



disease response to treatment on MRI can also potentially be graded using this software (but too few patients were present in this cohort to evaluate this fully).

**Discussion:** Needs validating in bigger studies but initial results of Dynamika software are promising and simple to reproduce in evaluating sacroiliitis.

## Innovation in service delivery

### P144 **e-Hospital: The good, the bad and the ugly**

[Ynyr Hughes-Roberts](#); [Scott McDonald](#); [Melanie Hopper](#)

*Addenbrooke's Hospital*

Cambridge University Hospitals NHS Foundation Trust was the first UK NHS trust to become a fully digitalised hospital with the introduction of its new tailor-made Electronic Patient Record (EPR) system. This was provided in partnership with EPR software manufacturer EPIC with the IT infrastructure provided by Hewlett Packard in a £200 million, 10-year investment.

The aim of e-Hospital is to provide easy and swift electronic access to all aspects of a patient's medical record in order to facilitate timely, effective and safe delivery of medical care. All clinical documentation is now performed electronically. This gives any clinician access to any aspect of medical information at the bedside and at any terminal within the hospital. The aim of e-Hospital is to introduce a better quality of patient care implementing this safely, more timely whilst maintain a patient centric approach.

Specialist training was provided for every member of the Radiology team. A series of role specific training modules were designed for the various users in preparation of a global go-live scenario. We look at the impact e-Hospital had on the Radiology department. We surveyed members of the department in order to ascertain the personal impact of the introduction of e-Hospital on members of the multidisciplinary radiology team. Departmental reporting statistics were used in parallel to assess productivity changes.

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### P145 **Paperless radiology - the Warrington strategy**

[Gareth James](#)

*Warrington and Halton Hospitals NHS Foundation Trust*

This poster will document the processes put in place to identify and tackle the areas of clinical Radiology that use paper. Cost saving is the obvious benefit to going paperless, but the following principals guided the approach we adopted. Achieving one or more of these should be the driver for change:

- Safety - the new workflow must be at least as safe as the previous;
- Efficiency - the time the new method takes must not be significantly slower than the old one;
- Effectiveness - the ability to perform a task must not be hindered more using the new technique;
- Business Intelligence - ideally the new method should provide information we can analyse to improve services further.

We started out by mapping the entire patient journey and seeing which parts use paper, and why. We then created a trail for each of the types of paper, using the theory that you need to eliminate the dependency at the end before removing it from the beginning.

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### P146 **Short term planning - intimations of disaster**

[David Collier](#)

*Australian Institute of Radiography*

The paper considers the impact on the national health budget from a changing emphasis in service delivery. Using the Australian expenditure data where the average annual growth over the last decade of expenditure on health has been 5.1% but still the lowest growth the AIHW has recorded since the mid-1980s. Government health funding fell by 2.5% during a decade where overall government funding grew by 4.4%.



Private practice expenditure in contrast grew by 7.4%.

This informs the health professions that government funding on health is restricted - at the time when health usage is increasing as the result of the general population living longer.

In order to deliver more health care with less funding, the emphasis is on outsourcing (private practice) and faster turnaround in clinical places - earlier discharge in particular. Performance measures for private practices reward greater throughput.

Early discharge brings a measurable risk in the long term outcome of health care. The late and longer term effects of an incomplete recovery suggest that health expenditure for later remedial and chronic care will have a logarithmic effect on national health budgets.

The paper concludes with an analysis of the impact these later costs will have on the health budgets in 25-30 years' time; an impact which could largely be minimised through simple measures taken at the initial point of care, such as an extra day before discharge.

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#### **P147 Small time, big money? Proposed efficiency savings in MRI**

[Claire Brettle](#); [Katie Bayly](#)

*Great Western Hospitals NHS Foundation Trust*

With current financial pressures, it is essential to ensure that radiology services are optimised to reduce waiting times and hospital stays. A potential for savings and service improvement has been identified in Lumbar spine MRI for inpatients within this DGH.

It has been noted that a number of inpatients who are requested for Lumbar spine MRI will be recalled whilst in hospital for the rest of the spine to be imaged, thus using additional ward slots, increasing the total cost of the scan and potentially extending the patients hospital stay (and that of others waiting for scans).

It is proposed that the addition of a T2 weighted sagittal scan of the upper spine at initial presentation would negate the need for recall in this cohort of patients, which according to the national tariff could save up to £160 per patient for the scan alone.

An audit of 6 months data was undertaken to evaluate the number of patients affected and of the 91 lumbar spine examinations performed on inpatients in this period, 10 were recalled for upper spine imaging. In addition, 5 patients would have potentially required recall, but the examination was extended during the initial scan by either the radiographer or the radiologist.

Combined, this equates to 16.5% of the total number of inpatient Lumbar spines and it is therefore believed that potentially significant time and financial savings can be made. This audit is on-going, and with more data, a true picture of potential savings will be possible.

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#### **P148 Handover of patients during radiology on-calls at Heartlands Hospital - a re-audit**

[Madhuvanti Joshj](#); [Asiya Maheen Khan](#)<sup>1</sup>; [Shahid Hussain](#)<sup>1</sup>

*Heartlands Hospital - Heart of England NHS Trust*<sup>1</sup>

**Objectives:** According to RCR guidelines and local policies, a handover policy was introduced in the Radiology department to ensure continuity of care during the transition from day to out of hours on-call cover.

The consultant covering the afternoon in-patient CT was to let the registrar taking charge at 5pm know of any patients awaiting a scan or any scans pending a report.

**Methodology:** To assess compliance, a prospective re-audit was conducted in a large trust hospital spread across three sites over 10 consecutive working days.

After qualitative and quantitative analysis of data, the results were compared with a similar audit from May 2013.

**Results:** Only 20% compliance was recorded in this re-audit as compared to 60% in the initial audit.

There were unreported scans on 4 occasions, out of which one had a clinically significant event (PE).

**Discussion:** In addition to scans awaiting a report, referrals accepted before 5pm need to be handed over. Improved co-ordination between registrars, consultants and radiographers ensures no scan is missed. Interacting with consultants during handovers serve as a fertile learning opportunity for the registrars.

‘Nothing to handover’ is also an important handover.

End of shift call from registrar to consultant to complete the loop.

**Outcome:** The audit was well received at the local clinical governance meeting. A more robust handover policy is in place now; this was devised in consultation with all the members involved. A re-audit is expected in 6 months

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#### **P149 "Fast track" protocol - can we reduce referral times for patients with suspected lung malignancy?**

[Suzanne McLenachan](#); [John Murchison](#); [Gillian Ritchie](#)

*Department of Radiology, Royal Infirmary of Edinburgh*

**Introduction:** Lung cancer remains a significant public health concern. Referral guidelines recommend patients with suspected malignancy should be seen by a specialist within 2 weeks, and NHS Cancer Plan initiatives require commencement of treatment no more than 62 days from referral. Since 2011, the Royal Infirmary of Edinburgh (RIE) has operated a “Fast Track” service for GP-referred patients whose chest radiograph (CXR) is suspicious of lung malignancy. We aim to establish whether this service has reduced waiting times to computed tomography (CT) and specialist assessment, thus enabling timely diagnosis and treatment.

**Methods:** Patients with a new diagnosis of lung cancer following abnormal CXR were identified from lung cancer multidisciplinary team meeting records at the RIE between January and March 2012. Data regarding referral route and interval between initial CXR, CT and specialist respiratory assessment was obtained from electronic patient records (TRAK) and picture archiving and communication systems (PACS).

**Results:** 117 cases meeting inclusion criteria were identified. GP-referred patients investigated via the the “Fast Track” protocol (17%) underwent CT and respiratory assessment at 0.86 and 6.9 days respectively after CXR. Patients referred for CT from outpatient clinic waited 18.5 and 24.77 days respectively. Where GP’s arranged imaging, waiting times were 41.5 and 57 days.

**Discussion:** Radiology departments have an important role to play in helping to achieve referral targets. These results suggest that the “Fast Track” pathway could significantly reduce waiting times to CT scan and specialist assessment, supporting achievement of waiting time initiatives and reducing pressure on lung cancer clinics.

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#### **P151 Radiological perspective of the formation of pressure ulcers - a comparison of pressure and experience on two imaging surfaces**

[Charlie Everton](#)<sup>1</sup>; [Samantha Bird](#)<sup>1</sup>; [Wendy Brito](#)<sup>2</sup>; [Patricia Collé](#)<sup>3</sup>; [Andrew England](#)<sup>1</sup>; [Patricia Ana Franco](#)<sup>4</sup>; [Peter Hogg](#)<sup>1</sup>; [Sjors Lutjeber](#)<sup>3</sup>; [Kristin Nodeland](#)<sup>5</sup>; [Stéphane Rième](#)<sup>2</sup>; [Katy Szczepura](#)<sup>1</sup>; [Mahi Siddika](#)<sup>6</sup>; [Jo-anne Webb](#)<sup>1</sup>; [Seth Angmorther](#)<sup>1</sup>

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**Introduction:** Pressure ulcers are a high cost, high volume issue for health and medical care providers, affecting patients’ recovery and psychological wellbeing. The current research of pressure on support surfaces as a risk factor in the development of pressure ulcers is not relevant to the specialised, controlled environment of the radiological setting.

**Method:** 38 healthy participants aged 19-51 were positioned supine on two different imaging surfaces (X-ray Table & Mattressed Table). Interface pressure data was acquired using the XSENSOR pressure mapping over a time of 20



minutes, preceded by 6 minutes settling time to reduce measurement error. Qualitative data regarding participants' opinion of pain and comfort was recorded using a questionnaire. Data analysis was performed using SPSS 22.

**Results:** Data was collected from 30 participants aged 19 to 51 (mean 25.77, SD 7.72), BMI from 18.7 to 33.6 (mean 24.12, SD 3.29), for both imaging surfaces, following eight participant exclusions. Total average pressure, average pressure for jeopardy areas (head, sacrum & heels) and peak pressure for jeopardy areas were calculated as interface pressure in mmHg. Qualitative data showed that a significant difference ( $P < 0.05$ ) in experiences of pain and discomfort between the two surfaces. A significant difference is seen in average pressure between the two surfaces.

**Conclusion:** Pain and comfort data also show a significant difference between the surfaces. All findings support the proposal for further investigation into the effects of radiological surfaces and overlays as a risk factor for the formation of pressure ulcers.

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### P152 Accuracy of radiographer primary clinical evaluation of intraluminal pathology at computed tomography colonography

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*Taunton & Somerset NHS Foundation Trust<sup>1</sup>; University of Exeter<sup>2</sup>*

**Objective:** An audit was completed to determine the accuracy of a radiographer primary clinical evaluation of intraluminal pathology of computed tomography colonography.

**Design:** A retrospective audit using a validated audit tool was applied to a database of radiographer clinical evaluations to measure the accuracy against radiology reports, endoscopy and pathology findings.

**Method:** A database was designed to capture radiographer and radiologist reporting data. The radiographer's preliminary clinical evaluation of intraluminal pathology was given a score (PDS score) by the reporting radiologist based on the pathology present, the discrepancy between the preliminary clinical evaluation and the final report and the significance of that discrepancy on the clinical management of the patient. A one-way ANOVA was undertaken to assess for consistency in use of the audit tool by the radiologists. Accuracy of the radiographer primary clinical evaluation was assessed using percentage agreement and kappa scores. Significant discrepancies were compared against endoscopy and pathology reports.

**Results:** There was agreement with or an insignificant discrepancy between the radiographer primary evaluation and the final radiology report for 95.6% of cases. There was a significant discrepancy between findings in 2.7% of cases and a major discrepancy recorded for 0.3% of cases.

**Conclusion:** With suitable training radiographer primary clinical evaluation of intraluminal pathology of computed tomography colonography is accurate enough to provide a valuable contribution to decision making during the procedure and to support a double read reporting service.

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### P153 Feasibility study of a cost effective method for needle tracking

[Marc Edwards](#); [Nigel W John](#)

*Bangor University*

We present a feasibility study for using a cost effective 6 degree of freedom (6DOF) sensor to track a needle in vitro to assist with ultrasound guided interventional procedures. Such procedures are complicated by difficulties in visualising the needle and seeing its deflection thereby making it hard to avoid puncturing nearby blood vessels or organs. Needle tracking technologies exist and use either markers placed onto the needle for optical tracking, such as in ventricular puncture training, or an electromagnetic sensor that requires an electromagnetic field generator placed nearby.

Both technologies are on sale but cost thousands of pounds and have their weaknesses; needle markers have to be placed exactly for registration by cameras and electrical devices can interfere with electromagnetic sensors. The low cost 6DOF sensor (ca £5) are commonly used in drones (such as quad-copters) to keep them steady during flights contain an accelerometer and gyroscope that measure displacement and rotation, respectively.





The challenge in using this technology for needle tracking is twofold; (i) to house the 6DOF sensor onto the needle; (ii) to combine and filter measurements from the accelerometer and gyroscope. The feasibility study is currently assessing the accuracy of the measured displacement of the needle from 1D to 3D and in vitro using sheep liver. Future work will be to effectively house and protect the sensor assembly so that it can be sterilised and used without affecting the surgeons 'feel' of the procedure.

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#### **P154 RadAlert: Review of local practice**

[Mohammed Nabi](#); [Maruti Kumaran](#)

*Nottingham University Hospitals NHS Trust*

**Background:** RadAlert is a system designed to prevent urgent reports being lost or delayed once identified by the reporting clinician.

**Aim:** To determine our compliance in the use of the local RadAlert policy for reporting urgent abnormalities found on imaging studies.

**Methods:** A retrospective review of the RadAlert e-mails sent to acute medicine specialties in May 2014. The period between the report and emailing RadAlert team was analysed. We also looked at the email subject and content sent by the reporters and the email content used by the RadAlert team when they emailed the clinical team. Our findings were compared with the local RadAlert policy.

**Results:** Out of the total 51 cases analysed, 45 emails were sent to the RadAlert team within 24 hours. Only one of the reporters used the email subject 'RADALERT' and two of them mentioned all the 5 items of the template recommended by the RadAlert policy. The RadAlert Team used the same template and included all the items mentioned by the policy in all the cases.

**Conclusion:** 100% satisfaction with the performance of the RadAlert team. Although 88% of the cases were notified to the RadAlert team by email within 24 hours, our target should be 100%. Improvement is also needed from the reporters in writing the email subject and template recommended by the local policy when sending an email notification to the RadAlert team.

**Recommendations:** To distribute the results of this audit to all of the NUH radiology reporters and re-audit after 6 months.

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#### **P155 Patient obesity and the practical experience of the medical imaging professional: an interpretative phenomenological analysis**

[Amanda Woods](#); [Charles Sloane](#); [Paul Miller](#)

*University of Cumbria*

**Aims:** The purpose of this study was to discover the issues and problems that diagnostic imaging professionals encounter when imaging bariatric patients.

**Method:** A qualitative methodological approach was utilised which involved interviewing 8 clinical radiographers with experience ranging from 5 to 35 years. Five of the participants were active reporting radiographers. The subjects were involved in both the acquisition and interpretation of plain radiographic images. The interviews were analysed via Interpretative Phenomenological Analysis which generated a series of key themes which highlighted significant challenges faced by imaging staff when imaging the bariatric patient.

**Outcomes:** Four superordinate themes were identified which were: Communication issues, practical problems associated with image acquisition, technical difficulties related to equipment and issues related to effective diagnosis.

**Discussion:** The paper discusses the implications of the results for education, further research and the dissemination of best practice. Issues related to suboptimal image quality, embarrassment issues for both patients and staff and challenges related to safe manual handling.



**Conclusion:** The author will present a series of recommendations e.g. the dissemination of good practice and identify areas of further research such as the need to consult patients in relation to the most appropriate method of discussing potentially sensitive or embarrassing issues related to the practical conduct of imaging procedures.

## Professional training and education

### P156 Completion of imaging request forms at a private hospital: Do referrers take it for granted?

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*Cromwell Hospital, London*

**Background:** Private hospitals may be less inclined to reject inadequately completed imaging request forms due to the income-generating potential of radiological investigations. Consequently, referrers may be less motivated to fill in all necessary items on their requests. Instead, the onus is on Radiology staff to contact referrers for further information rather than returning incomplete requests. This reduces efficiency and may lead to errors. We audited the compliance of referrers to local and RCR standards in their completion of request forms at a private hospital.

**Methods:** Request forms received by our Radiology Department on two separate days in October 2014 were audited. For each form, the presence or absence of key items relevant to an investigation was recorded. For all items, the target was 100% compliance.

**Results:** There were 103 request forms. The modalities were: plain film (42%), ultrasound (25%), CT (15%) and MRI (18%). Excellent compliance (100%) was achieved for patient demographics and names of referrers. There was satisfactory compliance for provision of relevant background information (85.4%) and clinical question (82.5%). However, information on allergies (1.2%), infection risk (0%), contrast safety (33.3%), MRI contraindications (57.9%) and breast-feeding/pregnancy (40.9%) was poorly provided.

**Conclusion:** There is room for improvement. Plans are in place to increase awareness, including amongst resident medical officers who are frequently delegated to perform this task. There is also a drive to empower ward nurses to ensure compliance and to complete certain items, such as patients' MRSA status, given their better knowledge. A future re-audit will hopefully demonstrate positive changes in practice.

### P157 i Refer or i just Refer!

[Matthew Jones](#); [Andy Beale](#)

*Great Western Hospital*

**Objectives:** To see if GPs are aware of and use the iRefer guidelines.

**Method:** A questionnaire was sent out to GPs working in North Somerset, Bristol and South Gloucestershire CCGs to try and ascertain the local knowledge and use of the iRefer guidelines.

**Relevance:** Primary Care provider referral rates to Secondary Care are under increasing scrutiny. This, along with access to online point-and-click requesting platforms such as the Integrated Clinical Environment (ICE) is likely to increase direct requests to diagnostic services from Primary Care.

The RCR has published online guidelines to facilitate best use of clinical radiology services - the iRefer Guidelines.

**Outcomes:** The majority of GPs are either unaware of the existence of the iRefer guidelines, did not know how to access them or did not use them. Some GPs are aware of older resources designed to help make use of clinical radiology services.

**Discussion:** Clinical radiology is becoming more sophisticated and is increasingly in demand. It is imperative that this resource is used in the most effective way to avoid unnecessary (and potentially harmful) tests and indirectly harm those whose tests have been delayed as a result. The iRefer guidelines provide an easily updatable, agile resource and its existence should be more widely publicised. This poster will demonstrate the limited awareness of iRefer by GPs working in a small geographical area, and, if extrapolated, provide an indication of the limited degree to which