have very little training in regard to radiation safety which poses a particular problem when working in the IR theatre. This poster was aimed at those students and other new members of staff to give them a basic understanding of radiation protection and how to protect themselves when working within this environment.

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AI / IMAGING TECHNOLOGIES POSTER PRESENTATIONS

P091 An efficient way of collaborating on multicenter reader studies with your peers

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Collective Minds Radiology

Background: Collaboration in healthcare is crucial to improve patient outcomes and keep up with the continuous rapid technical developments that lean towards larger datasets and multiple imaging modalities. There is a need for a common infrastructure to collaborate between centers, institutions, countries and to conduct streamlined multicenter reader studies. This also has to be carried out in a regulatory sound way. The purpose of this study is to develop a cloud-based medical imaging platform to facilitate collaborative multicenter studies.

Method: A cloud-based medical imaging collaboration platform was developed to conduct streamlined multicenter reader studies. It facilitates collaboration options for multiple centers and enables reproducible imaging studies. Healthcare professionals can manage and invite collaborators to build local, national and international expert groups. The imaging platform was developed with a multi-modal data repository, embedded zero-footprint DICOM viewer, pseudonymization support, customisable case report forms (CRF) and annotation/segmentation tools.

Results: We have developed a scalable and secure cloud-based infrastructure that follows GCP and data handling according to GDPR. The platform includes work distribution of data management, structured reporting (*Figure1*) and result delivery together with image analysis.

Conclusion: A multi-site reader study collaboration platform for multi-modal medical images, has been developed following a privacy and compliance by design concept. The platform allows for easy collaboration following GCP and GDPR. We believe that this infrastructure will facilitate both academic single- and multi-institution reader studies as well as large clinical trials, especially where interdisciplinary work is required.

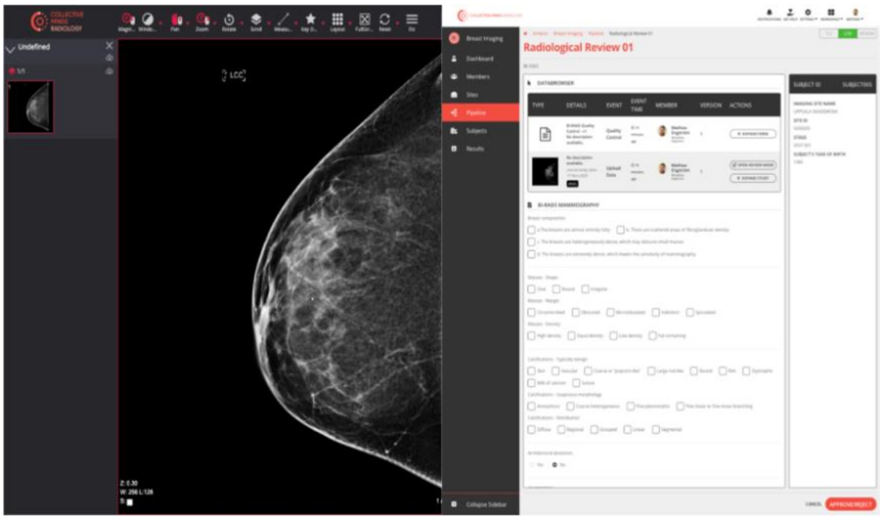

Figure1. Screenshot from the platform showing a reader study with the DICOM viewer and structured report.

P092 Diagnosing Covid-19 from images of chest X-rays communicated via WhatsApp

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[1]Indian Institute of Science; [2]Niramai Health Analytix; [3]ARTPARK

Background: Scarcity of skilled radiologists for interpretation of Chest X-rays (CXR) resulted in several deaths due to later presentation of COVID-19 patients particularly in some rural areas.

Methods: We developed a machine learning (ML)-based solution that enables radiographers to get an automated interpretation of CXR over WhatsApp Medium. Our novel ML model worked on low-resolution WhatsApp images and addressed the issue of lack of large training dataset by using a multi-task deep learning (MTL) model trained with a small COVID-Net dataset and two large CXR datasets meant for other diseases to co-learn best data features for CXR. This MTL architecture was validated on the COVID-Net test dataset of 373 images after WhatsApp compression. The WhatsApp service was also used in real-life to predict COVID-19 labels in a prospective study of 262 images which was later validated by RT-PCR results.

Results: Our MTL model resulted in a sensitivity and accuracy of 89% and 79%, respectively on native high-resolution COVID-Net testdata, when compared to 89% sensitivity and 76% accuracy on corresponding WhatsApp-API converted COVID-Net testdata. On the other hand, the traditional deep learning architectures such as Densenet and ResNext resulted in an approximate 20-25% drop in sensitivity and accuracy with WhatsApp compression. The key benefit of our technique was best seen on real-life WhatsApp images, which were taken using a mobile-phone camera with bad lighting, where our ML model had 98% sensitivity when ground truth was obtained using corresponding RT-PCR results.

Conclusion: The use of MTL in our AI service resulted in a reliable performance that is minimally affected with WhatsApp compression.

Model	COVID-Net Native Test Data		COVID-Net Whatsapp Test Data		Prospective Whatsapp Test Data	
	Accuracy	Sensitivity	Accuracy	Sensitivity	Accuracy	Sensitivity
DenseNet	0.72	0.64	0.54	0.38	0.58	0.85
ResNeXt	0.75	0.66	0.55	0.40	0.65	0.96
MTL	0.79	0.89	0.76	0.89	0.65	0.98

Table 1. Performance Comparison of DenseNet, ResNeXt and MTL on COVID-Net Native Test Data, COVID-Net Whatsapp Test Data and Prospoective Whatsapp Test Data

P093 Evaluating screening performance of Artificial Intelligence-based Thermalytix by comparing breast lesion sizes detected by Thermalytix with Mammography

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[1]NIRAMAI Health Analytix; [2]Healthcare Global; [3]Central Diagnostic Research Foundation; [4]Royal College of Radiologists

Background: Thermalytix is a portable, radiation-free, contactless technique for detecting early-stage breast cancer using AI over thermal images. Prospective clinical studies have earlier shown Thermalytix to be non-inferior to mammography [1,2,3].Unlike Mammography which has low sensitivity in dense breasts, performance of Thermalytix is breast-density-agnostic [1]. Since Thermalytix uses affordable equipment and can be conducted by less-skilled health-workers, it is also suitable for community screenings in resource-constrained settings. In this post hoc analysis, we evaluate the ability of Thermalytix to detect malignant lesions of different sizes.

Method: We evaluated 470 women who underwent Thermalytix followed by standard imaging investigations in a multisite observational study. The sizes of malignant lesions were extracted from the mammography and breast ultrasonography reports. The largest dimension was used to categorise the lesions in subgroups of 0.5 intervals. In each subgroup, the number of cases detected by AI-based Thermalytix was correlated with those identified by radiologist-interpreted mammography reports.

Results: Of the 470 women, 78 women (16.6%) were considered disease positive based on standard imaging and histopathology results. Out of these 78 women with breast malignancies, lesion size information was available for 60women of which mammography results were not available for eight women and hence, were excluded. In total, we correlated the number of cases detected in different sizes for the remaining 52 women who underwent both Thermalytix and mammography tests. 31 women had a lesion with maximum size greater than 2cm, of which 29 women were detected by Thermalytix and 28 women by Mammography. Out of 5 sub-centimetre lesions, Thermalytix detected two and Mammography also detected two. The bar chart in figure (**see remarks**).

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P095 The effect of AI-assisted imaging in a supraregional mechanical thrombectomy referral network

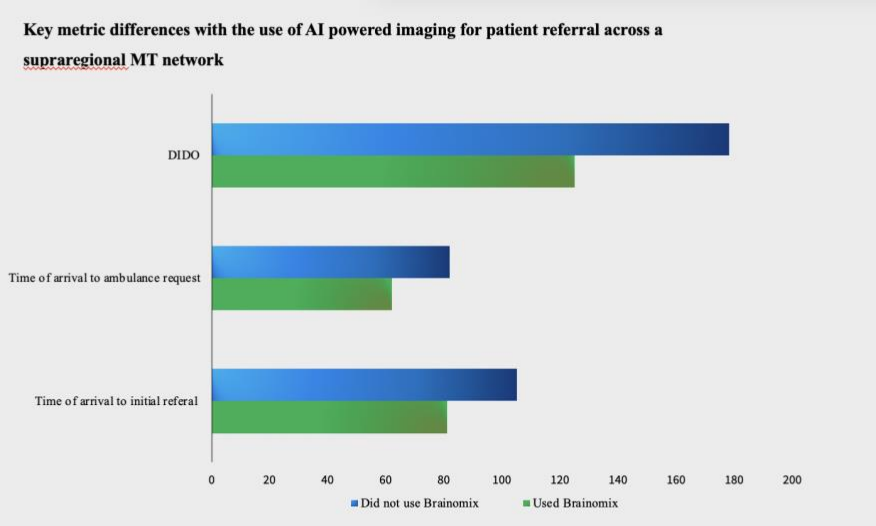
Christos Nikola; Oliver Spooner; Alexandra Andrews; Levansri Makalanda; Pervinder Bhogal

Barts Health NHS Trust

Introduction: Fast detection of large vessel occlusion (LVO) and timely image transfer to comprehensive stroke centre is crucial to reducing decision-making and reperfusion times. The Brainomix AI platform has been widely implemented in the Royal London Hospital mechanical thrombectomy catchment area.

Material and methods: We performed a retrospective analysis of patients that underwent MT between 01/07/2021 and 14/12/2021.We included patients that were referred from external sites that used AI and the sites that did not use. Data was sourced from a local database and SSNAP audit. Time was analysed as minutes for initial referral, ambulance request and departure with subsequent calculation of Door-In-Door-Out (DIDO).

Results: A total of 112 patients were referred for MT. Out of the 112 patients 26 presented locally and 86 were external referrals. 59 were males with median age 70 (29 to 90). 109 patients progressed to MT. One third of the external network hospitals use Brainomix. From the external network referrals,59 patients were included for statistical analysis. Time of first arrival to ambulance request for transfer appeared lower from sites using AI (Md=81.0, n=19) compared to the sites that did not (Md=105.3, n=40) U= 299, z=-1.314, p=0.189. Time differences between DIDO for patients referred from a site implementing AI was significantly faster to the ones who did not (Md=125.0, n=19) vs (Md=183.0, n=40) U=240, z=-2.271, p=0.023.



Conclusion: AI-assisted imaging for stroke can be effectively implemented across a supraregional MT network and used to enable and improve decision-making for MT. Reducing DIDO times are crucial to timely reperfusion.

P096 Insights from implementation of an artificial intelligence assist device across a national radiology network

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[1]I-MED Radiology & Annalise.ai; [2]I-MED Radiology; [3]Annalise.ai

Background: Many Artificial Intelligence (AI) assist devices are proven to augment radiologist diagnostic performance and are already approved for clinical use. Implementation into clinical practice, however, is a complex task with many challenges. There is currently very little in the literature regarding the intricacies of successful AI device implementation.

Purpose: This presentation highlights the challenges of large-scale implementation of a comprehensive AI assist device for chest radiograph interpretation throughout a national radiology network comprised of over 250 clinics and hospitals and describes how these challenges were overcome.

Summary: For successful implementation, a device must integrate seamlessly into existing workflows, maintain performance across diverse clinical settings, and be deployable into various technical infrastructures. Early stakeholder engagement, and ultimately, collaboration between device manufacturer and radiology service provider is pivotal.

Change management strategies around user engagement and adoption are also important as perceptions of AI may hinder implementation. Radiologists' attitudes towards AI in clinical practice have been shown to correlate highly with AI-specific knowledge (Huisman et al, 2021), therefore user training and education is key to widespread adoption.

Pre-determined implementation success metrics are also discussed. In our case study (Jones et al, 2021), 90% of radiologists reported subjective improved accuracy. Post-implementation feedback also showed high user satisfaction - most importantly, 93% maintained device usage after 3 months and 75% indicated they would be disappointed if device access was ceased.

The complexities of implementation across a large radiology network, with a diverse range of sites and users, were therefore shown to be overcome through careful planning and pre-determined success metrics.

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P097 Early experiences of the use of a Virtual Reality Environment to prepare adult patients for MR imaging

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University Hospitals Plymouth NHS Trust

Background: MRI can be a challenging examination to undergo due to a combination of factors including the length of the imaging procedure, scanner noise, the use of coils and the size of the scanner bore. This can be exacerbated for individuals who experience claustrophobia. MRI radiographers typically utilise a patient centred approach to identify a strategy to best support patients who find undergoing MRI challenging.

Purpose: The use of Virtual Reality is increasingly being explored as part of the MRI radiographer's toolkit. The purpose of this communication is to describe early experiences (from a small-scale service evaluation) of the use of a bespoke MRI Virtual Reality Environment (VRE) tool within a busy MRI department in terms of impact upon patient experience and scan outcome.

Summary: A pictorial overview of the MRI VRE tool will be provided together with service evaluation data outlining early experiences of its use in practice. These data will include practical information about implementation such as the radiographer's perception of ease of use and amount of time taken. Limited data (within the scope of a service evaluation) about patient experience will also be provided together with outcomes in terms of whether patients subsequently underwent an MRI scan of diagnostic quality. Limitations to the data set will be discussed and suggestions for future research made.

EDUCATION AND RADIOTHERPY POSTER PRESENTATIONS

P099 Clinical research placement for radiotherapy students - a pilot study

Elaine Smith; Gillian Bestwick; Emma Delaney; Emma Charman

Gloucestershire NHS Foundation Trust

Background: The College of Radiographers released their new 5-year research strategy (CoR 2021) which aims to embed research, improve patient care and service delivery and expand UK radiography research capacity. The Council for Allied Health Professions in Research have also published a Practitioner Research Framework (CAHPR 2019) which sets out the knowledge and skills required by an AHP to perform and apply research in different health care settings. To ensure newly qualified radiographers were equipped with research knowledge and skills our Radiotherapy department developed a placement opportunity for students.

Method: Third year students undertook a week placement alongside the Radiotherapy research radiographers. This gave them an insight into the role of a research radiographer and gain experience of clinical trials, local service evaluations and research. To assess the efficacy of the placement the students were asked to complete a pre and post placement questionnaire and to take part in a focus group to expand on any themes raised from the questionnaires.

Results:

Results

Table 1 Comparison of Pre and Post Placement Responses.

	Pre Placement Mean	Post Placement Mean
Current Knowledge of research	3.8	5.8
Current confidence level of undertaking research	3.6	5.4
Current knowledge of Radiotherapy Trials	3.8	6.8