

**Method:** Following University ethical approval, 3rd year BSc and 1st year MSc Diagnostic Radiography students were recruited and randomly assigned to intervention or non-intervention groups, split equally amongst 30 participants. The students completed a questionnaire on their knowledge of BA and were shown a video about using RadiAnt DICOM viewer software. The intervention group were shown an additional video on how to measure BA. All participants measured BA on 14 lateral ankle radiographs, 6 containing calcaneal fractures, 4 were 'normal', 4 images were repeated. Two qualified radiographer's measurements were considered the 'gold standard'.

**Results:** There was a statistically significant difference ( $p < 0.001$ ) between the intervention group's average angle (23.3) compared to the non-intervention group (42.6). Similarly, there was a statistically significant difference ( $p < 0.001$ ) of the mean difference to the gold-standard for the intervention group (3.1) compared to non-intervention (20.9).

**Conclusion:** The significant inaccuracies within the non-intervention group indicate that students require more training on measuring BA. The Diagnostic Radiography curriculum should include dedicated teaching sessions on measuring radiographic angles to prepare students for creating PCEs once qualified.



## SERVICE DELIVERY AND INNOVATION POSTER PRESENTATIONS

### P160 The HCPC standards of proficiency are changing -- what does this mean in practice?

*Christine Heales; Lucy Banfield; Demelza Green; Jenny Shepherd*

*University of Exeter*

**Background:** In order to be eligible to apply for registration with the Health and Care Professions Council (HCPC) upon graduation, programmes that are undertaken by radiography students and degree apprentices must be approved by the HCPC. To gain approval education providers need to demonstrate how they fulfil the HCPC's Standards of Education and Training [1]. This includes demonstrating that successful graduates applying for entry onto the HCPC register have met the Standards of Proficiency for their chosen profession.

**Purpose:** The Standards of Proficiency (SoPs) for diagnostic radiography will change for all new learners commencing programmes on or after the 1st September 2023 [2]. The change in emphasis within the SoPs will require a broader range of clinical skills to be developed [3]. The purpose of this poster is to outline the changes and discuss the opportunities presented for meeting current and future workforce needs. It will also seek to raise understanding of how and why education providers design the clinical elements of their programmes in the way they do i.e. to align with the SoPs.

**Summary of content:** The poster will summarise key differences between the current and incoming SoPs for diagnostic radiography, with an increased emphasis on cross-sectional imaging being of note. It will highlight how changes in key terminology can create flexibility in how the SoPs are interpreted by education providers and clinical departments leading to a more readily adaptable workforce. Challenges and potential tensions arising from the changes will also be outlined.

1. <https://www.hcpc-uk.org/resources/standards/standards-of-education-and-training/> (Accessed 7th December 2022)

2. <https://www.hcpc-uk.org/news-and-events/news/2022/sop-revisions-aug-2022/> (Accessed 7th December 2022)

3. <https://www.hcpc-uk.org/globalassets/standards/standards-of-proficiency/reviewing/radiographers---new-standards.pdf> (Accessed 7th December 2022)

### P161 Quality standard for imaging in the independent healthcare sector

*James Mico*

*Practice Plus Group*

The Quality Standard for Imaging (QSI) is a framework to "help diagnostic imaging services ensure their patients consistently receive high quality services, delivered by competent staff working in safe environments" UKAS (2023). As an independent healthcare provider this e-poster highlights the differences in approach and the growing support

options available for independent providers. As more independent providers of imaging services push for QSI accreditation to support their quality improvements, safety and patient experience, this poster intends to signpost the resources, knowledge and networks connections that can aid growth. We hope to support the spread of QSI in the independent healthcare imaging sector. We aim to highlight available resources from independent providers when starting the QSI journey to accreditation. The poster also demonstrates the overlap and resources available from sources such as the Future NHS website and the wealth of knowledge on tap supported by the RCR, SOR, NHS and UKAS. The e-poster hopes to convey our journey as an independent healthcare imaging service. The poster will identify the similarities, differences and unique challenges when working through the stages as an independent healthcare service. How we started the conversation and gained support for QSI both with the company board, but also with the staff across the business. The business case and how independent funding can differ. Working through the gap analysis and the tools, resources and lessons learned. The action planning and service deployment stage as well as building the quality manual, to support the application stage for accreditation.

1. FUTURE NHS Collaboration Platform (2023) NHS Choices. NHS. Available at: <https://future.nhs.uk/QSINetworking> (Accessed: February 10, 2023).
2. Quality Standard for Imaging (QSI) accreditation (2022) UKAS. Available at: <https://www.ukas.com/accreditation/standards/qquality-standard-imaging/> (Accessed: February 10, 2023).
3. The Quality Standard for imaging (QSI) process (no date) The Quality Standard for Imaging (QSI) process | The Royal College of Radiologists. Available at: <https://www.rcr.ac.uk/clinical-radiology/service-delivery/quality-standard-imaging-qsi/quality-standard-imaging-qsi> (Accessed: February 10, 2023)

## **P162 Development of new MRI protocol for peritoneal surface malignancies, detecting previously underestimated disease and reducing the need for laparoscopies**

*Sarah O'Connell; Rohit Kochhar; Michelle Johnson*

*The Christie NHS Foundation Trust*

**Background:** Peritoneal surface malignancies are a range of diseases involving the peritoneum. Surgical cytoreduction and heated intraperitoneal chemotherapy (HIPEC) are standard management for treatment.<sup>1</sup> Surgery is complex, lengthy and not all patients are suitable. Decision making and planning is based on disease burden and distribution.<sup>2</sup> Historically CT and PET CT have been used to measure disease but have a limited ability to detect small volume disease. This results in an underestimation of disease, potentially leading to unnecessary surgery in patients whose tumours are too extensive to be adequately cytoreduced. Gadolinium enhanced MRI has a sensitivity for depicting peritoneal tumours <1cm of 85-90% compared to 22-33% for CT. <sup>3</sup>

**Method:** A literature review was conducted on the use of negative contrast agents in gastrointestinal imaging. Experiments on the MRI scanner using phantoms tested the efficacy of diamagnetic contrast agents. New scan sequences were developed by the clinical specialist radiographers and tested on volunteers. A final protocol was approved and shared with the colorectal MDT.

**Results:** 75 scans were performed in 12 months. The new protocol drastically reduced the need for additional liver and pelvic imaging, saving the equivalent of 21 scanner days.

**Conclusion:** The new protocol was found to detect disease below the resolution of PET CT and CT and patients are no longer exposed to ionising radiation. It reduced the need for laparoscopic surgeries and avoided major surgery in patients not suitable for cytoreduction, enabling MDTs to plan more affectively and ensuring the right surgical specialities are involved.

1. National Institute of Clinical Excellence Published March 2021 [www.nice.org.uk](http://www.nice.org.uk) Cytoreduction surgery with hyperthermic intraoperative peritoneal chemotherapy for peritoneal carcinomatosis. Interventional Procedures Guidance (IP688) (accessed 20 Nov 2022)
2. Sugarbaker PH and Jablonski KA (1995) Prognostic features of 51 colorectal and 130 appendiceal cancer patients with peritoneal carcinomatosis treated by cytoreductive surgery and intraperitoneal chemotherapy. *Ann Surg.* Feb; 221(2): 124–132.
3. Low, RN (2016) Preoperative and surveillance MR imaging of patients undergoing cytoreductive surgery and heated intraperitoneal chemotherapy *Journal of Gastrointestinal Oncology* 7 1:58-71

**P164 Evaluation of resource allocation for reactive adaptation pathway**

*Kirsty Farnan; Ashley Lambert; Kirsty Muir; Damian Parr*

*NHS Tayside*

**Background:** Deformable image registration (DIR) offers additional information in decision making regarding re-active adaptation of a treatment plan, with no additional dose where there is a daily volumetric imaging protocol (The Royal College of Radiologists, 2021). This route aims to ensure only those requiring re-plans have additional CT scans. Therapeutic radiographers, medical physicists and the oncologist are required. The resource implications are less than those associated with a query re-plan route via an additional CT alone. Evaluating impact on resource allocation is useful.

**Method:** A review was performed of dosimetric assessments requested on CBCT's for thoracic lung patients. A total of 34 cases were identified for analysis. The data captured included treatment site, reason for request, quality of the dosimetric assessment, and resultant decision.

**Results:** In 32% of cases a re-CT was requested with 29% resulting in a re-plan. A reduction in 68% of additional CT scans was seen due to the use of DIR. This equates to approximately 3 days on CT, and although harder to quantify similarly impactful for resources required for tasks associated with importing and contouring 4DCT's.

**Conclusion:** DIR offers a means of reducing additional dose to patients when evaluating the need to replan. The value of DIR is seen in not only reduction in additional dose to the patient but also the Radiotherapy resource implications overall. The next step of evaluating the pathway will be to review the data to indicate if any further guidance can be given for decision making regarding requesting a DIR.

1. The Royal College of Radiologists. (2021) *On target 2: updated guidance for image-guided radiotherapy*. London: The Royal College of Radiologists.

**P165 Radiographer led administration of beta-blocker and gtn for ct coronary angiography: mobile ct**

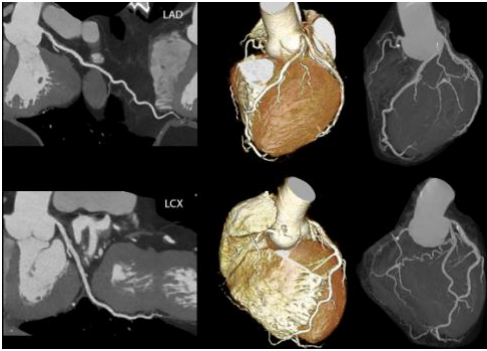
*Aoife Murphy; Rachael Mullen; Emma Cheasty*

*Medneo*

**Background:** Coronary Computed Tomography Angiography (CCTA) is increasingly used as a non-invasive technique to assess the coronary blood vessels for a variety of cardiac diseases including coronary artery disease. In order to achieve high spatial resolution images at low radiation doses, ECG gating is utilised and requires patients to have a low and regular heart rate. Administration of beta-blockers including IV Metoprolol reduces heart rate, reduces heart rate variability and reduces ectopic activity. Coronary artery vasodilation to aid the assessment of vessel stenosis is achieved by administering sublingual Glyceryl Trinitrate (GTN) spray.

**Purpose:** Administration of controlled drugs, deciding on acquisition protocol and image assessment usually require direct and time-consuming supervision by a radiologist or cardiologist. Hence, in order to reduce strain on stretched resources our independent mobile diagnostic imaging company trained CT radiographers to administer IV metoprolol and GTN spray to undertake CCTA examinations independently, whilst acquiring scans using industry leading one-beat, whole-heart acquisition AI assisted CT scanning fleet.

**Summary:** With a reported 30% shortfall of consultant radiologists in England, direct supervision of Cardiac CT list's is an obstacle to providing timely cardiac CT examinations. However, by maximising the potential of highly trained cardiac CT staff, we can contribute significantly to imaging departments productivity whilst providing safe, effective patient care and high quality images for diagnosis. Further benefits include a streamlined patient pathway resulting in reduced waiting times for patients, cost saving mechanisms for imaging departments as radiologists have greater time to focus on other work and valuable career progression for radiographers.



1. National Institute for Health and Care Excellence (NICE) (2016) Recent-onset chest pain of suspected cardiac origin: assessment and diagnosis. CG95. Available at: <https://www.nice.org.uk/guidance/cg95/chapter/Recommendations>
2. Reid, K., Rout, J., Brown, R., Forton, M.B., Crawford, M.J., Bennie, J.J., Curtin (2016) Radiographer advanced practice in computed tomography coronary angiography: Making it happen, *Radiography*, 22, 319-326. Available at: <https://doi.org/10.1016/j.radi.2016.03.006>
3. Royal College of Radiologists (RCR) (2014) Standards of practice of computed tomography coronary angiography (CTCA) in adult patients. Available at: <https://www.rcr.ac.uk/publication/standards-practice-computed-tomography-coronary-angiography-ctca-adult-patients>

## **P166 Capacity utilisation and flow improvement within a ct department of a district general hospital**

Jasmine Turner

*Maidstone and Tunbridge Wells NHS Trust*

An audit was completed which demonstrated an under utilisation and poor flow of four CT scanners across two sites of a district general hospital. Long lead times, outsourcing at significant cost, inpatient delays, a lack of understanding of demand, activity and capacity was resulting in poor utilisation and staff feeling fatigued and demoralised with constant demands on their time. GANTT charts were created from the cycle time data that was collected and all staff were encouraged to complete an analysis of where they thought the issues were. Late starts, portering issues, long cycle times and patient cancellations were identified as some of the issues. Outsourcing was costing the trust £325k per annum with a DNA rate of 20% and scanners left empty at a cost of £400 per hour. Through engagement with stakeholders, we were able to eliminate all outsourcing, separate acute and elective pathways as per the Richards Review, have a dedicated porter, train all RDAs to cannulate, adjusted cycle times, removal of some carve out, allow all appointments to be made by phone, cross site vetting and booking, increase of clerical support and introduction of POCT. This resulted in, better outcomes and experiences for both in and out patients, improved relationships with key stakeholders and improved morale for staff. Poster to include GANTT charts, vitals charts, issues, actions, findings and outcomes.

## **P167 Acoustic times or "scan you believe it!" A quality publication. Ultrasound governance and communicating standards during a pandemic**

Helen Brown

*Shrewsbury and Telford Hospital NHS Trust*

**Background:** Introducing new governance processes into a multi-site ultrasound department during a pandemic required re-thinking of current models of communication. Clear communication is vital when introducing governance processes such as peer review audit into a department, to ensure staff are not threatened by the processes and are able to use it as a learning opportunity to shape their practice and development, thereby improving patient safety.

**Purpose:** To explain the changes and processes, a monthly newsletter "Acoustic Times" was introduced, giving the opportunity to provide the evidence base and links to national guidance in an accessible format. Peer review audit and learning meetings were introduced and held virtually across sites to identify and share any individual or group learning points.

**Summary of content:** The presentation will give a plan of adopted processes and how documentation was introduced, with supporting rationale and evidence provided for staff through the newsletter including; evidence based protocols,

process of standard setting, peer review audit including supporting learning outcomes and CPD; actionable reporting; preceptorship; service user feedback and equipment QA. It covers, further supported learning on, critical reflection, specific focus on technical aspects of clinical examinations, sharing of external learning events, CPD and in-house ultrasound training. The benefits of the newsletter are shared including focus on improving consistency of practice and setting standards; faster reporting of audit findings and reaudits; and improved engagement with consultant colleagues. It also provides an accessible record of the development of governance processes which has been shared with sonographers in other organisations.

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**P168 CT CTA time intervals within a supraregional stroke thrombectomy network**

*Marco Mancuso-Marcello; Christos Nikola; Tom Jia; Oliver Spooner; Paul Bhogal*

*Barts Health NHS Trust*

**Background:** Mechanical thrombectomy (MT) is the gold standard of care for patients suffering an acute ischaemic stroke (AIS) secondary to a large vessel occlusion (LVO). Decision making for MT requires a non-contrast CT (NCCT) head and CT Angiogram (CTA). As a comprehensive stroke centre (CSC) we sought to determine the NCCT and CTA time interval within our referral network of Acute Stroke Centres (ASC).

**Methods:** We performed a retrospective review of the first 100 patients transferred to our CSC for a MT procedure in 2022. We recorded the time of the NCCT and CTA at the referring hospital. Patients were sub-divided into two cohorts: Group 1: NCCT and CTA performed at the same sitting, defined as the interval time being 10 minutes, Group 2: NCCT and CTA performed separately, defined as the interval time being 10 minutes.

**Results:** Of the 100 patients sequential patients 60% were female and the median age was 74yrs (range 18-95). 10 patients had incomplete reports with NCCT and/or CTA times missing. Of the remaining 90 patients, there were 51 patients (57%) in Group 1 with an average interval time of 33 minutes. In Group 2, the 39 patients (43%), had an average interval time of 4836 minutes.

**Conclusion:** In over 40% of our sample there was a significant delay between the NCCT and CTA. Imaging pathways and process times in ASCs should be reviewed and optimised to conform to the National Optimised Stroke Imaging Pathway (NOSIP) guidelines.

1. NHS England (2021) National stroke service model.

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**P169 Mri protocol for imaging of pancreatic cystic lesions in oncology**

*Jennifer Newman<sup>1</sup>; Sadiq Usman<sup>2</sup>*

*<sup>1</sup>Royal Marsden Hospital; <sup>2</sup>The Royal Marsden Hospital*

**Background:** Pancreatic cystic lesions (PCL) are a common pathology which have a rising detection rate(1). Due to MRI's excellent soft tissue resolution, it is imaging modality of choice for aiding diagnosis and characterisation of PCL(1,2). There are several published protocols for imaging pancreatic cystic lesions (PCL), however there is no consensus on one standard MRI protocol for diagnosis or surveillance of PCL. While there is no standard protocol the available literature agrees on the following sequences: T2-weighted ultrafast spin echo (T2-TSE), T1-weighted fat-saturation pre-contrast, diffusion-weighted imaging (DWI), contrast enhanced T1-weighted fat-saturation and MR Cholangiopancreatography(2,3). There is an increasing interest in developing an abbreviated MRI of the pancreas (A-MRI) protocol for surveillance of patients with PCL.

**Purpose:** This poster will explore current practice in MRI pancreas imaging and highlight the need for an abbreviated protocol as the demands for MRI services is ever-increasing.

**Summary of content:** Patient preparation for MRI of PCL and typical imaging features of common PCL in oncology will be outlined. The rationale behind a pancreatic protocol will be explored and the potential for implementing an abbreviated protocol (A-MRI protocol).

1. Al Ansari, N., Ramalho, M., Semelka, R. C., Buonocore, V., Gigli, S., & Maccioni, F. (2015). Role of magnetic resonance imaging in the detection and characterization of solid pancreatic nodules: An update. *World Journal of Radiology*, 7(11), 361. 2. European evidence-based guidelines on pancreatic cystic neoplasms. (2018). The European Study Group on Cystic Tumours of the Pancreas. *Gut*, 67, 789-804. 3. Hill, D. V., & Tirkes, T. (2020). Advanced MR imaging of the pancreas. *Magnetic Resonance Imaging Clinics*, 28(3), 353-367.

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**P170 Measuring utilisation of CT scanners within an acute trust**

*Richard Flood<sup>1</sup>; Lesley Wright<sup>2</sup>*

*<sup>1</sup>Maidstone and Tunbridge Wells NHS Trust; <sup>2</sup>Kent and Medway Imaging Network*

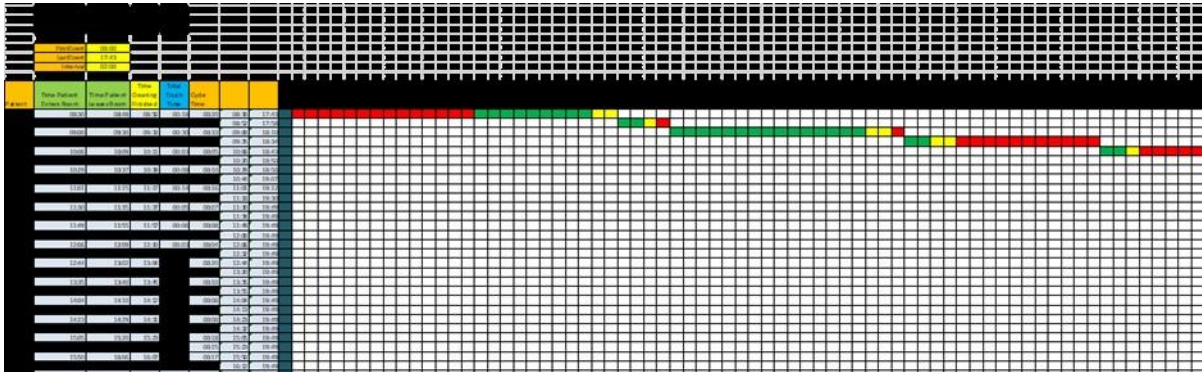
The Getting It Right First Time (GIRFT) in Radiology report recommended that Radiology departments look at opportunities to increase capacity from within existing resources and examine ways that Trusts may be able to manage demand more effectively, to improve its service to patients. The utilisation of the available CT scanner time was between 38% and 91% because:

Appointment slots were longer than the measured cycle-times.

Patients were booked at 2 weeks or 6 weeks even if there was an appointment available sooner.

The first patients were booked to arrive well after the scanner was open.

There were delays waiting for porters to bring patients from the wards.



| Scanner M8                 | 08/06/2021        | 09/06/2021        | 10/06/2021        | 11/06/2021        | 12/06/2021        |
|----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Load                       | 07:10             | 07:17             | 08:38             | 08:53             | 08:34             |
| Operational Hours          | 12:00             | 12:00             | 12:00             | 12:00             | 12:00             |
| Number of Patients         | 36                | 35                | 38                | 34                | 42                |
| % Utilisation              | 60%               | 61%               | 72%               | 74%               | 71%               |
| Operating Hours / Activity | one every 20 mins | one every 20 mins | one every 19 mins | one every 21 mins | one every 17 mins |

This was a large piece of work to address the important question is there sufficient CT time-capacity to match the CT demand the trust is requested to do. The findings have shown:

There is already more than enough CT time-capacity. Eradicating the need to outsource CT service and cancelled the private mobile CT scanner contract driving a £700K cost saving.

The relatively low CT utilisation looks to be the effect of policies that fall within the circle of influence of the Trust. The trust has a dedicated portering service to ensure acute patient flow, therefore inpatients are accessing the service quicker.

The efficiencies seen have reduced waiting times, improved target yields December 2022 the trust DMO1 position was 3 patients over 6 ww with a WL performance metric of 0.2% compared with a regional performance of 18.3%.

1. Halliday K, et al. Radiology GIRFT Programme National Specialty Report November 2020 <https://www.gettingitrightfirsttime.co.uk/wp-content/uploads/2020/11/GIRFT-radiology-report.pdf> 2. Richards M. Diagnostics: recovery and renewal. NHS England. November 2020

**P171 I can't get no, satisfaction: What satisfies our patients in magnetic resonance imaging?**

*Darren Hudson<sup>1</sup>; Ruth Evans MBE<sup>2</sup>*

*<sup>1</sup>InHealth; <sup>2</sup>The Patient Experience Network*

**Background:** Patient experience is an essential component of high-quality care, often measured through the satisfaction of patients. This service evaluation draws on a model from customer service to help better understand patient expectations and what matters to them most when attending for MRI. This will help identify how different areas influence satisfaction, which in turn could help services improve their patient experience.

**Methods:** Previous service users who had agreed to be contacted further, were emailed an online survey. The survey was based on Kano's model of customer satisfaction and aimed at identifying which, of 28 attributes as part of undergoing an MRI scan, might be considered of most importance to patient satisfaction, and thereby their experience.

**Results:** 615 patients responded to the survey, with the majority aged 55-74years and having had an MRI before. Based on responses, each attribute was classified according to Kano's model. Classification of the attributes show how those deemed 'functional' in nature have more potential to dissatisfy if not present, whereas those considered 'relational' are thought to have more of an influence over enhancing satisfaction.

**Conclusion:** The importance of relational aspects focused on communication and ensuring patients are fully informed were highlighted as drivers for improving satisfaction within MRI. Therefore, whilst it is essential that the fundamental components of a service are in place, services should then turn their attention to addressing any gaps to help provide what matters most to many patients, thereby helping to improve their experience.

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**P172 Are you being served? - how service animals could help improve the patient experience**

*Darren Hudson<sup>1</sup>; Ruth Evans MBE<sup>2</sup>*

*<sup>1</sup>InHealth; <sup>2</sup>The Patient Experience Network*

**Background:** Patient experience is an integral part of high-quality care, equal to clinical effectiveness and safety, with clear evidence that it directly impacts on patient outcomes. In the context of MRI, this could relate to whether a patient manages to complete a scan, or whether quality is compromised due to movement or shortened scan times due to anxiety related to the nature of examination. This in turn impacts on accuracy of diagnosis and onward treatment, as well as how they view any further imaging that may be required or even wider engagement with health services in general.

**Purpose:** An integral element of patient experience and delivery of person centred care is communication and interaction with members of the clinical imaging teams. Being able to establish rapid rapport is an important skill, through which this connection helps build trust that in turn reduces anxiety, supports patient compliance and leads to a more positive experience. One such communication tool that is being used to support staff training is Service Animals(TM). Based on the work of Carl Jung, this tool explains how individuals are most likely to interact with others, particularly in a service situation, such as engaging with patients. Service Animals(TM) looks at behaviours and habits that have developed over time to provide an assessment of these across six dimensions, resulting in a classification based on four defined styles. Thereby helping to identify strengths and weakness to support more effective communication.

**Summary of content:** The Service Animals(TM) model will be presented along with application in practice.

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**P173 Managing claustrophobia in magnetic resonance imaging**

*Olanrewaju Lawal<sup>1</sup>; Philp Regelous<sup>1</sup>; David Omiyi<sup>2</sup>*

*<sup>1</sup>University of Hertfordshire; <sup>2</sup>Univeristy of Bradford*

**Introduction:** A common challenge with using magnetic resonance imaging (MRI) is the claustrophobia some patients experience during the examination. Several interventions have been developed and used to help support patients with claustrophobia. Evidence shows that MRI radiographers believe that supportive instruction is the most effective method of supporting these patients 1,2. The supportive instruction is an elaborate explanation of the MRI

examination, and what the patient needs to do during the examination. One of the studies reports that the radiographers' level of education and years of experience affects their ability to use supportive instructions to support patients 1. This research aims to develop a consistent structured approach for applying supportive instructions to help claustrophobic patients during MRI examinations.

**Methods:** The MRI radiographers and the individuals who have previously complained of claustrophobia during the MRI examination constitute the research participants. These individuals are recruited through print Newspaper advertisements and social media platforms (the authors' LinkedIn and various professional WhatsApp groups). Ethical approval was obtained from the University of Hertfordshire Research Ethics Committee. Two focus group discussions are used to explore the views of the MRI radiographers and the patients with a history of claustrophobia separately. The thematic analysis approach is used to develop relevant categories, themes and subthemes from the data.

**The implication to practice:** This study will further help radiographers understand the experience of patients with claustrophobia during MRI examination. Structured guidance would be provided to ensure supportive instruction is consistently and effectively used in clinical practice.

1. Al-Shemmari AF, Herbland A, Akudjedu TN, Lawal O. Radiographer's confidence in managing patients with claustrophobia during magnetic resonance imaging. *Radiography*. 2022 Feb 1;28(1):148-53. 2. Hudson DM, Heales C, Vine SJ. Radiographer Perspectives on current occurrence and management of claustrophobia in MRI. *Radiography*. 2022 Feb 1;28(1):154-61.

#### **P174 Patients previously contraindicated for MRI now scanned following introduction of radiographer led service for performing setting checks on programmable shunts**

*Sandra Towers; Antony Birtwistle*

*The Christie NHS Foundation Trust*

**Background:** Programmable shunts provide better neurological outcomes for brain tumour patients with a build up of cerebrospinal fluid, compared to shunts with a fixed pressure setting (1). However their settings can be affected in the MRI environment and need to be checked before and after scanning by a neurosurgeon. For sites that do not have neurosurgical support, the presence of a programmable shunt is a contraindication for patients that need to undergo MRI. As a specialist oncology centre with no direct access to neurosurgeons, radiographers undertook training to perform the required checks enabling patients to be scanned.

**Purpose:** This service development has provided a more streamlined pathway, eliminating unnecessary delays to treatment, alleviating stress to patients (2) and providing much better continuity of care (3). The process involved collaboration between radiographers, physicists, neurosurgeons and manufacturers to allow standardised procedures and guidelines to be developed. This approach could be replicated and successfully adopted at other sites.

**Summary of content:** Poster outlines in detail the process from the initial problem through to the successful implementation of the service development and its full impact on patients, clinicians and radiographers. Headings include: background, method, evaluation and impact.

1. Li, M, Wang, H, Ouyang, Yim, M, Yin, X. (2017) Efficacy and safety of programmable shunt valves for hydrocephalus: A meta-analysis *International Journal of Surgery PV (programmable valve) treatment is safe and may reduce the revision rate and over- or under-drainage complication rate, especially in patients aged less than 18 years with hydrocephalus.* 2. Thompson CA, Charlson ME, Schenkein E, et al. (2010) Surveillance CT scans are a source of anxiety and fear of recurrence in long-term lymphoma survivors. *Ann Oncol.* 21(11):2262–2266 3. Stefania, R et al (2021) Do oncologists prefer sub-speciality radiology reports? A quality care study. *Insights into imaging* <http://insightsimaging.springeropen.com/articles>

#### **P175 Building Medical Engagement in Imaging Networks**

*Ruth Williamson; Charles Peebles; Mary So; Jane Hayward*

*University Hospitals Dorset*

**Background:** Imaging networks were formed in 2022 1 to improve patient care through alignment of process, sharing of resources and better use of technology. Medical engagement is a key enabler particularly around the aspirations of shared reporting and optimising workforce with a hybrid home and on site model.

**Purpose:** This study describes our regional experience in building medical engagement. The methodologies which have been most effective and those which required a revision of approach. Within this we describe engagement around radiologist training, subspecialty working and building understanding of how the networks are currently



configured as well as sharing risks and opportunities. By taking a subspecialty based face to face approach a rich understanding of key problems and possible solutions has been generated. Key indicators of success are ensuring that all trusts in the network are represented and that colleagues are allowed sufficient time to explore and understand what the network means to the current position and how they might influence future developments.

**Conclusion:** Medical engagement is a significant enabler of network development. Working in carefully supported subspecialty groups with a focus on identifying and co creating possible solutions to emergent issues has been the most effective tool to date in involving the wider workforce.

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#### **P176 The implementation of mobile CT CDCs across an NHS trust partnership**

[Lauren Matthews](#)

*Humber and North Yorkshire NHS Mobile CDC Service*

**Background:** CDCs are community diagnostic centres developed to improve the patient experience by bringing healthcare to the community, ensuring an accessible and efficient patient journey. As a recommendation of the Richard's report (2020)(1), these services aim to corroborate and improve current healthcare, remaining at the forefront of innovation within the NHS. A partnership was formed between three trusts across North Yorkshire and the Humber with a united vision to reduce patient waiting lists and improve population health outcomes by taking the concept and implementing it within a mobile imaging context.

**Purpose:** From the design process of the CT CDC unit to having a fully functional mobile CT CDC operating across three NHS trusts, the application of CT CDCs has presented both inordinate benefits and challenges, with several learning points throughout. The amalgamation of mobile CT scanning into the NHS as a core provider has enabled radiographers to develop new skills, increasing job satisfaction and promoting autonomy within the radiography profession. Patient feedback indicates a preference of scanning on the mobile CT CDC units resultant of reduced appointment waiting times and accessibility. The mobile nature of the service has enabled targeted diagnostic services in the most necessary locations within each trust at the time of service rotation.

**Summary of content:** The success of the service is down to the hard work and determination of individuals involved throughout the implementation process. The expansion of the service is imminent and we look forward to further success implementing future CDCs across the partnership.

1. Richards, M. (2020). Diagnostics: recovery and renewal. NHS England, PAR242, pp.8–47.

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#### **P177 Imaging networks -- Turning the dial on the maturity matrix**

[Ruth Williamson](#); [Charles Peebles](#); [Mary So](#); [Jane Hayward](#)

*University Hospitals Dorset*

**Background:** Imaging networks were formed in 20221 to bring together transformation of imaging to improve patient care through alignment of process, sharing of resources and better use of technology. The delivery of the networks is informed by a complex maturity matrix with key waypoints identified as markers of project success.

**Purpose:** This presentation describes our network's progress along the maturity matrix highlighting areas where progress has been achieved and where significant barriers remain. Differential progress has been achieved in the 7 key domains of operational governance, IT and digital, Shared Reporting, Workforce, capital Planning & Equipment, Outsourcing and Capacity and Demand Modelling. A specific clinical workstream centred around subspecialty groups has supported engagement and the development of pilot use cases to explore benefits of working differently. The challenges to engagement have been mitigated by combining some programmes eg workforce and capital planning. The areas where greatest progress has been made include leadership and governance, modest progress in digital maturity reflects a relatively developed state for part of our network and areas where the current organisational form finds it most challenging to progress are around procurement and shared finances.

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**P178 The introduction of initial image commenting**

*Sabah Awan; Danielle Hogg*

*Warrington and Halton Teaching Hospitals*

**Background:** Historically, the "red dot" scheme has been utilised by the radiology department as an established practice to highlight abnormalities to Accident and Emergency clinicians. The red dot scheme fails to specify what potential abnormality the radiographer is flagging, posing a considerable degree of ambiguity. On the 01/08/2021, the department evolved from "red dot" to "initial image commenting", via the application of a sticky note to the image describing the identified abnormality. The commenting process applies primarily to AED images. Any of the following abnormalities may be commented upon; fractures/bony abnormalities which are suspicious of a fracture, dislocations, soft tissue signs indicative of trauma, foreign bodies and previously undiagnosed pneumothorax. This new scheme of work was audited a year later, with the aim of assessing the level of compliance.

**Method:** 100 AED examinations, undertaken between June-September 2022, where an abnormality had been highlighted by the radiographer. Data was obtained from Radiology Information System (RIS).

**Results:** 51% of images where an abnormality had been identified by the radiographer had no initial image comment attached to them via a sticky note.

**Conclusion:** The audit results revealed a low compliance with the new scheme, identifying the need for further education and staff support. To improve image interpretation skills radiographers were asked to complete an image interpretation workbook along with any additional CPD activities. A further audit is to be completed in 2023 assessing the level of improvement.

Neep MJ, Steffens T, Owen R, McPhail SM. Radiographer commenting of trauma radiographs: a survey of the benefits, barriers and enablers to participation in an Australian healthcare setting. *J Med Imaging Radiat Oncol.* 2014 Aug;58(4):431-8. doi: 10.1111/1754-9485.12181. Epub 2014 Apr 29. PMID: 24774619. Williams I, Baird M, Pearce B, Schneider M. Improvement of radiographer commenting accuracy of the appendicular skeleton following a short course in plain radiography image interpretation: A pilot study. *J Med Radiat Sci.* 2019 Mar;66(1):14-19. doi: 10.1002/jmrs.306. Epub 2018 Oct 9. PMID: 30302949; PMCID: PMC6399192.

**P179 Image anonymisation -- improving the process**

*Leticia Baker; Nick Gibson*

*Nottingham University Hospitals*

**Background:** The radiology research team are beginning to see an increase in large data requests for anonymised images for research purposes. With a large proportion of research now based in AI technology and deep learning algorithms we are seeing an increase in requests for large data transfers (>500 examinations per Trial). For this reason R&D Imaging Support unit wanted to innovate the way anonymisation of DICOM is completed to ensure the ability to provide bulk anonymisation and uploading is efficient and streamlined. The current process of anonymising radiology images is time consuming and labour intensive with several steps which include identifying the correct images, retrieving from PACs, anonymising and quality assurance, prior to transfer. This process has several limitations such as speed as only one study can be processed at a time, and using an external system where support is limited. We sought to develop a simple programme which makes this process more efficient through automated searching, downloading and anonymising of required images from the PACs system.

**Method:** The currently anonymization system was reviewed and a project plan developed regarding how to streamline the process. An anonymization software was developed by our informatics team which automates the retrieving, anonymising and storing of images, ready for quality assurance and transfer. The system was tested robustly to ensure compliance with information governance requirements.

**Results:** The programme allows staff to set up anonymization of several studies (Minimum 20 studies), which can run in the background whilst staff then move onto other tasks.

**P180 Radiographer abnormality flagging systems in the UK -- a preliminary updated assessment of practice**

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*<sup>1</sup>School of Medicine, University of Leeds; <sup>2</sup>Walsall Healthcare NHS Trust*

**Background:** Radiographer abnormality flagging systems have been in use in the UK for over 30 years, with the guidance of the SCOR(2,3) indicating that the preliminary clinical evaluation (PCE), or comment, be the preferred system of choice. This study aimed to provide an updated assessment of current practice from a previous 2008 study(1).

**Method:** A cross-sectional online survey was disseminated via Twitter and aimed at departmental and reporting leads. It requested information on the types of flagging and reporting systems operated, scope of the systems employed, required education of participants, and the role of audit.

**Results:** Responses were received from 31 Trusts within the UK. Red dot systems were employed in 90% (n=28) of sites, with 26% (n=8) undertaking PCE. Skeletal radiographs were most commonly reviewed (90%; n=28) followed by chest (58%; n=18) and abdomen (32%; n=10). Only 13% (n=4) sites indicated if the image was normal but 71% (n=22) allowed the radiographer to indicate if they were unsure. There was marked variation in the educational requirements and use of audit.

**Conclusion:** Significant conclusions cannot be drawn due to limited sample size, however, compared to 2008(1) there appears to be minimal change in practices in the UK. There was some increase in the use of flagging systems generally and a higher proportion of PCE systems in comparison to red dot but the use of education and audit does not necessarily show much development. This study may support further research and consideration of potentially standardising abnormality detection systems.

1. Snaith, B and Hardy, M (2008). Radiographer abnormality detection schemes in the trauma environment – an assessment of current practice. *Radiography*. 14(4):277-281. Doi: <https://doi.org/10.1016/j.radi.2007.09.001> 2. Society and College of Radiographers. (2013) Preliminary clinical evaluation and clinical reporting by radiographers: policy and practice guidance. London: The Society and College of Radiographers. 3. Society and College of Radiographers. (2006) Medical image interpretation and clinical reporting by non-radiologists: the role of the radiographer. London: The College of Radiographers

**P181 Does proving a bank of anatomical side markers to an x-ray department increase the usage of anatomical side markers in a general imaging department**

*Daniel Smith; Frances Verity; Courtney Penn*

*County Hospital, Stafford*

"The gold standard for annotating radiographic images is to include an unambiguous anatomical side marker [ASM] in the primary beam." (1) Unfortunately in recent times there has been a downturn in the usage of anatomical side markers. This could be due to a number of factors, including infection control reasons (2) and the availability of digital ASMs (3). In order to ensure compliance with the gold standard of ASMs a district general hospital instituted marker champions. Their remit was to get the usage of anatomical side markers to 90% compliance. A bank of departmental ASMs (10 sets) was provided for the use of all staff in the department. This, along with verbal encouragement of the department were the only actions undertaken by the marker champions. A subsequent audit of the use of ASMs was performed, collating data from the departmental RIS system for all patients imaged for a random week before the introduction, and a random week after, ensuring only qualified radiographers images were used, and the same radiographers were on for both weeks. The results showed a total marker usage of 60% in the week prior to the introduction of the bank of departmental ASMs, and a use of 76% in the week following. Of all the images following the introduction of the bank of ASMs, 11% of the images were taken with departmental ASMs. It is clear, therefore, that a bank of departmental ASMs is an effective and cost effective way to increase the use of ASMs.

1) Barry K, Kumar S, Linke R, Dawes E. A clinical audit of anatomical side marker use in a paediatric medical imaging department. *J Med Radiat Sci*. 2016 Sep;63(3):148-54. doi: 10.1002/jmrs.176. Epub 2016 May 25. PMID: 27648278; PMCID: PMC5016612. 2) Jenna Tugwell, Adele Maddison, Radiographic markers - A reservoir for bacteria?, *Radiography*. 2011 17(2):115-120. doi: 10.1016/j.radi.2010.10.005. 3) Hayre CM, Blackman S, Eyden A, Carlton K. The Use of Digital Side Markers (DSMs) and Cropping in Digital Radiography. *J Med Imaging Radiat Sci*. 2019 Jun;50(2):234-242. doi: 10.1016/j.jmir.2018.11.001. Epub 2019 Jan 17. PMID: 31176431.

**P182 Audit and promotion of local red dot policy with PACS "sticky notes"**

[Emma Eamer](#)

*Somerset NHS Foundation Trust*

**Background:** Recent studies have proven that all plain imaging radiographers have the ability to provide red dot and commenting systems for ED radiographs regardless of experience (Stevens and White, 2018, Verrier et al., 2022). This is supported by the Society of Radiographers (2013). Our local red dot policy requires a brief written communication of perceived, or query, of pathology via a PACs sticky note after red dot application. Ensuring communication with ED staff and the reporter for either; correct pathways for patients, additional clinical information or learning objectives in image interpretation. It was documented via reporting radiographer meetings that the majority of images with red dots did not have sticky notes applied.

**Purpose:** To describe the promotion and education of local red dot policy and PACS sticky notes to improve compliance.

**Summary:** The poster will include the history of the red dot system which was presented to the radiographers via a monthly departmental poster. A link and evaluation of the policy video that was created and shared.

**Results:** of audit that showed 71% compliance of attaching a sticky note. Discuss limitations of the audit and possible reasons for non-compliance. Description of education of the policy to the newly qualified radiographers. Compliance of policy will be assessed by further audit with additional questions of accuracy of sticky notes to ascertain if any knowledge gaps in image interpretation arise. It is hoped this will confirm continual promotion of policy will improve compliance further.

Stevens, B. and White, N. (2018) 'Newly qualified radiographers' perceptions of their abnormality detection abilities and the associated training they received at undergraduate level', *Radiography*, 24 (3) pp219-223. Available at: doi: 10.1016/j.radi.2018.01.004 (Accessed: Feb 2023) The Society of Radiographers (2013) Preliminary Clinical Evaluation and Clinical Reporting by Radiographers: Policy and Practice Guidance. Available at: [https://www.sor.org/getmedia/520af092-cd10-4ae4-8f2f-3625a91b47c3/Preliminary%20Clinical%20Evaluation%20and%20Clinical%20Reporting%20by%20Radiographers\\_%20Policy%20and%20Practice%20Guidanc\\_1](https://www.sor.org/getmedia/520af092-cd10-4ae4-8f2f-3625a91b47c3/Preliminary%20Clinical%20Evaluation%20and%20Clinical%20Reporting%20by%20Radiographers_%20Policy%20and%20Practice%20Guidanc_1) (Accessed at 10/2/2023) Verrier, W., Pittock, L., Bodoceanu, M. and Piper, K. (2022) 'Accuracy of radiographer preliminary clinical evaluation of skeletal trauma radiographs in clinical practice a DGH', *Radiography*, 28 (2) pp 312-318. Available at: <https://doi.org/10.1016/j.radi.2021.12.010> (Accessed: Feb 2023).

**P183 How small is too small? Suture needle visibility on radiographic imaging**

[Emma Rose](#); [Emily Quinn](#); [Lauren Davies](#); [Jessica Eaton](#)

*Great Ormond Street Hospital for Children*

**Background:** A retained surgical instrument post-procedure is an NHS never-event<sup>1</sup>. Imaging is sometimes required in the operating theatre to locate a missing item following the surgical count. One of the smallest items in the surgical count are suture needles and previous studies have shown that smaller sized suture needles can be difficult to visualise with imaging<sup>2</sup>. This may cause patients to be exposed to ionising radiation with no benefit. The aim of this study was to establish which suture needles used at the Trust were visible on imaging to provide guidelines for the Surgical Count Standard Operating Procedure.

**Method:** All suture needles used at the Trust were imaged using an image intensifier (II) (OEC 9900 Elite, General Electric) and a lumbar spine phantom. Suture needles were placed into the phantom and imaged with an II distance of 35cm from the phantom (Image 1)



The smaller sutures that could not be visualised were subsequently imaged using a portable x-ray machine (DRX-Revolution, Carestream, 67kVp, 1.6mAs, distance 110cm). All images were reviewed by a second radiographer.

**Results:** Larger suture needles (0 - 6/0) were easily visualised using an II. The five smallest suture needles (7/0-10/0) were difficult to visualise but were visible on the portable x-ray (Image 2)



**Conclusion:** Missing suture needles sized 0 - 6/0 can be identified using an II. Suture needles smaller than 7/0 are unlikely to be visualised with an II and a portable x-ray could be used. Consideration must be given to patient stability, overlying anatomy, sterility, and artefacts.

1. NHS Improvement (2018) Never Events List. NHS Improvement <https://www.england.nhs.uk/wp-content/uploads/2020/11/2018-Never-Events-List-updated-February-2021.pdf>

2. Weprin, S., Crocerossa, F., Meyer, D., Maddra, K., Valancy, D., Osardu, R., Kang, H.S., Moore, R.H., Carbonara, U., J Kim, F. and Autorino, R., (2021) Risk factors and preventive strategies for unintentionally retained surgical sharps: a systematic review. *Patient Safety in Surgery*, 15, pp.1-10.

#### **P184 Management of scout/localiser images across radiology department in the UK**

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<sup>1</sup>Basingstoke & North Hampshire Hospital, UK; <sup>2</sup>Institute of Medical Imaging & Visualisation, Department of Medical Science & Public Health, Faculty of Health & Social Sciences

**Background:** Scout/Localiser (S/L) images are crucial to identifying potentially life-threatening conditions as they may hold critical information for diagnosis and management of disease. However, it remains unclear how these images are managed as part of the diagnostic series. This study is aimed at exploring if there exist local protocols for the management of S/L and if cross-sectional imaging (CMI) radiographers are aware of the recently issued joint position statement on the topic by relevant professional bodies (i.e., RCR, IPEM and SCoR).

**Method:** An ethically approved cross-sectional survey of CMI radiographers in the UK was conducted online (23rd May - 3rd July 2022). The survey sought information regarding 1. Demographics 2. S/L image management protocols, and 3. Awareness of the joint position statement on S/L. Data collected was analysed using the Statistical Package for Social Sciences (v.28) and thematic analysis.

**Results:** A total of 130 responses were received. Of the respondents, (59/129; 45.7%) indicated that there exist no local policy/protocol in their department while only 23.3% (30/129) do have protocols in place. There exist a large variation in management policies for S/L in the UK and majority of CMI radiographers are not aware of the recent joint statement.

**Conclusion:** Standardised protocols for the management of S/L images are lacking. Local policies need to be developed and implemented to effectively manage S/L images to enhance patient care. Education and awareness creation in relation to the critical role of S/L images to patient care and about the joint statement needs to be prioritised.

1. Kaasalainen T, Palmu K, Reijonen V, Kortensniemi M. Effect of patient centering on patient dose and image noise in chest CT. *AJR Am J Roentgenol* 2014; 203: 123–30. doi: 10.2214/AJR.13.12028. 2. Laborde, G., Gilsbach, J., Harders, A., Klimek, L., Moesges, R. and Krybus, W., 1992. Computer assisted localizer for planning of surgery and intra-operative orientation. *Acta Neurochirurgica*, 119(1-4), pp.166-170. 3. Lambert, J., Kumar, S., Chen, J., Wang, Z., Gould, R. and Yeh, B., 2015. Investigating the CT localizer radiograph: acquisition parameters, patient centring and their combined influence on radiation dose. *The British Journal of Radiology*, 88(1048), p.20140730. 4. Lim, I., 2017. What is Localizer on CT Scan. [online] Radtechonduty.com. Available at: <http://www.radtechonduty.com/2017/03/localizer-on-ct-scan.html> [Accessed 17 February 2022]. 5. Schmidt, B., Saitybaeva, N., Kolditz, D. and Kalender, W., 2013. Assessment of patient dose from CT localizer radiographs. *Medical Physics*, 40(8), p.084301. 6. SoR. 2021. Role of scout or localiser images during CT or MRI in diagnostic radiology | SoR. [online] Available at: <https://www.sor.org/news/imaging/role-of-scout-or-localiser-images-during-ct-or-mri> [Accessed 19 February 2022].

## **P185 Estimating the carbon footprint and heat recovery potential of linear accelerator cooling systems**

*Joshua Cartwright; Fiona McDonald*

*Newcastle upon Tyne Hospitals NHS Foundation Trust*

**Background:** The NHS aims to reduce the carbon footprint of its directly controlled emissions to net zero by 2040 [1]. A 2022 study estimated the carbon footprint of a course of radiotherapy to range approximately from 75 to 240 kgCO<sub>2</sub>e per patient [2]. This did not include the contribution from linear accelerator (LINAC) cooling systems. Electric chillers used to cool LINACs operate continuously and are an area where improvements may be made without clinical consequence. We have estimated the carbon footprint of these cooling systems and assessed options for reducing this.

**Method:** The scope of estimating the carbon footprint of the LINAC cooling system was limited to the operational electrical energy consumption of the electric chillers and did not include carbon embodied in manufacture. We collected energy metering data for groups of electric chillers as well as current clamp data for individual chillers dedicated for cooling single LINACs over the course of a week. This was converted to CO<sub>2</sub> equivalent values using standard BEIS conversion factors [3]. We measured circulating coolant temperatures upstream and downstream of the chillers to estimate their heat recovery potential. Through literature searches and consultations with engineers, we assessed the feasibility of various methods of reducing this carbon footprint including through heat recovery.

**Results & Conclusion:** We will report on the results of estimating the carbon footprint of LINAC cooling systems and on the potential for heat recovery solutions.

1. National Health Service (2022). Delivering a net zero NHS. Available at: <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/> (Accessed: 08/02/2023). 2. Cummings J, Taylor C and Chuter R. 2022. Estimating the Carbon Footprint of the Radiotherapy Pathway. [Poster]. ESTRO, 2022, Copenhagen. 3. Department for Business, Energy & Industrial Strategy (2022) Greenhouse gas reporting: conversion factors 2022. Available at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022> (Accessed: 08/02/2023).

**P186 Reducing carbon footprint in radiotherapy: Portable workflow management tools and waste reduction**

*Alexandra Pyett; Catriona Buchan*

*Leeds Teaching Hospitals NHS Trust*

**Background:** Working towards the ambition to be one of the greenest Trusts in the country by embedding sustainable practices, we explored solutions within radiotherapy that would enable an entirely paperless environment and reduce waste by improving workflow efficiency. Workflow inefficiencies can introduce delays in the patient pathway, impact the effectiveness of a system and contribute to carbon emissions. Close collaboration with the provider of an oncology informatics system enabled us to influence developments to ensure the product fit with clinical goals and had real-world applicability. Quality improvement methodologies directed our approach to analysis, development and implementation which facilitated identification of key areas for improvement. Subsequently, a carefully managed, phased roll-out of technology-based solutions was initiated and was systematically reviewed adopting the Plan-Do-Study-Act approach.

**Purpose:** The aim of this poster is to share our experience of working with the technology provider to create novel solutions to complex pathways and will highlight the challenges and successes of its implementation. It will also outline the ambitions for a truly portable solution with imaginative use of existing resources and devices.

**Summary of content:** Content will include an outline of existing pathways and illustrate the development to the new, and improved, ones. There will be examples of electronic forms, and dashboards that allow pathways to be monitored. To quantify this, there will be an impact analysis on efficiency along the patient pathway as a result of integrating software solutions.

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**P187 Towards a greener clinical radiology and radiotherapy practice: A systematic literature review**

*Messiah Anudjo<sup>1</sup>; Theophilus Akudjedu<sup>2</sup>*

*<sup>1</sup> University Hospitals Dorset NHS Foundation Trust; <sup>2</sup>Bournemouth University*

**Background:** Environmental sustainability (ES) in healthcare has dominated discussions surrounding climate change. Practice modifications across clinical radiography is required to reduce the contributions to global climate change. This study sought to explore and integrate current evidence relating to considerations for ES in radiography practice to provide a comprehensive guide for greener clinical practice, education, and research.

**Method:** A systematic literature search and review of studies of diverse evidence across various key databases was completed. The Preferred Reporting Items for Systematic Review and Meta-Analysis guidelines and the Quality Assessment Tool for Studies with Diverse Designs assured the inclusion, quality, and credibility of the review. A result-based convergent data synthesis approach was employed to integrate the findings.

**Results:** A total of 151 journal articles were identified, after the application of exclusion criteria, 9 articles were eligible for inclusion in the review. Three key themes emerged, 1: energy consumption and data storage practices, 2: Usage of clinical consumables and waste management practices and 3: Travel activities related to radiology and radiotherapy practice.

**Conclusion:** The carbon footprint of clinical radiography practice is substantial and highlights considerable contributions to climate change. Despite these contributions, considerations for greener practice in radiography appear to be poorly prioritised due to lack of discipline-specific ES policies, legislations, and limited research. Widening the scope of research and awareness is imperative in providing a more holistic and better appreciation of the environmental burden from radiography practice.

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**P188 Zen**

*Lorraine Whyte*

*Beatson West of Scotland Cancer Centre*

A learning needs analysis was carried out. Staff reported that the introduction of a staff wellbeing initiative was high on their list of priorities, with stress being singled out as the most detrimental factor to their work/life balance. To actively reduce stress mindfulness sessions were introduced throughout the work day with the intent of motivating

and re-balancing staff. Results showed that stress levels were reduced and staff became more relaxed and more positive. The project was so successful that it has now been incorporated as part of our weekly CPD agenda.

1. Bergen-Cico, D. et al. (2013). Examining the efficacy of a brief mindfulness-based stress reduction program (brief MBSR) on psychological health. *Journal of American College Health*, 61, 348–360 2. Trowbridge, K, et al. (2017) Preliminary Investigation of Workplace-Provided Compressed Mindfulness-Based Stress Reduction with Paediatric Medical Social Workers. *Health & Social Work*, Volume 42, Issue 4.

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### **P189 Chest radiographs conducted despite a recent prior examination: an audit**

*Panagiotis Papaqeorqiu; Kalliopi Bisba*

*Papanikolaou General Hospital of Thessaloniki*

**Descriptor:** An audit on the adherence of clinicians to IRMER guidelines when it comes to repeating chest radiographs.

**Background:** Chest radiograph (CXR) is the by far the commonest imaging module ranging from primary to tertiary health care sector. Nevertheless it remains a source of ionising radiation whose indications are thoroughly described in IRMER and the topic highlighted in the annual CQC report of IRMER regulatory activity (1, 2). Sometimes failing to check previous history leads to overexposure of patients to unnecessary X-rays which conflicts with the aforementioned guidelines.

**Method:** 53 consecutive individuals from the Internal medicine ward were scanned in November 2022 - January 2023 in Papanicolaou General Hospital of Thessaloniki, Greece (PGH) and their electronic notes were reviewed for their compliance. This practice was compared against the standard Local policy and NHS guidelines in concordance with the IRMER radiation protection regulations (1) and the RCR guidelines (2). This is the first adherence audit of its kind so no prior results were subject to comparison.

**Results:** The sample percentage that had a CXR repeated was 92% , from that 100% was repeated within less than 6 weeks given as a standard (1,2). In 39% of the cases consolidation has already been described in the first report and more specifically CAP was diagnosed in 35% of the sample. Finally, the cases who described a CAP worsening in the 2nd CXR were 14% (N=53). Suggestions for change: - Awareness of referring clinical staff performing IR(ME)R practitioner justification

1. Ionising Radiation (Medical Exposure) Regulations 2000 [http://www.legislation.gov.uk/ukxi/2000/1059/pdfs/ukxi\\_20001059\\_en.pdf](http://www.legislation.gov.uk/ukxi/2000/1059/pdfs/ukxi_20001059_en.pdf) 2. iRefer: making the best use of clinical radiology. London. RCR 2012. <http://guidelines.irefer.org.uk/about/#Abt10>

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### **P190 Diagnostic radiography students' attitudes towards gender inclusive pregnancy status checks**

*Katie Morrow; Stuart MacKay*

*University of Liverpool*

**Background:** Under IR(ME)R17, radiographers are responsible for protecting fetuses against ionising radiation. Previously, only females were screened for pregnancy prior to a pelvic X-ray, however new guidance from the SoR and CQC relating to IR(ME)R17 phrasing recommends all individuals of childbearing potential must be screened, including male, female, transgender and intersex patients. There is a lack of literature exploring student radiographers' views about gender inclusive pregnancy status checks.

**Method:** A qualitative study was conducted with nineteen third-year students on the BSc Diagnostic Radiography degree programme at a University in the North West. Focus groups were conducted using open-ended questions to gain insight into how IPS checks are conducted at each of the seven NHS Trust clinical placement sites. Students were also asked about their attitudes towards conducting IPS checks.

**Results:** A thematic analysis yielded four main themes: education, standardisation, fear of reaction, and placement involvement. Barriers to conducting the IPS check include a lack of staff encouragement due to the guidance being enforced at the discretion of the employer, as well as a general lack of awareness around gender inclusivity. All students showed a willingness to conduct the IPS checks despite this.

**Conclusion:** For service users and providers to welcome IPS checks, more training and awareness should be enforced surrounding LGBT+ issues in healthcare. Age and experience range of participants were limiting factors. Students generally feel well-prepared to conduct IPS checks due to experience on placement, however IPS checks should be standardised across placement sites to ensure equal learning opportunities.

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**P191 Initial experience with whole brain radiotherapy with hippocampal avoidance using Varian HyperArc at Complejo Hospitalario Universitario de Cartagena (CHUC)**

*Miguel Martinez-Albaladejo; Vicente Puchades Puchades; David Ramos Amores; Jonathan Suárez Arteaga; Alfredo Serna Berná*

*Complejo Hospitalario Universitario de Cartagena*

**Background:** The aim of this study is to preliminary evaluate the use of Varian HyperArc (HA) as a planning and treatment strategy for whole brain radiotherapy with hippocampal avoidance (WBRTHA) in the radiotherapy department at CHUC.

**Method:** 14 patients treated in Clinacs for WBRTHA by the VMAT technique (TP), 4 coplanar 6X-arcs, were retrospectively planned for a TrueBeam HD-MLC linac (TPTB), and using the newly commissioned HA technique (non-coplanar FFF-arcs, max-1400MU/min). The main efficiency and dosimetric parameters of PTV&OAR were analysed/compared in Eclipse TPS by statistical significance (Wilcoxon-signed-rank test).

**Results:** The HA plans demonstrated significant improvements in the PTV dosimetric quality including a reduction in the parameters V105%, D2%, Dmax and an increased Dmin, V95% compared with TP. A significant decrease in OAR doses was also found for the HA plans (Figures 1-2). HA plans resulted in significantly shorter planning and beam-on times with regards to TP (TPTB) on average by 52.4 minutes (26.8) and 1.8 minutes (2.0), respectively. The MUs and modulation index were significantly lower for HA compared with TP and TPTB.

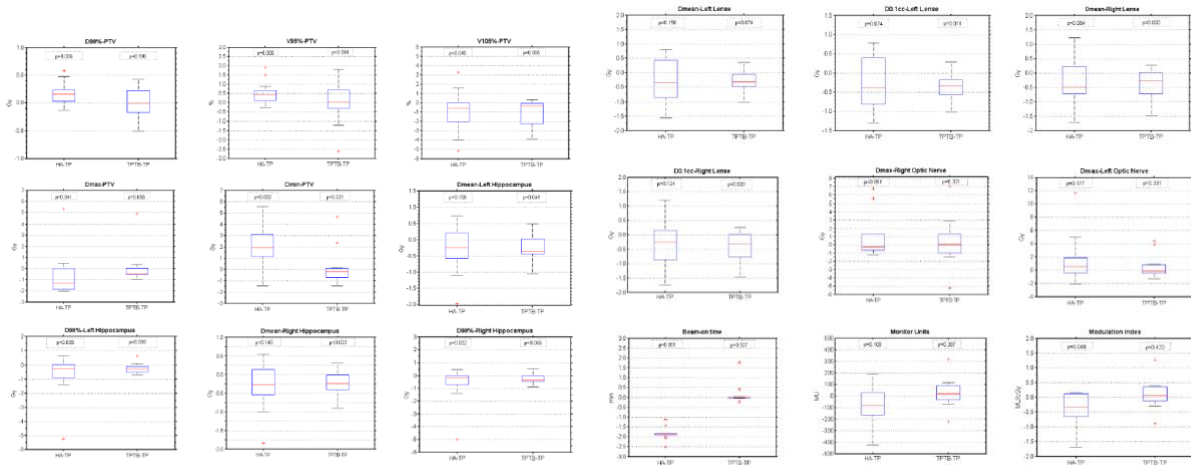


Figure 1. Dosimetric differences in the PTV and hippocampal parameters between the techniques HA,TP and TPTB. p-values shown are result from the statistical tests between HA and coplanar VMAT metrics. Note the vertical scale is different on each plot.

Figure 2. Dosimetric differences in the lenses, optic nerves and efficiency parameters between the techniques. p-values shown are result from the statistical tests between HA and coplanar VMAT metrics. Note the vertical scale is different on each individual plot.

**Conclusion:** HA is an efficient strategy for WBRTHA treatments in a TrueBeam HD-MLC. The main advantages found for this modality compared to coplanar VMAT are the gains in the dosimetric OAR sparing, the reduction of the high doses to PTV and the increase of minimum doses to PTV, being less time-consuming and independent on the user experience. We believe that the efficiency and confidence increase due to process automation improves patient care. Therefore, HA has become our new standard technique for WBRTHA.

1. Sprowls, C. J. et al. (2021). *Whole brain radiotherapy with hippocampal sparing using Varian HyperArc*, Medical Dosimetry. doi: [10.1016/j.meddos.2021.02.007](https://doi.org/10.1016/j.meddos.2021.02.007).

2. Rusu, I. et al. (2022). *Fully automated planning and delivery of hippocampal-sparing whole brain irradiation*, Medical Dosimetry, 47(1). doi: [10.1016/j.meddos.2021.06.004](https://doi.org/10.1016/j.meddos.2021.06.004).

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