

Centre for Science and Policy Policy Workshop

The use of AI in cancer care and cancer research

**Summary note of the discussion held on 8 July 2025
Downing College, Cambridge**

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Introduction

The Policy Workshop on AI in cancer care and cancer research was organised by the [Centre for Science and Policy](#) (CSaP), University of Cambridge, in partnership with the [Mark Foundation Institute for Integrated Cancer Medicine](#) (MFICM), Cancer Research UK (CRUK) Cambridge Centre. The Policy Workshop was delivered in conjunction with the 2025 ICM Symposium, “AI in Healthcare: Governance and Policy”. It brought together policy makers, researchers from the University of Cambridge and beyond, and other relevant experts for a roundtable discussion under the Chatham House Rule.

The workshop addressed the following questions:

- Where can AI realistically shift the dial on reducing lives lost to cancer and improving care and patient experience? What problems in the UK cancer care problem book could AI be applied to?
- What support mechanisms and governance structures would be needed to enable the efficient, inclusive and responsible development and maintenance of AI tools?
- What infrastructure is needed to enable promising AI tools to be trialled, scaled and better integrated into cancer care?
- How can AI tools meet the needs of patients and clinicians as healthcare shifts from analogue to digital?
- Which particular tools could be piloted in the near future? How can they be evaluated and compared to help prioritisation?

The current state of play

The policy context

- The [NHS AI Lab](#) (2020 – 2025) tested ways of working and different AI tools in an NHS setting, and will inform DHSC’s AI policy moving forward.
- The [2025 Spending Review](#) provided substantial support for the shift from analogue to digital in healthcare.
- The [AI Opportunities Action Plan](#) highlights five key health areas of focus.

10 Year Health Plan for England

- The recently published [10 Year Health Plan for England](#) (July 2025) outlines how AI contributes to all 3 shifts of the Government Health Mission:
 - by supporting remote monitoring, diagnostics and treatments to take place closer to home.
 - by increasing NHS productivity by shifting from analogue to digital.
 - by improving the availability of screening and app-based personalised prevention services.
- Consultations for the 10 Year Plan revealed that the prerequisite need for an AI-enabled health service, of basic digitisation, was still a concern for clinicians; data and a single-patient record are a prominent element of the Plan.
- AI is and will have a significant role in the day-to-day running of DHSC, direct patient care, administration of health care – both clinical and non-clinical, public health and prevention, adult social care, and life sciences research.
- The [National Institute for Health and Care Research](#) (NIHR) continues to fund AI development through fellowships and research programmes.
- AI tools for early detection and diagnosis of cancer have been funded through the NHS England [NHS Cancer Programme Innovation Open Call](#).

Regulation

- The [Medicines and Healthcare products Regulatory Agency](#) (MHRA) and the [International Organization for Standardization](#) (ISO) have existing standards for medical devices, which cover many AI tools for cancer care.
- The regulation challenge, compared to medicines, is the diversity of medical devices.

The Cambridge research scene

- The [Cancer Research UK \(CRUK\) Cambridge Centre](#) is a partnership between Cancer Research UK, the University of Cambridge and Cambridge University Hospitals (CUH) NHS Foundation Trust.
- The CRUK Cambridge centre receives the largest amount of funding from CRUK in the country.

- Multi-disciplinary research, combining biochemistry, engineering, physics, and clinical medicine, is carried out via a series of virtual and physical institutes.
- The Mark Foundation Institute for Integrated Cancer Medicine (ICM) uses data-rich approaches to bring research into clinical cancer care.

Examples of AI tools in cancer care

Artificial intelligence and machine-learning tools are already being used and piloted across cancer care pathways. Examples discussed during the workshop include:

AI for breast cancer screening

- The EDITH ([Early Detection using Information Technology in Health](#)) trial is an NIHR-funded programme testing AI tools in a head-to-head comparison with clinical specialists.
- Nearly 700,000 women across 30 different sites will participate in the trial, which will test the effectiveness of five different AI tools.
- To host the different tools, a £4 million cloud platform was designed and developed by a private company.
- The trial may find that different tools are more effective at different testing sites.

Deep learning for kidney cancer screening

- There is currently no screening programme for kidney cancer in the UK, despite it being the 6th most common cancer in the UK and rarely symptomatic.
- The [Yorkshire Kidney Screening Trial](#) bolted on to the [NHS England Lung Cancer Screening Programme](#), extending the CT-scan region of interest to include the kidney, and found a substantial number of abnormalities (including kidney cancers).
- However, there is a national shortage of radiologists, and there is a cost associated with additional consultant time spent reviewing scans.
- An upcoming clinical trial seeks to understand if AI triaging of CT scans can reduce the cost of kidney cancer screening.
- Research found that there was overlapping performance between the AI algorithm and consultants; however, compared to the consultant, the algorithm discovered and missed tumours relative to radiologists at the same order of magnitude.
- This study suggests that AI and radiologists can synergise to perform better together.

- Using a conservative confidence score to rule out cases, rather than identify cases, can reduce the number of scans requiring radiologist review by 50%, showing that an imperfect model could be highly productive and maintain patient safety.

AI for virtual triaging of skin cancers

- [Deep Ensemble for Recognition of Malignancy](#) (DERM) analyses images of skin lesions, taken using a smartphone and a specialist lens attachment.
- It has been conditionally approved for NHS use as a [Class II medical device](#) while further evidence is collected over the next three years, and is currently being used by 20 NHS Trusts.

Augmented AI for radiotherapy

- Radiotherapy has been an early adopter and testbed of machine learning techniques, enabled by its structured workflows, digital data, and many existing processes to obtain patient consent for research purposes.
- [Open-Source AI model for Radiotherapy Image Segmentation](#) (OSAIRIS) is currently being used by NHS Trusts, augmented with clinician decision making, saving clinicians 2 hours per patient and potentially reducing patient waiting times.
- Key enablers include a strong clinical-industry partnership, the necessary digital infrastructure and regulatory partners.

Generative AI for radiotherapy

- High-quality CT scans allow radiation oncologists to optimise the treatment dose for the size and position of a patient's tumour, which can vary significantly daily, and minimise damage to healthy tissue.
- However, there is a limited number of CT scanners available in each clinic.
- Diffusion-based models are being used to generate synthetic high-quality CT images from lower-quality CT images that can be easily acquired with most treatment equipment, reducing the demand for scarce high-quality CT slots and providing more personalised radiotherapy treatment for patients.
- A key challenge with generative AI is its tendency to hallucinate, generating structures not present in the original image.

- Communicating uncertainty is critical to improving trust, reliability and interpretability of AI-generated scans for clinical use; this can be done using uncertainty maps and confidence thresholds.
- Another challenge is bridging the gap between researchers developing models and clinicians using the models.

Text-based summaries

- Synthesising complex free-text data in busy clinical settings is challenging; AI tools can reduce clinicians' cognitive burden.

Integrated data platforms

- In partnership with GE Healthcare, CUH and CRUK Cambridge Centre are developing an AI tool which integrates cancer patient information and facilitates clinical decision making.

Other highlighted examples of digital best practice included:

- AI algorithms can predict the likelihood of patients missing appointments, enabling proactive interventions to improve attendance.
- Health and Social Care Northern Ireland has mandated an electronic patient record across all health Trusts.
- The Department for Education has developed an [AI tool to help schools in England monitor pupil attendance](#).

Existing plans for AI in cancer care

- An AI in health strategy is expected in Autumn 2025 to supplement the 10 Year Health Plan.
- DHSC will be reviewing the needs for AI in regulation in health care.
- A new cloud platform, to enable multi-site trials using AI tools, has been commissioned by NIHR and is expected to be available to NHS Trusts in the summer of 2027
- The [Cambridge Cancer Research Hospital](#) was approved in January 2025 and is designed as a digital-first hospital.

Remaining questions and gaps to be addressed

Needs, opportunities and remaining questions were raised through the discussion.

Patient trust

- Patients' trust in doctors can already be fragile, so care must be taken that patient trust is not eroded by negative media coverage or perceptions of being treated as test subjects.
- Does the social contract with patients have to change for AI tools? Is it necessary for AI tools to outperform clinicians to gain public trust?
- Practical guidance is lacking on how clinicians should communicate algorithmic uncertainty and provide psychosocial reassurance to patients when AI cannot give definitive answers.

Digital and health equity

- Better outreach is essential to bring screening programmes to underserved groups not currently attending appointments; AI alone cannot solve access issues without community networks and local champions.
- Tools developed in research-rich centres such as Cambridge must be validated in digitally constrained Trusts to prevent widening the urban–rural technology gap.
- Deployment and use of the NHS App by Trusts should be more complete and geographically uniform.
- Should AI be used to identify patients who could benefit from social prescribing?

Workforce

- Clinicians are seeking guidance on how to have a two-way dialogue with patients about AI tools and their impact on patients' care.
- There is a digital and technological staffing and training gap in hospitals.
 - Radiologists, pathologists and junior doctors require targeted training to interpret AI outputs safely and avoid automation bias.
 - The degree of general upskilling needed to realise AI-driven productivity gains remains unclear.
- It is important to involve medical staff, as well as patients, in the co-production and codesign of AI tools.

- Current barriers to widespread workforce engagement include limited digital access (e.g. not using emails), implementation fatigue and strong hospital hierarchies.

Adoption

- The greatest opportunities for productivity gains appear to be low-tech, low-cost solutions, which lessen the administrative burden in cancer care.
- There is a need for greater standardisation of linked digital patient records; current adoption of single patient records is patchy.
- AI-compatible data infrastructures are available to Trusts, at a cost, but secure development environments are also needed to allow algorithms and agents to be trained and tested safely.
- Moving beyond isolated pilots to broad deployment requires implementation science, dedicated academic translation teams, and NHS technology adoption teams, which are currently not widespread.
- Broad adoption requires greater collaboration between researchers, NICE, MHRA and the Royal Colleges (e.g. Radiologists, Physicians).
- Economic incentives should be aligned to reward Trusts for digitising patient records and adopting AI.

Evaluation

- Researchers and clinicians are seeking more support to design clinical trials which generate the evidence necessary for medical device classification and approval.
- How can health economics help quantify the benefits—such as avoided procedures—and the potential harms, including unnecessary preventive interventions, associated with AI?
- More evidence is needed on the real maintenance costs of AI systems and the resources required for ongoing monitoring and performance evaluation.

Follow-up points for consideration

- “Boring but high-value” use-cases should be prioritised—such as reducing missed appointments or automating low-complexity tasks—to deliver quick productivity benefits and reduce waitlists.
- Patient and efficiency benefits can be generated by deploying AI for rapid triaging in diagnostic pathways.
- There are different pathways for infrastructure and technology investment, dependent on which of the three Health Missions shifts or outcomes is prioritised.
- Embedding NHS adoption teams could help scale AI adoption more effectively from the ground up.
- There is a need for communities of practice or peer networks.
 - These could encourage cocreation, collaboration, and partnerships between researchers, healthcare professionals, patients, and policy makers.
 - They could also support researchers developing medical devices, for example, by providing detailed ‘how-to’ guides on obtaining CE marks and designing evaluation roadmaps.