Written evidence submitted by Radiotherapy UK and #CatchUpWithCancer campaign (FCR0050)

Executive summary

Radiotherapy is one of our most innovative and important weapons in the fight against cancer. However, on our current path, UK cancer patients will continue to miss out on cutting edge treatments all because of the way the Government and NHS leaders plan and fund radiotherapy. It has taken years for the NHS to rollout the last generation of radiotherapy cancer treatments and in many areas of the country they are still not fully available. We have a tremendous opportunity to transform cancer treatment and save more lives with the next generation of radiotherapy technology. However, without a significant change in policy, funding, and organisation, we risk missing out on the potential of the next generation of technology. The good news is that much of this technology is already available, so all we need is a plan and modest investment to implement it effectively. The Government must act now to ensure that patients can benefit from these improvements in the short, medium, and long term, and ultimately save more cancer patients' lives.

Radiotherapy is a cancer therapy needed in half of all cancer patients and involved in 40% of cures. High quality personalised precision radiotherapy is a major pillar of future cancer care. Over the last few years there has been a digital revolution in radiotherapy with image adapted treatment, remote cloud-based technology and AI, and a biological transformation with its interaction with immunotherapy and potential of high dose rate FLASH treatment. These developments allow patients to be treated faster, more accurately and in fewer hospital visits. Given the value of radiotherapy right now, as one of our most curative cancer treatments, and its potential to use technology to transform cancer care in the future, it should be featuring in cancer-related policy discussions from the Prime Minister down. However, in our experience, it is rarely considered and those advocating for it are fighting to have their voices heard. The potential of modern radiotherapy in future cancer care is massive, but the UK must act differently to harness this potential.

Frustratingly, technological advances in radiotherapy, which cancer patients in comparable countries benefit from, are not widely available in the UK. Decades of underfunding and under-resourcing means we lag behind internationally in infrastructure, technological advances and investment in the small, specialised multi-disciplinary workforce. It has taken over a decade for internationally recognised innovations like SABR (stereotactic ablative radiotherapy) to be rolled out across the NHS. It is disappointing that SABR is still not available for all cancers where needed across the country and that next level adaptive image guided radiotherapy is not universally available. This means UK patients are not able to all access modern precision radiotherapy, which can increase patient survival and decrease long term side effects.

It would not be difficult to redress this inequity and begin deploying the latest radiotherapy techniques. The recent revolution in radiotherapy technologies offers low-risk, hi-tech, digital solutions which can be implemented quickly. Earlier this year an inquiry undertaken by the APPG for Radiotherapy reported that these solutions have the potential to transform radiotherapy services and cancer infrastructure, support the workforce, help deal with the backlog and improve cancer survival both now and in the future.

The urgency required to begin implementing these technologies cannot be underestimated. Cancer services in England are currently facing record wait times for treatment. The workforce and systems are overwhelmed by the COVID backlog, and we were already at the bottom of the cancer survival league. At present, vital time is being wasted whilst cancer waiting times continue to worsen and

yet international research tells us that every 4 weeks of delay in starting cancer treatment can increase the risk of death by 10%.

While there has been investment in diagnosis, there has been no significant funding to update and increase radiotherapy capacity. CRUK estimate that cancer incidence will increase by a third by 2040[1] . If, as planned, we diagnose more cancers early, we will need far more access to modern radiotherapy to cure these patients. This can only realistically be achieved by harnessing the technology revolution which has occurred in radiotherapy. We strongly recommend that addressing these issues and developing a practical yet ambitious plan to boost modern radiotherapy, as one of the three main cancer treatments, forms a part of the Committee's assessment of the future of cancer care.

Radiotherapy UK is the only charity dedicated to improving radiotherapy treatment throughout the UK. The #CatchUpWithCancer campaign was co-founded in July 2020 by Radiotherapy UK and campaigns for a boost to cancer services to tackle the cancer diagnosis and treatment backlog.

What are the innovations with the greatest potential to transform cancer diagnosis and treatment in the short, medium and long term?

Radiotherapy is a cancer treatment that is founded on technological innovation. The past decade has seen these innovations transform the capability of radiotherapy worldwide to precisely target and cure earlier stage disease and replace surgery in some cases, reduce waiting times for treatment, transform systems and processes to improve capacity, and support the workforce.

Short and medium term innovative and proven solutions include:

- Systems that utilise cloud-based functionality for patient engagement and remote monitoring. This personalised, real-time capture and analysis of symptom information can help clinicians better manage patient symptoms, improve health related quality of life, reduce A&E and hospital admissions, and improve treatment outcomes.

- Artificial Intelligence (AI) solutions can adapt treatment plans and allow for more precise irradiation of tumours, improving outcomes and reducing potential side-effects of treatment. Create more streamlined workflows freeing up clinician and workforce time.

- SABR \ SBRT reduces the number of fractions (episodes of treatment) that each patient requires, meaning less hospital visits having potential to reduce waiting times. This treatment delivery also reduces side effects and increases cure rates, concentrating on high dose delivery to the target area only.

- Online adaptive radiotherapy: using real time patient monitoring during treatment to increase precision, increase chance of cure and reduce side effects.

- Efficient workflow software which delivers comprehensive platforms for patient quality assurance and treatment plan management.

[1] cancer_in_the_uk_overview_2023.pdf (cancerresearchuk.org)

- Digital networking to allow rapid dissemination of expertise in planning and treatment delivery. This will allow expertise to be shared across the country, improving quality and supporting the workforce.

- Extending MR imaging for planning across the UK which will allow more precision radiotherapy in some tumour sites.

- High-precision MR Imaging through MR guided LINACS. This is rapidly becoming the treatment of choice in some cancers which allows online daily adaptation delivering more precise treatment according to a patient's daily anatomy changes.

- A developing body of evidence indicates that radiotherapy in conjunction with immunotherapy enhances the effects of immunotherapy treatments.

Long term innovations include:

- Next generation radiotherapy including research and development of Flash Radiotherapy (high dose rate) FLASH Radiotherapy: An (r)evolution in cancer treatment (openaccessgovernment.org) and next generation ion beam therapy e.g. being developed in the UK with the STFC. PPD LhARA (stfc.ac.uk)

High precision, personalised radiotherapy treatments are currently being rolled out in other countries to the benefit of patients. Remarkably, radiotherapy is also incredibly cost-effective when compared with other cancer treatments. Typically, the cost of a radiotherapy cure is between £3-£7k, a mere fraction of the costs of surgery and chemotherapy.

How best can innovations in diagnosing and treating cancer be transitioned into frontline clinical settings?

Technology introduction is often delayed by a lack of understanding of what is needed to validate its use. Inappropriate methodology often used for drugs/medicine introduction is also utilised to rollout complicated technology-based treatments and software. This indicates a lack of understanding and a systemic blind spot for radiotherapy technologies which don't fit within the existing framework. As a result, the country is consistently a late adopter.

Innovation is coming now, and we need to plan for it to ensure an equitable, fast, efficient and cost-effective roll out. This requires early and responsible adoption through systems that can evaluate and establish its worth (in terms of efficacy and affordability) quickly and roll it out to patients. The need for a new approach to usher in radiotherapy technology should go right to the top of the NHS and Government. This will build capacity, reduce workload, streamline processes and collect data, ensuring outcomes are measured in timely way and allowing an equitable and timely adoption of innovation.

Without informed objective assessments for the development and introduction of MedTech, patient access will be delayed and expensive. Systems that cause these unnecessary delays fail to keep pace with developments in quickly moving technology-based fields. Simply put, by the time the NHS rolls out new radiotherapy technology, the software or hardware developments will have already moved onto the next generation.

To make sure more people can benefit from advanced radiotherapy, we need new policies for how medical technologies are rolled out. We also need the specialist cancer workforce to be involved in

developing these R&D technology processes. Clinical trials help, but we also need new ways to evaluate technology, like looking at how much time and money it saves, how it improves worker skills, and how it reduces side effects. Continued integration of diagnosis and treatment is needed. Good data collected in an open and ongoing way that can inform decision making is key. The government needs to lead the way and promote radiotherapy developments as a central part of cancer care innovation.

This is already happening in Europe, where experts are advising on when and what assessment of technology is needed. Focusing on value-based care through scientific analysis is an approach being increasingly used in other countries. The UK would benefit from this approach to get the best care with the best value for money.

What can be learnt about innovative cancer diagnosis and treatment from international examples of best practice?

In the UK, we do not diagnose patients early enough, and once patients are diagnosed, we do not treat them quickly enough. Our poor performance on international benchmarking has been highlighted by the Organisation of Economic Co-operation and Development (OECD), The King's Fund, the IFS, the Health Foundation, and Nuffield Trust. A Lancet Oncology editorial described the UK as a 'poor performer in cancer care compared with other European countries.'

When evaluated against comparable countries, the UK significantly lags behind in radiotherapy delivery in all metrics: the number of patients able to access life-saving radiotherapy treatments, the number of machines delivering radiotherapy per head of population, and the delivery of advanced technologies that cancer patients in other countries are benefiting from.

- The internationally accepted standard is that 53%[2] of cancer patients should have access to radiotherapy. In the UK only 24 -27%[3] [4] of cancer patients currently access radiotherapy.

- The inadequacy of radiotherapy machines (known as LINACs) in the UK has been long-established, with a 2014 ESTRO-HERO study[5] showing the UK ranked 13 out of 28 European countries with only 4.8 LINACS per million population. The international benchmark is 7 per 1 million population and is being met by other comparable countries such as the Netherlands, Belgium, Denmark and France. To meet this, England would need to add an estimated 125 LINACS to the current fleet.

- Radiotherapy only receives around 5% of the cancer budget in the UK. Annual expenses for radiotherapy in Europe, including capital investment, represented between 4.3% and 12.3% of the cancer care budget.[6] The average in Western European countries specifically is between 10% and 12%.

The UK needs a plan to increase access to high quality radiotherapy, develop its infrastructure, invest in the specialist workforce and harness the technological advances that can cure patients earlier and improve quality of life.

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[2] Borras JM, Lievens Y, Barton M, et al. How many new cancer patients in Europe will require radiotherapy by 2025? An ESTRO-HERO analysis. *Radiother Oncol* 2016; **119:** 5–11.
[3] https://www.cancerdata.nhs.uk/covid-19/rcrd
[4] Chemotherapy, Radiotherapy and Surgical Tumour Resections in England - GOV.UK (www.gov.uk)
[5] Radiotherapy equipment and departments in the European countries: Final results from the ESTRO-HERO survey - ScienceDirect
[6] Lievens (2019) How public health services pay for RT .pdf

International best practice in radiotherapy tells us that much can be achieved with advances that have already been implemented in other countries and are now benefitting cancer patients in those countries. Research shows that consistency of cancer policies is reflected in better outcomes, and that those countries with a bespoke, consistent cancer control plan perform better for cancer patients.

In the absence of a bespoke cancer control plan with fully funded provisions for transforming radiotherapy services, it is difficult to see how the NHS can deliver an evidenced-based, ambitious future for cancer that will raise the UK to international standards, curing more cancer patients and enhancing their quality of life.

To what extent is workforce planning keeping up with innovations in the diagnosis and treatment of cancer?

Radiotherapy services in the UK are delivered by a small, multidisciplinary workforce of around 6,400 professionals made up of therapeutic radiographers, engineers, physicists, and oncologists. They treat over 100,000 cancer patients a year. They are highly specialised and technical, and hugely important for a functioning cancer service. If the committee were looking for a workforce who should be at the heart of our efforts to deliver innovations in cancer treatment, it is the radiotherapy workforce.

Multiple studies have shown that UK workforce planning in radiotherapy is in crisis. These problems were recently identified in an All-Party Parliamentary Group for Radiotherapy inquiry and include:

- 10% vacancy rates for scientific engineer professionals, critical to the delivery of radiotherapy.

- Numbers of therapeutic radiographer posts vacant are at least 30% higher than numbers of new graduates qualifying.

- A therapeutic radiography workforce growing at 4% rather than the 16% needed between 2021 – 2026.

- The RCR workforce report stated that the NHS needs at least another 189 (17%) clinical oncologists to meet demand by 2025. The shortfall of clinical oncology consultants in the NHS will be between 21–29%.

- Half of all radiotherapy departments reported to the APPG that they needed to reduce capacity due to staff shortages.

Additionally, the radiotherapy workforce are navigating an environment where chronic underinvestment in radiotherapy means many centres are working with older equipment and are unable to implement or commission advanced technologies that can improve patient capacity and outcomes.

All of these issues significantly impact on the workforce's ability to take advantage of IT and technological advances. This devastating situation will only be exacerbated as demand increases in the future.

A future workforce plan must include specific provisions for the future of the specialist cancer workforce in areas like radiotherapy. They require the tools, resources and infrastructure to enable

them to make the radical changes needed to ensure the service is not only maintained but also future proofed to provide for the ever-growing numbers of cancer patients.

Investing in radiotherapy and the workforce can play a central role in arresting the devastating deterioration in cancer care and has the capacity to future-proof our cancer services for years to come. But this needs to happen now.

Is the impact of innovations in cancer diagnosis and treatment on health inequalities being sufficiently taken into account?

The potential of innovative radiotherapy technologies and treatments to address health inequalities is not sufficiently being considered. Access to high quality radiotherapy across the UK is patchy, despite the fact that 1 in 4 of the population will need radiotherapy in their lifetime. Examples of this inequality include:

- 24% of curable lung cancer patients are not receiving any treatment when they would have benefitted from/be cured by radiotherapy (PHE audit 2019)[7].

- 3.5 million people live outside of the recommended travel time of 45 minutes from a radiotherapy centre. This particularly impacts patients living in rural areas of the country and has a dramatic impact on health inequalities.

- The latest cancer waiting times for starting treatment also show a clear problem with the inequality of cancer treatment. All areas of the country are failing to meet the 62-day operational standard for cancer waiting times; some areas are even worse. This is compounded by a lack of access to radiotherapy in this country. In the UK only 24 -27%[8] [9] of newly diagnosed cancer patients currently access radiotherapy, this compares disastrously with the international standard of 53%.

However, the digital and agile nature of radiotherapy offers one of the easiest and most cost-effective ways to improve equality of access to cancer care.

It is now possible to use off the shelf, relatively inexpensive, connectivity software that would allow the latest radiotherapy techniques to be better rolled out across the country. For example, software could be deployed to enable clinicians to treat patients, even if the clinician is at another centre or working remotely. This functionality would almost immediately help increase throughput of patients as it acts as a 'workforce multiplier'.

Innovative web-based audits in radiotherapy are already being used to drive up standards across the country. However, except in a few cases, we are not making use of this capability. If there was an option to deploy the best surgeons in the country to various different locations at the same time, the Government would do it without hesitation. The technology revolution unfolding in radiotherapy means that this, and more, is possible. However, there appears to be an institutional blind spot in Government and NHS leaders' policy making when it comes to radiotherapy. Correcting this requires input from the very processes and structures that are currently overlooking radiotherapy in the NHS.

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[7] Phillips et al Stereotactic Ablative Body Radiotherapy Versus Radical Radiotherapy: Comparing Real-World Outcomes in Stage I Lung Cancer. Clinical Oncology 31 (2019) 681-687

[8] https://www.cancerdata.nhs.uk/covid-19/rcrd

[9] Chemotherapy, Radiotherapy and Surgical Tumour Resections in England - GOV.UK (www.gov.uk)

Without a more innovative approach to cancer treatments, we will continue to have a country where, depending on where you live, you are faced with waiting times that are either bad or terrible.

Professor Pat Price

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