

BSCI recommended new codes and tariffs for Cardiac CT

Introduction

At present there are no specific nationally agreed tariffs for Cardiac CT examinations. In addition the National Interim Clinical Imaging Procedure (NICIP) code set has not accurately reflected the expanding scope and complexity of cardiac CT examinations. In the absence of this data proposed tariffs have varied widely across the UK with little available supporting evidence. This has proved a problem both to those developing and commissioning services.

This document makes recommendations for national tariffs for Cardiac CT and links these recommendations to the up-dated NICIP code set. The recommendations have been developed by the British Society of Cardiovascular Imaging (BSCI) in collaboration with the Imaging Council of the British Cardiovascular Society (BCS), the Royal College of Radiologists (RCR). These recommendations may be subject to change reflecting evolving codes and costs.

Recommended Tariffs and code summary

<i>Short Code</i>	<i>Descriptor</i>	<i>Relative value</i>	<i>Cost</i>
CCAGA	CT cardiac gated no contrast	1.2	£149
CCAGAC	CT cardiac gated with contrast	2.15	£320
CCAGFC	CT cardiac gated function with contrast	2.15	£320
CCGCCC	CT cardiac gated complex / congenital with contrast	3.13	£467

All tariffs would be uplifted by a market forces factor (MFF) ranging from 1.0 to 1.42.

Current Position

Most imaging departments in the UK currently use tariffs tracked to a limited number of HRG codes set out in Table 1. For cardiac examination this will often be either taken as a 2 part or 3 part examination with contrast (RA12Z, RA13Z) resulting in a tariff of £135 - £145 with a reporting fee. Some units have negotiated a tariff locally with their commissioners with a much broader range of fees.

Table 1.

Final HRG	HRG Label - Including Split	Emerging tariff (£)	Cost of reporting only (£) Proposed 2009/10
RA08Z	Computerised Tomography Scan, one area, no contrast	100	24
RA09Z	Computerised Tomography Scan, one area with post contrast only	125	
RA10Z	Computerised Tomography Scan, one area, pre and post contrast	145	
RA11Z	Computerised Tomography Scan, two areas without contrast	110	
RA12Z	Computerised Tomography Scan, two areas with contrast	135	32
RA13Z	Computerised Tomography Scan, three areas with contrast	145	
RA14Z	Computerised Tomography Scan, more than three areas	150	

Tariff modelling process

The complexity of cardiac CT is not reflected in the current tariffs and we suggest a more realistic and granular coding & tariff structure. The costs have been derived from 2 separate methods:

- a. Ground up cost analysis, including every item (consumables, scanner time, analysis time, staff time, capital repayment, PACS costs etc)
- b. Benchmarking costs for performing a Cardiac CT against an established CT examination (such as a thoracic CT with contrast, HRG RA09Z)

We recommend the use of 4 categories of scan depending on complexity of performance and interpretation, these are reflected in the latest release of the NICIP:

1. CT cardiac gated (without contrast), e.g. calcium scoring
2. CT cardiac gated with contrast, e.g. CT coronary angiogram (including Calcium scoring if performed)
3. CT cardiac gated function with contrast, e.g. retrospectively gated CT for functional or valve assessment.
4. CT cardiac gated complex / congenital with contrast.

The benchmarking process has been performed for each of these categories (see appendix 2 for details)

Ground up cost analysis

This analysis has been undertaken by the University Hospitals Bristol NHS Foundation Trust and the details are included in Appendix 1. The analysis covers all of the costs from capital equipment purchase and maintenance through to workforce and consumables. The tariff has been calculated on the basis of number of scans performed per session as an indicator of complexity.

Equipment

The technical requirements for performing cardiac CT are more demanding than standard CT. The minimum equipment requirements have been recommended by the BSCI and are included in the Cardiac Imaging Report of the National Imaging Board March 2010 (Link to 'Downloads- Guidelines' on BSCI website: http://bsci.org.uk/downloads/doc_view/74-cardiac-imaging-report-march-2010?tmpl=component&format=raw). A minimum of 64 slices is required to achieve robust diagnostic accuracy. The need to keep radiation doses to a minimum mandates the use of prospective ECG gating techniques where possible and places further demands upon the specification of the CT scanners used. In order to deliver optimal scan parameters for patients having cardiac CT equipment replacement plans over 5-7 years will be required rather than the 7-10 years which is considered standard.

Staffing

The staffing needs for cardiac CT are also greater than general CT due to the increased complexity of the scan acquisition and the added reporting time. Many patients will require preparation for the scan with oral/IV β blockade \pm GTN necessitating cardiovascular monitoring. Greater medical and nursing input is therefore included in the cost analysis.

Reporting times for cardiac studies are also significantly increased particularly for the more complex examinations when extensive post-processing may be needed. Dual reporting between radiologist and cardiologist is also encouraged.

Ground up derived tariffs

Max £335
Min £215

Benchmarking

Details of the benchmarking process are in Appendix 2. Cardiac gated CT without contrast (equivalent to a calcium score protocol) has been benchmarked against a CT Chest without contrast. More complex cardiac CTs have been benchmarked against a CT Chest with contrast. The standard tariffs have been uplifted for the additional costs related to; the scanner, additional equipment, throughput, non-consultant staff costs, consultant staff costs, and reporting time.

The cost difference between a cardiac gated CT with contrast (CCAGAC) and a cardiac gated CT function with contrast (CCAGFC) was minimal and these tariffs have therefore been averaged as a single tariff.

Benchmark derived tariffs

CT cardiac gated no contrast:	£149
CT cardiac gated with contrast ± function:	£320
CT cardiac gated complex / congenital:	£467

Conclusion

The development of a dedicated tariff and code set for cardiac CT will help to standardise the delivery of services and enable more accurate and realistic commissioning of cardiac imaging. The BSCI encourages the adoption of these codes and their related tariffs.

Appendix 1:

Ground up cost analysis

University Hospitals Bristol NHS Foundation Trust: Costs associated with Cardiac CT service

	Whole Time Equivalent (WTE)	Cost (£) – Full Time	Cost (£) – 2 sessions / wk (8 scans / session)	Cost (£) – 2 sessions / wk (16 scans / session)
Consultant	1.50	195,000	32,500	32,500
Physicist	0.50	26,269	5,254	5,254
Radiographer	2.00	91,934	18,387	18,387
Radiographer Helper	1.00	22,323	4,465	4,465
Administrative & Clerical	1.00	22,323	4,465	4,465
Cover for absences		82,305	14,966	14,966
Maintenance of scanner		90,000	18,000	18,000
Capital Charges (Scanner)		269,239	53,848	53,848
Accommodation Cost incl. capital charges on land & building		37,864	7,573	7,573
Consumables		125,143	25,029	25,029
Other Non-Pay (PACS, IT etc.)		80,000	16,000	16,000
Training (Junior Doctors)		19,500	3,900	3,900
Sub Total		1,061,900	204,385	204,385
Overheads (Trust)		37,036	7,087	7,087
Overheads (Radiology)		27,777	5,316	5,316
Total Costs		1,126,713	216,788	216,788
Scans / year (42 week year)		3,360	672	1,008
Indicative Tariff		335	322.60	215

Assumptions

- Full time model = 1.5 WTE Consultant time
- 2 session/week model = 2.5 PA Consultant time
- Cover for absences = 23%
- Maintenance of scanner = 10% of capital cost
- Capital charges on scanner assumes 5 year economic life
- Accommodation costs are at 09/10 prices and based on 200m² - need to confirm actual floor area
- Consumables - assumed £30 per patient

Notes to accompany Cardiac CT/MR costings

- **"Consultants"** – cost is assumed at mid-point of scale, for 10 Programmed Activities and is gross of on-costs (National Insurance, Pension contributions etc) less Clinical Excellence Award (funded via separate route);
- **"Junior Doctors (Training)"** – cost is taken at mid-point of scale and is weighted according to assumed contribution to service. The cost of Junior Doctor training, unless specified, is treated as an overhead on all specialties. Cost is gross of on-costs (National Insurance, Pension contributions etc);
- **"Non-Medical staff (Physicist, Radiographers etc)"** - cost is assumed at mid-point of scale, with cost of living (where applicable) and is gross of on-costs (National Insurance, Pension contributions etc);
- **"Cover for absences"** – assumed at 23% of pay cost. Includes annual leave, study leave, and weighted averages for sickness, maternity leave etc;
- **"Maintenance"** – cost represents expenditure incurred in maintaining assets;
- **"Capital Charges"** - taken to be depreciation charged to the income & expenditure account and the cost of capital absorbed (i.e. paid over as Public Dividend Capital dividend). Assets will be depreciated over their useful economic life (determined by capital accounting manual);
- **"Accommodation Costs"** – Weighted costs (basis for allocation differs according to cost) in respect of cleaning, portering, sewage, rates, electricity, water, linen, waste, gas, maintenance to building and plant, patient catering etc.;

- **“Consumables”** – includes cost of consumables such as contrast media, syringes, gloves etc.;
- **“Other Non-Pay”** – cost includes weighted average costs in respect of postage, stationery, telephones, Information Technology (including PACS), ad-hoc MEMO etc.;
- **“Overheads (Trust)”** – 4% of total cost and contributes towards Finance, HR, Payroll, CNST etc.;
- **“Overheads”** – 3% of total cost and contributes towards Radiology management and infrastructure not covered in the above

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June 2011

Appendix 2

Benchmarking

Table 1:

CT Chest without contrast (RA08Z) compared to CT cardiac gated no contrast (e.g. CT calcium score)

	Chest CT (RA08Z £124)	Cardiac CT no contrast (calcium score)	cost increase
Scanner	State-of-the-art scanner, lifetime 7-10 years	State-of-the-art scanner, lifetime 5 years Advanced hardware and software for cardiac imaging e.g. ECG gating, post-processing	£25
Additional equipment	standard		
Throughput	24 patient (8 hours, 20minutes per scan)	24 patients	0
Non-consultant Staffing	Radiographer + 1 junior (AFC 6 + HCA)	Radiographer (AFC 7) + 2 nd radiographer/HCA	0
Consultant staffing	Not present	Not present	0
reporting	Minimal post processing, rapid	Equivalent to standard CT	0
Summary			£149

Table 2:

CT Chest with contrast (RA09Z) compared to CT cardiac gated with contrast (e.g. CT coronary angiography)

	Chest CT (RA09Z £149)	Cardiac CT (average scan)	cost increase
Scanner	State-of-the-art scanner, lifetime 7-10 years	State-of-the-art scanner, lifetime 5 years Advanced hardware and software for cardiac imaging e.g. ECG gating	£25
Additional equipment	standard	Cardiac CT post-processing package Dual headed contrast injector Drugs (Oral/iv β blocker, GTN, increased contrast)	£20
Throughput	24 patient (8 hours, 20minutes per scan)	16 patients (8 per 4 hour session, average case mix)	£72
Non-consultant Staffing	Radiographer + 1 junior (AFC 6 + HCA)	Radiographer (agenda for change 7) plus 2 nd radiographer/HCA plus 1 doctor in training	£22
Consultant staffing	Not present	Present in the control room in ~25% of scans	£10
reporting	Minimal post processing, rapid	Extensive post processing, complex analysis, can be time consuming Add 0.5 PA per list (£20 per patient)	£20
Summary			£318

Table 3:

CT Chest with contrast (RA09Z) compared to CT cardiac gated function with contrast

	Chest CT (RA09Z £149)	Cardiac CT (average scan)	cost increase
Scanner	State-of-the-art scanner, lifetime 7-10 years	State-of-the-art scanner, lifetime 5 years Advanced hardware and software for cardiac imaging e.g. ECG gating	£25
Additional equipment	standard	Cardiac CT post-processing package Dual headed contrast injector Drugs (Oral/iv β blocker, GTN, increased contrast)	£20
Throughput	24 patient (8 hours, 20minutes per scan)	16 patients (8 per 4 hour session, average case mix)	£72
Non-consultant Staffing	Radiographer + 1 junior (AFC 6 + HCA)	Radiographer (agenda for change 7) plus 1 doctor in training	£22
Consultant staffing	Not present	Present in the control room in ~25% of scans	£10
reporting	Minimal post processing, rapid	Extensive post processing, complex analysis, can be time consuming Add 0.75 PA per list (£28 per patient)	£28
Summary			£326

Table 4:

CT Chest with contrast (RA09Z) compared to CT cardiac gated complex congenital heart disease

	Chest CT (RA09Z £149)	Cardiac CT (average scan)	%cost increase
Scanner	State-of-the-art scanner, lifetime 7-10 years	State-of-the-art scanner, lifetime 5 years Advanced hardware and software for cardiac imaging e.g. ECG gating	£25
Additional equipment	standard	Cardiac CT post-processing package Dual headed contrast injector Drugs (Oral/iv β blocker, GTN, increased contrast)	£20
Throughput	24 patient (8 hours, 20minutes per scan)	12 patients (6 per 4 hour session, average case mix)	£149
Non-consultant Staffing	Radiographer + 1 junior (AFC 6 + HCA)	Radiographer (agenda for change 7) plus 1 doctor in training	£22
Consultant staffing	Not present	Present in the control room in 100% of scans	£51
reporting	Minimal post processing, rapid	Extensive post processing, complex analysis, can be time consuming Add 1 PA per list (£51 per patient)	£51
Summary			£467