
Radiotherapy

Position Statement from The Institute of Cancer Research, London

Summary

Patients are missing out on potentially life-saving treatments because of barriers to carrying out radiotherapy research and ensuring access on the NHS to the latest technologies. We need to do more to embed the latest advances in radiotherapy into routine healthcare by expanding patients' access to the clinical trials that drive technological advances, and by improving training and infrastructure. Lack of coordination in radiotherapy services means many patients are either missing out or having to travel long distances to receive treatment or participate in clinical trials. We are not training up enough health professionals in use of the latest radiotherapy technologies and that is limiting the ability of the NHS to provide state-of-the-art treatment to patients. We need the Government to work with research institutions, funders and healthcare providers to ensure the UK can continue to lead in developing innovative new forms of radiotherapy, and that the NHS is able to offer cutting-edge treatment across the UK.

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Background information

Radiotherapy is one of the most efficacious, and cost-effective, treatments for cancer and is a component of care in around 40 per cent of all cancer patients cured of their disease. Advances in radiotherapy research, many of them led by The Institute of Cancer Research (ICR) and The Royal Marsden, have translated into exciting new treatments. Modern, high-precision techniques such as intensity-modulated radiotherapy (IMRT) and image-guided radiotherapy (IGRT) – which target radiation doses precisely to the shape of tumours – increase the effectiveness of treatment and reduce side effects. Combining radiotherapy with targeted treatments and immunotherapies is also leading to significant improvements in patient outcomes. Advances in Big Data and artificial intelligence (AI) are now changing the landscape of radiotherapy research by allowing algorithms to predict individual patients' responses as a means to improve quality of life for patients after treatment.

However, it can be difficult to gain funding to assess research advances like these in clinical trials of cancer patients. Radiotherapy research is not well funded by industry and so trials are often carried out in an academic setting. NHS England does not automatically fund provision of radiotherapy or associated costs such as imaging in clinical trials, if they are not already commissioned by the NHS. Researchers conducting NHS trials can apply for excess treatment cost funding (ETCs) to cover additional expenses, but this adds to the complexity of getting studies up and running. Additionally, disparity between services means many patients have to travel long distances to receive appropriate care or take part in trials.

It can also be difficult to ensure that the payments the NHS makes to hospitals for providing radiotherapy are ring-fenced to support innovations in care. NHS England recognised in the Long Term Plan that the current funding structures could disincentivise hospitals from adopting modern approaches to radiotherapy, and pledged to address that through reforms to specialised commissioning. NHS trusts are reimbursed based on the number of hospital visits for a patient, which has been a barrier to rolling out new regimens where radiotherapy is delivered in fewer, larger-dose fractions. In addition, payment tariffs do not take into account the additional planning time needed in advanced forms of radiotherapy, and the length of time required when each dose is given to perform complex imaging guidance.

As the technical capabilities of radiotherapy have advanced, the planning and delivery of care has also become much more complex – requiring a highly trained workforce, large multidisciplinary teams and additional infrastructure.

In recent years, NHS England has begun to invest in infrastructure to support radiotherapy delivery. It began a £130 million upgrade of radiotherapy machines across England in 2016 as well as commissioning new proton beam facilities in London and Manchester to treat specific types of cancer. NHS England is also rolling out 11 radiotherapy networks across the country,¹ responsible for coordinating radiotherapy services for their catchment populations. The Clinical

¹ [Modernising Radiotherapy Services in England – developing proposals for future service models](#)

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Oncology UK Workforce Census report highlighted that as demand for cancer services increases, shortages in the radiotherapy workforce have been intensifying.^{2,3} NHS England suggested in the NHS Long Term Plan in 2019 that this will be addressed in an upcoming workforce implementation plan.

² [Clinical oncology UK workforce census report 2018](#)

³ [Cancer Workforce Plan phase 1 – Delivering the cancer strategy to 2021](#)

Key ICR positions on radiotherapy

- Modern radiotherapy is a state-of-the-art treatment which has a crucial role to play in improving survival rates for cancer patients. It has the potential to deliver many more cancer cures in combination with other innovative treatments.
- We need to address the postcode lottery that patients face across the UK in access to the latest radiotherapy trials, technologies and approaches. Lack of up-to-date equipment, properly trained staff or support for clinical trials restricts access to advanced, high-precision radiotherapy in many parts of the country. That forces some patients to travel long distances for access to the highest-quality care or latest trials. We welcome the new radiotherapy networks as a way to deliver a coordinated approach to radiotherapy across the UK, and urge the Government to provide additional funding to ensure their success. The networks could help spread best practice, share skills and data, and coordinate establishment of major, multi-centre trials.
- NHS England needs to create a simpler system for funding radiotherapy clinical trials in the UK as current complexities are causing delays to setting up trials. Clinicians currently have to apply for ETC funding to cover the cost of additional activities in trials where they are not already commissioned by the NHS. NHS England should commit to covering these costs in trials as a way of encouraging innovation and expanding access to trials for patients. It is vital to ensure these additional trial costs include use of CT, PET and MRI scans as part of radiotherapy planning, to ensure centres are not hindered from participating in trials of the latest forms of high-precision, image-guided radiotherapy. We welcome the pilot of the new Schedule of Events Cost Attribution Tool (SoECAT), and believe it is critical that this is supported properly so it is a success.
- The UK should continue to build a more coordinated approach nationally to designing clinical trials that assess the benefit of innovative radiotherapy technologies and approaches. Researchers, funders and the NHS should develop robust trials collaboratively in order to change clinical practice more quickly. Newer technologies such as the MR Linac and proton beam therapy can present good treatment options for patients with less common or hard-to-treat cancers, but a nationally coordinated approach is needed in assessing these to include sufficient numbers of patients to demonstrate benefits. A more coordinated approach can reduce the current waste seen when large numbers of smaller trials fail to yield strong enough results to drive changes in practice. We strongly support the work of groups like CT-Rad and ART-Net in working to coordinate clinical trials across the country. ^{4,5}

⁴ [Clinical and Translational Radiotherapy Research Working Group](#)

⁵ [Introducing the Cancer Research UK Advanced Radiotherapy Technologies Network \(ART-NET\)](#), Harrington, K. et al, Clinical Oncology, Volume 29, Issue 11, 707-710

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- We need to find new ways to incentivise pharmaceutical companies to trial their therapies in combination with radiotherapy to deliver more effective and curative options for patients. There is currently little incentive for industry to engage in this research, because of a perceived lack of return on investment. Testing drugs in combination with radiotherapy should also be done early in drug development and targeted towards patients with early-stage cancer to assess their curative potential, rather than just in advanced cancer. We need more initiatives in place to encourage industry engagement in this exciting field, such as the Radiotherapy-Drug Combinations Consortium (RadCom)⁶ which has promoted research into drug and radiotherapy combinations.
- The Government should take a strategic approach to upgrading radiotherapy and imaging infrastructure to ensure that patients across the UK have access to the latest technologies. We welcome the investment from NHS England to update radiotherapy equipment across the country. However, there are still many hospitals with out-of-date equipment unable to deliver the latest, high-precision forms of radiotherapy. We need a hub and spoke model to be established to provide access to the latest radiotherapy technologies, such as the MR Linac, and for investment to extend to cover advanced imaging equipment, such as MRI and PET scanners. It is important that NHS radiotherapy equipment is updated and maintained on a rolling basis. Radiotherapy often depends on new technology that needs to be purchased before it can be evaluated and its efficacy tested. The NHS should ensure that a system is in place to allow investment in innovative technology for its evaluation.
- We believe the current national tariff for radiotherapy is discouraging the adoption of the latest innovations. Hospitals can be unwilling to adopt new approaches to radiotherapy that reduce the number of appointments patients have for fear of losing funding, and may also be reluctant to introduce high-tech forms of radiotherapy where tariffs do not cover the cost of imaging for treatment planning. Additionally, the process for updating tariffs is too slow to keep up with advances in radiotherapy technology. It is essential that the Government updates tariffs and keeps up with advances in radiotherapy that offer equivalent or better patient outcomes through fewer hospital appointments. Tariffs also need to recognise the complexity and effort required in delivering modern, image-guided radiotherapy, and to pay hospitals accordingly.
- We need to make the most of advances in technology such as AI in radiotherapy research and treatment. That will require increased investment in IT infrastructure and more joined-up approaches to data sharing. We need to create interoperable storage systems so that researchers can safely and effectively access and share data on radiotherapy and the outcomes of treatment. Linking data to cancer registries will also be highly informative for research and NHS planning.

⁶ [Radiotherapy-Drug Combinations Consortium \(RadCom\)](#)

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The new NHS radiotherapy networks need to agree standard protocols for collecting radiotherapy outcomes data.

- The Government should address the shortage of clinical oncologists, medical physicists, therapeutic radiographers and scientists with the skills to deliver high-quality radiotherapy. Training schemes are not keeping sufficient pace to enable the workforce to deliver advances in radiotherapy technology in an increasingly multidisciplinary environment. Lack of NHS bursaries to study has caused a decline in numbers enrolling onto radiotherapy courses, which in turn makes it financially impossible for some universities to run radiotherapy degrees. We recommend these grants are reinstated to increase student numbers and avoid a long-term depletion of the radiotherapy workforce. We also need to continue recruiting highly qualified staff, from abroad where necessary, including physicists who are crucial to the delivery of modern radiotherapy.
- We need to ensure staff who are involved in radiotherapy delivery receive continual training in the latest advances, and to set up training courses in new areas such as convergence science, where biology and medicine are brought together with physics and engineering. With the development of new radiotherapy networks, the lead institution could provide training initiatives which are made available across the catchment area.
- We need to ensure that there is ring-fenced time for clinicians to conduct research. In order to progress radiotherapy research and continue to provide good services NHS clinicians should be allowed adequate time to conduct research and deliver clinical trials separate to the provision of care, so as not to spread resource too thinly.
- It is especially important that we provide patients with access to advanced forms of radiotherapy in streamlined regimens during the coronavirus pandemic. In specific circumstances, high-precision radiotherapy can be a safer option than chemotherapy or surgery while the prevalence and incidence of coronavirus is high. Radiotherapy also has an important role to play in helping to clear the backlog in cancer treatment that has built up during the pandemic. Radiotherapy is a localised treatment and may not suppress the immune system to the same extent as chemotherapy, and puts less pressure on hospital capacity than surgery. We are particularly keen to see the NHS adopt new forms of hypo-fractionated radiotherapy, in which radiotherapy is given in a smaller number of higher doses, as it can radically reduce the number of hospital visits required for patients with some types of cancer.