

**Clinical: Cardiac****P-064 Efficient management of echocardiography resource at a district general hospital**

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**Background:** Echocardiography is a highly valued diagnostic non-invasive imaging modality frequently implemented in clinical practice to monitor cardiac physiological function, review cardiac anatomical abnormalities and exclude the presence of intracardiac thrombus. The British Society of Echocardiography (BSE) has defined and stratified echocardiography clinical indications with a view to provide incremental value to patient care and facilitate effective resource utilisation.

**Methods:** We reviewed 424 echocardiography in-patient request forms received during 2 months at a secondary care centre. We assessed the appropriateness of the requests in accordance with BSE guidelines, delays between the requests and the scans, and the completion of request forms with respect to provided requester contact information, consultant name and patient demographics.

**Results:** Based on BSE guidelines, 71% of requests were classified as appropriate and 29% were classified as inappropriate assessing from the provided clinical information. 80% of scans were performed within 24 hours and 90% were performed within 48 hours. Over 97% of requests forms were deemed legible, contained the requester contact information, consultant name and patient demographics.

**Conclusions:** Excess echocardiographs were performed at the Trust. We have formulated a set of local guidelines adapted from the BSE guidelines to aid decisions regarding echocardiography requests. We aim to reinforce this with oral presentations, educative posters and algorithms with a view to re-audit in 6 months. By implementing these interventional measures, we aim to decrease clinically inappropriate referrals and enhance clinically urgent echocardiographs.

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**P-065 Extra-cardiac findings on CT Coronary angiograms – a pictorial review**

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CT Coronary Angiograms (CTCAs) are becoming an increasingly popular non-invasive method of evaluating the coronary arteries. Whilst conventional angiography is traditionally performed by Cardiologists, CTCAs are normally performed and reported by Radiologists.

Our centre is very experienced in performing coronary angiograms, with 312 successfully completed in the 12 month period of review. Of these, 53 (17%) identified incidental findings within their report, which ranged from potentially clinically significant pulmonary emboli, pleural and pericardial effusions to liver and renal cysts as well as a wide range of intrapulmonary findings.

We present our findings in the form of a pictorial review of incidental findings in order to highlight the importance of knowledge of clinically important extra-cardiac abnormalities.

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**P-066 High variability in signal intensity and contrast dynamics during CMRI first pass perfusion imaging when a standard dose of contrast agent is used - transit times of bolus & peak signal intensity in the blood pool**

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**Aim;** This study sought to provide a semi-quantitative analysis of the CMRI first-pass perfusion (FFP) images of thirty eight volunteers, focusing on the dose/kg, bolus transit time (BTT), peak signal intensity (PSI) in the blood pool (BP) of the left ventricle (LV), patient heart rate (HR), ejection fraction (EF) and in order to determine the variability in contrast dynamics and PSI in the BP.

**Materials and Methods:** Imaging was performed at 1.5T (Siemens, Erlangen, Germany) using a standard dose (20ml) of contrast agent (Gadoteric Acid, Guerbet) and TR/TE (2.4/1.01) ms, FA = 10°, slice thickness = 6mm. Image analysis was performed using ARGUS software (Siemens, version VB15).

**Results:** Individual contrast doses varied depending on body mass index (BMI) and this variation bore no correlation to BTT from the injection site to the LV BP or on the PSI in the LV BP. Similarly, EF and HR did not impact on BTT through the four chambers of the heart, the arrival time of the bolus in the LV or the PSI detected in the BP at first pass.

**Conclusion:** This study has highlighted that the variability of contrast agent PSI and TT during FPP cannot easily be accounted for by BMI, dose/Kg or cardiac function. This suggests that variability in PSI may also occur in the myocardium during first-pass (\*poster II). These findings should be considered in the clinical interpretation of rest perfusion data.

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**P-067 Evaluation of vulnerable plaque in postmenopause females with acute coronary syndrome by using 64-MDCT**

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**Objective** To evaluate morphology, composition and size of vulnerable plaque using 64-detector spiral Computed Tomography Angiography (CTA) in postmenopause females with acute coronary syndrome (ACS) confirmed by coronary angiography.

**Methods** 44 patients diagnosed with coronary artery disease documented by CTA and coronary angiography were studied. The coronary plaques were evaluated for the degree of stenosis, the minimum CT density, and calcification morphology as well as plaque volumes.

**Results** CTA and coronary angiography showed no significant differences in the degree of stenosis between the groups. The minimum CT density was significantly lower in ACS groups than in Stable Angina Pectoris (SAP) group. The total volume of plaque was not significantly different between the groups. Spotty and large calcification was

significantly more frequent in the lesions associated with ACS than SAP. The minimum CT density less than 35 HU were significantly more frequent in the ACS lesions. Presence of both (spotty calcification and the minimum CT density <35 HU) showed high positive predictive value, while absence of both showed high negative predictive value for the vulnerable plaques associated with ACS.

**Conclusions** The CT characteristics of vulnerable plaques associated with ACS in postmenopause females include: low plaque density, spotty calcification, a larger proportion of soft plaque volume. The coronary atherosclerotic plaque with CT values below 35HU together with spotty calcification characteristics at the same time is easier to rupture.

#### **P-068 Simple guidelines may improve appropriateness of referrals for CT coronary angiography**

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**Aims:** We re-evaluated our cardiac CT service to assess whether the issuing of guidelines had improved the rate of inappropriate referrals.

**Content:** In 2009 our service was receiving unacceptably high rates of inappropriate referrals. Having identified patient-related factors contributing to non-diagnosis, assessable at the point of referral, we introduced simple guidelines to highlight these to our referrers.

**Outcomes:** Since 2009 our rate of non-diagnostic scans in a like-for-like population has fallen significantly ( $p = 0.0001$ ). In those patients where scans are not attempted, not diagnostic or of poor image quality, the same patient factors have been identified.

Rates of inappropriate referral have fallen most significantly in those who received our guidance ( $p = 0.004$ ) but remain high, similar to our initial data, in new referrers to our service.

**Relevance:** As cardiac CT services are accessed by a wider range of referrers, ongoing education is required to ensure appropriate use. This is likely to be applicable to all diagnostic modalities.

**Discussion:** A number of factors may influence whether a scan is ultimately diagnostic. While increased confidence of reporters and improvements in technology are likely to be important, our evaluation suggests that the quality of referral is still key. Where CT has been unsuccessful, patient factors such as heart rate or rhythm, and inability to breath-hold, remain common. Referring clinicians require an understanding of any investigative technique and awareness of its limitations in order to utilise it most appropriately.

#### **P-069 RADAR assisted cardiac device implantation. Achieving very-low radiation dose during device deployment**

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**Background:** Cardiac device implantations are associated with a small but not insignificant radiation dose to both patient and operator. State of the art fluoroscopic systems enable integrated dose reduction strategies. These strategies were implemented under our Radiation Dose Assessment and Reduction (RADAR) program. We evaluated the effect of this integrated strategy on procedural device implantation.

**Methods:** Dose area product (DAP) values were gathered from 69 device implant (pacemakers & ICDs, excluding BiV) procedures after RADAR implementation between November 2011 and March 2012. RADAR strategies included very low pulse rates, gridless imaging and a reduction in dose per pulse on our equipment. This was compared to 74 consecutive previous procedures between March and August 2010. Clinical complications were monitored and analysed.

**Results:** Median DAP was significantly reduced from 5.11 to 0.452 Gy $\text{cm}^2$  ( $p < 0.0001$ ) with no significant change in median fluoroscopic time (322 vs 366 secs:  $p = \text{NS}$ ). There was no significant change in clinical complications.

**Conclusion:** Implementation of the RADAR program reduced the radiation dose required for cardiac device implantation to very-low levels. Median DAP values compare favourably to published data and approximate a standard chest x-ray series dose.

**Clinical: Vascular****P-070 Inferior vena cava anomalies and variants: implications for deployment of IVC filters**

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**Aims/Objectives:** The purpose of this poster is to illustrate a range of Inferior Vena Caval anatomic variants and to explain the technical challenges in deployment of IVC filters in this patient group.

**Content :** Inferior vena cava anatomic variants are a diverse group of entities, encountered from time-to-time during radiological procedures. These congenital abnormalities range from duplication of the IVC to left sided IVC. These anatomic variants are a challenge to Interventional Radiologists, as they first must be identified prior to IVC implantable filter deployment This review presents an illustrated overview of the wide variety of inferior vena cava abnormalities, and show examples of IVC Filter deployment in variant anatomy.

**Outcome:** To illustrate inferior vena cava abnormalities and how filter deployment technique must be modified.

**Relevance :** Interventional Radiologists need an awareness of the IVC variations in anatomy to anticipate potential deployment and retrieval difficulties. In some cases, a knowledge of abnormal anatomy may influence the decision to deploy the device, depending on the clinical setting.

**Conclusion:** IVC variant anatomy is encountered occasionally by Interventional Radiologists, and strategies must be in place to identify these variants and alter the approach to device deployment accordingly.

**P-071 On-call provision of interventional radiology: the view from the hub**

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**Aim:** To review the practice of an on-call interventional radiology (IR) department providing ad-hoc regional cover and to assess the burden of out-of-trust work on its system.

**Content:** A retrospective review of the on-call practice over 3 years (2009-11) using the RIS database was made.

**Relevance:** The demand for an effective 24-hour IR service has increased significantly over recent years and seemingly this demand can only grow further with government guidelines that all patients should have robust access to on call IR.

**Outcomes:** 289 on-call procedures were carried over 3 years, 39.4% of which (115 patients) came from a different hospital trust on admission. Fifty-one out-of-trust patients (44.4%) went on to have further interventional procedures during their admission. The majority of out-of-trust patients underwent vascular intervention (45 patients). The largest out-of-trust proportion was hepatobiliary, with 48.0% of all hepatobiliary interventions being performed on an out-of-trust patient.

**Discussion:** This institution has offered a long established 24-hr IR service, and currently takes on a significant proportion of patients from the surrounding catchment area, with no formal service level agreement in place. A validated hub and spoke arrangement would allow for on call service provision to smaller hospitals while concomitantly increasing recruitment at the hub.

**P-072 Inter- and intra-observer reproducibility in whole-body contrast enhanced MRA stenosis grading and systemic atheroma scoring**

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**Aim:** To determine the reproducibility of two radiologists in whole-body contrast-enhanced MRA cardiovascular analysis.

**Methods:** 20 patients (11 male, 9 female, age range 52-77 years), with 5 patients in each subgroup of healthy, mild, moderate and severe atheroma burden, were imaged on a 3.0 Tesla MRI scanner (Magnetom Trio, Siemens,