EVALUATING REAL-WORLD CLINICAL IMPACT OF IMAGING AI IN A TERTIARY NHS TRUST

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INTRODUCTION

The recent rapid development of artificial intelligence (AI) has led to a global abundance of AI products within Radiology.

My main focuses during my fellowship year were to gain an overview of all existing imaging AI products, to participate in real-world clinical evaluation and implementation of imaging AI products and to identify and try to solve issues in successful implementation of AI tools.

CLINICAL PROBLEM

There is a 32% shortfall of clinical radiology consultants, forecast to increase to 40% by 2030, alongside a doubling of demand for complex imaging vs rate of workforce growth.[1] AI forms part of the Royal College of Radiology's proposed solution to the workforce shortfall.

Registries have emerged to keep track of existing imaging AI products, however differences in regulatory frameworks, registry structure and a significant implementation gap cloud what the true landscape of radiology AI looks like.

ARTIFICIAL INTELLIGENCE SOLUTIONS

Pixyl.Neuro.MS – MDR Class IIa tool that annotates, quantifies and compares multiple sclerosis (MS) specific lesions on MRI head scans over time.

Harrison.ai CT brain – MDR Class IIb AI clinical decision-support tool that detects up to 130 findings on non-contrast CT head scans. Potential for rapid triaging of ED patients.

Brainomix eCTA/LVO detection tools – MDR Class IIa tool that detects large vessel occlusion (LVO) on CT angiograms (CTA) in patients with suspected stroke, allowing for rapid triaging of patients that may benefit from time critical intervention.

Fracture detection tools – Various AI tools that detect fractures on standard plain film radiographs. Potential for reducing fractures missed in situations where a radiologist report may not be immediately available.

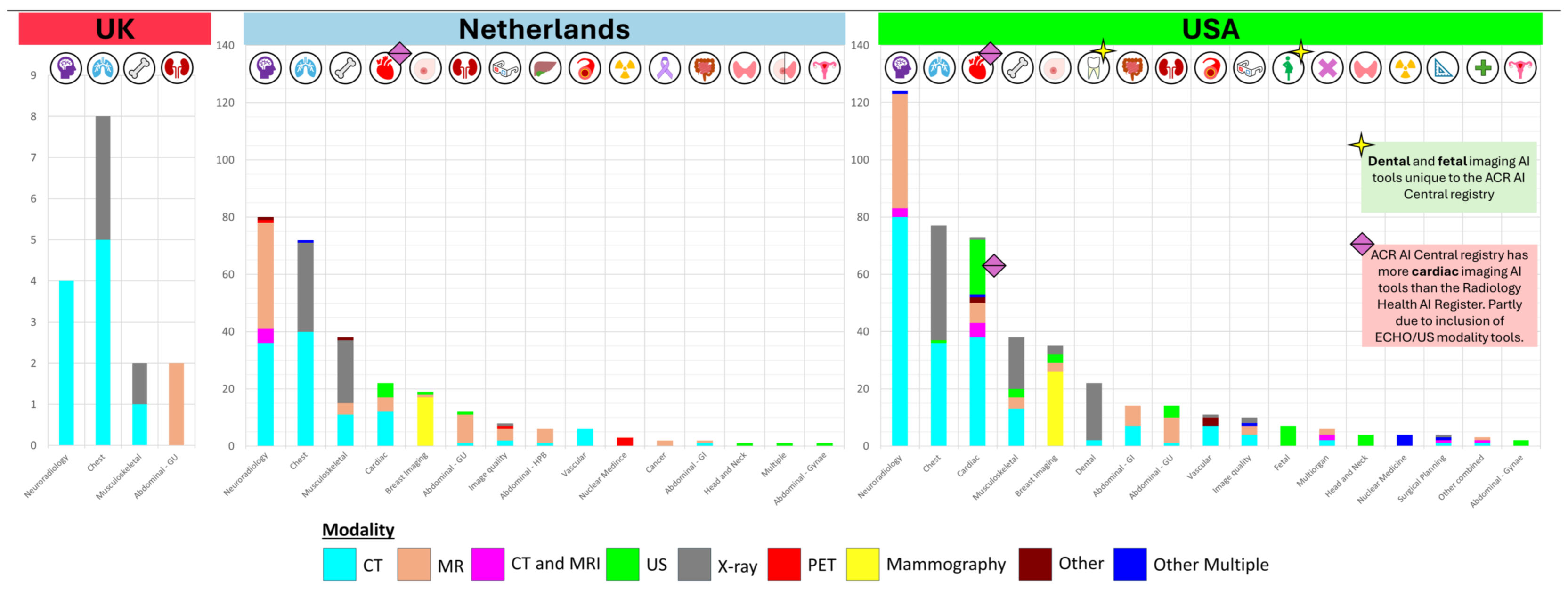
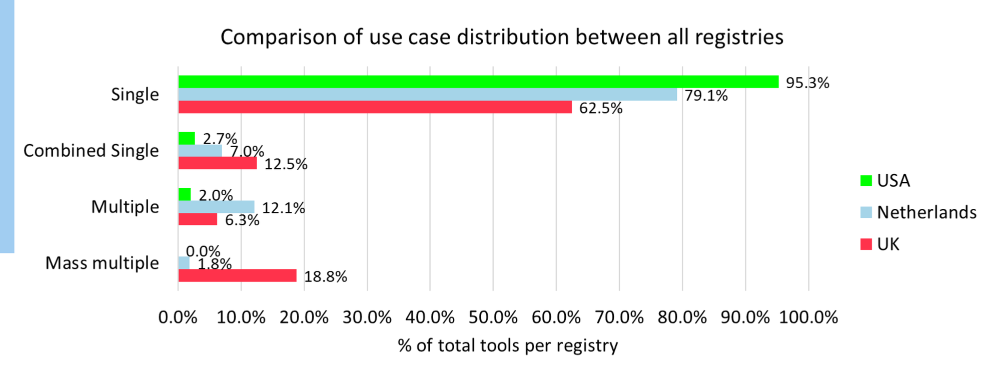


Figure 1 – Count of imaging AI tools across three registries by subspecialty and modality
Left: UK – RCR AI registry[4]
Centre: Netherlands – The Radiology Health AI Register[2]
Right: USA – ACR AI Central[3]



Count of number of use cases	UK	Netherlands	USA
Single	10	216	427
Combined Single	2	19	12
Multiple	1	33	9
Mass multiple	3	5	0

Definitions	
Single	Single use case tool e.g. only Pneumothorax detection
Combined Single	Single use-case tools paired together e.g. Pneumothorax detection + ET tube position
Multiple	Multiple use cases such as different diagnoses but ≤50 use cases e.g. 15 acute differentials on CXR
Mass multiple	>50 use cases e.g. 150 differentials on CXR

Figure 2 – Count of imaging AI tools based on number of use cases
Top: Table showing the total count per use case
Middle: Bar graph comparing the use case distribution between all registries. Note the higher proportion of mass multiple use case tools in the UK registry.
Bottom: Definitions of each use-case category

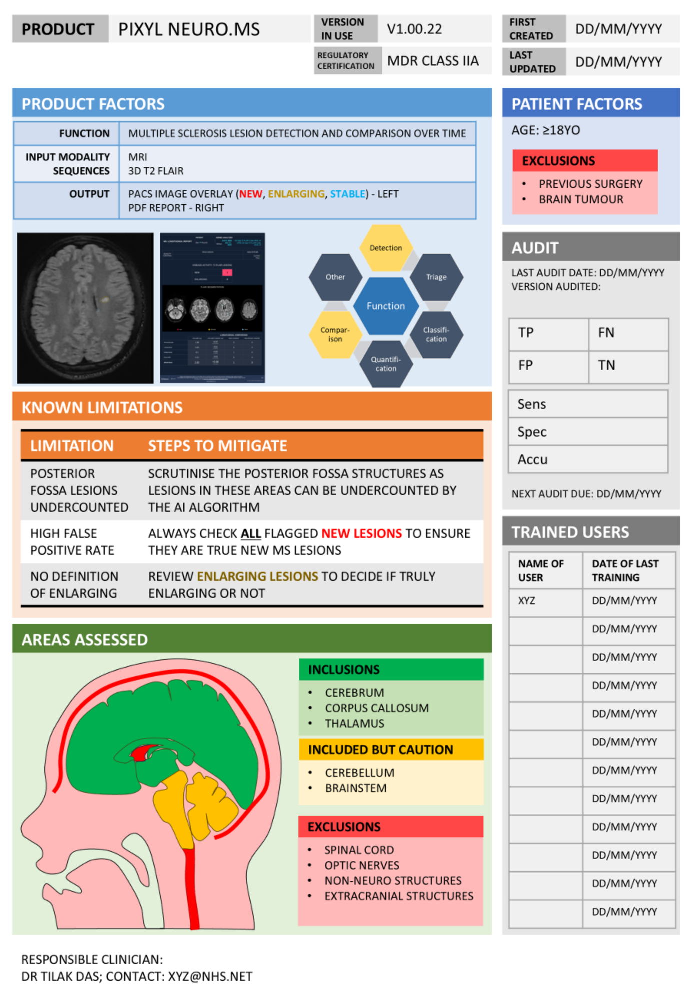


Figure 3 – Example tool summary document
Includes known limitations of the tool at both patient and product levels, anatomical areas reviewed and audit details.

PROGRESS & KEY LEARNING POINTS

AI Registries Project – three registries reviewed: The Radiology Health AI Register[2] (Netherlands) included 273 tools from 109 companies; ACR AI Central[3] (USA) 448 tools from 212 companies; and the RCR AI registry[4] (UK) 169 entries corresponding to 16 tools from 8 companies.

Neuroradiology and thoracic radiology were the most represented subspecialties across all registries (see Figure 1). The most common functions were detection, quantification and triage; and most tools were single use case (see Figure 2)

Brainomix eCTA/LVO detection tools – I was primary co-author of a multicentre evaluation of the diagnostic performance of AI tools in the detection of LVO on CTAs in patients presenting with suspected anterior circulation stroke. 2917 examinations reviewed over 7 sites. My involvement was in data collection, curation and analysis. One key learning point from this project was the lack of explainability in select cases where the algorithm marks the wrong vessel and in the absolute boundaries of what parts of the intracranial arteries are assessed e.g. extracranial ICA is not assessed – but does it assess the extradural intracranial part of the ICA?

This inspired the creation of a tool summary document (see Figure 3) for reference by users of any AI tool being deployed.

Pixyl.Neuro.MS – I was involved in and creation of the clinical safety case documents (DCB0160) and tool summary document.

CT brain H2H– I wrote a project proposal and labelled the test data for a head-to-head evaluation of two CT brain clinical decision support tools to be used for high-confidence normal identification in ED to help improve patient flow. Labelling proved difficult due to relatively high complexity and variation – this task would benefit from LLM use

Fracture detection H2H – I was tasked with labelling the test data for a head-to-head evaluation of various fracture detection tools. This was much easier task than for the CT brain project due to the simple and structured nature of MSK plain film reports – could be automated by staged filtering process without having to use a LLM.

Figure 4 – Title slides from teaching presentations
Top: AI in Radiology: Hype, Hope or Headache? (UKRST webinar – October 2025)
Middle: Mapping the Radiology AI Landscape (UoC-CUH Monthly Imaging AI Meeting – February 2026)
Bottom: The Role of the Radiologist in AI Development (SRT webinar – March 2026)

OTHER OUTPUTS

One local and two national-level teaching sessions to radiology trainees/consultants (see figure 4)

Presented two posters at the RCR 2nd Annual Global AI Conference 2026 (see figure 5)

NEXT STEPS

I aim to make the most of the skills I have gained through the fellowship this year through:

- Continued involvement in the projects I have been involved in throughout the year, including the LVO detection AI head to head project which is currently awaiting outcome on abstract submitted to RSNA.
- Publishing work on AI registries.
- Continuing imaging AI teaching at both local and national levels.

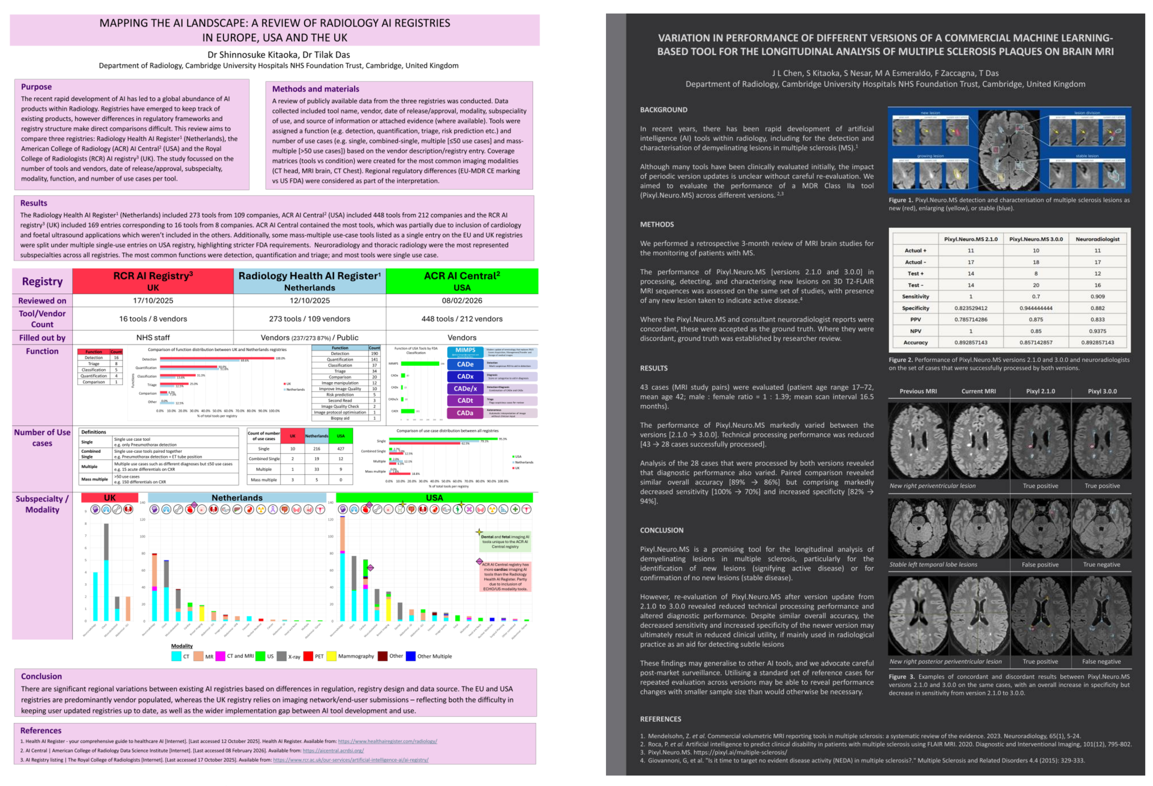


Figure 5 – RCR 2nd Annual Global AI Conference 2026 Posters
Left: Mapping the AI Landscape: A Review of Radiology AI Registries in Europe, USA and the UK (1st author)
Right: Variation in performance of diffent versions of a commercial machine learning based tool for the longitudinal analysis of multiple sclerosis plaques on brain MRI (2nd author)

REFERENCES

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