EAC costing update report for medical technologies guidance

Work package number	MTG32
Work package name	HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography
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Appendix 1. Costing update report template

Document history

Version no.	Date	Author	Purpose
1	30.10.2020	M Kartha	For review by MTEP technical lead
2	06.11.2020	M Kartha	For review by MTEP technical lead
3	12.11.2020	M Kartha	Final Report
4	27.11.2020	M Kartha	Updated with 20-21Tariff

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EAC review team: Please provide names of the EAC authors and reviewers of the report.

Analyst: Murali Kartha

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Senior signoff: Anastasia Chalkidou

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- Plain text, not in square brackets, is to be included in the review report.
- Plain text in square brackets is an instruction.
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- The final report shall be accurate and be provided in a format suitable for publication. A redacted version of the report will also be provided

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Costing update report of MTG32: Heartflow FFRCT for estimating fractional flow reserve from coronary CT angiography

This medical technology guidance was published in February 2017.

All medical technology guidance is reviewed 3 years after publication according to the process described in the MTEP Interim addendum on guidance reviews.

This report is part of the information considered in the guidance review. It describes an update of the cost model so that it reflects any new relevant information including revising the cost and resource parameters to current values. The results from the updated cost model are used to estimate the current savings associated with the use of the technology.

Produced by: King's Technology Evaluation Centre (KiTEC)

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No advice has been sought from any experts

1. Background

The sponsor submitted a decision tree model based on NICE CG95. It was proposed that Heartflow's non-invasive FFRCT technology will be used in conjunction with CCTA, in place of CCTA alone in the pathway for a likelihood of disease of 10% to 29%; appropriate functional imaging tests in the pathway for a likelihood of disease 30% to 60%; and ICA in the pathway for a likelihood of disease 61% to 90%.

The NICE guideline on chest pain (NICE clinical guideline CG95) was reviewed during the assessment process and new evidence was identified relating to the use of non-invasive tests for the diagnosis of coronary artery disease (CAD) in people with stable chest pain of suspected cardiac origin. The review also identified new evidence on clinical prediction models which impacted on the assessment of the pre-test likelihood of CAD in this population. Based on the evidence and economic analysis, changes were made to the clinical guideline. The most important recommendation was offering 64-slice (or above) coronary CT angiograph (CCTA) to patients with features of typical or atypical angina based on clinical assessment, irrespective of pre-test likelihood scoring (10-90%). The use of non-invasive functional imaging for myocardial ischaemia was recommended if 64-slice (or above) CCTA indicates CAD of uncertain functional significance or is non-diagnostic. The updated guideline also recommended offering invasive coronary angiography (ICA) as a second-line investigation when the results of non-invasive functional imaging are inconclusive.

Updated HeartFlow model

Based on the new recommendations in the revised chest pain guideline, the Heartflow cost model submitted by the sponsor was subsequently revised by the EAC. The key changes to the model were as follows.

1. Different pathways (from CG95) for the three likelihood groups were replaced with a single pathway (Figure 1). All the patients with pre-test likelihood of 10-90% were now offered 64-slice (or above) CCTA as the first line of investigation. Functional imaging is offered following uncertain CCTA results and ICA is offered if the results of functional imaging are also uncertain.

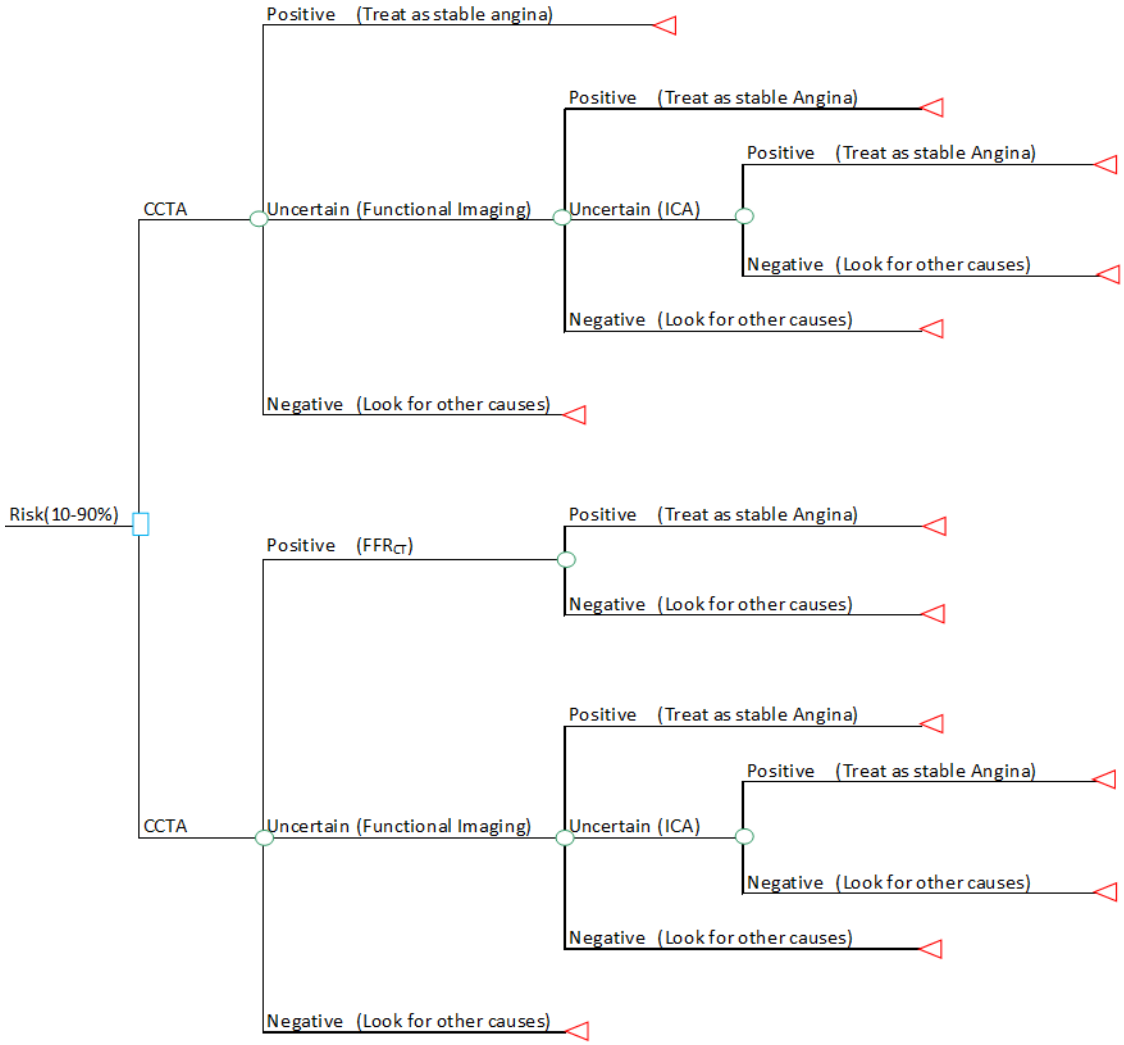

Figure 1: Updated chest pain model structure

2. Two strategies were compared in the updated model 1) using CCTA to inform treatment of stable angina and 2) using FFRCT (Heartflow) after a positive CCTA result to inform treatment. The terminal nodes in the model indicate treatment for stable angina with either percutaneous coronary intervention (PCI) or optimal medical therapy. The time horizon for the model was 1 year to capture the impact of diagnosis on initial treatment.

3. The diagnostic accuracy for CCTA, ICA and functional imaging were estimates from the EAC meta-analysis of per-patient based diagnostic accuracy

4. For the economic model in the revised guideline, test costs were taken from the NHS reference costs

Three separate model results using different functional imaging techniques (SPECT, MRI and ECHO) were estimated by the EAC. The results showed that the adapted pathway using FFRCT had a cost saving of £214, irrespective of the functional imaging test used. The main drivers of the cost were the diagnostic accuracy of CCTA, ICA and FFRCT and the price of the technology.

The objective of this report is to check the current validity of the model and update input parameters if new estimates are available.

2. Current validity of model

The updated CG95 pathway is still valid and so is the updated model. There are no changes to the original assumptions in the model. Some of the parameters, especially the test costs taken from the NHS reference costs have changed and needs updating in the model.

3. Updated input parameters

A significant input parameter update is the company's price of Heartflow technology. [redacted] With the current price being applicable from next year onward, the original price has been retained for this update and the new price included in a scenario analysis. Other cost parameters have been updated in line with the most recent NHS tariffs and BNF prices. If the original HRG codes have been changed or not available, then the most appropriate/available codes have been used. The updated cost estimates are presented in Table 1.

Test	Code, description	Original cost estimate	Updated cost estimate	Source	EAC comment
Calcium Scoring	RA08Z (£77) - Computerised Tomography Scan, one area, no contrast	£77	£70	NHS Tariffs, 2020 -21	Code changed to RD20A
ICA	EY43A to EY43F, Standard cardiac catheterisation	£1685	£2,369	NHS Tariffs, 2020 -21	Average
CTCA	RD28Z, Complex computerised tomography scan	£122	£290	NHS Tariffs, 2020 -21	

SPECT	RN21Z, Myocardial perfusion scan, stress only	£367	£282	NHS Tariffs, 2020 -21	
ECHO	EY50Z, Complex echocardiogram	£271	£199	NHS Tariffs, 2020 -21	
CMR	RA67Z, Cardiac magnetic resonance imaging scan, pre and post contrast	£515	£574	NHS Tariffs, 2020 -21	Code changed to RD10Z
PCI	EA31Z, Percutaneous Coronary Intervention (0-2 Stents) and EA49Z Percutaneous Coronary Interventions with 3 or more Stents, Rotablation, IVUS or Pressure Wire Weighted average	£2832	£3526	NHS Tariffs, 2020 -21	Average, Codes EY41A-D, Standard Percutaneous Transluminal Coronary Angioplasty
PCI drugs	Aspirin and clopidogrel (annual cost)	£33	£36.48	BNF 2020	
OMT	Aspirin, simvastatin, glyceryl trinitrate and propranolol hydrochloride (annual cost)	£84	£75.36	BNF 2020	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table 1: Updated cost estimates.

4. Results from updated model

Results of three models using different functional imaging (SPECT, MRI and ECHO) are presented in Table 2. Results of a scenario analysis including the updated HeartFlow price from April 2021 are presented in Table 3. Irrespective of the functional imaging used, the cost saving is £391 per

patient. When Heartflow's price drops down in April 2021, the resultant cost saving will be [redacted]

	Average total cost per patient (patient based)		
	(Functional Imaging: SPECT) Model	**(Functional Imaging: MRI) Model**	**(Functional Imaging: ECHO) Model**
NICE Updated Guideline	£1,859	£1,841	£1,780
Adapted NICE Guideline using FFR_{CT}	£1,469	£1,450	£1,389
Difference (cost saving)	£391	£391	£391

Table 2: Updated base case results (patient based)

	[redacted]		
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Table 3: Scenario analysis results (patient based)

5. Conclusion

The original guidance is based on evidence that details the impact of HeartFlow on diagnostic accuracy and resource utilisation and the assumption that there is access to appropriate CCTA facilities. This original guidance suggests that using HeartFlow FFRCT leads to a cost savings of £214 per patient. With the updated cost parameters, the cost saving per patient has increased by £177 to £391 per patient. Since there are no changes to the CG95 guidance or pathway, the original guidance remains the same. [redacted]

6. References

NHS Improvement. 2020. National tariff payment system 2020-2021, Available at https://improvement.nhs.uk/resources/national-tariff/#h2-202021-national-tariff-payment-system , Accessed 25 Nov 2020

NICE.2020. British National Formulary, Available at https://bnf.nice.org.uk/ , Accessed 11 Nov 2020

Appendix 2. Background documents for this review

Hyperlinks for the background documents for this review report:

1. Medical technologies guidance document
2. Assessment report

   Additional work at consultation
3. Scope of assessment
4. A copy of the company information request regarding the technology
5. A list of expert advisers and their completed questionnaires on the MTG review
6. Executable cost model which aligns with the base case described in the MTG documents
7. If there is new evidence which is relevant to any of the clinical parameters in the model, the analyst should send the updated values.
8. Any relevant other documents which are not available on the NICE website.