of 0, 6, 12 were 0, 13.1% and 36.7% respectively. Pearsons correlation coefficient showed a strong correlation (r=0.82, 95% CI 0.70 to 0.89) between the Jeopardy Score and volume of hypoperfusion on CMR (p<0.0001) (Abstract 099 figure 1).

Conclusion There is a strong correlation between myocardium at risk by invasive indices and volume of inducible ischaemia by dynamic 3D CMR whole heart perfusion imaging. 3D CMR perfusion imaging offers a non-invasive alternative method of detecting ischaemic burden and myocardium at risk for the purpose of serial studies, guiding revascularisation and risk stratification.

100 DIAGNOSTIC ACCURACY OF HIGH DEFINITION COMPUTED TOMOGRAPHIC CORONARY ANGIOGRAPHY COMPARED TO INVASIVE CORONARY ANGIOGRAPHY IN THE ASSESSMENT OF PATIENTS WITH HIGH PRE-TEST PROBABILITY OF OR ESTABLISHED CORONARY ARTERY DISEASE

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S Iyengar,* O Gosling, V Raju, G Morgan-Hughes, C A Roobottom. *Plymouth Hospital NHS Trust, Plymouth, UK*

Background 64-slice Computed Tomographic Coronary Angiography (CTCA) has high negative predictive value in assessment of patients with low-risk of coronary disease (CAD). However, it has a low specificity in assessment of patients with high pre-test probability of or established CAD, due to limited spatial resolution and blooming artefact from coronary artery calcium. Recently published NICE guidelines recommend the use of conventional CTCA for the assessment of patients with low pre-test probability of CAD, but not for patients with high pre-test probability of CAD or those with calcified coronary atheromatous disease (Agatston Calcium score >400). High-definition CT (HDCT) combined with the use of iterative reconstruction (ASIR), aims to address the shortcoming of conventional CT technology by improving spatial resolution and reducing calcium blooming artefact, without increasing ionising radiation exposure.

Methods Patients with high pre-test probability of and established CAD, were prospectively enrolled in our HD-CTCA accuracy trial. We present the interim results of our 50 consecutive patients who underwent HD-CTCA following invasive coronary angiography (ICA) for the assessment of coronary disease. HD-CTCA was conducted on all patients within 30 days of ICA. Anonymised ICA and HD-CTCA studies were evaluated separately and results compared with ICA as the reference standard.

Results All HD-CTCA studies were acquired using prospective gating, 100 kV tube voltage and optimum radiation dose reduction strategies and images were reconstructed using 50% ASIR. The male: female ratio was 37:13 and the median (IQR) age, BMI and Agatston Calcium Score of patients at the time of scanning were 67.5 (60–76.5) years, 26.5 (24.4–28.6) kg/m^2 and 708 (293–1615) respectively. The median (IQR) radiation dose was 151 (131–275) mGy.cm, representing effective doses of 4.2 (3.7–7.7) mSv using a cardiac specific conversion factor (0.028/cm). All coronary segments visualised on ICA were demonstrated on HD-CTCA. Of the 726 coronary segments evaluated on HD-CTCA, 96.4% were of excellent, 2.8% moderate and 0.8% poor diagnostic quality. Compared to ICA, HD-CTCA had sensitivity and specificity of 97% (95% CI 81% to 100%) and 95% (95% CI 72% to 99%) on a per-patient basis and sensitivity and specificity of 94% (95% CI 87% to 980%) and 98% (95% CI 97% to 99%) on a per-coronary segment basis respectively.

Conclusion Our interim results demonstrate that HD-CTCA has excellent accuracy compared to ICA in the assessment of patients with high pre-test probability of CAD or with established CAD and can be performed within acceptable radiation dose limits.

101 INCORPORATION OF STRESS ECHOCARDIOGRAPHY INTO AN ACUTE CHEST PAIN SERVICE PROVIDES EXCELLENT FEASIBILITY, EARLY TRIAGING AND ACCURATE RISK STRATIFICATION OF PATIENTS WITH SUSPECTED ACUTE CORONARY SYNDROME BUT NON-DIAGNOSTIC ECG AND NORMAL 12-H TROPONIN

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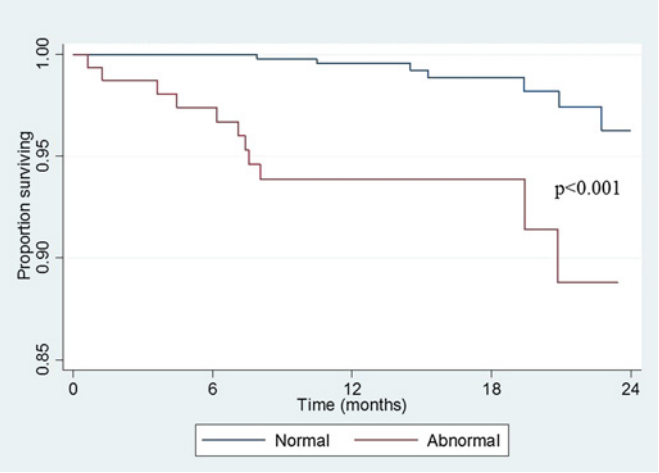
[1,2]B N Shah,* [1]G Balaji, [1]A Al Hajiri, [1]I S Ramzy, [1]S Ahmadvazir, [1,2]R Senior. *[1]Northwick Park Hospital, London, UK; [2]Royal Brompton Hospital, London, UK*

Background Acute chest pain accounts for a substantial proportion of patients attending the Emergency Department (ED). Initial investigations are frequently inconclusive and many patients thus require admission for further risk stratification. We have previously demonstrated the clinical benefits and cost savings of stress echocardiography (SE) compared to stress ECG for risk stratification of patients admitted with suspected acute coronary syndrome (ACS) but normal ECG and negative 12-h troponin. However, the feasibilty of SE in routine clinical practice and its ability to predict hard cardiac events in this patient population is unknown.

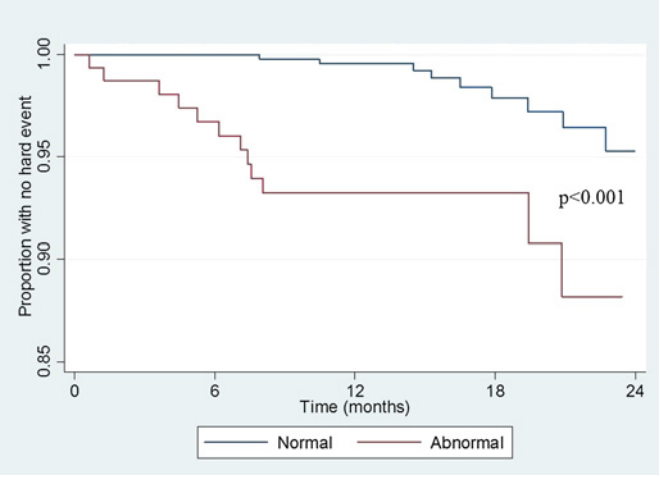
Methods Consecutive patients admitted via the ED with chest pain and who underwent SE within 24 h of admission via our acute chest pain service were assessed for feasibility of SE, time to test and were followed-up for hard cardiac events (cardiac death and acute myocardial infarction—AMI).

Results Of 719 consecutive patients, 674 (94.6%) had diagnostic images at SE and were followed-up over 26 months. The median time to test for all patients was 1 day and median in-hospital length of stay for those with normal SE was also 1 day. There were 17 hard events (14 cardiac deaths and 3 AMI). Annualised hard cardiac event rate in the normal SE group (n=517, 73.6%) was 0.58% compared with 3.5% in the abnormal SE group (p=0.002). Cox regression analysis revealed that among clinical, ECG and SE variables, only abnormal SE [p=0.001, HR 4.02, 95% CI 1.73 to 9.36] and advancing age (10-year increase) [p=0.005, HR 1.70, 95% CI 1.18 to 2.44] were independent predictors of hard events in the multivariate model. Similarly, abnormal SE was also the strongest predictor of cardiac death [p=0.001, HR 4.52, 95% CI 1.81 to 11.3]. At any stage during follow-up, an abnormal SE carried at least a fourfold increased risk of either cardiac death or any hard event over a normal SE result.

Conclusion This is the first study to show that the incorporation of SE into a clinical acute chest pain service has excellent feasibility, provides rapid assessment with early triaging and accurate risk stratification of patients with suspected ACS but non-diagnostic ECG and negative 12-h troponin.



Abstract 101 Figure 1 Kaplan–Meier survival estimate of time to death.



Abstract 101 Figure 2 Kaplan–Meier survival estimate of time to hard event.

102 POCKET-SIZE HAND-HELD CARDIAC ULTRASOUND IN THE HANDS OF STUDENTS AND JUNIOR DOCTORS: DOES IT IMPROVE DIAGNOSTIC ACCURACY OVER HISTORY, PHYSICAL EXAMINATION AND ECG?

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V F Panoulas,* A L Daigeler, A S Lota, A S N Malaweera, D Baskaran, S Rahman, P Nihoyannopoulos. *Hammersmith Hospital, Imperial Healthcare NHS Trust, London, UK*

Background Even though patient history taking and physical examination remain the foundations of patient evaluation in daily clinical practise, there has been a decline in the accuracy of the later. Pocket hand held echocardiographic (PHHE) devices have recently been introduced and could potentially improve diagnostic accuracy in the hands of non-cardiologists. The amount of training required to achieve optimal results remains a matter of debate.
Aim We hypothesised that use of PHHE after limited training, can improve diagnostic accuracy even in the hands of medical students and inexperienced physicians.
Methods Five final year medical students and 3 junior doctors without prior echocardiographic experience participated in a standardised 2-h PHHE bed-side training program. Subsequently they assessed 122 patients (history taking, physical examination, ECG interpretation and PHHE). Their physical and echocardiographic findings were compared to those of a transthoracic echocardiography accredited cardiologist.
Results A total of 122 V-scans were performed of which 64 (53%) by final-year medical students and 58 (47%) by junior doctors. Mean age of the participants was 64±16.1 years and 87 (71.3%) were male. Out of 122 patients, 69 (56.6%) had LV dysfunction, 16 (13.1%) had RV dysfunction, 74 (52.5%) had valvular abnormalities, 5 (4.1%) had prosthetic valves, 6 (4.9%) had pericardial effusions and 4 (3.3%) ascending aorta disease. Mean±SD for diagnostic accuracy (maximum=1) after history, physical examination and ECG interpretation was 0.53±0.19 whereas addition of PHHE increased its value to 0.85±0.2 (Z=−8.964, p<0.001). In 88 (73.3%) patients there was concordance between cardiologist and trainees in LV assessment, in 23 (19.1%) trainees underestimated or overestimated LV by one grade and in 9 (7.4%) by at least two grades. When assessing for presence of moderate to severe left ventricular dysfunction by means of history and physical examination specificity was 84.9% and sensitivity only 25.9% whereas after PHHE these figures raised to 93.6% and 74.1% respectively. There were a total of 94 valvular lesions (present in 74 patients), 10 of which (10.6%) were stenotic and 84 (89.3%) regurgitant. There was a total of 40 moderate to severe valvular regurgitation lesions. Trainee sensitivity in identifying the afore mentioned lesions was 70% whereas specificity 98%. Regarding moderate to severe valvular stenosis sensitivity was 85.7% whereas specificity was 100%. Ausculatation for presence of valvular abnormality (without specifying which valve or what kind of abnormality) revealed a 93.8% specificity and a 45.9% sensitivity.
Conclusions In the current study use of PHHE after brief, bed-side training greatly improved the diagnostic accuracy of medical students and junior doctors, over and above history, physical examination and ECG interpretation.

103 AORTIC INFLAMMATION IS REDUCED, AND PARALELLES CHANGES IN AORTIC STIFFNESS BY ANTI-TNF α THERAPY IN RHEUMATOID ARTHRITIS

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K M Maki-Petaja,* M Elkhawad, F Joshi, F Hall, A Ostor, J Cheriyan, J H Rudd, I B Wilkinson. *University of Cambridge, Cambridge, UK*

Background Rheumatoid arthritis (RA) is a systemic inflammatory condition associated with increased cardiovascular risk which is not fully explained by traditional risk factors. Endothelial dysfunction and increased aortic stiffness may mediate some of the increased risk. Additionally, there may be direct vascular inflammation which could directly accelerate atherosclerosis. We hypothesised that patients with RA exhibit a subclinical aortic vasculitis which can be reversed with anti-tumour necrosis factor α (TNF) therapy.
Methods The aortas and carotid arteries of 15 patients with severe rheumatoid arthritis were imaged before and after anti-TNF therapy using 18F-fluoro-deoxyglucose positron emission tomography (FDG-PET) with CT co-registration. Tracer uptake was analysed in various arterial segments by measuring maximum standard uptake values (SUV) and subsequently corrected for blood uptake to obtain a target to background ratio (TBR). Carotid to femoral pulse wave velocity (PWV) as a measure of aortic stiffness, disease activity and inflammatory biomarkers were also measured.
Results Mean baseline aortic TBR was 2.07±0.20. Following anti-TNF α therapy, there was a significant reduction in abdominal aortic TBR (−0.18±0.27, p=0.03) and in the most diseased segment in the whole aorta (−0.48±0.59, p=0.01). TBR was also reduced in all other aortic segments and the proportion of hot slices (defined as TBR>1.9) was reduced by 31%, but these did not reach statistical significance. There was no change in carotid TBR following treatment. Aortic PVW was reduced by 0.43±1.0 m/s, p=0.1) and there was a significant correlation between a reduction in aortic PWV and abdominal TBR (R=0.57, p=0.03) and between aortic PWV and proportion of "hot" slices (R=0.66, p=0.01). There was a concomitant reduction in serum CRP (−8±12 mg/l, p=0.02) and disease activity (DAS28 −1.41±1.51, p=0.002).
Conclusions This study demonstrates for the first time that patients with RA have high aortic and carotid FDG uptake, suggesting subclinical vasculitis. Moreover, they exhibit a reduction in FDG uptake following anti-TNFα therapy, which correlated with a reduction in aortic stiffness. These results suggest that subclinical vasculitis could be the mechanism behind the increased cardiovascular risk and that effective treatment of inflammation may help to reduce the cardiovascular risk in this patient population.

104 ENHANCING ENDOTHELIAL INSULIN SENSITIVITY REDUCES NITRIC OXIDE BIOAVAILABILITY: A ROLE FOR NADPH OXIDASE-DERIVED REACTIVE OXYGEN SPECIES

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H Viswambharan,* P Sukumar, M C Gage, N Yuldasheva, A Skromna, H Imrie, S Galloway, J Smith, R Cubbon, S B Wheatcroft, M T Kearney. *University of Leeds, Leeds, UK*

Introduction Insulin resistance at a whole body level and in the endothelium precedes type 2 diabetes. Insulin resistance at the level