Recovering radiotherapy services in England: Our plan for action

In recent months, operational performance in radiotherapy has declined with services reporting long delays for patients needing treatment. However, this generally does not receive the same level of visibility in the public debate as chemotherapy and other cancer treatments.

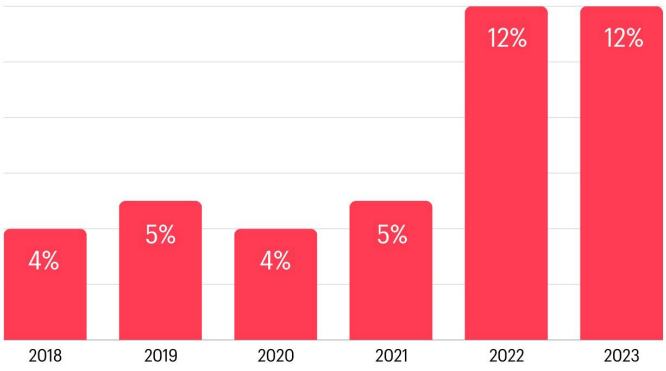
This briefing explores the main drivers of lengthening waiting times for radiotherapy and what action we need at a national and local level to support services*

The challenge

Over the past few decades, cancer incidence has risen, and it will continue to do so with the increasing availability of routes to diagnosis.[1]

However, performance against radiotherapy targets is falling. NHS England's target is that 96% of all patients start their treatment within 31 days of the decision to treat being agreed with their clinical team. This target was consistently met until July 2021 but since 2022, performance has been substantially declining.

% OF PATIENTS STARTING TREATMENT AFTER 31 DAYS IN SEPTEMBER OF THE PAST SIX YEARS [2**]

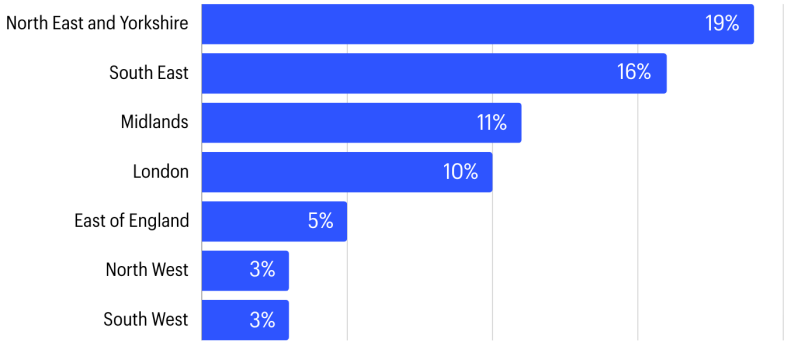


In October 2023, over 2,300 patients (11%) started their treatment more than 31 days after the decision to treat. The data shows unacceptable regional variation in progress against this target, leading to a postcode lottery of care which exacerbates health inequalities.

* Due to the availability of the data, this briefing focuses on the challenge in England, but many of the themes and recommendations put forward will be applicable across the four nations.

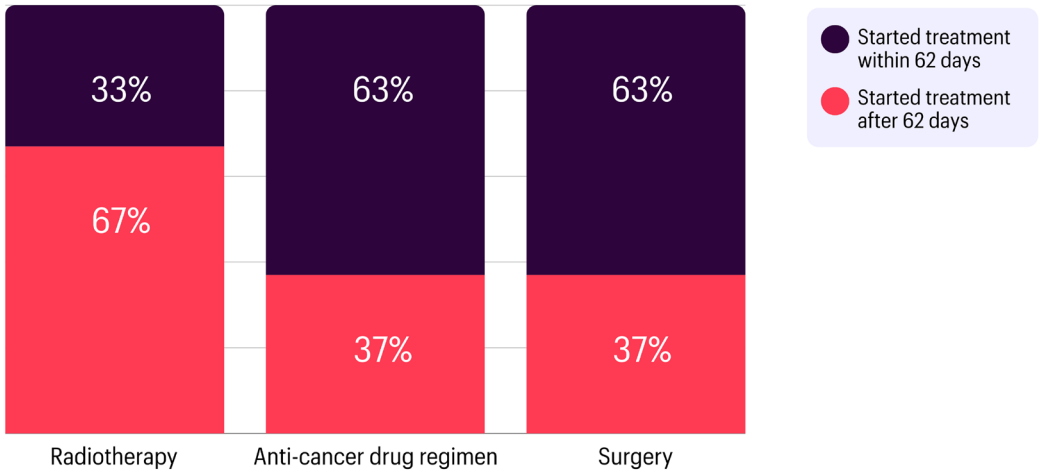
** Data from NHS England's Cancer Waiting Times October 2023 data release has been used throughout the document. In this instance, data has been taken from September 2023 since changes in data collection has meant that this graph is no longer easily producible.

% OF PATIENTS STARTING RADIOTHERAPY AFTER THE RECOMMENDED 31-DAY TIMEFRAME IN OCTOBER 2023 BY REGION [3]

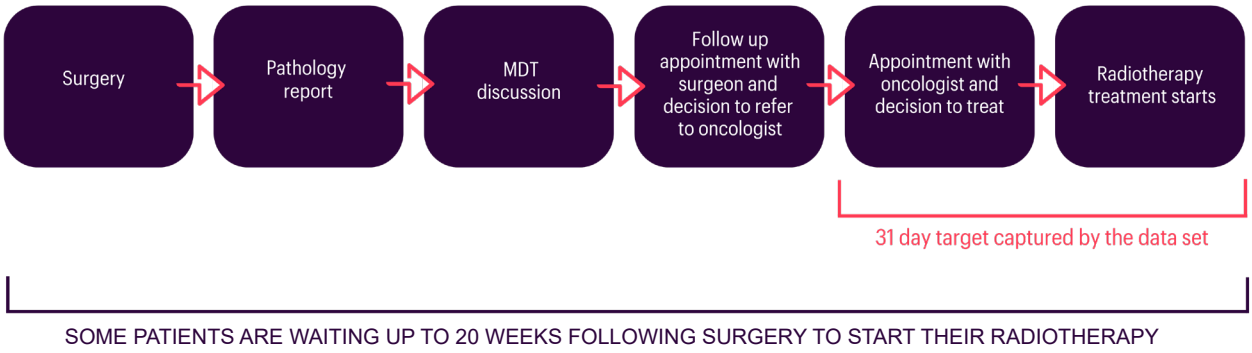


When looking at the full pathway, patients needing radiotherapy as their first cancer treatment were by far the least likely to be treated within 62 days of a GP referral.

% OF PATIENTS STARTING FIRST TREATMENT WITHIN 62 DAYS OF A GP (OR OTHER URGENT) REFERRAL OF SUSPECTED CANCER IN OCTOBER 2023, BY MODALITY [3]



The existing 31- and 62-day targets present an additional challenge, since there are also hidden delays throughout the cancer treatment pathway which are not captured in the dataset. The below diagram details the journey of a patient who needs radiotherapy as a follow up treatment to surgery.



These hidden waits introduce an unacceptable delay between one cancer treatment and another, limiting the value of both treatments.

There are also challenges around the timely delivery of palliative radiotherapy. Palliative radiotherapy is mostly used to relieve distressing symptoms for people with cancer that cannot be cured, and accounts for between 30-50% of radiotherapy courses.[4]

It has been reported that some patients are having to wait six weeks for their palliative radiotherapy, making its short-term value extremely limited. This is due to capacity constraints, where for example, some services pre-book all available radiotherapy slots for patients receiving curative radiotherapy, meaning there is no flexibility for patients requiring palliative treatment (whose need for treatment is unpredictable) to be booked in. Again, the available data does not capture the waiting time to see a clinical oncologist, meaning waits may be substantially longer than these data suggest.

Treatment delays can have a serious impact on a patients' health outcomes, both physical and mental. In some cancer treatment types, the risk of death increases by approximately 10% for every four weeks a patient is delayed from starting treatment.[5]

What is preventing patients from receiving timely care?

1. Workforce Shortages

Radiotherapy is delivered by a multi-professional team, including clinical oncologists, therapeutic radiographers, and medical physics professionals. They work with the wider cancer multidisciplinary team to deliver a patient-centred service.

Workforce costs make up only 31% of the total cost of delivering radiotherapy but all three professions face huge challenges in ensuring the right staff are in place to realise the potential of radiotherapy. A relatively small increase in staff funding would make a big difference to patient care.

Clinical oncologists are responsible for overseeing and developing a patient's cancer treatment plan. This includes deciding on radiotherapy as a treatment, designing and approving the radiotherapy contours which tell the wider team what to irradiate, and prescribing treatment.

- *There is a 15% shortfall of clinical oncologists, which is expected to rise to 25% in five years' time.*[6]

These shortages create bottlenecks in the pathway as other staff groups are reliant on the doctor to complete their next task.

Therapeutic radiographers are the only healthcare professionals qualified to deliver radiotherapy with very high levels of accuracy using a wide range of sophisticated and technical equipment. They also care for patients before, during and after their radiotherapy.

- *There is currently an 8% shortfall of therapeutic radiographers within the NHS.*[7]

The **radiotherapy physics** workforce includes clinical scientists, clinical technologists, engineers, and systems/IT support staff. **Clinical scientists** provide leadership on the development and implementation of new techniques, and are responsible for procuring and managing radiotherapy equipment. **Clinical technologists** can either be clinical engineers or dosimetrists, who plan individual patients' radiotherapy.

- *Across the three main radiotherapy physics professions, there is an average shortfall of 8%.*[8]

Challenges in recruitment and retention

In all staff groups, there are challenges in recruiting staff. In 2023, just 51% of clinical oncology training posts were filled making it difficult to catch up on shortfalls.[9]

For therapeutic radiographers, who often enter the workforce via pre-registration undergraduate degrees, attrition for this course is particularly high – approximately one fifth of the cohorts do not complete their degree.[10] Undergraduate recruitment numbers will need to be even higher than anticipated to account for this.

Apprenticeships are increasingly seen as a route to stabilising the therapeutic radiographer workforce and build a local workforce who are more likely to be retained over time, as recognised in NHS England's long term workforce plan. However, there are currently very few apprentices in training, largely because there is no central commissioning or guaranteed funding support for services to recruit and train via this model.

Meanwhile, radiotherapy physics training posts are in high demand, but departments face challenges in securing central funding to expand the workforce.

The development of the national non-surgical oncology advanced practice programme, which offers AHPs opportunities for career progression and role development, is a promising innovation with potential to support service improvement and staff retention. However, once implemented, investment in therapeutic radiographers will still be required to grow the workforce to support patients.

Retention poses a similarly significant threat. Within the next five years, a concerning proportion of each workforce group are expected to retire:[10]

Workforce group	% expected to retire in the next five years
Clinical oncologists	20%
Therapeutic radiographers	5%
Clinical scientists	9%
Clinical technologists	20%

Recommendations

1. NHS England should undertake a formal analysis of the necessary steps required to build a sustainable radiotherapy workforce for the future.
    - This should recognise current challenges alongside projections of future cancer incidence, cancer stage and likely technological advances.
    - Targeted investment should then be used to deliver the necessary changes to workforce recruitment and retention.

2. NHS England should maintain the expansion of clinical oncology training places to ensure there are sufficient doctors to meet the rising demand for cancer treatment.
    - NHS England should commit funding for a recruitment campaign, led by The Royal College of Radiologists (RCR), to encourage trainees to apply to these positions.
    - Regions with fewer consultants per incident cancer population should receive greater focus to address inequalities.

3. NHS Trusts should invest in the training programs for clinical scientists and clinical technologists, as well as going further to attract IT/systems support staff.
    - To keep up with innovations in radiotherapy, including the expansion of AI, this staff group will be particularly important.

4. NHS England should develop a central commissioning structure to support departments to take on therapeutic radiographer and clinical technologist apprentices.

5. NHS Trusts must invest in training capacity, both in terms of physical space and educator availability, supported by new funding from the Government and with direction from NHS England.

5. NHS England and local health systems should actively invest in staff retention, including by seeking an understanding of and addressing the concerns of staff, and by supporting flexible working and implementing wellbeing measures.

2. Clinical capacity to embed innovations

Radiotherapy has advanced significantly in recent years, thanks to the development and implementation of cutting-edge innovations and new techniques including stereotactic ablative radiotherapy (SABR), novel molecular radiotherapies and proton beam therapy.[11,12,13]

Artificial intelligence (AI), and specifically AI-based auto-contouring and planning tools, may improve the consistency and quality of treatment and speed up treatment pathways.

Implementation across the NHS is currently extremely patchy with some providers lagging and innovation being stifled by workforce constraints. Staff capacity, both for clinical and specialist IT staff, has been identified as a major barrier to introducing new technologies and job timetables do not adequately reflect the time needed for quality assurance, clinical evaluation, and implementation of AI tools into the service.

Time should be allocated and protected for members of the radiotherapy team to undertake non-clinical work. In the current environment, even time allocated for service development is frequently overridden by clinical commitments inevitably limiting the potential for the implementation of technologies that may improve productivity.

The potential time-savings delivered by new techniques such as AI are limited if staff are already working beyond their contracted hours to cope with demand. Future innovations coming down the line in radiotherapy- including automation enhanced contouring, treatment plan development, and quality assurance - will fail to fulfil their potential without the clinical leadership and headspace to implement these.

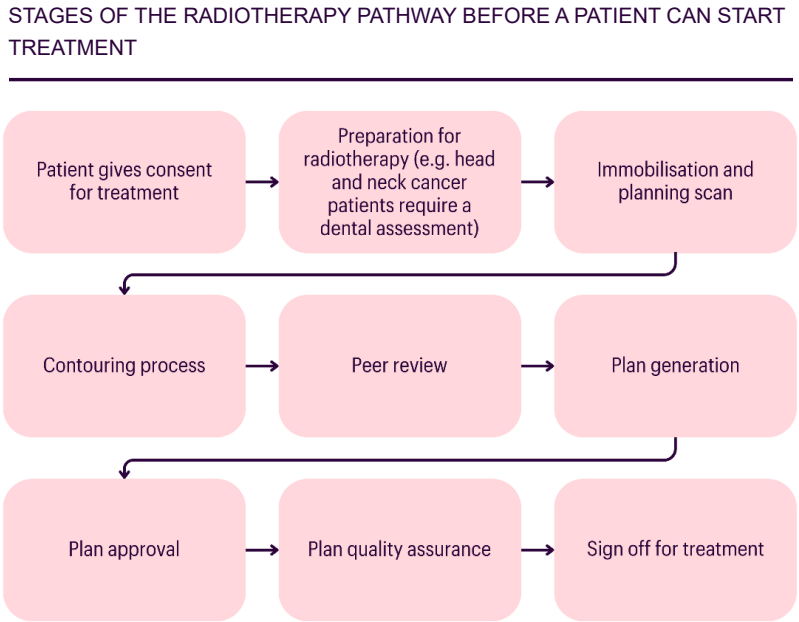
Recommendations

6. NHS Trusts should ensure that the radiotherapy workforce is given adequate and protected time for service development.

3. Pathway redesign

The design of the radiotherapy patient pathway, from decision to treat to the start of treatment, does not accommodate for delays. Since NHS England have said that patients should start treatment within 31 days, patients are often scheduled to start their first treatment close to day 31 to allow sufficient time for the team to complete all stages of the pathway.

However, the lack of excess capacity in the system means that services can't be flexible and adapt to unexpected delays. There are several stages of the radiotherapy pathway that need to take place before a patient can start treatment:



If there is a delay at any one stage of this process, such as from a key person being unavailable, a surge in patient referral numbers or machine breakdown, the patient's treatment start date may be pushed back past the 31-day mark.

For many healthcare professionals, 31 days is considered too long for patients to start radiotherapy. In many countries, patients routinely start curative treatment within two weeks of referral and palliative

treatment within days. Consideration should be given as to how we can make the patient pathway much shorter, including how we can increase capacity, flexibility, and resilience to make this feasible.

Certain regions are already performing better than others, and have been able to design shorter pathways for groups of patients, so examples of best practice should be shared, especially with struggling regions.

Recommendations

7. NHS England should fund a formal pilot that trials a 17-day pathway in some tumour types in one or more Radiotherapy Operational Delivery Network (ODN)
    - This pilot should identify opportunities for accelerating the pathway and collect data on the resources required to do so, with the view of rolling out a more ambitious national target in the near future.

4. Equipment

The ESTRO-HERO report shows that equipment makes up over 62% of the total cost of delivering radiotherapy. A clear, robust, long-term plan for radiotherapy equipment procurement at a national level would help the NHS get best value for money.

There is some concern that the NHS does not have enough linear accelerators (Linacs), brachytherapy machines and CT/MRI scanners to meet the demand for radiotherapy. International comparisons suggest that the UK has fewer machines per capita than many countries.[14] This complex equipment inevitably breaks down and must be repaired, reducing service capacity in the short-term which can result in increased delays for patients. 36% of cancer centres in England reported that their equipment breaks down most months and 8% reported that their equipment breaks down most weeks.[15] Proactive service repair and maintenance are key.

Providers need sufficient funding to maintain and replace equipment, and capital budgets should be protected, rather than being used to fund day-to-day spending. The responsibility for replacing radiotherapy equipment is beginning to move to Integrated Care Systems (ICSs) rather than individual trusts, which is creating considerable uncertainty over future funding plans.

Alternatively, instead of the NHS organisation owning and operating the equipment, they could explore other funding methodologies, such as leasing and managed equipment service models (MES). In the case of MES, a whole service is leased over a period of many years so that the costs of equipment, maintenance and upgrades can all be spread over the length of a contract.

Recommendations

8. NHS England should clarify future funding arrangements for radiotherapy equipment. They should consider national and regional procurement models, and the transfer budgets to Integrated Care Systems.
9. Cancer Alliances should require local trusts to have maintenance contracts with equipment suppliers so that machines are serviced regularly to reduce downtime.

5. Data collection limits our understanding of the patient pathway and experience

The Radiotherapy Dataset (RTDS) is a vital national resource that provides valuable information for the commissioning, planning and delivery of radiotherapy services. While it has seen significant improvements in recent years in data quality, completeness, and geographic scope, it is still limited as analyses do not currently measure the hidden waiting times across the whole patient pathway or for individual tumour types. NHS England should prioritise the delivery of these analyses. This may require the capture of additional data but crucially will also rely upon the provision of an adequately resourced team of expert analysts, in addition to support for clinical teams to translate these findings into service improvement.

There are other gaps in our understanding about radiotherapy provision, radiotherapy equipment, and patient outcomes. All could be informed by a comprehensive, up to date and reliable datasets incorporating all relevant data items.

Recommendations

10. NHS England should further invest in the radiotherapy dataset, prioritising capture of data and delivery of analyses assessing the whole patient pathway by tumour type.

6. Tariff reform

The current tariff model is outdated and does not adequately compensate hospitals for the total cost of providing radiotherapy as outlined by the ESTRO-HERO report. NHS England have acknowledged the problem but have not yet been able to incorporate technological developments in radiotherapy into the current tariff system.

Major changes to the delivery or radiotherapy are occurring through the increasing use of hypofractionation – higher doses of radiation in fewer visits. This can lead to more convenient patient care and more effective use of healthcare resources. However, if the tariff mechanisms incentivise more visits, this has the counter effect of disincentivising innovative approaches like hypofractionation. Services may be perversely incentivised to pursue income generation rather than implementation of innovative techniques.

The greater complexity of planning and delivering these hypofractionated courses must also be recognised.

Since 2020, radiotherapy has been funded by a block contract model. In the future, ICSs will have responsibility for funding treatment but there is a lack of clarity on when or how this will be approached.

Recommendations

11. NHS England should set out their plans for a funding model which is fit for purpose and rewards the quality of radiotherapy as a whole treatment rather than the number of doses delivered. The ESTRO-HERO model provides excellent data to support this.

References

[1] Cancer Research UK. Cancer incidence statistics. Available at: https://www.cancerresearchuk.org/health-professional/cancer-statistics/incidence#heading-Zero. [Accessed April 2024].

[2] NHS England. Cancer Waiting Times: CWT statistics up to September 2023. Available at: https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/#cwt-statistics-up-to-september-2023. [Accessed April 2024].

[3] NHS England. Cancer Waiting Times for October 2023-24 (Provisional). Available at: https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/monthly-data-and-summaries/2023-24-monthly-cancer-waiting-times-statistics/cancer-waiting-times-for-october-2023-24-provisional/. [Accessed April 2024].

[4] Nelissen, K. J., Versteijne, E., Senan, S., Rijksen, B., Admiraal, M., Visser, J., … Verbakel, W. F. A. R. (2023). Same-day adaptive palliative radiotherapy without prior CT simulation: Early outcomes in the fast-mets study. Radiotherapy and Oncology, 182, 109538.

[5] Hannah T P, King W D, Thibodeau S, Jalink, M, Paulin G A, Harvey-Jones E et al. (2020) Mortality due to cancer treatment delay: systematic review and meta-analysis BMJ; 371:m4087

[6] The Royal College of Radiologists. Clinical oncology workforce census 2022. Available at: https://www.rcr.ac.uk/news-policy/policy-reports-initiatives/clinical-oncology-census-reports/. [Accessed April 2024].

[7] The Society of Radiographers. Radiotherapy Radiographic Workforce Census 2023. Available at: https://www.sor.org/getmedia/4fe04eb7-46c6-4856-913d-441e09f6c3e4/RR-Census-2023_D1-7. [Accessed April 2024].

[8] Institute of Physics and Engineering in Medicine. Radiotherapy Census Report 2021/22. Available at: https://www.ipem.ac.uk/media/qdajodwe/2021-radiotherapy-census-report-v2.pdf. [Accessed April 2024].

[9] NHS England. 2023 Recruitment England Fill Rates Round 1 and Round 2. Available at: https://medical.hee.nhs.uk/medical-training-recruitment/medical-specialty-training/fill-rates/2023-fill-rates/2023-england-recruitment-fill-rates. [Accessed April 2024].

[10] The Royal College of Radiologists. Template: Radiotherapy workforce strategy 2023-2033, Available at: https://www.rcr.ac.uk/media/nqppxmwm/template_radiotherapy_workforce_strategy_sep2023.docxz. [Accessed April 2024].

[11] The Royal College of Radiologists, NHSE rolls out stereotactic radiotherapy (June 2020). Available at: https://www.rcr.ac.uk/posts/nhse-rolls-out-stereotactic-radiotherapy

[12] The Royal College of Radiologists, Royal College of Physicians, the Institute of Physics and Engineering in medicine, the British Nuclear Medicine Society, Review of molecular radiotherapy services in the UK (November 2021). Available at: https://www.rcr.ac.uk/publication/review-molecular-radiotherapy-services-uk

[13] The Royal College of Radiologists, Royal College of Physicians, the Institute of Physics and Engineering in medicine, the British Nuclear Medicine Society, Review of molecular radiotherapy services in the UK (November 2021). Available at: https://www.rcr.ac.uk/publication/review-molecular-radiotherapy-services-uk

[14] Grau, C., Defourny, N., Malicki, J., Dunscombe, P., Borras, J. M., Coffey, M., Slotman, B., Bogusz, M., Gasparotto, C., Lievens, Y., HERO consortium, Kokobobo, A., Sedlmayer, F., Slobina, E., Feyen, K., Hadjieva, T., Odrazka, K., Grau Eriksen, J., Jaal, J., Bly, R., … Cleries Soler, R. (2014). Radiotherapy equipment and departments in the European countries: final results from the ESTRO-HERO survey. Radiotherapy and oncology journal of the European Society for Therapeutic Radiology and Oncology, 112(2), 155–164.

[15] The Royal College of Radiologists. Insight panel; IT and equipment. Data available on request.