Addressing barriers to diagnostic AI implementation in the NHS: A roundtable discussion

NOVEMBER 2026

The Royal College of Radiologists

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01 Addressing barriers to diagnostic AI implementation in the NHS: A roundtable discussion

In July 2025, the UK government committed to making the NHS the most 'AI-enabled care service in the world'. The government's 10-Year Health Plan for England placed a 'big bet' on the role of artificial intelligence (AI) in the NHS of the future, with a specific commitment to 'roll out validated AI diagnostic tools' from 2027 onwards [1].

In June 2026, nearly one year on from the publication of the 10-Year Health Plan, the Royal College of Radiologists (RCR) convened a roundtable of health system leaders, all of whom play an active role in AI deployment in the NHS and/or shape national policy around it. The roundtable, which was held under Chatham House rules, was a timely opportunity to look at how diagnostic AI tools are now being used across the NHS and to better understand some of the specific barriers to their widespread implementation.

Key themes emerged from the discussion:

1. Diagnostic AI tools are now blurring lines of responsibility across NHS departments. This adds to the complexity of successful and safe implementation.
2. Proving 'system benefit' of different AI models is a consistent challenge which often results in failed long-term implementation.
3. There are disparities between AI readiness in different parts of the system. Trusts and health boards do not have adequate support for successful, long-term AI implementation.
4. Responsibility and liability in the context of AI use remains a major barrier to its successful at-scale deployment. Cross-departmental use cases add to this challenge.

This report gives more detail on these themes and makes several recommendations for government which, if implemented, will support the 10-Year Plan's vision for an AI-enabled NHS.

02 How is diagnostic AI currently being used in the NHS?

In radiology, 75% of departments now report using AI, up from 69% in the previous year [2]. In contrast to this, adoption of the technology is patchier in pathology, in part because of the complexity of the transition to digital pathology.

In some cases, AI tools are now challenging 'traditional' departmental lines of responsibility, creating new complexities around pathways and governance. For example, some emergency departments are deploying an AI diagnostic tool for head CT to help prioritise urgent cases for review. Similarly, AI models are used in some stroke centres to accelerate urgent patient pathways. In both examples, radiology AI tools are being deployed in non-imaging departments, yet radiology expertise is needed to ensure implementation is safe and effective.

These blurred governance and oversight lines are only set to increase as familiarity with AI in healthcare grows and new AI models emerge. **A more multispecialty approach to AI implementation and oversight is therefore needed, where joint clinical leadership is the standard.** This will strengthen patient safety and ensure appropriate governance structures are in place, particularly to ensure that AI tools are not used outside of their designated or clinically approved use-case.

National guidance on training requirements for AI tools which are used across departments is also needed. This should include clarification on re-training requirements when there is an update to an AI model. Sufficient time and resource for this training should be provided, to ensure training is taken up across the country.

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03 The challenge of demonstrating 'system benefit'

Beyond the growing need for a more multidisciplinary approach to diagnostic AI implementation, greater consensus on how 'system benefit' of these tools is established and evidenced is needed to support their procurement and use.

Some of the potential system benefits of AI use in the NHS include:

- **Diagnostic accuracy** – an AI tool that spots breast lesions not easily analysed by the human eye, allowing for greater diagnostic accuracy. This, in turn, can speed up treatment initiation and improve patient outcomes.
- **Time saving** – an AI tool that can help reduce time spent on specific clinical tasks. For example, AI-driven autocontouring (AIAC) for radiotherapy planning which can speed up this task for clinical oncologists.
- **Improved staff experience** – an AI tool that can reduce workload and free up clinician time to focus on direct patient contact. In some cases, AI tools can enable clinicians to take a full lunch break or leave on time from work, helping to protect against burnout.
- **Pathway efficiencies** – an AI tool that effectively identifies scans that should be prioritised for interpretation, helping to make sure the most urgent patients are treated first and accelerating patient progress through the relevant pathway.

Some of these system benefits, such as improved diagnostic accuracy, can be quantitively evidenced. Benefits such as reduced staff burnout, however, are harder to demonstrate and generating that evidence at pace is difficult. There is no consensus on what constitutes proven system benefit or the evidence required to demonstrate such benefits. Additionally, there will be AI use cases where the benefits are realised in one department to the detriment of another.

Trusts and health boards often prioritise cost-savings or cost-neutrality as the primary system benefit when assessing new AI tools. At-pace return on investment (ROI) is needed for trusts to commit to long-term procurement, but this can be difficult to evidence in a relatively short period. This contributes to so-called 'pilot-itis'– the effect of AI innovations failing to scale from small, short-term trials to widespread adoption and long-term investment.

The need to demonstrate at-pace ROI as well as limited consensus on acceptable evidence thresholds for wider system benefits is hampering AI implementation. **Central government should define sensible, consistent evaluation criteria for AI tools which include system benefits beyond ROI**. Government needs to work with trusts and health boards to get buy-in for these criteria, and harness the NHS's significant research and evaluation capabilities to generate the necessary evidence at pace.

04 Readying and supporting the system

Trusts and health boards play a vital role in NHS AI implementation. Their procurement decisions dictate which AI tools are clinically available, whether they are procured long-term, and whether wider support for their deployment is in place.

With the average cost improvement plan for NHS trusts in England reaching 5.7% in 2025/26 [3], it is understandable that trusts and health boards want evidence of ROI. In addition to AI model procurement, trusts and health boards are required to fund and maintain the infrastructure needed to optimise AI use across and between medical specialties (digital pathology and interoperable data, PACS and RIS systems, for example), ensure appropriate governance and safety processes are in place, and facilitate the multispecialty implementation and oversight of cross-departmental AI models.

Trusts and health boards are not evenly equipped or resourced to support all this activity, with significant variation in their digital maturity [4]. National funding is sometimes made available to bridge the gap, but this is rarely maintained. AI tool pilots may come with additional support from the companies seeking to test their models (i.e. staff training, information governance assistance, free model use), but as with national funding, this support is frequently withdrawn once the pilot has ended. The result is inequitable continued procurement of AI tools and therefore inequitable patient care.

Long-term investment from central government is needed to better ready and support trusts and health boards for AI adoption. Targeted investment in the underlying data and IT systems needed for AI optimisation would be transformative. So too would sustained funding for AI tools with proven system benefits beyond ROI.

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05 The liability question

The growth in cross-departmental AI tool use adds to the well-documented concerns around medical liability in the context of AI. For example, when an AI radiology triage tool is deployed in another, non-radiology department, it is unclear who could be held responsible for a triage error. Anticipating these issues and engaging with clinical leaders, medical royal colleges, regulators, vendors and patients should help ensure and maintain safe and responsible deployment.

Questions around liability in the context of AI use must be clarified nationally, with the involvement of medical royal colleges. Waiting for case law should not be regarded as the best workable viable option. Doing so risks limiting clinician willingness to support AI use both within their own departments and, in a growing number of cases, where cross-departmental models are deployed.

Questions around liability in the context of AI use must be clarified nationally, with the involvement of medical royal colleges.

To address the challenges outlined above, we propose the following recommendations for central government and healthcare leaders to address the barriers identified and support the effective and sustainable adoption of AI across the NHS.

Recommendations

- **Trusts and health boards should facilitate multispecialty implementation and oversight of AI tools where multiple departments are involved in their use. Joint clinical leadership in such cases should be the standard.**
  - Trusts and health boards would benefit from guidance to support their facilitation of this new approach.
- **Central government should produce guidance on user training and qualification requirements, not only but particularly in cases where clinical AI tools are used across departments. This should include clarification on re-training requirements when there is an update to an AI model.**
  - Sufficient time and resource for this training should be provided.
- **Central government should define sensible, consistent evaluation criteria for AI tools which include system benefits beyond ROI.**
  - Government needs to work with trusts and health boards to get buy-in for these evaluation criteria.
- **Central government should provide long-term investment to bolster system readiness for at-scale AI adoption.**
  - This funding should focus on the digital infrastructure needed to optimise AI use both within and across specialties.
- **Central government should fund AI tools with proven system benefit beyond ROI.**
- **Questions around liability in the context of AI use must be resolved nationally, with the involvement of medical royal colleges.**

Appendix

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The Royal College of Radiologists. Addressing barriers to diagnostic AI implementation in the NHS: A roundtable discussion.

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