 4D heart flow MRI.

Dr. Garg said: "This technology is revolutionizing how we assess [heart disease](#) and our research paves the way for the super-fast 4D flow MRI scans by halving the scan time.

"This will benefit hospitals and patients across the whole world," he added.

NNUH Medical Director Prof Erika Denton said: "NNUH is proud to have taken part in ground-breaking research which has the potential to improve the diagnosis and treatment of people with [heart disease](#)."

"Kat-ARC accelerated 4D flow CMR: clinical validation for transvalvular [flow](#) and peak velocity assessment" is published in the journal *European Radiology Experimental* on September 22.

**More information:** Kat-ARC accelerated 4D flow CMR: clinical validation for transvalvular flow and peak velocity assessment, *European Radiology Experimental* (2022).

Provided by University of East Anglia

Citation: The super-fast MRI scan that could revolutionize heart failure diagnosis (2022, September 21) retrieved 6 May 2024 from <https://medicalxpress.com/news/2022-09-super-fast-mri-scan-revolutionize-heart.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.