

## SCHEDULE 2 – THE SERVICES

### A. Service Specifications

<b>Service Specification No.</b>	B01/S/a
<b>Service</b>	Adult External Beam Radiotherapy Services delivered as part of a Radiotherapy Network – <b>INDIVIDUAL RADIOTHERAPY NETWORK NAME TO BE INSERTED AT CONTRACT STAGE</b>  <b>INDIVIDUAL PROVIDER NAME TO BE INSERTED AT CONTRACT STAGE</b>
<b>Commissioner Lead</b>	
<b>Provider Lead</b>	

<b>1.</b>	<b>Scope</b>
<b>1.1</b>	<p><b>Prescribed Specialised Service</b></p> <p>This Service Specification (the “Specification”) covers the provision of radiotherapy for adults (≥18 years of age).</p>
<b>1.2</b>	<p><b>Description</b></p> <p>The scope of specialised services is set out within the Prescribed Specialised Services Manual (the “Manual”). The Manual states that radiotherapy services include all use of this treatment modality including brachytherapy and any associated outpatient activity. In addition, that radiotherapy includes all provision of intracranial stereotactic radiosurgery/radiotherapy (SRS/SRT) and extracranial stereotactic radiotherapy and that this applies to both adults and children.</p> <p>Radiotherapy services are commissioned to treat both malignant and benign disease, though the majority of people undergoing radiotherapy are treated for malignant disease. Radiotherapy may be used:</p> <ul style="list-style-type: none"> <li>• To cure an illness – for example by destroying a tumour. This is called ‘radical’ treatment;</li> <li>• To control symptoms – for example, to relieve pain. This is called ‘palliative’ treatment;</li> <li>• Before surgery – for example, to shrink a tumour to make it easier to remove; and</li> <li>• After surgery – for example, to destroy small amounts of tumour that may be left.</li> </ul> <p>Both malignant and benign conditions must be treated and governed by the same standards.</p> <p>This Specification relates only to the provision of External Beam Radiotherapy for adults (≥18 years of age). Paediatric Radiotherapy, Proton Beam Radiotherapy, Brachytherapy and Intracranial SRS/SRT services are excluded from the Specification because they are subject to separate service specifications, published by NHS England.</p> <p>There are fifty-two separate providers of radiotherapy services in England which are tertiary services accessed only by referral from a secondary care Consultant, usually following at least one multi-disciplinary team (MDT) discussion. The Services cannot be directly accessed from primary care.</p> <p>The Specification, in addition to setting out the clinical, service and quality requirements and standards for the delivery of external beam radiotherapy which all providers of radiotherapy must comply with, requires each Radiotherapy Network (the “Network”) to agree sub-speciality arrangements for the</p>

Network across the Network. This means that provider organisations within the Network may be commissioned to treat different sub-specialties as detailed in Appendix C. Each member provider organisation must only deliver radiotherapy in accordance with the Network arrangements.

### **1.3 How the Service is Differentiated from Services Falling within the Responsibilities of Other Commissioners**

NHS England commissions all activity at specified centres. Clinical Commissioning Groups (CCGs) do not commission any elements of the Services.

## **2. Care Pathway and Clinical Dependencies**

### **2.1 Service Overview**

Radiotherapy is the safe use of controlled doses, called 'fractions', of ionising radiation to treat people who have cancer. The aim of radiotherapy is to deliver as high a dose of radiation as both possible and necessary to destroy the cancerous tumour(s), whilst sparing the surrounding normal tissues.

The Services are an integral component of modern cancer care with four out of ten people that are cured of cancer having received radiotherapy as part, or the whole, of their treatment plan (Cancer Research UK, 2014). The advent of innovative radiotherapy techniques also provides an opportunity for radiotherapy to play an increasingly important role in improving cancer outcomes in England.

Radiotherapy is part of an overall cancer management and treatment pathway. Decisions on the overall treatment plan must relate back to a MDT discussion. It is often used on its own or as part of a treatment plan which includes surgery and/or chemotherapy. Referral for radiotherapy treatment is made by a Consultant Clinical Oncologist who is a member of a tumour specific MDT. Most radiotherapy treatment is delivered on an outpatient basis.

Radiotherapy is a key component of both radical treatment, which aims to cure the disease and palliative treatment, which aims to provide symptom relief. In cancer treatment, palliative care is given where cancers are at an advanced stage.

The process of radiotherapy is complex and involves an understanding of the principles of medical physics, radiobiology, radiation safety, dosimetry, radiation treatment planning, simulation and interaction of radiation with other treatment modalities. Radiotherapy is generally delivered by a machine called a Linear Accelerator or 'linac', (note this is a generic term for all megavoltage radiotherapy equipment) which is housed in a thick concrete 'bunker' or specially adapted room in order to protect patients, members of the public and members of staff from radiation.

Treatment involves the calculation of the overall dose of radiation that a patient requires which is then usually divided into a number of smaller doses, or 'fractions'. The purpose of delivering the overall dose in a number of fractions is to allow healthy cells to recover during treatment. Fractions are typically delivered to patients on a daily basis, five days per week and over a number of weeks, depending on the tumour site. Palliative treatment is usually given in significantly fewer fractions and sometimes a single fraction is required. Innovative radiotherapy treatment approaches also now mean that some radical treatments can be delivered using stereotactic radiotherapy techniques. Such techniques involve the delivery of fewer fractions leading to a shorter course and duration of treatment. Each fraction must be recorded as an 'attendance' and each course of treatment must be recorded as an 'episode'.

Seven-day working is a cornerstone of NHS England's strategic ambition and within Radiotherapy services there is recognition of the need to balance the opportunities this affords with the practical requirements of delivering safe and highly effective radiotherapy treatments e.g. business continuity plans in the event of machine breakdown. Therefore, seven day working is expected to result in treatment being delivered to patients at least 5 days every week whilst retaining access to accommodate servicing and planned preventative maintenance, quality assurance checks and other key activities (including capacity to accommodate machine breakdowns) on the other days of the week. This change in clinical practice will also contribute to achieving increased equipment utilisation rates in

England.

## **2.2 Advanced Radiotherapy Techniques**

Advanced radiotherapy are techniques which are already in clinical use in England, but may, in some cases, benefit from further uptake or development within the NHS. These include 4D Adaptive Radiotherapy and volumetric modulated arc therapy which is a type of intensity modulated radiotherapy (IMRT) involving shorter times on the treatment couch, meaning less scope for patient movement as well as higher throughput and efficiency and improved patient experience.

## **2.3 Innovative radiotherapy**

Approaches (including planning, software, training and delivery) and treatments with the potential to deliver significant patient benefit which are not currently in mainstream clinical use in England but have the potential to become available in the next few years.

## **2.4 Stereotactic Ablative Radiotherapy (SABR)**

SABR is a form of external beam radiotherapy using specialised equipment to precisely deliver highly focused radiation to malignant tumours in the body. This technique enables a high dose of radiotherapy to be delivered to tumours in a small number of treatments, whilst sparing the surrounding healthy tissue. It usually requires specialised positioning equipment. SABR can be delivered using a smaller number of fractions than conventional radiotherapy. This therefore represents a greater opportunity for efficiency gains within the NHS as the fractionation usually utilised is not conventional. This treatment is subject to NHS clinical commissioning policies which are and will continue to be based on clinical evidence as it emerges.

Accordingly careful follow up, both in the short- and long- term, is necessary to confirm the efficacy, and to assess early and late toxicity. Doses and detailed techniques used are specified in the UK SABR guidelines.

The treatment is restricted to a limited number of centres whilst evidence of clinical effectiveness emerges. This will be continually reviewed by NHS England. It is expected that as radiotherapy networks, as described in this specification, become established they will have a key role in developing SABR services over time as clinical partnerships evolve whilst ensuring that services deliver SABR treatments as described within the NHS England clinical commissioning policies and that the required standards and sufficient activity/case throughput is achieved.

## **2.5 Service Model**

The Specification sets out a requirement for radiotherapy providers to form Radiotherapy Networks, aligned to Cancer Alliances or the Cancer Vanguard where relevant. This is to enable the ambitions set out within 'A Vision for Radiotherapy, 2014-2024' (NHS England, Cancer Research UK, 2014) to be fulfilled at pace. Our ambition is for people across England to receive, and have access to, modern and innovative radiotherapy, which has been shown to be clinically and cost effective. Implementation of this vision would provide patients with substantially improved outcomes, higher cure rates and fewer side effects from their treatment.

From April 2018, eleven Radiotherapy Networks will be established (Appendix B) across England.

The network service model is based on partnerships between radiotherapy providers within a 3-6m population geography that is aligned to existing cancer pathways. Radiotherapy should not be seen in isolation but part of a fully integrated cancer service. It should be shaped to support the range of co-located cancer services underpinned by the appropriate subspecialist multi-professional team. In this way, the hospital services are shaped appropriately to serve the wider network population needs rather than the local catchment population defining the services for its local hospital.

In order to achieve collective population-based oversight of individual tumour sites across the networked service by the sub-specialist teams each Network will be governed through a Radiotherapy Network Board (the "Board"), hosted and supported by a constituent provider organisation and chaired by the

lead Cancer Alliance (where the radiotherapy network spans more than 1 Cancer Alliance) with accountability via the Cancer Alliance(s) governance structures and linked to STP arrangements. Professional leads from the 3 main specialisms (Radiotherapy Physics, Radiography and Clinical Oncology) from each of the providers will form an equal and balanced representation on the Radiotherapy network board **to determine the operational shape and delivery** in accordance with a national operational framework.

The Board is required to:

- Agree the service configuration;
- Agree Network-wide treatment protocols and pathways;
- Tackle clinical variation;
- Develop an integrated Network-wide workforce plans;
- Plan services at the Network level, including capacity/demand planning and clinical trial coordination and referral processes between providers (where necessary);
- Ensure a robust and coordinated radiotherapy equipment replacement programme is in place to include the replacement of linear accelerators at 10 years old that are in full clinical use;
- Develop a Network-wide plan for developing treatment planning systems and supporting Network IT infrastructure solutions to underpin innovative operational delivery approaches;
- Ensure a coordinated approach to the rapid rollout of modern, innovative techniques to all centres within the Network;
- Develop strategies for accessing clinical trials within the Network including; supporting local access for common cancers where appropriate and ensuring adequate information for centres not participating in research to inform patients and refer appropriately; and
- Prepare a Network-wide annual report for submission to commissioners outlining Network performance and improvement to meet the network quality metrics, outlined above.

The aim of modernising the Services is not to set a 'one-size fits all' approach. Instead, the aim is to enable local flexibility within an overall national framework. It is not the intention to reduce the number of radiotherapy units, but rather for the Networks to develop using different models shaped to meet the specific requirements detailed in supporting documents and the needs of the local population.

Led by the Board, the Network must:

- Improve access to modern, innovative radiotherapy techniques, enabling more patients to benefit from cutting-edge technology and treatments;
- Improve the experience of care by ensuring that patients will be managed by an experienced multi-professional tumour specific subspecialist team able to provide holistic care;
- Increase participation in research and clinical trials, up to 15% more people will be treated within a clinical trial framework over 3 years, aiding faster development of new treatments;
- Reduce variation in quality by reducing mortality and morbidity from adverse side effects; and
- Reduce variation in equipment utilisation in England through changing operating arrangements, clinical practice and equipment replacement; an average 15% increase in equipment utilisation for England as a whole is expected over the next 3 year period aligned to the equipment modernisation programme.

This clearly places radiotherapy networked services within the wider emerging Cancer Alliance / Cancer Vanguard and Sustainability and Transformation Partnership (STP) structures, reinforcing the need to develop coherent clinical pathways for patients. In addition, the adoption of electronic networking solutions now offers far-reaching opportunities for ambitious change.

## 2.6 Clinical Model

The clinical model strikes a balance between maintaining local access to the Services for the vast majority of Patients and concentrating care for patients requiring radical radiotherapy treatment for the less common and rarer cancers (Table 1) to enable access to these sub-specialist teams. Therefore the Board must consider and determine the locations within the network able to treat patients requiring radical radiotherapy for each sub-specialist cancer type, ensuring alignment and access to the

appropriate cancer specific multi-professional team infrastructure.

This will ensure that each local service and hospital is a vehicle to serve the appropriate case-mix of population rather than the radiotherapy referral population defining the services for its local hospital. This approach is essential to ensure resilience in service provision, avoid isolated practice and to address variation in clinical practice between services.

The Board must:

- Agree the members of the network sub-specialist team for each tumour site. Each Consultant Clinical Oncologist will be responsible for at least 25-50 cases of radical radiotherapy per year for the less common cancers. These thresholds will differ for the rare cancers as there is already a requirement for these treatments to be concentrated in fewer centres and common cancers (Table 2);
- Ensure that each Network sub-specialist Clinical Oncology team harnesses the expertise from constituent providers within the networked service geography;
- Ensure that radical radiotherapy treatments are delivered by providers treating sufficient tumour specific case numbers to generate at least 50-100 radical radiotherapy treatments per year to maintain expertise and competence; and
- Ensure the multi-professional expertise from all constituent providers is harnessed.

Where there are insufficient activity/case numbers per year for all providers in the Network to meet the requirements outlined above, the providers must evidence an agreement in place that clearly defines:

- The arrangements defining which providers will sub-specialise in each tumour-specific clinical area (Appendix C);
- The cohort and number of patients to be treated at each delivery site; and
- The role and progression towards a partnership working within multi-professional teams.

During the consenting process, which must be run in accordance with relevant guidelines and legislation, it will be important for each Oncologist to:

- Discuss the full and optimum range of treatment options recommended by the MDT for each patient;
- Provide details of where the treatments are available within the Network, together with information about travel, transport and any available accommodation options.

The level of operational and team integration between providers will be dependent on the co-operation necessary to deliver the cancer specific service. This will mean that some neighbouring radiotherapy services will need to work in close partnership to achieve this. At an operational level this will require a concentration of expertise available to all patients and would include:

- The formation of a single sub-specialist oncology team providing a service across two centres with a two site treatment delivery model with the combined service meeting the required 50-100 cases per annum requirement;
- A single multi-professional team approach to patient management and treatment planning of the less common cancers concentrated on one site;
- Multidisciplinary team support, supportive care and rehabilitation is available locally for patients (e.g. SALT, specialist nurse, dietetic and gastrostomy service etc for head and neck cancers); and
- All integrated site specialist team members participate in relevant MDTs, have arrangements for cover for absence, use shared protocols and participate in regular Quality Assurance /audit.

## **2.7 Role of Subspecialist Teams**

The sub-specialist teams must recommend to the Board how best to configure the tumour specific radical radiotherapy service in order to meet the requirements of the Specification for each cancer site-specific service (i.e. all network providers or only some). The final configuration, having been agreed after any patient involvement activities, must ensure that each sub-specialist team aligns with the

specific sub-specialist cancer specific MDT structures and specialist infrastructure so that patients can access the full range of sub specialist multi-professional input into their care during their radiotherapy.

Which types of cancers can be treated with radiotherapy at each provider site within the Network will be dependent on:

- Co-dependency and co-location of some surgical and other specialist support services relevant to and dependent on the complexity of the disease;
- The size and shape of the non-surgical clinical oncology service available locally including; staffing, in-patient facilities, chemotherapy services, out-patient services and the availability of the clinical and medical oncologist team;
- Local sub-specialisation of at least two Consultant Clinical Oncologists to manage each cancer type at each provider site delivering the service. This can be achieved through partnership working between two providers (see above);
- Consultant Clinical Oncologists will be expected to concentrate their cancer tumour site sub-specialisation to two or three broad clinical areas. Higher activity volumes will engender improved patient management, clinical care and radiotherapy planning expertise;
- Integration of all non-surgical oncologists as core members of the associated tumour specific MDTs with opportunities for rationalisation; and
- Radiotherapy workload, and activity throughput, and management responsibility by an individual clinical oncologist - noting that the activity numbers may be considerably higher to include palliative radiotherapy, brachytherapy and chemotherapy activity.

## 2.8 Alignment of radiotherapy provision to the cancer population served at individual trusts

Each Network of 3-6 million populations will vary in its composition of providers dependent on the range of specialist treatments delivered at each of the host hospital(s). The framework is detailed in table 2.

**Table 1 Hierarchy of cancers**

<b>Common Cancers</b>	1.radical (standard) breast 2.radical prostate/bladder 3.radical rectum 4. lung
<b>Less common cancers</b>	5 Head and neck 6 Gynaecological 7 Lymphoma 8 Upper GI (oesophagus; Hepatic pancreatic biliary (HPB) 9 Primary CNS
<b>Rare cancers</b>	10 Paediatric cancers (separate specification under development) 11 Sarcoma 12 Anal (could be integrated with colorectal cases) 13 Penile 14 Rare head and neck (sinus, nasopharynx)

**Table 2 Clinical Framework**

The clinical framework, below, has been developed to guide Boards in identifying which cancers can be treated where as well as defining a number of operational arrangements to support integrated working where multi-professional teams are available and activity numbers allow.

Trust Cancer Service Population and supporting MDT Infrastructure	Radiotherapy service requirements: Cancer type and activity numbers	Infrastructure
<p><b>Scenario A</b></p> <p>The host hospital (s) provides cancer services to a population of up to 500,000 predominantly delivering the full range of specialist treatments to the common cancers.</p> <p>Common Cancer (4) MDT</p> <p>Majority of radiotherapy patients (65% approx) and majority of radiotherapy fractions (65% approx.) including palliation for all metastatic cancer sites</p> <p>Radiotherapy trials for common cancers must be made accessible locally for patients or referred to another centre.</p>	<p>Each tumour site at least 25-50 radical cases/year per clinical oncologist per cancer type for common cancers At least 2 clinical oncologists per cancer type</p> <ol style="list-style-type: none"> <li>1. radical (standard) breast</li> <li>2. radical prostate/bladder</li> <li>3. radical rectum</li> <li>4. lung</li> </ol> <p>Palliative radiotherapy for Mets (any primary) Palliative radiotherapy to primary site for 4 common cancers above and for other primary sites with advice from specialist team.</p> <p>Scope of radical treatments for the less common cancers dependent on operational partnerships</p>	<p>Satellite services –</p> <ul style="list-style-type: none"> <li>• Planning via a single integrated and coordinated team;</li> <li>• electronically connected to the parent centre for planning activities and for QA;</li> <li>• use of common protocols across the network;</li> </ul> <p>Independent centre requires</p> <ul style="list-style-type: none"> <li>• a team of at least 5 locally based clinical oncologists.</li> </ul> <p>In addition to the 4 common cancers and palliative radiotherapy, some of the less common cancers particularly in the elderly could be planned centrally and delivered locally in exceptional circumstances as defined by the radiotherapy network board.</p> <p>Synchronous intravenous chemo-radiotherapy must generally not be delivered in a satellite setting as this generally requires locally based clinical oncologists</p>
Trust Cancer Service Population and supporting MDT Infrastructure	Cancer type and activity throughput	Infrastructure
<p><b>Scenario B</b></p> <p>The host hospitals(s) provide cancer services to a population of at least 0.5m -1 million approx. delivering the full range of specialist treatments to the common cancers and some less common cancers</p> <p>Common cancer MDTs as above plus host of specialist MDTs for any of the following: Gynae, Head and neck, Lymphoma, Upper GI, Primary CNS Where the workload is below 50-100 radical cases per tumour site per year the delivery sites will be selected by the radiotherapy network board.</p>	<p>Common cancers (4);</p> <p>Less common cancers concentrated in defined number of radiotherapy providers able to meet a minimum of 25-50 cases per year per clinical oncologist (minimum of 2 per cancer type)</p> <ol style="list-style-type: none"> <li>5 Head and neck</li> <li>6 Gynaecological</li> <li>7 Lymphoma</li> <li>8 Upper GI (oesophagus; HPB)</li> <li>9 Primary CNS</li> </ol> <p>Scope of radiotherapy for less common cancers to be agreed by the radiotherapy <b>network board</b> and networked team and aligned to the site specific MDT and specialist team infrastructure.</p> <p>Centres must be selected where</p> <ul style="list-style-type: none"> <li>• the specialist staffing infrastructure at the delivery site is available</li> <li>• the treating specialists attend the specialist MDT.</li> </ul> <p>This may require additional referrals from another centre within the networked geography to meet the minimum numbers. This may change as pathways change.</p>	<ul style="list-style-type: none"> <li>• Planning via a coordinated team electronically connected to the linked centre for planning activities, if required, and for QA;</li> <li>• use of common protocols across the network; with locally based clinical oncologists.</li> <li>• Need critical mass of activity, staff expertise and full infrastructure support if uncommon cancers (5-9) to be treated locally within agreed networked provision</li> <li>• (a).planned centrally/delivered locally or (b).planned locally with team coordination / delivered locally.</li> </ul> <p>All subspecialist practitioners <b>MUST</b> treat at least 25-50 cases of uncommon cancer and can continue to provide treatment planning and delivery locally as long as there is close operational working as part of an extended integrated team potentially with an adjacent centre <b>and each</b> centre treating approximately 50 cases.</p> <p>This will encompass contouring and plan review and cover for absence and MDT participation / common protocols / QA /audit and availability of multi-professional support team locally. This will serve to avoid isolated working, ensure consistency of practice and provide appropriate multi-professional Patient care.</p>
Trust Cancer Service Population and supporting MDT Infrastructure	Cancer type and activity throughput	Infrastructure
<p><b>Scenario C</b></p> <p>The host hospitals(s) provide cancer services to a population of at least 1-1.5 million delivering the</p>	<p>Common cancers (1-4) and less common cancers (5-9) treated with a minimum of 25-50 cases per year per clinical oncologist (minimum of 2 per cancer type)</p>	<p>Centres must have:</p> <ul style="list-style-type: none"> <li>• Planning via a coordinated team:</li> <li>• electronically connected to neighbouring centres if required for planning activities and for QA;</li> </ul>



<p>full range of specialist treatments for common cancers and less common cancers</p> <p>Majority of patients and fractions (95%+)</p> <p>Partnership working: Contouring, planning audit</p>	<p>5. Head and Neck 6. Gynaecological 7. Lymphoma 8. Upper GI (oesophagus, HPB) 9. Primary CNS (each constitutes approx. 1.5-7.5% total episodes)</p> <p>Scope of radiotherapy for less common cancers to be agreed by the radiotherapy network board and aligned to the site specific MDT and cancer specific specialist teams</p>	<ul style="list-style-type: none"> <li>• use of common protocols cross the network;</li> <li>• Has critical mass of activity, staff expertise and full infrastructure for treatment of uncommon cancers within agreed networked provision.</li> <li>• Full range of integrated diagnostic and planning infrastructure (MRI,PET-CT)</li> </ul> <p>Brachytherapy for some indications where agreed.</p> <p>Lung SABR may be concentrated to these sites (achieving minimum case numbers) whilst additional evidence of clinical effectiveness for other indications is established so that rollout to more centres can be implemented under the direction of the radiotherapy network board.</p> <p>Centres should consider:</p> <p>It is expected that some patient accommodation would normally be available for patients that may require this. However, it is recognised that this is normally provided only through provider organisation partnerships with charitable organisations.</p>
Trust Cancer Service Population and supporting MDT Infrastructure	Cancer type and activity throughput	Infrastructure
<p><b>Scenario D</b></p> <p>The host hospital(s) provide cancer services to a population of over 2m delivering the full range of specialist treatments for common cancers, less common cancers and rare cancers</p> <p>Closely fulfil the definition of comprehensive cancer centre; full participation in broad range of cancer MDTs; may participate in specialist MDTs for rare conditions of e.g. paediatric, sarcoma anal, penile cancer, rare head and neck (sinus, NPC)</p>	<p>Common cancers (1-4), less common cancers (5-9) and rare cancers (10-14) treated with a minimum (if possible) of 25-50 cases per year per clinical oncologist. (minimum of 2 per cancer type)</p> <p>10 Paediatric (separate specification) 11 Sarcoma 12 Anal (could be integrated with colorectal cases) 13 Penile 14 Rare head and neck (sinus, nasopharynx)</p>	<p>Centres must have:</p> <ul style="list-style-type: none"> <li>• Planning via a single integrated and coordinated team;</li> <li>• electronic links to other centres for planning activities and QA as required; use of common protocols across the network.</li> <li>• Full range of integrated diagnostic and planning infrastructure (MRI; PET-CT)</li> </ul> <p>Will provide radiotherapy for rare (less than 1.5% total episodes) cancers and some will provide rare activity (total skin electrons, comprehensive brachytherapy, Total body irradiation (TBI), extracranial SABR (for uncommon conditions) <b>Many of these services have been nationally designated. Nationally agreed protocols and outcome audit must be in place.</b></p> <p>Centres should consider:</p> <p>It is expected that some patient accommodation would normally be available for patients that may require this. However, it is recognised that this is normally provided only through provider organisation partnerships with charitable organisations.</p>

\*Two centres in England will be contracted to deliver Proton Beam Therapy from 2018 onwards

## 2.9 Patient pathways

Networks are established based on partnership working between radiotherapy providers across a defined geographical population footprint of 3-6m in England and aligns to established cancer pathways (or change in line with developing service models for other specialist cancer services) across the geography. The Network configuration must include a tertiary centre that closely fulfils the definition of a comprehensive cancer network, i.e., must host the full range of specialist MDTs in line with tumour specific Improving Outcomes Guidance (IOG), including population size and activity/case numbers for the full range of cancers including rare cancer specialist MDTs (sarcoma, neuro-oncology, paediatric oncology, hepato-biliary and pancreatic cancers etc) and must be a specialist regional provider of radiotherapy, treating a large range of cancer sub-site specialisations.

The networked model requires that radiotherapy is part of a fully integrated non-surgical oncology service that is shaped to support the range of co-located cancer services and MDTs provided at each of



the networked delivery sites. This will require the cohort of tumour specific sub-specialist clinical oncologists, across the networked geography, to work as part of an integrated multi-professional team. The teams must be configured to serve populations sufficiently sized to underpin the full range of cancer surgery services and their supporting MDT structures.

The Board must agree the location of services across the Network and ensure that each provider has systems and processes in place to:

- Register patients;
- Collect relevant clinical and administrative data;
- Manage the appointment process, (reappointment and Did Not Attend (DNA) process if appropriate);
- Provide an appropriate range of information to patients which supports informed consent; and
- Undertake initial assessment in the appropriate location as agreed.

At point of intervention, each individual provider must have systems and processes in place to ensure that:

- The intervention is conducted safely and in accordance with accepted quality standards and good clinical practice;
- The patient receives appropriate care during the intervention(s), including on treatment review and support, in accordance with best clinical practice;
- Where clinical emergencies or complications do occur they are managed in accordance with best clinical practice;
- The intervention is carried out in a facility which provides a safe environment of care and minimises risks to patients, staff and visitors;
- The intervention is undertaken by staff with the necessary qualifications, skills, experience and competence;
- There are arrangements for the management of out of hours care according to best clinical practice and monitored via a local recording system; and
- Where any radiotherapy is used concurrently with other treatments (such as brachytherapy or chemotherapy), it must be integrated appropriately and scheduled to meet Patients' needs.

At exit from pathway, the provider must have systems and processes in place, which are agreed with all parties within the radiotherapy networked service to:

- Undertake telephone triage as appropriate;
- Make urgent onward referrals where life-threatening conditions or serious unexpected events occur during an intervention/assessment;
- Ensure that patients receive end of treatment information relevant to their intervention including arrangements for contacting the provider and follow up if required;
- Provide timely feedback to the referrer and primary care re intervention, complications and proposed follow up;
- Ensure that the Patient receives required drugs/dressings/aids if applicable;
- Ensure that support is in place with other care agencies including the voluntary sector; and
- Provide General Practitioners (GPs) and patients with treatment summaries monitored through a local recording system. Guidance on treatment summaries can be found at:

<http://www.macmillan.org.uk/about-us/health-professionals/programmes-and-services/recovery-package#297725>

## **2.10 Treatment and post-treatment care**

Radiotherapy is normally provided on an outpatient (OPA) basis but patients may be admitted due to their overall condition or co- morbidities rather than as a result of their radiotherapy. It is the responsibility of all the radiotherapy providers to prevent and minimise late effects through better targeted treatments, provision of information and the management of acute side effects.

Irrespective of where the outlining occurs (i.e. base or distant hospital) all relevant information must be available to the oncologist at the time of volume definition including appropriate diagnostic imaging, clinical letters, operation notes, clinical photographs, endoscopy reports. This same data must be made available for effective peer review of target volumes which itself may be conducted on site or remotely through an effective IT infrastructure. <https://www.rcr.ac.uk/publication/RT-target-definition-peer-review>

The Board must also agree tumour specific protocols and peer review & audit processes that take account of the RCR guidelines e.g. <https://www.rcr.ac.uk/publication/radiotherapy-dose-fractionation-second-edition>

During and after treatment; patient contact with the wider cancer MDT (Specialist therapeutic radiographer, Clinical Nurse Specialist [CNS], Dietician etc.) must be encouraged. Supporting patients during and after radiotherapy is essential. Regular review of Patients on a daily basis is the responsibility of the registered therapeutic radiographer treating the Patient, additionally regular formal review will involve a team approach that requires multiple skills and attention.

The vast majority of patients with late effects following radiotherapy treatment should be managed locally as an integral part of rehabilitation or as part of locally stratified follow-up care pathways which include options for referral to local specialties / services that have expertise to manage common late effects. However, it is expected that specialist late effects centres will manage and co-ordinate the provision of specialist services for complex late effects including late effects caused by other cancer treatments, and align to specialist cancer surgery and other treatment pathways as they arise. Clinical guidance on long-term effects is available via [www.macmillan.org.uk/cot](http://www.macmillan.org.uk/cot)

## **2.11 Patient access to radiotherapy**

The Board must have arrangements in place to ensure that patients are able to access the Services, in accordance with wider arrangements set out within the NHS Constitution and NHS England policies, such as those relating to hospital transport and travel costs, as follows:

<http://www.nhs.uk/NHSEngland/Healthcosts/Pages/Travelcosts.aspx>

In determining the configuration of the Service, the Board must consider access arrangements across the Network. The Clinical Model sets out that this is particularly important in relation to the provision of radiotherapy for people with rare and less common cancers (Scenarios C and D) where the provision of care is likely to remain concentrated into a few centres within the Network. The Board must consider the availability of patient accommodation when determining the Network locations for the provision of care for people with rarer and less common cancers. It is recognised that patient accommodation is not within the scope of NHS services. However, it is the case that many providers already have arrangements in place with the charitable sector for the provision of patient accommodation. The Specification seeks to encourage the further development of such arrangements and their application to radiotherapy services.

## **2.12 Service User and carer information**

For all Patients receiving radiotherapy, there must be written information, supplementary to that on any general consent form, which as a minimum includes:

- Patient-related aspects of radiotherapy treatment in general; and
- Patient-related aspects of treatment, both acute and late effects, specific to the anatomical sites treated and modalities used in the department.

The consent form for a course of radiotherapy treatment must be designed so that the person giving consent acknowledges that they have been offered the general and site-specific information and that they are satisfied with the content in order for treatment to proceed. The treatment site must be specified on the consent form.

Access to support and information out of hours by telephone must be available.

Information about travel arrangements (including how to claim costs if eligible) and whether

accommodation can be provided must be provided.

Every effort should be made to offer a patient their preferred treatment time, not to rearrange or cancel appointments unnecessarily and to limit the time patients have to wait for their appointment, in accordance with the NHS Constitution and other appropriate NHS policies.

### **2.13 Patient reported outcomes**

NHS England plans to radically improve care and support for people once treatment ends. The Cancer Quality of Life metric is in its pilot phase and it is expected that service will implement the metric as part of any national implementation programme. The new 'quality of life metric' will use questionnaires to measure how effective this support is and the data will be made available on My NHS – helping Patients, the public, clinicians and health service providers see how well their local after cancer care support is doing.

<https://www.england.nhs.uk/2017/09/new-quality-of-life-measure-for-recovering-cancer-patients>

In addition, all services must consider the routine use of the ALERT-B screening tool in appropriate patients to assess the late-effects of radiotherapy to the bowel to identify patients who should be offered referral to a specialist in managing chronic gastrointestinal symptoms after pelvic radiotherapy

[http://www.clinicaloncologyonline.net/article/S0936-6555\(16\)30122-4/fulltext](http://www.clinicaloncologyonline.net/article/S0936-6555(16)30122-4/fulltext)

### **2.14 Waiting times for radiotherapy**

There are a number of waiting time performance measures governing the delivery of cancer services, those which specifically relate to the Services include:

- A maximum one-month (31 day) wait from the date a decision to treat (DTT) is made to the first definitive treatment for all cancers;
- A maximum two month (62 day) wait from referral from urgent referral for suspected cancer to the first definitive treatment for all cancers;
- A maximum 62 day wait from referral from an NHS cancer screening service to the first definitive treatment for cancer;
- A maximum 62 day wait for the first definitive treatment following a consultant's decision to upgrade the priority of the patient (all cancers); and
- A maximum 31 day wait for subsequent treatment where the treatment is a course of radiotherapy.

The Guidelines for the Management of the Unscheduled Interruption or Prolongation of a Radical Course of Radiotherapy, RCR guidelines 2012 recommends that during machine breakdowns, patients in "category 1" (radical treatments for patients with lung, oesophagus, bladder, SCC of head and neck and cervix cancers) must not have their treatment disrupted or delayed. In addition, it is particularly important not to delay the commencement of radiotherapy. Networks and member provider organisations must aim, for these patients, to treat 85% of these patients within seventeen days from date of decision to treat with radiotherapy to date of commencement i.e., the fourteen days recommended by the Joint Collegiate Council for Oncology (JCCO, 1993) with the flexibility of an additional weekend if it was planned to commence treatment on a Monday).

The networked services should have agreed contingency plans to ensure that the arrangements for the management of patients during periods of staff shortage and machine maintenance and breakdown are in place and should form part of the Memorandum of Understanding and Inter-provider Agreements.

In addition, all services must have robust cover arrangements for absence and holidays, out of hours and emergencies in place to ensure continuity of service. Networks must also agree contingency arrangements to ensure services are sustained at all locations within the Network during periods of long absences.

### **2.15 Workforce**

The radiotherapy workforce is experiencing a significant shortage of key staff groups, such as Medical Physics. It is therefore considered that a radically different approach to the way services are organised is needed and vital to consolidate the existing knowledge and expertise so that learning is shared at pace and at scale to benefit every patient, helping to make services sustainable and resilient.

It is considered that a radically different approach to the way services are organised is needed but it is recognised that in the short term there may be an impact on staff as services move towards a networked approach that is configured around integrated, multi-professional teams and which will define the range of radiotherapy treatments available at each of the delivery sites within the networked geography.

In order to create effective networks able to drive and support staff through these changes, strong clinical leadership is required from all professional groups. Opportunities for promoting innovation in ways of working across disciplines and locations as well as multi-professional approaches to skills mix must be explored regularly as part of the network-wide workforce review process. This must include any associated training and development opportunities for individuals from all constituent radiotherapy departments forming the Network to support staff retention and development.

To support this approach, the Board must explore ways of making better use of IT and data sharing and explore opportunities for greater integration between and within teams within the Network in order to maximise staff utilisation and development. The requirement to do this may be driven by the level of operational integration required between neighbouring teams to deliver local services.

Flexible working to meet the move towards seven day services should be overseen by the Board to ensure a fair and transparent approach across the workforce to ensure that any impact of service change on the workforce is evenly and fairly shared.

Assurance processes must be in place to ensure that the workforce is registered with an appropriate regulatory body (i.e. therapeutic radiographers, medical physicists, oncologists, clinical technologists, dosimetrists and other support and administrative staff) has the minimum levels of experience, qualifications, staff development and competencies appropriate to their role.

The introduction of new treatment techniques and technologies requires that appropriate education and continuing education of professionals must be given a high priority and should be overseen by the Board, e.g., SABR. Training should include Quality Assurance, treatment planning, treatment delivery and verification technologies and techniques.

Safety considerations must also be included in the training for these new techniques.

The training of professionals must involve the 'normal' and 'unusual' circumstances likely to occur in the radiotherapy process. Services in the Network must contribute to understanding the impact of new and changing treatments and regimens in order to play into the planning assumptions of the future. The Network must consider the findings of the Cancer Research UK report and other national publications when developing their radiotherapy workforce strategies and plans.

The Board must ensure the development, agreement and delivery of a radiotherapy workforce strategy to ensure a resilience across the geography to include:

- The development of a strategic workforce plan with priorities benchmarked against Professional Body guidelines;
- Opportunities for job exchanges / joint appointments and extended roles;
- Opportunities for the roll out of innovation across the network of providers particularly in areas of challenge e.g. adaptive radiotherapy where there could be real benefits to sharing and learning;
- A process for tackling shortcomings in terms of meeting quality standards, peer review and adherence to protocols and audit findings;
- The evaluation of new technologies including contouring and planning activities; and
- A strategy and implementation plan to enable shared technology approaches for treatment planning systems and licences across multiple providers (as beam data is universal) as well as:
  - a. shared folders for governance but challenging;

- b. reliable fibre-optic link;
- c. VTC capability but also face to face meetings to facilitate team working; and
- d. opportunities to enable support between providers though pooling resources at times of difficulty.

<https://www.rcr.ac.uk/publication/clinical-oncology-uk-workforce-census-2015-report>

### 2.16 Interdependence with other services

The networked model requires that radiotherapy is part of a fully integrated non-surgical oncology service that is shaped to support the range of co-located cancer services and MDTs locally and associated multi-professional teams.

## 3. Population Covered and Population Needs

### 3.1 Population covered by the Specification

The Service outlined in this Specification are for patients resident in England\*, or otherwise the commissioning responsibility of the NHS in England (as defined in Who Pays?, Establishing the responsible commissioner and other Department of Health guidance relating to Patients entitled to NHS care or exempt from charges).

\*Note: for the purposes of commissioning health services, this EXCLUDES Patients who, whilst resident in England, are registered with a GP Practice in Wales, but INCLUDES Patients resident in Wales who are registered with a GP Practice in England.

### 3.2 Population needs

It is anticipated that a number of factors will have a significant impact on future linac capacity. Evidence suggests that approximately 40% of cancer patients should receive radiotherapy as part of their cancer treatment. A capacity planning exercise has modelled future radiotherapy activity levels for England predicated on an unprecedented 2% increase in patient numbers per year, in line with cancer incidence.

The impact of changes in clinical practice and technology over the next 5–10 years will significantly affect the activity projections associated with these changes and, therefore, the number of machines required in the future. This is particularly important as in general, the average number of fractions associated with an episode of care is likely to reduce.

The anticipated changes include:

- A trend of reducing fractionation;
- Requirements for treatment imaging;
- Capitalising on equipment efficiencies that are associated with new equipment; and
- Equity of access to innovative radiotherapy by concentrating some specialist treatments in a smaller number of centres.

Any service located at the boundary of two cancer referral networks (potentially crossing two networked radiotherapy services) should be:

- Associated with a single networked non-surgical oncology service;
- Accessed by clinical oncologists from a single networked service in order not to fragment care;
- Linked to a provider that owns the activity delivered locally; and operates through a single governance arrangement which defines the team responsibilities; and
- Restricted to a single multi-provider networked service to ensure robust, integrated and consistent pathways of care.

### 3.3 Additional requirements for satellite provision (run by a parent centre)

Should a networked service envisage a re-provision of activity and associated capacity (or expansion) to a new location within their geography, the case must be substantiated in terms of; demonstrating for that population an existing differential access rate to radiotherapy, the capacity required to meet current activity levels for that population involved to include efficiencies and machine utilisation; and an assessment of the impact of this re-provision on existing cancer pathways particularly those outside the networked geography.

The scope of treatments delivered at a satellite location of a distant centre (parent centre) would also fall within the framework as described above and to comply with the full supportive infrastructure and criteria for specialist care and safety. In addition to the Inter-provider Agreements of all centres forming the Network, robust governance arrangements must be in place between the service provider of a linked satellite service and the satellite service itself to include;

- Common Network protocols and integrated Quality Assurance systems should be in place, including: electronic links to the designated linked provider for image capture, treatment planning, radiotherapy prescription and clinical records; outcomes reported as single service for extended geographical population using common dataset across provider units; common Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) 2000 (IR(ME)R) and incident reporting framework;
- Any deviation from these protocols will be clearly documented and investigated with regular reviews and where appropriate updated;
- Any satellite unit must demonstrate compliance with the clinical governance and leadership arrangements of the linked provider organisation;
- Common patient information and consent process; the same research governance, equal access to studies and adequate trial support infrastructure; common training of staff / CPD process; adequate staffing and recruitment;
- A seamless pathway as part of a single networked service and, to avoid fragmentation of care, all colleagues involved in the delivery of care to a patient must be informed of the care plan;
- A transparent business model; agreed contingency plans to manage service disruption; an integrated equipment replacement programme;
- Clear lines of professional leadership (medical, therapeutic radiographer and physics), responsibility and accountability;
- Innovative delivery models should be explored to increase efficiency, enhance patient experience and quality of life and optimised staffing models to increase productivity; and
- The service should be set up to support compliance with the NICE IOG for all cancer services, and fulfil / participate in membership of the relevant multi-disciplinary teams as required.

## **4. Outcomes and Applicable Quality Standards**

### **4.1 Quality Statement – Aim of Service**

NHS England's aim is to turn the ambition for the Services set out within the Report of the Independent Cancer Taskforce and the Vision for Radiotherapy publications into a reality. This will mean that people who require radiotherapy treatment will have access to high quality, safe and efficient services regardless of where they live.

The models are designed to improve patient outcomes, tackle variation in quality and enable access to the appropriate team of experts able to deliver the full range of cancer specific clinical care, clinical trials and advanced radiotherapy technologies.

The Specification aims to:

- Ensure that clinically effective and economically efficient reconfigured clinical and service models for the provision of radiotherapy services are developed to achieve improved patient outcomes;
- Ensure optimum and geographically equitable access to innovative radiotherapy treatments delivered in a clinically coherent and cost effective configuration;
- Improve life expectancy and quality of life for patients that meet the requirements of the national

- commissioning policies for radiotherapy treatments;
- Ensure patients have equitable access to high quality innovative radiotherapy treatment and care appropriate to the condition treated. Evidence suggests that approximately 40% of cancer Patients should receive external beam radiotherapy as part of their cancer treatment;
- Ensure the quality and safety of radiotherapy services delivered to a consistently high standard in England through comparative audit and quality assurance to reduce variation in clinical practice;

In addition, the Specification requires that:

- Information included in the mandated national radiotherapy dataset (RTDS) must be collected and submitted according to national requirements;
- Each department must have robust mechanisms in place for monitoring treatment outcomes;
- The delivery of accurate treatment is the responsibility of all staff and each department must develop a safety-conscious culture as demonstrated by reporting to national reporting and learning service (NRLS);
- Patients and staff should be encouraged to question and raise concerns to which the provider is required to respond; and
- Commissioners should be informed of clinically significant errors reported to patients as reported under the IR(ME)R regulations.

It is imperative that the radiotherapy service is compliant with the current (and any developing) IR(ME)R 2000. These regulations (which now also include the Ionising Radiation (Medical Exposure) (Amendment) Regulations 2006) are legislation intended to protect the Patient from the hazards associated with ionising radiation. Major errors within radiotherapy are reported under IR(ME)R and investigations are conducted under criminal law and under the threat of caution.

IR(ME)R is flexible and allows for a wide variety of practices to be undertaken as long as they are clearly justified. It is imperative that roles and responsibilities are clearly set out in procedures and that everyone understands their individual roles. Responsibility for compliance with IR(ME)R rests with the employer and all entitled duty holders as defined in the regulations.

The employer should be considered to be the chief executive unless an alternative individual has been formally designated as the employer. Under IR(ME)R, the employer is legally responsible, when establishing practices for the safe delivery of radiotherapy, for ensuring that robust procedures exist including those listed in Schedule 1,(Regulation (4(1))).

It is usual for the detailed implementation of IR(ME)R to be delegated to an appropriate professional. Providers need to demonstrate compliance with IR(ME)R and show clear lines of authority from the professional leads to the employer as the employer's responsibility cannot be delegated under IR(ME)R. Each department must have a system for reporting and analysing errors. The lessons learnt should be fed back to the staff in multidisciplinary meetings. It is required that the radiotherapy pathway coding system set out in 'Towards Safer Radiotherapy' is used to aid the sharing of information and learning between centres through the NRLS.

#### **NHS Outcomes Framework Domains**

<b>Domain 1</b>	<b>Preventing people from dying prematurely</b>	✓
<b>Domain 2</b>	<b>Enhancing quality of life for people with long-term conditions</b>	✓
<b>Domain 3</b>	<b>Helping people to recover from episodes of ill-health or following injury</b>	✓
<b>Domain 4</b>	<b>Ensuring people have a positive experience of care</b>	✓
<b>Domain 5</b>	<b>Treating and caring for people in safe environment and protecting them from avoidable harm</b>	✓



## 4.2 Indicators

Number	Indicator	Data Source	Outcome Framework Domain
<b>Clinical Outcomes</b>			
101	RT waiting times to start of treatment	RTDS	1,2,3,5
102	Number of patients receiving radical treatment by tumour site	RTDS	1,2,3,5
103	Proportion of all Radiotherapy Radical Episodes receiving Inverse Planned IMRT (excluding breast).	RTDS	1,2,3,5
104	Proportion of radical patients treated using image guidance – to be defined.	Provider	1,2,3,5
105	Mean time to treatment for category 1 patients.	RTDS	1,2,3,5
106	Proportion of patients for whom radiotherapy is indicated as part of treatment for breast cancer (after primary surgery) greater or equal 15 fractions (excluding any boost). See NHS E policy	RTDS	1,2,3,5
107	Proportion of metastatic bone radiotherapy episodes greater or equal to a single fraction of external beam RT. See NHS E policy	RTDS	1,2,3,5
108	Proportion of prostate cancer patients requiring radical external beam radiotherapy greater or equal to 20 fractions of treatment. See NHS E policy	RTDS	1,2,3,5
109	Percentage of patients recruited to trials.	NCRI / CRUK	1,2,3,5
110	30 day mortality after RT (adult palliative patients only).	RTDS	1,2,3,5
111	departmental average number of fractions per linac	RTDS	1,2,3,5
<b>Patient Experience</b>			
201	There is patient information specific to radiotherapy	Self declaration	4

202	The service has undertaken an exercise to gain feedback from patients	Self declaration	4	caring ,
203	ALERT-B screening tool is in use	Self declaration	4	caring ,
<b>Structure and Process</b>				
001	The RT service is part of the network. This must be contractually underpinned, as a minimum, by a Network-wide MOU and inter-provider agreements.	Self declaration	1,2,3,5	effective
002	There is a network board	Self declaration	1,2,3,5	Well led effective
003	There is a defined organisational structure	Self declaration	1,2,3,5	Well led effective
004	There is a multiprofessional governance group	Self declaration	1,2,3,5	Well led effective
005	There is a minimum of 2 clinical oncologists for each tumour site	Self declaration	1,2,3,5	Safe effe
006	The service meets the network agreed workforce plans	Self declaration	1,2,3,5	Safe effe
007	There is a training strategy	Self declaration	1,2,3,5	Safe effe
008	There is a quality management system	Self declaration	1,2,3,5	Safe effe
009	There is a network wide quality assurance programme	Self declaration	1,2,3,5	Safe effe
010	There is a policy for error classification and reporting	Self declaration	1,2,3,5	Safe effe
011	There is a policy in place for the management of interruptions	Self declaration	1,2,3,5	Safe effe
012	The service provides modern RT techniques	Self declaration	1,2,3,5	Safe effe
013	There is an agreed equipment replacement programme	Self declaration	1,2,3,5	Safe effe
014	There is a network agreed out of hours treatment policy	Self declaration	1,2,3,5	Safe effe
015	There are agreed protocols for checks	Self declaration	1,2,3,5	Safe effe

016	There are network agreed protocols in place	Self declaration	1,2,3,5	Safe effe
017	There are standard operating procedures	Self declaration	1,2,3,5	Safe effe
018	There are network agreed treatment protocols	Self declaration	1,2,3,5	Safe effe

### 4.3 Prospective radiotherapy data collection

Routine data collection and submission to the Radiotherapy Dataset is mandatory as part of the NHS Standard Contract. However, it is also expected that the clinical teams will have streamlined processes in place to routinely collect and analyse meaningful clinical outcome data. Consequently the most value is likely to be derived from data using the following principles:

1. Definitive treatments with radiotherapy +/- systemic treatment (not palliative or adjuvant/post-op)
2. Meaningful number of assessable events including loco-regional relapse, death from disease and late effects
3. Protocol driven follow up of patients by the clinical oncology team
4. There should be agreement by national expert site-specific groups as to the dataset collected to ensure consistency including quality of life indicators.

It is recommended that prospective data collection is rolled out by first using category 1 patients including all lung and oesophagus radical radiotherapy (no planned surgery) as well as SCC head and neck, cervix, vulva, vagina, anus. Data must be triangulated with RTDS and other national tumour specific datasets. Each provider should take organisational and financial responsibility for providing Patient outcome data.

If practitioners are treating these category 1 conditions they will wish to know their outcomes both in terms of tumour control as well as toxicity; this local information is then available to Patients for discussion of treatment options and likely outcomes during the informed consent process.

There is the potential for amalgamating outcomes data (collected consistently) at a national level to assess treatment effectiveness; obviously patient and tumour data, which could well impact on outcomes, need to be collected as well as the treatment details.

For example; head and neck cancer patient data that is relevant to outcome includes age, gender, smoking status, weight loss, performance status and haemoglobin level; tumour data would include T and N stage, HPV status and histological grade; treatment data would include total radiotherapy dose, number of fractions and overall treatment time as well as brachytherapy and systemic therapy details.

RTDS should be exploited to its full extent to examine consistency of practice, promote innovation and generate hypotheses for radiotherapy research. Data from radiotherapy planning and delivery should be linked to detailed outcomes data collection where possible to underpin the ambition of personalised radiotherapy.

### 4.4 Policy Context

- Improving Outcomes; a Strategy for Cancer – Department of Health (2011) with updates to 2014;
- A Vision for Radiotherapy, 2014 – 2024;
- Five year forward view - Department of Health (2014); and
- Report of the Independent Cancer Taskforce - 'Achieving World-Class Cancer Outcomes: A Strategy for the NHS 2015-2020.

## 5. Designated Providers (if applicable)

The designated providers for the **[INSERT INDIVIDUAL RADIOTHERAPY NETWORK NAME AT CONTRACT STAGE]** are as follows:

**[DRAFTING NOTE – AT CONTRACT STAGE SELECT A SINGLE RADIOTHERAPY NETWORK CONFIGURATION]**

## 6. Terms, Abbreviations and Acronyms Explained

4D Adaptive Radiotherapy	The ability to take account of the tumour shape in the three physical dimensions plus the fourth dimension of change with time
Arc therapy	A type of IMRT involving shorter treatment times, meaning less scope for Patient movement as well as higher throughput and efficiency
Benign tumour	A non-cancerous growth that lacks the ability to invade neighbouring tissue or to spread to other parts of the body, but, when in the brain, can cause serious harm.
Brachytherapy	The delivery of radiation using sealed sources which are placed close to the site that is to be treated. Isotopes used in brachytherapy can be applied directly to the tumour by surface applicators, inserted into body cavities and tubular organs via specially designed delivery systems (intracavitary and intraluminal therapy) or inserted directly into a tumour (interstitial therapy).
Cancer Alliance	A way of organising local stakeholders, such as commissioners and providers, to lead improvement and key to effecting the transformational change needed to achieve world-class cancer outcomes for their populations
Cancer Network	A geographical area and population size that covers the cancer referral pathways to a single tertiary centre
Cancer Research UK	A UK cancer research and awareness charity and the world's largest independent cancer research charity.
Cancer Vanguard	A joint cancer hospital NHS England approach to developing new models of cancer care including accountability for whole population service planning and provision; this learning will be shared with Cancer Alliances as they develop.
Clinical Reference Groups (CRG)	A group consisting of clinicians, commissioners and Patient/carer members, that provides clinical advice to NHS England for a specific prescribed specialised service.
Clinical Oncology	The medical specialty which oversees the delivery of the majority of non-surgical cancer treatment (radiotherapy and systemic therapy) in the UK; each specialises in the management of specific types of cancer.
Co-dependencies	Other services in a hospital which are needed to assist the provision of a specialised service.
Conservative management	Treatment designed to avoid radical medical therapeutic measures or operative procedures.
Comprehensive cancer network	A tertiary centre providing the full range of specialist cancer surgery and hosts the full range of specialist cancer MDTs AND in line with the tumour specific Improving Outcomes Guidance. This includes meeting the population requirements and patient numbers for the full range of cancers including rare cancer specialist MDTs (e.g. sarcoma, neuro-oncology, paediatric

	oncology etc)
Elective	Pre-arranged; booked in patient treatment.
Extracranial	Outside of the cranium (skull)
Fraction	The term describes how the full dose of radiation required to treat a tumour is divided into a number of smaller doses.
Image Guided Radiotherapy (IGRT)	Imaging at pre-treatment and delivery, the result of which is acted upon, that improves or verifies the accuracy of radiotherapy. IGRT encompasses the whole range of imaging, from simple to more complex imaging, that allows direct visualisation of the tumour and surrounding tissue.
Intensity Modulated Radiotherapy	High precision form of radiotherapy. It moulds (conforms) the shape and dose of the radiation precisely to the volume of tumour tissue that needs to be treated, reducing exposure to healthy surrounding tissue.
Incidence rates	The number of new cases for a population in a given time period.
Innovative radiotherapy	The ability to deliver radiation that is more targeted at a patient's cancer, and causes less damage to the surrounding healthy tissue. It includes approaches (including planning, software, training and delivery) and treatments with the potential to deliver significant patient benefit which are not currently in mainstream clinical use in England, but have the potential to become available in the next several years.
Late Effects	Some body tissues express radiation damage (at least 3) months after treatment and these side effects may be enduring and troublesome in a minority of patients.
Lesion	An abnormality in the tissue usually caused by disease or trauma.
Malignant tumour	A cancerous growth involving abnormal cell growth with the potential to invade or spread to other parts of the body.
MDM	A multi-disciplinary meeting involving members of the MDT.
MDT	A multi-disciplinary team involving the key staff delivering the service e.g. neurosurgeon, oncologist, radiologist, physicist.
Metastasis	Spread from the origin (primary site) of the cancer through either lymphatic channels (to lymph nodes) or more seriously to distant sites via the bloodstream.
Molecular Radiotherapy	The treatment of disease with radiopharmaceuticals. As with external beam radiotherapy, MRT offers the advantage of delivering high radiation doses to a specific target and sparing healthy organs from serious side effects
NHS Commissioning Board	The predecessor organisation to NHS England
Palliative radiotherapy	Given with intention to relieve/prevent symptoms or prolong life with minimal expectation of cure, usually with fewer fractions than radical treatment together with a sub-radical dose.
Prescribed specialised services	Services provided in relatively few hospitals to catchment population of more than one million people.
Proton Beam Therapy	A type of particle radiotherapy that has no 'exit' dose, which potentially can be exploited to give clinical advantages over conventional X Ray (photon) radiotherapy in certain patients.
Radical radiotherapy	Given with curative intent either definitively as main / primary treatment or as adjuvant therapy together with surgery (or less often chemotherapy) as supplementary treatment.
Radiotherapy Physics	Responsible for the safe and effective planning, delivery and adaptation of a prescribed radiotherapy course of treatment.
RTDS	Radiotherapy Data Set is a mandatory requirement of all NHS E radiotherapy providers to collect and submit consistent and comparable data in order to inform service planning, commissioning and research.

Stereotactic Ablative Radiotherapy (SABR)	Refers to the precise irradiation of an image defined extra cranial lesion (not in the brain) and is associated with the use of a high radiation dose delivered in a small number of fractions. The technique requires specialist positioning equipment and imaging to confirm correct targeting. It allows sparing of the surrounding healthy normal tissues. SABR is currently supported by a national clinical policy for non-small cell lung cancer. Other indications are being evaluated.
Stereotactic radiosurgery (SRS)	Refers to the precise irradiation of an image defined lesion, similar to SABR, but given as a single fraction. It has become the standard treatment for a number of cranial (in the brain) treatments. National clinical policies are in place for a variety of conditions
STP	NHS E organisations and local councils have formed Sustainability and Transformation Partnerships in 44 geographical areas of England to plan improved health and care for the whole population.
Subspecialisation	Clinical Oncologists specialise in a limited number (recommended 1 or 2 but at most 3) of cancer subsites (e.g. breast cancer, lung cancer etc) in order to facilitate up-to-date expertise.
Therapeutic Radiographer	An allied health professional (AHP) who has undergone specific training with responsibility for the planning and delivery of accurate radiotherapy to cancer Patients.

## Appendix A - References

1. Chen, Y. W., Mahal, B. A., Muralidhar, V., et al. 2016. Association between treatment at a high-volume facility and improved survival for radiation-treated men with high-risk prostate cancer. *International Journal of Radiation Oncology Biology Physics* 94(4) 683-690.
2. Shumway, D. A., Griffith, K. A., Pierce, L. J., et al. 2015. Wide variation in the diffusion of a new technology: Practice-based trends in intensity-modulated radiation therapy (IMRT) use in the state of Michigan, with implications for IMRT use nationally. *Journal of Oncology Practice* 11(3) e373-e379.
3. Tsukada, Y., Nakamura, F., Iwamoto, M., et al. 2015. Treatment patterns for T4 stage III esophageal cancer in Japan: Analysis from 233 designated cancer care hospitals. *International Journal of Radiation Oncology Biology Physics* 93(3 SUPPL. 1) E142.
4. Wright, J. D., Huang, Y., Ananth, C. V., et al. 2015. Influence of treatment center and hospital volume on survival for locally advanced cervical cancer. *Gynecologic oncology* 139(3) 506-12.
5. Lee, M.-S., Tsai, S.-J., Lee, C.-C., et al. 2014. Higher caseload improves cervical cancer survival in patients treated with brachytherapy. *Radiation oncology (London, England)* 9 234.
6. Teshima, T., Numasaki, H., Shibuya, H., et al. 2010. Japanese structure survey of radiation oncology in 2007 based on institutional stratification of patterns of care study. *International journal of radiation oncology, biology, physics* 78(5) 1483-93.
7. Peters L J, O'Sullivan B et al. 2010. Critical Impact of Radiotherapy Protocol Compliance and Quality in the Treatment of Advanced Head and Neck Cancer: Results From TROG 02.02. *Journal of Clinical Oncology* 28:2996-3001.
8. Wuthrick EJ, Zhang Q et al. 2015. Institutional Clinical Trial Accrual Volume and Survival of Patients With Head and Neck Cancer. *Journal of Clinical Oncology* 33:156-164.
9. Corry J, Peters LJ, Rishon D. J. 2015. Impact of Center Size and Experience on Outcomes in Head and Neck Cancer. *Clinical Oncology* 33:138-140.
10. Boero IJ, Paravani AJ et al. 2016. Importance of Radiation Oncologist Experience Among Patients With Head-and-Neck Cancer Treated With Intensity-Modulated Radiation Therapy. *Journal of Clinical Oncology* DOI:10.1200/JCO.2015.63.9898.
11. Quality Health (2013). Radiotherapy Patient Experience Survey  
<http://www.quality-health.co.uk/resources/surveys/national-cancer-experience-survey/2013-national-cancer-patient-experience-survey-reports/493-radiotherapy-patient-experience-survey-2013-national-report>
12. NHS England Radiotherapy Clinical Reference Group (2013). Radiotherapy service specification.  
<http://www.england.nhs.uk/wp-content/uploads/2013/06/b01-radiotherapy.pdf>
13. Delaney GP, Jacob S, Featherstone C, Barton NB. 2005. The role of radiotherapy in cancer treatment: estimating optimal utilization from a review of evidence-based clinical guidelines. *Cancer* 104:1129e1137.,
14. Round CE et al. Radiotherapy demand and activity in England 2006-2020
15. The Radiotherapy Access Survey 2013, initially commissioned by the Department of Health, was prepared by Quality Health and, with fieldwork undertaken before April 2012. The document has been approved by NHS England
16. Society and College of Radiographers and the Institute of Physics in Engineering and Medicine (2012). Report on the census of radiotherapy workforce in the UK 2012.  
[www.sor.org/learning/document-library/report-census-radiotherapy-workforce-uk-2012](http://www.sor.org/learning/document-library/report-census-radiotherapy-workforce-uk-2012)



17. Royal College of Radiologists (2012). Clinical Oncology workforce report 2012.  
[www.rcr.ac.uk/docs/oncology/pdf/BFCO\(13\)4\\_census.pdf](http://www.rcr.ac.uk/docs/oncology/pdf/BFCO(13)4_census.pdf)
18. Royal College of Radiologists (2011). Oncology registrars' forum: trainee survey.  
[www.rcr.ac.uk/docs/oncology/pdf](http://www.rcr.ac.uk/docs/oncology/pdf)
19. The START trial in breast cancer has recently reported that hypo-fractionation is as safe and effective as the standard international dose.  
<http://www.cancerresearchuk.org/cancer-help/trials/start-standardisation-of-breast-radiotherapy>
20. The CHHIP trial has reported that treating prostate cancer in fewer, higher doses is as safe and effective as treating with conventional radiotherapy. <http://www.cancerresearchuk.org/cancer-help/trials/a-trial-comparing-different-ways-of-giving-radiotherapy-for-prostate-cancer>
21. Cancer Research UK has recently published a set of principles for supporting radiotherapy research in England. ([https://www.cancerresearchuk.org/sites/default/files/cruk\\_principles\\_for\\_supporting\\_radiotherapy\\_research\\_in\\_england\\_jan2016\\_final\\_1.pdf](https://www.cancerresearchuk.org/sites/default/files/cruk_principles_for_supporting_radiotherapy_research_in_england_jan2016_final_1.pdf))
- 22. A Vision for Radiotherapy, 2014 – 2024.**  
([https://www.cancerresearchuk.org/sites/default/files/policyfeb2014radiotherapy\\_vision2014-2024\\_final.pdf](https://www.cancerresearchuk.org/sites/default/files/policyfeb2014radiotherapy_vision2014-2024_final.pdf))
23. Cancer Taskforce Report, 2015  
<https://www.england.nhs.uk/wp-content/uploads/2016/05/cancer-strategy.pdf>

## Appendix B - Radiotherapy Networks

RADIOTHERAPY NETWORK PARTNERSHIPS	CANCER ALLIANCE(S)
Brighton and Sussex University Hospitals NHS Trust Imperial College Healthcare NHS Trust Royal Surrey County Hospital NHS Foundation Trust The Royal Marsden NHS Foundation Trust	North West and South West London Surrey and Sussex
Barking, Havering and Redbridge University Hospitals NHS Trust Barts Health NHS Trust East and North Hertfordshire NHS Trust North Middlesex University Hospital NHS Trust Royal Free London NHS Foundation Trust University College London Hospitals NHS Foundation Trust	North Central and North East London
Guy's and St Thomas' NHS Foundation Trust Maidstone and Tunbridge Wells NHS Trust	South East London Kent and Medway
Gloucestershire Hospitals NHS Foundation Trust Plymouth Hospitals NHS Trust Royal Devon and Exeter NHS Foundation Trust Royal Cornwall Hospitals NHS Trust Royal United Hospitals Bath NHS Foundation Trust Taunton and Somerset NHS Foundation Trust Torbay and South Devon NHS Foundation Trust University Hospitals Bristol NHS Foundation Trust	Peninsula Somerset, Wiltshire, Avon and Gloucestershire
Hampshire Hospitals NHS Foundation Trust Oxford University Hospitals NHS Foundation Trust Royal Berkshire NHS Foundation Trust Poole Hospital NHS Foundation Trust Portsmouth Hospitals NHS Trust University Hospital Southampton NHS Foundation Trust	Thames Valley Wessex
Cambridge University Hospitals NHS Foundation Trust Colchester Hospital University NHS Foundation Trust Ipswich Hospital NHS Trust Norfolk and Norwich University Hospitals NHS Foundation Trust Peterborough and Stamford Hospitals NHS Foundation Trust Southend University Hospital NHS Foundation Trust	East of England

Derby Teaching Hospitals NHS Foundation Trust Northampton General Hospital NHS Trust Nottingham University Hospitals NHS Trust United Lincolnshire Hospitals NHS Trust University Hospitals Of Leicester NHS Trust	East Midlands
Royal Wolverhampton Hospitals NHS Trust Shrewsbury and Telford Hospital NHS Trust University Hospitals Birmingham NHS Foundation Trust University Hospitals Coventry and Warwickshire NHS Trust University Hospitals of North Midlands NHS Trust Worcestershire Acute Hospitals NHS Trust	West Midlands
Lancashire Teaching Hospitals NHS Foundation Trust The Christie NHS Foundation Trust The Clatterbridge Cancer Centre NHS Foundation Trust	Lancashire and South Cumbria Greater Manchester Cheshire and Merseyside
Hull and East Yorkshire Hospitals NHS Trust Leeds Teaching Hospitals NHS Trust Sheffield Teaching Hospitals NHS Foundation Trust	Humber, Coast and Vale West Yorkshire South Yorkshire, Bassetlaw, North Derbyshire and Hardwick
North Cumbria University Hospitals NHS Trust South Tees Hospitals NHS Foundation Trust The Newcastle Upon Tyne Hospitals NHS Foundation Trust	North East and Cumbria

### Appendix C – Network sub-specialist arrangements

**TO BE INSERTED AT CONTRACT STAGE**

Date published: <insert publication date>