THE COLLEGE OF RADIOGRAPHERS

A Curriculum Framework for Radiography

THE SOCIETY OF RADIOGRAPHERS

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Foreword

The Society and College of Radiographers (SCoR) is pleased to be able to bring you this curriculum framework for radiography. The framework addresses the spectrum of practice for radiography and outlines the broad learning outcomes associated with competent clinical practice at assistant practitioner, practitioner, advanced practitioner and consultant practitioner levels.

The fundamental purpose of the framework is to identify the scope of learning associated with the four levels of clinical practice within the profession. It is as relevant, therefore, for individuals planning their career pathways and for managers supporting continuing professional development as it is for education institutions planning pre-and post-registration education and development programmes and workforce development confederations specifying contracts. However, it is not intended to be definitive in the context of what constitutes curricula nor any particular role within radiography.

The framework is ambitious in its scope, and makes significant demands on individuals, clinical departments and their managers, and higher education institutions. It also makes demands on the National Health Service (NHS) in terms of supporting the continuing development of the profession envisioned within the framework, particularly through the provision of appropriate resources.

No apologies are made for these demands. They are essential if the profession is to meet the challenges associated with modernising the NHS and ensure that it plays its proper role in enhancing the delivery of clinical imaging and intervention, and radiotherapy and oncology services.

The document has been designed to be used actively and referred to frequently. It will be reviewed and updated periodically to take account of continuing developments in radiography and the pace of change in clinical imaging and radiotherapy and oncology. The SCoR will, therefore, be pleased to receive comments and information that will inform the development of the framework.

Ian Henderson, President of The Society and College of Radiographers

CONTENTS

GLOSSARY

Commissioning authorities
Currently Workforce Development Confederations working closely with employers taking primary responsibility for local workforce planning and the funding of radiography education and training.

Continuing Professional Development (CPD)
A range of learning activities that maintain and develop competency to practice within an evolving scope of practice.

Curriculum framework
A structure that specifies content that can be used flexibly to build relevant curricula.

Education benchmark statements
Education benchmark statements are developed and published by the Quality Assurance Agency for Higher Education. They describe the nature of characteristics of higher education programmes in a specific subject . The current radiography benchmarks represent the general expectations about the standards for an award of qualification at BSc(Hons) degree level.

Education provider
Normally, schools of radiography based within higher education institutions.

Evidence based health care
Using best available evidence to inform decision making about the care of individuals and the organisation of that care. Involves the integration of evidence from systematic research, practitioners' professional judgement and experience and understanding of patients' preferences.

Fields of practice
Specialisms in radiography practice configured by modalities, techniques and functions.

Formative assessment
Ongoing assessment procedures undertaken by learners as an integral part of the learning process. Their main function is diagnostic and developmental and therefore they do not count towards the classification of the award.

Interprofessional learning
Shared learning that involves active collaboration with learners across different health care occupations.

Learner
An individual at any of the four levels of practice in radiography involved in the learning process formally or informally and within academic or clinical environments.

Learning process
The entire educational experience including educational philosophy, structure, methods, assessment and evaluation.

Lifelong learning
Constant process of learning and development that incorporates CPD and which must persist throughout the working life of the individual.

Practice based learning
Learning that takes place in settings that reflect the broad range of environments in which radiography is practised. It provides opportunities for learners to develop, extend, refine and consolidate learning that may have been gained in an academic setting.

Professional Body
The Society of Radiographers together with its charitable subsidiary, The College of Radiographers. Together called The Society and College of Radiographers (SCoR).

Professional competence
Adherence to a moral and ethical code in addition to the necessary skills, knowledge, attributes and technical expertise to enable capability to practice.

Programme
A course of study linked to specified learning outcomes.

Quality Assurance Agency
An independent body set up to safeguard and enhance the quality of provision and standards of awards in the UK structure. It reviews the quality of UK higher education institutions at institutional level and the academic standard and quality of teaching and learning in each subject area.

Radiations
Includes the range of ionising and non-ionising radiations used for medical purposes.

Reflective practice
A process of analysing and evaluating new learning in order to modify previous perceptions, assumptions and understanding, and applying this new learning in the development of personal approaches to care.

Role development
Developing and extending the scope of practice to meet changing service needs.

Scope of practice
Current working practice of the individual.

Spectrum of practice
The scope of practice of all individuals within the profession.

Stakeholder
An individual, or group who have an interest in using the curriculum framework.

Statutory regulatory body
The Health Professions Council (HPC).

Student centred learning
Modes of programme delivery that place a strong emphasis on students taking responsibility for their own learning and playing an active part in the learning process.

Summative assessment
Assessment procedures that count towards the classification of award.

PART ONE

THE CURRICULUM FRAMEWORK IN CONTEXT

Chapter one

RADIOGRAPHY: A HISTORICAL CONTEXT

The Context of Change

The past decade has witnessed great changes in radiography education and practice. The education base moved from largely hospital based schools of radiography, where entry to the profession and state registration was the Diploma of the College of Radiographers, to higher education institutions (HEIs) offering degree level qualifications. The Bachelor of Science degree with Honours has provided the basis for state registration but, recently, in order to provide a wider entry gate and to attract graduates there are opportunities to enter the profession by studying at masters' level. Post-registration qualifications such as the Higher Diploma of the College of Radiographers, the Diploma in Medical Ultrasound and the Diploma in Nuclear Medicine have been superseded by qualifications at masters' level.

The capacity of diagnostic and therapeutic services has been increased by the introduction of new technologies with an ever increasing demand placed upon them (COR 2003a). In response to these demands, skill mix and emergent new and expanded roles have been introduced (DOH 1995, DOH 2000a, DOH 2000b, COR 2001, RCR 2002). During the last ten years the College of Radiographers has accredited intravenous injection courses in eleven HEIs and it is now commonplace, for example, for radiographers to undertake gastro-intestinal studies, once the domain of the radiologist. From image reporting to angiography, from radiotherapy planning to review clinics, radiographers are making major contributions to health care and patient management (COR 2003a). There are many more opportunities for radiographers to undertake research, involve themselves in education and to attain senior management positions.

The Government in *The NHS Plan* (DOH 2000a) and *Meeting the Challenge: A Strategy for the Allied Health Professions* (DOH 2000b) stated its commitment to modernising education and training and substantially increasing the number of health professionals. New ways of working with the concept of workers recognised at consultant practitioner, advanced practitioner, practitioner and assistant practitioner levels were introduced (COR 2000, COR 2002a, COR 2002b). Emphasis is being placed on the development of interprofessional education, a strong commitment to continuing professional development (CPD), widening access to education and training and the creation of an environment that supports evidence based practice (e.g. DOH 2000a, DOH 2000c, ScotExec 2000, Bristol Royal Infirmary Inquiry 2001, DOHSSPS 2001, NHSE 2001a).

Professional regulation has not been exempt from change and the powers of the Health Professions Council (HPC) are far more extensive than were those of the Boards at the former Council for Professions Supplementary to Medicine (HPC 2002). There will be greater emphasis on the use of occupational standards, benchmark statements, standards of proficiency, standards of education, training and continuing professional development (CPD). Each of these clearly impacts on the development and demonstration of competence in the radiography workforce.

Other legislative changes will continue to influence practice including the *Ionising Radiations (Medical Exposure) Regulations 2000* (HMSO 2000), the amendment to the *Disability and Discrimination Act 2002* and the *Human Rights Act 2000*. Consequences of other legislation concerning data protection (HMSO 1998), consent and confidentiality (HMSO 1999a), the operation of the Criminal Records Bureau and EC directives such as the mutual recognition of qualifications (e.g. 89/48/EEC) will require the radiographer to keep abreast of developments and to consider their impact on practice. Where necessary, radiographers may need to alter their practice.

Education providers are being asked to absorb rapid increases in student numbers to meet National Health Service (NHS) workforce targets which, in turn, places pressure on the capacity of clinical placements. There can be no compromise on the quality of education and there is no shortage of quality indicators and procedures to measure the performance of education providers from academic review (QAA 2001a), student benchmarks (QAA 2001b), institutional review and contract monitoring by workforce development confederations (NHSE 2001b). Also, greater emphasis is now being placed on quality assurance of education and its processes in clinical departments e.g. NHS Quality Unit.

What then of the needs of the individual radiographer against the background of continual change?

The Professional Body's Response

The College of Radiographers published *A Strategy for Education and Professional Development (EPD) of Radiographers* (COR 2002a). This strategy set out a vision for the future education and professional development for radiography that supports continuous improvements in patient services. Important tenets in the strategy included:

- a ladder of education and professional development;
- flexible pathways for education and professional development;
- matching education, professional development and lifelong learning to service needs;
- recognising the benefits of interprofessional education and working.

An Educational Philosophy

Underpinning the EPD strategy is a strong philosophy grounded in the belief that education is central to the delivery of high quality care to patients and clients, and that the education of every member of the profession is of equal value. Therefore, all radiography environments should be learning environments and should seek to support the aspirations of learners such that they are able to:

- achieve their full potential;
- feel valued and value others;
- practise independently within a moral and ethical framework;
- become a confident and supportive team member;
- understand how to operate effectively within the various radiography and health care settings;
- uphold and take forward the beliefs and values of the profession.

This approach should mean that the attributes, knowledge and skills that prepare individuals for practice also instil a commitment to lifelong learning, supporting innovation and change through partnership working and in line with service needs. The learning process must therefore ensure good integration of theory and practice and enable radiography learners to develop the necessary attitude, aptitude and ability to cope with change and uncertainty whilst fostering a commitment to the concept of continuous quality improvement.

Chapter two

RADIOGRAPHERS: A SIGNIFICANT CONTRIBUTION TO THE CARE PROCESS

Background

The profession of radiography has traditionally embraced two distinct disciplines, therapeutic and diagnostic radiography. Therapeutic radiographers practise within the broad field of radiotherapy and oncology whilst diagnostic radiographers practise within the broad field of clinical imaging. Within their specific discipline, radiographers utilise ionising and non-ionising radiations to safely and effectively achieve a diagnostic and/or therapeutic health gain. Using a range of complex imaging and treatment equipment within a variety of clinical environments, radiographers perform diagnostic examinations and/or treatment procedures across the life span and the extremes of health, from screening the well, to patients with terminal disease. Clinical imaging practice also encompasses forensic and post mortem investigations. Additionally, radiographers take primary responsibility for support service functions that are necessary for the provision of safe, effective and efficient radiography services including management and associated research. The service functions of radiography are outlined in Appendix A.

Radiographers have a key responsibility to minimise dosage of ionising radiation to individuals and to consider the contribution it makes towards the overall population ionising radiation burden. Therefore radiographers must possess significant knowledge and understanding of the criteria for selection, application of, benefits, risks and outcomes associated with a wide range of imaging and treatment modalities and techniques. The diverse and dynamic roles of radiographers are supported and developed by education and training, research and evaluation, quality assurance and clinical audit. Furthermore, radiographers must be mindful to practise within the moral and ethical framework set out by their professional and regulatory bodies and with due regard to relevant legislation and legal precedent.

Therapeutic Radiography

Therapeutic radiographers are responsible for providing safe and accurate high energy radiation treatments to individual patients with cancer and for patients' physical and psychosocial well being prior to, during and following

radiotherapy. The majority of the work is the provision of curative cancer treatment and a proportion is for symptom control and palliation, rarely too, benign conditions are treated. These involve a continuum of care requiring the acquisition of complex technical skills in pre-treatment localisation, target delineation, planning and dosimetry, technique development, verification and management of the treatment process. A crucial aspect of the role is enabling patients to make informed decisions about treatment and supporting them through rigorous treatment regimes, thus aiding compliance, often the key to successful outcome in treatment.

The role requires a detailed knowledge of cancer pathology and progression, cancer management and radiotherapy practice. It also requires the ability to recognise and support needs of all kinds, including physical, emotional and social. A further attribute is the ability to liaise successfully with other professionals to provide seamless care throughout what is often a long and complex journey that may involve social issues for both patients and carers. Routinely this includes roles such as:

- radiographer led information, support and counselling;
- planning, verification and delivery of treatment;
- on-treatment review and assessment;
- conformal radiotherapy;
- volume delineation, for example, breast, prostate and neuro-axis irradiation;
- radiographer led palliative care;
- radiographer prescribing for treatment related toxicity;
- radiotherapy site specialism;
- follow up care;
- management of the service;
- clinical education;
- research and research trials.

Therefore the current scope of practice for therapeutic radiographers is embraced within the following broad framework:

- **Occupational role**: clinician, manager, researcher, educator.
- **Employment sector**: NHS (acute, community, GP practice), higher education, private practice, commercial and industrial, veterinary practice, research centres.
- **Clinical departments**: radiotherapy service within the cancer unit or cancer centre, nuclear medicine.
- **Fields of practice**: to include, brachytherapy, clinical research, counselling, dosimetry planning, health promotion and education, informatics, information and outreach support, pharmacology, pre-treatment planning to include, computed tomography, ultrasound, magnetic resonance and other functional imaging techniques, portal imaging, quality assurance, radiation protection, review and assessment, site specialism, treatment delivery.
- **Patient groups**: children and adults to include those with special needs and the elderly.

Therapeutic radiographers work closely with other members of the multidisciplinary cancer team to deliver cohesive care for patients.

Diagnostic Radiography

Diagnostic radiographers are responsible for providing safe and accurate imaging examinations in a wide range of clinical environments, using a variety of imaging modalities and techniques so that appropriate management and treatment of patients and clients can proceed. The identification, evaluation and monitoring of systemic diseases, skeletal and soft tissue abnormalities and trauma are the major focus of diagnostic radiography. Significantly, radiographers provide this service throughout the twenty-four hour day, often working alone or in interprofessional care teams. Hence, they need to be prepared to deal with medical emergences which may arise during examination and treatment.

Diagnostic radiographers are concerned with both non-invasive and interventional procedures, radiation treatments, health surveillance screening and research, with additional involvement in occupational medicine. They use their professional judgement to decide how to achieve a diagnostic outcome. This includes deciding what examination is indicated and how best to execute the procedure. Increasingly, radiographers report on the images they produce and hence play a vital role in the diagnosis and management of disease and trauma.

A key aspect of the radiographers' role is the management of complex interpersonal dynamics in what is sometimes a short episode of care. During that period, diagnostic radiographers take responsibility for the physical and psychological well being of the patient. They work independently and frequently in situations where they are required to make rapid professional judgments using their scientific, technical and patient care related knowledge base.

Routinely this includes roles such as:

- plain film radiography and trauma imaging;
- ultrasound investigations;
- nuclear medicine investigations and treatments;
- computed tomography examinations;
- magnetic resonance imaging and functional studies;
- breast imaging;
- urography;
- vascular investigations and treatments;
- gastro-intestinal procedures;
- clinical education;
- research;
- service management.

The current scope of practice for diagnostic radiographers is embraced within the following broad framework:

- **Occupational role**: clinician, manager, researcher, educator.
- **Employment sector**: NHS (acute, community, GP practice), higher education, private practice, commercial and industrial, veterinary practice, armed forces, prisons, customs and excise, research centres.
- **Clinical departments**: radiology, nuclear medicine, ultrasound, magnetic resonance, computed tomography and breast screening.
- **Fields of practice**: to include, accident and emergency, bone densitometry, clinical research, counselling, dental, forensic, gastro-intestinal, health promotion and education, health screening, informatics, interventional, minor injuries, mobile imaging, quality assurance, radiation protection, reporting, urological, vascular.
- **Patient groups**: fetal, neonates, children and adults to include those with special needs, elderly and post mortem.

The Need for the Curriculum Framework

The view of the professional body is that the background of change, widening scope of practice and increasing diversity outlined demand that a coherent curriculum framework be developed. This curriculum framework will inform and sustain continuing development of the profession supporting it to make a significant contribution to the care process.

Chapter three

CURRICULUM FRAMEWORK FOR RADIOGRAPHY

Introduction

The curriculum framework is a key implementation guidance document in support of the EPD strategy and is a means of providing information and advice to stakeholders. It embraces the needs of learners across the broad fields of clinical imaging and radiotherapy and oncology. It sets out and clarifies the elements required to ensure appropriate education of the profession from the assistant level to the highest levels of clinical practice, and has relevance for management, education and research roles. The framework builds on and complements relevant existing work in education and practice within radiography and in the wider health care and education sectors. Therefore, this document should not be used in isolation but in conjunction with other documents and developments that impact on radiography and the broader aspects of education. Many of these other current documents are listed in the references and bibliography.

The curriculum framework provides guidance to those responsible for ensuring the appropriate development of learners at the different levels of radiography practice, to include education providers, the statutory regulatory body, employers, education commissioners and other stakeholders who wish to support education and other developments within the profession. Additionally and importantly, learners who wish to benefit from the gains in knowledge and skills that accrue from planned study will find the framework useful. Tangible benefits are to assist learners in achieving goals, such as targets in their career pathway, and in the development and enhancement of practice based skills that will help them deliver a better service to patients and clients. The framework also supports a continuing process of lifelong learning.

The intention of the professional body is that the framework:

- maximises flexibility and facilitates innovation in curriculum design and delivery;
- promotes rapid development of learners in the broad fields of clinical imaging and radiotherapy and oncology.

Underpinning Curriculum Framework Principles

In developing the framework it was necessary to clearly identify and agree a number of underpinning principles. In this regard, the framework:

- sets out its broad purpose without being over-prescriptive;
- provides guidance to scope of practice;
- is informed by developing practice;
- promotes integration between theory and practice;
- advises on learning outcomes for all levels of practice within radiography;
- promotes interprofessional working;
- takes account of research, education and management needs;
- supports access, transferability and flexibility in education;
- takes account of current initiatives which impact on education and practice;
- promotes learning that is evidence based and research led;
- identifies the essential nature of practice within relevant ethical and regulatory frameworks;
- sets out the roles of stakeholders.

It is the intention to review the curriculum framework on a periodic basis. However, users will need to take account of changes and developments in the health care and education sectors in the interim period.

Stakeholders and Main Purposes

It is expected that various stakeholders will make use of the curriculum framework. The various stakeholders are listed below together with indications of main purposes that may be associated with the particular stakeholder.

Learners

- provides guidance on the expected depth and range of learning;
- supports self monitoring of progress and defines expectations;
- supports and informs career development plans and professional development portfolios.

Learning Representatives

- assists in supporting, facilitating and assessing learning at all levels of practice;
- supports and complements individuals' ongoing learning and development.

Managers

- promotes understanding of the learning involved in preparing individuals for defined levels of practice;
- facilitates development of an appropriate learning environment that supports life long learning;
- informs expectations of staff at each level of practice;
- informs expectations of, and approaches to, practice based learning;
- facilitates the development of fields of practice;
- provides advice regarding the support and supervision required for all learners including those undertaking formal postgraduate and doctoral studies in the clinical setting.

Providers of Radiography Education

- guides the design and development of relevant programmes and learning environments (both university and practice based);
- guides the development of awards appropriate to the associated levels of practice;
- informs the preparation of documentation for validation, accreditation and monitoring purposes;
- facilitates coherence between programmes;
- clarifies expectations regarding the maintenance of nationally recognised standards.

Professional and Statutory Regulatory Bodies

- guides evaluation of the appropriateness of programmes for approval;
- informs standards related to initial and ongoing registration;
- informs assessment of equivalence for registration purposes (e.g. an overseas application).

Commissioning Authorities
- informs contract specifications at all levels of practice;
- supports the ongoing evaluation of commissioned programmes.

External Reviewers
- provides a reference document to support evaluation of programmes.

Other Health Care Professions and Members of the Public
- provides a statement on radiography education and practice in the UK;
- informs interprofessional education.

In addition to the above, it needs to be recognised that all members of the profession have roles and responsibilities in relation to supporting, developing and in some cases assessing learners as specified in the *Statements for Professional Conduct* (COR 2002c).

Chapter four

THE LEARNING PROCESS

Introduction

Learning styles and methods differ and individuals will draw from past experiences as well as using new strategies of learning to help them reach their particular outcomes and goals. In recognising those individual differences this chapter sets out and explains the relationship between the learning process and the curriculum framework. The learning process explains how a triangular relationship between the learner, the educational provider and the clinical department can operate together to facilitate professional development.

The learning process is central to remaining competent to practice; therefore, it must be career long. The learning process is guided by outcomes and identifies how learners can access and acquire knowledge and skills, which become the building blocks for lifelong learning. In keeping with the purpose of the curriculum framework the learning process must provide for a continuum of learning and development through knowledge and skills acquisition throughout the entire scope of radiographic practice.

Key Principles

The learning process should be based on the following principles:
- integration of theory and practice is made explicit;
- learning in practice based settings is of equal value to that in the university setting;
- competence to practise is underpinned by the learning and assessment process;
- autonomy of learners is respected and valued as a key strength in achieving fitness for purpose and practice;
- generic and transferable skills are valued alongside professional skills;
- CPD is integral to the culture and practice of radiography.

The creation of a curriculum framework will enable learners to determine their learning needs according to career aspirations. For the learners themselves, the development of learning skills is an important outcome in its own right if the learning process is to be effective. Where the learning is in a formal setting, direction and guidance will be an integral part of a programme of study. However, much of the learning will be outside a formal setting and is likely to be self directed. Therefore, the ability to learn independently becomes an asset and a key skill which the learner should strive to attain. The ability to reflect on learning and practice, the ability to problem solve and to evaluate the effectiveness of practice will be essential characteristics at all levels of practice.

Continuing professional development is vital in order to maintain safety and effectiveness given the rapid rate of change within clinical practice. Ongoing professional competence is more than skills, knowledge, attributes and technical expertise. It is also about coherent integration of these and adherence to a moral and ethical code, recognising the emotional dimension of practice and embracing the idea that practice is dynamic and constantly changing. Reflection in, and on, practice allows for thinking about what has happened, combining with past knowledge and experience to reframe ideas and practice for the future.

Interprofessional learning in the academic and practice setting is to be supported as a way of facilitating the acquisition and sharing of knowledge to the benefit of the patient and to meet the needs of the service. It facilitates effective team working and informs communication and understanding

between professions. There are already many initiatives for interprofessional learning in the university and practice based settings. Both use formal and informal methods that encourage an ethos of interprofessional learning that permeates throughout the profession. The development of skills and knowledge which are radiographer specific must not however be compromised or weakened by the interprofessional approach.

Learning and Teaching Strategies

An appropriate range of learning and teaching strategies should be used to fulfil the framework outcomes, including distance and e-learning. Viable strategies are required so that learners acquire the necessary attitude, aptitude, skills and knowledge.

Learning and teaching strategies need to:

- take into account statutory and mandatory requirements;
- support accredited and non-accredited learning;
- be sensitive to the needs of individual learners and be learner centred;
- encourage ownership of learning by the learners;
- foster a culture of valuing learning and the ability to reflect;
- include the acquisition of problem solving skills, independent learning and transferable skills;
- engender initiative and original thinking;
- support learners who do not necessarily want to progress in terms of promotion, but who wish to engage with a programme of continuing professional development;
- meet expectations whilst being clinically realistic;
- be rooted in a partnership with university and clinical partners;
- provide opportunities for learners to engage in shared learning with learners from other professions;
- facilitate learning through a range of activities and media;
- facilitate the acquisition of research skills;
- facilitate the acquisition of assessment skills.

Learning Resources

In order for learners to maximise their learning potential, access to a range of learning resources is necessary. Inevitably, these will vary according to circumstances and the learning outcome being pursued. For example, learners registered on a formal course of education should have access to facilities and support from the host institution. At the other end of the scale a learner may require a copy of a recent journal article to remain abreast of developments in a particular technique.

All learners, therefore, will require access to a range of resources to support their learning activity. These may be straightforward or more complex, involving support mechanisms to be set up by an employer or a higher education, or other institution. It is likely, however, that learners will experience a wide range of learning resources at some stage during their working life. Indeed, making effective use of resources is part of the learning process.

A learner registered on a formal course with a higher education institution can expect to have access to a learning resources centre. This should go beyond access to a traditional library and lending rights for books to include internet access to course material, discussion groups, search engines and electronic journals.

The World Wide Web does provide the opportunity for learners to access a whole range of resources from image libraries to information on disease and professional matters. Undoubtedly, the World Wide Web opens up new frontiers in term of access to information. However, learners will need to be careful in how information is used and applied, especially research results if it is uncertain whether or not the information has been subjected to a proper peer review process.

Notwithstanding the above, a regular calling point for radiography learners is the Society and College of Radiographers website. This gives direct access to discussion groups on a variety of topics so linking learners with common interests. The website also provides links to other websites, which may be of interest to radiography learners.

Learners should also expect support from employers. This could range, at one level, from the appointment of mentors, access to trust libraries and hence to journals and the Internet. On another level, funded access to courses, protected study time (SOR 2002) and participation in departmental CPD activities, including clinical meetings could be expected.

It is not possible to specify every resource that can be accessed but the above provides a flavour of what could be available to learners to support their professional development. It also signifies that learners should increasingly expect such a range of resources to be available to them.

Scope of Learning in Practice Settings
Learning in practice remains an essential part of the learning process. In order to succeed in integrating practice based and academic learning curricula need to be explicit but not prescriptive. Whilst experience in clinical imaging and radiotherapy and oncology departments continues to be essential for inculcation into the culture and practise of radiography, the current pressure on clinical departments predicates a need for more creative ways of teaching clinical skills. For example, practice based settings may include some computer simulations and use of role play. What is essential is that learners need to recognise the reciprocal relationship between learning that occurs in academic and practice based environments.

Assessment Strategies
The assessment of the learning must be an integral part of the learning process itself and must satisfy the educational criteria of validity, reliability and sufficiency. The assessment would need to be appropriate to the level of practice and be focussed on outcomes. Assessment of learners in practice based settings is an integral part of ensuring clinical competence.

The assessment strategy should achieve the following:
- offer a variety of ways of assessing learning, including self reflection;
- provide a robust means of assessing clinical competence;
- take account of regulatory frameworks;
- acknowledge benchmarks and proficiency standards, where appropriate;
- acknowledge occupational standards, where appropriate;
- provide for both formative and summative assessments;
- focus on learners' development and demonstration of learning achieved;
- encourage learners to assess their own learning and identify their own development needs;
- provide explicit and detailed guidance of expectations;
- provide a balance between effective assessment and assessment overload.

The learning, teaching and assessment strategy articulated within individual curricula should be consistent with the overall educational philosophy of the programme. Programmes as a whole should be coherent such that the learning process integrates with, and underpins the achievement of, educational aims and learning outcomes. Education providers are expected to make explicit this relationship within their curricula.

Chapter five
FRAMEWORK OUTCOMES

The outcomes below describe professional competence in broad terms relative to the four levels of professional practice in radiography.

Education providers will be expected to demonstrate that these outcomes are achieved in relevant programmes. However, the content and organisation of any programme will be a matter for education providers to determine.

Assistant Practitioner
The assistant practitioner in radiography is required to have a sound knowledge of the basic concepts of a defined area of practice. The ability to communicate accurately and to exercise personal responsibility needs to be demonstrated. The learning process should enable the assistant practitioner to perform effectively within their area of practice, using given protocols as necessary.

The assistant practitioner will:
1. Work effectively and safely within their defined area of practice under the instruction and supervision of a registered practitioner within relevant legal and ethical frameworks and in accordance with agreed protocols.
2. Demonstrate knowledge and physical skills required within their own area of practice.
3. Undertake patient care procedures within their sphere of radiography competence.
4. Function as a member of the multi-disciplinary health care team.
5. Demonstrate effective interpersonal and communication skills.
6. Demonstrate accountability for own actions.
7. Demonstrate an ability to gather relevant information and act appropriately.

8. Apply problem-solving skills to routine situations.
9. Demonstrate effective use of information technology, literacy and numeracy skills in relation to their defined area of practice.
10. Demonstrate an ability to reflect on their area of practice and engage with CPD.

Education programmes should be designed such that assistant practitioners can:

- recognise the importance of the knowledge and understanding relative to their defined roles;
- develop the skills necessary to perform their roles;
- recognise the links between different programme elements and themes;
- appreciate that their knowledge and understanding is acquired within an evidence based framework;
- recognise that learning can occur in both education and practice environments and exploit the relationship between them.

Practitioner

The practitioner in radiography will have developed an understanding of a complex body of knowledge. Analytical techniques and problem solving skills enable the practitioner to operate in a variety of settings including active involvement in research. The practitioner needs to be able to exercise personal responsibility and make decisions in complex and unpredictable circumstances. The learning process must enable the practitioner to be able to evaluate evidence, argument and assumptions, to reach sound judgements and adapt practice as required, and to communicate effectively.

In addition to the outcomes defined for the assistant practitioner, the practitioner will:

1. Work effectively and safely within their defined area of practice contributing towards the development of existing and evolving legal and ethical frameworks.
2. Manage a clinical workload and meet deadlines.
3. Adapt to different work settings within their professional area.
4. Demonstrate accountability for actions of self and others.
5. Recognise and respond sensitively and appropriately to individual patients' needs.
6. Apply sound clinical reasoning skills as the basis for making appropriate professional decisions and acting autonomously.
7. Demonstrate a proactive, flexible and interprofessional approach to practice.
8. Access and apply an evidence-based approach to practice.
9. Promote the profession and participate in education and training including clinical supervision of others.
10. Demonstrate an ability to reflect on practice and promote continuing professional development.

Education programmes should be designed such that the practitioner can:

- recognise the importance of knowledge and understanding to their current and future professional practice;
- develop the skills necessary to perform their roles;
- integrate their learning effectively;
- develop their knowledge and understanding within an evidence based framework;
- recognise and exploit relationships between learning developed in university and practice based environments;
- transfer knowledge and understanding to situations encountered in practice.

Advanced Practitioner

The advanced practitioner in radiography will have developed expertise to be able to function at the forefront of professional practice. Detailed application of knowledge and understanding of how research informs practice are required. Advanced practitioners must be able to deal with complex issues and tackle and solve problems. They are required to demonstrate sound judgement, personal responsibility and initiative in complex and sometimes contentious situations. Advanced practitioners may also take the initiative in research and may lead research projects.

In addition to the outcomes defined for the practitioner, the advanced practitioner will be expected to:

1. Evaluate critically and apply a range of theoretical perspectives relevant to their own area of practice to underpin professional decision making.
2. Demonstrate the critical application of knowledge, experience and advanced clinical skills to novel and challenging situations.
3. Adopt a critical and analytical approach to their own and others' performance.

4. Exercise clinical, teaching and team leadership skills in their chosen field.
5. Evaluate critically legal, ethical and professional issues relevant to their practice.
6. Develop and review approaches to their own area of practice.
7. Engage in research and development in order to contribute to the evidence base within their field.

Education programmes should be designed such that the advanced practitioner can:

- evaluate critically and apply knowledge and understanding to their own areas of practice;
- synthesise and appraise critically material from diverse and/or complex sources;
- develop specialist knowledge and understanding through active engagement with the evidence base;
- apply knowledge, understanding and skills to complex and challenging situations.

Consultant Practitioner

The consultant practitioner in radiography practices at the leading edge of the profession. The consultant is able to create and interpret knowledge that extends the forefront of the profession. The consultant provides leadership in relation to clinical practice and the delivery of clinical services and hence operates in the best interest of the patients. Consultant practitioners are able to make informed judgements on complex issues and demonstrate innovation in solving clinical problems often within multidisciplinary and/or multi-agency environments. Conceptualisation, design and implementation of projects for the generation of new knowledge and understanding may also be part of the role, as is knowledge transfer.

In addition to the outcomes defined for the advanced practitioner, the consultant practitioner will be expected to:

1. Demonstrate expert clinical practice which extends the forefront of the profession.
2. Provide professional and clinical leadership and consultancy widely.
3. Lead education, training and development.
4. Lead practice and service development.
5. Lead research and integrate findings into practice.
6. Contribute to development of the health and social care economy.

Education programmes should be designed such that the consultant practitioner can:

- subject their professional knowledge to critical questioning, reflection and debate;
- integrate the best of current knowledge and practice to their discipline;
- provide original and innovative contributions to the knowledge base of their discipline and practice;
- disseminate best practice widely.

PART TWO

THE CURRICULUM FRAMEWORK

A USER'S GUIDE

The framework may be used to configure or clarify education and development programmes that support clinical roles in radiography and are in line with service needs. It has equal relevancy for the contents of a course of study leading to a formal qualification, such as a BSc or MSc degree, as a guide for planning individual CPD and to inform education contract specifications. It represents a flexible structure that can be used by any of the stakeholders to identify the depth and breadth of skills and attributes required together with the knowledge and understanding necessary for competent clinical practice within the profession.

The framework is set out in two linked sections: A and B:

Section A is entitled *skills and attributes together with knowledge and understanding relevant to the four levels of practice.* It identifies the key professional skills and attributes within a template that outlines the associated

- illustrative content;
- levels of knowledge and understanding.

Each key skill/attribute is taken separately and is linked to a list of illustrative content. This list outlines subject/topic areas that together could support development of the identified skill/attribute. The depth of knowledge and understanding to be acquired for each level of practice is then articulated.

Every attempt has been made to match the *levels of knowledge and understanding* to the specified framework outcomes for the four defined levels of practice (as defined in chapter five, Part one of this document). However, this rule may not always hold when applied in the context of specific advanced and consultant level roles (**see examples 3, 4 and 6**).

For example, it is envisaged that the **entire** collection of skills and attributes will need to be embedded within programmes designed for assistant practitioner and practitioner levels of practice and in order to achieve the respective framework outcomes (**see examples 1 and 2**).

However, as specialisation occurs at advanced and consultant levels of practice it may not be deemed necessary to pay equal consideration to the full range of skills and attributes identified. Rather, some skills and attributes may be viewed as essential with others as supporting/secondary. Consequently, some programmes designed for advanced or consultant practitioners may require only some of the identified skills and attributes (underpinned by knowledge and understanding at the relevant level) in order to achieve the respective framework outcomes (**see examples 3, 4 and 6**).

Section B entitled *discipline specific knowledge and understanding to be achieved at the four levels of practice*, identifies seven broad subject areas that uniquely form the core underpinning professional knowledge base for each discipline. Please note that radiotherapy and oncology and clinical imaging are listed separately given the significant differences in context and practice. This section is set out as a template under two headings:

- levels of knowledge and understanding;
- outcomes to be achieved.

The *levels of knowledge* and understanding for each subject area are specified according to the relevant level of practice. Again, it is envisaged that all subject areas must be embedded within programmes designed for assistant practitioner and practitioner levels of practice and in order to achieve the respective framework outcomes (**see examples 1 and 2**).

However, as specialisation occurs at advanced and consultant levels of practice it will be necessary to clearly identify those subjects that particularly support development of that role (specialisation) at an advanced/higher level. Consequently only identified subjects may need to be acquired at advanced and consultant/managerial level of knowledge and understanding (**see examples 3, 4 and 5**).

The *outcomes to be achieved* gives an indication of the expectations from any individual who has successfully completed that learning and link back to the skills and attributes described in section A and the respective framework outcomes.

It is important to note that the content of these sections are illustrative and not exhaustive. It should **not** be viewed as a definitive list of curriculum content, nor taken as a prescription of how topics should be configured in individual curricula. It is **not** expected that the elements of learning described here should be addressed discretely within programmes but that they should be integrated within individual curricula in such a way that best meets the programme's overall educational philosophy.

Further, the framework outcomes are **not** intended to be definitive in the context of what constitutes any particular role within radiography. This is particularly relevant at advanced and consultant levels of practice where it would not be expected that any one individual would have achieved all of the learning outcomes identified for that level of practice. Indeed, more probably, advanced and consultant roles are likely to be characterised by concentration on relevant, selected learning outcomes associated with an individuals' job role.

How to navigate around the framework

Five examples are provided that are intended to offer some guidance on how the curriculum framework may be used in different circumstances.

Example 1

For an assistant practitioner (radiotherapy), please refer to the following:

1. **Part one; chapter five**: Framework outcomes – assistant practitioners.
2. **Part two, section A**: All fifteen skills and attributes for assistant practitioners.
3. **Part two, section B**: All seven subject areas for radiotherapy and oncology for assistant practitioners.
4. In addition, within the context of the role, refer to the agreed national occupational standards for radiotherapy services taking account of relevant National Service Frameworks (NSFs) and clinical guidelines e.g. Lung Cancer.

Example 2

For a practitioner (clinical imaging), please refer to the following:

1. **Part one, chapter five**: Framework outcomes – practitioners.
2. **Part two, section A**: All fifteen skills and attributes for practitioners.
3. **Part twp, section B**: All seven subject areas for clinical imaging for practitioners.
4. In addition, refer to the agreed national occupational standards for clinical imaging services taking account of relevant NSFs and clinical guidelines e.g. Paediatric Services.

Example 3

For an advanced practitioner (on-treatment review), please refer to the following:

1. **Part one, chapter five**: Framework outcomes – advanced practitioners.
2. **Part two, section A**: Essential skills and attributes should match to the specific job/role description and, for example, may include: patient care, communication, problem solving, analytical and judgement, autonomy, patient client assessment and team-working, and interprofessional practice at a level of knowledge and understanding for advanced practitioners. Consideration might also be given to patient care and communication at a level of knowledge and understanding for consultant practitioners.
3. **Part two, section B**: Radiotherapy and oncology subject areas, for example, biological sciences; behavioural and communications sciences; legislative policy, ethical and research dimensions for advanced practitioners.
4. In addition, within the context of the role taking account of relevant NSFs and clinical guidelines e.g. Supportive and Palliative Care.

Example 4

For an advanced practitioner (Breast Screening) please refer to the following:

1. **Part one, chapter five**: Framework outcomes – advanced practitioners.
2. **Part two, section A**: Essential skills and attributes should match to the specific job/role description and, for example, may include, problem solving, reflection, psychomotor, analytical and judgement, autonomy, patient client

assessment and team-working and interprofessional practice at a level of knowledge and understanding for advanced practitioners. Consideration might also be given to patient care and communication at a level of knowledge and understanding for consultant practitioners.
3. **Part two, section B**: All clinical imaging subject areas listed within the context of breast screening practice and in particular its applications, techniques and technologies.
4. In addition, refer to the agreed national occupational standards for breast screening services taking account of relevant NSFs and clinical guidelines e.g. Breast Cancer guidance.

Example 5

For a short course on Informatics, please refer to the following:

1. **Part one, chapter five**: Framework outcomes – relevant to the level of practice for the learner concerned.
2. **Part two, section A**: Information management and technology, psychomotor.
3. **Part two, section B**: Technology.
4. In addition, refer to the latest competency framework for informatics published by the National Health Service Information Authority (NHSIA).

Example 6

For a consultant practitioner (Vascular ultrasound) please refer to the following:

1. **Part one, chapter five**: Framework outcomes – consultant practitioners.
2. **Part two, section A**: Essential skills and attributes should match to the specific job/role description and, for example, may include, patient care, communication and interpersonal, problem solving, reflection, psychomotor, analytical and judgement, analytical and clinical judgement, autonomy, research and development, patient client assessment, protocol and policy development, and team-working and interprofessional practice at a level of knowledge and understanding for consultant practitioners.
3. **Part two, section B**: All clinical imaging subject areas within the context of ultrasound practice and in particular its applications, techniques and technologies.
4. In addition, refer to the agreed national occupational standards for ultrasound services taking account of relevant NSFs and clinical guidelines e.g. Coronary Care.

Example 7

For a CPD course

The learner should check the outcomes for the programme against the outcomes for his/her current level of practice using either section A and/or B, as appropriate. Learners should, on the whole, access programmes at a level that is commensurate with his/or current level of practice or moving towards higher levels in continuum of practice.

SECTION A

SKILLS AND ATTRIBUTES TOGETHER WITH KNOWLEDGE AND UNDERSTANDING RELEVANT TO THE FOUR LEVELS OF PRACTICE

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Patient/Client Care	• managing people; skills to liaise, collaborate and negotiate safely • understanding and dealing sensitively with equality/diversity issues e.g. gender • patient confidentiality and consent • legal, moral and ethical frameworks • dealing with difficult patients • care procedures to support patients undergoing radiographic examinations and/or treatments • concepts of health and illness • interpersonal relationships • factors impacting on patients' perceptions • professional relationships • patient referral • patient dignity and respect	Should be sufficient to enable the: **Assistant practitioner** to implement the identified patient/disease management package, to include basic nursing care, under supervision. **Practitioner** to develop patient/disease management package in own area of practice. **Advanced practitioner**, where appropriate, to develop specialised patient/disease management package for own area and/or across care pathway, professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to be accountable for the provision of patient/disease management package.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Communication and Interpersonal	• methods for effective communication relevant to scope of practice (clear, concise and accurate both orally and written) • managing people; skills to liaise, collaborate and negotiate safely, effectively and sensitively in a professional manner with others • understanding and dealing sensitively with equality issues e.g. cultural diversity • anti-oppressive and non-confrontational communication • encourage and enable a partnership approach • formal and informal situations; written, verbal and non-verbal presentation skills as appropriate • group/team dynamics; e.g. co-operative team-working • information and knowledge management; how to present, manage (store and retrieve) and analyse information accurately, appropriately and efficiently • patient confidentiality; to work in accordance with ethical and legal policies • listening, empathic and counselling skills as appropriate • personal integrity; open, honest, sensitive to needs of others (probity issues)	Should be sufficient to enable the: **Assistant practitioner** to provide and receive routine information orally, in writing and electronically to inform colleagues, patients and members of public. **Practitioner** to provide, receive and negotiate complex, sensitive and/or contentious information where persuasive, motivational, negotiating, training, empathic or reassurance skills are required. **Advanced practitioner**, where appropriate, to provide, receive and negotiate complex, sensitive and/or contentious information where there are significant barriers to communication. Presents complex, sensitive or contentious information, sharing best practice to a large group of staff or to the general public. **Consultant practitioner**, where appropriate, to provide, receive and negotiate complex, sensitive or contentious information from trusts and external agencies. Presents complex, sensitive or contentious information at trust level and to external agencies.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Problem Solving	• problem solving process • understanding of the broad context of radiography practice (technology, techniques and application) at the appropriate level • planning, prioritisation, negotiation, implementation and evaluation strategies • learning from experience • learning to learn	Should be sufficient to enable the: **Assistant practitioner** to be able to overcome routine problems within area of own practice, seeking help where necessary. **Practitioner** to be able to consistently and accurately synthesise information to achieve desired outcome within own area of practice. **Advanced practitioner**, where appropriate, to be able to consistently and accurately synthesise complex information to achieve innovative but desirable outcomes across professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to be able to critically evaluate complex information in order to develop new policy and to achieve desired outcomes during policy implementation.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Reflection	• reflection and reflective skills • nature and models of reflection • portfolio development • understanding of the context of health and social care • interaction of the broad context of radiography practice (technology, techniques and application) at the appropriate level • clinical decision-making • self-evaluation	Should be sufficient to enable the: **Assistant practitioner** to reflect on and learn from experience within own area of practice. **Practitioner** to reflect on and learn from radiographic research evidence and experience and apply to own and others working practices. **Advanced practitioner**, where appropriate, to reflect on and learn from relevant research evidence, policies and legislation and apply across professional and organisational boundaries. **Consultant practitioner**, where appropriate, to reflect on and learn from other practices, political, economic and social contexts and use to effect changes to service delivery.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Psychomotor	• radiographic examinations and techniques • clinical examinations • spatial awareness, visual precision and manual dexterity in the manipulation of equipment and accessories • orientational awareness in patient positioning • computer technology and keyboard skills • complete relevant mandatory local and/or national training e.g. regular VDU assessment	Should be sufficient to enable the: **Assistant practitioner** to consistently and accurately apply psychomotor skills developed through training and experience for identified equipment and techniques. Hand, eye and sensory co-ordination may be necessary. **Practitioner** to apply highly developed psychomotor, including fine manipulation skills, with consistency and accuracy across a wide range of equipment and techniques. Highly developed hand, eye and sensory co-ordination may be necessary. **Advanced practitioner**, where appropriate, to apply highly developed psychomotor, including fine manipulation skills, with consistency and accuracy. Highly developed hand, eye and sensory co-ordination in a specialist area. **Consultant practitioner**, where appropriate, will have highly developed hand, eye and sensory co-ordination.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Analytical and Clinical Judgement	• evidence based health care • problem solving and reflection processes • models of decision making • planning, prioritisation, implementation and evaluation strategies • professional self regulation • legal and ethical frameworks • models of clinical reasoning • learning about learning • learning from experience • modelling • critical analysis and review • research skills • clinical supervision and preceptorship	Should be sufficient to enable the: **Assistant practitioner** to make judgements involving facts or situations, some of which require limited analysis. **Practitioner** to make judgements involving a range of facts or situations, which require analysis or comparison of a range of options. **Advanced practitioner**, where appropriate, to make judgements involving complex facts or situations, which require the analysis, interpretation and comparison of a range of options and synthesis of information and with possible consequences across professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to make judgements involving highly complex facts or situations, which require the analysis, interpretation and comparison of a range of options and synthesis of information with consequences for the service and/or organisation.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Information Management and Technology (informatics)	• computer technology and keyboard skills • electronic patient records • legal requirements relating to record keeping (Data Protection Act) • information management and retrieval systems • data manipulation • data interpretation • security of data • health informatics • recognise, capture, evaluate and apply information • presentation skills • complete relevant mandatory local and/or national training e.g. European Computer Driving Licence (ECDL)	Should be sufficient to enable the: **Assistant practitioner** to record and retrieve data that has been personally generated in line with protocol and legal requirements. **Practitioner** to take responsibility for data processing and storage related to own area of practice within an ethical and legal framework. **Advanced practitioner**, where appropriate, to generate information from stored data and to manipulate data in different formats for use across professional and/or organisational boundaries in line with relevant ethical and legal frameworks and contributing to the integration of health and social care systems. **Consultant practitioner**, where appropriate, to be accountable for the design and development of information technology systems to meet service, ethical and legal specifications and to meet the needs of the integrated health and social care economy.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Research and Development	• sources of information and evidence • data protection • security of data • patient confidentiality • research process • research methodologies • understanding the reciprocal relationship between theory and practice • clinical effectiveness • information technology • critical evaluation and review • coping with uncertainty and lack of evidence • theory arising from practice • research methodologies and methods • ethics • data analysis and interpretation • research dissemination (presentations and journals)	Should be sufficient to enable the: **Assistant practitioner** to undertake surveys or audits relevant to own work. Occasional participation in research and development projects. **Practitioner** to be regularly involved in research and audit, publishing and presenting findings. **Advanced practitioner**, where appropriate, to be responsible for co-ordinating and implementing research & development programmes or activities as a requirement of the job, publishing and presenting at interprofessional fora. **Consultant practitioner**, where appropriate, to be responsible for initiating and developing research programmes and for wide dissemination of findings which may impact broadly.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Planning and Organisational	• synthesis of the broad context of radiography practice (technology, techniques and application) at the appropriate level • adapting practice to different settings • legal, moral and ethical frameworks • protocols and guidelines • time management • people management • self awareness and reflection • personal, social and professional development • developments in the structure, funding and organisation of health and social care • change management • health and social care policy • policy implementation • motivation theories • clinical supervision	Should be sufficient to enable the: **Assistant practitioner** to organise self to undertake own day-to-day work tasks or activities. **Practitioner** to plan and organise daily work and some complex activities or programmes for an area of practice, some of which may be ongoing. **Advanced practitioner**, where appropriate, to plan and organise a number of complex activities or programmes, which may require the formulation and adjustment of plans or strategies for a unit, department or across a care pathway, and/or professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to formulate long-term, strategic plans which involve uncertainty and which may impact broadly.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Autonomy	• autonomy and independence • personal, social and professional development • the multi-professional/disciplinary team in health care • issues of self-regulation and registration • professionalism and professional practice • legal and ethical responsibilities • professional duty of care • competence • negligence • clinical governance • financial and staff governance	Should be sufficient to enable the: **Assistant practitioner** to work to agreed protocol with a personal responsibility for reporting non-routine situations. **Practitioner** to take account of legal and ethical considerations in exercising professional self-regulation within own area of practice, and to supervise others. **Advanced practitioner**, where appropriate, to exercise professional self-regulation taking account of limitations of self and the practice of other professional members of the multi-disciplinary team. **Consultant practitioner**, where appropriate, to contribute to the development of, and ensuring adherence to, self-regulatory frameworks across the service/organisation.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Protocol and policy development	• understanding of the broad context of radiography practice (technology, techniques and application) at the appropriate level • the challenges of pressures and constraints within service delivery • current guidelines and legislation e.g. cancer care standards, health and safety legislation including IR(ME)R 2000 • recent and current policy developments related to health care organisations and delivery • interprofessional and multidisciplinary team working in various settings to include across the age range • clinical governance agenda • functions, structures, culture and change within health and social care • management of health records	Should be sufficient to enable the: **Assistant practitioner** to follow given protocols & policies and to be able to identify any missing or out of date policies. **Practitioner** to implement policies and to propose changes to working practices or procedures in own work area. **Advanced practitioner**, where appropriate, to implement and develop policy for discrete areas of service and/or across professional boundaries. **Consultant practitioner**, where appropriate, to take responsibility for a range of policy implementation and for policy development for the service.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Human Resource Management and Teaching	• challenges of pressures and constraints within health care • managing people • supervision skills • coaching skills • mentorship • clinical supervision and preceptorship • understanding and dealing sensitively with equality/diversity issues • presentation skills • using learning contracts • continuing professional development/lifelong learning cycle • role in the promotion of health and health education • teaching, assessing and learning skills • staff governance • motivation	Should be sufficient to enable the: **Assistant practitioner** to provide advice and demonstrate own activities or workplace routines to new or less experienced employees. **Practitioner** to be regularly responsible for providing training and supervision in own discipline and/or undertake workplace assessments on peers and more junior members of staff and students. **Advanced practitioner**, where appropriate, to be responsible for placement and supervision of staff and students for an area and/or within the multi-disciplinary team. Responsible for teaching and assessing on a range of subjects. **Consultant practitioner**, where appropriate, to be responsible for teaching or devising training and development programmes as a major job role. Responsible as line manager for department and/or service.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Financial and Equipment Management	• health and safety • Ionising Radiation Regulations 1999 • quality control • quality assurance • risk management • business planning • cost analysis • operations management • principles of budget planning, control and manipulation • current technological developments in equipment and accessories • technology assessment • financial governance • planning for and procurement of new equipment	Should be sufficient to enable the: **Assistant practitioner** to be responsible for the safe use of equipment used in own area of work **Practitioner** to be responsible for supervising the safe use of a range of equipment. **Advanced practitioner**, where appropriate, to monitor and to contribute to the formulation of departmental equipment procurement plans and to be responsible for the purchase of some physical assets. **Consultant practitioner**, where appropriate, to be responsible for budget setting and procurement of all physical assets for the service.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Patient/client assessment	• data collection strategies • understanding of the broad context of radiography practice (technology, techniques and application) at the appropriate level • communication strategies to include negotiation (patient, carers, interprofessional team members) • patient confidentiality and consent • legal and ethical framework of practice • documentation of policies and procedures e.g. electronic patient record systems • clinical examination procedures • clinical guidelines and standards	Should be sufficient to enable the: **Assistant practitioner** to initiate the procedure to protocol after patient have been properly assessed. **Practitioner** to use a range of information to safely and effectively assess patients for the particular intervention contributing to the development of protocols and can refer, where appropriate. **Advanced practitioner**, where appropriate, to use a range of information to access care for complex patients and to develop protocols for the integrated care pathway spanning professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to be accountable for development of patient assessment frameworks for the service.

Skill/Attribute	Illustrative Content	Levels of Knowledge and Understanding
Team-working and interprofessional practice	• organisation of health and social care • individual and team working practices • team dynamics and structure • interprofessional communication • task and role delegation • role development – legal implications • working effectively in collaboration with all members of the health and social care team • workload analysis • clinical supervision • models of decision making • National Service Frameworks, Care Groups and Collaboratives e.g. for cancer and coronary care	Should be sufficient to enable the: **Assistant practitioner** to understand and be part of team working practices. **Practitioner** to have a developed understanding of, and an ability to operate in, both individual and team working contexts. **Advanced practitioner**, where appropriate, to be able to form and lead teams and/or regularly operates across professional and/or organisational boundaries. **Consultant practitioner**, where appropriate, to be able to contribute to development and manage strategies for safe and effective interprofessional collaboration at local and national level.

SECTION B

DISCIPLINE SPECIFIC KNOWLEDGE AND UNDERSTANDING TO BE ACHIEVED AT THE FOUR LEVELS OF PRACTICE:

RADIOTHERAPY AND ONCOLOGY

Biological sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the structure and function of the human body in health and disease, with a particular emphasis on those body systems commonly encountered in their defined area of practice ● basic pathophysiological processes in relation to radiotherapy and oncology ● the radiobiological principles on which the practice of radiotherapy is based	Their level of knowledge should be sufficient to enable them to: ● select and use appropriate terminology ● understand the significance of the relationship between anatomy, physiology, the malignant disease process and defined radiotherapeutic applications ● implement identified pre-treatment / treatment procedures under protocol ● ensure that they can work safely under the supervision of registered practitioners and within relevant legal and professional frameworks
Practitioners need to possess a thorough and detailed knowledge and understanding of: ● the structure and function of the human body in health and disease, with particular emphasis on regional and cross-sectional anatomy of the head and trunk, histology, haematology, and the lymphatic and immune systems ● concurrent and common pathologies and mechanisms of disease ● the biochemical science of radiation pathophysiology ● the radiobiological principles on which the practice of radiotherapy is based	Their level of knowledge should be sufficient to enable them to: ● identify and respond to those situations that are outside the scope of practice of the assistant practitioner ● relate anatomy and pathophysiology to malignant disease processes and cancer management ● recognise and respond to both normal and aberrant anatomy and pathophysiology in routine clinical situations ● select, plan, implement, manage and evaluate care packages that account for individuals' health status, environment and needs ● ensure that consent given by patients to procedures is 'informed' ● apply their knowledge of hazards and biological effects of radiations to their practice within a risk-benefit philosophy and work within current legislation and regulations relating to radiation protection

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the structure and function of the human body in health and disease, with particular emphasis on anatomy and pathophysiology of strongest relevance to their specialist area of practice • the range of pathologies encountered within their specialist area of practice and associated mechanisms of disease • the biochemical science of radiation pathophysiology • radiobiological concepts and theories and the implications of radiation exposure within a broad range of contexts	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • develop and review care packages and strategies appropriate to their specialist area of practice • evaluate hazards and biological effects of radiations within a broad range of contexts and utilise this to underpin professional decision-making and risk management in practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • engage in the development and advancement of innovative practice • apply integrated knowledge and clinical governance principles to inform risk management across practice and care episodes

Physical sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the fundamental principles of radiation generation, interaction, modification and protection (including essential coverage of the requirements defined in schedule 2 of IR(ME)R 2000). There should be a particular emphasis on those principles strongly related to their defined area of practice	Their level of knowledge should be sufficient to enable them to: • adhere to the role of 'operator' in accordance with IR(ME)R 2000 • ensure the radiation safety of all individuals in their working environment • interpret the radiation prescription and treatment plan in such a way that procedures relevant to the defined area of practice are implemented safely and accurately under protocol • generate simple radiation dose delivery calculations relevant to their defined area of practice
Practitioners need to possess a thorough and detailed knowledge and understanding of: • the physical principles of radiation generation, interaction, modification and protection (including essential coverage of the requirements defined in schedule 2 of IR(ME)R 2000) • radiation dosimetry and the principles of dose calculation systems used within radiotherapy, including multidimensional computer modelling	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • distinguish between the prime roles described in IR(ME)R 2000 and competently perform both the 'practitioner' and 'operator' roles • ensure the radiation safety of all individuals in their working environment • undertake and evaluate radiation dose delivery calculations involving a range of radiation types and energies • undertake equipment testing and quality monitoring in own area of practice • generate a treatment plan and evaluate its accuracy, effectiveness and appropriateness in terms of the delivery of the optimal radiation prescription and with regard to practicality and patient compliance • interpret, monitor and evaluate the radiation prescription in its broadest context in such a way that radiotherapy is delivered accurately and reproducibly • manipulate exposure and image recording parameters to optimal effect for both pre-treatment and treatment imaging procedures • evaluate treatment and imaging modalities in relation to ensuring appropriateness to need

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the theoretical concepts and practical perspectives relating to radiation generation, interaction, modification and protection in their specialist area of practice • radiation dosimetry and the principles of dose calculation systems used within radiotherapy, including multidimensional computer modelling	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • take responsibility for the radiation safety of all individuals in their working environment • function as 'operator', 'practitioner' or 'referrer' as defined by IR(ME)R 2000 • develop and review pre-treatment and/or treatment procedures and strategies appropriate to their specialist area of practice • evaluate critically pre-treatment and/or treatment procedures and strategies within their specialist area of practice such that they make informed professional decisions regarding patient management, care and risk management
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • function as 'operator', 'practitioner' or 'referrer' as defined by IR(ME)R 2000 • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • engage in the development and advancement of innovative practice • evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely • apply integrated knowledge and clinical governance principles to inform risk management across practice and care episodes

Technology

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the capability, applications and range of technological equipment used in radiotherapy, with a particular emphasis on that used in their defined area of practice ● the basic principles of operation of equipment and technology used in the radiotherapy process, with a particular emphasis on that used in their defined area of practice	Their level of knowledge should be sufficient to enable them to: ● effectively operate radiotherapy and relevant imaging equipment under supervision and in their defined area of practice to ensure safety and accuracy ● use effectively the currently available information technology based systems employed in their defined area of practice ● follow protocols effectively in the event of faults and malfunctions or deviations from normal operation and be aware of the possible implications of such faults or deviations on treatment delivery and patient safety
Practitioners need to possess a thorough and detailed knowledge and understanding of: ● the capability, applications and range of technological equipment used in radiotherapy ● the principles of operation of equipment and technology used in the radiotherapy process ● current developments and trends in technology and its applications to radiotherapy	Their level of knowledge should be sufficient to enable them to: ● identify and respond to those situations that are outside the scope of practice of the assistant practitioner ● evaluate the contribution of advances in technology to developments in the management and treatment of malignant disease ● effectively operate radiotherapy equipment to ensure safety, accuracy and efficient usage. ● generate and evaluate clinically appropriate treatment plans ● evaluate delivery of radiotherapy through application and interpretation of treatment verification procedures ● use effectively the currently available information technology based systems employed in the radiotherapy process ● recognise faults and malfunctions or deviations from normal operation and the possible implications of such faults or deviations on treatment delivery

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the capability, applications and range of technological equipment used in their specialist area of practice • the principles of operation of equipment and technology used in their specialist area of practice • current developments and trends in technology and its applications to their specialist area of practice in particular and radiotherapy in general	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • develop and review pre-treatment and/or treatment procedures and strategies appropriate to their specialist area of practice • evaluate critically technology and technological advances in their specialist area of practice (including information technology based systems) in order to underpin professional decision-making • contribute to the planning, selection and purchase of new technology and associated facilities • develop and apply clinical testing in the implementation of new technology and related practice development • develop training packages and train and educate other staff in the use of technology in their specialist area of practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge, including development of new technology, within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • manage clinical case loads effectively • engage in the development and advancement of innovative practice, including evaluation of new technology • evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely • play a key role in identifying the need for new equipment and associated services

Clinical sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the risk-benefit principles involved in radiotherapy ● oncology, the pathophysiology of those common solid and systemic malignancies and the management of cancers routinely encountered in their defined area of practice ● the pharmacological basics of those drugs routinely used in their defined area of practice ● the principles underpinning moving and handling ● the principles underpinning emergency aid ● the principles underpinning assessment, monitoring and care of the patient before, during and after irradiation in their defined area of practice	Their level of knowledge should be sufficient to enable them to: ● implement identified pre-treatment / treatment procedures under protocol ● participate effectively within the multi-disciplinary healthcare team ● collate data and information relevant to the care and management of individuals in their area of practice ● offer the highest standards of care within their sphere of competence and in their defined area of practice ● make sound judgements in relation to their involvement in the radiotherapy process ● apply safe and effective moving and handling skills in order to protect all individuals ● demonstrate proficiency in basic life support skills and initiate resuscitation where necessary

Levels of knowledge and understanding

Practitioners need to possess a thorough and detailed knowledge and understanding of:

- the risk-benefit philosophy and principles involved in radiotherapy
- oncology, the pathophysiology of solid and systemic malignancies, epidemiology, aetiology, and the management and impact of cancer
- the pharmacology of drugs used in the relief of symptoms commonly encountered within the oncology setting, cytotoxic drugs, hormonal agents, imaging contrast agents and radiopharmaceuticals
- the methods of administration of drugs
- the role of the therapeutic radiographer in the promotion of health and health education in relation to cancer prevention and treatment and to the care pathway
- current developments and trends in cancer management and therapy
- the principles underpinning moving and handling
- the principles underpinning emergency aid
- the principles underpinning assessment, monitoring and care of the patient before, during and after irradiation

Outcomes to be achieved

Their level of knowledge should be sufficient to enable them to:

- identify and respond to those situations that are outside the scope of practice of the assistant practitioner
- select, plan, implement, manage and evaluate care packages that account for individuals' health status, environment and needs
- participate effectively in interprofessional approaches to oncology management
- analyse systematically and evaluate all data and information relevant to the care and management of individuals and groups in order to ensure the most appropriate management
- evaluate and schedule clinical workloads with regard to patient needs and resources
- offer the highest standards of care in both physical and psychological respects at all stages of the radiotherapy process in order to ensure effective procedures that ultimately achieve therapeutic health gains
- make informed, sensitive and ethically sound professional judgements in relation to each part of the radiotherapy process in which they are involved
- anticipate, identify and actively manage common and complex treatment related side effects
- ensure that consent given by patients to procedures is 'informed'
- apply safe and effective moving and handling skills in order to protect all individuals
- demonstrate proficiency in basic life support skills and initiate resuscitation where necessary
- safely introduce contrast agents into the body when appropriate
- assess patients' needs and where necessary refer to relevant health care professionals

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of all of the above with a particular emphasis on their specialist area of practice	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner, particularly in complex and/or unusual clinical scenarios • actively engage in interprofessional approaches to oncology management • develop, implement and review care packages and strategies appropriate to their specialist area of practice • evaluate critically care packages and strategies in their specialist area of practice in order to underpin professional decision making • train and educate other staff in aspects of cancer management, therapy and care in relation to their specialist area of practice • apply knowledge of activity and caseload, scheduling and resource management to minimise patient waiting times
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • work interprofessionally and across professional/organisational boundaries • manage case loads effectively • engage in the development and advancement of innovative practice • be accountable for care and apply integrated knowledge and clinical governance principles to inform care • evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely

Applications and techniques

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the basic principles underpinning the range of treatment techniques and applications encountered within the radiotherapy setting with a particular focus on techniques applied within their defined area of practice	Their level of knowledge should be sufficient to enable them to: • participate in pre-treatment and treatment procedures within their defined area of practice safely and accurately under protocol, and under the supervision of a registered practitioner
Taking in to consideration different client groups, **practitioners** need to possess: • a thorough and detailed knowledge and understanding of the principles and concepts underpinning the broad range of applications and techniques used to plan, treat, verify and evaluate malignancies and other diseases encountered within the oncology setting. This will include pre-treatment planning, dosimetry, external beam radiotherapy (including 3-dimensional and intensity modulated radiation therapy), brachytherapy, treatment verification • a knowledge and understanding of the principles and concepts underpinning more specialist applications and techniques including total body irradiation, stereotactic radiotherapy, intraoperative radiotherapy, radionuclide therapy, focussed ultrasound ablation, proton therapy, photo-dynamic therapy, biological and gene therapy, complementary therapies, patient review and assessment • knowledge and understanding of the influence of current trends and developments on applications and techniques in radiotherapy	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • select, plan, implement, manage and evaluate pre-treatment, treatment and post-treatment procedures and care safely and accurately and in such a way that they take account of individuals' health status, environment and needs • evaluate applications and techniques such that they are able to make informed professional judgements in relation to each part of the radiotherapy process in which they are involved • advise other professionals about suitability of various applications and techniques to individual patients with regard to needs and compliance

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • theoretical and practical perspectives relating to the applications and techniques used within the oncology setting in general and their specialist area of practice in particular • current trends and developments in applications and techniques used within the oncology setting in general and their specialist area of practice in particular	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner, particularly in complex and/or unusual scenarios • actively engage in interprofessional approaches to oncology management • develop, implement and review applications and techniques appropriate to their specialist area of practice • evaluate critically applications and techniques used in their specialist area of practice in order to underpin professional decision making • train and educate other staff in those applications and techniques encountered in their specialist area of practice • advise others on the appropriate applications and techniques in relation to their specialist area of practice • participate in peer review of their specialist area of practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient focused approach rooted in a multiprofessional perspective • work interprofessionally and across professional/organisational boundaries • manage case loads effectively • engage in the development and advancement of innovative practice • be accountable for care and clinical governance issues for their practice and sphere of influence • evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely

Behavioural and communication sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the basic principles of psychological, sociological and cultural factors relevant to health care in general and the oncology setting in particular • the impact of these factors on the care of those patients encountered within their defined area of practice • the principles and concepts relating to effective communication and teamwork	Their level of knowledge should be sufficient to enable them to: • care effectively for patients and their carers with due regard for human dignity, personal values, religious, cultural, ethnic and other diversity • identify the impact that cancer and its treatment may have upon the physical and psychological needs of patients • recognise the more explicit psychosocial needs of patients, their relatives and carers • apply effective interpersonal, communication and listening skills to routine situations within the scope of their practice and teamwork • communicate and collaborate inter- and intra-professionally in written and oral formats to ensure that care packages are implemented appropriately under protocol • use information technology skills to support their practice as appropriate

Levels of knowledge and understanding	Outcomes to be achieved
Practitioners need to possess a thorough and detailed knowledge and understanding of: • psychological, sociological and cultural factors, and their relevance and impact upon the management and care of patients with cancer and undergoing cancer treatment, particularly radiotherapy • the philosophies and dynamics of health, illness and healthcare in general • the principles and concepts relating to communication (including basic counselling skills) and teamwork	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • effectively care for patients and their carers with due regard for human dignity, personal values, ethical, religious, cultural, ethnic and other diversity so as to ensure equality • identify, assess and forward plan for the impact that cancer and its treatment may have upon the physical and psychological needs of patients • recognise, monitor and respond to the psychosocial needs of patients, their relatives and carers before, during and after radiotherapy • exercise highly developed interpersonal, communication and listening skills • provide support and information to patients and their carers in a timely, appropriate and sensitive manner • ensure that consent given by patients to procedures is 'informed' • communicate and collaborate inter and intra-professionally in written, oral and presentation formats to ensure that patients receive high quality and continuing care • evaluate and modify their own communication style appropriately according to the needs of the situation • use information technology to support practice as appropriate and respond to developments in information technology • train, assess, supervise and mentor effectively students, assistant practitioners and other less experienced staff • support the development of the team
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • psychological, sociological and cultural factors, and their relevance and impact upon the management and care of patients with cancer and undergoing cancer treatment, with a particular emphasis on their own specialist area of practice • the philosophies and dynamics of health, illness and healthcare in general with particular emphasis on oncology services and care pathway mechanisms • theoretical and practical perspectives relating to complex and/or contentious communication and teamwork issues	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • develop, implement and review care packages and strategies appropriate to their specialist area of practice • evaluate critically care packages and strategies in their specialist area of practice in order to underpin professional decision making • demonstrate effective clinical supervision, teaching and team leadership in their specialist area of practice • participate in peer review of their specialist area of practice • disseminate knowledge and best practice widely through lectures, publications, posters and other appropriate mechanisms

Levels of knowledge and understanding	Outcomes to be achieved
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to and communicate the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • work interprofessionally and across professional/organisational boundaries • exhibit excellent interpersonal skills in the clinical environment and demonstrate inspirational personal characteristics • exercise effective professional, clinical and team leadership within their discipline and, where necessary, across professional/organisational boundaries • contribute to and promote the education, training and continuing professional development of other staff and students, including other staff groups • lead dissemination of knowledge and best practice

Legislative, policy, ethical and research dimensions

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the legislative, ethical and policy frameworks that underpin, inform and influence radiotherapy practice. Particular emphasis should be placed on the legislation relating to the use of ionising radiation within the radiotherapy and oncology setting • the quality assurance processes and systems in place within their area of practice and their relationship to current legislation	Their level of knowledge should be sufficient to enable them to: • practise legally and ethically in all circumstances within their scope of practice • demonstrate personal responsibility in all circumstances • practise within local and national frameworks relating to their conduct • participate actively, under protocol, in quality assurance procedures and radiotherapy quality management systems • recognise and respond appropriately to their personal strengths and limitations in knowledge and competence

Levels of knowledge and understanding	Outcomes to be achieved
Practitioners need to possess a thorough and detailed knowledge and understanding of: • the legislative, policy, ethical and research frameworks that underpin, inform and influence the practice of therapeutic radiographers. Particular emphasis should be placed on the legislation relating to the use of ionising radiation within the radiotherapy and oncology setting • developments and trends in legislation and health and social care policy, with a focus on issues of particular relevance to radiotherapy and oncology serivces • the quality assurance processes and systems in place and their relationship to current legislation • the research process and research methodologies, and the principles of audit	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • practise legally, ethically and professionally in all circumstances and within an evidence-based framework • evaluate legal, ethical and professional issues and contribute towards the development of existing and evolving frameworks relevant to the profession • demonstrate personal accountability and appreciate the significance of professional regulation and responsibility • practise within the framework set out by the Society and College of Radiographers' *Statements for Professional Conduct* (2002), and the Health Professions Council's *Standards of Conduct, Performance and Ethics* (2003) • actively participate in and evaluate the effectiveness of quality assurance procedures and radiotherapy quality management systems • engage in research and development • interpret and evaluate the results of research and audit such that it informs and impacts positively on their practice • recognise and respond appropriately to their personal strengths and limitations in knowledge and competence
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the legislative, policy, ethical and research frameworks that underpin, inform and influence cancer therapy in general and their specialist area of practice in particular • developments and trends in legislation and health and social care policy, with a focus on issues of particular relevance to their own specialist area of practice • the quality assurance processes and systems in place and their relationship to current legislation • the research process, research methodologies, and audit	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • take responsibility for ensuring that all those working within their specialist area practise legally, ethically and professionally in all circumstances and within an evidence-based framework • interpret and translate relevant legal, ethical and professional frameworks in the development, implementation and review of evidence-based care packages and strategies within their specialist area of practice • interpret and evaluate critically legal, ethical and professional issues and the evidence base underpinning their specialist area of practice to inform professional decision making • demonstrate accountability and promote professional regulation and responsibility within the profession • evaluate critically the effectiveness of quality assurance procedures and radiotherapy quality management systems in their specialist area of practice • actively engage in research and development in order to contribute to the evidence base of their field

Levels of knowledge and understanding	Outcomes to be achieved
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • challenge current legal, ethical and professional frameworks where appropriate in order to identify professional/organisation barriers that limit/inhibit services • lead and collaborate on the development, implementation and review of protocols of care and patient care pathways • process complex, sensitive or contentious legal, ethical and policy issues in order to develop and implement strategic plans (including relevant national policies) which will drive change within their discipline and across the healthcare organisation • provide expert input into their organisation's quality strategy, including influencing and delivering clinical governance • be accountable for care and responsible for ensuring that legal, ethical and professional dimensions of practice are adhered to • evaluate, identify gaps in and integrate the evidence base into practice through an advanced level of clinical reasoning and decision making • initiate and lead research and audit and disseminate the outcomes in order that they enhance the evidence base and impact outside their local health care economy

SECTION B

DISCIPLINE SPECIFIC KNOWLEDGE AND UNDERSTANDING TO BE ACHIEVED AT THE FOUR LEVELS OF PRACTICE:

CLINICAL IMAGING

Biological sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the structure and function of the human body in health and disease, with particular emphasis on its demonstration on diagnostic images • common mechanisms of injury and disease and the resultant imaging appearances in relation to their own defined area of practice • basic radiobiological principles	Their level of knowledge should be sufficient to enable them to: • select and use appropriate terminology • implement identified procedures under protocol • understand the significance of the relationship between a set of medical images and the patient's medical history and presenting signs and symptoms • ensure that they can work safely under the supervision of a registered practitioner and within relevant regulations relating to radiation protection
Practitioners need to possess a thorough and detailed knowledge and understanding of: • human anatomy and physiology (including common variant anatomy) and its development from fetal life to old age with a particular emphasis on its demonstration on diagnostic images • common mechanisms of injury and disease, resulting trauma and pathologies and their resultant imaging appearances • the biochemical science of radiation pathophysiology • radiobiological principles	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • identify both normal and aberrant anatomy and pathophysiology on diagnostic images in routine clinical situations • interpret the results of imaging examinations • make informed clinical judgements regarding the adequacy of a set of medical images related to the patient's medical history and presenting signs and symptoms • ensure that consent given by patients to procedures is 'informed' • work within current legislation and regulations relating to radiation protection and apply the risk-benefit philosophy to radiation exposure to protect both individual patients and the population gene pool

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • human anatomy and physiology (including variant anatomy) with a particular emphasis on the demonstration of anatomy and pathophysiology on diagnostic images and of strongest relevance to their specialist area of practice • mechanisms of injury and disease, resulting trauma and pathologies and the resultant imaging appearances encountered within their specialist area of practice • the biochemical science of radiation pathophysiology • radiobiological concepts and theories and the implications of radiation exposure within a broad range of contexts	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • report on imaging examinations in their specialist area of practice • develop and review care packages and strategies appropriate to their specialist area of practice • evaluate hazards and biological effects of radiations within a broad range of contexts and utilise this to underpin professional decision making and risk management in practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession.	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • engage in the development and advancement of innovative practice • apply integrated knowledge and clinical governance principles to inform risk management across practice and care episodes

Physical sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the fundamental principles of radiation generation, interaction, modification and protection (including essential coverage of the requirements defined in schedule 2 of IR(ME)R 2000). There should be a particular emphasis on those principles strongly related to their defined area of practice ● the principles of radiation dose minimisation and dose limits of examinations carried out in their defined area of practice	Their level of knowledge should be sufficient to enable them to: ● ensure the radiation safety of all individuals in their working environment ● comply with current European and UK legislation and regulations pertaining to the medical use of radiations ● adhere to the role of 'operator' in accordance with IR(ME)R 2000 ● carry out imaging examinations in their defined area of practice in such a way that procedures relevant to the defined area of practice are implemented safely and accurately according to protocol ● manipulate exposure and image recording parameters under protocol ● assess the technical quality of images produced within own area of practice.
Practitioners need to possess a thorough and detailed knowledge and understanding of: ● the physical principles of radiation generation, interaction, modification and protection (including essential coverage of the requirements defined in schedule 2 of IR(ME)R 2000) ● radiation dosimetry and radiation dose minimisation as applied to diagnostic imaging procedures, and the radiation doses and dose limits of examinations carried out	Their level of knowledge should be sufficient to enable them to: ● identify and respond to those situations that are outside the scope of practice of the assistant practitioner ● articulate and integrate proficient radiation protection into all radiographic practice ● comply with current European and UK legislation and regulations pertaining to the medical use of radiations ● undertakes equipment testing and quality monitoring in own area of practice ● distinguish between the prime roles described in IR(ME)R 2000 and competently perform both the 'practitioner' and 'operator' roles ● ensure that any dose of radiation is properly justified and will result in a positive health gain ● select imaging modalities and techniques appropriate to need ● manipulate exposure and image recording parameters to optimal effect ● assess the quality of images produced and where necessary, carry out additional projections or imaging

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the theoretical concepts and practical perspectives relating to radiation generation, interaction, modification and protection in their specialist area of practice • radiation dosimetry and radiation dose minimisation as applied to their specialist area of practice, and the radiation doses and dose limits of examinations carried out	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • take responsibility for the radiation safety of all individuals in their working environment • develop and review imaging procedures and strategies appropriate to their specialist area of practice • evaluate critically imaging procedures and strategies within their specialist area of practice such that they make informed professional decisions regarding patient management, care and risk management • function as 'operator', 'practitioner' or 'referrer' as defined by IR(ME)R 2000
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	aTheir particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • function as 'operator', 'practitioner' or 'referrer' as defined by IR(ME)R 2000 • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective. • engage in the development and advancement of innovative practice • evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely • apply integrated knowledge and clinical governance principles to inform risk management across practice and care episodes

Technology

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the capability, applications and range of technological equipment used in clinical imaging, with a particular emphasis on that used in their defined area of practice ● he basic principles of operation of equipment and technology used in clinical imaging in their defined area of practice	Their level of knowledge should be sufficient to enable them to: ● use imaging technology safely and effectively under supervision and protocol ● utilise processing and related technology supporting film based imaging and computer based imaging systems ● use effectively the information technology based image acquisition, storage, retrieval and manipulation systems employed in their defined area of practice ● follow protocols effectively in the event of faults and malfunctions or deviations from normal operation and be aware of the manifestation of faults or deviations on that arise in their defined area of practice
Practitioners need to possess a thorough and detailed knowledge and understanding of: ● the capability, applications and range of technological equipment used in clinical imaging ● the principles of safe operation of equipment and technology used in clinical imaging ● current developments and trends in technology and their applications to clinical imaging	Their level of knowledge should be sufficient to enable them to: ● identify and respond to those situations that are outside the scope of practice of the assistant practitioner ● evaluate technology used in clinical imaging and intervention ● use imaging technology safely and effectively to maximise diagnostic outcome and minimise radiation detriment ● utilise to best effect processing and related technology supporting film based imaging and computer based imaging systems ● use effectively information technology based image acquisition, storage, retrieval and manipulation systems currently available ● recognise faults and malfunctions or deviations from normal operation and the possible implications of such faults or deviations on imaging outcomes

Levels of knowledge and understanding	Outcomes to be achieved
Applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: ● the capability, applications and range of technological equipment used in their specialist area of practice ● the principles of operation of equipment and technology used in their specialist area of practice ● current developments and trends in technology and its applications to their specialist area of practice in particular and clinical imaging in general	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: ● identify and respond to those situations that are outside the scope of practice of the practitioner ● develop and review imaging procedures and strategies appropriate to their specialist area of practice ● evaluate critically technology and technological advances in their specialist area of practice (including information technology based systems) in order to underpin professional decision making ● contribute to the planning, selection and purchase of new technology and associated facilities ● develop and apply clinical testing in the implementation of new technology and related practice development ● develop training packages and train and educate other staff in the use of technology in their specialist area of practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge, including development of new technology, within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: ● identify and respond to those situations that are outside the scope of practice of the advanced practitioner ● exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains ● manage clinical case loads effectively ● engage in the development and advancement of innovative practice, including evaluation of new technology ● evaluate, identify gaps in and integrate the evidence base into practice such that they can exercise expert professional judgements routinely ● play a key role in identifying the need for new equipment and associated services

Clinical sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the risk-benefit philosophy as applied to radiation exposure • the scientific basis for examinations and treatments used in their defined area of practice • the pharmacological basics of drugs commonly encountered within those imaging settings relevant to their defined area of practice and with a particular emphasis on contrast agents • the principles underpinning moving and handling • the principles underpinning emergency aid • the principles underpinning assessment, monitoring and care of the patient before, during and after examination in their defined area of practice	Their level of knowledge should be sufficient to enable them to: • implement identified procedures under supervision and protocol • participate effectively within the multi-disciplinary healthcare team • collate data and information relevant to the care and management of patients in their defined area of practice • offer the highest standards of care within their sphere of competence and in their defined area of practice • make informed, sensitive and ethically sound judgements in relation to their involvement in those imaging procedures within their scope of practice • apply safe and effective moving and handling skills in order to protect all individuals • demonstrate proficiency in basic life support skills and initiate resuscitation where necessary
Practitioners need to possess a thorough and detailed knowledge and understanding of: • the risk-benefit philosophy as applied to radiation exposure • the scientific basis for imaging examinations and interventions • the pharmacology of drugs commonly encountered within imaging settings with a particular emphasis on contrast agents, associated drugs and radiopharmaceuticals • the methods of administration of drugs. • the role of the diagnostic radiographer in the promotion of health, health education and health screening • current developments and trends in the science and practice of diagnostic radiography • the principles underpinning moving and handling • the principles underpinning emergency aid • the principles underpinning assessment, monitoring and care of the patient before, during and after examination	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • select, plan, implement, manage and evaluate imaging procedures that are appropriate to, and take account of, individuals' health status, environment and needs • participate effectively within multi-professional health care and multi-agency teams, and in health care environments both within and outside clinical imaging services • analyse systematically, evaluate and act upon all data and information relevant to the care and management of the patient • select imaging modalities and techniques appropriate to the patient's needs • assess patients needs and where necessary refer to other relevant health care professional • offer the highest standards of care in both physical and psychological respects in all aspects of examinations and interventions in order to ensure effective procedures that ultimately achieve measurable health gains • make informed, sensitive and ethically sound professional judgements in relation to imaging procedures in which they are involved • ensure that consent given by patients to procedures is 'informed' • apply safe and effective moving and handling skills in order to protect all individuals • demonstrate proficiency in basic life support skills and initiate resuscitation where necessary • safely introduce contrast agents into the body when appropriate

Levels of knowledge and understanding	Outcomes to be achieved
Applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of all of the above with a particular emphasis on their specialist area of practice	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner, particularly in complex and/or unusual clinical scenarios • actively engage in multi-professional health care and multi-agency teams, and in health care environments both within and outside of clinical imaging services • develop, implement and review care packages and strategies appropriate to their specialist area of practice • evaluate critically care packages and strategies in their specialist area of practice in order to underpin professional decision making • train and educate other staff in relevant clinical aspects of their specialist area of practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multi-professional perspective • work interprofessionally and across professional/organisational boundaries • manage case loads effectively • engage in the development and advancement of innovative practice • be accountable for care and clinical governance issues for their practice and sphere of influence • evaluate, identify gaps in, and integrate the evidence base into, practice such that they can exercise expert professional judgements routinely

Applications and techniques

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the basic principles underpinning the range of techniques and applications encountered in their defined area of practice within the imaging setting	Their level of knowledge should be sufficient to enable them to: • participate in procedures within their defined area of practice safely and accurately under protocol, and under the supervision of registered practitioners
Taking in to consideration different client groups, **Practitioners** need to possess: • a thorough and detailed knowledge and understanding of the principles and concepts underpinning the broad range of applications and techniques used for imaging. This will include projections and examinations of appendicular and axial skeleton; projections of chest, abdomen and soft tissue structures (including mammography); standard contrast agent examinations (including IVU and GI tract); fluoroscopy; mobile radiography; operating theatres; dental radiography; computed tomography • a knowledge and understanding of the principles and concepts underpinning magnetic resonance, nuclear medicine, ultrasound, positron emission tomography, forensic, lithotripsy, bone densitometry, invasive and interventional procedures • a knowledge and understanding of how current trends and developments are influencing applications and techniques in clinical imaging	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • perform the full range of plain film and standard contrast agent examinations, including those requiring to be undertaken on patients suffering from acute trauma, and where the patient's medical, physical or mental health needs require examinations to be carried out in non-standard imaging environments • manage and assist with fluoroscopic and complex contrast agent procedures • undertake computed tomographic examinations of the head, neck, chest and abdomen in acute trauma cases, and contribute effectively to other computed tomographic studies • evaluate imaging modalities, applications and techniques such that they are able to make informed professional judgements in relation to imaging and intervention procedures • advise appropriately other health care professionals about the relevance and application of other imaging modalities to the patient's needs

Levels of knowledge and understanding	Outcomes to be achieved
Applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • theoretical and practical perspectives relating to the applications and techniques used within the clinical imaging setting in general and their specialist area of practice in particular • current trends and developments in applications and techniques used within clinical imaging in general and their specialist area of practice in particular	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner, particularly in complex and/or unusual scenarios • perform imaging examinations and interventions in those environments and/or using those modalities normally outside the scope of the practitioner as outlined above • develop, implement and review applications and techniques appropriate to their specialist area of practice • evaluate critically applications and techniques used in their specialist area of practice in order to underpin professional decision making • train and educate other staff in those applications and techniques encountered in their specialist area of practice • participate in peer review of their specialist area of practice
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multiprofessional perspective • work interprofessionally and across professional/organisational boundaries • manage case loads effectively • engage in the development and advancement of innovative practice • be accountable for care • evaluate, identify gaps in, and integrate the evidence base into, practice such that they can exercise expert professional judgements routinely

Behavioural and communication sciences

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: • the basic principles of psychological, sociological and cultural factors relevant to health care, clinical imaging in general and their defined area of practice in particular • the impact of these factors on the care of those patients encountered within their defined area of practice • the principles and concepts relating to communication and teamwork	Their level of knowledge should be sufficient to enable them to: • care effectively for patients and their carers with due regard for human dignity, personal values, ethics, religion, cultural, ethnic and other diversity • be aware of the psychology of illness, anxiety and uncertainty and likely behaviour of patients (and carers) routinely encountered within their defined area of practice • apply effective interpersonal, communication and listening skills to routine situations within the scope of their practice • communicate and collaborate inter and intra-professionally in written and oral formats to ensure that identified procedures are implemented appropriately under protocol • use information technology skills to support their practice as appropriate and respond to developments in information technology
Practitioners need to possess a thorough and detailed knowledge and understanding of: • psychological, sociological and cultural factors, and their relevance and impact upon the management and care of patients undergoing imaging procedures and interventions • the dynamics of health, illness and healthcare in general • the principles and concepts relating to communication and teamwork	Their level of knowledge should be sufficient to enable them to: • identify and respond to those situations that are outside the scope of practice of the assistant practitioner • effectively care for patients and their carers with due regard for human dignity, personal values, ethics, religion, cultural, ethnic and other diversity, ensuring equality • be aware of and respond to the psychology of illness, anxiety and uncertainty and the likely behaviour of patients undergoing imaging procedures, as well as that of their carers • exercise highly developed interpersonal, communication and listening skills • provide support and information to patients and their carers in a timely, appropriate and sensitive manner • ensure that consent given by patients to procedures is 'informed' • communicate and collaborate inter and intra-professionally in written, oral and presentation formats to ensure that patients receive high quality and continuing care • evaluate and modify their own communication style appropriately according to the needs of the situation • use information technology to support practice as appropriate and respond to developments in information technology • supervise and mentor effectively students, assistant practitioners and less experienced staff

Levels of knowledge and understanding	Outcomes to be achieved
Applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • psychological, sociological and cultural factors, and their relevance and impact upon the management and care of patients undergoing imaging procedures and interventions, with a particular emphasis on their own specialist area of practice • the philosophies and dynamics of health, illness and healthcare in general • theoretical and practical perspectives relating to complex and/or contentious communication and teamwork issues	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • develop, implement and review care packages and strategies appropriate to their specialist area of practice • evaluate critically care packages and strategies in their specialist area of practice in order to underpin professional decision making • demonstrate effective clinical supervision, teaching and team leadership in their specialist area of practice • participate in peer review of their specialist area of practice • disseminate knowledge and best practice widely through lectures, publications, posters and other appropriate mechanisms
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • exhibit expert clinical practice in managing complete episodes of care that lead to satisfactory patient outcomes and/or health gains • deliver a whole system patient-focused approach rooted in a multiprofessional perspective • work interprofessionally and across professional/organisational boundaries • exhibit excellent interpersonal skills in the clinical environment and demonstrate inspirational personal characteristics • exercise effective professional, clinical and team leadership within their discipline and, where necessary, across professional/organisational boundaries • contribute to and promote the education, training and continuing professional development of other staff and students including other staff groups • lead dissemination of knowledge and best practice

Legislative, policy, ethical and research dimensions

Levels of knowledge and understanding	Outcomes to be achieved
Assistant practitioners need to possess a knowledge and understanding of: ● the legislative, ethical and policy frameworks that underpin, inform and influence clinical imaging in general and their defined area of practice in particular. Where appropriate, particular emphasis should be placed on the legislation relating to the use of radiations within the clinical imaging setting ● the quality assurance processes and systems in place within their area of practice and their relationship to current legislation	Their level of knowledge should be sufficient to enable them to: ● practise legally and ethically in all circumstances within their scope of practice ● demonstrate personal responsibility in all circumstances ● practise within local and national frameworks relating to their conduct ● participate actively, under protocol, in quality assurance procedures and quality management systems ● recognise and respond appropriately to their personal strengths and limitations in knowledge and competence
Practitioners need to possess a thorough and detailed knowledge and understanding of: ● the legislative, policy and ethical frameworks that underpin, inform and influence the practice of diagnostic radiographers. Particular emphasis should be placed on the legislation relating to the use of radiations within the clinical imaging setting ● developments and trends in legislation and health and social care policy, with a focus on issues of particular relevance to clinical imaging services ● the quality assurance processes and systems in place and their relationship to current legislation ● the research process, research methodologies, and the principles of audit	Their level of knowledge should be sufficient to enable them to: ● identify and respond to those situations that are outside the scope of practice of the assistant practitioner ● practise legally, ethically and professionally in all circumstances ● evaluate legal, ethical and professional issues and contribute towards the development of existing and evolving frameworks relevant to the profession ● demonstrate personal accountability and appreciate the significance of professional regulation and responsibility ● practise within the framework set out by the Society and College of Radiographers' *Statements for Professional Conduct* (2002), and the Health Professions Council's *Standards of Conduct, Performance and Ethics* (2003) ● actively participate in and evaluate the effectiveness of quality assurance procedures and relevant quality management systems ● engage in research and development ● interpret and evaluate the results of research and audit such that it informs and impacts positively on their practice ● recognise and respond appropriately to personal strengths and limitations in knowledge and competence

Levels of knowledge and understanding	Outcomes to be achieved
Where applicable to their particular area of practice, **advanced practitioners** need to possess a highly specialised and detailed knowledge and understanding of: • the legislative, policy, ethical and research frameworks that underpin, inform and influence clinical imaging in general and their specialist area of practice in particular • developments and trends in legislation and health and social care policy, with a focus on issues of particular relevance to their own specialist area of practice • the quality assurance processes and systems in place and their relationship to current legislation • the research process, research methodologies, and audit	Their level of knowledge should be sufficient to enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the practitioner • take responsibility for ensuring that all those working within their specialist area practise legally, ethically and professionally in all circumstances and within an evidence-based framework • interpret and translate relevant legal, ethical and professional frameworks in the development, implementation and review of evidence-based care packages and strategies within their specialist area of practice • interpret and evaluate critically legal, ethical and professional issues and the evidence base underpinning their specialist area of practice to inform professional decision making • demonstrate accountability and promote professional self regulation and responsibility within the profession • evaluate critically the effectiveness of quality assurance procedures and quality management systems in their specialist area of practice • actively engage in research and development in order to contribute to the evidence base of their field
Consultant practitioners will possess advanced knowledge and understanding of all the above and, where appropriate, contribute to the generation of new theoretical and practical knowledge within their profession	Their particular depth and breadth of knowledge and expertise will enable them, **where appropriate**, to: • identify and respond to those situations that are outside the scope of practice of the advanced practitioner • challenge current legal, ethical and professional frameworks, where appropriate, in order to identify professional and or organisation barriers that limit and or inhibit services • lead and collaborate on the development, implementation and review of protocols of care and patient care pathways • process complex, sensitive or contentious legal, ethical and policy issues in order to develop and implement strategic plans (including relevant national policies) which will drive change within their discipline and across the healthcare organisation • provide expert input into their organisation's quality strategy, including influencing and delivering clinical governance • be accountable for care and responsible for ensuring that legal, ethical and professional dimensions of practice are adhered to • evaluate, identify gaps in, and integrate the evidence base into, practice through an advanced level of clinical reasoning and decision making • initiate and lead research and audit and disseminate the outcomes in order that they enhance the evidence base and impact outside their local health care economy

Appendix A
Radiography Service Functions

Within radiotherapy and oncology and clinical imaging services radiographers take key roles in delivering the following service functions.

(These have been derived from the functional maps, which underpinned the development of occupational standards for the radiotherapy and oncology and clinical imaging domains).

1. Establishment and maintenance of individual patient pathway

- Monitor and maintain appointment service e.g. communication, information management and technology
- Assess patient/client and allocate to protocol as appropriate, e.g. IR(ME)R justification
- Obtain informed consent for procedure
- Provide patient support, assessment and care process as part of integrated multi-disciplinary team

2. Management of equipment for the service

- Commission, purchase and de-commission equipment/sealed and unsealed sources
- Quality assure equipment and processes e.g. QA checks and QA management systems
- Develop and maintain supporting systems e.g. use of digital technology
- Advise on optimal use of equipment e.g. adverse incident/non-compliance reporting.

3 Management of the workforce and service

- Manage services e.g. evaluate demand, continuous quality improvements
- Manage people e.g. skills mix and inter-professional team working, performance management
- Manage resources e.g. recruitment and retention, financial, negotiate agreed priorities and plan
- Manage information e.g. policies and procedures

4 Provision of the radiotherapy pre- treatment process

- Identification and specification of areas for treatment e.g. simulation, CT planning, treatment volume delineation
- Devising and verifying individualised treatment e.g. portal imaging
- Treatment planning processes e.g. calculation and prescription preparation for standard and specialist procedures
- Commission and production of treatment specific accessories e.g. calibration of sealed and unsealed sources, immobilisation devices

5 Delivery of radiotherapy treatments

- Preparation for treatment e.g. setting and accepting treatment parameters
- Dosage/treatment delivery
- Patient assessment and review
- Delivering individualised programmes of care e.g. multi-disciplinary care plans, radiographer led delivery

4 Provision of preparatory support for clinical imaging services

- Identification and specification of the examination
- Assessment of referral and justification of the examination
- Supply and administration of radiological contrast agents
- Commission and production of treatment specific accessories e.g. calibration of sealed and unsealed sources and immobilisation aids

5 Delivery of clinical imaging examinations and/or treatments

- Preparation for examination/treatment e.g. positioning
- Acquiring and processing the image
- Performing the interventional procedure, if appropriate
- Care of patient before, during and after examination e.g. transmitting sensitive and contentious information
- Evaluation and reporting of findings of examinations

6. Research and development for the service

- Development of local research and development strategies e.g. identification of need and participation in trials
- Dissemination and implementation of research outcomes
- Audit of research activities and implementation of evidence in practice

7. Establishment and maintenance of a safe environment

- Development of local health and safety guidelines and procedures e.g. safety framework for radiation activities, general risk assessments.

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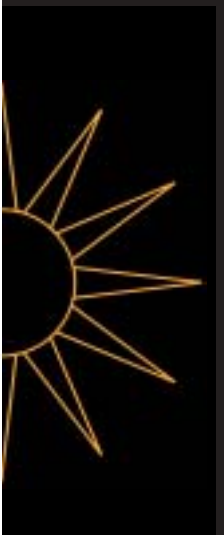

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