Achieving World-Class Cancer Outcomes:
The Vision for Therapeutic Radiography.

Foreword from Sheila Hassan, President

The therapeutic radiography profession has been evolving ever since the career progression framework was first described in 1999. Recent Society and College of Radiographers (SCoR) surveys demonstrate this evolution continues, with our profession being jointly responsible (with our clinical oncology and medical physics colleagues) for the provision of equitable, high quality, safe and patient-centred radiotherapy services. This is alongside an increasing number and diversity of roles being implemented, especially at advanced and consultant levels of practice where therapeutic radiographers are routinely responsible for the care of their patients across the entire management pathway. Many therapeutic radiographers are now fulfilling the role of key worker for their patients, identified as critical within the recent Independent Cancer Task Force Report.

This guidance from the Society and College of Radiographers (SCoR) is intended to be a vision for our profession as these roles continue to change and develop in the future in response to technical, operational and political influences. It also aims to assist radiotherapy managers in making informed decisions about their local service needs. At an early stage in its development it was established there was no evidence base for 'one size fits all' approach, so this document outlines the influences that radiotherapy service managers must consider when identifying their local therapeutic radiography workforce needs. It builds upon the SCoR's Principles of safe staffing for radiography leaders guidance published in 2015, and assists managers in providing patient-centred care.

I was privileged to be a member of the SCoR Radiotherapy Advisory Sub-Group who worked hard to understand the needs of radiotherapy services and provide this robust and useful guidance relevant to radiotherapy service managers. The group comprised of a range of therapeutic radiographers, reflecting the full range of professional practice as well as including a patient representative. A special thanks goes to all the sub-group members including SCoR Professional Officers, Sarah James and Spencer Goodman.

Introduction

Therapeutic radiographers play a vital and changing role in the delivery of radiotherapy services. They are extensively involved at all stages of the patient's radiotherapy journey and the only healthcare professionals qualified to plan and deliver radiotherapy. Therapeutic radiographers are not only responsible for the planning and delivery of accurate radiotherapy treatments using a wide range of sophisticated and technical equipment, they have unique expertise and skills[1] required to care for patients before, during and after radiotherapy. They are supported by the appropriate use of health care assistants, administrative and clerical staff to undertake activities not requiring the expertise of therapeutic radiographers and are headed by a Radiotherapy Services Manager (or similar title), a state registered therapeutic radiographer who is recognised as the professional lead within their organisation.

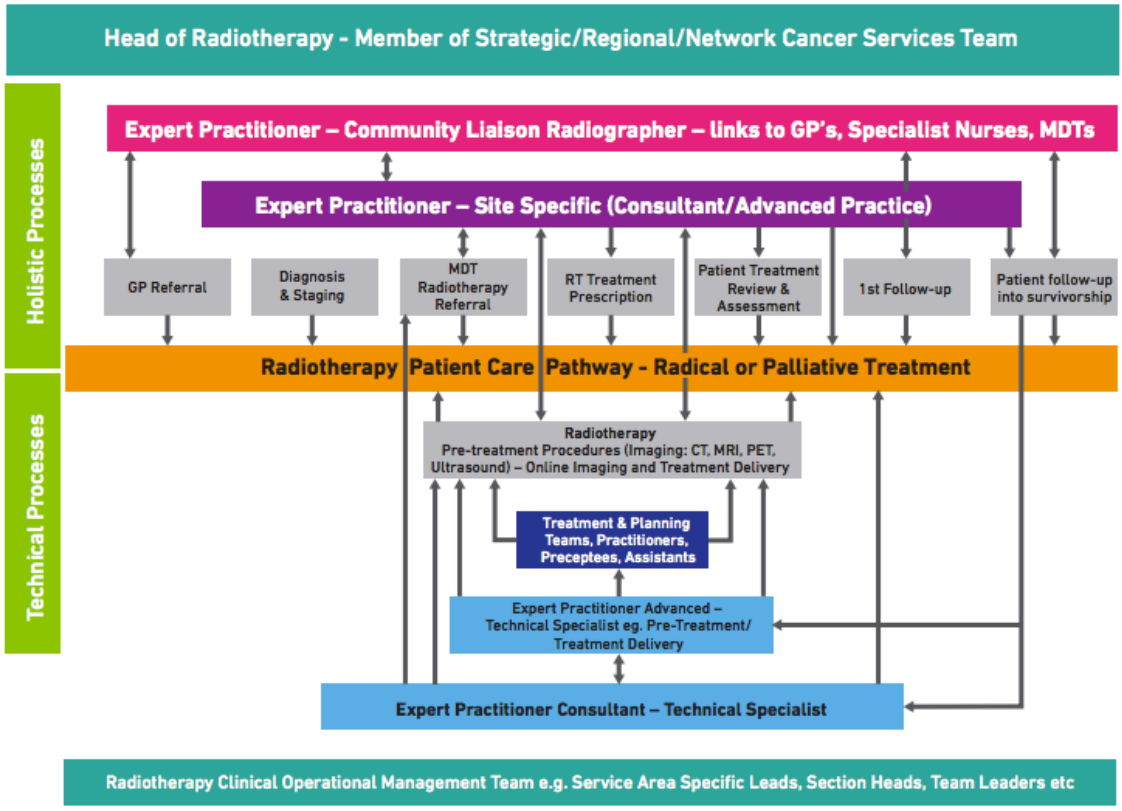


Diagram demonstrating the three models of radiographer led expert practice in the cancer care pathway

Background

More than half the workforce in radiotherapy are therapeutic radiographers. Since 1997 when the Society and College of Radiographers (SCoR) published Therapeutic Radiography: A Vision for the Future[2], guidance and advice documents have been published[3,4,5,6,7,8,9] which have defined the direction of travel for therapeutic radiographers and supported them to embrace change in order to respond and to deliver patient-centred care.

This document supersedes and replaces existing SCoR therapeutic radiography guidance.[10,11,12] It outlines the practice of therapeutic radiography in providing high quality care to patients while continuing to develop the scope of practice of therapeutic radiography, safely and effectively[13] when working as a critical part of the radiotherapy team and responding to the challenges of a changing health care provider environment. [14,15]

It builds on the recently published SCoR's 'Principles of safe staffing for radiography leaders'[16] guidance, informs the therapeutic radiography profession and supports the head of radiotherapy (radiotherapy service manager) by outlining the principles to be considered with regards to the therapeutic radiography workforce. It encompasses the future vision of a flexible workforce utilising all their skills at the highest possible level. Therapeutic radiographers may fulfil the role of 'key worker' for individual patients throughout their care pathway, while also utilising their unique knowledge and expertise to ensure evidence-based practice and the safe implementation of innovation for specific patient groups and technical specialities within radiotherapy. Of core consideration are the requirements for the delivery of safe and effective patient-centred services, set in the current political context.[15]

Therapeutic radiography staffing guidance has previously modelled the workforce required to staff a generic radiotherapy service, thus identifying the therapeutic radiography workforce needed to staff a "linear accelerator hour", the so called Benchmark Figure.[10] In 2010, the National Cancer Action Team (NCAT) developed a sophisticated Workforce Integrated Planning Tool (WIPT)[17] which enabled service managers to map and identify non-medical workforce requirements for radiotherapy services, allowing for variables such as equipment, workload, demand, model of service. The uptake and ongoing use of this tool was not widespread across radiotherapy services, indicating the limited usefulness of this mathematical approach to identifying radiotherapy workforce requirements. The International Atomic Energy Agency (IAEA) has investigated and documented an activity-based approach [18] by measuring a range of procedures but acknowledges that this is an onerous task and lags behind emerging technologies and, as a consequence, is limited in its usefulness.

These issues along with continually evolving service developments across the UK indicate that it is unrealistic to establish a replacement benchmark figure that would be meaningful, useful and safe; compounded by the increasing diversity of models of radiotherapy service provision. This guidance does however provide example therapeutic radiography workforce arrangements to illustrate the outline requirements for a series of differing service provider models. These have been based upon data collated from recent UK Surveys.[19,20,21,22]

Context

The context for outlining the future of the therapeutic radiography profession is drawn from a range of influences as follows:

National and political influences

Ongoing national work to raise radiotherapy standards since the publication of the National Health Service (NHS) Cancer Plan,[23] the subsequent formation of the National Radiotherapy Advisory Group[24] in 2005, and the more recently published *Vision for Radiotherapy 2014 – 2024*[14] have been influential in improving radiotherapy provision in both quality and accessibility. This Vision paper highlights the importance of skills-mix and new roles at advanced and consultant levels of practice in order to enable delivery of innovative and advanced radiotherapy to patients. These principles have been endorsed by the Independent Cancer Task Force Report.[25]

The Independent Cancer Task Force was established in 2015, with an action plan aiming to improve the outcomes that the NHS delivers for people with cancer. The strategy[25] proposes the following strategic priorities: increasing access to radiotherapy; investment in a radiotherapy equipment replacement programme; addressing critical workforce deficits; a strategic review of future workforce needs and access to a clinical nurse specialist (CNS) or other key worker for all people with cancer. All of these will impact the therapeutic radiography profession, and this guidance may therefore need to evolve in parallel as the actions of the Cancer Task Force Implementation Group become evident. At the time of developing this guidance there were already a number of NHS initiatives, recognised as being influential in driving these strategies forward. These include:

- NHS Services seven days a week[26]
- Partnership working (centralisation of specialised services, where not all providers will deliver all services)[27]
- Financial payments related to outcomes rather than activity[27]
- National Cancer Survivorship Initiative.[28]

The above are all underpinned by the need to ensure holistic patient-centred care,[29] that is equitable and accessible to all users. The SCoR policy outlining the therapeutic radiography profession's contribution to these strategies is inherent within the approach of the profession implementing the following specialist practitioner roles at both consultant and advanced practitioner level: Site Specific expert practitioner, technical specialist expert practitioner and community liaison expert practitioner. The implementation of such roles assists with the introduction of treatment innovations and transformational service changes across cancer care pathways, thus contributing to the safe provision and continuity of care across the entire radiotherapy patient management pathway.

Service provider models

Developments in technology, the drive to improve patient accessibility and the increasing provision of radiotherapy by independent sector and private providers is resulting in a rapid increase in the number of geographical locations of radiotherapy services across the UK, as well as an increase in the variety of service provider models: large cancer centres, satellites from existing centres, new

centres by new providers, partnership working between providers[27] and providers of specialist modalities such as stereotactic radiotherapy and proton beam therapy.

Leadership

The development and implementation of newer technologies requires effective leadership at a local service level, and will necessitate multi-professional guidance from the radiotherapy professional bodies to ensure consistency of implementation and equality of access for patients. The head of the radiotherapy service must work with their medical and physics colleagues to ensure the delivery of a high quality radiotherapy service. One of the strategic mechanisms to facilitate this is the leadership role of the Radiotherapy Board. This was set up in 2013 to develop the work of the now defunct National Radiotherapy Implementation Group (NRIG). It was established jointly by the SCoR, IPEM and RCR to support the delivery and development of radiotherapy services in the UK and has recently published a number of guidelines. [30,31,32]

Changes in therapeutic radiography scope of practice

SCoR continues to encourage the therapeutic professional workforce to seize opportunities for developing roles within a dynamically changing health care environment.[15] In response, the profession has developed both educationally and in practice, resulting in diversified and expanded roles at advanced and consultant levels, thus contributing to quality improvements to the benefit of radiotherapy provision and service users, all building upon the long established four tiers of the career progression framework .[5,6]

The increasing complexity of both radiotherapy planning and delivery, such as the use of multiple imaging modalities (4DCT, PET CT, MRI, Ultrasound) will require therapeutic radiographers to have complex skills to support the use of existing and newer technologies as they emerge.[33,34,35] This includes the implementation of newer modalities such as protons, MRI linacs and molecular radiotherapy, and the increasingly complex decision making required when imaging and delivering radiotherapy. The increasing use of combined treatment modalities such as radiotherapy, chemotherapy, immunotherapy and biological therapies will also require effective multi-disciplinary working between all involved; working collectively to provide continuity of care across the entire cancer management pathway. Therapeutic radiographers will play a pivotal role in caring for patients before, and during, radiotherapy, and into the survivorship phase of their care pathways.

Studies have identified that the pace of change continues.[19, 20,36,37,] The role of the professional therapeutic radiography workforce continues to expand its responsibilities across the entire radiotherapy pathway in the majority of radiotherapy centres: specifically these include advanced and consultant level practitioner-led planning services and on-treatment review, supplementary and independent prescribing.[38] Many centres have both tumour site specialists and technical specialist roles within their establishment and a smaller number of centres have developed community specialist radiographer roles. The annual therapeutic radiography workforce census[21] and regular therapeutic radiography scope of practice surveys[20,36,37] demonstrate the vast majority of radiotherapy services have radiographer-led treatment planning services and radiographer-led on-treatment review. Alongside these there has also been a steady growth in the number of specialist radiographers appointed, particularly in tumour site specialist roles at both advanced and consultant levels of practice. Therapeutic radiographers in these specialist posts undertake vital roles in co-ordinating and providing consistently high quality care to their patients while being a point of

contact and the patients' key worker during their radiotherapy pathway, as specified in the Cancer Task Force Report. [25]

Clinical governance, audit and research

All therapeutic radiographers have a duty of care to ensure they deliver the highest possible standards of care to all their patients. To embrace service innovation and technical developments, the therapeutic radiography workforce needs to undertake service evaluation, audit and radiographer-led research in line with the SCoR Vision for Research[39] to drive local quality improvements while also ensuring patients' treatment and care follows evidence-based practice that is provided in a transparent and accountable way with a patient-centred approach.

Professional education

Education underpins the therapeutic radiography profession, where the effective implementation of skills mix is a key component within the comprehensive education and career framework for the therapeutic radiography workforce.[1] This outlines the importance of individual practitioners' competency, while also placing significance on the need for education providers and service managers to provide educational and supportive mechanisms in the clinical setting, for both pre and post-registration radiographers. This should include access to the tool for use in education programme development, while also facilitating, supporting and monitoring the achievement of both professional and personal development goals of therapeutic radiography professions across their career pathway.

The indicative curriculum[40] for practitioners reflects the requirement for a highly professionalised workforce with a clear identity and set of values. These, together with the appropriate knowledge and skills, ensure that radiographers are able to operate professionally in uncertain environments and in a dynamically changing work place. The values of integrity, person-centred, personal responsibility, respect, trustworthiness, collegiality and reflective practice are embedded to ensure the curriculum prepares newly registered radiographers entering the workplace as novice professionals to develop the level of professional maturity required to enable them to progress to advanced and consultant level practitioner roles, including those with a remit of leadership and management.

The role of therapeutic radiographers in public health education.

While there are around 40,000 people employed directly to work in public health, it is increasingly recognised that this workforce alone cannot tackle the nation's public health problem. [41] The recent report from Public Health England[42] recognises the role therapeutic radiographers already play as one of the twelve Allied Health Professionals, in championing the public's health and wellbeing through their day to day contact with patients.

Health conversations or making every contact count (MECC)[43] encourages all those working within the health care sector to use every opportunity to make a significant contribution to the national prevention agenda as outlined in the NHS Five-Year Forward View.[44] The PHE report identified examples of where therapeutic radiographers are already making a difference to their patient's health through having health-related conversations with them while caring for them across their entire cancer management pathway. There have also been a number of case studies published where therapeutic radiographers have been involved in developing local strategies and improving patient care, leading to improvements in the health and well being of their patients. [45,46] The regular

contact therapeutic radiographers have with patients gives them the opportunity to provide continuity of care prior, during and after completion of their course of radiotherapy. During this time they develop a relationship, so allowing them to discuss more sensitive issues such as the need for emotional and psychological support and the benefits of adopting health life style behaviours as they enter their 'survivorship' phase of their cancer journey, hopefully leading to improved survival and quality of life.[47] The growing number of specialist therapeutic radiographers at advanced and consultant level[18,19] will provide increasing opportunities for therapeutic radiographers to play an ever increasing part in improving the nation's general health.

Principles of therapeutic radiographer staffing

The Principles of Safe Staffing for Radiography Leaders [16] outlines key considerations when reviewing staffing models, for both clinical imaging or radiotherapy/oncology services.

This guidance outlines principles of staffing that apply specifically to the therapeutic radiography workforce, thus building upon the generic guidance.[16] In order to provide high quality, efficient, effective and safe radiotherapy services it is now recognised that the radiotherapy workforce profiles differ from those modelled in 2006.[24] This is owing to the increasingly sophisticated nature of radiotherapy especially at the time of radiotherapy delivery. However, it is acknowledged that workforce requirements will continue to be dependent upon a number of other factors such as:

- service provider model eg single site, multiple site services
- commissioning arrangements eg regional, supra-regional or national service providers
- culture to enable implementation of innovation and transformational service changes
- skills mix across care pathways
- links to other centres and the extent of regional-wide protocol standardisation, governance arrangements and staff cover arrangements
- case mix
- geographical location
- radiotherapy equipment, eg availability of dosimetric planning (on site or remote)
- modality and technical ability of units
- optimal use of available technologies
- use of automated and computer-assisted technologies when appropriate and safe
- IT infrastructure within the centre and links with neighbouring centres.

There will be an expectation that therapeutic radiography staffing provision will enable services to provide clinical placements for pre-registration therapeutic radiographers and the clinical education of other relevant professionals.

Once the above factors have been identified within the clinical setting, there will need to be provision for the effective leadership and management of the radiotherapy service and the required therapeutic radiography workforce to ensure the following criteria are fulfilled:

a) Patient-centred service. Staffing requirements to be based upon the need to provide a patient-centred, holistic approach across the entire radiotherapy pathway of care including the provision of patient information and psychological support. It will be need to be streamlined care, sensitive and responsive to patients' needs, and not based upon

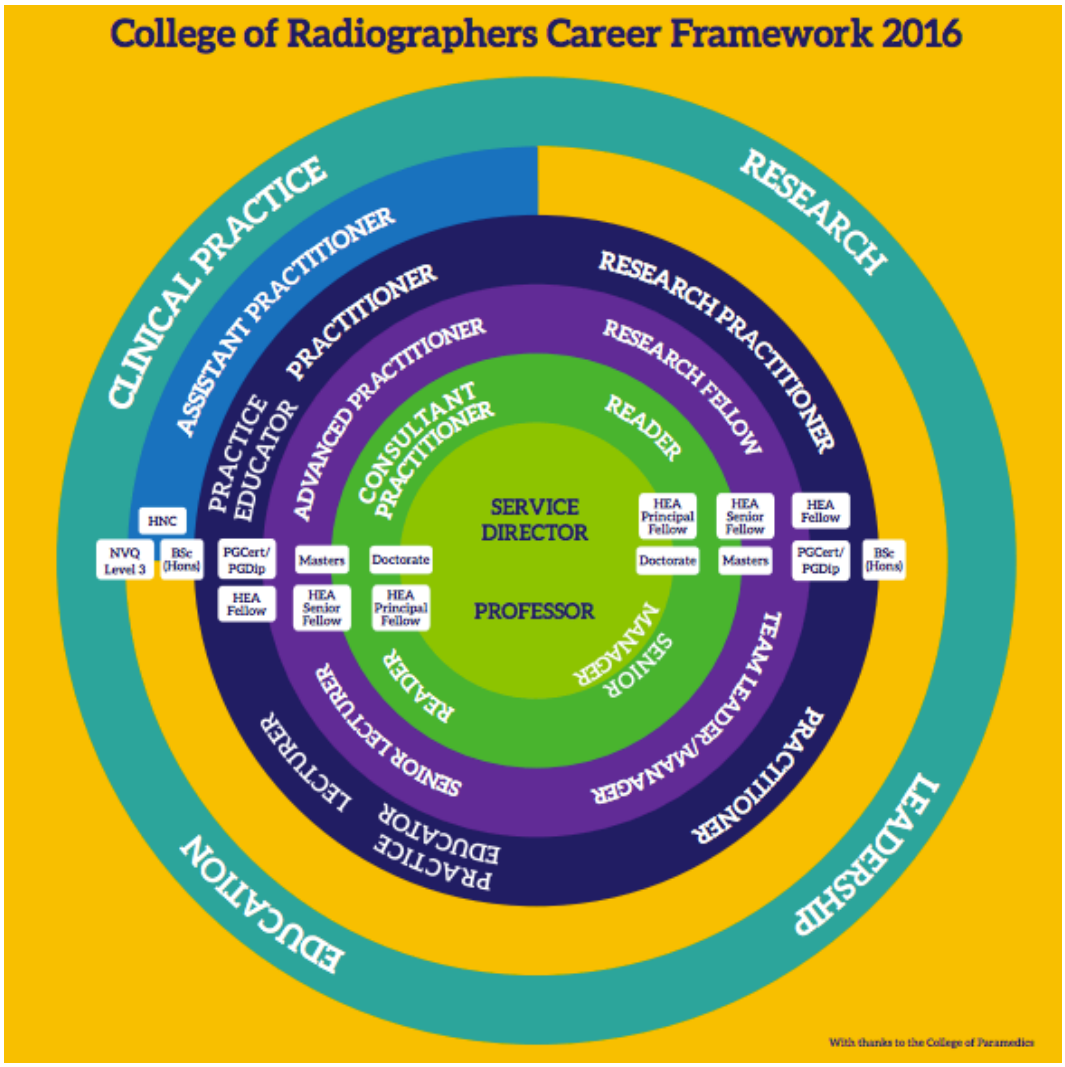
professional roles and /or historical practices.[29, 48] Overall staffing requirements must be identified to ensure appropriate staffing arrangements at all times, so that planned absences (professional development, mandatory training, annual, maternity and paternity leave) and unplanned absences (sickness) do not compromise the quality and continuity of treatment and care provided.

b) Head of radiotherapy and professional lead for the therapeutic radiography workforce and named deputy/deputies. The post holder will be a registered therapeutic radiographer who works in conjunction with all relevant professional colleagues involved in providing care across the patient radiotherapy management pathway, while adhering to all relevant multi-disciplinary guidance thus enabling a multi-professional approach to workforce planning across the wider cancer care pathways.

c) Clinical governance, quality management and audit. Service provision will need to conform with all required applicable legislation and national guidance. Local procedures and documentation must be in place to ensure all legal requirements are met as outlined in the recent SCoR guidance,[16] examples of which are the current Ionising Radiation (Medical Exposure) Regulations and amendments (IR(ME)R)[49] and the Ionising Radiations Regulations 1999 (IRR) .[50] IR(ME)R is designed to ensure patient safety and IRR to ensure public and staff safety. Non-statutory guidance exists for both Regulations.[51,52] The new European Medical Exposures Directive (MED) was published at the end of 2013,[53] the basis of which will form new UK radiation protection legislation in 2018.

d) Implementation of effective and appropriate skills mix across the multi-disciplinary radiotherapy workforce. The development of the radiotherapy workforce to enable effective skills mix is essential so that therapeutic radiographers play a vital role in the delivery of the more routine elements of the radiotherapy pathway previously delivered by clinical oncologists. This was clearly outlined by the *National Radiotherapy Advisory Group Report*[24] and recently reaffirmed by the *Vision for Radiotherapy Report:2014-2024*.[14]
This principle is facilitated by the following:

   i) Implementation of the career progression framework (see below, please note in radiotherapy, the Service Director is often titled the Radiotherapy Service Manager or Head of Radiotherapy) to suit local service need, while enabling and supporting innovation. The Education and Career Framework for the Radiography Workforce[1] defines the educational outcomes for each level of practice and is sufficiently broad to allow education and service to respond to service need when implementing innovation. Completion of SCoR accreditation[54] at consultant, advanced and assistant level practice also provides assurance to employers and patients of individuals' competence and capability to fulfil their roles.



Career progression framework.

ii) Implementation of the three models of radiographer-led expert practice at both advanced and consultant practitioner roles:

- site specialist expert practitioners
- technical specialist expert practitioners
- community liaison expert practitioners.

Progress with the implementation of these roles across clinical practice is evident from a series of SCoR surveys.[19,20,21]

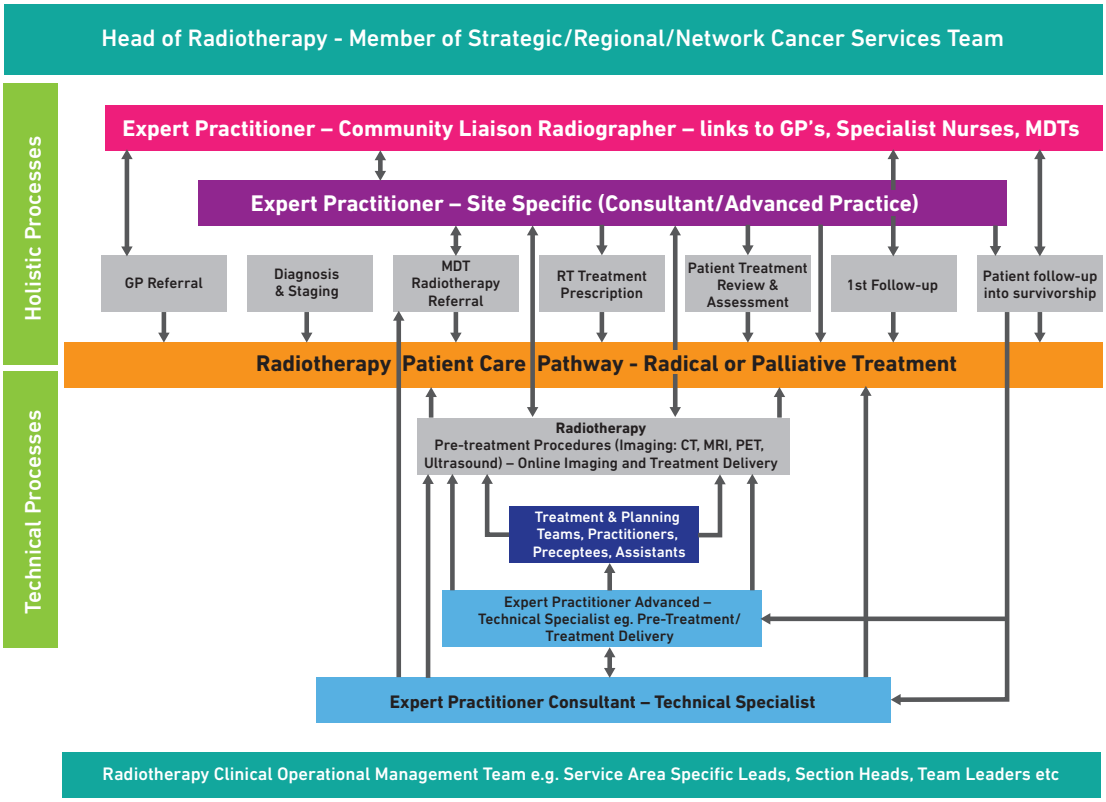


Diagram demonstrating the three models of radiographer led expert practice in the cancer care pathway

iii) Effective succession planning of key posts within the therapeutic radiography workforce to ensure continuity of service provision when post holders resign.

iv) Appropriate and effective use of support workforce in radiotherapy such as:

- health care assistants being employed to support radiotherapy services by providing basic nursing tasks such as dressings, blood tests and patient care
- administrative and clerical staff providing support to all levels of practitioner throughout the pathway. These staff may cover a range of activities such as appointment scheduling, active monitoring of the service activity and cancer tracking.

e) Research and development. To provide high-quality, evidence-based and outcome-improving radiotherapy, all therapeutic radiographers must have research and development activity scheduled within their job plan. Departmental workforce planning should include provision for dedicated research and academic radiographers to lead research, to engage in international, national and local research policy, to publish findings and to translate research findings into clinical implementation. As set out in the SCoR vision for research[39] all

radiotherapy centres should strive to have a local research strategy and the workforce to deliver this. There is emerging evidence that patients treated within a research-active setting do better than those who do not[15] and therapeutic radiographers have a vital role in the development, implementation and quality assurance of local, national and international clinical trials.

f) Data management. Increasingly the provision of high quality accurate data is a requirement to comply with mandated national data gathering eg Radiotherapy Data Set (RTDS) and locally for business planning and finances. The radiotherapy service is best placed to manage and quality control the data flows from the department. Therapeutic radiographers are integral to ensure that accurate data is inputted at source ie the record and verify systems connect to the treatment units. The management of these data items is often best supported by a dedicated therapeutic radiographer who has the knowledge and skills to verify data across the patient pathway.

g) Professional education. Professional practice with practitioner outcomes and an indicative curriculum is in place to ensure pre-registration radiographers can achieve the HCPC Standards of Proficiency[55] and be well prepared for their on-going career development. There is a clear focus on professional development and collaborative practice to ensure provision in the learning environment for both pre and post registration professionals; this must be reflected in the clinical setting. Both the employer and employee are responsible for ensuring an individual's competence to practice, enabling them to be competent to practice across the entire range of responsibilities within their current role. There should be the appropriate provision of educational and supportive roles to facilitate education and supervision for all practicing therapeutic radiographers.

The extent and manner in which (a) to (g) have been implemented in radiotherapy centres across the UK is inconsistent at the time of writing this guidance. It is imperative that these approaches are fully implemented by all service providers to the benefit of all patients in order to meet changing service need and optimise care. To assist radiotherapy managers make informed decisions about their local service needs, the information in Appendix A provides outline therapeutic radiography workforce profiles based upon the current situation for a range of differing radiotherapy service models and sizes.

It is realised that the therapeutic radiography profession is continually evolving and therefore future therapeutic radiography workforce profiles will change. In the light of this, it is expected that Appendix A will be reviewed in the future, to ensure it remains in line with the progression of therapeutic radiography professional practice.

Summary

The therapeutic radiography workforce continues to rise to the challenge of providing high quality radiotherapy services to patients in a rapidly changing working environment. This guidance builds on the principles outlined in the SCoR document 'Principles of safe staffing for radiography leaders'.[16] It defines the role of the therapeutic radiography workforce and supports radiotherapy managers in

identifying their workforce requirements for the delivery of safe and efficient patient-centred radiotherapy services.

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- Newcastle Upon Tyne Hospitals NHS Foundation Trust
- NHS Greater Glasgow and Clyde
- North Middlesex University Hospital NHS Trust
- Peterborough and Stamford Hospitals NHS Trust
- Taunton and Somerset NHS Foundation Trust
- The Christie NHS Foundation Trust
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Kate Burton – Consultant Radiographer in Neuro-Oncology, Cambridge University Hospitals NHS Foundation Trust

Angela Francis - Head of Radiotherapy Service, Guy's and St Thomas' Hospital NHS Foundation Trust

Spencer Goodman – Professional Officer, Society and College of Radiographers

Sheila Hassan - President Society and College of Radiographers and Sanctioning Lead Radiographer, Guy's and St Thomas' NHS Foundation Trust

Sarah James - Professional Officer, Society and College of Radiographers

Barbara Jones – Patient representative, Society and College of Radiographers, Patient and Public Liaison Group

Julie Massey – General Manager for Radiation Services, Clatterbridge Cancer Centre NHS Foundation Trust

Libby Mills - Principal Radiographer, Radiotherapy department, The Christie NHS Foundation Trust

Kevin Sullivan - Radiotherapy Services Manager, University College London Hospitals

Appendix A

Outline therapeutic radiotherapy workforce profiles based on the situation as of March 2016, for a range of differing radiotherapy service models and sizes.

It is beyond the scope of this guidance to be prescriptive about local workforce requirements for an entire radiotherapy service as configurations will be dependent upon a variety of factors and will need to vary to meet local circumstances.

This information has been provided to assist radiotherapy managers make informed decisions about their local therapeutic radiography workforce staffing requirements. All information provided in this appendix is based upon data collated from a recent SCoR survey[22] conducted by the SCoR Radiotherapy Advisory Sub-Group (RASG). Seventeen radiotherapy centres were surveyed during March 2016 to profile their multi-disciplinary radiotherapy workforce establishments, radiotherapy activity (level and specialities), equipment and working hours.

The SCoR Radiotherapy Advisory Sub-Group advises that the information provided in this appendix must not be taken in isolation. It should be considered in the context of the *Principles of Therapeutic Radiographer Staffing* criteria (a) to (g) on pages 5-8 within *Achieving World Class Outcomes: The Vision for Therapeutic Radiography*. It is the view of this expert group (RASG) that the following outlines the current therapeutic radiography staffing requirements for a variety of models and sizes of service provider.

Managerial and supervisory radiographer posts

- Head of radiotherapy (Radiotherapy Service Manager) who is an HCPC registered therapeutic radiographer with deputy/deputies who is/are the identified leads in the event of absences.
- Service area specific leads (eg pre-treatment and treatment lead) for each working area within the main centre and each satellite.

Registered practitioners: consultant, advanced and practitioner levels

Therapeutic radiographers play a pivotal role in caring for patients with cancer across the entire radiotherapy pathway. They are critical in the delivery of patient centred care and, as such, they are required to care for patients prior to and during radiotherapy delivery, and into patients' survivorship phase of their management pathway.

The current data has highlighted the need for therapeutic radiographers to operate both pre-treatment imaging units and treatment units, and undertake a range of other associated activities all of which are critical to ensure a safe, efficient and effective radiotherapy service. These include the following:

- MDT meeting attendance and decision making
- pre-treatment patient information and patient consent
- role of therapeutic radiographer as key worker
- supplementary and independent prescribing
- dosimetry and mould room services
- professional education
- clinical governance, quality management and audit
- data management

- clinical trials, research and development
- brachytherapy
- molecular radiotherapy
- radiographer led on treatment clinic reviews, follow up clinics, survivorship clinics and community liaison
- radiographer- led information, support and counselling services.

The variable nature of the data acquired during the recent survey [22] supports the principle that many of these associated activities are not always exclusively undertaken by therapeutic radiographers, but are often carried out in conjunction with professional colleagues; clinical oncologists, medical physicists and nurses. As a consequence, it has not been possible to identify definitive therapeutic radiographer staffing requirements for each of these essential associated activities. A multi-professional approach will be required by the service manager to determine the overall radiotherapy staffing requirements as they will be influenced by local service requirements and arrangements.

It will be for each individual radiotherapy centre to implement the number, range and mix of therapeutic radiographers required at consultant, advanced and practitioner levels, according to local circumstances based on a number of factors to include: specialist patient needs, case load, availability of Specialist Registrars and succession planning.

Consultant and advanced practitioners

The number of consultant and advanced practitioners will be dependent on local circumstances. Job descriptions and job plans include the requirement to fulfil the four domains of practice [1] in accordance with SCoR guidance.[7] They are only allocated as part of 'core' treatment or planning delivery team for a small proportion of their job plan.

The current data highlighted that radiotherapy centres support the following:

a) up to two consultant practitioners regardless of model or size of radiotherapy centre
b) the number of advanced practitioners vary according to radiotherapy centre model and size, as follows:
    - multi-site centres support between 3 - 7 WTE♦
    - large centres (8-10 linacs) support between 0 - 5 WTE♦
    - medium centres (4-6 linacs) support between 0 - 7.5 WTE♦
    - small centres (2-3 linacs) support between 0 – 7 WTE♦.

Details about the range and number of specialist radiographer posts in employment in radiotherapy centres across the UK have been published by the Society and College of Radiographers.[20,21] These surveys demonstrate the variety of tumour site specific, technical specialist posts and community liaison specialist posts that have been implemented. A recent collaborative project with Prostate Cancer UK [19] has also demonstrated that significant growth in numbers is expected in the next three years, for both prostate/urology tumour site specialist radiographer and palliative specialist radiographer posts.

Practitioners

Practitioners underpin the service and are the largest proportion of the therapeutic radiography workforce [21] responsible for the delivery of daily care for patients attending radiotherapy pre-treatment imaging and treatment units.

Local capacity and demand planning will dictate the hours of service required to operate each available imaging and treatment unit within the radiotherapy centre. All data provided within this appendix has been acquired from the recent SCoR survey[22] by benchmarking seventeen radiotherapy centres' workforce requirements for an 8 hour day, highlighting that all these radiotherapy centres support the following:

- when working to capacity, a linear accelerator delivering radiotherapy across an eight hour day requires a radiotherapy workforce of four, in their capacity as entitled IR(ME)R Operators. The skills mix of this workforce will be reflective of the required elements of the career progression framework which will be dependent upon the complexity and range of imaging and treatments being delivered. This is to enable the efficient use of technically sophisticated equipment while also delivering patient centred care.

- an uplift to this staffing level is required for extended hours beyond the eight hour day.

- when working to capacity, an imaging unit working an eight hour day requires a radiotherapy workforce of four, in their capacity as entitled IR(ME)R Operators. The skills mix of this workforce will be reflective of the required elements of the career progression framework which will be dependent upon the complexity and range of imaging being undertaken. This is to enable the efficient use of technically sophisticated equipment while also delivering patient centred care. In smaller centres, the imaging unit may not be working to capacity and/or may not be working an eight hour day, in which case the data suggests a reduced staffing level is appropriate.

Assistant practitioners

Assistant Practitioners are a small proportion[21] (3.8%) of the workforce and the current data highlights that:

- multi-site centres support between 0.5 – 5 WTE♦
- large centres support between 1 - 2 WTE♦
- medium centres support between 1.8 - 5 WTE♦
- small centres support between 0 - 1.2 WTE♦.

The data also highlights that assistant practitioners are increasingly working in pre-treatment areas such as imaging units and mould room rather than on treatment units.

Other staffing requirements

The current data has highlighted the need for a range of support staff such as health care assistants, administrative and clerical staff to undertake a range of tasks such as appointment scheduling, receptionist duties and basic nursing and patient information duties. The variable nature of the data

acquired during the survey[23] indicates that it will be for each individual head of radiotherapy to identify and employ the required number of support staff to fulfil these tasks in their centre.

♦ Whole Time Equivalent

NB The Operator does not have to be a registered healthcare professional. The definition of 'Operator' is stated in IR(ME)R as any person who is entitled, in accordance with the employer's procedures, to carry out practical aspects of exposures.