



The APPG for Radiotherapy (APPGRT)

Radiotherapy:

Securing the future of
Britain's secret lifesaver

August 2019

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Executive Summary

Aim of the Inquiry

To investigate current UK radiotherapy provision and its ability to meet present demands and anticipated future need.

The challenge: Radiotherapy is an established anticancer treatment which kills tumours with high-energy radiation. The earlier a cancer is diagnosed, the higher the likelihood is that radiotherapy will be prescribed as a treatment. With an NHS-wide focus on improving early cancer diagnosis, the proportion of cancer patients requiring radiotherapy is predicted to rise in the next 10 years: some international estimates suggest an increase need from around the at present 50% to 60%¹. If improvements in cancer diagnosis are to be fully translated into improved cure rates, **urgent reform and significant increased investment will be required in the UK's radiotherapy service provision.** This would be in stark contrast to currently where radiotherapy loses out to other, more high-profile cancer treatments such as chemotherapy in policy discussions and spending reviews.

Access to radiotherapy: This inquiry investigated the concern that not all patients who would benefit from radiotherapy are getting access to it. The assertions made by NHS England (NHSE) – the main commissioner of radiotherapy – that no one was missing out were found to lack a firm evidence base. Furthermore, NHSE was contradicted by one of the authors of the model for radiotherapy provision that was central to their calculations. Among other respondents to the inquiry, there was consensus that more than 20,000 patients in England (24,000 in the UK) are likely to be missing out on the radiotherapy they need. The panel concluded that if NHSE wished to dissent from this 20,000 figure, they should at least attempt to do so from a position based firmly on evidence. In the meanwhile they should accept the 20,000 figure as a reasonable estimate of the current shortfall in access and provision of radiotherapy in England. There was consensus among practitioners that much of the shortfall could be attributed to access and travel time, which was found to have a direct and statistically significant impact on access. NHSE seemed reluctant to accept what seemed the consensus view of most other respondents and there was concern they were presenting evidence in a misleading way. Being clear on this point was central to assessing the case for further investment in workforce and IT, satellite centres and awareness of radiotherapy, which the inquiry found would be integral to future efforts to boost radiotherapy uptake.

NHSE modernisation of radiotherapy: Attempts to address this shortfall in access have floundered. In 2014, Cancer Research UK (CRUK) and NHSE co-published their *Vision for Radiotherapy*², which took a clear-eyed view of the problems facing UK radiotherapy provision and the scale of what was required, and suggested a roadmap towards achieving those goals. However, after several rounds of consultations, NHSE as a way forward produced their *Radiotherapy Specification*³, which fell woefully short of the ambition shown five years earlier. The rationale behind grouping radiotherapy-providing NHS Trusts into 11 operational delivery networks (ODNs) with integrated IT was broadly welcomed by the radiotherapy community. Currently, however, many – if not most – ODNs would

¹ Borrás et al. How many new cancer patients in Europe will require radiotherapy by 2025? An ESTRO-HERO analysis. *Radiother Oncol* 2016; 119 (1): 5-11

² *Vision for Radiotherapy 2014–2024*. CRUK and NHSE

³ *NHSE Radiotherapy Service Specification*, January 2019

not be in place by the end of the allotted 3-year maturation period and there were concerns that, without significant centralised additional investment, the system would fail.

NHSE commissioning of radiotherapy: The current commissioning system allows perverse incentives and arbitrary, damaging restrictions to persist. NHSE commissions radiotherapy centrally using an archaic system, which pays NHS Trusts per fraction of radiotherapy delivered, rather than per treatment course, resulting in a situation where cash-strapped NHS Trusts have financial incentives to provide patients with older, less effective radiotherapy treatments, since better, more modern treatments require fewer fractions. Not only does this lead to worse outcomes, but it also puts decision makers at NHS Trusts – to use the words of one NHS Trust’s radiotherapy lead – in the ‘*morally repugnant*’ position of choosing between patient care and the financial solvency of their NHS Trust. The panel heard NHSE’s rationing in the commissioning of the advanced radiotherapy technique known as stereotactic ablative radiotherapy (SABR). This is currently arbitrarily limited to 25 of the 52 centres providing radiotherapy despite NICE guidelines unambiguously recommending it for certain cancer indications and as a result was cutting short real human lives. NHSE’s stated reasoning that it is waiting for further evidence did not stand up to scrutiny. If there is sufficient evidence for SABR treatment to be recommended by NICE and is offered at one of the centres with the equipment and training to provide it safely, then it should be provided at all such centres. On both SABR rationing and the tariff, the inquiry panel left with the feeling that NHSE, while notionally committed to reform, did not grasp the urgency of the issues and the human cost that NHSE’s continued prevarication was having.

Workforce and equipment: There were concerns that radiotherapy’s lower footing was having a significant impact on the workforce. Radiotherapy provision is dependent on a body of multidisciplinary highly trained and well-motivated professionals, but the inquiry heard there were intense pressures on recruitment and retention across all the individual disciplines involved. It heard that Health Education England had lost commissioning powers in certain key areas, that there had been problems securing the required funding for a suitable apprenticeship schemes and that the conversion of bursaries into loans had had a seismic negative impact. The Inquiry also found that the radiotherapy capital stock was dilapidated. A series of freedom of information requests found that 40% of radiotherapy-providing NHS Trusts had radiotherapy machines at or over the recommended 10-year lifespan, despite having received a much-needed £130 million investment in 2016. Because of the predictable nature of the demand for radiotherapy machines, considerable cost savings could be achieved by having centrally funded rolling replacement fund, in contrast to the current situation where funding is allocated sporadically at spending reviews.

Organisation of radiotherapy provision across the NHS: Despite NHSE’s robust view that it was able to deliver a high-quality radiotherapy service under the current management structure, the inquiry found the radiotherapy service was suffering as a result of its various component parts being under the control of differing management chains within the Department of Health and Social Care DHSC; many of the 28 agencies and public bodies working with the DHSC cover different aspects of radiotherapy provision. There appeared to be insufficient accountability or oversight and engagement with the professionals. One convincing solution mooted was the formation of a new overarching post – a radiotherapy tsar – to oversee the coordination and development of radiotherapy provision across these disparate structures and to respond to the advice of the skilled professionals rather than allow a highly technical service to be run by disparate arms-length bureaucrats.

Recommendation

The APPGRT recommends the DHSC urgently respond to the findings of this inquiry and the solutions proposed in their manifesto. Without this, the cancer 10-year plan will be unable to deliver the increase in cancer cures that have been promised.

Background

About the APPGRT

The aim of the All Party Parliamentary Group for Radiotherapy (APPGRT) is to provide an effective voice for radiotherapy in the UK and to improve access to modern radiotherapy for cancer patients. The APPGRT want to ensure radiotherapy receives increased funding so that all patients have the best radiotherapy for their individual cancer.

About radiotherapy

Radiotherapy is a treatment that kills cancer cells by delivering high-energy radiation to a tumour. The UK was one of the pioneers of radiotherapy, developing the first Linear Accelerator (LinAc) radiotherapy machine and one of the big three global radiotherapy machine manufacturers still make 25% of their LinAcs for international export here in the UK. Modern radiotherapy is accurate within millimetres, limiting damage to healthy cells around the cancer. Radiotherapy is delivered in 62 centres in the UK. There have been major revolutionary technology advances in the last 10 years.

One in four people will need radiotherapy at some time in their lifetime. Radiotherapy is needed in the 40% of people who are cured of cancer and is highly effective curing 16% of cancer patients on its own compared with 2% with chemotherapy.

The problem

Radiotherapy is underfunded in the UK, receiving only 5% of the cancer budget, with varied access across the UK and advanced modern radiotherapy being restricted by NHSE commissioning only to a limited number of centres. There is no commercial lobby for radiotherapy and it is a poorly understood high-tech area of medicine with only around 5,000 multidisciplinary professionals delivering the service across the UK. With the increased early diagnosis of cancer within the DHSC 10-year plan, the UK radiotherapy service, as currently funded and organised, will likely not be able to translate these early diagnoses into cures.

The APPGRT manifesto

The APPGRT was formed in May 2018 in response to concerns from patients and the radiotherapy community. The APPGRT launched its [Manifesto for Radiotherapy](#) in September 2018 at the UK's Academy of Medical Science and is seeking to represent the views of UK radiotherapy stakeholders: the three main professional bodies; the UK Radiotherapy Board; many individual professionals and representative groups; patients; constituents; NHS Trusts; some cancer Charities; and Industry with support from some of the International community.

Background to the inquiry

The APPGRT conducted an inquiry in June–July 2019 into the current and future state of radiotherapy provision across the UK. A range of stakeholders involved in the provision of radiotherapy services were invited to submit evidence.

Evidence

Written evidence

A range of individuals and key organisations were invited to submit written evidence, of which a total of 24 responded.

Some organisations have published their written evidence on their websites. Some organisations felt unable to respond in the short time frame allowed. One organisation, NHS Digital, was unable to respond as they said they had not been asked to provide input to, or solutions for, radiotherapy. Written evidence can be found here:

[Link to view submitted evidence](#)

Oral evidence

Oral evidence was invited from 16 individuals/organisations to gather a broad range of opinions and experience. Oral evidence was taken over two sessions. The oral-evidence sessions of the inquiries were in the style of a House of Commons Select Committee hearing and were an opportunity for the APPGRT members to explore in more detail issues raised in the written evidence submissions.

See [Appendix 1](#) for details.

Findings

1. NHSE Radiotherapy Specification

The NHSE *Radiotherapy Specification* was published in January 2019 in response to the *CRUK/NHSE vision for radiotherapy 2014* following NHSE's taking over of radiotherapy commissioning in 2013. This *Radiotherapy Specification* recommended that radiotherapy could be modernised by a management reorganisation, grouping NHS Trusts providing radiotherapy into 11 ODNs with integrated IT.

- This was broadly welcomed as a step in the right direction. It was hoped the new configuration would tackle regional variation in practice, make best use of the workforce and improve the efficiency of machine utilisation.
- The professional bodies (UK Radiotherapy Board)⁴ cautioned that workforce gaps would likely impact on the success of the networks. The APPGRT response⁵ was that this management reorganisation was *'too little too late'*.
- Most responders commented that it was far too early to assess the efficacy of the new system and noted that there would be variation in how quickly different ODNs would be able to adapt based on how strong existing links between NHS Trusts in the network were. The original NHSE timetable⁶ of forming the networks over the next three years was unrealistic and already falling behind: all 11 networks were to be formally established and operational with all necessary governance arrangements by April 2019, yet apparently only one ODN had volunteered already.
- NHS Trusts were not ready for the new system and there was no operational and strategic support available from NHSE to help them adapt to the new system. Devolving into networks will require central coordination since the oversight groups will need some central support and coordination. ODN development would involve major IT projects, currently with no funding, transferring delivery responsibility to ODNs with NHSE maintaining central commissioning power.

The role of ODNs was debated at length. The concept was generally agreed to be a positive development. However, there was no funding for implementation of ODNs and this was seen as the key barrier to progress. There was widespread and deep frustration about the pace of development of ODNs as continued progress to the development of an advanced radiotherapy service was now deemed to be dependent on them being established. The lack of central financial support was considered likely to completely undermine the initiative and make it meaningless. There was concern the ODNs had not been thought through and that they would simply be a hybrid of local networks charged with all the delivery organisation, despite NHSE centrally controlling the commissioning. The depth of the frustration was highlighted by 1 witness who stated that he struggled to even get a video conference call facility established across his Trust, never mind the IT infrastructure required to plan, deliver and monitor treatment. In addition, there was considerable

⁴https://www.rcr.ac.uk/sites/default/files/statement_on_nhs_england_radiotherapy_service_specifications_feb2019.pdf

⁵ https://docs.wixstatic.com/ugd/4fcdc3_4203349fc3564d4f8f2b0dea352c8466.pdf?index=true

⁶ NHSE response to the radiotherapy consultation report, January 2019

concern that the timetable had already slipped, with all 11 networks to be in place by April 2019, but with only one ODN formed. It appeared highly unlikely that all 11 networks would be formed, or would be fully operational, within five years. As a result, there is a high risk that at the end of the 2014–2024 period, all that would have been achieved would be an incomplete, poorly functioning management reorganisation. This was seen as a potentially enormous wasted opportunity. The panel was particularly concerned at an apparent mismatch between statements made by NHSE and by the Chief Executive’s office of NHS Digital with regards to how much input NHS Digital had had into the development of the IT side of the ODNs. NHSE stated that there had been an ongoing dialogue between the two bodies. However, the office of the Chief Executive of NHS Digital has made a written statement that they had “*not been asked to provide input to or solutions for radiotherapy*”. The radiotherapy-machine manufacturing companies had expressed concern that commercial IT solutions were available and were simply not being considered, and they were frustrated with the lack of engagement by NHSE. The panel heard of the significant interconnectivity opportunities to share best practice within ODNs but that investment in workforce and IT was critical to this.

Conclusions

The NSHE Radiotherapy Specification released in January 2019, which suggested a management reorganisation to group NHS Trusts into 11 ODNs providing radiotherapy with integrated IT is, in principle, a welcome development. It is hoped the new system will tackle regional variation in practice, make best use of the workforce and improve the efficiency of machine utilisation. But without funding, the new system was thought likely to fail to deliver these prospective benefits and would delay further radiotherapy developments. There is likely to be discrepancies across the country in ODN development as some areas already have a degree of integrated working, while others do not. The move to a system of ODNs will only succeed if there is a fully funded bespoke IT solution coupled with a raft of other changes such as the expansion of SABR commissioning, a root and branch reform of the radiotherapy tariff, an annual fund for capital replacement, a fund for ODNs to set up satellite centres where needed to improve access and an overall expansion in the workforce.

Recommendations

- 1. NHSE should publish regular updates on the development of the ODNs.**
- 2. NHSE should provide adequate financial and management support to the teams tasked with setting up their ODNs.**
- 3. NHSE should review the involvement of NHS Digital in its planning and ensure it is making best use of the expertise of NHS Digital, and provide a funding source for the complex IT solutions that will be required.**
- 4. NHSE should ensure that the other required changes, such as an expansion of SABR, reform of the tariff and provision of satellite centres, are carried out swiftly to ensure that they are not dependent on ODN development.**
- 5. There should be significant investment in IT and workforce to capitalise on the opportunities in this high tech field of medicine.**

2. Radiotherapy provision

Radiotherapy centres are unevenly distributed across the UK with varied access for patients⁷ Access to radiotherapy in England varies from 25% to 49% of cancer patients depending on the region⁸. Key themes from written and oral evidence were:

- The broad consensus is that there is an existing shortfall between the number of people receiving radiotherapy and the number who should be receiving radiotherapy in the UK. Cancer incidence is increasing, so this gap is likely to widen.
- The size of the gap was very difficult to estimate due to the regional variations in the provision of radiotherapy across the country.
- Analysis recently undertaken by Action Radiotherapy⁹ (who provides the Secretariat to the APPG) based on government data (Office of National Statistics, Public Health England in their Radiotherapy Data Sets and NHSE published data) estimates this shortfall figure at a conservative estimate to be approximately 20,000 for England (24,000 for the UK). This shortfall figure was supported by the Royal College of Radiologists.
- Evidence provided by CRUK was an outlier in that it suggested they preferred to use the Malthus model¹⁰ to calculate the number of patients who ought to be receiving radiotherapy. In written evidence, CRUK claim only 40.6% of cancer patients need radiotherapy according to this model. This leads to no real shortfall in the current external beam radiotherapy provision in the UK. However, CRUKs website still suggests this figure is 50%, all its published data in 2009–2014 suggests 50% and international estimates are 53%–54% of cancer patients needing radiotherapy. In its Radiotherapy Specification, NHSE had also suggested a figure of 40% and stated that it was basing its calculations of demand on the Malthus model and stated that it did not believe there was a gap in provision as NHS multidisciplinary teams were robust in ensuring patients were referred appropriately for radiotherapy.

It was generally agreed that it was difficult to ascertain with precision the total number of patients who would benefit from radiotherapy in the UK every year but who were unable to access it. However, it was widely accepted that the international accepted methodology to estimate any such shortfall was based on subtracting actual radiotherapy usage (ARTU) from optimal radiotherapy usage (ORTU). This methodology had been used by the charity Action Radiotherapy; based on a conservative figure of 47% of cancer patients needing radiotherapy, the shortfall was around 20,000 in England. Its method and workings can be accessed [here](#). There was widespread acknowledgement of this estimate and acceptance of the methodology during the evidence sessions, including from the Royal College of Radiology. A key figure used in the calculations is the percentage of cancer sufferers who *should* receive radiotherapy. There is widespread acceptance, and has been over the last ten to fifteen years, that this percentage figure should be around 50%. Such a figure has always been used by the Government, the DHSC and NHSE. However, in its Radiotherapy Specification, NHSE for the first time in 2019 lowered this to a figure of just 40%. During the inquiry, it transpired that NHSE had started to use this lower figure as a result of using the Malthus method to predict

⁷ <https://www.england.nhs.uk/wp-content/uploads/2013/06/b01-radiotherapy.pdf>

⁸ Cullen et al. Recommendations for achieving a world class radiotherapy service in the UK: final report for Cancer Research UK, 2014

⁹ <https://www.actionradiotherapy.org/analysis>

¹⁰ Jena, R et al. Radiotherapy demand and activity in England 2006–2020, *Clinical Oncology* 2013; 25: 522–530

regional demand for radiotherapy. However, one of the main authors of that method gave oral evidence, and suggested using the Malthus model in this context was both inappropriate and inaccurate. This follows since the model only includes those patients who ought to be receiving radiotherapy as part of their primary cancer treatment. A significant number of patients with other cancers will need radiotherapy later in their treatment pathway and these patients are not considered in Malthus predictions; thus, the Malthus model will always underestimate the number of cancer patients who need radiotherapy at some time in their cancer treatment. Under questioning, NHSE considered they clarified their position, by suggesting their 40% figure did not include all forms of radiotherapy and agreed that more work was required to determine any shortfall figure and that currently it did not know what the shortfall was.

Conclusions

The inquiry panel is deeply concerned that the prime commissioning body, NHSE, appeared to have no comprehensively internally generated estimate of the number of people missing out on radiotherapy. Additionally, the panel was concerned that NHSE seemed to be at risk of using the Malthus methodology inappropriately. When pressed on whether NHSE would embark on a body of work to ascertain the size of any shortfall, the inquiry panel was not convinced of the will or commitment to do so. It is unacceptable the primary commissioning body for such a vital service has no clear estimate of the need it is trying to meet.

Recommendations

- 1. The DHSC and NHSE should recognise that the number of those missing out on radiotherapy in England is likely to be of the order of 20,000 and use this figure as a basis from which to improve the situation.**
- 2. An independent review of the number who would benefit from radiotherapy and advice on the reasons and what can be done to improve matters should be commissioned by the DHSC.**

3. Access to advanced radiotherapy such as SABR

There have been significant advances in the accuracy of delivery of radiotherapy in the last ten years. Thanks to technical developments, advanced radiotherapy is able to target tumours more precisely than ever before, producing fewer side effects and leading to more cancer cures. One such development, stereotactic ablative body radiotherapy (SABR), was first used 25 years ago and the UK professionals introduced this via the development of a UK SABR consortium in 2007. Since NHSE took over commissioning of radiotherapy in 2013, this development however, has been actively restricted in England. Key themes from written and oral evidence that emerged were:

- Widespread criticism of the way in which advanced radiotherapy – SABR – is currently being rationed, despite NICE guidelines for lung cancer and evidence that it significantly improves survival in lung cancer and oligometastatic disease, and mounting evidence that it is also likely to be beneficial in prostate cancer.
- Responders recommended the commissioning of lung SABR be expanded to those NHS Trusts not currently commissioned to provide the treatment; this would help reduce regional inequalities in radiotherapy provision and improve cancer outcomes with very little cost.
- CRUK commented that this process would need to be done carefully and quality managed, and stressed that the change in the system to move towards 11 ODNs would improve SABR provision as per the suggestion of NHSE.

In answer to a recent parliamentary question (PQ 230712)¹¹, it was stated that lung SABR was being restricted to only 25 of the 52 radiotherapy centres in England, despite this being lifesaving technology recommended by NICE. The panel heard that in one NHS Trust, which had decided to offer SABR on its own volition, had received what the representative described as a *'rap on the knuckles'* from NHSE for doing so. There was extensive discussion as to the reasons for the lack of will to roll SABR out to all centres. NHSE explained that 'safety' and lack of evidence was a concern. This was robustly challenged by the panel as evidence from previous witnesses stated that most centres were equipped with the necessary equipment and skilled staff, and many had not been commissioned with no good reasons given: clinical trials have been carried out and the results published. In one striking example, an NHS therapeutic radiographer and radiotherapy lead at an NHS trust commented that her trust had *'been begging commissioners for the last three years'* to be allowed to deliver SABR to no avail. This was despite her Trust having *'followed the SABR consortium guidance about how to set up the practice, been peer reviewed, got all the documentation, had all the audits performed and got all that evidence to say we're in a position to deliver it'*. This clinician said that her Trust had been given a *'flat no'* without any stated reason for the refusal.

The efficacy and safety arguments were also challenged as radiotherapy is one of the most regulated, computerised and safest medical specialties. It was noted that SABR roll out is overseen by the Radiotherapy Trials Quality Assurance (RTTQA) group – an experienced and internationally highly regarded body – ensuring highest-quality standards are maintained through rigorous QA processes. The panel understood that the roll out of previous advanced technology, such as Intensity-modulated radiation therapy (IMRT) – which was even more of a technical step change at the time – was rolled out by a department-led, anatomical, site-by-site, stepwise process. In the case of IMRT, departments gained experience and the roll out was done safely in response to emerging evidence with oversight from the RTTQA group through clinical trial participation. The panel

¹¹ <https://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2019-03-11/230712/>

understood this had been the route to the implementation of SABR from 2008 to 2013, but that this roll out was reversed when NHSE took over control of radiotherapy commissioning in 2013. The panel understand many feel the number of patients NHSE decided were needed by a given radiotherapy centre to be able to treat safely with SABR was not evidence based and orders of magnitude different from other forms of radiotherapy such as brachytherapy. The panel noted written evidence from Middlesbrough's 10-year SABR data for early-stage medically inoperable non-small cell lung cancer (418 patients) which showed overall survival matched international standards and demonstrated no learning curve that affected overall survival. There is no difference in outcomes between consultants of different experience and no difference in outcome between the first 25 patients treated and the rest. This showed clearly SABR was an easily reproducible technique deliverable in the non-academic setting and in centres with patient populations with very high medical co-morbidities providing no evidence that SBRT should be restricted on safety grounds and provided no reasons SABR should not be available in every UK radiotherapy centre. Many felt this NHSE centrally restricted roll out has resulted in unnecessary delays and frustration, with little or no benefit, and has left patients denied access to advanced radiotherapy and was costing lives.

Conclusions

The restrictions in the commissioning of the advanced radiotherapy technique SABR is an acute example of the mismanagement ailing the provision of radiotherapy services in England. The NICE guidelines are unequivocal: SABR is recommended for early stage (stage I–IIA) lung cancer patients who cannot have surgery. Yet NHSE will only commission SABR for lung cancer in 25 centres: fewer than half of the NHS trusts that provide radiotherapy, citing lack of evidence. Where Trust are not commissioned to provide SABR, patients are supposed to be referred to the nearest centre that does provide the treatment. However, the panel were convinced by the evidence that many patients are unwilling or unable to travel the extra distance to a different centre, having to have an inferior treatment closer to home. The panel heard evidence that rationing of SABR is creating an unnecessary blockage, which is costing lives. More illogical still is the fact that many of the Trusts that are not commissioned to provide SABR have the skills and infrastructure to do so. SABR is a stepwise development in technical radiotherapy, which was halted in its UK wide introduction when NHSE was formed and took over commissioning of radiotherapy. Professionals in the field said that the rationing of SABR leads to another example of those in decision-making positions at NHS Trusts being put in the unenviable position of choosing between following proper commissioning processes and providing a treatment that could prolong, and in some cases save, lives. It is unfair for NHS staff to be put in this difficult moral and professional situation. Faced with this choice, some Trusts have taken the decision without commissioning to provide SABR treatments that they have the capability of administering and know is the best treatment for particular patients. Reports that some Trusts that have gone down this road have been 'rapped on the knuckles' by NHSE underscores the absurdity of the current system for SABR commissioning.

Recommendations

- 1. NHSE's stated ambition to expand SABR commissioning to more centres should now be expedited as a urgent priority.**
- 2. NHSE should be asked to clarify which additional evidence it awaits to allow it to commission lung SABR in all 52 centres and publish the results of their assessment of SABR via commissioning through evaluation (CtE).**

4. Workforce

Radiotherapy is delivered by a high-tech multidisciplinary workforce of around 5,000: therapeutic radiographers (approximately 50%), medical physicists, dosimetrists, engineers and clinical oncologists. The main elements of the written evidence were as follows:

- A recurring thread was underinvestment: a lack of funding for training and withdrawal of bursaries for therapeutic radiographers.
- Universal agreement that there were approaching critical shortages in all three professions of therapeutic radiographers, medical physicists and clinical oncologists: vacancies remain unfilled and the workforce gap is widening, while demand increases and there is underinvestment such as the abolition of the bursaries and lack of funding for post-registration training.
- All three professional bodies have published workforce concerns and this underpins the whole sector. CRUK has also particularly highlighted this area.

Concerns about workforce featured prominently in the evidence submitted by those delivering the service. The abolition of the bursary for therapeutic radiography was cited as having a significant detrimental effect. The inquiry heard that, in the last year of bursaries, there were 310 students a year entering to train, but this had now fallen to only 240, representing a reduction of some 23%. Many trained radiographers had been recruited out of the mainstream service into the new proton developments. Additionally, it was highlighted that radiographers had also moved into treatment planning roles. While role diversification was welcomed, this had an impact on an already struggling profession that makes up 50% of the overall radiotherapy workforce. The panel heard that steps to see a key role for apprenticeships in the sector had been severely hampered by the £19,000 salary banding constraint. Lack of funding for post-registration education and training to encourage retention of staff was also a major concern. Clinical scientists reported the problem of having to train more staff 'on the job' led to a lack of efficiency in service delivery. There was also concern about doctor 'burn out' and the problems of the pension-related difficulties if staff worked after 60 years of age. In response to these concerns, Health Education England (HEE) explained retention of therapeutic radiographers was of particular concern and that it no longer had the commissioning power in this area.

Conclusions

Issues around the recruitment, training and retention of staff in the three main disciplines that underpin radiotherapy services are severe. Workforce was identified by most as a major challenge. There was a view that without action, the situation would soon approach crisis level.

Recommendations

The inquiry recommends support for the recommendations of the professional bodies:

- 1. The therapeutic radiographer bursary be reinstated urgently.**
- 2. A review of the apprenticeship payment banding with the Institute of Apprenticeships of around £19,000 is considered to be insufficient to attract both educators and trainees, and should be reviewed.**
- 3. HEE be given powers to oversee commissioning of courses most relevant to the provision of radiotherapy.**
- 4. Immediate increase in funding in the workforce in all three specialities and workforce be coordinated with the technical developments and investment.**

5. Patient travel times to radiotherapy centres

- Areas with geographically dispersed populations suffered the most: travel times were the key issue for many patients.
- There was some conflicting testimony on the effect travel times have on access to radiotherapy: anecdotal evidence from those involved in radiotherapy provision indicated that long travel times can often lead to patients not taking up the radiotherapy offered to them. Similarly, Macmillan Cancer Support stated they were persuaded by evidence from the UK, North America and Australia, which showed travel times to be inversely related to the likelihood of receiving cancer treatment.
- CRUK had a different view, citing one study in prostate cancer that did not reflect a link between travel times and patient take-up.

There was a widely held view among practitioners giving oral evidence that there was a link between travel times and accessibility. Some recent data from the radiotherapy dataset (RTDS)¹² showed that 2,000 (34.5%) patients in England in 2015 with stage 1 early stage lung cancer received no treatment at all for their lung cancer and of the 560 (9.6%) who received SABR, travel times ranged up to 379 minutes-over 6 hours (well in excess of the 45 minutes' travel time previously recommended by the DHSC). NHSE did not consider travel times as a priority despite the responses to the SMART¹³ survey they had commissioned and previous Department of Health recommendations¹⁴. However, when challenged, NHSE accepted this was a resource rather than a priority issue. The role of satellite centres, which, by their localised nature tended to reduce travel times, was explored. NHSE stated its view that evidence of an increase in uptake around a newly established satellite centre was likely to be because of a corresponding fall in demand at the more distant centre. This was the subject of robust and probing questioning as evidence from a 2018 British Institute of Radiology meeting suggested when satellite centres were installed there was an average up to 20% increase in radiotherapy delivery than had been expected. The Department of Health 2012 report, which stated there was a correlation between travel times and uptake, was cited and discussed. The impact of travel times on patients was explored, particularly in situations where the patient may be acutely ill and find travelling 5 days a week for 6 or 7 weeks much more difficult and daunting than for a reasonably fit and healthy person.

Conclusions

The evidence was very strong. The further patients live from radiotherapy centres, the less likely they are to access radiotherapy; there is an inverse relationship between travel times and access. Travel time is consistently by far the number one concern of patients accessing radiotherapy. It is important to be clear that travel times will not always be the limiting factor. In many cases, something else will inhibit uptake of radiotherapy such as the accessibility of the accompanying social care requirements. But travel times of 45 minutes or greater remain a considerable barrier to increasing access to radiotherapy. It is hoped that the NHSE's Radiotherapy Service

¹² Phillips et al. Assessing the use of SABR in stage 1 non-small cell lung cancer in England: the use of the National Radiotherapy data set lung cancer, Vol 115, supplement 1 P s22, January 2018

¹³ NHS England, Modernising radiotherapy services public consultation report, August 2018

¹⁴ DOH Radiotherapy services in England 2012

Specification's ambition to move more decisions closer to patients by creating 11 ODNs will begin to help allocate resources in a way that seeks to reduce travel times and maximise access. But this change to ODNs needs to be coupled with a new centralised fund specifically for the purposes of increasing the number of satellite centres; in turn reducing travel times for patients currently let down by the regional post code injustices in the system.

Recommendations

- 1. NHSE should acknowledge and address patients' and professionals' concerns over travel times and make reducing travel times a priority.**
- 2. NHSE should embrace and encourage the technology advances that now allow for delivery of radiotherapy treatment nearer home.**
- 3. NHSE should accept the positive role of satellites centres and increase their number as part of the Radiotherapy Specification.**

6. Tariff reform

Radiotherapy is currently commissioned under a tariff system, which pays NHS Trusts an amount of money (in region of approximately £150) for every fraction (or daily dose) of radiotherapy with an additional on off fee for planning the treatment. Radical treatments have previously needed up to 37 fractions of radiotherapy over seven-and-a-half weeks. Modern advanced radiotherapy needs more complex planning, but far fewer fractions; often only three or five in less than a week. The current tariff therefore provides a financial disincentive to NHS Trusts to provide modern radiotherapy. The current NHS tariff also came in for criticism from all the practitioners submitting evidence. These criticisms included the following:

- While fit for purpose some years ago, tariffs are now too low to cover the cost of treatment delivery and have not kept up with the technology in planning, imaging and verification. They now fail to adequately consider the increasing complexity of radiotherapy techniques and the time involved in delivering these treatments.
- Older, less-effective treatments attract higher tariffs for a patients' treatment. This leads to a perverse incentive as newer, more cost-effective treatments, which require fewer fractions, are less attractive financially to the Trusts. As such, patients are treated 'less effectively, more often' (and therefore have a higher chance of suffering side effects), rather than 'more effectively, less often'. Other advanced radiotherapy treatment such as deep inspiration breath hold (DIBH) radiotherapy given to spare treatment of the heart – which is proven to reduce heart disease – had no tariff to allow this treatment to be given, meaning patient are simply unnecessarily having their hearts irradiated.
- The current tariffs are not fit for purpose and are blocking innovation. They produce a perverse system leading to the disincentivising of adopting modern radiotherapy techniques and upgrades to capital infrastructure.

The panel heard confirmation that patients are routinely treated using machines that are not operated to their full level of capability with modern advanced radiotherapy. There seemed to be an acknowledgement of the seriousness of this situation from NHSE. However, when pressed, it maintained that it would take some time to reform this situation. In the words of a radiotherapy service manager who gave evidence this situation was '*morally repugnant*'.

Conclusions

Cancer charities, NHS Trusts and representative bodies agree: the current NHS tariff is perverse, outdated and needs urgent reform. Trusts receive payments per fraction for the treatment they provide, rather than per course of treatment. The panel heard this gives NHS Trusts a financial incentive to offer patients poorer treatment. Changing this system would remove this perverse system, lead to better outcomes for patients, and not put decision makers at cash-strapped NHS Trusts in the impossible position of having to decide between the lives of patients and the long-term financial solvency of their Trust. The NHS tariff for radiotherapy was useful when first introduced as it incentivised the uptake of radiotherapy treatments that required more imaging and high-tech planning at a time when much of the radiotherapy being offered was very basic, but its continued use is costing lives.

Recommendations

- 1. NHSE should prioritise reform of the national tariff and aim to have a new tariff system fit for the twenty-first century in place within 3–6 months.**
- 2. NHSE should immediately introduce a tariff for advanced radiotherapy innovations, for example DIBH and adaptive radiotherapy etc, to introduce improved radiotherapy faster.**

7. Strategic oversight and leadership

There was general consensus among the practitioners giving evidence that the efficacy and cost-effectiveness of radiotherapy was not understood by the public or the body politic and, in some cases, it was felt that its significance was not truly appreciated in the medical professions and NHS management structures. Additionally, there was concern that radiotherapy did not receive enough attention in the overall cancer budget. The division of the NHS into different silos of responsibility was particularly disadvantageous to radiotherapy as radiotherapy is delivered by a high-tech multidisciplinary workforce and relies on complex technology developments. In particular, it needs infrastructure and modern IT. There was some support for the view that a new central coordination role was required, in the style of a radiotherapy 'tsar'. However, when pressed on this point, NHSE appeared to be of the strong view that management positions in its organisation discharged this function with the help of 'local partners'. However, the panel challenged its view on the basis that the constituent services and functions that go into providing the overall radiotherapy service cover a wide range of matters, including training, workforce, equipment procurement, IT and local and regional management structures.

Conclusions

The panel felt there was a significant mismatch between the perceptions of practitioners and NHSE relating to the overall management and provision of radiotherapy. The panel saw no real accountability for meaningful feedback to NHSE being acted on or informed oversight of NHSE performance being provided. The panel judge that there is a need for a new role to draw together all the constituent services and functions that come together to provide the overall service. The panel was struck by the unanimous view of practitioners that radiotherapy services lacked the professional, political and public profile that radiotherapy's role as a main cancer cure warranted. The panel felt the creation of a new central coordinating function would help develop this profile.

Recommendations

A new central coordinating position should be created in the style of a radiotherapy tsar to lead in two areas:

- 1. To provide a central coordinating management across all the constituent parts of the service.**
- 2. To champion the service across the medical establishment, the body politic and among the public.**

8. Equipment procurement

The quality of the radiotherapy service is significantly dependent on the number and quality of the radiotherapy machines available. The DHSC recommend radiotherapy machines be replaced every 10 years. In overall discussions around radiotherapy, the investment of £130 million in new machines made in 2016 is often quoted by the DHSC and NHSE. It was generally acknowledged by practitioners that the £130 million was a welcome and much-needed investment. However, there was clarification that this money had now all been spent. The inquiry panel had separately been informed of the results of a freedom of information (FOI) request initiated by the campaign Radiotherapy4Life, which indicate some 40% of responding Trusts still have radiotherapy machines that are over 10 years old.

There was a strong view from practitioners there was a need to have a rolling fully planned and fully funded (including costs of machine installations and IT/software) programme of machine acquisition and installation, rather than to have the current system, which had a feeling of 'feast and famine' in machine procurement. NHS Supply Chain confirmed there would be financial savings if a long-term rolling programme was established.

Conclusions

The much-vaunted investment of £130 million in new radiotherapy machines has all been spent, but the FOI responses clearly show that there is an urgent need for investment in new machines as 40% of replying Trusts have machines older than the accepted 10-year threshold. The NHS is missing an opportunity to secure financial savings on new machines by not having a long-term centrally funded rolling programme of machine replacement.

Recommendations

1. **NHSE should allocate sufficient investment to upgrade existing radiotherapy machines so that no Trust has to rely on machines older than 10 years.**
2. **The NHS should adopt a long-term centrally fully funded rolling procurement strategy for new machines and associated upgrades to radiotherapy planning software to help secure financial savings.**

Summary of Findings and Next Steps

Following publication of this inquiry, the APPGRT plans to request that the House of Commons Select Committee on Health and Social Care undertake an urgent formal inquiry into the issues uncovered by this APPGRT to ensure that more patients' lives can be saved by better organisation and funding for this important service.

The APPGRT is concerned about the gap that has emerged between what patients see as concerns (travel times) and what professionals advise about solutions to save lives (increased investment in IT, equipment, workforce and advanced radiotherapy) with how NHSE is responding and is commissioning the service. There appeared to be insufficient accountability or oversight and engagement by NHSE with the professionals and industry.

The evidence received to date suggests that the DHSC will not be able to achieve the improvements in survival promised by the NHS 10-year plan with the current seemingly failing policies being pursued by NHSE.

Appendix 1

Oral evidence sessions and attendees

Session one: Monday 17 June, 5pm to 7pm, Committee Room 13

Attendees

IPEM	Dr Vivian Cosgrove	Chair of the IPEM Radiotherapy Professional Standards Panel and member of the Radiotherapy Board
RCR	Dr Tom Roques	Medical Director for Professional Practice, Clinical Oncology Faculty and member of the Radiotherapy Board
Society of Radiographers	Charlotte Beardmore	Director of Professional Policy, The Society and College of Radiographers and member of the Radiotherapy Board
UK Radiotherapy Board	Names in bold above	Names in bold above
Individual Professional	Adrian Flynn	Chief Therapy Radiographer/Head of Radiotherapy and Trust Lead for Allied Health Professions, The Christie Hospital NHS Foundation Trust
Individuals Professional	Professor Raj Jena	Consultant Clinical Oncologist, Cambridge University Hospitals
Barking, Havering and Redbridge University Hospitals NHS Trust	Stuart McCaighy	Head of Radiotherapy
Royal Wolverhampton NHS Trust	Stephen West	Head of Radiotherapy
North Midlands NHS Trust	Carolyn O'Donovan	Radiotherapy Services Manager
Institute of Cancer Research	Professor David Dearnaley	Professor of Uro-Oncology at The Institute of Cancer Research and Consultant Clinical Oncologist at The Royal Marsden NHS Foundation Trust
Macmillan Cancer Care	-	Invited, but unable to attend on the day
CRUK	Rose Gray	Policy Manager

MPs chairing

Tim Farron MP	Liberal Democrats MP for Westmorland and Lonsdale, APPGRT Chair
Derek Thomas MP	Conservative MP for St Ives and APPGRT Vice Chair
Jim Shannon MP	DUP MP for Strangford and APPGRT Member

Session two: Tuesday 9 July, 6pm to 7pm, Committee Room 17

Attendees

NHS England	Nicola McCulloch	Head of the Cancer Programme of Care
NHS England	Kim Fell	Lead Commissioner for Radiotherapy
NHS Supply Chain	Tracy Bagnall	Senior Buyer- Radiotherapy
Health Education England	Dr Julia Whiteman	Postgraduate Dean, North West London

MPs chairing

Tim Farron MP	Lib Dem MP for Westmorland and Lonsdale and Chair of the APPGRT
Grahame Morris MP	Labour MP for Easington and Vice Chair of the APPGRT
Karen Lee MP	Labour MP for Lincoln and Member of the APPGRT
Gillian Keegan MP	Conservative MP for Chichester and Vice Chair of the APPGRT

Appendix 2

List of APPGRT members

APPGRT members

Tim Farron MP	Lib Dem MP for Westmorland and Lonsdale and APPGRT chair
Grahame Morris MP	Labour MP for Easington and APPGRT vice chair
Gillian Keegan MP	Conservative MP for Chichester and APPGRT vice chair
Derek Thomas MP	Conservative MP for St Ives and APPGRT vice chair
Steve Double MP	Conservative MP for St Austell and Newquay and APPGRT vice chair
Karen Lee MP	Labour MP for Lincoln
Jim Shannon MP	DUP MP for Strangford
Damian Green MP	Conservative MP for Ashford
Baroness Armstrong of Hill Top	Labour: area Durham
Catherine West MP	Labour MP for Hornsey and Wood Green
Diana Johnson MP	Labour MP for Kingston upon Hull North
Faisal Rashid MP	Labour MP for Warrington South
Henry Smith MP	Conservative MP for Crawley
The Rt Hon Lord Tyler	Liberal Democrat: area Cornwall
Mark Tami MP	Labour MP for Alyn and Deeside
Scott Mann MP	Conservative MP for North Cornwall
Sir Kevin Barron MP	Labour MP for Rother Valley
Sir Oliver Heald QC MP	Conservative MP for North East Hertfordshire
Andrea Jenkyns MP	Conservative MP for Morley and Outwood
Ruth George MP	Labour MP for High Peak
Mike Hill MP	Labour MP for Hartlepool
Tonia Antoniazzi MP	Labour MP for Gower
David Simpson MP	DUP MP for Upper Bann
Liz McInnes MP	Labour MP for Heywood and Middleton

For further details visit the APPGRT website:

<https://www.actionradiotherapy.org/appg>

or email: appg-rt@actionradiotherapy.org