Introduction The National Institute for Health and Clinical Excellence (NICE) have released guidelines for the investigation of chest pain of recent onset (1). There is concern that the guidelines will increase the burden on cardiac imaging, requiring service reconfiguration and investment (2, 3). This study was performed to assess the impact of the guidelines on outpatient cardiology services in the UK.
Methods 595 consecutive patients attending chest pain clinics at two hospitals over six months preceding release of the NICE guidelines (51% male; median age 55 yrs (range 22–94 yrs)) were risk stratified using NICE criteria. Preliminary cardiac investigations recommended by NICE were compared with existing clinical practice and the relative costs calculated.
Results NICE would have recommended 443 patients (74%) for discharge without cardiac investigation, 10 (2%) for cardiac computed tomography (CCT), 69 (12%) for functional cardiac imaging and 73 (12%) for invasive coronary angiography (ICA). Relative to existing practice there would have been a trend towards reduced functional cardiac imaging (−24%; p=0.06) and increased CCT (+43%; p=0.436) but a significant increase in ICA (+508%; p<0.001). The cost of investigations recommended by NICE would have been £15 881 greater than existing practice.
Conclusions This study suggests implementation of the NICE guidelines will require investment in cardiology services, particularly ICA. It will be necessary to establish and maintain CCT for relatively few patients; also to establish and maintain functional cardiac imaging even though referrals are likely to decline. Individual hospitals should assess their local populations prior to service reconfiguration.

Abstract 126 Table 1 Preliminary cardiac investigations undertaken (pre-NICE) compared with those recommended by NICE (N=595)

	Pre-NICE	NICE	% change
No investigation	33	443	+1242% (p<0.001)
Cardiac CT	7	10	+43% (p 0.436)
Functional cardiac assessment	91	69	−24% (p 0.06)
Invasive angiography	12	73	+508 (p<0.001)

127 TIMING OF CARDIOVASCULAR MRI AFTER ACUTE MYOCARDIAL INFARCTION: EFFECT ON ESTIMATES OF INFARCT CHARACTERISTICS AND PREDICTION OF LATE VENTRICULAR REMODELLING

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Background The pathophysiological remodelling processes associated with acute myocardial infarction (AMI) evolve over time and the optimal acute imaging time point to predict medium-term surrogates for outcome has not been established. This study aimed to define the evolution of infarct characteristics by cardiovascular magnetic resonance (CMR), and to assess whether CMR data acquired at "day 2" or at "1 week" post-AMI are stronger predictors of infarct size and left ventricular (LV) function measured at 3 months.
Methods Fifty-seven patients were recruited with first presentation ST elevation AMI treated successfully with primary percutaneous coronary intervention. Cine, T2- weighted and late gadolinium enhancement CMR imaging were performed at days 2, 7, 30 and 90 after index presentation.
Results Infarct size and extent of myocardial oedema decreased significantly between "day 2" and "1 week" (mean %LV-scar (SD) 27.2 (13.9) vs 21.6 (14.1), p<0.001 and %LV-AAR (Area At Risk) (SD), 37.9 (15.2) vs 32.3 (14.3), p=0.003). These changes were accompanied by a significant improvement in LV ejection fraction (%LVEF (SD), 41.7 (9.6) vs 44.6 (10.1), p<0.001). CMR data acquired at "1 week" were better predictors of LVEF and infarct size at "3 months" than data collected at "day 2".
Conclusions The extent of myocardial oedema and infarct size decrease significantly during the first week after reperfusion for AMI and these changes are associated with a significant improvement in LVEF over the same interval. These findings have implications for the timing of CMR studies in the early post-infarct period. We found that the percentage myocardial salvage index did not change significantly between "day 2" and "1 week". Therefore, accurate assessment of the efficacy of reperfusion therapy can be made up to one week after revascularization. In addition, CMR data acquired at "1 week" were better predictors of CMR endpoints measured at "3 months". Thus, we conclude that the optimal time point to image patients post-reperfusion therapy for AMI is at 1 week.

128 BRIGHT BLOOD T2 WEIGHTED MRI HAS HIGHER DIAGNOSTIC PRECISION AND ACCURACY THAN DARK BLOOD STIR MRI FOR ASSESSMENT OF THE ISCHAEMIC AREA-AT-RISK AND MYOCARDIAL SALVAGE IN ACUTE MYOCARDIAL INFARCTION

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Background T2-weighted MRI reveals myocardial oedema and enables estimation of the ischaemic area-at-risk and myocardial salvage in patients with acute myocardial infarction (MI). We compared the diagnostic accuracy of a new bright blood T2-weighted with a standard black blood T2-weighted MRI in patients with acute MI.
Methods A breath hold bright blood T2-weighted ACUTE pulse sequence with normalisation for coil sensitivity and a breath hold T2 dark blood short τ inversion recovery (STIR) sequence were used to depict the area-at-risk in 54 consecutive acute MI patients. Infarct size was measured on gadolinium late contrast enhancement images.
Results Compared with dark blood T2-weighted MRI, consensus agreements between independent observers for identification of myocardial oedema were higher with bright blood T2 -weighted MRI when evaluated per patient (p<0.001) and per segment of left ventricle (p<0.001). Compared to bright blood T2-weighted MRI, dark blood T2-weighted MRI under-estimated the area-at-risk compared to infarct size (p<0.001). The 95% limits of agreement for inter-observer agreements for the ischaemic area-at-risk and myocardial salvage were wider with dark blood T2-weighted MRI than with bright blood T2-weighted MRI. Bright blood enabled more accurate identification of the culprit coronary artery with correct identification in 94% of cases compared to 61% for dark blood (p<0.001).
Conclusion Bright blood T2-weighted MRI has higher diagnostic accuracy than dark blood T2-weighted MRI. Additionally, dark blood T2-weighted MRI may underestimate area-at-risk and myocardial salvage.

129 MYOCARDIAL SALVAGE DURING PRIMARY PCI CAN BE PREDICTED IN THE CATH LAB

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Objectives This study investigated the relationship between the index of microcirculatory resistance (IMR) and myocardial salvage as determined by T2-weighted and contrast-enhanced cardiac magnetic resonance (CMR) imaging in patients undergoing primary percutaneous coronary intervention (pPCI) for ST elevation myocardial infarction (STEMI).

Background IMR is a simple invasive measure of microvascular function available at the time of pPCI. T2-weighted non-contrast CMR can reveal myocardial oedema, and in the post-infarct population this represents the ischaemic area at risk (AAR). Contrast-enhanced CMR delineates the area of myocardial infarction. The volume of myocardium within the AAR, but not contained within the infarct area is salvaged myocardium.
Methods 108 patients with STEMI underwent invasive coronary physiology measurements during pPCI and had a subsequent CMR scan at a median of 19 h post pPCI. Short axis non-contrast T2-weighted images were acquired and delayed enhancement imaging was performed following administration of intravenous gadolinium (0.1 mmol/kg). AAR was determined and myocardial salvage was calculated as AAR—infarct area.
Results IMR was 29 (21), AAR 32% (13%) and myocardial salvage 6% (9%)—all mean (SD). Spearman rank correlation between IMR and AAR was 0.27 (p 0.02) and between IMR and salvage was −0.31 (p 0.01). IMR was also a multivariate predictor of AAR (p 0.01) and a negative multivariate predictor of myocardial salvage (p 0.02).
Conclusions IMR measured acutely correlates with AAR and correlates negatively with myocardial salvage as determined by MRI.

130 COMPARISON OF HARMONIC PHASE IMAGING WITH LOCAL SINE WAVE MODELLING FOR THE ASSESSMENT OF CIRCUMFERENTIAL MYOCARDIAL STRAIN USING TAGGED CARDIOVASCULAR MAGNETIC RESONANCE IMAGES

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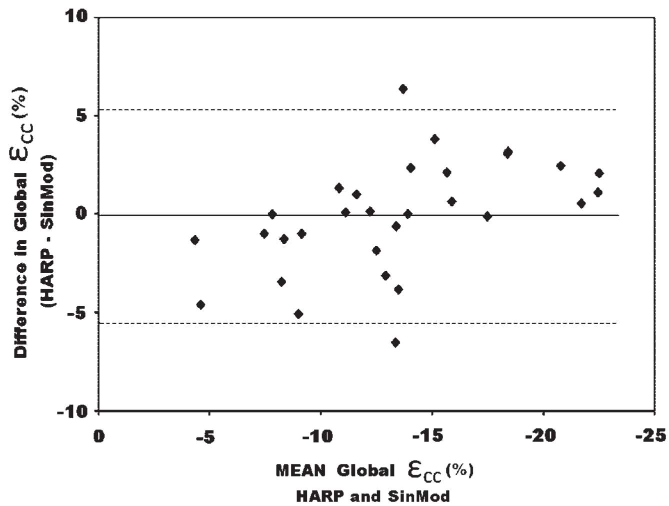
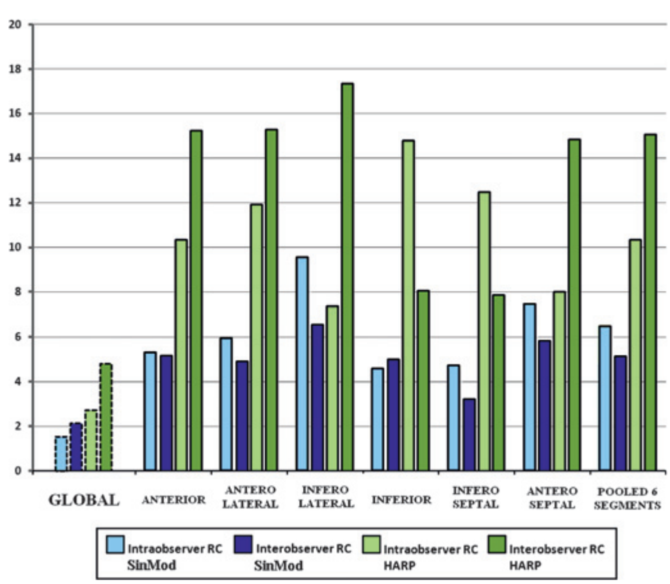
Introduction Assessment of myocardial strain promises to become an important quantitative tool in early diagnosis of cardiac disease and treatment monitoring. Advances in image processing software have facilitated rapid and clinically feasible analysis of strain from tagged cardiac magnetic resonance (CMR) images. Harmonic Phase Analysis (HARP) or Local Sine Wave Modelling (SinMod) can be used for automated derivation of strain. We obtained tagged CMR images to compare measurements of left ventricular (LV) circumferential strain obtained using a HARP with a SinMod method.
Methods Ten normal controls, 10 hypertrophic and 10 dilated cardiomyopathy patients (mean age 46.6±14.8 years) were included. Spatial modulation of magnetisation using short-axis LV slices at mid-ventricular level, with a temporal resolution of 30–50 mS, were obtained using a 1.5 Tesla scanner (Siemens Avanto) with a 32-channel coil. Global and segmental transmural peak circumferential strains (ϵ_{cc}) were measured using HARP (Diagnosoft, USA, version 2.7) and SinMod (InTag, University of Lyons, France, version 3.6.1). Prior to running the algorithm, both methods involve manual tracing of the endocardial and epicardial borders, and localisation of right ventricle-to-septum insertion points, in one frame. Agreement between HARP and SinMod was assessed by Spearman's correlation co-efficient R and Bland Altman methods. Repeated measurements were carried out on 10 randomly selected scans to assess reproducibility.
Results There was a high level of agreement between HARP and SinMod for global ϵ_{cc} (HARP—SinMod mean difference: −0.12%, 95% limits of agreement: −5.69% to 5.45%, R=0.83, p<0.001) (Abstract 130 figure 1). Agreement was much lower for segmental ϵ_{cc}, ranging from very poor in lateral segments to modest in inferoseptal segments (Abstract 130 table 1). Analysis time using SinMod was significantly shorter than for HARP (84±42 vs 201±120 S, p=0.02). Inter- and intra-observer reproducibility were extremely high for SinMod measurements of global ϵ_{cc} (inter-observer R=0.99, repeatability co-efficient (RC) 2.14; intra-observer R=0.99, RC 1.49). Reproducibility of global ϵ_{cc} measurements by HARP was somewhat lower, but still high (inter-observer R=0.89, RC 4.80; intra-observer R=0.98, RC 2.73). There was much greater variability in segmental ϵ_{cc} measurements using both methods, particularly with HARP (Abstract 130 figure 2).



Abstract 130 Figure 1

Abstract 130 Table 1

Analysed segment for circumferential strain	HARP vs SinMod Mean Difference ± SD (%)	HARP vs SinMod 95% Limits of agreement (%)	HARP vs SinMod Correlation Coefficient	p-value for correlation
Anterior	−1.68±6.38	−14.18 to 10.82	0.59	0.001
Anterolateral	−3.18±8.07	−18.99 to 12.64	0.22	0.25
Inferolateral	1.48±8.24	−14.67 to 17.62	0.24	0.21
Inferior	1.33±6.17	−10.76 to 13.42	0.48	0.008
Inferoseptal	−1.66±5.63	−12.68 to 9.37	0.59	0.001
Anteroseptal	−2.47±6.77	−15.73 to 10.79	0.52	0.007
All 6 segments pooled	−0.99±7.11	−14.92 to 12.95	0.43	<0.001



Abstract 130 Figure 2 Inter- and intra observer variability for HARP local sine wave modelling: repeatability co-efficients.