Shape of Training Mapping Exercise
Response from Clinical Radiology

Service requirements

1. What is your view of the future patient and service needs in your specialty and the implications of this in terms of the role of doctors in your specialty and what they should be doing - and therefore what they should be trained to do?

- Clinical radiology is a pivotal specialty, central to diagnosis and treatment.
- Patients require a comprehensive diagnostic imaging service with consultants trained in all imaging modalities to at least core (standard) level.
- Radiology is multi-modality and multi-body system and radiologists are trained to interpret the breadth of modalities and body systems thus providing the safest service for patients.
- Patients who require access to specialist diagnostic and treatment services require radiologists with advanced skills who deliver both general and specialist imaging across body systems, age groups (paediatrics) or diseases (eg oncology).
- Radiology plays a pivotal role in streamlining care of patients referred to emergency services due to trauma or other acute presentations. Rapid access to high quality diagnostic imaging is vital in making swift and correct diagnoses in acute situations, allowing appropriate triage and impacting on transit times through emergency departments and ultimately on inpatient capacity and length of stay.
- Patients require access to non-acute services, such as for the detection and monitoring of malignant disease and the diagnosis and follow up of major co-morbidities.
- Patients requiring acute intervention including procedures for control of bleeding, abscess drainage, relief of acute renal and gastrointestinal obstruction, the endovascular treatment of ruptured aortic aneurysms or interventional neuroradiology (eg stroke intervention) require rapid access to 24/7 networked specialist interventional radiology/interventional neuroradiology services.
- Quality assured image based population screening is central to well established services such as the NHSBSP (national health breast screening program) as well as to newer screening services such as CT screening for lung cancer and colon cancer. With an aging population increasing demand for radiology led screening will be an important factor in assuring population health outcomes are sustained.
- Image guided biopsy is central to diagnosis for the majority of patients with suspected cancer. Adequate numbers of skilled radiologists will be vital to ensure that diagnoses are made in timely fashion to enable rapid access to correct treatment.
- Radiology services require strong consultant leadership with consultants trained to lead imaging services and manage multidisciplinary teams
- Patient management is enhanced by multidisciplinary team discussions in which radiologists are pivotal members with leadership roles, with very few decisions made about patient management without radiology input.
- Patient and service needs are currently only partly met because of a shortage of consultant radiologists, year on year increase in workload (increase per annum of 10% for CT and 12% for MRI) with insufficient increase in training numbers.
- Development of advanced practitioner radiographers and training other practitioners in aspects of diagnostic imaging and intervention requires leadership, management and education skills.
2. Do your curricula currently meet the objective of producing doctors in your specialty equipped in terms of their knowledge, capability, experience, attitudes and behaviour to meet the changing needs of the patient population and flexibility to continue to meet those needs as they may evolve?

- The curricula state that core competences must be maintained throughout special interest (advanced) training in ST4/5. All radiologists should have the knowledge, skills and behaviours to deliver a 'general/emergency radiology service.
- General competences are maintained throughout training but often lost due to job planning and pressures of special interest clinical work.
- The curricula are flexible and are updated on an annual basis to ensure they are up to date and responsive to developments in technology, clinical practice and population needs.
- Lay involvement in the curriculum committee provides patient perspective.
- New competences outwith the curriculum have been delivered within stand alone bespoke practice cases & supervised experience as in PET CT. Regular annual curricular updates enables rapid incorporation into the curriculum.
- The curriculum adapts quickly to new generic areas, such as the inclusion of quality improvement science.
- Interventional Radiology is the only recognized sub-specialty, which encompasses Vascular, General and Non-Vascular Intervention and Interventional Neuroradiology. Interventional techniques are added to the curriculum as they evolve. Mentored preceptorships are available for established consultant training in evolving techniques.
- Special interest training is delivered pre CCT in all special interest areas and trainees are encouraged to undertake training in ST4 & 5 in at least 1 special interest area whilst maintaining core radiology skills.
- Post CCT fellowships in the UK & abroad are undertaken by trainees wishing to undertake additional special interest training prior to consultant appointment.

3. What are the clinical pathways/areas in your specialty which require or will require cross medical specialty working? This may be particularly relevant to the boundaries between primary and secondary care.

- Nuclear Medicine: from 2015 Nuclear Medicine trainees will undertake 3 years of core radiology training followed by 3 years of Nuclear Medicine Training.
- Molecular Imaging curriculum development is cross specialty between Radiology and Nuclear Medicine.
- Breast Imaging: Credentialing for Breast Physicians
- Cardiothoracic Radiology: Cardiologists undertaking 'certificated' practice in cardiac CT & MR. (Cardiothoracic Radiologists have the skills to interpret the whole of the study, not just the heart)
- Clinical Oncology: interpretation skills to enhance treatment planning

4. Which other specialty(ies) could or should your specialty and curricula be combined with?

- Nuclear Medicine: with Clinical Radiology for imaging and Clinical Oncology for therapy

5. What is the overall scope for more generic training in your specialty and with whom? Are there generic components in your curricula which would be useful for other specialties? This may be particularly relevant to the boundaries between primary and secondary care.

- Other specialties wishing to work with ionizing radiation require training in areas such as radiation protection and the Ionizing Radiation (Medical Exposure) Regulations (IR(ME)R) legislation
- The Nuclear Medicine and Vascular Surgery curricula are examples where sharing has already occurred
- Cardiac imaging is an example where cardiac CT and MRI interpretation is already
undertaken by cardiologists. Acquisition of the knowledge, skills & behaviours outlined in the Clinical Radiology Curriculum and assessment to the level of the FRCR would enable comprehensive interpretation of the whole imaging dataset.

6. **Which other specialties could you usefully collaborate with to produce quality training?**

   - All specialties could benefit from collaboration to produce high quality training in diagnostic imaging and intervention but with no compromise on the standards or quality of training.
   - In order to maintain a comprehensive imaging service, radiologists are best placed to provide the whole gamut of imaging and intervention and to be responsible for the training, appraisal and assessment of other specialties that want to provide imaging.

7. **What role could dual accreditation of specialties play?**

   - Dual accreditation could be available to clinical radiologists undertaking Radionuclide Radiology special interest training and undertaking an additional year in Nuclear Medicine.
   - For other specialties requiring competences in aspects of imaging and intervention, dual accreditation would be a pathway to ensure adequate competence.

8. **What specific parts of your curriculum need to be shared with or exported to other specialties? i.e. what elements of your curriculum do you believe doctors from other specialties need to understand to provide the best care for their patients?**

   - IR(ME)R requirements
   - Complexities of imaging pathways
   - Basic emergency radiographic interpretation skills
   - Collaboration with radiologists
   - Understanding of both the potential and limitations of imaging
   - An understanding of concept of overdiagnosis and its implications for individual patients

9. **What specific parts of curricula from other specialties need to be imported to your curriculum? i.e. What elements of the curricula of other specialties do you believe doctors in your specialty need to better understand to provide the best care for your patients?**

   - Shared care of patients particularly in some special interest areas. An example of this is radiology trainees undertaking vascular intervention with timetabled sessions in theatre, on the wards and in clinics.

Handling acute and emergency patients

10. **Do your current curricula equip doctors at CST level to manage appropriate acute and emergency patients if required?**

    - Yes. Trainees maintain general radiology skills and undertake acute radiology and/or intervention out of hours.

11. **If they do not, how might training and curricula equip doctors at CST level to manage appropriate acute and emergency patients?**

    - N/A

Credentiaing

12. **Are there elements of your current curricula (currently perhaps sub specialty or special interest) which you think would be suitable for undertaking as credentials outside of the current training programme? What are these and what impact would that have on the training programme?**

    We will be responding separately to the current GMC consultation on credentialing and are generally not in favour of this approach. We perceive that in Clinical Radiology the added value
of credentialing would be minimal.

Interventional Radiology is the only sub-specialty. If credentialing is introduced there might be some value in developing separate credentialed training in general and non-vascular intervention, vascular intervention, interventional neuroradiology and interventional oncology.

13. Are there any areas of your curricula that would be a possible area for credentialing pre-CST or should credentialing only be post-CST

If credentials in Interventional Radiology were to be developed (and we are by no means sure of the value of that) then it would be important that training in these areas could continue to take place pre-CST to ensure no further drop off of provision in these national shortage areas.

Sub-specialty training

14. How do you envisage the training of sub-specialists in your specialty?

- There is only a single sub-specialty interventional radiology curriculum within our specialty although it encompasses a number of separate special interest areas within it.
- Training likely to continue as 5/6 year programme although some aspects could be considered for post CST credentialed training.
- Nuclear Medicine training could be encompassed within Clinical Radiology/Clinical Oncology curricula.

15. Are there areas of the sub-specialty/special interest curricula that could be applicable to generalists within your specialty or other specialties? What are these?

- All areas are applicable to general radiologists and although all radiologists do not undertake interventional radiology, image guided diagnostic biopsy work is becoming a generic skill for the majority of radiologists.

Academic training

16. What is the scope for more generic academic training (research and education/teaching experience) across the specialties?

- There is a lot of scope for generic academic training (research and education/teaching experience).

The generic materials we promote are:

1. The ethics knowledge and Helsinki’s principles
2. Good clinical practice (the GCP training required before you undertake research project)
3. Undertaking a research project
4. Scientific writing
5. Literature searching and critical analysis
6. Presentation skills
7. Project management

- We would benefit from sharing statistical modules, peer review of manuscripts skills, research methodology modules such as literature searching, critical analysis, systematic reviews, IPD analysis techniques, trial design, scientific writing, project management.

- In teaching the following could be shared
  1. Principles of teaching
  2. Small group teaching
  3. Lecture construction and delivery
Length of training

17. *How long do you think it should take to acquire the competences to meet the overall training requirements? Should there be a prescribed length of training or an overall average length of training?*

- 5/6 years
- For delivery of a safe consultant service with radiologists having the required general and special interest skills an indicative training time of 5 years is appropriate (6 for attainment of more advanced interventional skills and experience).

18. *Is there scope for shortening the length of training or a need for longer training? Why?*

- Not shorter. 5 years to acquire the knowledge, skills and behaviours for a specialty that covers all imaging modalities and all body systems.
- 6 years to acquire essential skills in a range of interventional techniques for those specialising in this area
- Post CCT fellowships are used by many to increase experience/confidence prior to consultant post.

19. *If the length of training was shortened what impact would that have? What could be delivered and what components of the various curricula could not be delivered if training was shortened to the arbitrary time scale of a maximum of 6 years as suggested in the Shape of Training Review?*

- Training in clinical radiology is only 5 years post Foundation
- Training in Interventional Radiology is only 6 years post Foundation
- Shortening training is likely to result in a consultant workforce without the required breadth of knowledge and skills to provide the general radiology workload let alone any special interest experience.

Foundation and undergraduate training

20. *What do you consider as fundamental to the undergraduate and Foundation programmes as preparation for all doctors in a context of a broader initial approach to medical training?*

- Imaging is central to patient diagnosis & management
- Enhanced exposure to imaging, delivered by experts not general clinicians in other specialties.
- Trainees in radiology enter the specialty from Foundation and require an excellent grounding in all aspects to provide knowledge and experience of clinical practice and patient pathways and disease to underpin their radiology training

21. *What elements of your curricula are essential and would need to be incorporated into undergraduate and Foundation programmes prior to entry to your specialty should the length of training be shortened?*

- The RCR has produced an undergraduate radiology curriculum of aspects it considers essential.
- Radiological anatomy is utilized by many medical schools for the delivery of anatomy teaching.
- All doctors need to have an understanding of issues around imaging (radiation protection, contraindications, contrast etc) as well as a solid basis for plain film/basic cross-sectional interpretation which is best delivered by radiologists.
- The ESR has produced an undergraduate curriculum which mimics the curriculum for clinical radiology and the syllabus for the Scientific Basis of Imaging and Radiology Anatomy Examinations. This is not considered deliverable within an already overcrowded undergraduate curriculum.
- Imaging essential to clinical practice is included in the foundation Curriculum and there are some Foundation Placements available. However it is not considered appropriate to increase
these as there is a requirement for trainees to gain as much clinical experience as possible to underpin their training in radiology.

Description

22. Describe (in no more than 2/4 sides) the components of a curriculum that you would propose having considered all the issues above?

See attached Appendix ‘Radiology Training – Post Shape’

23. Would you be interested in piloting your possible curricula?

The RCR would be open to contributing to any pilot regarding specialty training, though as we are proposing minimal change this might not be needed.
Appendix: Radiology Training – “Post Shape”

Radiology Training – “Post Shape”

Pre-entry

Foundation training to provide comprehensive grounding in clinical medicine, surgery &
general practice to underpin specialty training. Also covering understanding of issues around
imaging (radiation protection, contraindications, contrast etc.) as well as a solid basis for
plain film/basic cross-sectional interpretation.

Mainstream Specialty Training

Year 1

Emphasis on acquiring:
- knowledge of the anatomy needed to perform and interpret radiological studies
- knowledge of the physical, cellular and molecular principles that underpin diagnostic
  medical imaging
- practical skills in diagnostic imaging and interpretation

Years 1-3. Core Radiology

Minimum competence across all imaging modalities and all body systems to:
- reflect what is likely to be required by any radiologist performing acute imaging
- form a basis for developing consultant-level expertise

Years 4-5. Higher Radiology

Consolidation of core skills and further development of clinical acumen and judgment.

Opportunity for research

Develop skills in areas of special interest to reflect the service need for consultant
radiologists with the ability to deliver both general and specialist imaging across body
systems, age groups (paediatrics) or diseases (eg oncology).

Years 1-5. Generic Professional Capabilities

Development of generic professional capabilities throughout training. Emphasis on radiology
leadership, management and multidisciplinary working.

Branches

Interventional Radiology

Entry at year 4 or beyond. Three further years (4-6) training to acquire the skills in vascular
and non-vascular intervention to investigate, diagnose and treat patients with common and
important acute presentations and to provide an out of hours cover. Specialist interventional
skills required to provide vascular, general and non-vascular intervention and interventional
oncology services.

Interventional Neuroradiology

Entry at year 4 or beyond. Three further years (4-6) training in diagnostic and interventional
neuroradiology. Specialist diagnostic neuroradiology skills required to underpin acute
neuroradiology service including stroke and oncology services. Specialist interventional
neuroradiology skills increasingly required for acute intervention in spontaneous intracranial
haemorrhage and clot retrieval in stroke.
Molecular imaging

Entry at year 4 or beyond. Three further years (4-6) training in molecular and functional imaging training to prepare trainees to lead the implementation and development of new imaging capabilities for personalised imaging, diagnosis, prognosis, treatment and treatment monitoring.

Training, incorporating translational research, would provide a detailed understanding of cross-sectional anatomy, together with detailed knowledge of the key elements of human physiology and metabolism responsible for sustaining cellular, organ and system function.

Nuclear Medicine

Entry at year 4 from clinical radiology into diagnostic Nuclear Medicine training.