

# Fixing broken hearts

You had hoped it was heartburn but when the pain spreads to your arm you call an ambulance. 'You have coronary heart disease,' says the doctor. The words fill you with fear and questions. You know this is bad news but wonder what happens next. Will you have a heart attack? Would surgery or medication help? Technology can help your doctor decide what option is best for you.

Coronary heart disease (CHD) kills around 681,000 Europeans per year and is a major cause of disability<sup>1</sup>. This eats up €60 billion in healthcare costs, causes productivity losses and a need for informal care at home by family members<sup>1</sup>. Heart disease discriminates: there are major differences in death rates from CHD across Europe<sup>1,2</sup>. Lower socioeconomic status is linked to a higher risk of developing CHD and to worse outcomes<sup>3</sup>.

The build-up of fats such as cholesterol in the arteries of the heart causes them to narrow, leads to CHD. This restricts the flow of blood, sometimes depriving the heart of oxygen. Fortunately, this need not be a death sentence if the artery can be reopened using angioplasty and stenting.

For many patients, this is life-saving treatment. For others, medication and/or lifestyle changes could be considered. Doctors need to know which patients would benefit most from angioplasty and stenting.

To answer this question, European Society of Cardiology guidelines recommend using fractional flow reserve (FFR), a new diagnostic technique which can be easily performed during a routine heart scan<sup>4</sup>.

The test is conducted during angiography when the inside of blood vessels is viewed by imaging. FFR is performed using a small sensor on the tip of a wire placed inside the blood vessel. It shows the severity of the narrowing of the arteries and helps to identify patients who could benefit most from stenting<sup>5</sup>.

For patients, this test helps doctors to save lives by selecting the optimal treatment for each patient, reducing their risk of heart attack. For society, FFR keeps people healthy longer and makes health systems more efficient by getting stents to those who need them most. FFR has been shown to reduce healthcare costs in Germany, France, Italy and the UK<sup>8,9</sup>.

### Medtech: value for people

- Can save lives using innovative, non-invasive technologies
- Identifies people who would benefit from surgery<sup>6</sup>
- Offers a more personalised approach to heart health

### Medtech: value for governments

- Facilitates decision-making on which patients are most likely to benefit from angioplasty and stenting, thereby potentially reducing unnecessary costs<sup>6,7</sup>
- Improved outcomes for patients<sup>6,7</sup>
- Contributes to efficient use of resources<sup>7</sup>
- Delivers value through innovation and supports high-quality jobs in Europe

### Medtech: value for regulators

- Ensures the right patients receive the right interventions<sup>7</sup>
- Recommended by the European Society of Cardiology<sup>6,7</sup>

### Medtech: value for payers

- Well-studied technologies supporting the efficient use of resources<sup>7</sup>
- FFR has been shown to save costs in Germany, France, Italy and the UK with savings per patient ranging from €300 in Germany to €900 in France<sup>8,9</sup>
- Cost-utility study showed FFR was cost-saving in 90.74% of cases<sup>8</sup>



#### NOTES

- 1) Nichols M, Townsend N, Luengo-Fernandez R, et al (2012). European Cardiovascular Disease Statistics 2012. European Heart Network, Brussels, European Society of Cardiology, Sophia Antipolis. Available at: <http://www.bhf.org.uk/publications/view-publication.aspx?ps=1002098>. Accessed 13 March 2015.
- 2) Cowburn G, Bhatnagar P, Logstrup S. Cardiovascular disease prevention in Europe - the unfinished agenda. EuroHeart work package 5: National plans, policies and measures impacting on cardiovascular health promotion and cardiovascular disease prevention. European Heart Network, European Society of Cardiology 2009. Available at: <http://www.ehnheart.org/projects/euroheart/publications-wp-5-wp-6/publication/119.html>. Accessed 13 March 2015.
- 3) Bajekal M, Scholes S, O'Flaherty M, et al. Unequal trends in coronary heart disease mortality by socioeconomic circumstances, England 1982-2006: an analytical study. PLoS One. 2013;8:e59608.
- 4) Wijns W, Kolh P, Danchin N, et al; Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS); European Association for Percutaneous Cardiovascular Interventions (EAPCI). Guidelines on myocardial revascularization. Eur Heart J. 2010;31:2501-2555.
- 5) Silber S, Albertsson P, Avilés FF, et al; Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology. Guidelines for percutaneous coronary interventions. The Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology. Eur Heart J. 2005;26:804-847.
- 6) Sieber S, Bornschein B, Schnell-Inderst P, et al. Measurement of fractional flow reserve to guide decisions for percutaneous coronary intervention. GMS Health Technol Assess. 2008;4:Doc07.
- 7) Siebert U, Bornschein B, Arvandi M, et al. Cost-effectiveness and public health/budget-impact of FFR-guided PCI in multivessel patients in 6 European countries - analysis along the FAME trial data. Society for Medical Decision Making. 2011. Abstract TR2-1. Available at: <https://smdm.confex.com/smdm/2011ch/webprogram/Paper6663.html>. Accessed 13 March 2015.
- 8) Fearon WF, Bornschein B, Tonino PA, et al. Economic evaluation of fractional flow reserve-guided percutaneous coronary intervention in patients with multi-vessel disease. Circulation. 2010;122:2545-2550.