

## Innovation in service delivery

### P-118 CT thorax, abdomen and pelvis audit: an audit comparing non-trauma requests made by GPs and the accident and emergency department

[Cheng Xie](#); [Amdad Ahmed](#); [Arpan Banerjee](#)

*Birmingham Heartlands and Solihull Hospitals, Heart of England Foundation NHS Trust*

**Purpose:** Body Computed Tomography (CT) imaging is an important diagnostic tool increasingly used in the primary care setting and by hospital Accident and Emergency departments (A&E) to make a clinical diagnosis. The potential problem with body CT imaging is the high radiation dose incurred by patients. The Royal College of Radiology (RCR) has set guidelines to help regulate the requesting process. The aim of this audit was to review thorax, abdominal and pelvis CT scans requested by GPs and A&E, to determine what proportion are within Royal College of Radiology recommendations.

**Method:** Retrospective audit of 101 CT thorax, abdomen and pelvis requests from primary care centres and 101 from A&E department in 2012.

**Results:** 72% GP and 91% A&E referrals met the RCR referral criteria, of these 78% GP and 87% A&E referrals were suspected malignancies. 28% GP and 9% A&E referrals did not comply with RCR criteria. The non-compliant referrals ranged from unexplained anaemia, abdominal pain, hernia, to suspected gallbladder conditions without an initial ultrasound scan. 53% GP scans showed abnormalities including malignancy (20%), and in 69% A&E scans with abnormalities 37% demonstrated malignancy.

**Conclusions:** A significantly higher portion of requests made in the hospital settings meets the recommendations made by the Royal College of Radiologists. Oncology-related pathology forms a major source of inpatient and outpatient referral. Although, the GP referrals did not meet the RCR guidelines, the percentage of pathology in the two groups was fairly comparable. A detailed analysis will be presented.

### P-119 Innovative approach to 'Excellence in Quality' for ultrasound services

[Ankia Meiring](#)

*InHealth Ltd*

Our organisation continuously strives for 'Excellence in Quality' and as part of our initiative to improve the quality for ultrasound services; we have put together a few important key activities to ensure that the quality in our service is delivered. Our most recent addition to our Ultrasound service was the newly designed audit process that is specifically targeted at community based services. This enables the auditors to assess various categories for specific protocols followed, ultrasound image quality, report writing-skills and appropriate onward recommendations for each patient. The ultrasound examinations performed are set against revised protocols, guidelines and a robust escalation policy to ensure that the patient follows the correct pathway when abnormalities are detected. The aim of the audit is not just for overall quality but to derive which category the operator requires improvement. Remedial action is put in place for all operators that demonstrate underperformance of a category. With the continuous need to provide a service that is faster and more readily available, we have introduced locums. The short coming of this decision is constancy in quality as the turnaround time for each locum is costly. Hence our locums go through a formal one week induction program. Prior to their appointment they undergo an introduction interview to familiarise themselves with the company and also allows the organisation to ask the relevant questions to ensure that the candidate is fit for purpose. The first day is the start of the induction process to disseminate ultrasound protocols, guidelines and escalation policy and familiarise with company policies. Day 2 – 4: work alongside another sonographer with double reporting. Day 5: undergo a formal competency assessment with one of the lead sonographers. Once signed off, they will be able to work individually. If unsuccessful, the induction process will resume. Up to date, we have had no locum repeat the induction week. To develop continuously improvement across the team, we have also introduced a mandatory Saturday training clinic for all permanent staff members. This is lead by a consultant radiologist and is run on a weekly basis to allow all to rotate through the clinic 2 – 3 times per year. The clinic varies between general, gynae, small parts and musculoskeletal ultrasound cases. On this day, the sonographer is formally assessed and given the chance to bring case studies or learning objectives to discuss. This

acts as CPD activity that they can document in their portfolio. Through feedback reports, competency assessment and our audit process, we can continuously act on specific areas that need improvement. By implementing these processes have lead to a reduction in clinical complaints, gradual improvement in audit results, increased participation of the team; and direct access to specific quality areas that need to be addressed. Most importantly these processes have made our staff feel valued and motivated to be part of a team that strives for excellence in service quality.

### **P-120 Magnetic resonance imaging of the claustrophobic patient in the mobile environment**

[Gillian Winter](#)

*InHealth Limited*

**Aim:** To identify the key factors affecting claustrophobic patients attending for Magnetic Resonance Imaging on a mobile trailer.

**Content:** An audit of a group of patients, using semi structured interviews, was carried out to determine whether there were any actions the imaging provider could take to improve the patient experience in the mobile environment.

**Relevance/impact:** Mobile MRI services currently provide significant additional capacity to the provision of static MRI in the United Kingdom. Space is limited and patients with a tendency towards claustrophobia find this a challenge.

**Outcomes:** Key factors raised included:

- Lack of information about the scan at the point of referral and appointment
- Some had a previous claustrophobic episode which they did not share with the imaging provider
- Some were not aware that they could have attempted the scan feet first
- Some were not offered a chaperone for support
- Being told what will happen next following a failed attempt at MRI

**Discussion:** Information leaflets should be specific to a mobile service.

Patients must advised that they are booked on a mobile and should be asked if they have had an MRI before

Feet first scans should be offered as standard where equipment allows.

Patients expressing reservations should be encouraged to try again with a chaperone.

Music and an eye mask should be offered

In the event of a failed attempt, MRI staff should explain what will happen next and the alternatives.

### **P-121 Introducing a change: New MRI protocol for detection of liver lesions in non-cirrhotic patients using hepatobiliary specific contrast agent.**

[Sumita Chawla](#); [Nadya Jabbar](#); [J Malla](#); [Ashok Katti](#); [Anbu Nedumaran](#)

*University Hospital Aintree, Liverpool*

**Purpose:** Gd-EOB-DTPA (PRIMOVIIST) is specifically taken up by hepatocytes and shows liver-lesion contrast not achievable with gadolinium based contrast agents that significantly improve both detection and characterization of focal liver lesion.

Our aim was to evaluate the usefulness of the 10 versus 20 minute delayed sequences in patients with non-cirrhotic using a liver specific contrast agent MRI imaging protocol.

**Method:** Standard sequences for liver imaging performed at our institution are:

- Normal Sequences localiser
- T1 in and out of phase
- T2
- T2 Fat suppressed
- T1 Immediate, Arterial, portal-venous and delayed.

- T1 (10 minutes) with contrast.
- T1 (20 minutes) delayed.
- Diffusion weighted sequences.

We collected 50 randomly selected patients with non-cirrhotic liver disease over a 12-month period in 2011.

We performed a retrospective analysis to see whether or not there was additional diagnostic benefit at 20 minutes post primovist administration when compared with imaging done at 10 minutes.

**Results:** In our institution we found that in all cases (100%) of patients did not benefit from the additional 20 minute delayed sequence. We present a spectrum of cases from our tertiary centre demonstrating no conceivable change between the 10 and 20 minutes post contrast delayed sequences.

**Conclusion:** Introduction of the new liver imaging protocols with the single 15 minutes post primovist delayed sequences, replacing 10 and 20 minute delayed sequences provides many positive factors in reducing the overall MRI Liver scanning times, improve cost effectiveness, patient compliance and reduction in MRI waiting list times.

### **P-122 Audits into extravasation of contrast during CT imaging and cannulation practice.**

[James Allred](#); [Ann Pinder](#); [Frank Ellwood](#); [Priya Suresh](#); [Dushyant Shetty](#)

*Derriford Hospital Radiology Department, Plymouth*

CT scan numbers in the UK have increased enormously in recent years (1.4 – 3.4 million from 1997/8 – 2008), most of which require contrast. Consequently, the pressure on hospitals has been to scan more patients in less time with an increase in post-contrast investigations without the commensurate increase in resources. Contrast extravasation is one occurrence that can adversely affect the through flow of patients within a CT scanner and its causes are multi-factorial. Extravasation should be recognised quickly and treated accordingly. As such, regular audit of extravasation incidents is essential. This has implications not only for the patient who suffers an extravasation of contrast event and endures the subsequent associated symptoms, but also has ramifications for further irradiation of the patient if the desired post-contrast scan is not initially successful and impacts directly on the time available to scan subsequent patients. Over a two year period (June 2008 – May 2010) in Derriford Hospital, there were nine contrast extravasation incidents recorded via Datix at a rate of 0.02% based on CT scan numbers. This is being re-audited over a similar time period with the results being analysed for extravasation rates. A further audit with relevance to extravasation rates looking at cannulation practice in the CT department is being undertaken and analysed for possible cannulation training requirements of staff, ward cannulation of inpatients and any time efficiency savings that might be made to improve through flow of patients and hence increase the number of patients scanned.

### **P-123 RadBENCH; Benchmarking image interpretation performance**

[Chris Wright](#)

*Sheffield Hallam University*

**Aim:** To allow image interpretation performance to be benchmarked (measured), within hospitals, Trusts, Nationally and Internationally.

**Method:** A quantitative approach is adopted using a series of image data banks. Candidates are free to opt-in at their discretion. All data is anonymised. Performance is measured in terms of Accuracy, Sensitivity and Specificity. Re-test is typically annually as part of CPD, but is also useful after a training intervention.

**Discussion:** The majority of Radiographers fall into the 'non-reporting' category, yet are often expected to be able to express accurate opinions on the images they produce every day of their working lives. RadBENCH facilitates progression from Red Dot > Commenting > Reporting by identifying key talent and identifying training needs. It supports the DoH ROI strategy by benchmarking an individual pre and post training event to quantify return on investment. Several applications have been tested; 1) Individual annual performance check as part of CPD, 2) Training planning for managers, 3) Selection differentiator for job interviews, 4) Selection differentiator for UCAS applications, 5) Anonymised database to support other research projects. Further research is on-going.

**Conclusion:** RadBENCH provides a major leap forward and provides an objective view of image interpretation performance. Investment funding has been secured and a multi-lingual global version of the product will be available in 2013.

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**P-124 Are the multidisciplinary team meetings (MDTs) serving their education value for the radiology trainee?**

Sumita Chawla; Tahira Aslam; Ashok Katti

*Department of Radiology, University Hospital Aintree, Liverpool*

**Key learning objectives:** We present a pictorial synopsis highlighting the educational importance of the various MDT meetings to the radiology trainee.

We aim to encourage the additional contribution of the radiology trainee alongside the Radiology consultants in undertaking an active role in the MDT meetings.

We emphasize the key elements involved in making a MDT meeting successful, which in turn aims to enhance the radiology trainee's detection and knowledge of the imaging findings, understanding of the related pathology and the subsequent management involved in the patient's best interests.

**Description:** The MDT model was introduced and endorsed to ensure that care delivery is consistent with the best available evidence. MDT meetings create a real time discussion forum with an output that records the activity of the meeting with regard to each patient and the decisions made. In this educational poster, we will cover the importance of the MDT meetings and how it attains the training requirements for the radiologists.

MDT meetings to the radiology trainee are best described as an invaluable tool, which serve by increasing the awareness about the various imaging findings and correlating with the appropriate treatment plan by input from other members of the MDTs.

**Conclusion:** We hope to have availed the observer with this pictorial review, acting as an eye opener, in particular to the junior radiology trainees demonstrating the exceptional educational benefit that the MDT meetings consistently achieve.

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**P-125 Variation, so what?**

Jim Cannon; Iain Robertson

*Managed Diagnostic Imaging Clinical Network (MDICN)*

**Aim -** To deliver a service led "quality" benchmarking model in Radiology. "Process" benchmarking (BM) is a model where service representatives define improvement datasets and agree what type of analysis is carried out.

**Methodology -** Moving services from a competitive approach [to quality benchmarking] - where nationally collected data was often disowned - to a collaborative and trusted methodology for accurate, standardised data collection and analysis.

The MDICN core team has achieved national collaboration across every territorial board where representative (modality) groups are brought together to define datasets and prescribe the process of data collection and analysis. Datasets remain anonymous until trust is developed and services understand how the analysis best fits with local planning and redesign.

**Results -** Early outputs from modality benchmarking in MRI have accelerated the development of new services and led to local work on throughput which has directly impacted the number of patients being seen and therefore directly reducing waiting times.

**Conclusion -** The "Process BM" model is a tested methodology used in quality improvement work in local government, delivering locally generated improvements based on standardised and robust data. Ownership of the whole process is the key factor in this model.

Strategic leadership at national level without the constraints of board priorities or a performance management badge has allowed the model to develop as services see fit whilst maintaining national priorities and building trust.

Local leadership is the key to driving the conversion of outputs to outcomes within services, as part of continuous improvement programmes.

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**P-126 Minnie hands make light work!!!**[Rachael Hilton](#); [Stuart Wade](#)*The Great Western NHS Foundation Trust*

With the steady annual increase in theatre activity and the role extension of theatre nurses to undertake screening procedures there was much discussion and thought behind purchasing a Mini C-arm to increase availability of theatre slots and improve time flexibility. As a number of senior theatre nurses had been given formal and practical training in order to perform radiographic examinations in theatres within the trust, it was deemed feasible and manageable to expand this service to incorporate orthopaedic surgeons who would operate and manage the radiographic aspects of the surgical case.

Following a trial of two Mini –C Arms based on practicability, ease of use, manoeuvrability, image quality and dose a unit was purchased in 2011. The chosen unit met the criteria and provided ease of use for a diverse range of users. IRMER and operator training requirements were provided by Medical Physics and the equipment supplier. On going reviews of competencies and image quality were assessed by the Radiology department.

Interim results in the 12 month period since implementation of the unit have seen an increase in theatre flexibility and activity by approximately 30%. The unit is primarily used for hand surgery both elective and trauma cases, and approximately 60% of foot and ankle cases. Implementation of the unit has enabled radiographers to be deployed to other more specialised cases. Previously they would have been required to cover all theatre cases, limiting radiographer availability and often causing patient delays. This ultimately has given the trust more theatre flexibility enhancing patient care and providing a quicker through put of radiographic surgical cases.

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**P-127 Service-user involvement in research: the benefits of letting them take control**[Leslie Robinson](#); [Ann Newton-Hughes](#)*University of Salford*

**Purpose:** to report how using a feminist approach to service-users research unearthed unanticipated findings not entirely related to the concept under investigation but important because they were participant-derived. The presentation therefore focuses on: i) the relevance of this methodology for service-user research and ii) the findings unearthed in this particular study.

**Research Aim:** to explore experiences of breast compression with clients of the UK NHS Breast Screening programme (NHSBSP).

**Methodology:** a feminist approach was used to conduct three focus group interviews. Feminist research explores the topic from the standpoint of women and also aims to empower subjects/participants to have greater control in the research process. It is thus ideally suited to involving service-users in research about their care. Therefore, although our intention was specifically to explore breast compression as the cause of pain in the mammography examination, the feminist approach required us to empower participants to direct and control the discussion according to what was important to them about their mammography experience.

**Results:** the anxieties women have concerning mammography are broader than compression-related pain and user-guided discussion showed that issues related to equipment design; uncomfortable positioning; lack of information; and unfriendly staff can all enhance the perception of, and contribute to, discomfort and pain.

**Conclusion:** researchers interested in service-user involvement should not be afraid of allowing participants to take control of the discussion. Engaging with participants in a subjective rather than objective way can unearth unanticipated data and can give a new perspective to the research concept under investigation.

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**P-128 A foot in both camps- Surviving a split clinical/academic role**[Alexandra Partner](#); [Claire Mansell](#); [Kerry Bingley](#)*University of Derby*

**Aims/Objectives** This brief presentation will explore the challenges behind working in a split clinical / academic radiography post in a changing NHS climate.

**Content** Through the personal perspectives of three lecturer-practitioners we will explore the issues and opportunities that have arisen during the first year of a split clinical-academic role. In this session we will discuss the challenges associated with the transition period, the practical realities of working in a split role and the benefits to both students and employers.

**Relevance/Impact** Full time academics sometimes struggle to keep their own clinical practice current and can become detached from the practical realities of service provision. For radiographer education to succeed in HEIs, educators must be responsive to changing NHS priorities.

However, the move towards seven day service delivery and shift working has resulted in significant challenges for staff employed in a clinical-academic role.

**Outcomes** Looking forward, we will explore the potential for this role to enhance student experience, professional recognition, currency of teaching, CPD, research and scholarly activity.

**Discussion** On-going service modernisation has resulted in a need to consider how lecturer-practitioners may respond to changing service demands, student expectations and shifting professional focus. Through personal experience and feedback from colleagues, we will consider how the role could be developed to have a positive effect on radiography education, how this may be measured and the remaining challenges.

### **P-129 Court on the web: Courtroom simulation for distance learning**

[Jacquie Vallis](#)

*Teesside University*

This year the postgraduate forensic radiography programme has moved from blended to distance learning delivered entirely online. There were a number of aspects of the blended programme that students highly valued, such as the use of external subject specialist lecturers, practical workshops, and courtroom simulation. One of the challenges in transferring this programme to distance learning has been focussed on how these practical based sessions that rely on resources at the university can still be delivered when students will never attend. Radiographers engaged in forensic practice may be required to attend court to give evidence, something which the International Association of Forensic Radiographers (2012) states is on the increase, based on the number of requests for advice received from radiographers. The blended delivery took students into the mock courtroom during their block of attendance at the university to be cross-examined on their evidence and statement. Students reported that this process was highly important in enabling them to prepare for the real thing and in teaching them how to write a good statement. This university is the only HE provider that offers such training; therefore, the team were keen to keep this in the programme. This presentation will examine how this has been achieved with the courtroom simulation using software Adobe Connect webinar software, provided by Mizaru. In addition, the experiences of the staff and students involved will be discussed.

### **P-130 Radiographer commenting: is there a reluctance to participate?**

[Carys Hunt; Elizabeth Carver](#)

*Bangor University*

#### **Aims:**

- Establish if radiographers feel confident to comment on all anatomical regions
- Ascertain why radiographers may not participate in some aspects of commenting
- Determine if radiographers prefer to red dot or comment
- Ascertain if radiographers comment when lacking confidence in their opinion
- Ascertain if radiographers believe commenting systems benefit patient care

**Content:** Previous related research; methodology.

**Results:** radiographers' confidence in performance and preferred scheme. Potential future studies. Recommendations for improving participation in commenting.

**Relevance/impact:** The commenting system is currently a 'hot topic' in radiography. This project highlights current level of participation in a scheme in a district general hospital, and reasons for level of participation.

**Outcomes:** Results indicate that radiographers were reluctant to comment on abdominal, chest, axial skeleton and paediatric images. Reasons given were: lack of time, confidence and level of training. 42.9% would not offer indication of abnormality if they were unsure regarding confidence in their opinion. 42.9% would still offer comment if unsure and 14.2% would offer a red dot. 50% stated they preferred the commenting system to the red dot system and 71.4% agreed that the commenting system is beneficial for patient care.

**Discussion:** It appears that level of training may not be perceived as adequate and this may affect confidence and participation. Recommendation is that further training and updates may improve confidence and improve level of participation, with audit of participation after 6 months.

### **P-131 Audit of the quality of DATIX incident reporting for contrast extravasation**

[Sophia Sakellariou](#); [Giles Roditi](#)

*Department of Radiology, Glasgow Royal Infirmary*

**Background:** Iodinated contrast media are the most commonly used injectables in Radiology today. Extravasations can occur during hand or power injection in 0.1%–0.9% of cases but is more common in the latter. Small extravasations of contrast result in minor or no effect to the patient, but occasionally effects are severe with subsequent requirements for tissue debridement and/or surgical intervention.

Extravasation incidents are reported in the DATIX system and analysed. Most of the information relating to the incident is electronically inserted by the incident reporting person in free text format. The authors hypothesised that this method of data input is inconsistent and unreliable for accurate incident reporting.

**Method/Results:** Based on previous experimental computational fluid dynamics (CFD) results relating contrast media parameters with probability of extravasation, nine items of information were considered essential for inclusion in the free text section of the incident reports for accurate documentation of extravasation incidents.

A retrospective audit of the records demonstrates a vast divergence in the quality of information reported on DATIX with an average of 4 items reported per record and a range of 1-9 items per record. Most records have limited documented evidence of actions being taken in response to the adverse event.

**Rationale for inclusion:** It is proposed that the introduction of a pro-forma will improve the documentation of information and allow for better data collection leading to improvement in the service and patient management as well as provide data that will further inform research and audit.

## **Errors and discrepancies**

### **P-132 Disagreement in chest x-ray interpretation: comparative analysis between consultant radiologists and a reporting radiographer**

[Nicholas Woznitza](#); [Stephen Burke](#); [Suvarna Amin](#); [Kamini Patel](#); [Kathryn Grayson](#); [Keith Piper](#)

*Homerton University Hospital; Statistics by Design; Canterbury Christ Church University*

**Aims:** Accurate image interpretation is crucial to enable correct patient management by clinicians. Image interpretation is a subjective task, and studies demonstrate significant observer variation in x-ray interpretation. There is little work examining the agreement between consultant radiologists and reporting radiographers in chest x-ray (CXR) interpretation.

**Methods:** A random sample of cases (n=100) was selected from a consecutive series of 1,000 CXR reports produced by the reporting radiographer in clinical practice. Fifty images were reviewed by each radiologist who examined the radiographer report for accuracy and agreement, including 50% duplication of cases between radiologists to determine inter-radiologist variation. The radiologist's evaluation was independent, blinded to the proportion of cases receiving multiple radiologist opinions. Inter-observer agreement analysis using Kappa was performed.

**Results:** Eight discrepancies were produced between the radiologist and radiographer interpretation; four of these occurred in cases which received two radiologist opinions. Only one discrepancy was confirmed by both radiologists; three cases produced findings in which a radiologist was in disagreement with the other radiologist and radiographer. Only one major discrepancy was identified. This case was deemed normal, in agreement with the