

**SESSION I2**

**12.1 A double transformation: From Exeter Nightingale to CDC - the implementation of a Community Diagnostics Centre**

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**Background:** An example of extensive collaboration: NHS Nightingale Hospital Exeter saw the transformation of a warehouse into a state of the art Covid facility in 2020, being re-purposed and transformed again in 2021 into a Community Diagnostic Centre - National Accelerator Programme. Led by RDUH, partnering Devon Trusts, the vision to accomplish recommendations of the Diagnostics Recovery and Renewal Report (Richards) 2020 and NHS Long Term Plan.

**Purpose:** Aim to relocate suitable GP and OP work away from acute sites, improving patient experience, reducing waiting times and improving outcomes. Initially focusing on backlog clearance, the facility is part of longer-term planning, enabling radical improvement to cope with increased demand. New pathways to diagnosis by a number of one-stops will be established in 24/25. The latest technology has been heavily invested in with a strive to ensure dose optimisation and reduction. Workforce development includes apprenticeships and advanced practice roles; job satisfaction and a 'great place to work' have been key benefits. Strong collaboration with outsourced providers enabled some services to be rapidly developed and operational.

**Summary:** Working collaboratively, over 50,000 patients were imaged in the Devon CDC's first year. The CDC offers CT, MR, x-ray, ultrasound and fluoroscopy. Some MSK treatments are available. Clinically led the success of the Centre is attributed to the hard work and persistence of everyone involved throughout the programme, from design of the physical space to implementing services. We are very proud of the CDC and look forward to developing and transforming pathways further this year.

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**12.2 MRI safety screening - is it time for patients' previous imaging to become part of the conversation?**

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**Background:** Thorough pre-MRI safety screening, to identify any internal implants or foreign bodies (FBs), is essential to determine their MRI status so they can be scanned under the correct conditions(1,2,3). Despite the methods of pre-MRI screening being well established (screening questionnaire followed by verbal review)(4,5), undeclared implants/FBs are still being introduced into the MR Environment(6,7), highlighting a gap in these methods. Patients may not be providing accurate histories or omitting relevant medical history for many reasons, including misinterpretation of the questions, incomplete or inaccurate recollection of their medical history, or unfamiliarity with medical terminology(1,8,9,10). The exact number of undeclared implants/FBs in MRI is unknown, but MRI incidents/near-misses of all natures are largely underreported internationally(9,11) and undeclared implants are currently not reportable to the MHRA(4). Routine review of existing previous imaging by radiographers during pre-MRI safety screening, currently only mentioned when screening unconscious patients(4,5), could avoid the introduction of undeclared implants/FBs into MRI.

**Purpose:** To highlight the role of additional screening steps, e.g., image review, for older patients, patients with complex medical histories or those who have had numerous medical interventions, in pre-MRI safety screening.

**Summary of contents:** Three case studies will be presented (with images), where patients failed to declare they had an implant (one active pacemaker, one passive coil-embolisation, one MR Unsafe breast tissue expander) during their pre-MRI safety screening, despite giving otherwise accurate medical histories. It will examine the implications of missing implants, provide a discussion of risk and look at the pros and cons of reviewing imaging.

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### **12.3 Operational delivery of planned radiology modalities out of an outer London Community Diagnostic Centre - lessons learned**

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**Background** An outer London Hospital Trust's Community Diagnostic Centre (CDC), located in one of the most deprived areas in London, recorded for Q1 and Q2 for 2023/24 that 16,939 scans were delivered (= 46.8% of the annual radiology activities).

- The planned CT split i.e., with and without contrast was that 65% of all CTs would be delivered with contrast and remaining without contrast. However, the actual delivery was 40% of all CTs scans were delivered with contrast.
- The planned MRI split suggested 13% with contrast and the remaining 87% without contrast. The actual delivery saw only MRI without contrast

Looking at the acceptance of the CDC using attendance figures as it's indicator the following results were revealed:

- Attendance at CDC for MRI, CT and NOUS was comparable with acute hospital sites
- Cancellations for appointments at CDC sites were slightly higher for MRI and CT but lower for NOUS when compared to acute Hospital sites
- DNA were slightly higher when invited to attend an appointment at local CDC most noticeably for NOUS appointments.

**Conclusion** Our CDC is accepted by our local community. Ongoing engagement with patients is pivotal to maximise attendance and utilising available appointment slots. MRI/CT split i.e. with and without contrast may not be the same as national target and is depending on local needs and requirements

**Purpose** Learning Objectives:

- insight into planned versus actual activities
- ongoing engagement with patients to maximise appointment utilisations
- identify referral source and requested diagnostic types

### **12.4 Assessment of vascular parameters and lifestyle factors towards disability prevention in multiple sclerosis patients - a personalised medicine approach**

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**Background:** In South Africa, previous studies conducted on multiple sclerosis (MS) have shown that disability is associated with vascular parameters, lifestyle factors and biochemistry in people with MS (pwMS). MS is an immune-mediated, chronic inflammatory disorder, however pharmaceutical interventions targeting the immune system, have not demonstrated reversal or prevention of disability progression. Incorporation of data-driven insights, such as personal biomarkers, in a personalised medicine healthcare approach for MS is necessary to provide a net benefit to pwMS and address their needs.

**Method:** Extracranial vascular ultrasound was performed on 51 pwMS and 25 age-matched controls. Sonographic interrogation determined carotid intima-media thickness (cIMT) and blood flow patterns. Disability was assessed using the Expanded Disability Status Scale (EDSS). Lifestyle and biochemical data were obtained for all participants and included in a pathology supported genetic testing (PSGT) tool which forms part of a chronic disease screening programme for pwMS

**Results:** This ultrasound study demonstrated significant associations ( $p < 0.01$ ) between vascular parameters, biomarkers and lifestyle factors. The significant associations with cholesterol, dietary intake and physical activity were included in the

PSGT tool that provides pwMS a personalised risk reduction plan for implementation and can also be used by referring clinicians to monitor and manage treatment.

**Conclusion:** Associations made between lifestyle and biochemistry data were incorporated into a clinical risk assessment algorithm, integrated with genetic test results, which can be used to write a report for each patient, indicating the steps to be undertaken to reduce their disability.

## 12.5 From cataracts to cancer - exploring knowledge, awareness and perception of radiation and risk in relation to the risk benefit discussion

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**Background** The recent introduction of the European Directive<sup>(1)</sup> increased the onus on those involved in a patients imaging pathway to have a risk benefit discussion with patients. Recent research has shown that medical knowledge was not considered adequate<sup>(2-4)</sup>. The literature in the systematic review came from many different countries and covered many of the professional groups. However, there were only two studies study which mentioned Nurse Practitioners, one in the USA and one in Australia, which given the increase of Advanced Practice in the UK, is an important participant group about which little is known. Minimal studies included student or qualified radiographers.

**Method** This PhD research was carried out using constructivist grounded theory methodology and included three groups; non-medical referrers, radiographers, and final year students, imminently to become autonomous practitioners, all of whom could be involved in the risk benefit discussion. Semi-structured interviews were carried out and analysed using constant comparison and thematic analysis.

**Results** Results regarding radiation knowledge were encouraging when compared to what is known about medical referrers, and there were similar themes, with similar results, such as communication. One issue highlighted was the lack of standardisation in IR(ME)R training of non-medical referrers across the UK.

**Conclusion** This research showed several potential areas for future research and improvement in the training of those involved in the imaging journey including, the potential use of simulation in training of undergraduate student radiographers, and postgraduate education of radiographers and non-medical referrers

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## 12.6 Portable fundamentally safe medical scanner to aid the diagnosis of a stroke at the point of care

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**Background:** There is a compelling need for a new form of medical scanner to diagnose whether a patient is experiencing a stroke. Crucially the scanner must be fundamentally safe and portable so that it can be readily transported to and deployed at the site of the emergency (e.g. the patient's home) with no prior planning or specialist shielding. That will shorten the time between the onset of stroke symptoms and a formal diagnosis, which will improve the outlook of these patients and reduce the £billions cost of stroke to the UK economy(1) since fewer stroke survivors will require long term care.

**Method:** The authors are developing a proof of concept demonstrator of a new scanner that uses low intensity electromagnetic waves in the radio-frequency/microwave band. Initially the beam was propagated through the whole subject and detected on the far side(2). However, now the reflected portion of the beam is used which has greatly improved the quality of the acquired data.

**Results:** An extensive programme of scans has been performed on materially correct phantoms of a human head containing a stroke-affected region in the brain. The results using the reflected portion of the beam confirm that this new scanning method is capable of more reliably detecting the stroke-affected region in these subjects.

**Conclusion:** Scanning at radio-frequency/microwave frequencies affords several benefits over X-ray CT and MRI which could be game changing for stroke diagnosis. Extracting data from the reflected portion of the beam has been shown to be the preferred approach.

Research

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