



The Society & College of
Radiographers

The role of the radiographer in Magnetic Resonance Imaging

Introduction

Magnetic Resonance Imaging (MRI) is an ever-advancing technology. Since its introduction into mainstream imaging departments in the UK in the late 1980s, the growth in MRI has been rapid culminating in it becoming the preferred imaging modality for many investigations. Advances in magnet design, Radio Frequency (RF) technology and the increasing availability of high field strength systems means that techniques such as cardiac, functional and interventional MRI to name a few are available in many imaging departments. The scope of radiographic practice within MRI continues to broaden, with highly specialised and knowledgeable radiographers providing this essential imaging service.

Clinical applications of MRI

MRI produces extremely detailed images of soft tissue and anatomical structures making it ideal for imaging the brain, spine, and joints. It plays an important role in imaging patients with conditions such as stroke, epilepsy, dementia and brain tumours, and the development of functional MRI which assesses brain function has led to a greater understanding of how our brain works. There are centres performing intra-operative MRI allowing neurosurgeons to remove brain tumours with higher accuracy.

In abdominal imaging, MRI is frequently the first line investigation. It plays an important role in the diagnosis and characterisation of liver tumours. MRI is the investigation of choice for accurate staging of prostate cancers. It can also evaluate the response to treatment for patients with breast cancer. Techniques in whole body imaging are developing which will be most useful for imaging patients with cancers.

The use of MRI in imaging vascular structures has improved the patient experience as it is a minimally invasive technique (e.g. in imaging the heart, aorta and the arteries supplying the kidneys and digestive tract) and is a tool for diagnosing various vascular problems.

Interventional MRI techniques include its use in accurately locating uterine fibroids and allowing them to be destroyed by directing a high intensity ultrasound beam.

There are many applications and potential applications for MRI all requiring radiographers who are able to build upon their core skills and knowledge to carry out these specialised imaging techniques.

Knowledge and skills

Radiographers registered with the Health and Care Professions Council (HCPC) specialising in MRI need to build upon their pre registration knowledge gained in anatomy, physiology, pathology recognition and technology in order to effectively deliver high quality services for patients. They are required to have a highly developed understanding of the physical principles of MRI and a detailed anatomical knowledge including micro anatomical structures now demonstrated by higher field strength magnets. In order to produce high quality images, they must also understand the

The radiography workforce delivers diagnostic imaging and radiotherapy services in a range of health and social care settings across the UK. Radiographers are pivotal to delivering fast and reliable diagnoses of disease, as well as curative and palliative treatment and care for patients with cancer. A large majority of patients will be referred for imaging during their treatment and radiographers are key to the delivery of successful clinical outcomes.

The Society and College of Radiographers (SCoR) is a professional body and trade union. With more than 90% of the radiography workforce in membership, it represents the entire profession. It shapes the healthcare agenda and leads opinion on a wide range of professional issues, setting standards and developing policies that are adopted and acclaimed by governments and health professionals worldwide.

The SCoR pioneers new ways of working and ensures that its members work in a safe and fair environment. Its activities are designed to ensure that patients receive the best possible care.

The SCoR believes that:

- Every patient must have the right diagnostic examination, at the right time, undertaken by the most appropriate person, using the right equipment to the best possible standard and with timely results to inform the outcome.
- Every cancer patient must be able to be in control of decisions about their care and have access to the most effective treatment, delivered at the right time and by the most appropriate person.

“MRI radiographers are highly skilled, HCPC registered professionals. To provide safe and effective services for patients, they require detailed knowledge and understanding of the physical principles and safety aspects of MRI.”

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structure and function of organs and systems within the human body and of contrast agents and other drugs utilised in MRI.

The high static magnetic fields used in MRI present significant safety considerations and require radiographers to have extensive knowledge and understanding related to MRI safety. This knowledge ensures the safety of patients and others entering the MR environment.

Undergoing an MRI examination can be quite daunting to patients, with relatively long examination times. Radiographers in MRI are required to have highly developed soft skills particularly in effectively managing patients who may be claustrophobic and anxious. They will build upon their pre registration training in patient care and their understanding of MRI in the patient pathway. Radiographers can administer oral sedation to those patients with severe anxiety and claustrophobia issues. They can successfully deal with those patients who are needle-phobic during the administration of intravenous contrast.

The role of the radiographer

The increase in the scope of MRI applications means that radiographers have extended their roles to incorporate advanced techniques. For example, within the field of vascular imaging, MR Angiography (MRA) techniques are used for the assessment of peripheral arteries, thoracic vessels, coronary arteries and for pulmonary vein evaluation. Perfusion Cardiac MR is a technique used for perfusion and ischaemia testing, as well as the diagnosis of coronary heart disease, heart valve problems and congenital heart defects. The radiographers' core skills enable new and advanced techniques to be implemented effectively and efficiently for improved patient outcomes.

Advanced practitioner radiographers are now routinely reporting many MRI investigations. These reporting radiographers have undergone extensive post registration training in clinical reporting of lumbar spine, knees and internal auditory Meatus (IAM) and, in some cases, of brains and cervical and thoracic spines. The reporting radiographer also has the skill set to report urgent and non urgent cases and to offer clinical advice to clinicians and other health professionals with regards to the above examinations enabling streamlined care. They will also advise on whether the exam is appropriate and offer guidance on alternative imaging if necessary.

MRI research radiographers are involved in clinical and academic research, both in hospitals and university academic settings. Their roles vary from posts such as academic educators and researchers, clinical research radiographers (either with sole responsibility for their own research or working in a multi-disciplinary team), or research managers working as trial coordinators or managing research governance.

Management MRI radiographers lead and evaluate service development for this modality. This is underpinned by the implementation of NHS quality improvement strategies, benchmarking, departmental audit and integrated care pathways.

Summary

MRI radiographers are highly skilled, HCPC registered professionals. In order to provide safe and effective services for patients, they require detailed knowledge and understanding of the physical principles of MRI and the safety aspects relating to MRI. Following qualification, they must build on their pre registration training to extend their anatomical knowledge of structures in all imaging planes alongside developing more detailed expertise in the understanding of physiology and pathologies. Radiographers have extended their practice in MRI to include reporting and continue to develop highly specialised advanced skills in the fields of cardiology, neurology and oncology; in research, and in functional and interventional MR Imaging. The radiographers' core skills enable new and advanced techniques to be implemented effectively and efficiently for improved patient outcomes.

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