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Clinical Radiology

The Royal College of Radiologists

Introduction for new registrars in clinical radiology

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Welcome

Congratulations on achieving your training post in this exciting and rewarding specialty.

This introduction pack aims to give you some idea of what to expect of the job, as well as some tips that most of us wish we'd been given when we started. It's been written for trainees by trainees. It is not comprehensive and the aim is not to overburden you with information.

The pack is split up into the following sections:

Introduction

Before you start

Make no bones about it, you think you've just begun to find your feet as a confident and knowledgeable doctor when you enter the world of radiology as a specialty registrar and then someone asks you a question about a scan and all that confidence and surety vanishes. Some people starting their career in radiology have already spent years working as a clinician and will have gained valuable clinical experience, perhaps even at a senior level. It can be quite an adjustment starting afresh in radiology and feeling a little out of one's depth all over again. Those coming into radiology from Foundation training have the advantage of being familiar with the ePortfolio and workplace-based assessments (WPBAs), but may feel somewhat inexperienced in managing complex clinical cases and referrals from a broad range of clinical specialties. It is daunting and there is a lot to learn but don't panic – you will get there in the end!

While your structured teaching (in-house or courses) will help you to obtain a large chunk of the required knowledge, (which is covered by the syllabus for the First and Final part 2A FRCR examinations) your fellow registrars and your supervising consultant(s) are valuable sources of information to be mined frequently. As well as asking questions of them left, right and centre, we recommend you or preferably your department identify a senior registrar who can formally or informally provide you with advice, guidance and information and help to answer your questions and uncertainties. There is a separate section further on in this document regarding good educational resources.

Induction

You should have a period of time when you start (variable length) where you do not have formal commitments but can be introduced to the various aspects of your work. This should include as a bare minimum an introduction to and information on the department and its layout as well as the hospital as a whole, including other sites within the trust/board. You should also be introduced to all the relevant staff within the department. There are many diverse groups within a radiology department, all with a vital role to play in ensuring the smooth running of day-to-day activities. You will be working with radiographers, radiography department assistants (RDAs), radiology nursing staff, admin and clerical staff, information technology (IT) support and medical physicists to name but a few!

You should also be given access to the hospital information systems and to IT training. Not all radiology departments have the same equipment, however, every department should have a picture archive and communication system (PACS) with dedicated workstations on which to view images, a radiology information system (RIS) and often a number of dedicated workstations allowing one to manipulate images, perform reconstructions and operate dedicated software packages for specific applications. Some departments use voice recognition software for dictation of reports, while others use traditional

dictaphones which then require secretarial support/typing. In addition to these radiology specific systems, you will probably also be given access to other patient information systems such as electronic patient records (EPRs) with pathology results and clinical information. This can be an invaluable source of information, particularly when there is a paucity of clinical detail on the request card.

Radiology is a unique specialty

Many junior doctors know very little about what radiologists do, having had very little exposure to the radiology department during their undergraduate training. We are very fortunate to be part of such a unique and incredibly diverse specialty, one that provides a valuable service to the vast majority of other medical specialties. As such, we get to interact with a wide range of clinicians both within the hospital and in the primary care setting. Needless to say, good communication skills are an essential part of the job – let's not forget about interaction with patients. While some entering radiology from a clinical background may fear that they have given up seeing patients to sit in front of a computer screen issuing reports, this is certainly not the case. There are still ample opportunities for direct interaction with patients, especially when performing ultrasounds, fluoroscopic examinations and interventional procedures.

There are certainly some mental adjustments that have to be made at the start, such as coming to terms with being supernumerary in what is predominantly a consultant-led service and no longer being part of the clinical team with house officers or medical students at your beck and call. You will be working very closely with your consultants, often on a one-to-one basis, which some find requires a little getting used after being on the wards.

The radiologist's typical working week

This will be very different to the type of week you've been used to as a doctor on the wards. You are likely to have a varied timetable that will usually include plain film reporting, ultrasound, fluoroscopy, computed tomography (CT), magnetic resonance imaging (MRI) and interventional lists, depending on where you train. Initially you will be directly supervised by a consultant, senior specialty resistrar (StR) or radiographer/sonographer, and will gradually take on increasing responsibility for lists as you become more competent and require less senior input. Don't rush into anything unless you feel comfortable that you know what is expected of you and feel able to deliver. This is especially important to remember when using ionising radiation. You will learn about radiation protection during your first year physics teaching, this is important both for your patients' safety and your own!

Some training schemes start their first years off straight away in one of the main special interest areas while others will rotate you through modality-centered blocks to give you a flavour of what radiology entails.

Radiological special interest areas

During your first three years, you should rotate through the main topic areas to acquire core knowledge and skills in general radiology. The main topic areas include musculoskeletal (MSK), neuroradiology, head and neck, cardiothoracic (including chest and cardiac), paediatric, interventional, gastrointestinal and hepatobiliary, genito-urinary, oncology, breast and nuclear medicine. In years four and five, you should be encouraged to choose one or two special interest areas in which to obtain either level two or level one competencies respectively (that is, to level two if in a single area or to level one in two areas).

Reporting sessions

Much of your time will be spent learning how to create a good radiological report. Initially, you may start off sitting with a consultant and watching how they report. This is important as there is a whole new language of radiology that you will have to learn, which you won't pick up by going off and having a bash at it on your own. You will learn how subtle differences in phrasing within your report can change the emphasis of findings and gently help to steer clinicians in their management decisions.

Different departments do things differently, but all will have a system of imaging inpatients and outpatients. Sometimes these can be on separate lists in different parts of the department or all mixed in together. Some departments have a general acute CT list that is reported by a group of senior StRs, consultants or both, while others may have a named consultant responsible for the list. Certain lists will be supervised by a named consultant specialising in that area. It is important for you to know who is covering the list you've been assigned to. You should always feel supported and know where you can get help.

Timetable

You should sit down with your clinical supervisor at the start of each attachment and work out a timetable for your week. This will usually include a mix of ultrasound, CT and plain film reporting sessions. You are also likely to do a fluoroscopy list and may be involved in an interventional list and MRI reporting, although this will depend on the kind of attachment.

Multidisciplinary team meetings (MDTMs)

The radiologist plays a vital role in and often runs the MDTM. Initially you will only be expected to attend these, but as you become more senior there should be opportunities for you to become increasingly involved in the preparation of cases before the meeting and finally in presenting cases/running the meeting yourself. Much can be learned just from attending these meetings which involve complex cases, interesting clinical discussions and provide insight into how imaging plays a key role in determining a patient's pathway and management decisions. They are also very useful to brush up on clinical knowledge.

Administration

Prior to the use of voice recognition software, reports were usually typed by secretarial staff once dictated by the reporting radiologist. The typed report then had to be verified or signed by the reporter before it become available to the clinicians. It was important that you kept up to date in verifying these reports to ensure a timely result for each examination. If your department still uses this system, the administrative staff should provide you with instructions on where to obtain dictaphones and the system that is in place for signing off reports, either manually or electronically.

With the introduction of voice recognition software, one can now see one's report as it's dictated – this can be very useful, however, it does require more radiologist time to edit the inevitable mistakes that crop up and one needs to be careful to read through the report meticulously to avoid errors in the final report. The major benefit of this system is the instant availability of a verified report once the reporter has dictated and edited it, as there is no backlog/delay in waiting for it to be typed up. Some departments have a hybrid system between the two and you will soon learn the ropes of your local set-up.

On-calls (and lack thereof)

Unlike most medical specialties, you will not be on-call from day one. As mentioned above, radiology is a highly specialised consultant-driven service and the skills required to deliver meaningful out-of-hours support to clinicians take time to develop. When you join your local on-call rota varies from region to region but the earliest would be during your second year, most likely after about 18 months of training.

What does an on-call radiologist do?

This varies from hospital to hospital but there are many common aspects. Generally, you'll be expected to field phone calls and hold face-to-face consultations with clinicians looking for either advice on plain films or hoping to request CT, MR or ultrasound out of hours. You'd also need to provide written or verbal reports on acute CT scans and, in some hospitals, accident and emergency (A&E) plain films.

Acute radiology can be terrifying, exhilarating and challenging simultaneously. There are few things more satisfying than finding the answer to a patient's problems not thought of by the referring clinician!

In all hospitals, there will also be at least one consultant supervising your work. They may be physically in the building for a few hours after 5:00 pm or, more commonly, they will work remotely from home at the end of the phone. It's considered standard practice to discuss every report you made while on-call with the covering consultant at some point, generally the following day. This might be face-to-face or over the phone. Always make sure you keep a record of which patients you reported in case you don't get direct feedback. At least that way you can check the edited report at a later date.

It's still common for the radiology registrar to be non-resident while on-call, at least from about 11:00 pm (although this is changing with a greater emphasis on shift systems). As this may well be the first time you've been able to leave the hospital while on-call there are a few simple things to consider. Make sure the switchboard has both your mobile number and your home phone (in case you lose signal overnight). Never get angry with a clinician for waking you up at 3:00 am for a legitimate scan request – remember you are being paid! Finally, as in all other areas of medicine, good handover is mandatory and a formal mechanism should be in place in each hospital (as recommended by the General Medical Council [GMC]).

Education

The College

The Royal College of Radiologists (RCR) is the professional body responsible for the specialties of both clinical radiology and clinical oncology throughout the UK. Its role is to advance the science and practice of radiology, set the professional standards of practice and further public education. The College is also responsible for setting and monitoring the educational curriculum for those training to enter the profession.

All clinical radiologists training in the UK must register with the College and pay an annual subscription. Membership entitles you to sit the component exams for the Fellowship of The Royal College of Radiologists (FRCR) and receive the respected monthly journal, *Clinical Radiology* (both online and print versions) and an RCR ePortfolio account.

You should have received details from the College on how to register. The current annual subscription charges are available on the website (**www.rcr.ac.uk/college/membership/fees**) and it is worth noting that these will increase once you become a Fellow of the College.

Below are a few useful College web links:

College website
www.rcr.ac.uk

Clinical radiology specialty training
www.rcr.ac.uk/clinical-radiology/specialty-training

Clinical radiology examinations
www.rcr.ac.uk/clinical-radiology/examinations

Clinical Radiology journal
www.clinicalradiologyonline.net

Exams

Of all the specialties in medicine, radiology has to be one of the most exam-centred and exam-heavy of all. This is not because the College is cruel, merely that radiology is a vast specialty and all radiologists need a substantial core generic knowledge in their day-to-day practice.

Detailed information regarding the exams is available on the RCR website (**www.rcr.ac.uk/clinical-radiology/examinations**) and it is well worth acquainting yourself with this early on. We have summarised certain aspects for you in this section.

The FRCR examination is split into two parts; the First FRCR (FRCR Part 1) and the Final FRCR (which itself is split into two parts; 2A and 2B).

First FRCR

The First FRCR comprises two exams – physics and anatomy. The physics exam is a multiple choice question paper and will test knowledge on the physics relating to the major imaging modalities, including X-ray, fluoroscopy, nuclear medicine, ultrasound, CT and MRI. The anatomy exam is computer-based (you will be shown single radiological images of normal anatomy and be expected to identify them), testing knowledge of both normal anatomy and common anatomical variants. Both exams are sat during your ST1 year and successful completion of them is required to demonstrate satisfactory progression at your annual review of competency progression (ARCP). Both modules are held three times a year, normally in March, June and September and exact exam dates and fees are available on the RCR website. Your local training scheme should provide dedicated teaching sessions for these subjects. You can take these two modules together in the same sitting or individually at separate examination sittings. It is best to take advice from fellow trainees and supervising consultants in deciding the best approach for you.

Final FRCR

Part 2A comprises two, 120 question, three-hour single best answer exam papers sat on the same day. The exams test both clinical and radiological understanding and cover a broad range of the core curriculum. You are expected to have completed 24 months of clinical radiology training before applying to sit the 2A examination. The exam runs twice yearly in December and June.

Part 2B comprises three components: a rapid reporting session, a 'long-case' reporting session and an oral examination. The rapid reporting session comprises 30 cases (similar to those found in a typical A&E or general practice [GP] referral pile) to be reported in 35 minutes.

The reporting session is 60 minutes long and you are expected to write a report/discuss six cases.

The oral examination is comprised of two 15-minute vivas each with a pair of consultant radiologist examiners. Part 2B can be sat once you have passed part 2A and completed at least 36 months of radiology training. It is expected that you will have achieved your FRCR by the end of ST4.

Junior Radiologists' Forum (JRF)

The JRF is the representative body for all of the radiology trainees in the UK. It is made up of 38 registrars (one representative from each of the 36 training programmes, a less-than-full-time trainee representative and an academic trainee representative). Representatives serve terms of two years (this can be extended) and are elected by the trainees on their training scheme. Together we are the voice of nearly 1,000 radiology registrars.

The purpose of the JRF is to discuss any and all issues that may be of relevance to current and future trainees and these discussions directly inform the RCR. Your local representative will keep you informed of new developments, disseminate information on useful courses and will often seek your input or opinion on various matters that arise at the JRF.

If you ever have an issue regarding your training that your educational supervisor cannot or will not help with or if you think of a great idea that could be implemented on a larger, national, scale then talk to your JRF representative.

More information can be found on the JRF pages of the RCR website (**www.rcr.ac.uk/junior-radiologists-forum**).

Learning and assessment

Radiology, like the rest of medicine, requires you to be a lifelong learner. The only reliable way we have to determine if our learning is satisfactory is through assessment (horrid I know!). The FRCR examination is a useful method of assessing your accumulation of factual knowledge but other mechanisms are required to assess and document your accumulation of practical, communication and other skills.

All trainees are required to maintain an electronic, online, portfolio of achievement (known as the ePortfolio). You should have received information already from the College informing you that you have been registered to use it (if not, contact **eportfolio@rcr.ac.uk**). The direct link to the ePortfolio is **www.nhseportfolios.org**. It is vital that you use this portfolio to record your achievements in training, as it will form the basis for your end-of-year assessment (ARCP).

The ePortfolio contains your syllabus (that is, what you are expected to have learnt by the time you are awarded your Certificate of Completion of Training [CCT]), a personal library (an area where you can upload important documents such as course certificates of attendance, CV and so on that can subsequently be viewed at your annual appraisal) and your workplace-based assessments (WPBAs).

Workplace-based assessments

Those of you who have come from Foundation training are likely to be familiar with WPBAs (although they are radiology-specific) but trainees from different backgrounds may not. There are six types of WPBA; they are described below.

Mini-imaging interpretation exercise (Mini-IPX)

This is designed to assess your skill in interpreting and reporting an imaging study by reviewing imaging reports that you have produced. Good opportunities to complete these might be following a reporting session with a consultant or perhaps following an on-call (where you could remotely send a request via email to the consultant on-call). A minimum of six per year is required.

Radiology direct observation of procedural skills (Rad-DOPS)

This is a focused observation or 'snapshot' of you undertaking a practical procedure. Good opportunities might be following a fluoroscopy or ultrasound list. You must complete a minimum of six per year, again equally distributed over 12 months.

Audit/quality improvement assessment

This is used to demonstrate your competence in completing an audit or quality improvement project. You must complete at least one per year.

Multi-source feedback (MSF)

This tool is designed to assess lots of generic skills such as communication, leadership, team work and so on. You nominate at least twelve raters (who must be a mixture of doctors, nurses and radiographers among other departmental staff). The raters anonymously complete a form rating you on various aspects of your professionalism and character. This will be fed back to you at your end of year appraisal by your educational supervisor. You must complete one per year.

Teaching observation

This tool provides feedback to you regarding your performance and ability to deliver a good teaching session to others. You must undertake at least two per year.

Not only must the above minimum WPBAs be completed but it is also necessary to maintain an up-to-date log book of activities. How you do this is up to you. The College has provided a web-based log book within the ePortfolio which you are free to use but some trainees take other approaches. For instance, keeping a record of the number and type of study reported each day and recording this in a spreadsheet that can be uploaded to the personal library in the ePortfolio to be viewed by the ARCP panel at the end of each year.

Keeping a record of interesting cases that you have come across during your working day is also advisable, not only for interest's sake but also for use in subsequent teaching you may have to deliver. How to keep a record is again a matter of personal preference, but it is important that you comply with your trust's policy regarding patient data storage and maintain patient confidentiality at all times. Always make sure that any images are saved in an anonymised format.

Multi disciplinary team working

The MDT assessment tool is designed to assess your ability to contribute effectively to multidisciplinary team working and to assume a leadership role in multidisciplinary meetings. This assessment tool is only essential for ARCP in the later years of training but can be used by more junior trainees to get feedback if they participate in MDT discussion/ presentation.

Journals

There are a large number of journals where the majority of radiology articles can be found, both within the UK and abroad. The College has its own journal, *Clinical Radiology*, to which you will automatically gain access via College membership. The other large general radiology journal in the UK is the *British Journal of Radiology* (BJR). Across the pond, the Radiological Society of North America (RSNA) has two excellent journals, *Radiology* and *Radiographics*. These often provide review articles (invaluable when it comes to the middle-of-the-night tricky on call scan). Of course, you only have to undertake a simple literature search to discover just how many good radiology publications there are out there, both in general radiology and special interest areas; it would be impossible to name them all here.

Books

Likewise, there is an absolute plethora of excellent radiology books out there. Your radiology department will probably have copies of the majority of popular titles, particularly reference books. Your fellow registrars can usually advise on books they found useful and may even be kind enough to lend you their copy before you decide on which ones to buy. Most people would regard a good anatomy textbook (either one with which you are familiar from your medical student days, and/or one of a growing number of radiological anatomy books) and a general radiology textbook as essential. There are a number of books which concentrate on common lists one must know (that is, very much condensed text without much in the way of picture content) – a combination of both is usually useful. There are also several exam-specific books with practice examples of single best answer format questions and answers and other more illustrative case-based texts which are particularly helpful in preparing for the FRCR 2B exam.

For your FRCR Part 1 exam, most people tend to study from *Farr's Physics for Medical Imaging*, but there are other similar texts also available. Some would also advocate reading a basic MRI book and there are also an increasing number of multiple choice question books available.

Electronic media

The RCR, in collaboration with the Department of Health, has developed an excellent e-learning resource called the Radiology Integrated Training Initiative (R-ITI). Access is free to anyone with an NHS email address – just go to the R-ITI project page to register (**www.e-lfh.org.uk/projects/radiology/access-the-e-learning/**).

The physics module is very useful in preparing for the FRCR Part 1 and the remaining modules are an excellent resource for the FRCR 2A exam.

There is a rapidly growing number of e-resources for radiology. These include podcasts, vodcasts, recorded lectures available on the internet and a host of radiology websites and apps. It is impossible to list all of these in this document, but it is well worth asking your colleagues which ones they have found most useful.

The College eLearning hub, RCR Learning (**www.rcrlearning.org**), is a good place to start for webinars and other useful learning material.

Courses and annual meetings/conferences

The College runs an annual programme of one-day meetings covering a range of topics throughout the year. These vary from topics appealing to the general radiologist to days specifically targeted at the experts in specialist interest areas. The annual RCR conference is a three-day meeting usually held in September. This growing meeting offers several streams of excellent lectures and workshop sessions and has recently introduced scientific paper sessions. This meeting is very well suited to trainees, with a wide range of specialist areas covered and talks predominantly pitched at the general radiologist. There is also the opportunity to present at the scientific papers sessions or to submit an audit or scientific poster.

The College website also includes a meetings diary (**www.rcr.ac.uk/clinical-radiology/events**) with details of many other local and some international meetings and courses .

The UK Radiology Congress (UKRC) is held each year in the summer over three days. This has been the biggest radiology meeting in the UK for many years, catering for radiologists, radiographers and other allied health professionals, technicians and scientists. Traditionally, the JRF has organised a half-day session at this meeting which is free to all trainees.

Further afield, the two largest radiology congresses most people tend to attend at some point during their training are the European Congress of Radiology (ECR) – held in March in Vienna, and RSNA – held in November/December in Chicago.

Membership and societies

There are a number of radiological societies offering free or significantly reduced membership rates.

The RSNA offers all trainees free membership, providing unlimited access to electronic content of their world-renowned journals, *Radiographics* and *Radiology* and also free registration to the largest radiology congress worldwide.

The British Institute of Radiology (BIR) offers trainees a much reduced membership fee and organises a number of educational meetings and courses, many specifically with trainees in mind.

Membership of the European Society of Radiology (ESR) costs approximately €10 per year, providing access to a number of excellent e-resources including a case archive, access to e-posters and selected lectures from a number of previous ECR meetings and self-assessment tools. There is also a wealth of information regarding courses and scholarships organised by European School of Radiology (ESOR). Every European country has a trainee representative on the Radiology Trainees' Forum (RTF), the UK representative being elected from the JRF.

Checklist

Things to make sure you have done in the first month of starting.

- Get all the passwords you need.
- Read this starter pack.
- Join RCR and check you have ePortfolio log-in details.
- Meet with the Educational and Clinical Supervisor of your first attachment.
- Download/create a log book.

There are a number of subspecialty interest groups and societies within the UK and wider international and European community which you may want to consider joining in your final years of training.

The Society of Radiologists in Training (SRT) is formed by a group of UK trainees and organises an annual meeting every summer. This is not only an excellent educational opportunity, but also a great forum to meet fellow colleagues from around the country and is highly recommended. The SRT have their own website (http://thesrt.co.uk/) which you may have encountered prior to entering radiology as there are a number of chat forums providing a great deal of useful advice on a range of radiology training related topics.

Last words of advice

- Keep your log book up to date – don't try to fill it in retrospectively, you will regret it!
- Likewise, make sure you fill in WPBA regularly throughout each attachment, don't leave them all for the end.
- Make friends with the radiographers, nurses and ancillary staff – they have seen and done it all and are an invaluable source of information and guidance.
- Make sure you have personally communicated any urgent/potentially life-threatening imaging findings to the referring clinical team that require immediate action – don't leave it up to them to look up the report. It is a good idea to document this as well.
- Always make sure you have appropriate protection, especially when working with ionising radiation (classic schoolboy error: forgetting to put on your lead coat before scrubbing up for an interventional procedure!).
- Don't feel pressurised into taking on more than you feel comfortable with. Patient safety is paramount.
- Remember that consultants and final year registrars have been doing this a lot longer than you – you will get there.

Good luck!

Written by G Pettet and S Hutchings on behalf of the JRF April 2012. Updated April 2017 by N Spence.

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