

Imaging and Radiology research delivery infrastructure and processes – advisory document

Version 1.0 – September 2026

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Section 1 – Introduction

Introduction and rationale

Imaging is essential to ensuring safe and effective research delivery, whilst also offering new insights into diseases and processes. It can provide in vivo, whole body, real-time information and medical images reflect both structural and functional information, qualitatively and quantitatively. It is non-invasive and can be employed over multiple time points and across multiple organs – tracking and following changes in the body due to disease progression or as a result of interventions. It can also plan and direct treatment, most directly in the field of interventional radiology. Imaging is frequently used to support research, for example drug trials, but also the primary focus for research, for example new ways to diagnose, treat and monitor disease.

NHS Imaging and Radiology departments are under pressure and often struggle to provide a robust, effective and efficient imaging research support service, particularly for clinical trial related work, but also for trials of imaging technology. Clinical research is an essential component of healthcare, enabling treatment options, validating techniques and allowing translation and innovation in a planned, cost-effective and appropriate way. As such, investment in capacity and capability to do and deliver research must be justified and thus prioritised by the NHS. It should be recognised, that without investment in this infrastructure, the current situation where imaging is often a block to the successful delivery of clinical trials^{1,2}, will not improve.

This document is intended to provide guidance to the NIHR Research Delivery Network(s), Radiology, Medical Physics and Trust R&D departments on the appropriate infrastructure required to run such a service, taking into account the varying levels of complexity and demands, the range of staff and professional groups involved, and the infrastructure (including hardware/software/IT) and processes that might help with this delivery.

Information has been obtained from a range of different centres, and stakeholders (including the Regional RDNs, Health Research Authority and Vaccine Innovation Pathway groups) and through consultation with members of the NIHR Imaging National Specialty Group.

This is intended as guidance, not a stipulation, but as stated above, it should be recognised that with the current level of infrastructure there is a risk of failing to deliver wider clinical trial work, resulting in suboptimal diagnostics and treatment for our

¹ <https://www.abpi.org.uk/publications/uk-industry-clinical-trials-translating-actions-into-impact/>

² <https://www.gov.uk/government/publications/commercial-clinical-trials-in-the-uk-the-lord-oshaughnessy-review>

patients, a loss of confidence in the UK as a place to run clinical trials and a loss of income to both individual Trusts, and the NHS and UK economy as a whole.

Section 2 – Issues and barriers

The issues and barriers to enabling effective imaging research delivery within the NHS are multi-factorial and interlinked. We have grouped them into three broad categories – workforce, operational, strategic & financial:

Workforce

Imaging research delivery within the NHS is critically dependent on a complex, multidisciplinary workforce; however, this workforce often lacks visibility or formal structure, with undefined roles and poor strategic coordination. Across Trusts, responsibilities have often evolved organically rather than being designed systematically, resulting in arrangements that may function operationally day-to-day but lack resilience and efficiency. This manifests in organisational fragility, with “single points of failure” or no clear point of contact. The results in inconsistent communication, fragmented decision-making, and a lack of coordination and robust leadership.

Staff frequently lack protected or funded time to undertake essential components of research delivery, including feasibility assessments, engagement with R&D teams, and financial oversight. In addition, early specialist input into study design, costing, and operational planning—are often delayed or omitted. This not only undermines the efficiency of study setup but can also compromise study viability and cost recovery. Limited resource also constrains the ability to track research-related financial transactions, further compounding operational and governance risks.

The workforce challenges are exacerbated by deficits in knowledge, training, and career development pathways. There is often limited awareness of research processes, terminology, and regulatory frameworks within Radiology departments. Lack of undergraduate or early career research training and limited opportunities for progression discourages engagement and reduces workforce sustainability. In parallel, there is often an inadequate supply of staff with specialist technical expertise—such as medical physics experts (MPEs), clinical radiation experts (CREs), and professionals skilled in MRI, data management, and image processing—further limiting the system’s ability to deliver increasingly complex imaging studies.

Collectively, these issues are interdependent: unclear roles and weak career structures contribute to capacity and capability gaps, which in turn hinder effective engagement with research processes and limit strategic development of expertise. The divide between service delivery and academic research further entrenches these challenges, creating silos that restrict collaboration and innovation. Addressing workforce issues in imaging research delivery therefore requires a coordinated approach that simultaneously clarifies

roles, strengthens career pathways, invests in training and specialist skills, and ensures adequate, protected resource to support high-quality research activity across the NHS.

Operational

Operational delivery of imaging research within the NHS can be challenging resulting in limits to efficiency, scalability, and reliability. The absence of standard operating procedures (SOPs), clearly defined job descriptions, and agreed pathways further contributes to how research activity may be sub-optimally delivered across organisations. This extends to interactions with R&D and support services, where inconsistent points of contact and opaque processes impede timely study set-up.

Communication processes can be fragmented, relying on email exchanges rather than streamlined, transparent systems. This results in misalignment between Radiology departments and R&D teams, particularly with respect to expectations around set-up times, competing clinical pressures, and financial impact. In parallel, ambiguity around Radiology governance processes—such as who is responsible for study sign-off, escalation routes, and decision-making authority—introduces delays and uncertainty at critical points in the research lifecycle.

Imaging professionals are frequently not engaged early in grant development, sometimes resulting in protocols that are impractical, poorly costed, or misaligned with operational realities. The absence of detailed imaging manuals during protocol review limits accurate costings and feasibility assessments. These challenges are amplified in multicentre trials, where lack of protocol harmonisation and differing local practices create additional complexity.

Finally, operational delivery is complicated by the increasing technical and governance demands. Requirements such as standardised reporting frameworks (e.g. RECIST), management of incidental findings, integration of AI and advanced data management, all require coordinated processes and specialist input that are not consistently available. Systems for tracking research activity from initial request through to delivery—and linking this activity to appropriate funding streams—are often underdeveloped, which hinders investment in this infrastructure (see next section).

Strategic and financial

Imaging research activity often lacks a strong strategic profile within organisations (due to some of factors mentioned in previous sections), which can limit ability to obtain funding for this work. This has an impact on workforce and development of staff groups,

with limited structured approaches to progressing and retaining expertise over time. Coordinated, networked working across organisations and the RDN would improve knowledge sharing, standardisation of approaches, and development of a critical mass in specialist areas. Opportunities for collaboration, innovation, and efficiency at scale may be missed without establishing well-defined regional and national networks.

Robust data collection of imaging research activity, to inform demand modelling and future service requirements is often lacking, making it difficult to align capacity with anticipated research activity. In parallel, gaps in training, knowledge exchange, and professional support structures weaken the pipeline of skilled staff required to sustain and grow imaging research. Without clear investment in these areas, organisations risk perpetuating reactive rather than proactive approaches to research delivery, with implications for both quality and competitiveness in attracting studies. This lack of wider investment also risks research not reaching underserved populations, being limited to better financed larger institutions with strong academic affiliations

These strategic weaknesses directly translate into financial challenges. A limited understanding of imaging-specific costings undermines the accuracy and consistency of study budgets. This is further exacerbated by national gaps in tariff structures, where certain imaging-related costs—such as AI infrastructure or specific interventional procedures—are not fully captured within established costing frameworks (although there have been recent important steps to address this). Consequently, organisations may systematically under-recover the true cost of delivering imaging research, creating hidden financial pressures on clinical services.

In addition, systems for tracking research activity and linking it to funding flows are often underdeveloped or fragmented across platforms such as EDGE, and local Radiology Information Systems (RIS). The lack of automated, integrated tracking mechanisms reduces transparency and limits the ability to demonstrate activity, justify investment, or ensure appropriate reinvestment of research income back into imaging services. Taken together, these issues create a cycle in which poor visibility and weak financial infrastructure constrain investment, which in turn limits the development of capacity and capability. Addressing these challenges requires a more strategic, system-wide infrastructure development approach that aligns data, costing, and investment with the true scale and complexity of research imaging delivery.

Section 3 – Solutions

Overarching coordination – who, what, how?

A key requirement for improving imaging research delivery within the NHS is establishing clear coordinated staffing structures and SOPs. This includes defining responsibility for “who does what, and how” across the pathway, supported by dedicated roles such as a research service lead (typically superintendent radiographer level), an imaging research coordinator and a clearly identified R&D link contact. These roles should be underpinned by appropriate administrative support and sufficient familiarity with radiology-specific terminology, workflows, and costing processes. Establishing such coordination mechanisms would reduce ambiguity, streamline interactions between teams, and provide a consistent point of accountability throughout the research lifecycle.

Recommendations:

- Senior radiographic lead (at least Band 8A)
- Research coordinator/senior CTA type role
- Admin support
- R&D link person (within R&D)
- Clear and documented lines of communication, escalation and responsibility within Radiology and R&D

Communication channels

Structured and effective communication channels are also essential to support delivery at each stage of the research process. This requires clarity on which meetings, committees, and communication forums are necessary, when they should occur, and who should be involved. The implementation of standardised digital tools—such as Microsoft Teams, Forms, and Lists—alongside mechanisms analogous to an Imaging Trial Assessment Form (TAF) can facilitate the systematic capture and dissemination of imaging and radiology specific clinical trial information. This will reduce reliance on fragmented communication methods and improve transparency and coordination across multidisciplinary teams.

Recommendations:

- Clear recording of information and requests – spreadsheets, databases, EDGE workflows
- Regular meetings to address acute (set-up) and longer-term issues
- Visible, clearly documented and fully accessible workflows for Radiology approvals

- Amber light (C&C agreed) and green light (QA, training and protocols set-up completed) checkpoints

Processes/SOPs (including 150 day processes)

Implementing standardised processes with associated standard operating procedures (SOPs) is essential to establish a clearly defined delivery pathway, aligned to timelines such as the 150-day study setup target. This should include key stages such as study design (if required), gathering expressions of interest, feasibility assessments, costings, governance and approvals (e.g. radiation, ARSAC), site initiation, protocol implementation, and final authorisation (“green light”). Incorporating imaging-specific considerations at each stage, including factors relating to set up of advanced imaging techniques, reporting requirements (for example RECIST reporting, incidental findings), and data management, ensures that studies are appropriately designed, resourced and delivered from the outset.

Recommendations:

- SOPs – see Appendix 2 for a list of examples
- Flow charts to ensure visibility and clarity of the processes involved
- Identifying who is required to provide input at each stage, with timelines and expectations

Other staffing requirements

Workforce configuration remains a central enabler of effective delivery, requiring clearly defined staffing models and role expectations. This includes dedicated contributions from radiographers, radiologists (particularly for specialist reporting such as RECIST or RANO), medical physicists (including MPE approvals), and IT/data specialists supporting or within PACS and scientific computing teams. These roles should be supported by clear job descriptions, appropriate training (e.g., GCP and modality-specific competencies), and structured career pathways incorporating progression and succession planning, potentially linked to academic development opportunities.

Key additional roles:

- Modality lead radiographers
- Key Consultant Radiologist contacts/leads for decision making and specialist reporting
- Consultant Radiologists providing biopsy capacity for cancer trials
- Medical physicists for MPE approvals – ring-fenced resource

- MRI physicists for protocol set up, MR safety advice and data analysis
- PACS and scientific computing (SciCom) support for data management and AI
- Radiopharmacy input

Equipment and data management

Imaging equipment and data management infrastructure must also be strengthened to meet the demands of modern research. This includes ensuring sufficient scanner capacity, access to advanced imaging technologies and software, and robust IT systems for data storage, curation, and transfer—particularly for data-intensive studies such as those involving AI. Dedicated expertise and resource are required both to design data handling processes and to operationalise them, including support for platforms such as PACS, IEP, or XNAT, and the associated data transfer workflows.

Recommendations

- Research activity to be included in imaging equipment capacity and demand modelling
- Use of external capacity including university scanner facilities, community diagnostic centres (CDCs), private providers
- Computing infrastructure
- Digital infrastructure for AI implementation and evaluation such as vendor-neutral AI platforms
- Adequate PACS capacity
- XNAT or equivalent
- Software for data analysis
- Other specialist equipment – radiopharmacy, MRI, interventional radiology, including phantoms

Costings, tariffs, finance and funding

Financial frameworks and costing mechanisms need to be clarified and standardised to ensure sustainability. This involves aligning with national systems such as the National Contract Value Review (NCVR) and iCT for commercial studies, SoECAT and associated tariffs for non-commercial research, and ensuring appropriate costing practices across academic and other funding streams. Improved understanding of these frameworks, alongside consistent application, would support accurate cost recovery and enable more transparent financial planning for imaging research activity.

- Clear NCVR processes agreed with local R&D departments

- Clarify non-commercial costings – work towards a nationally agreed tariff
- Clear tracking of activity and financial compensation
- Reinvestment of research income for staffing infrastructure, research and innovation within Radiology departments
- Activity and finance tracking – including linking/aligning Radiology Information Systems to EDGE or similar

Other infrastructure

Finally, broader infrastructure and support systems are required to enable continuous improvement and collaboration. This includes access to guidance, training, and knowledge exchange via national platforms such as NIHR Learn, as well as engagement with Research Delivery Networks (RDNs), Research Support Services (RSSs), and other relevant organisations. Strengthening regional and national networks would facilitate shared learning, standardisation of best practice, and the development of collective capability across the NHS imaging research community.

- Radiology (delivery) specific research training for all modalities and professions
- Building regional networks via RRDNs, for example research delivery radiographer networks, AI expertise, industry and sponsor engagement
- Development of aligned SOPs, frameworks, checklists and standards

Section 4 – Example structures

The following three diagrams provide example imaging research delivery models/templates, at three different levels. *Advanced* would be applicable in a large tertiary teaching hospital setting, *intermediate* a large DGH setting and *basic* a smaller DGH-type trust. They are not prescriptive or necessarily comprehensive, but provide an idea of what structures and resources may be appropriate to enable a robust imaging research service in such settings, and how these posts and groups can link together. Some real-world examples are provided in Appendix 1.

Key:

Green – core Radiology research staffing (with dedicated time/roles)

Aqua – core Medical Physics research staffing (with dedicated time/roles)

Yellow – R&D department staff

Orange – Academic/university staff

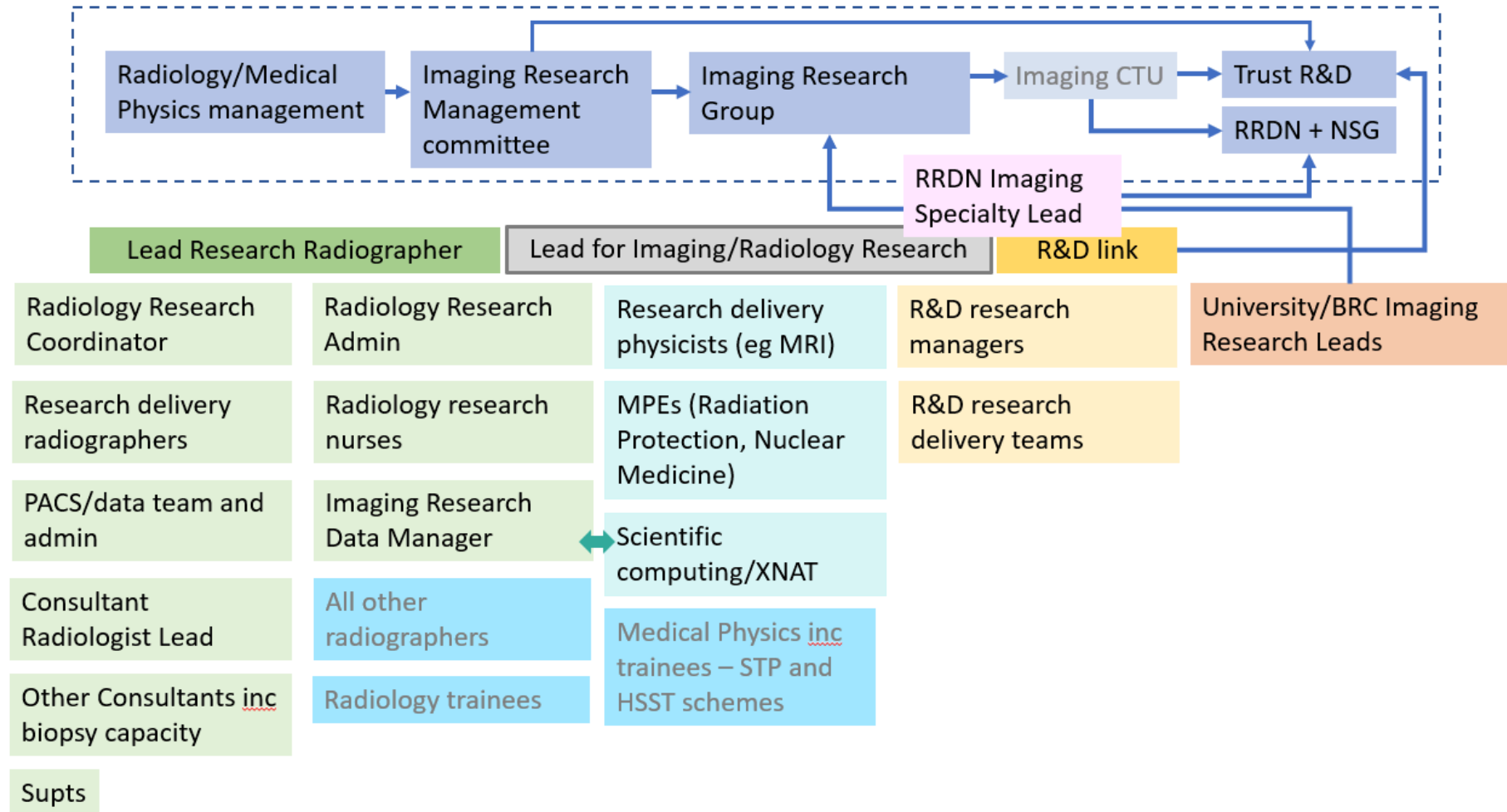
Grey – overarching leadership role – no specified professional group

Pink – RRDN Imaging Speciality Lead

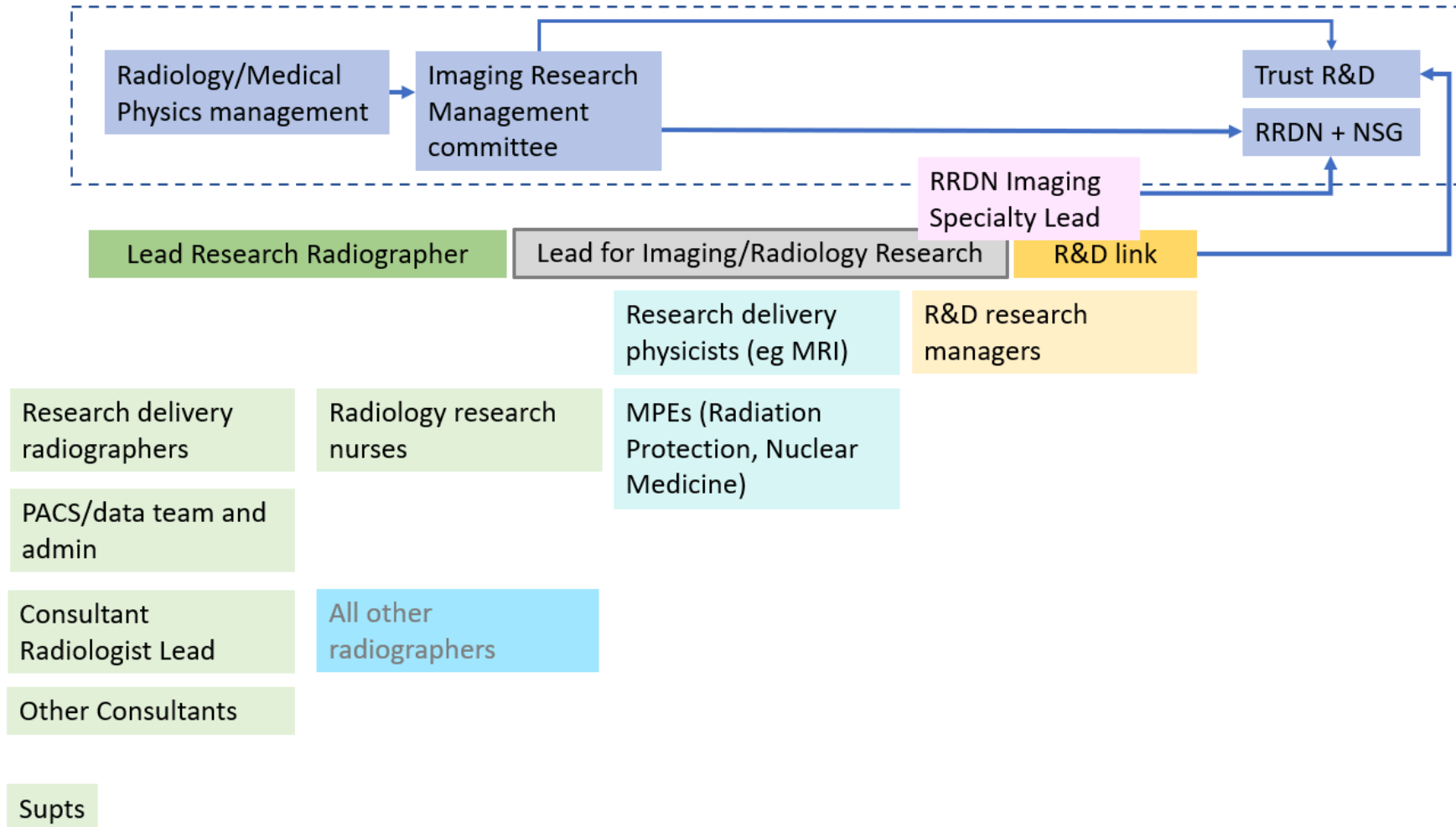
Dark blue – Research management groups

Bright blue + grey text – other staff/trainees with research awareness and routine interactions

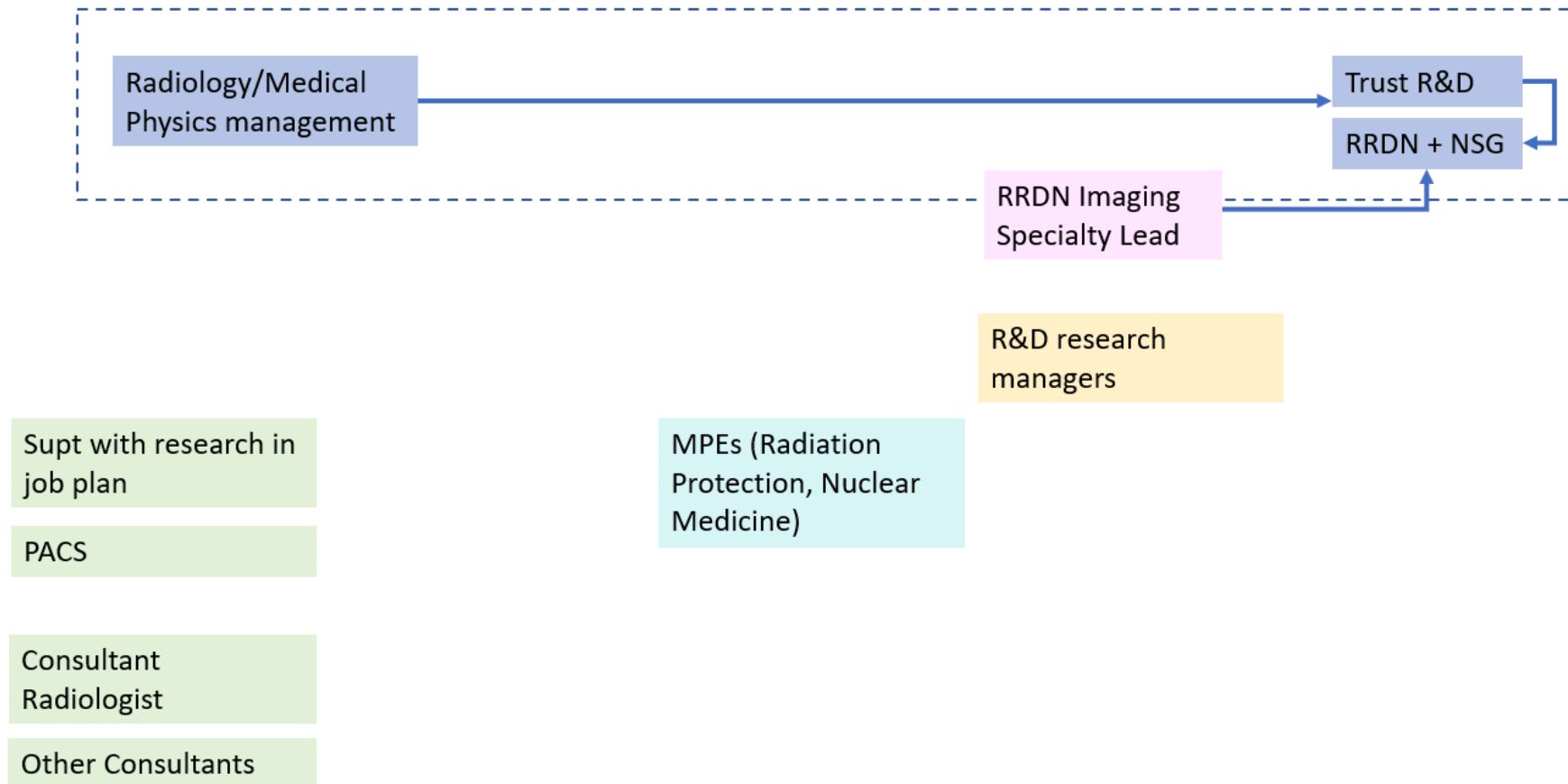
Advanced:



Intermediate:



Basic:



Section 5 – Typical workflow for imaging/radiology research

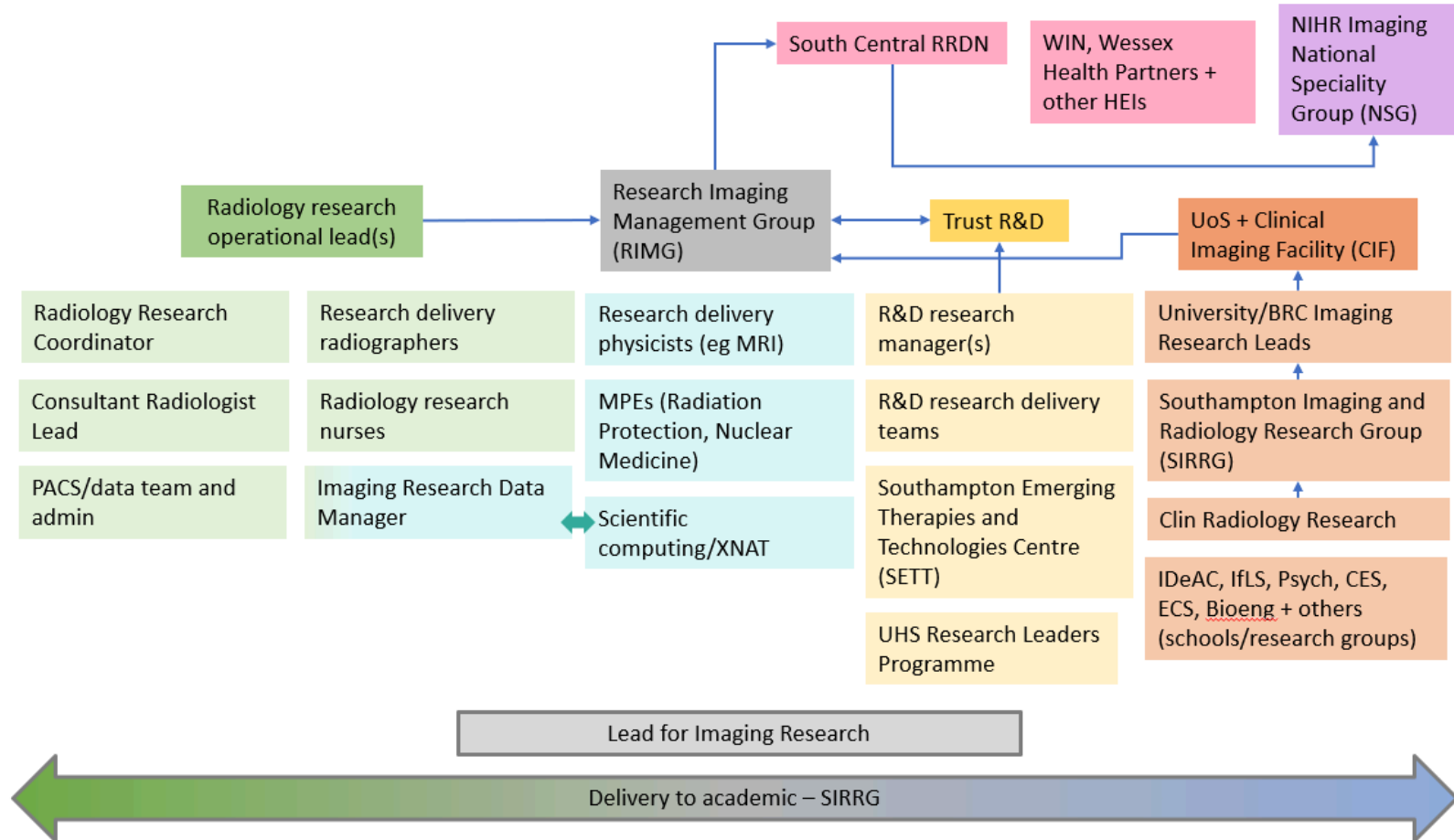
A typical workflow starting from expression of interest (EoI) to study delivery is provided below. This is just an example of the stages required for Radiology to provide confirmation of capacity and capability and subsequently open a trial for recruitment and associated Radiology activity.

Task		Comments	Who
Phase 1: Feasibility & Costing			
1	Receive new study enquiry from R&D	EoI and site selection completed – set-up/feasibility required	Research coordinator
2	Obtain and review trial documentation	Protocol, imaging manual, IRAS docs etc – complete trial assessment form or similar	Research coordinator, Lead research radiographer, Research radiographers
3	Provider identified	Trust, PP/outsource, university – initial capacity assessment based on expected recruitment number	Research coordinator, Lead Supts
4	Imaging/Radiology feasibility assessment	Consider modality, body part, SoC/non-SoC, frequency, age/GA, reporting requirements, Radiology practitioner review (Cons Rad), ARSAC requirements etc	Research coordinator, Lead research radiographer, Research radiographers, Lead supts, Consultant Radiologists
5	MPE/IRMER practitioner (Radiologist) review	May be outsourced or provided locally	Medical Physics, Radiologists
6	Advanced setup review	Specialist MRI, software/hardware, QA	Medical Physics, Research radiographers
7	PACS/data management review	IT, uploads, post processing etc	PACS/SciCom
8	Costings finalised	NCVR, SoECAT completed	Research coordinator, Lead research radiographer
Phase 2: Approvals & Set-up			

9	Radiology approvals – capacity and capability	Radiology Clinical Lead, Supt and Research Radiographers, CRE and MPE approval, ARSAC, PACS, costings	Lead research radiographer
	<i>Amber Light</i>		
10	QA, scanner validation	Specific phantoms and isotopes (in Nuclear Medicine) may be required – sponsor to provide	Medical Physics, Research radiographers
11	Protocol setup	Specific sequences (MRI) and assistance from lead site/scanner vendor may be required	Medical Physics, Research radiographers
12	Test data transfers		PACS/SciCom, Research radiographers
13	Requesting/booking/reporting/upload procedures agreed	Including timelines and out of hours provision	Research Radiographers, Consultant Radiologists
14	Site initiation visit		Research coordinator, Research radiographers
	<i>Green Light</i>		
Phase 3: Study Delivery			
15	Open for recruitment		Lead research radiographer
16	First Patient First Visit/Scan (FPFV)		Research radiographers
17	Activity recorded (CRIS/EDGE)		Research coordinator
18	Reimbursement checked		Research coordinator, Lead research radiographer
19	AOB (eg protocol amendments)		Lead research radiographer

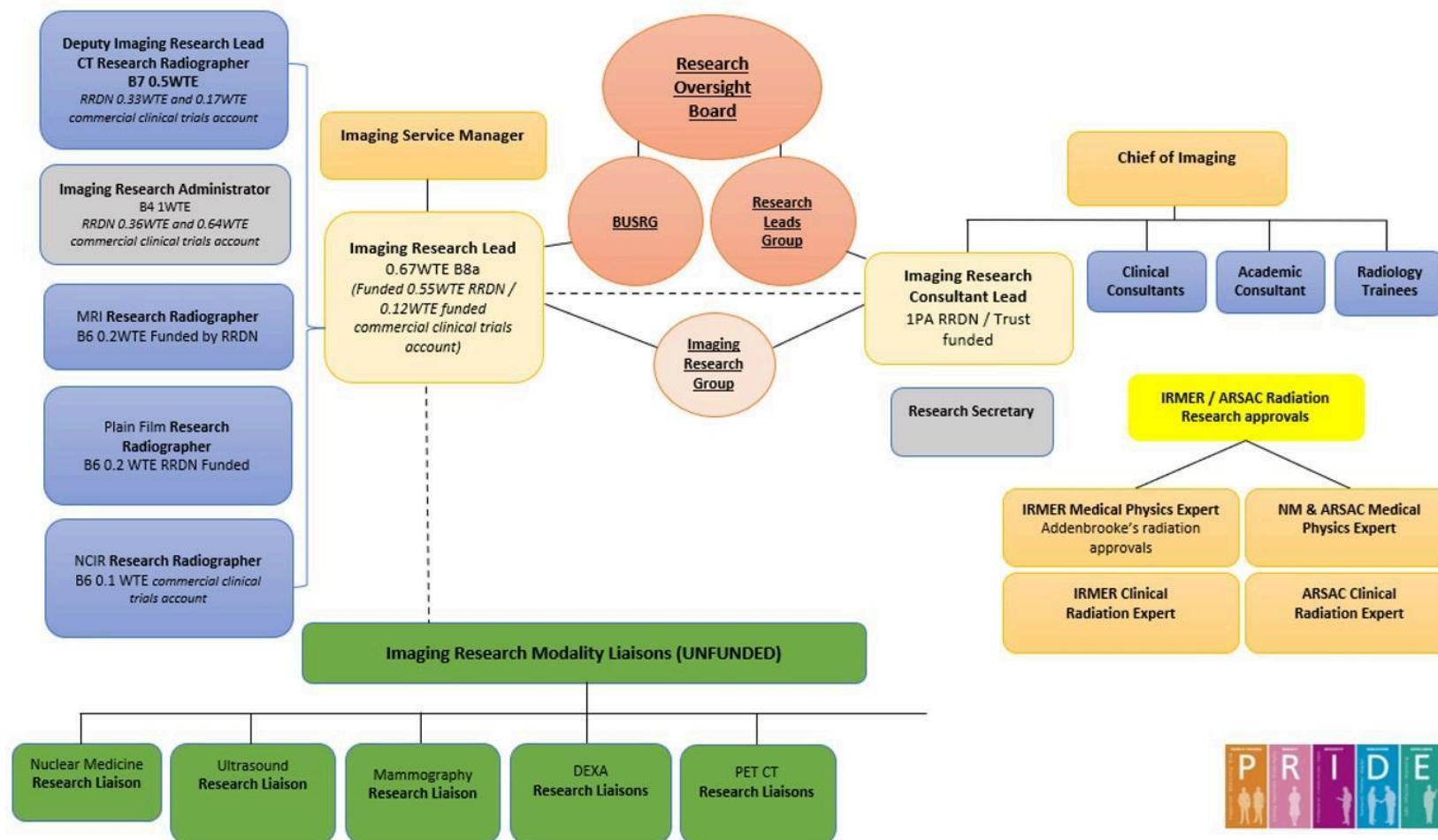
Appendix 1 – Real-world models for NHS imaging research delivery

University Hospital Southampton



Norfolk and Norwich University Hospitals

NNUH IMAGING RESEARCH STRUCTURE



Appendix 2 – List of example SOPs

A list of some relevant, useful and example SOPs and processes, from a range of sites, is provided below

Document/SOP	Scope/rationale/comments
Radiology research trial approval pathway	Instructions enabling research to be facilitated and performed in Imaging/Radiology departments via a systematic process and to ensure IR(ME)R and research pathways are adhered to
Trial assessment form	Proforma (could be within a system such as EDGE) to record imaging/radiology activity for each trial – modalities, frequency of scans, standard of care (SoC) vs non-SoC, biopsy requirements, specialist techniques/reporting, isotopes, image processing/data management (uploads) etc
Radiation governance checks process	Process and checklist to ensure local IRMER compliance and ARSAC requirements (if relevant)
Imaging research costings principles and processes	Particularly helpful for non-commercial and academic costings (outside NCVR)
Imaging research requesting pathway	Specific instructions to request research scans via systems such as Ordercomms or other Radiology requesting systems – to ensure radiation governance, highlight specialist reporting requirements and to enable activity and finance tracking
Incidental findings procedure and reporting	Particularly important for non-SoC scans or healthy volunteer studies
Imaging research data management policy	Will become more necessary as greater numbers of imaging AI studies are initiated
RECIST and other specialist reporting procedures	To describe specific processes, systems, timelines and staff groups involved in any non-standard reporting required for research trials

Appendix 3 – Example job descriptions

Example job descriptions for a lead research radiographer/imaging research lead and modality specific research radiographer (MRI) are provided below, to evidence the types of activities and responsibilities of such a role.

Job Title:	Imaging Research Lead
Band:	Band 8a
Managerially Accountable to:	Imaging Service Manager
Professionally Accountable to:	Imaging Chief of Service

Key Relationships

Senior managers of Radiology
Radiology staff across all Imaging modalities
Imaging Research Team
Radiologist Consultants
All Medical Trust based Clinical Investigators & Principal Investigators
Divisional Management
Senior managers of Finance
Director of Research Operations
Associate Medical Director for Research
Research Leads Group
Research Services Manager, R&D administration team
Research Matron, research delivery team
Researchers and key members of their teams
Research Oversight Board
3rd Party external partners

Job Purpose:

To promote safe and effective research as a core activity in Imaging and the Trust. The post holder will foster an environment of continuous improvement and high quality imaging research, ensuring a promotion of a strong research culture.

To drive research generated income for Imaging through the on boarding and development stages of new research programmes, including facilitation with imaging modality leads leading to final departmental authorisation.

To consult with the research sponsor and the Trust's imaging department with regards to recommending and implement changes to working practices/ protocols, providing relevant policies in order to ensure an efficient and productive environment for research to be undertaken and reported on within the agreed timelines.

The post holder in conjunction with the Consultant Radiologist Research Lead, will offer expert advice and oversight in the field of imaging research.

To be responsible for Imaging Research strategic planning activities within the Trust's imaging department through liaising with the Imaging Service Manager and relevant modality leads, ensuring a balance is maintained between National Imaging department clinical performance targets and research activities.

To work collaboratively with both internal and external stakeholders to achieve the four pillars of service delivery related to Governance, Workforce, Performance and Finance.

To support the delivery of a high quality, safe and compassionate healthcare service, all staff are expected to act as a role model to others in all aspects of their work and consistently demonstrate Trust values.

(Full job description available on request)

Job Title:	Magnetic Resonance Imaging (MRI) Research Radiographer
Band:	Band 6
Managerially Accountable to:	Imaging Research Lead Radiographer
Professionally Accountable to:	Imaging Services Manager

Job Purpose:

The post holder will play a key role in the imaging provision for research projects undertaken by the directorate and work with the departmental team and the Lead Radiologist to develop the research capabilities within the Directorate and the Trust.

To support the delivery of a high quality, safe and compassionate healthcare service, all staff are expected to act as a role model to others in all aspects of their work and consistently demonstrate Trust values.

Overview of Essential Responsibilities:

1. To provide imaging leadership, organisation and implementation of clinical research within the MRI. To be a resource for staff both within and outside of the Directorate. To lead on conduction of MRI imaging in accordance with Research Protocols approved by the Trust.
2. To promote and encourage good communication with other members of the research project teams, to ensure imaging is delivered to “time and target” and within individual research protocol timeframes.
3. To ensure that key Research targets are defined and agreed, monitored and delivered and to report any constraints to the Lead Research Radiographer and Lead Radiologist. To undertake clinical duties within capabilities of the

recognised MRI competencies' matrix or arrange cover as required for Research participant imaging.

4. To maintain and develop own clinical skills and professional practice.
5. To keep up to date with current research theories and technology relating to imaging. To be able to cross reference Trust clinical imaging standards with those of a Research protocol. To be able to highlight what changes are necessary to standard practice, to carry out each individual Research protocol approved by the Trust.
6. To work within multi-disciplinary teams, where appropriate, to identify research and develop innovative practices. To act as a source of expert information for current MRI imaging techniques.
7. To conduct clinical and academic research to professional guidelines and in a professional and reliable manner, in accordance with the European Directive 2001/20/EC.
8. To develop and implement Research protocols and guidelines to underpin clinical practice.
9. To inspire and motivate staff involved in the implementation of Research protocols and guidelines, by the provision of underpinning training and teaching.
10. To assist in completion of any relevant paperwork or data entry associated with a research project, as required.
11. To be involved with all stages of studies from protocol development and implementation, through the regulatory approval process, participant recruitment and report writing.
12. To schedule and organise appointments for Research patients, within timeframes stated in each individual Research protocol, ensuring effective communication to ensure each participant does not fall behind schedule.
13. To liaise with all other modalities within imaging and departments across the Trust involved in common Research projects.
14. To observe the code of professional conduct of Radiographers/Technicians as suggested by the Health and Care

Professions Council to ensure standards are met for Research Participants for imaging and to meet the standards of each Research protocol in accordance with the NIHR Good Clinical Practice (GCP).