

RADIOTHERAPY: AN INTRODUCTION FOR COMMISSIONERS AND PROVIDERS

A NATIONAL RADIOTHERAPY AWARENESS INITIATIVE (NRAI)* BRIEFING

THE 2011 CANCER PLAN ‘Improving Outcomes: a Strategy for Cancer’ states “to improve outcomes from radiotherapy, there must be equitable access to high quality, safe, timely, protocol-driven quality-controlled services focused around patients’ needs”.¹”

To achieve these aims, individual commissioners and commissioning organisations should be planning to make the most of radiotherapy as a cancer treatment. This can be achieved through:

- **Building sufficient capacity** so that all patients who require radiotherapy receive it in a timely manner.
- **Access to the most appropriate radiotherapy treatments to deliver best outcomes with least toxicity** and ensure efficient and effective use of resources, including intensity modulated radiotherapy (IMRT), image guided radiotherapy (IGRT) and stereotactic radiotherapy when required.
- **A 3-5 year plan** to account for increases in the prevalence of cancer, improved earlier diagnosis of cancer and the introduction of new radiotherapy treatments **to meet increased demand for radiotherapy**. This should include a plan for workforce development and the replacement of radiotherapy equipment.

Over 275,000 people a year are diagnosed with cancer in England. Just over half of all cancer patients should receive radiotherapy as part of their treatment.²

However access rates are significantly lower than this, at around 38 per cent.³ It is estimated that in England alone around 36,000 patients who may benefit from radiotherapy do not receive it.⁴

Low access rates are thought to be attributable to the requirement to travel, a lack of awareness of the benefits of radiotherapy and a lack of availability of the latest radiotherapy treatments. This may mean that clinicians are not referring suitable patients, or that patients opt for treatments other than radiotherapy when given a choice.

Investment in recent years has led to improvements in both waiting and travel times for patients. Continued investment will ensure that the latest developments in radiotherapy can be translated quickly into clinical practice and allow for the effective and efficient use of resources. Commissioners and radiotherapy centres should work together to develop workforce plans and ensure that equipment is up to date, serviced, and upgraded.

Radiotherapy can cure cancer. Second only to cancer surgery, radiotherapy is involved in 40 per cent of cases where cancer is cured.^{5,6} It is estimated that radiotherapy is the primary treatment used in 16% of patients who are cured of their cancer.⁷ By comparison, chemotherapy is the primary modality in only 2%.⁸

Radiotherapy is highly cost effective, consuming only five per cent of the NHS’s annual cancer spend.⁹ European estimates are that radiotherapy costs less than €3,000 per course of treatment in comparison to €7000 for surgery and €17,000 for a course of chemotherapy.¹⁰ IMRT incurs a marginal additional cost of £500 per patient.¹¹

All departments have quality assurance systems for radiotherapy. Collection of the national radiotherapy dataset (RTDS), accessed via cancer network Directors,¹² is required to allow for benchmarking and future planning of the service. Peer review measures for radiotherapy are routinely collected and reported against.

All patients should be offered the most appropriate radiotherapy for their cancer. Radiotherapy treatments have become significantly more sophisticated in the last decade and deliver more targeted treatment.

Modern radiotherapy treatments include:

- **Intensity Modulated Radiotherapy (IMRT)** uses complex physics to sculpt radiotherapy to give a high dose to the tumour while avoiding normal tissues. IMRT should be used in at least a third of patients treated with curative radiotherapy especially with head and neck cancer, prostate, lung, breast and bladder cancer.
- **Image Guided Radiotherapy (IGRT)** uses imaging during treatment to adjust for tumour movement or change during therapy guaranteeing accuracy and allowing smaller volumes to be treated. IGRT should as a minimum be used in radical treatment for tumours that move with breathing or bowel function (lung, prostate, bladder).
- **Stereotactic Body Radiotherapy (SBRT)** is a combination of IMRT and IGRT to deliver a small number of very high dose treatments with curative intent. SBRT was first developed for brain tumours, and is now commissioned for early lung cancer in surgically unfit patients where local control is increased from about 30% to 80% with SBRT.¹³ SBRT can be delivered by specialised linear accelerators and other specially designed equipment.
- **Proton Beam Therapy (PBT)** uses proton beams for radiotherapy to deliver energy directly to the tumour and further reduce normal tissue exposure. It is used for paediatric, paraspinal and skull-base tumours. Currently patients are treated overseas through the national proton beam service, pending development of UK PBT centres.

Improving outcomes and efficiencies through IMRT

The Cancer Research UK funded PARSPORT trial¹⁴ showed that, for head and neck cancer, IMRT reduces the incidence of serious dry mouth after treatment from 71% to 29%, reducing the need for tube feeding at two years from around 20% to less than 5%. For prostate cancer, IMRT allows a dose escalation from 64Gy to 74Gy, leading to a 12% improvement in efficacy and halving the rate of side effects from 16% to <8%.¹⁵

Getting to know your local radiotherapy services

The questions below aim to provide a template to assess the quality of radiotherapy services in your local area.

	Ideal Response	Where to find this information
How many attendances for radiotherapy occur per million population?	35,000 attendances per million population by 2010 and 47,000 attendances per million population by 2016	RTDS
What proportion of newly referred cancer patients receive radiotherapy for the first time?	52%	Cancer incidence (cancer registry) vs. numbers treated with radiotherapy, excluding those being re-treated (local services department)
What is the maximum travelling time for patients?	45 mins	Mapping by NatCanSat or local GIS postcode mapping
What proportion of patients are treated within 31 days of a decision to treat (both first and subsequent treatment)?	96% and 94% respectively	Cancer Waits database
What proportion of patients are seen within 14 days for palliative treatment?	90%	RTDS
What proportion of patients are treated with IMRT?	30%	RTDS
What proportion of patients are treated with IGRT?	27%	RTDS
How well do current service providers comply with peer review measures?	no immediate risks or serious concerns and with an agreed action plan	CQUINS
Have dose fractionation regimens been agreed within the service?	Should be in line with peer review measures	Local services department
Does the local radiotherapy service have a workforce strategy to maintain service levels?	Should include the four-tier model for radiographer staffing; training and recruitment strategies	Local services department
How many machines are over 8 years old? How often is software upgraded?	Machines replaced at 10 years; software at 3-4 years	Local services department

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* THE NRAI IS A COLLABORATION BETWEEN: THE NATIONAL CANCER ACTION TEAM, THE SOCIETY AND COLLEGE OF RADIOGRAPHERS, THE ROYAL COLLEGE OF RADIOLOGISTS, INSTITUTE OF PHYSICS AND ENGINEERING IN MEDICINE, CANCER RESEARCH UK, ASSOCIATION OF X-RAY EQUIPMENT MANUFACTURERS AND THE RADIOTHERAPY LEADERS OF THE 4 NATIONS OF THE UK.