investigation of stable chest pain. CG95 uses a modified Diamond Forrester (DF) to evaluate individuals' risk of coronary artery disease (CAD) and determine the most appropriate test. Patients with DF likelihood scores <10% do not require further investigation; 10%–29% require calcium scores (CS); 30%–60% stress imaging; and >60% invasive angiography (IA). For those patients requiring CS, the guidance recommends that a score of 0 requires no further investigation; 1–399 CT angiogram (CTCA); and >400 IA. This study compared the cost implications of DF and CS as risk stratification tools as part of a larger ongoing randomised control trial, CAPP (Cardiac CT for the Assessment of Chest Pain and Plaque) [ISRCTN52480460], which aims to evaluate the cost-effectiveness of cardiac CT.

Methods Written and informed consent was obtained from 250 patients with stable chest pain. Age, sex, risk factors and character of pain were documented, and the probability of significant CAD was calculated using the DF. Patients had CS followed by CTCA, performed on a Philips Brilliance 64. CS was assessed using a semi-automated analysis package to determine the Agatston score. CTCA was taken as the reference point for CAD severity, with disease classified according to the most significant lesion, ranging from none to severe. The total number and cost for investigations was determined theoretically by two models. Model 1 used the DF and model 2 the CS criteria. The unit costs of the investigations were obtained from the NHS National Tariff 2011/12 and NICE CG95.

Results Of the 250 patients three withdrew. 146 of the 247 were male with a mean age of 57.93. The mean CS was 175.84. The average DF was 48.21%. CS predicted CAD better than DF score (McNemar's χ^2 =14.52, p<0.0001). OR=2.88 (95% CI 1.60 to 5.44). When the cost implementation of CG95 was assessed using the DF criteria, 52 had scores between 0–9 and no further investigation was needed; 49 between 10% and 29% required CS; 53 between 30% and 60%, needed stress imaging; and 93 above 61% required IA. Of the 49 that would receive CS, 28 had a score of 0 requiring no further investigations; 17 had a CS>0–400 necessitating CTCA; 4 had a CS above 400 and required IA. This model had a projected total cost of £124 130. When the cost implementation of CG95 was assessed using the CS, the cost for investigation would be 247 CS; 126 patients had a CS of 0 and no further investigation was necessary; 94 had a CS>0–400 and CTCA is indicated; and 27 had a CS above 400 and would require IA. This model had a projected total cost of £48 282.

Conclusions The use of CS to triage patients with stable chest pain appears to be more cost effective for the prediction of CAD. This model could replace the subjective and difficult assessment of chest pain symptoms with a more objective assessment of CAD presence.

Abstract 097 Table 1

Investigation	CG95 using DF	CG95 using CS
CS	49×£113=£5537	126×£113=£14 238
Follow on CTCA (minus the price of CS)	17×(173–113)=£1020	94×(173–113)=£5640
IA	97×£1052=£102 044	27×£1052=£28 404
Stress imaging (MPI)	53×£293=£15 529	NA
Total	£124 130	£48 282
Per patient (n=247)	£503	£195

098 QUANTITATIVE CARDIOVASCULAR MAGNETIC RESONANCE MYOCARDIAL PERFUSION IMAGING: INTER-STUDY REPRODUCIBILITY

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Background Absolute quantification of myocardial perfusion with Cardiovascular Magnetic Resonance (CMR) is increasingly available and can potentially improve current qualitative and semi-quantitative analysis. The absence of ionising radiation makes CMR ideal for serial examinations for patient management or in clinical trials. Inter-study reproducibility is crucial for serial examinations but is not known for quantitative CMR perfusion.

Methods 16 healthy volunteers underwent high-resolution stress and rest perfusion imaging at 3 Tesla on 3 occasions during a single day. Scan 1 was at 0900, scan 2 immediately after and scan 3 at 1400. Absolute perfusion was determined in each coronary artery territory and globally by Fermi constrained deconvolution of myocardial signal intensity curves. Left ventricular volumes and function were also calculated. Scan 1 and 2 were used to evaluate perfusion inter-study reproducibility under the same conditions while scan 3 was used to assess for diurnal variation. Inter-study reproducibility was determined by calculation of coefficients of variation (CV) defined as the SD of the differences of the measurements from the first two examinations, divided by the mean.

Results 11 full datasets were suitable for quantitative perfusion analysis. Participants were 27±5 years old and five were male. Myocardial perfusion and haemodynamics for all 3 studies, and the significance of associated differences, are shown in Abstract 098 table 1. Inter-study reproducibility was reasonable; rest perfusion was more reproducible than stress and global more reproducible than territorial. CV was 26.8%, 16.0% and 23.9% for global stress and rest perfusion and myocardial perfusion reserve (MPR)

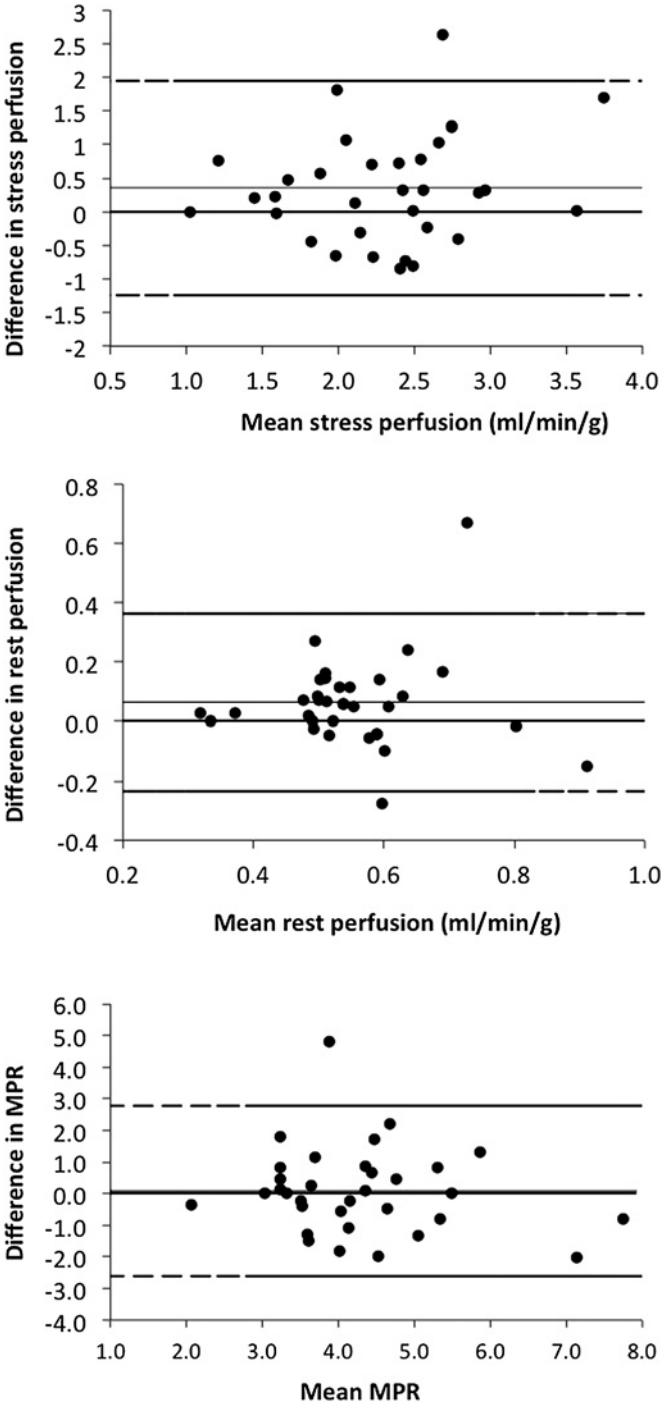
Abstract 098 Table 1

	Scan 1	Scan 2	Scan 3	p Value
Perfusion-segmental (ml/min/g)				
Stress	2.5±0.8	2.1±0.6	2.2±0.8	0.05
Rest	0.6±0.2	0.5±0.1	0.5±0.2	0.05
Perfusion-global (ml/min/g)				
Stress	2.5±0.5	2.1±0.5	2.2±0.7	0.19
Rest	0.6±0.1	0.5±0.2	0.6±0.2	0.1
MPR				
Stress	4.3±1.3	4.3±1.4	3.8±1.1	0.34
Rest	4.3±0.9	4.2±1.2	3.7±0.6	0.37
Heart rate (bpm)				
Stress	111±14	105±16	106±17	0.03
Rest	74±10	73±9	73±14	0.92
Systolic blood pressure (mm Hg)				
Stress	121±16	120±14	122±16	0.54
Rest	119±21	119±16	120±23	0.92
Rate pressure product (SBP.HR)				
Stress	13 550±2747	12 696±2592	13 009±2758	0.046
Rest	8919±2639	8764±1698	8789±2377	0.90

Abstract 098 Table 2

	Segmental	Global
Stress perfusion (ml/min/g)		
Mean difference±SD	0.35±0.81	0.36±0.62
Coefficient of variation	35.2%	26.8%
Rest perfusion (ml/min/g)		
Mean difference±SD	0.07±0.16	0.07±0.09
Coefficient of variation	27.5%	16.0%
Myocardial perfusion reserve		
Mean difference±SD	0.07±1.43	0.07±1.03
Coefficient of variation	33.5%	23.9%

respectively. Corresponding segmental CV were 35.2%, 27.5% and 33.5% (Abstract 098 table 2). The agreement between segmental perfusion and MPR from scans 1 and 2 are shown in Abstract 098 figure 1. The reproducibility of left ventricular volumes and function was excellent (CV 4%, 7.7% and 4.6% for end diastolic volume, end-systolic volume and ejection fraction respectively). There were no significant diurnal variations in perfusion or LV volumes and function.



Abstract 098 Figure 1

Conclusions The inter-study reproducibility of quantitative myocardial perfusion is reasonable and best for global rest perfusion. No significant diurnal variation in perfusion was observed.

099 DYNAMIC THREE-DIMENSIONAL WHOLE HEART MAGNETIC RESONANCE MYOCARDIAL PERFUSION IMAGING: VALIDATION AGAINST THE DUKE JEOPARDY SCORE TO ASSESS MYOCARDIUM AT RISK

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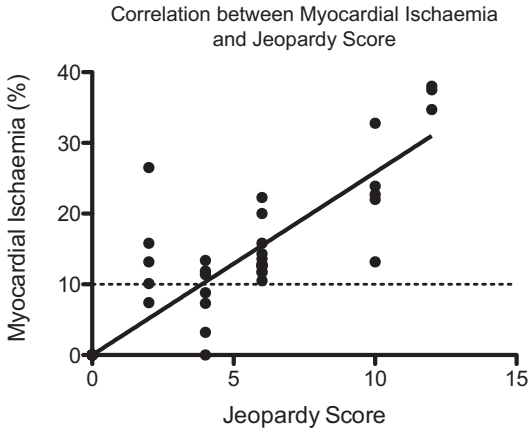
Background Three-dimensional (3D) myocardial perfusion cardiovascular magnetic resonance (CMR) permits whole heart coverage and can establish an estimation of myocardium at risk and ischaemic burden. For invasive estimation of ischaemic burden, semi-quantitative angiographic scores including the Duke Jeopardy Score have clinical legitimacy as the magnitude of myocardium at risk due to severe coronary stenosis is associated with an adverse prognosis. The Duke Jeopardy score combines assessment of stenosis severity and location.

Objectives To determine the association between myocardium at risk defined by the Duke Jeopardy Score and 3D CMR perfusion imaging.

Methods 53 patients referred for angiography underwent rest and adenosine stress 3D myocardial perfusion CMR at 3Tesla (3D turbo gradient echo, flip angle 15, TR 2.0 ms/TE 1.0 ms, 12 slices of 5 mm thickness, in-plane resolution $2.3\times2.3\ mm^2$, 10-fold k-space and time k-t broad linear speed up technique acceleration with k-t principal component analysis). Volume of myocardial hypoperfusion was calculated by a blinded observer using with GTVolume software (GyroTools, Switzerland) with quantitative methods based upon adjusting the signal intensity threshold >2 SDs below the signal of remote myocardium. Volume of hypoperfusion was calculated by summation of the contiguous slices. Jeopardy score was calculated from the coronary angiograms to quantify the myocardium at risk. The coronary tree was divided into six segments of nearly equal myocardial perfusion (eg, left anterior descending artery, major diagonal branch, circumflex artery, major obtuse marginal branch artery, right coronary artery, and posterior descending artery). A score of 2 for each significant lesion was given. Vessels were analysed by a cardiologist blinded to CMR and clinical details and assigned a score ranging from 0 (no Jeopardy) to 12 (maximum Jeopardy).

Results 53 patients were scanned with 159 coronary vessels anaylsed. The mean percentage volume of hypoperfusion on 3D-CMR was 9.9% (±10.9). The mean Jeopardy Score was 4.0 (±3.9). The mean percentage volume of hypoperfusion for Jeopardy scores



Abstract 099 Figure 1 Strong correlation between invasive measures of disease severity and ischaemic burden (r=0.82). The dotted line represents the 10% threshold for which revascularisation may confer prognostic benefit over medical therapy alone.