

Putting NICE guidance into practice

**Resource impact report:
HeartFlow FFR_{ct} for estimating fractional
flow reserve from coronary CT angiography
(MTG32)**

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Summary

The case for adopting HeartFlow FFR_{CT} for estimating fractional flow reserve from coronary CT angiography (CCTA) is supported. HeartFlow FFR_{CT} is coronary physiologic simulation software used to analyse cardiac CT images. It is intended for use in patients with stable, recent onset chest pain and suspected angina. Please see the [guidance](#) for details.

It is estimated that around 89,300 people with stable, recent onset chest pain who are offered coronary CT angiography as part of the NICE chest pain pathway will be eligible for HeartFlow FFR_{CT}. Uptake will be steady from year 5, with around 35,600 people having HeartFlow FFR_{CT} each year.

Table 1 shows the estimated minimum annual cost saving of implementing this guidance for the population of England.

Table 1 Estimated annual cost saving after implementing the guidance for the population of England, using NICE assumptions

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
People having HeartFlow FFR _{CT}	0	7,100	14,200	21,400	28,500	35,600
Cost savings with HeartFlow FFR_{CT} (£000s)	0	-1,826	-3,651	-5,477	-7,303	-9,128

This report is supported by a resource impact template which may be used to calculate the resource impact of implementing the guidance by amending the variables.

This technology is commissioned by clinical commissioning groups. Providers are NHS hospital trusts.

1 Introduction

1.1 This report looks at the resource impact of implementing the NICE guidance on [HeartFlow FFR_{CT} for estimating fractional flow reserve from coronary CT angiography](#) in England.

1.2 The guidance states that:

- The case for adopting HeartFlow FFR_{CT} for estimating fractional flow reserve from coronary CT angiography (CCTA) is supported by the evidence. The technology is non-invasive, safe and has a high level of diagnostic accuracy.
- HeartFlow FFR_{CT} should be considered as an option for patients with stable, recent onset chest pain who are offered coronary CT angiography as part of the NICE chest pain pathway. Using HeartFlow FFR_{CT} may avoid the need for invasive coronary angiography and revascularisation. For correct use, HeartFlow FFR_{CT} requires access to 64-slice (or above) CCTA facilities.
- Based on the current evidence and assuming there is access to appropriate CCTA facilities, using HeartFlow FFR_{CT} may lead to cost savings of £214 per patient. By adopting this technology, the NHS in England may save a minimum of £9.1 million by 2022 through avoiding invasive investigation and treatment.

1.3 This report is supported by a resource impact template. The template aims to help organisations in England, Wales and Northern Ireland plan for the financial implications of implementing the NICE guidance by amending the variables.

1.4 This technology is commissioned by clinical commissioning groups. Providers are NHS hospital trusts.

2 Background and epidemiology of coronary artery disease

- 2.1 Mortality from coronary artery disease is the biggest single cause of death in the UK. In 2014, 15% of male deaths and 10% of female deaths were from coronary artery disease (around 69,000 total deaths). Figures for 2011 showed that 5.7% of all men (aged 16 and over) and 3.5% of all women in England had coronary artery disease ([British Heart Foundation, 2015](#)).
- 2.2 An audit by the British Cardiovascular Intervention Society found that around 247,000 diagnostic angiography procedures and 96,000 percutaneous coronary intervention procedures were done in 2014 ([British Cardiovascular Intervention Society audit returns, 2014](#)).
- 2.3 HeartFlow FFR_{CT} is intended for use in patients with stable, recent onset chest pain of suspected cardiac origin. Using HeartFlow FFR_{CT} requires access to 64-slice (or above) coronary CT angiography facilities, but may avoid the need for other non-invasive tests, invasive coronary angiography and revascularisation.
- 2.4 NICE clinical guideline 95 was updated during the development of this guidance. The clinical and cost evidence used to develop recommendations on HeartFlow FFR_{CT} related to patients who would have been assessed, using previously recommended clinical scoring systems, as having a pre-test probability of intermediate risk (10-90%) of coronary artery disease.

Table 2 Number of people eligible for HeartFlow FFR_{CT} in England

Population	Percentage of line above (%)	Number of people
Total population		54,316,618
People attending rapid access chest pain clinics (RACPC) ^a	0.222	120,000
People with stable, recent onset chest pain ^b	82	99,200
People able to have coronary CT angiography ^c	90	89,300
People eligible for HeartFlow FFR _{CT}	100	89,300
People with a positive coronary CT angiography result and having HeartFlow FFR _{CT} each year from year 5 ^d	40	35,600
a. Department of Health RACPC attendance data, England 2011 b. Derived from data in Timmis et al 2016 c. Manufacturer estimate d. EAC modelling estimate		

2.5 We estimate that approximately 89,300 people are eligible for HeartFlow FFR_{CT} each year.

2.6 From year 5 after implementation, we estimate that around 35,600 people will have HeartFlow FFR_{CT} each year (based on 100% uptake).

3 Assumptions made

3.1 The resource impact template makes the following assumptions:

- 90% of people presenting at chest pain clinics with stable, recent onset chest pain will receive coronary CT angiography (CCTA);
- Of these CCTAs, 40% are positive.
- By year 5, all people with positive CCTAs have HeartFlow FFR_{CT}.
- Currently, no people with positive CCTAs have HeartFlow FFR_{CT}.

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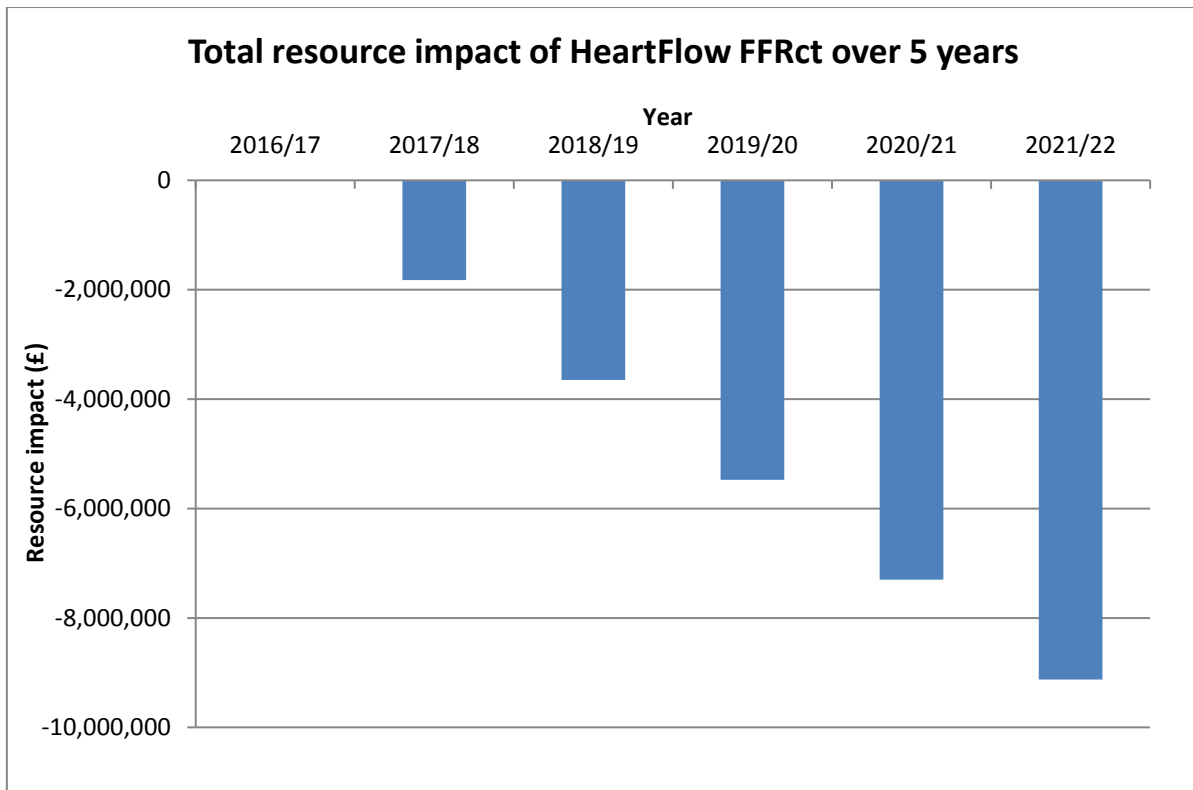
- The cost of percutaneous coronary intervention is weighted based on 75% of people having 0 to 2 stents, and 25% of people having 3 or more stents, rotablation, IVUS or pressure wire.
- All people having percutaneous coronary intervention will also have aspirin and clopidogrel.
- The comparative treatment of optimal medical therapy consists of aspirin, statins, nitrates and beta blockers.
- Uptake will increase evenly over 5 years from implementation.

4 Resource impact

4.1 The annual saving associated with implementing the guidance for the population of England is £9.1 million, as shown in table 3. The saving from year 5 is equivalent to £16,800 per 100,000 population.

Table 3 Resource impact of implementing the guidance for the population of England using NICE assumptions

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
People having HeartFlow FFR _{CT} each year	0	7,100	14,200	21,400	28,500	35,600
Cost savings each year with HeartFlow FFR _{CT} (£000s)	0	-1,826	-3,651	-5,477	-7,303	-9,128



5 Savings and benefits

5.1 Using HeartFlow FFR_{CT} as specified in the guidance is cost saving to the NHS. The level of savings depends on the availability of 64-slice (or above) coronary CT angiography facilities, which HeartFlow FFR_{CT} needs.

5.2 Using HeartFlow FFR_{CT} may avoid the need for invasive coronary angiography and percutaneous coronary interventions. Fewer of these procedures will result in savings to commissioners and providers.

6 Other considerations

6.1 The availability of 64 slice (or above) coronary CT angiography (CCTA) services will impact on the ability of provider organisations to implement the guidance. Where CCTA services are limited or not available, it will not be possible to use HeartFlow FFR_{CT} to determine appropriate further treatment.

- 6.2 The saving of £9.1 million has been estimated using national tariff figures where possible, to show the effect for commissioners once the guidance is implemented. The per-patient cost saving in the guidance was calculated based on provider costs used in the economic model to support the guidance.

7 Sensitivity analysis

- 7.1 A number of key assumptions have been varied to explore which has the greatest effect on the overall resource impact for this guidance. The full sensitivity analysis can be found in the 'sensitivity analysis' section of the resource impact template.
- 7.2 The model used in the template is sensitive to changes to all four variables that were tested in the sensitivity analysis: attendance at chest pain clinic; population with stable recent onset chest pain; the number of people having coronary CT angiography; and the number of people having HeartFlow FFR_{CT}.

8 Implications for commissioners

- 8.1 There is currently no national tariff for HeartFlow FFR_{CT}. Uncertainties around funding flows for provider organisations may be a barrier to implementation of the technology.
- 8.2 Commissioners are encouraged to work with provider organisations to develop a local tariff to establish the use of HeartFlow FFR_{CT} in interventional cardiology service provision.
- 8.3 HeartFlow FFR_{CT} falls within the programme budgeting category 10A – coronary heart disease.