

Study supports 3-D MRI heart imaging to improve treatment of atrial fibrillation

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A University of Utah-led study for treatment of patients with atrial fibrillation (A-fib) provides strong clinical evidence for the use of 3-D MRI to individualize disease management and improve outcomes.

Results of the Delayed-Enhancement MRI Determinant of Successful Radio-frequency Catheter Ablation of Atrial Fibrillation (DECAFF) study will be published Wednesday in the *Journal of the American Medical Association*.

Atrial fibrillation is a common arrhythmia, or an [irregular heartbeat](#), which is a major cause of stroke, heart failure and death. For treatment, doctors have mostly relied on drugs, or more recently, on catheter ablation. Despite those two [treatment options](#), outcomes remain mediocre mainly due to poor patient selection, says Nassir F. Marrouche, M.D., founder of the U's interdisciplinary Comprehensive Arrhythmia Research & Management Center (CARMA) and associate professor of internal medicine at the University's School of Medicine. "We've been treating A-fib based on [patients'](#) symptoms, duration of arrhythmia and associated comorbidities. Instead we should be integrating the diseased, fibrotic heart tissue itself into our management plan."

"Every cardiologist in the world knows that A-fib and atrial tissue disease are intertwined. But, until recently, we have been lacking noninvasive tools to define this relationship," he says. "We at CARMA have developed a significant breakthrough in the way A-fib is managed."

The DECAFF study built on innovative work from CARMA, which invented the technology enabling heart tissue imaging with MRI. With these images, physicians can assess the extent of the disease using a novel staging system similar to the ones developed for cancer. "This is a major step for individualizing arrhythmia management."

Conducted in partnership with 15 major medical centers across the United States, Europe, and Australia, Marrouche's landmark study demonstrated that the amount of atrial injury can effectively predict whether patients were likely to benefit from A-fib [catheter ablation](#) procedure. Using the enhanced MRI and the Utah Staging System, the hearts of 329 patients were scanned and staged on a scale of 1-4 before undergoing ablation and procedure outcomes were assessed at follow-up.

What Marrouche and his worldwide study partners found reflected early published findings from CARMA at the U of U: that those with less extensive fibrotic tissue had a greater chance of responding to ablative treatment.

According to the data, patients with less than 10 percent left atrial wall fibrosis (Utah Stage 1) showed good outcomes with ablation therapy while those with greater than 30 percent fibrosis (Stage 4) experienced significantly higher failure rates.

Marrouche believes the study findings will encourage a shift in the way physicians treat patients with [atrial fibrillation](#), specifically by integrating MRI into their A-fib management protocols.

"MRI scanning of [heart tissue](#) is more and more becoming a screening test to predict people at risk for arrhythmias and its associated complications like stroke and [heart failure](#)," he says. He also believes atrial disease-causing arrhythmias should be screened for just like cancers and other common diseases.

Provided by University of Utah Health Sciences

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