

# Improved technology may obviate need for drug when assessing patients for a coronary stent

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A new method for measuring narrowing in the arteries of the heart may allow patients to be assessed for a stent without having to take a drug with unpleasant side effects.

In England, it is estimated that one in seven men and one in 12 women over the age of 65 experience chest pain called [angina](#) caused by narrowing of the arteries in the heart. Around 60,000 such [patients](#) a year are fitted with a [coronary stent](#) – a wire mesh tube that acts as a scaffold to keep open arteries that risk becoming blocked, leading to a heart attack. However, stents sometimes lead to problems later on as they can promote the growth of scar tissue, leading to re-narrowing of the artery. It is therefore important to determine when a stent is needed and when it might not be worth the risk.

The most accurate method currently used to measure narrowing in arteries requires the patient to take a drug such as adenosine that dilates the blood vessels. Now, a refined, investigational drug-free technique may be just as reliable, according to the results of a feasibility study published today in the *Journal of the American College of Cardiology*.

Doctors traditionally assess narrowing of the coronary arteries using an X-ray image called a coronary angiogram, but it may not always be clear from the angiogram whether a stent is absolutely necessary.

A technique called fractional flow reserve (FFR), which involves inserting a wire into the artery to measure changes in blood pressure, is sometimes used in addition to an angiogram to give a more clinically accurate measurement to help clinicians make the decision to insert a stent. However, FFR requires the patient to be given a drug such as adenosine to dilate blood vessels, which can cause unpleasant side effects including facial flushing and shortness of breath. Although there is good evidence that FFR is useful, it is done in only 5-10 per cent of cardiac stenting procedures because it is costly, time-consuming and some patients cannot receive adenosine, such as patients with certain heart conduction diseases.

Now, researchers at Imperial College London, in collaboration with US-based medical technology company Volcano Corporation (NASDAQ: VOLC), have developed a way to measure narrowings in the arteries instantaneously, using the same instruments as FFR but without the need for a drug. The new investigational method, termed the instant wave-Free Ratio™ (iFR™), could benefit patients by making it easier for doctors to determine whether a stent is the best option.

"FFR is a valuable tool that helps doctors make treatment decisions, but certain barriers mean it isn't used as often as it might be," said lead researcher Dr Justin Davies, from the National Heart and Lung Institute at Imperial College London. "One of those barriers is the need to inject adenosine, which simulates how the heart behaves when the patient is exercising. Having to use adenosine increases the time, cost and complexity of the procedure, not to mention causing some discomfort for the patient. Our new approach could enable doctors to perform an accurate measurement without the use of drugs. We think this will have a big impact on clinical practice."

Like FFR, iFR works by inserting a wire into the coronary artery to measure blood pressure on either side of the narrowing. Dr Davies and

his colleagues demonstrated that it was possible to obtain a measurement during a particular time in the heart's cycle, which did not depend on using drugs to dilate the blood vessels.

In the study, the researchers used the new iFR method to measure 157 artery narrowings in 131 patients. They found that iFR produced very similar results to FFR, and that the measurements using iFR were highly reproducible.

**More information:** S. Sen et al. 'Identification of a Diastolic Wave-Free Period to Derive and Validate a Vasodilator Independent Measure of Fractional Flow Reserve: Results of the Adenosine Vasodilator Independent Stenosis Evaluation Study (ADVISE)' Journal of the American College of Cardiology, published online 7 December 2011.

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