

# Can you see your future in radiology?

Become part of a specialty that is the guiding force behind modern healthcare.



[rcr.ac.uk](http://rcr.ac.uk)

# What is clinical radiology?

Clinical radiology is commonly misunderstood by the public, at medical school and even among junior doctors, many of who might think that it is limited to simple X-rays and possibly computed tomography (CT) scans.

Indeed radiology has arguably been a mystery since those early days in the late 1800s, when Roentgen produced the first image and called the rays 'X-rays' using 'X' to portray the unknown nature of the rays. Although the principle of radiograph (X-ray) production has remained the same, the applications to what we now call clinical radiology have evolved

quite considerably. Modern day clinical radiology is a branch of medicine that uses various imaging techniques to diagnose and treat various medical conditions.

Although originally based on X-rays, clinical imaging now encompasses other newer imaging techniques (modalities) which do not involve radiation. The main modalities in use are listed below.

<b>Plain radiographs</b>	X-rays
<b>Computed tomography</b>	CT scans
<b>Fluoroscopy</b>	Similar to plain X-rays. In fluoroscopy, multiple X-rays are taken at high frequency to create a cine loop which can be viewed in real time. This is especially useful in interventional radiology to guide placement of needles and other instruments.
<b>Magnetic resonance imaging (MRI)</b>	Uses magnetic fields and radio waves to produce tomographic (imaging by section) anatomical images. It produces excellent soft tissue resolution and has become the workhorse of pelvic, gynaecological, musculoskeletal (MSK) and neuro imaging. MRI is preferred in cases where the effects of radiation are deemed too risky, for example, occasionally in pregnancy or paediatric patients.
<b>Nuclear imaging</b>	Whereas the other modalities are primarily used to assess structural anatomy, nuclear imaging assesses physiological processes altered by disease. This is achieved by injecting a small amount of radioactive material into the bloodstream, which is then disproportionately absorbed into the diseased organs. The tracer then emits gamma rays, processed by a gamma camera, to produce images. The main application of nuclear medicine is in cancer imaging to determine disease metastases or to evaluate glandular function.
<b>Ultrasound</b>	Uses sound waves; applications include paediatric patients where radiation is less favoured and because young patients are unable to lie still for an MRI and for many other patients before proceeding to CT.

*\*Combining different modalities is also now common practice, for example, positron emission tomography-computed tomography (PET-CT) and positron emission tomography-magnetic resonance imaging (PET-MR).*

## 2 Can you see your future in radiology?

## Why clinical radiology?

Clinical radiology is one of the most rapidly advancing and technical specialities in medicine. With the development of new radiological techniques and the increasing dependence on imaging throughout the hospital, this is one of the most exciting times to join this expanding specialty. The training in clinical radiology is also renowned for being of a very high quality and is largely consultant led, which means radiology trainees are some of the most content and well supported in the hospital.

If you are looking for a specialty which is challenging, satisfying and innovative, with general training that also allows for specialisation, then this could be the path for you. Radiologists tend to be problem-solvers with broad clinical knowledge and a keen eye for detail. They also have good communication skills – necessary because they are often the ‘go-to person’ for other clinicians with a clinically challenging patient, and therefore play an integral role in all aspects of patient care.

There can be limited patient contact at times, but this is a changing perception and reality, and is especially not true in areas such as interventional radiology and those that are more procedure-focused, such as musculoskeletal and breast radiology. In the reporting room and elsewhere in the hospital, the radiologists work as a team and often turn to each other for advice and a second opinion, so there are plenty of opportunities for team-working and building relationships with like-minded colleagues.

**The pace of change within radiology is so rapid that we can expect to see ever more advances in imaging techniques, such as molecular and functional imaging.**



# Uncovering the truth about radiology

There are lots of misconceptions about radiology – this myth-busting section sets the record straight.

## 1 Radiologists have no patient contact

This is perhaps the biggest misconception that doctors considering a career in radiology often have. However, when compared to other specialties, one might be surprised at how little difference there is when it comes to patient contact. Many aspects of radiology involve interacting and engaging with patients; the most obvious are the ultrasound sessions which involve direct interaction, but there are also many other areas that are becoming increasingly popular – namely MSK (musculoskeletal) radiology, bone biopsies and interventional radiology. Certainly, there are times where there is no patient contact, such as reporting sessions and multidisciplinary team meeting (MDT) preparation, but clinical radiology offers a diverse working pattern, with opportunities for both team and independent working. Additionally, in those situations where patient contact may not take place, radiologists are not working solo – they are always collaborating closely with fellow clinicians and other doctors.

## 2 Radiologists spend all day in a dark room

This is another one of those BIG misconceptions about radiology. Reporting and MDT sessions are just one element of a clinical radiologist's role; therefore it is categorically not the case that they spend all day every day in front of a computer without seeing anyone!

## 3 Radiologists are not 'clinicians'

Most of radiology is about being a clinician. Now, more than ever before, radiologists are responsible for patient welfare. All significant findings are reported to the referring team immediately once the diagnosis is made. The 'hot seat' or 'duty' radiologist spends most of their time speaking to clinicians about how best to image their patient and come to a diagnosis, collaboratively solving clinical conundrums. This requires a breadth of subspecialist knowledge that is not required of any other team in the hospital but without which, relevant clinical discussions/discourse could not be had about the variety of pathologies encountered. In short, without a radiologist present in multidisciplinary meetings, no real decision about clinical management of a patient can be made, it is therefore crucial that radiologists have a good understanding of patient priorities and care.

## 4 Radiologists are not sociable

Most radiology training programmes have a large number of registrars – the majority of who you train with for 5–6 years. As such, they become quite a tight-knit community, sharing the experiences involved in learning radiology and working towards key milestones in training, such as FRCR exams. Colleagues are your 'work family' – they are a very sociable bunch!

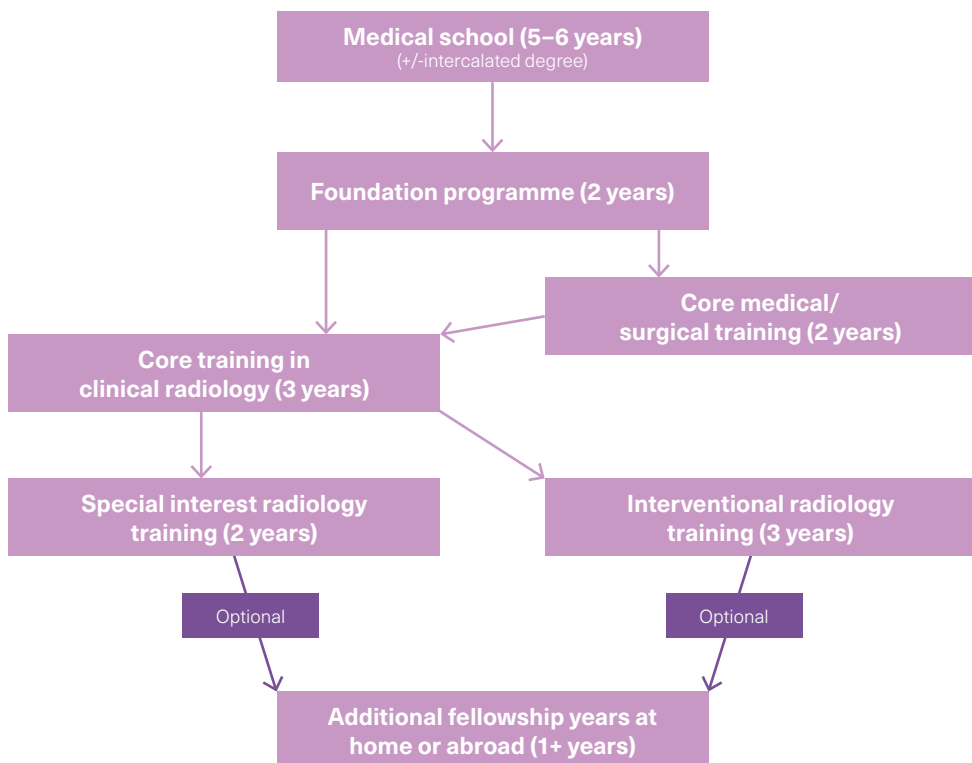
# How do I become a clinical radiologist?

Clinical radiology is among the most diverse and rewarding specialties available, particularly as imaging has become increasingly indispensable to patient care.

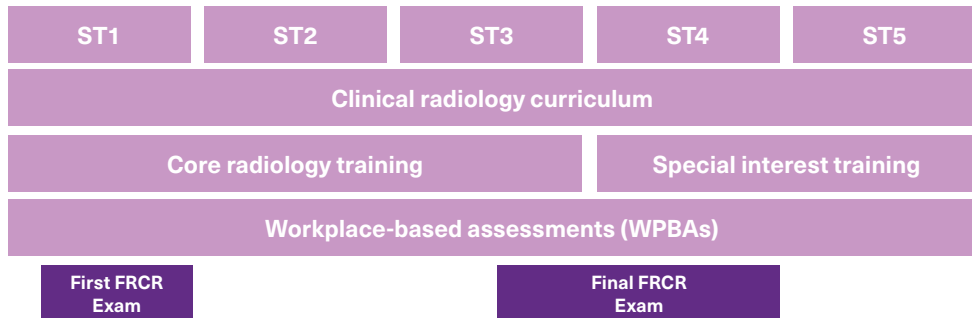
Given the increasing popularity of radiology as a career, selection is competitive and showing an early interest in the specialty through courses, audit and project work is always seen favourably.

However, radiology relies on a good grounding in and understanding of many specialties, so experience in other areas is never amiss – you will often find there is a radiological component somewhere.

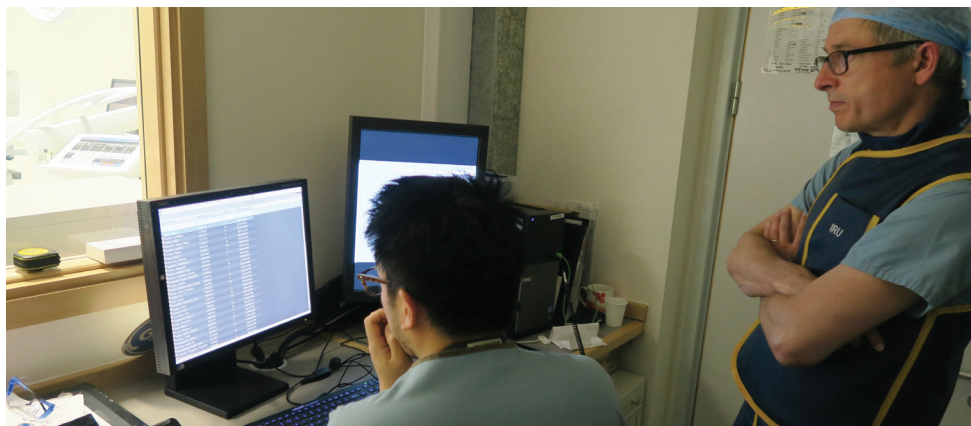
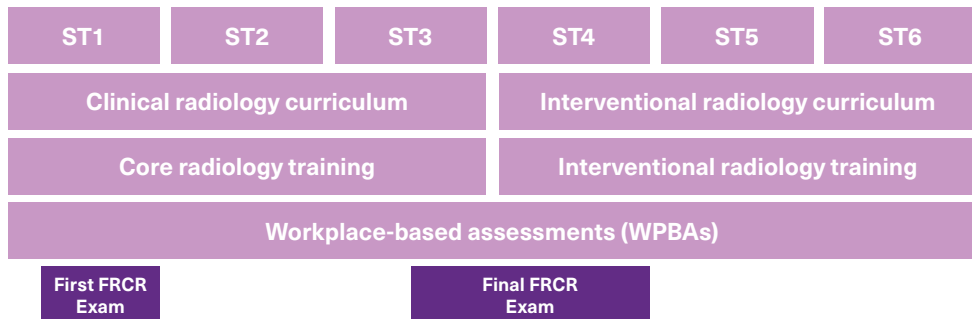
**The conventional steps involved in becoming a clinical or interventional radiologist are as follows:**



## Clinical radiology training pathway



## Clinical radiology with subspecialty in interventional training pathway



# My journey into clinical radiology

Roma Patel, ST1



Selecting your specialty is potentially the biggest challenge of your career.

When the time for applications arrived, I found myself undecided so I took a year out of training. I pursued my interests in medical education and used the time to make an informed decision about my future specialty.

I enjoyed making a diagnosis – the fundamental aspect of medicine – offering treatment through procedural interventions and problem solving and teaching. I wanted a multifarious specialty that would constantly expand my knowledge. Once I realised this, there was only one specialty central to my interests – clinical radiology.

Clinical radiology provides trainees with the perfect mix of diagnostics and interventions. Offering flexibility based on clinical interests, radiology today is a far cry from the 'sit in a dark room' myth. It is absolutely central to patient care and to the future development of our health service.

Entry into radiology is competitive and requires drive and motivation. I completed a taster week in both a district general and a teaching hospital to assess my level of interest in the specialty.

I also completed and presented a radiology based clinical audit and conducted radiology teaching for medical students. Putting in this extra effort helped me to secure a clinical radiology national training number.

Training begins at a very welcoming pace and finishing on time and having regular consultant led teaching are the norm. Your role as a first year registrar is highly supervised. Unlike many other specialties, the focus remains on training rather than service provision.

Once settled in, I began to realise the vast amount of knowledge and technical abilities I needed to master within the year. It was all initially overwhelming and it took quite a lot of determination to overcome these challenges; however, there hasn't been a day where I haven't learnt something new.

Image interpretation has been at the core of training. Initially, it was difficult but slowly the difference between normal and abnormal became apparent. The next challenge was to decipher what was or wasn't relevant depending on clinical context. Reaching a diagnosis through a combination of observational skills, clinical knowledge and reporting skills is something I have greatly enjoyed. Being able to identify common medical emergencies and influence their management is highly rewarding.

While there is variation between different training schemes, for me, on-calls began within a month (which is quite unusual) but these have proven to be the most valuable learning experiences, with problem solving and communication proving vital.

# My typical working day as a clinical radiology trainee

Noor Jawad, ST4



Today the day starts relatively early – 8 am – for a consultant-led trainee tutorial. This morning it's led by a consultant neuroradiologist – the cases are challenging and varied, but it's a great opportunity to learn from the best in a relaxed environment. It's even OK to make a mistake and name the wrong magnetic resonance (MR) sequence!

After absorbing as much as possible on the causes of T1 shortening, it's off to ultrasound. The scans range from abdomens, to lumps, to kidneys, to testes. I see a funny looking lump which I'm not quite sure about (not uncommon as a registrar), so I enlist the help of a willing consultant from the reporting room to come and have a look and decide what it is, and more importantly, what to do about it. I enjoy ultrasound as this is where I get to engage with patients and see how I am having a direct impact on their treatment.

Over lunch there is a trauma MDT held in the emergency department – a presentation of recent complex trauma cases. Radiology features heavily within the meeting, with one of our trauma consultants present to explain the imaging findings. For the radiologists it's a chance to see the impact of our reporting on immediate patient management

and to gain a broader understanding of the clinical aspect of trauma work.

For the clinicians they always seem interested in the radiology and this helps to build strong relationships between departments.

The afternoon consists of consultant-supervised CT reporting, and I'm secretly pleased for the opportunity to sit down with my cup of tea. Consultants give us free rein on what we would like to report, and we often get called over to go through the salient imaging findings (that is, things we have missed) or to discuss the differential diagnosis (do you think that lymph node is cancer or lymphoma or tuberculosis?). The feedback is personalised and constructive, and can vary from being a reminder, advice on checking review areas or comments about the wording of the report itself.

I've rarely met a clinical radiologist who doesn't enjoy their work and the sense of teamwork within the reporting room is a positive learning environment for everyone. The radiology timetable is structured and varied and every day I see something new and interesting, which I'm not sure many other people can say about their specialties.



## Special interest groups within clinical radiology

While interventional radiology is the only officially recognised subspecialty of clinical radiology, there is a breadth of options available for further 'specialisation', depending on your personal interest areas and previous experience.

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### Some of the major areas of special interest are:

- Paediatric radiology
- Musculoskeletal
- Vascular
- Neuroradiology
- Head and neck
- Gastrointestinal
- Genitourinary
- Oncology
- Cardiac
- Chest
- Breast
- Radionuclide (nuclear) radiology



# Radiology – the future!

Dr Giles Maskell,  
Clinical Radiology Consultant;  
President of the RCR 2013–2016



## So what's next for radiology?

After the explosion of new imaging modalities in the last 40 years, the new frontiers for radiology are in molecular and functional imaging, in quantification and automated image analysis and in new image-guided targeted treatments for cancer and other conditions. And by the way, not much of what we currently do is likely to go away any time soon.

Advancing technology will mean lower radiation doses from CT and faster acquisition times for MRI, both of which will lead to increased use of these techniques in preference to traditional diagnostic pathways using conventional X-rays. Radiologists will need new strategies to cope with the volume of imaging data that this will bring.

At the same time, patient and public understanding of the role of medical imaging will steadily increase and will drive the development of a new relationship between radiologists and their patients. Radiologists, with our comprehensive understanding of what imaging can and can't offer, will be ever more central to the provision of healthcare. Anyone looking for a quiet life in a dark room has come to the wrong place!



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# Undergraduate Radiology Societies Association (URSA)

## What is URSA?

The College is keen to support medical students interested in a career in radiology and is aware of the work that university societies do in this area. The College is also looking to engage with medical school radiology societies following the introduction of the Clinical Radiology undergraduate curriculum.

The College has set up an association to provide a central link for radiology societies where they currently exist and to encourage the development of societies in areas where none currently reside.

Member Societies can identify themselves as members of RCR URSA and have use of the RCR logo on their society pages and resources. The College will, where possible, offer support to societies in promoting local events, marketing the society and providing access to teaching and learning resources.

## No society in your medical school?

We can help with guidance on setting up a society and providing links to existing societies around the UK.

Find out more about how the RCR can support you throughout your career as a clinical radiologist by visiting [www.rcr.ac.uk/career-timeline](http://www.rcr.ac.uk/career-timeline)





# Top tips: make sure that you get noticed

## Medical students:

- Enhance your CV
- Apply for undergraduate bursaries and prizes (see the RCR website [[www.rcr.ac.uk](http://www.rcr.ac.uk)] for more info)
- Choose a special study module or elective in clinical radiology
- Develop your portfolio to demonstrate a commitment to the specialty – conduct audits and research in imaging
- Join a radiology society or found your own
- SPEAK to clinical radiologists!
- Foster links with local radiology departments (for example, sit in on reporting, attend relevant MDT meetings)
- Attend regional and national careers events
- Investigate the resources available on the RCR website ([www.rcr.ac.uk](http://www.rcr.ac.uk)) especially the careers pages, public lectures and other informative videos.

## Junior doctors:

- Consider an elective in radiology
- Undertake a portfolio of mainstream acute care clinical posts
- Take or create any opportunity for radiological research or audit in an imaging topic
- Foster links with the radiology departments and get to know the radiologists and the rest of the team
- Attend a taster week or taster evening promoting the specialty
- Investigate the resources available on the RCR website ([www.rcr.ac.uk](http://www.rcr.ac.uk)) especially the careers pages, public lectures and other informative videos.

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