

DHSSPS Review of Imaging Services

Radiology Workstream



Paper 2 of 4: “Where We Want To Be”

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Authors: Dr R McNally, J Robinson, M Wright

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1. Introduction

1.1 In 2013, the Department of Health, Social Services and Public Safety established a Review of Imaging Services in Northern Ireland. The Review is tasked with considering the full spectrum of imaging services provided by Health and Social Care, including radiological imaging, ultrasound imaging and nuclear medicine and established a number of Workstreams to take forward the substantive work in each of the core areas. At its first meeting in September 2014, the Project Board requested each Workstream to produce a series of four papers (listed below):

- **Paper 1: Current service:** *where we are* – report/analysis of the current service configuration, demand/capacity, capital resource, workforce etc.
- **Paper 2: Optimal service:** *where we would like to be* - paper outlining what an optimised service would look like, including taking account of regional approach, professional role expansion etc.
- **Paper 3: Gap analysis:** *what we need to get us there.*
- **Paper 4: Blue sky/horizon planning:** future proofing and strategic planning.

1.2 The Radiology Workstream is the largest of the workstreams established by the Review and membership is attached in **Appendix 1**. The workstream presented Paper 1 to the Project Board in September 2014. This paper outlined the current provision of adult radiology imaging services in Northern Ireland and endeavoured to describe some of the contributing factors where the current state was under challenge or pressure but it was not tasked with offering solutions.

1.3 Paper 2 of the imaging review challenges us to design an exemplar imaging service to support the needs of the health service in Northern Ireland for the next ten years. We identified in the first paper that substantial and sustained growth is expected for many years to come and that at this time there is already a significant gap between the present capacity and demand for NHS imaging in NI. Recommendations made within this paper are dependent on implementation of strategies to close the demand/capacity gap prior to (or in parallel with) growth to deal with the needs of the modern health service.

1.2 In the first paper a number of specific issues were identified by the Radiology Workstream which will be acknowledged in this paper. It was identified that the overall activity was limited by reporting capacity rather than the capacity for image acquisition, with greater than 20 consultant radiologist vacancies alongside potential under-utilisation of scanners across Northern Ireland. Capacity has been increased in recent years by use of internal and private sector led waiting lists initiatives. The recent embargo on these lists has shown how dependant our health service is on this after only a short period of time without. It was also noted that there was a surplus of recently qualified radiographers but a relative shortage of radiographers trained in specialist techniques such as MRI, ultrasound and reporting. Specific recommendations were made regarding the urgent need for increased training of

radiologists, increase in use of radiographers for suitable extended role tasks and investigation of strategies to retain and attract radiologists into this region.

- 1.3 As discussed in Paper 1, the triggers for further growth are largely beyond our control. Increasing and ageing population, pressures on acute hospitals for rapid solutions to unscheduled care, public demand for solutions to pain and disability causing conditions and closer monitoring of acute and chronic medical problems ensures that growth will continue. Comparison with other regions and countries suggests that we are not nearly reaching the peak and that demand will continue throughout the next decade, albeit at varying rates across modalities and local health economies.
- 1.4 In writing Paper 2, the Workstream has provided a narrative to present the views of the group of what an exemplar imaging service would look like. At the end of each section is a list of key statements reflecting what the service of the future would look like. These will be used to inform the gap analysis required in Paper 3 between where we are now and where we want to be. They are summarised in Section 13.
- 1.5 In relation to oncology, the project board has requested this to be brought into the remit of the radiology workstream. The specific imaging aspects of oncology are being reviewed and will be presented in a separate paper to follow.
- 1.6 In summary, it is inevitable that the needs of the modern health service will require more medical imaging, performed faster and available for many more hours per week. We need to find solutions to this and also ensure that it does not happen at the expense of service quality, patient safety and public confidence. An exemplar imaging service cannot simply be 'switched on' but will need to be realised over many years of growth. Equally, we recognise that via the Imaging Review, there is a unique opportunity for us to influence the design and development of imaging services for the future and are fully committed as a radiological community to doing so.

2. Follow Up on early Recommendations from Radiology Workstream Paper 1

- 2.1 Paper 1 from the Radiology Workstream outlined 3 areas which it considered as meriting early recommendations by the Imaging Review body. These were:
- Need for an increase in the number of training places to enable recruitment of consultant radiologists to funded vacant posts in the first instance
 - The need for accreditation of imaging services
 - The need for a single integrated image and radiology management system for Northern Ireland with the current Northern Ireland Picture Archive and Communications System (NIPACS) being the obvious solution
- 2.2 Following discussion of Paper 1 at the project board meeting in September 2014, a meeting was held on 7th November 2014, between representatives of the DHSSPS and the HSCB to discuss the imaging review and arrangements between the Department and HSCB to take these issues forward.
- 2.3 In relation to expansion of training places, a short business case was prepared by the HSCB and sent to DHSSPS on 7th November 2014. This is currently being considered by the Department and we are awaiting a decision regarding confirmation of funding. It is critical that funding is secured in time to ensure the increase in training places can take effect from 2015/16.
- 2.4 In relation to NIPACS, work has commenced with colleagues from IT regarding options for integration. From initial review, the complexity of the contractual arrangements with the private contractors for the RVH and BCH systems is such that input from contract law expertise is required. This is currently being explored and will better inform potential options. However, as referenced throughout this paper, it is imperative that options for integration consider not just unification, but the ability to also support transformational change such as regional reporting networks, which may ultimately influence the preferred solution.
- 2.5 In relation to ISAS, the Department has formally requested the Board to consider through the commissioning process, the establishment of an accreditation scheme for imaging in NI.
- 2.6 The Radiology Workstream will continue to review progress on these three key areas throughout the duration of the imaging review and escalate issues to the Project Board as required.

3.0 Unscheduled care / Out of Hours Radiology /7 day working

3.1 The three topics of unscheduled care, out of hours' radiology and 7 day working are intrinsically linked and should be considered together. This is very important in the current climate and radiology services must tie in with wider unscheduled care work. Responses to a discussion paper from the Patient Flow Workstream of the Regional Co-ordinating Group ¹ suggest that this has to be handled sensitively and with good engagement of the people who will need to carry out the work. It is important that there is representation across involved specialities and that the specialists are aware of the input from their colleagues; everyone recognises that this is important and inclusivity will ultimately determine how successful the implementation turns out to be.

3.2 Unscheduled care

3.2.1 Imaging services are necessary for the assessment, monitoring and occasionally treatment of acutely unwell adults and children every day of the week and at all times of the day. Immediate access to x-ray facilities has long been available on demand in all acute hospitals with on call services providing CT, ultrasound, fluoroscopy and (in some places) MRI as required in the emergency setting. Out of hours provision of specialist imaging has grown greatly in the last decade and seems to be growing still due not only to increased hospital attendances but also to changes in medical practice in response to NICE guidance and the growth of the 'rule-out' culture.

3.2.2 Extension in working hours and the number of working days of an imaging department leads to a reduction in on call time and increase in imaging capacity. It would be expected that if radiologists' and radiographers' numbers increase that the routine opening hours should grow organically and radiology leaders and commissioners should ensure that new job plans recognise the need for evening and weekend provision. It has been established in Paper 1, that at present there is a shortfall in the number of radiologists required to run a full 5 day service never mind extended 7-day services. The Trusts that are presently offering Saturday and Sunday CT and other services, are only able to do this by offering enhanced payment or time off in lieu, both for medical and non-medical staff. The use of time off in lieu unfortunately leads to a further reduction in service provision, particularly for radiologists, given the level of vacancy.

3.2.3 Extended day and 7 day working must be linked to an increase in reporting capacity (whether through increased radiologist training, radiographer reporting, retention and attraction of new radiologists or use of the private sector) or day to day services will be impaired and overall capacity will likely fall as full service 5 day working tends to be better supported by portering and non-clinical staff.

3.2.4 The Unscheduled Care Task Force led by the Department has also had radiology input to its work. The chair of the radiology group reported back to the MRCN that

¹ Improving Patient Flow in HSC Services, October 2014

the imaging consequences centred around access to diagnostic imaging on a 7 day basis and the need for faster turnaround times for reporting.

3.3 On Call Radiology

- 3.3.1 At present, radiology on call is provided in each Trust independently with either single or two tiered rotas. There is, to our knowledge, no consultant radiologist in NI who does not have home access or the opportunity to have home access to live PACS systems. It is expected that on call services can largely be covered by consultant radiologists at home (although in some cases they are second on call to radiology trainees). The quality of home reporting stations should be assessed with improvements made if required. Ideally, voice dictation should be available on home workstations with diagnostic quality monitors and the same level of image manipulation software available on hospital workstations. It is also important that the network speed for home reporting is sufficient to support all RIS/PACS functionality.
- 3.3.2 At present, with the exception of radiology registrars being shared by the SE Trust and Belfast Trust, and some temporary arrangements for cross cover of paediatric radiology, there are no cross trust rotas in operation. Trusts without full registrar rotas have investigated the use of independent sector 'Night Hawk' services with variable success. The use of Night Hawk services has been used by many UK trusts in order to minimise time lost from job plans and is considered the norm in many regions – shortage of radiologists being a national problem rather than a regional one. Any further use of Independent Sector providers must be carefully monitored to ensure appropriate response times, access to imaging history by the reporter and quality assurance of the reports. Ideally, a regional specification of requirements, both technical and clinical, could be produced that all Trusts could use irrespective of vendor.
- 3.3.3 At present, although the Belfast Trust uses 3 PACS systems which do not communicate, the other trusts share NIPACS and could potentially examine strategies for sharing on call services. This would decrease the frequency of on call for CT and MRI but would not allow cover for investigations which require a radiologist's presence such as screening or ultrasound. The need for these as on call investigations could be reduced by having regular evening or weekend radiologist presence in departments for limited hours.
- 3.3.4 In recent years, out of hours radiology has become more complex in a similar fashion to in hours radiology. There are increasing requirements for sub-specialist input in the fields of paediatric radiology, neuroradiology and intervention and similar levels of expertise should be available for assessment of complex imaging when this is performed out of hours. Cross cover between trusts could be engineered to support with the aid of NIPACS.
- 3.3.5 There is a mixture of extended hours working and emergency working and the interface will probably change. There is a potential to move towards provision of cover for emergency radiology over quite a wide area. For CT, there could be cover over the whole of NI if there was proper PACS integration. Exposure to on-call

radiology is very important in radiology training and the role of the radiology registrar in the process is vital.

- 3.3.6 There are separate on-call issues to consider for Interventional and Paediatric radiology, which we assume will be addressed by the respective Workstreams.

3.4 7 day working

- 3.4.1 There is an inevitable move towards 7 day access but we need to decide whether we are going to move towards a “Tesco” type model where everyone can get whatever they want 7 days a week (and overnight too in big centres), if we are aiming towards an enhanced emergency service (immediate access to ED and inpatient radiology) or something in between. Clearly, the overall plan for 7 day hospital services will help decide the level of radiology cover that is required but at present providing comprehensive services to ED and inpatients remains a challenge and a move towards full 7 day services to out-patients is beyond reach for many years.

3.5 Summary

- 3.5.1 Support from health executives will be required to allow the progress of radiology services towards more extended day and 7 day working arrangements. This can be achieved to a certain extent by rethinking present ways of working but is largely dependent on workforce expansion and skills mix. As ‘opening hours’ increase the burden on on-call would be expected to decrease but it would also be expected that a wider range of imaging would be available (e.g. Neuro MRI) and regional specialist networks would be required to sustain this.
- 3.5.2 Co-operation between trusts, commissioners, PHA and other bodies is essential in designing future out of hours’ activities and at present this is best served via the MRCN committee. Alternatively, further progress towards extended day and week working could be accelerated by use of independent sector out of hours’ services to allow radiologists’ on call hours to be used differently. The use of independent sector services would require rigorous quality assurance procedures with the understanding that contracts could be withdrawn if there are issues of safety or competence.

Where We Want To Be:

- 1.** Planned, inclusive, recurrently funded process to deliver 7-day working systems which consider the needs of imaging services as part of a holistic unscheduled care service.
- 2.** Reporting consequences of extended day and 7-day access are considered and recurrently funded.
- 3.** Clinical and non-clinical elements of service provision are quantified and funded appropriately to ensure out of hours, unscheduled care and extended access to service is secured.

4. Consultant radiologist and radiographer job plans are constructed to reflect the shift towards extended day and weekend working.
5. PACS home stations are fit for purpose and of equal functionality to hospital based systems, to include voice dictation. Access speeds from out of network are sufficient to utilise the technology.
6. Specialist networks are in place to support the increasing range of services delivered over a 7-day basis and optimise the skill base within the region.
7. If required, there should be intelligent and targeted use of Independent Sector to support out of hours and facilitate more flexible working. IS contracts are rigorously quality assured with option to withdraw if quality or safety is compromised.
8. The Modernising Radiology Clinical Network is used as a tool to develop solutions to operational challenges.

4.0 Radiology Clinical Networks

- 4.1 In September 2014, the Royal College of Radiologists (RCR) issued a short paper outlining the case for a new service model for imaging services in the UK and is attached in **Appendix 2**. Patients must have access to the expertise of a radiologist with appropriate skills and sub-specialisation where appropriate. As imaging has increased in its complexity, it is not feasible in most hospitals to deliver the range of specialist support in a timely fashion across all clinical presentations. This is most evident in relation to “out of hours” services when often only a single radiologist is available for consultation.
- 4.2 The RCR proposal was that existing radiology services should collaborate to form networks of expertise serving much larger populations than at present. It believes that the current workforce crisis is driving us towards the concentration of all specialist radiological expertise in a few centres of excellence. The College does not believe that this is in the best interest of patients. Rather, the hope is that in future most radiologists will work in a distributed network fulfilling a dual role as generalists to their local healthcare community and as an expert resource to a wider network in their specialist areas of practice.
- 4.3 Both the Radiology Workstream and Modernising Radiology Clinical Network (MRCN) believe that there is real merit in a Network approach to address key challenges facing the imaging service in NI today. Co-operation between imaging departments is crucial in supporting patient care within the health service as recruitment / retention of radiologists is just as big an issue in NI as the rest of the UK. Notwithstanding the current proposal for an increase in the number of training places, there is still a need to optimise the skills of all imaging staff, the equipment base and technology in ever more innovative ways to deliver the imaging service of the future.
- 4.4 These links are important for various reasons:
- Understanding of different issues being experienced across trusts
 - Sharing of good practice between departments
 - Sharing of learning from adverse incidents
 - Cross Trust reporting of specialist cases supporting specialist radiologist shortages
 - Mutual support and 2nd opinion reading of difficult cases especially in specialist areas
 - Move towards uniformity in radiology practice regarding studies reported
 - Development of referral guidelines with regional approval and authority
 - Planning for the future
- 4.5 The Workstream recommends that networks to support delivery of both specialist and non-specialist networks are developed / continue to develop. The MRCN has

already indicated the need for regional solutions to local problems and has overseen some work in this regard. Trusts are supportive in advancing further links and are willing to work collaboratively to deliver this.

- 4.6 Developments such as joint appointments between Trusts are going some way to addressing this, but there is a clear opportunity, as well as a clear need, to look to larger-scale change. With approximately 115 consultants in NI, it is viable to consider using this skill base to provide a regional network solution to out of hours reporting challenges. This will require careful design and absolute commitment from the imaging community and its referrers, as well as strong leadership from Trusts, the Board, PHA and DHSSPS. However, there is an appetite for change that will improve the quality of service to patients, reduce reliance on external suppliers and enhance in-house services to support sustainable services for the future.
- 4.7 Each imaging service struggles with the peaks and troughs of patient demand from its various sources. The ability to access regional support will greatly increase local flexibility and responsiveness and result in a much improved service for patients. Alongside mainstream continuous improvement, networks would not only improve flow regionally, but locally as well.
- 4.8 The efficacy of networks in many of these areas is dependent on RIS and PACS integration as available in a regional RIS/PACS system. Options for integration must therefore consider not only the best solution for unification of current systems but the needs of developments such as networks, for which a single NIPACS would be considered to be the ultimate aim.
- 4.9 Networks also need to be underpinned by high quality imaging services operating to consistent standards. Reduction in local variation across the five HSC Trusts via achievement of ISAS accreditation would significantly enhance and facilitate the opportunities for regional collaboration as well as delivering local improvements. ISAS will provide confidence that the competencies to deliver the range of imaging services and the consistency with which they are applied are in place.

Where We Want To Be:

9. Specialist and non-specialist Networks are in place to address local challenges in service delivery, i.e. reporting out of hours or where there are gaps in expertise.
10. An integrated NIPACS system for NI is in place to support innovative practice, facilitate regional solutions to local challenges, uniformity in radiological reporting and minimise duplication and inefficiency.
11. ISAS in place to support consistent regional practice, competencies, resources, minimisation of variation and effective regional collaboration.

5.0 Regional Referral Guidelines and Pathways.

- 5.1 The development of regional referral guidelines and pathways should be an important function of radiology specialist and non-specialist networks.
- 5.2 Standardised guidelines across NI is advantageous in ensuring uniformity of radiology practice across the region and the advantages of this have been realised with the adoption of Irefer (RCR online referral advice) by all Trusts in NI and the availability of the same on the trusts' intranets. The intention would not be to replace these guidelines but to identify areas where, following discussion with referrers and clinical specialists, the place of imaging in pathways to assess common conditions could be formalised. Examples would include assessment of shoulder pain, back pain or scrotal conditions. There is the potential, with education of referrers and the authority of regional agreements, to reduce waiting times by concentrating resources on those patients who are likely to benefit from imaging.
- 5.3 Suitable areas to develop regional pathways would be identified by the appropriate network.
- 5.4 There is also a need to assess the impact on imaging from recommendations from NICE, specialty groups and national and regional government bodies (particularly if there has been no local radiology input) to ensure that these can be accommodated or if alternative arrangements are required.

Where We Want To Be:

- 12.** Irefer is further developed by the specialist and non-specialist networks to formalise the imaging pathways for common conditions.
- 13.** The imaging impact of recommendations from bodies such as NICE is considered in a timely, appropriate way with associated funding where required.

6.0 Radiology Reporting Times Best Practice Guidance

- 6.1 Patients have a right to expect that investigations will be seen and accurately reported as quickly as is required. To provide high quality and effective patient-centred imaging services, it is essential that imaging departments support the whole patient pathway by providing the reporting of images in a timely manner.
- 6.2 Pathways are also vital to the delivery of the NHS priorities for 18 weeks, Cancer, Heart and Stroke management.
- 6.3 Technology is now available to support this with the introduction of nationwide RIS and PACS facilities and reporting systems including voice recognition (VR) and digital dictation.
- 6.4 These recommendations should lead healthcare commissioners to work with radiology departments in analysing current and future systems so that sufficient resource is provided to achieve 'No Wait' imaging services.
- 6.5 Standards were originally set by the Royal College of Radiologists in "Clinical Radiology quality specification for purchasers (1995)". This document has now been withdrawn, and the standards have not been updated since.
- 6.6 Success factors and improvement tools to support timely reporting can be found in the recent document Service Improvement for Radiologists (Nov 2007).
- 6.7 A number of process changes, additional investment, and technological advances (i.e. PACS, RIS and VR) will be necessary to ensure the turnaround times of image reporting are kept to a minimum.
- 6.8 It is recognised that a balance needs to be set between quality and timeliness of reporting. Clinical teams should be able to demonstrate 'end to end' imaging investigation turnaround times (i.e. from time of referral to report being available) including the reporting turnaround times from image acquisition to report availability to referrers. The minimum data measurement points required to do this are²:
 - Date of referral
 - Time of image capture
 - Time of report dictation
 - Time of verification
 - Time of report issue (dispatched, not printed)
 - Some best practice example case studies from institutions who have achieved these
 - Report turnaround times will be provided on the NHS Improvement website in due course.
- 6.9 However, it is absolutely vital to ensure that if report turnaround is improved, that the whole pathway is improved at the same time and needs to include the rapid

² National Diagnostic Imaging Board, September 2008

receipt of request and early clinical decision making after the report is available. Where services have reorganised themselves to improve turnaround time, and have done so in collaboration with the wider hospital clinical system, there is clear evidence of improvements in service delivery and patient flow and recent discussion at the MRCN have acknowledged this. However, it is also clear that despite the willingness of other imaging departments to work differently to improve turnaround times, improvements are not materialised due to lack of engagement by other specialties. This must be addressed with definitive and consistent direction from senior executive and clinical leaders.

Where We Want To Be:

- 14.** Turnaround times from examination to report being available to the referrer are in line with national standards as ratified by RCR/SCoR.
- 15.** Interim reporting turnaround time targets are in place, which differ from the DRTTs presently in place. The targets should be considered as aspirational but achievable with annual review by MRCN towards fulfilling the recommendation above. This is dependent on increasing reporting capacity.
- 16.** Process changes, additional investment, and technological advances (i.e. PACS, RIS and VR) are in place to ensure the turnaround times of image reporting are kept to a minimum.
- 17.** All components of the unscheduled care pathway work collaboratively to improve turnaround times and clinical decision making to deliver better services for patients.

7.0 Maximising Imaging Resources

- 7.1 As outlined in Paper 1, there is under-utilisation of the existing equipment base in many areas. Plans are in place for phased recurrent investment to fund vacant sessions to be utilised to the optimum rate and regionally consistent. There is the potential for extended hours, both in the evening and at weekends for routine and unscheduled care. This is fully reliant on the availability of recurrent funding and recruitment of the necessary staff to operate these sessions as part of wider commissioning plans to meet demand.
- 7.2 Optimising the current capital equipment base will further serve to reduce reliance on independent sector providers and introduce much needed flexibility into core services to deal with peaks and troughs of service demand.
- 7.3 Furthermore, increasing the number of sessions available for use per week will better support scheduling of complex imaging.
- 7.4 Paper 1 highlighted the challenges of providing resilience within the capital equipment base, particularly in relation to sites with single CT scanners who currently deliver ED services. There needs to be consideration of the optimum ways of ensuring resilience, whilst ensuring value for money and optimisation of the existing scanners.

Where We Want To Be:

- 18.** MRI, CT and US scanners are funded up to a 19 session per week level (in line with local demand) to optimise sessional utilisation.
- 19.** Plans for resilience of the equipment base are a core element of imaging services which ensure service continuity, patient safety and effective use of resources.

8.0 Interaction with Primary Care

- 8.1 It is essential that interaction with primary care is optimised at all stages. Primary care needs to know what examinations to request. As they have access to IRefer, there may be a need for further guidance or collaboration to improve how it is used.
- 8.2 Further work is required to ensure the most effective and reliable system for requesting and receiving results. Patients should be able to obtain imaging as close as possible to their home. For example, patients from the “West” of the province may be able to have their imaging in their local hospital with the images viewed centrally rather than having to come to Belfast for a scan.
- 8.3 Currently, the majority of patients do not have a choice in the date and time of their appointment and most receive fixed appointments. Advanced booking systems such as those in place for outpatient services have not been introduced to imaging services in Northern Ireland. Although, there are relatively low DNA rates for key modalities, there is a high level of clinical time associated with the current appointment process and centralised processes with trained admin support would facilitate redirection of clinical time to clinical task. The ideal would be for some variant of choose and book for radiology appointments directly from primary care. Introduction of advanced booking systems in radiology departments offering choice would be a reasonable step towards this.
- 8.4 As scanner availability increases, where there is spare capacity to scan we should be able to offer this to patients who are willing to travel. Regional scheduling through ECR would enable referrers to choose where they want their patients to be imaged based on access times etc.

Where We Want To Be:

- 20.** Primary care colleagues have clear guidance and information in order to optimise their access to and use of Irefer.
- 21.** Clear arrangements are in place for patients to be scanned locally, supported by central reporting where required.
- 22.** Patients have the opportunity to have a choice in the date and time of their appointment, through the introduction of advanced booking systems. Further progress would be the option to book appointments direct from primary care.
- 23.** ECR used as a tool to promote choice for patients and optimise capacity on a regional basis.

9.0 Medical and Radiographic Workforce

- 9.1 There needs to be a robust Regional workforce plan that involves the professions and the trainers as well as the Department of Health. This has been either absent or invisible in recent years, although there is an expectation that this is being addressed by the Workforce Sub-Group of the Imaging Review. As with so many areas of improvement, there needs to be open channels of communication. This should be proactive and not just react to a crisis.
- 9.2 The need for an increase in the number of training places for radiology is absolute and was highlighted as a priority in Paper 1. As referenced in section 1 of this report, a case has been presented to the Department for consideration of funding and we await a decision.
- 9.3 There is also a need to consider more innovative ways of recruiting potential candidates for vacant consultant radiologist posts and need to work collaboratively with the Royal College to optimise opportunities.
- 9.4 There is a general recognition of the value and need for skill mix. This should not just be about saving money but should incorporate elements of professional satisfaction and appropriateness. We must remember that backfill will be required if staff take on different roles and funding proposals / investment plans should reflect this.
- 9.5 There is a requirement to build upon the current infrastructure, address regional variation and plan staffing levels/skill mix accordingly.
- 9.6 Skill mix within radiography and appropriation of tasks across professional boundaries based on the skill and competence of all staff within imaging is required to ensure increased sustainable capacity.
- 9.7 We are fortunate that in the area of plain film reporting, there has been progress in some Trusts with regard not only to having trained reporting radiographers in post but crucially, in the development of an infrastructure of clinical support by medical colleagues to ensure that these staff are supported and mentored to perform in these advanced roles. Although some Trusts have minimal or no reporting of plain film in place within their imaging services, the MRCN is acting as a forum of sharing and promoting of best practice and we are optimistic that greater coverage will be achieved in the future.
- 9.8 Good practice recommends that newly qualified radiographers undertake a programme of Perceptorship for the first 6 months of their position. This ensures high-levels of competency with mentorship in the initial period of the Radiographers career. This should then be followed by a developmental plan linked to the appraisal process for Radiographers.

- 9.9 Neither the Perceptorship model nor developmental plans are fully in place in all Trusts in NI at present. A formal AHP supervision policy was issued in 2014 by the DHSSPS to be implemented in all Trusts through the AHP strategy, although coverage for radiography is not yet widespread.
- 9.10 One of the potential benefits of ISAS Accreditation is that measures of competency and reflective learning would be measured as outcomes in a standard way in each Trust.
- 9.11 Following Perceptorship, radiographer practitioners should then have the opportunity to participate in a rotational post, giving them a higher level of knowledge in specialist areas, but there is no formal process to facilitate staff rotation. Staff within other AHP professions staff can often rotate, e.g. between hospital and community services, but this does not happen in radiography. Given the increased complexity and range of imaging modalities, there is merit in considering the potential for staff to rotate across modalities in the imaging service of the future (e.g. on a 2-year rotation) to better understand and decide where they feel they would be best suited. Whilst there rotation at student level during training, this is more essential at post-graduate level. Consideration would need to be given to the funding arrangements for such rotational posts as they are essentially supernumerary in nature.
- 9.12 Advanced practitioner radiographer staff are typically located within CT, MRI, Ultrasound, Nuclear Medicine, PACS and Fluoroscopy, and plain film reporting. They will have been working towards an established Post-Graduate Diploma within their specialised area and as referenced in Paper 1, nationally agreed profiles are available for advanced practitioner roles.
- 9.13 Ideally, we would be looking to release these staff from any general x-ray duties to allow them to undertake advanced academic and practical training. This will be followed up with audits, research and mentorship linked to the university. There should also be the potential for advanced practitioners to be supported to further extend their roles within their specialised area, e.g. reporting of appropriate elements of plain film, MRI, CT, nuclear medicine, mammography as wells as undertaking appropriate procedures in general interventional and mammography services.
- 9.14 New imaging developments should be researched with the staff required at the appropriate skill level. Consideration should also be given to the changing profile of diagnostic imaging techniques for patients, e.g. shift from barium enema to CT Colonography, increase in CT urography etc. in order that training is re-directed to the evolving areas of high demand.

- 9.15 In Paper 1, the four-tier structure for radiography career progression was outlined and as indicated, unlike the rest of the UK, there are no consultant posts in diagnostic radiography in NI. There are varying opinions currently within the imaging service of this role and to move forward there should be inclusive discussion on this issue. This should be driven through the MRCN, with input from the Expert Reference Group of the Imaging Review.
- 9.16 There needs to be more consideration of the potential use of assistant practitioners as part of an overall workforce plan. This will facilitate the appropriate grade of staff for task, and enable radiographers to focus on the skills for which they are qualified to do.

Where We Want To Be

- 24.** A regional workforce plan is in place which takes account of the future needs of both medical and non-medical imaging staff.
- 25.** Investment plans for imaging services take the opportunity to promote and optimise skill mix and all funding implications are clearly identified and considered.
- 26.** A robust framework, in line with best practice, is in place to ensure career progression for diagnostic radiographic staff.
- 27.** Assistant practitioners are a core element of imaging teams.
- 28.** The role of consultant diagnostic radiographer is considered as part of MRCN and Expert Reference Group discussions as part of the implementation of the Four Tier Structure for Radiography career progression.

10.0 Streamlined, Responsive Commissioning

- 10.1 It is hard to imagine the service moving away from a commissioning model but it is vital that it is commissioned as appropriately as possible. The system should be as transparent as possible and the “commissioners” should work in harmony with the “providers”. A forum such as MRCN / Imaging Board should be a good place for this to happen. There should be the ability to respond quickly (and positively) to service developments and improvements.
- 10.2 Responsive methods should include consider options for tariff or cost and volume type arrangements which will ensure that robust baselines are in place and incentives for increased productivity are available.
- 10.3 As much as possible should be performed in-house in house rather than in the IS. Out-sourcing is likely to be required for some time due to the imbalance between demand and the existing staff’s capacity to perform and report the examinations and as recurrent investment plans are phased in. This will be a key determinant of the provision and commissioning of services and it is important that the forum for this maintains a clear dialogue between commissioners / providers and that the Department of Health remains involved.

Where We Want To Be:

- 29.** Options such as tariff or activity based service agreements are fully explored with the most appropriate option applied to the commissioning of imaging services in the future.
- 30.** Services are recurrently funded with clear and transparent processes for service developments and responsive to changes in demand.
- 31.** Speedy decisions made in respect of investment proposals.

11.0 Safeguarding and Clinical Governance

- 11.1 Essential that this should be included and it must underpin the service. It will impact on all areas of delivery and ISAS is likely to provide a strong regional base and ensure maintenance of professional standards.
- 11.2 This may be the place to consider the essential role of Radiology in the proper running of MDTs. This is an important role that is likely to increase and which may become more onerous yet it is not measured at all in terms of “productivity”. There are college standards which we should strive to achieve. This also needs to be supported by functionality and radiologists’ time to be managed / recorded through regional RIS/PACS.

Where We Want To Be:

- 32.** Imaging services are fully accredited by ISAS and essential resources in place to continually ensure safeguarding and clinical governance requirements are achieved.
- 33.** Funding in respect of radiologists time to attend MDTs is clearly identified as part of commissioning arrangements and investment plans.
- 34.** RIS/PACS has the necessary functionality to manage / monitor radiologist MDT time.

12.0 ICT in Medical Imaging

12.1 The following initiatives are important in a top quality imaging service.

12.2 RIS/PACS

12.2.1 Paper 1 highlighted ongoing difficulties and issues related to the lack of a unified RIS/PACS in the Belfast Trust and it is hoped that progress will be made to improve this position.

12.2.2 The best solution for NI as a whole would be a single RIS/PACS with a shared database of studies available for review in all NHS facilities with a single unique patient identifier as presently experienced by users in the NIPACS facilities. Integration of RVH and BCH/CC departments into this or a similar system has been identified as a priority and the reasons for this outlined in detail in the first paper.

12.2.3 A less good alternative, using a study sharing central database, would be an improvement in the status quo but efforts to engineer this have not been successful up to this point and confidence is low that a stable system will be forthcoming. This would only be a partial solution to the issues detailed in Paper 1.

12.2.4 Improvements in PACS communication or a change to a single RIS/PACS is required for full realisation of many regional initiatives suggested in this paper, which are considered essential for a modern, efficient imaging service of the future.

12.3 ECR:

12.3.1 Integration of NIPACS with NIECR is continuing with development of an imaging request module within NIECR which will be designed to work seamlessly with RIS and will include all sites in the Belfast Trust including the RVH and BCH. NIECR is also being developed to support tracking of requests and results acknowledgement which is recognised as being of great importance in patient safety given previous SAIs which occurred due to mis-handling of imaging reports. This system will significantly reduce error only if its use is made compulsory by health board and Trust Executives and the imaging review body request that this transpires.

12.4 PACS Workstations:

12.4.1 The quality of PACS workstations is of great importance in the accuracy of radiological reports and the efficiency of the reporting process. Monitoring is required to ensure that performance standards are maintained in terms of image quality and processing speed.

12.4.2 NIECR should be available on all reporting workstations given its increasing use and importance. Access to messaging functions or email, decision support software (such as StatDX) and intranet should be available for reasons of efficiency. Radiologists now spend many hours per day in front of workstation and the design must be ergonomically friendly to avoid RSI, back pain and absenteeism.

12.5 Teleradiology and ISPs:

- 12.5.1 It is inevitable that there will be continued use of the private sector both in terms of image acquisition and reporting services for some years to come.
- 12.5.2 Teleradiology reporting companies must be able to demonstrate that their reporting facilities meet standards and they must have access to the images and reports from previous studies in order to inform their reports properly.
- 12.5.3 Similarly, independent sector providers performing imaging examinations should have access to previous imaging and must be contractually obliged to ensure that NHS examinations and reports are automatically uploaded onto NIPACS to keep the imaging history complete.

12.6 Dose monitoring:

- 12.6.1 Systems which automatically record patient radiation dose are now available and suitable systems should be incorporated into regional PACS to allow total radiation exposure to be monitored as per current radiation control advice.

12.7 Total Image Archive:

- 12.7.1 AT present radiology PACS store and display only medical images and reports from our traditional X-ray departments. Cardiac studies, ED and ward based ultrasound studies are either stored in local archives or are not stored at all. Other medical specialties such as dermatology, ophthalmology and gastroenterology would benefit from a unified easily accessed archive. There are potential savings both in terms of archive cost and personnel time if automated systems could be set up.
- 12.7.2 The potential for a single portal access to all medical images from all sources (not just radiology) from the ECR screen is a realistic and attractive opportunity, leveraging the NIPACS infrastructure already in place. This would afford the same robust recording, sharing and storage of non-medical images that NIPACS provides for Radiology and would yield benefits in terms of quality of service and clinical risk reduction. The imaging review body would strongly support this development.

12.8 Home reporting:

- 12.8.1 The shortage of consultant Radiologists, the altered demographics of the Radiologist workforce, the increasing desire for part time and flexible working arrangements and the need to support work / life balance will require the provision of fully functional viewing and reporting workstations in radiologists' homes. This would facilitate on call, flexible work plans and those with domestic commitments.

Where We Want To Be:

- 35.** NI has a single RIS/PACS, with a shared database of studies and information available for review with a unique patient identifier.

- 36.** NIPACS is fully integrated with NIECR.
- 37.** Performance standards are fully achieved in respect of quality of PACS workstations.
- 38.** NIECR, messaging and decision support functionality, including internet, are available on PACS workstations.
- 39.** All PACS workstations are ergonomically designed.
- 40.** Independent Sector reporting facilities are of equal quality to those in the NHS.
- 41.** Independent Sector providers have full access to imaging history. Exams and reports are automatically uploaded to NIPACS to complete the patient history.
- 42.** NIPACS is fully capable of monitoring total radiation exposure to support compliance with radiation control advice.
- 43.** NIPACS capability is fully optimised and provides a single portal access to all medical images from all sources (not just radiology) from the ECR screen. This is considered to be a realistic and attractive opportunity, leveraging the NIPACS infrastructure already in place.
- 44.** Fully functional, viewing and reporting workstations are available in radiologists' homes.

13.0 Summary of Recommendations on “Where We Want To Be”

1.	Planned, inclusive, recurrently funded process to deliver 7-day working systems which consider the needs of imaging services as part of a holistic unscheduled care service.
2.	Reporting consequences of extended day and 7-day access are considered and recurrently funded.
3.	Clinical and non-clinical elements of service provision are quantified and funded appropriately to ensure out of hours, unscheduled care and extended access to service is secured.
4.	Consultant / radiographer job plans are constructed to reflect the shift towards extended day and weekend working.
5.	PACS home stations are fit for purpose and of equal functionality to hospital based systems, including voice dictation. Access speeds from out of network are sufficient to utilise the technology.
6.	Specialist networks are in place to support the increasing range of services delivered over a 7-day basis and optimise the skill base within the region.
7.	Intelligent and targeted use of the Independent Sector supports out of hours and facilitate more flexible working.
8.	The Modernising Radiology Clinical Network (MRCN) is used as a tool to develop solutions to operational challenges.
9.	Specialist and non-specialist Networks are in place to address local challenges in service delivery i.e. reporting out of hours or where there are gaps in expertise.
10.	An integrated NIPACS system for NI is in place to support innovative practice, facilitate regional solutions to local challenges, uniformity in radiological reporting and minimise duplication and inefficiency.
11.	ISAS Accreditation is in place to support consistent regional practice, competencies, resources, minimisation of variation and effective regional collaboration.
12.	Irefer is further developed by the specialist and non-specialist networks to formalise the imaging pathways for common conditions.
13.	The imaging impact of recommendations from bodies such as NICE is considered in a timely, appropriate way with associated where required.
14.	Turnaround times from examination to report being available to the referrer are in line with national standards as ratified by RCR/SCoR.
15.	Interim reporting turnaround time targets are in place, which differ from the DRTTs presently in place. The targets should be considered as aspirational but achievable with annual review by MRCN towards fulfilling the recommendation above. This is dependent on increasing reporting capacity.
16.	Process changes, additional investment and technological advances (i.e. PACS, RIS and VR) are in place to ensure the turnaround times of image reporting are kept to a minimum.
17.	All components of the unscheduled care pathway work collaboratively to improve turnaround times and clinical decision making to deliver better services for patients.
18.	MRI, CT and US scanners are funded and staffed up to 19 sessions per week (in line with local demand) to optimise sessional utilisation.

19.	Plans for resilience of the equipment base are a core element of imaging services which ensure business continuity, patient safety and effective use of resources.
20.	Primary care colleagues have clear guidance and information in order to optimise their access to and use of Irefer.
21.	Clear arrangements are in place for patients to be scanned locally, supported by central reporting where required.
22.	Patients have the opportunity to have a choice in the date and time of their appointment, through the introduction of advanced booking systems. Further progress would be the option to book appointments direct from primary care.
23.	The ECR is used as a tool to promote choice for patients and optimise capacity on a regional basis.
24.	A regional workforce plan is in place which takes account of the future needs of both medical and non-medical imaging staff.
25.	Investment plans for imaging services take the opportunity to promote and optimise skill mix and all funding implications are clearly identified and considered.
26.	A robust framework, in line with best practice, is in place to ensure career progression for diagnostic radiographic staff.
27.	Assistant practitioners are a core element of imaging teams.
28.	The role of consultant diagnostic radiographer is considered as part of MRCN and Expert Reference Group discussions as part of the implementation of the Four Tier Structure for Radiography career progression.
29.	Options such as tariff or activity based service agreements are fully explored with the most appropriate option applied to commissioning of imaging services in the future.
30.	Services are recurrently funded with clear and transparent processes for service developments and responsive to changes in demand.
31.	Speedy decisions made in respect of investment proposals.
32.	Imaging services are fully accredited by ISAS and essential resources in place to continually ensure safeguarding and clinical governance arrangements are achieved.
33.	Funding in respect of radiologists time to attend MDTs is clearly identified as part of commissioning arrangements and investment plans.
34.	RIS/PACS has the necessary functionality to manage / monitor radiologist MDT time.
35.	Northern Ireland has a single RIS/PACS, with a shared database of studies available for review with a unique patient identifier.
36.	NIPACS is fully integrated with NIECR.
37.	NIECR, messaging and decision support functionality, including internet access, are available on PACS workstations.
38.	All PACS workstations are ergonomically designed.
39.	Independent Sector reporting facilities are of equal quality to those in the NHS.
40.	Independent Sector providers have full access to imaging history. Exams and reports are automatically uploaded to NIPACS to complete patient history.
41.	NIPACS capability is fully optimised and provides a single portal access to all medical images from all sources (not just radiology) from the ECR screen. This is considered to be a realistic and attractive opportunity, leveraging NIPACS

	infrastructure already in place.
42.	Fully functional viewing and reporting workstations are available in radiologists homes.

Appendix 1

Membership of Radiology

Workstream of DHSSPS Imaging

Review

RADIOLOGY WORKSTREAM OF DHSSPS REVIEW OF IMAGING		
NAME	JOB TITLE	AREA / BASE
Dr Ronan McNally	Consultant Radiologist Joint Lead Radiology Workstream	SEHSCT
Mrs Jeanette Robinson	Radiology Services Manager Joint Lead Radiology Workstream	SHSCT
Dr Peter Flynn	Clinical Director and Consultant Neuroradiologist	BHSCT
Dr Martin Donnelly	Representing Chief Medical Officer	DHSSPS
Mr David Wallace	Radiology Services Manager	NHSCT
Mrs Maria Wright	Service Improvement Programme Manager / MRCN Network Manager	HSCB
Mr Dan McLaughlin	Radiology Services Manager	WHSCT
Dr Niall McKenzie	Consultant Radiologist	WHSCT
Dr Hall Graham	Head of IR(ME)R RQIA	RQIA
Dr Adam Workman	Head of Radiological Sciences and Imaging, Regional Medical Physics Service.	BHSCT
Dr John Lawson	Consultant Radiologist and Clinical Lead of DHSSPS Imaging Review	BHSCT
Mrs Nicky Harvey	Regional NIPACS Service Manager	BSO IT
Dr Muhammad Sartaj	Consultant Public Health Medicine	PHA
Dr James Clarke	Consultant Radiologist Nuclear Medicine / PET	BHSCT
Eddie Gibson	NI Breast QA Lead	NHSCT
Dr Anton Collins	Consultant Radiologist – ad hoc member to inform on training and manpower issues	BHSCT

Appendix 2

RCR Paper – A new service model for Radiology



Radiology in the UK – the case for a new service model September 2014

Radiology services in the UK are in crisis. The ever-increasing role of imaging in modern clinical care has led to a relentless increase in demand, particularly for complex imaging including CT and MR scans which has far outstripped the ability of current services to cope. This is compounded by a failure to recruit to consultant radiologist vacancies in almost all parts of the UK. The results of this crisis are increasing delays in the reporting of imaging tests with delayed diagnosis of cancer and other serious conditions, and a damaging impairment of the central role played by clinical radiologists in supporting high quality patient care.

Why the crisis?

The UK has around 48 trained radiologists per million population, a figure which has remained almost static for the past five years. Figures from other comparable health economies include 78 in Germany, 107 in Sweden and 113 in France. During this time, the year-on-year average increase in activity in England has been 10.3% for CT and 12% for MRI. Despite this increase, imaging rates in the UK remain significantly below those found in other healthcare systems for most tests, suggesting that further growth is to be expected.

The current model

Traditionally each hospital has its own radiology service employing its own radiologists to support its own services and providing a variable level of local primary care imaging access. The increasing demands for complex imaging in the acute and planned care environment have resulted in the main focus being support of hospital services. This has led in some areas to dissatisfaction among primary care physicians and the resultant commissioning of less complex imaging services (mainly radiography and ultrasound) from alternative providers.

Are we using technology to its best effect?

The advent of digital imaging and image storage using Picture Archiving and Communications Systems (PACS) has allowed the separation of image acquisition from reporting. This has the potential to improve outcomes and efficiency as well as patient experience. Some of the benefits of PACS have been realised by the NHS. Images are instantly available for diagnosis and clinical management and can be transmitted to specialist centres when appropriate, but the full potential for improved efficiency and quality is far from being realised.

Is outsourcing the answer?

PACS has, however, facilitated the proliferation of providers offering remote reporting services (“teleradiology”), increasingly not just to overcome short term capacity gaps but also to replace parts of a local, patient-centred radiology service. The availability of these new

services has helped to mask the growing gap between capacity and demand for image interpretation.

There are superficial attractions to the outsourcing model, particularly in areas where there are challenges with recruitment and retention of radiologists, but this model has a number of hidden costs and drawbacks which are increasingly apparent with greater use. These mainly arise from fragmentation of the clinical pathway and the perception of radiological interpretation as a commodity rather than a clinical specialty. In such an increasingly fragmented service, clinicians frequently seek second opinions locally, resulting in duplication and further inefficiency. Radiologists working outside the main service, often without access to all relevant previous imaging and clinical information, are driven to practise in a more “defensive” fashion resulting in a greater frequency of repeat or additional tests. Other drawbacks include the loss of training opportunities and the temptation for individual trusts and health boards not to make necessary long-term investments in the radiological workforce and infrastructure when short term solutions are available.

Is skill mix the answer?

Reporting of some images by radiographers is already an established part of the service in most UK radiology departments. The current and anticipated increase in demand is for the more complex and time-consuming imaging examinations for which the expertise of a radiologist is required.

An alternative model – networks of expertise

What patients deserve is accurate and timely interpretation of their images, wherever those images are acquired. The priority for the NHS is to deliver this in the most efficient and effective way.

To achieve this, patients must have access to the expertise of a radiologist with appropriate skills and sub-specialisation where appropriate. As imaging has increased in its complexity, it is not feasible in most hospitals to deliver the range of specialist support in a timely fashion across all clinical presentations. This is most evident in relation to “out of hours” services when often only a single radiologist is available for consultation.

About a third of NHS trusts and health boards employ fewer than 10 radiologists. Smaller services are also challenged in responding rapidly to significant variation in demand and capacity.

Our proposal is that existing radiology services should collaborate to form networks of expertise serving a population of several million rather than a few hundred thousand as at present.

A grouping of say 150-200 radiologists would have the capacity to provide continuous 24 hour cover across the range of required specialties. There are a few examples in practice, particularly in relation to neuroradiology, demonstrating that collaborative solutions can work. **Annex A** illustrates a possible model.

What are the obstacles?

The main obstacles to introducing such a model are technological, organisational and cultural.

Technological

Although the technology required for cross-enterprise data sharing has been in existence for some time, the NHS has been slow to realise its potential. Concerns about the resilience of the infrastructure as well as information governance have resulted in sub-optimal arrangements for data transfer even to support existing, established pathways of patient referral.

Organisational

Within the NHS in England in particular, the prevailing ethos of competition between providers must be overcome if a networked model of service is to be introduced. There are many organisational structures that might be adopted - a "federation" of participating organisations would offer one possibility. This would be least challenging to trusts and health boards who wished to keep control of their own services and equipment but enjoy the benefits of scale including access to specialist expertise, smoothing of capacity and potentially reducing outsourcing costs. If required, a teleradiology provider could be contracted to a federation offering better value to the multiple organisations involved. To protect interests and provide sustainability, a federation would need to be underpinned by a suitable legal vehicle such as a joint venture.

Cultural

The emphasis on maintaining the viability of local services has led to a defensive culture in the NHS. Any new model would fail were it to rely on reversing such a culture. The model proposed is put forward as a true network and not "hub and spoke". Willingness to collaborate may be the most important requirement. "Members" of the network could be either foundation trusts or non-foundation Trusts within English structures.

The hospitals would all maintain their own imaging services, including equipment base and staff. The only part of the service in which networking is proposed is in the reporting of acquired images.

Conclusion

The current workforce crisis is driving us towards the concentration of all specialist radiological expertise in a few centres of excellence. We do not believe that this is in the best interests of patients. Rather, our hope is that in the future most radiologists will work in a distributed network fulfilling a dual role as generalists to their local healthcare community and as an expert resource to a wider network in their specialist areas of practice.

There is a desperate need to recruit more radiologists to address current and future demands. We have too few radiologists to deliver the workload currently required, regardless of how they are deployed. Training the numbers needed will take several years but a new model of service along the lines we have suggested would make the most of the current limited capacity, would offer advantages to patients in terms of equitable access to expertise and would provide the best environment for the training of the radiologists we will require in the future.

September 2014

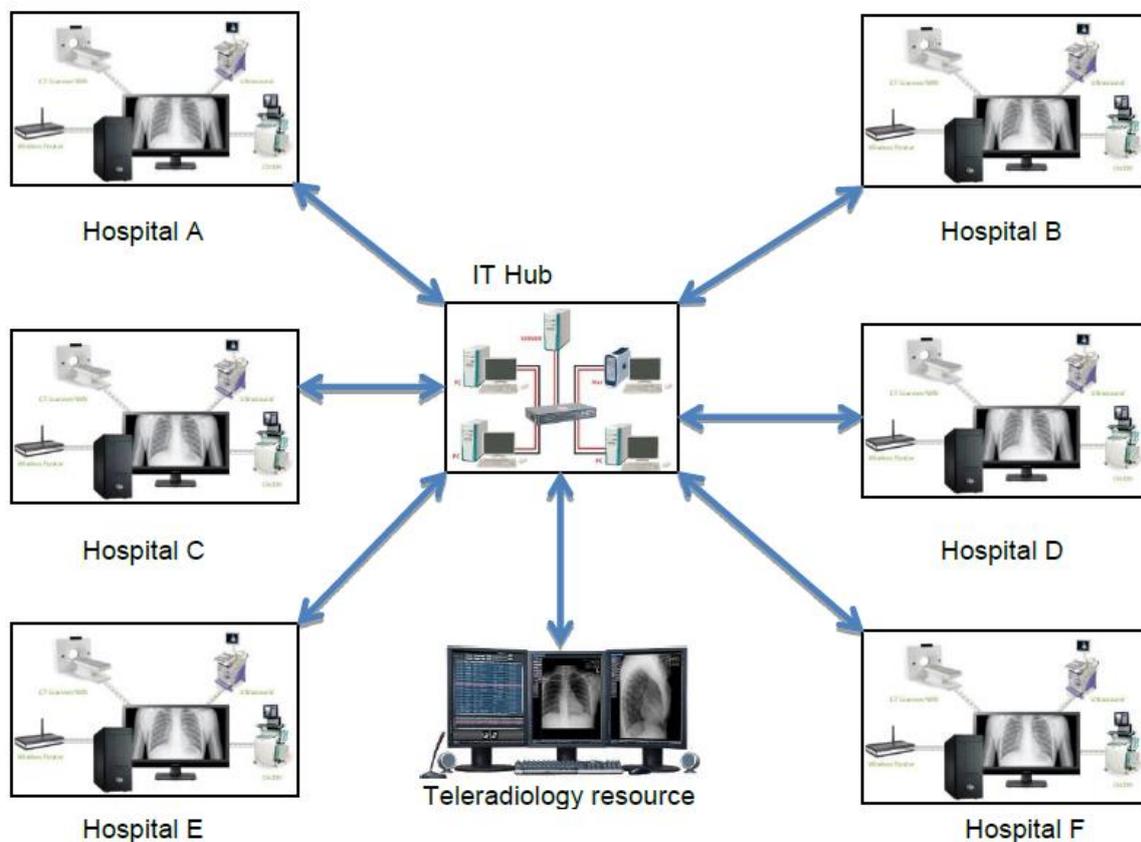
Annex A: A proposed networked model for imaging services

Introduction

The following is an illustration of how a network might be configured to show the potential benefits to the service overall while highlighting a number of the challenges to implement and maintain it.

The proposed example

The diagram below shows a network involving the imaging services of six hospitals - the number of hospitals is not critical but to achieve economies of scale we believe the minimum would be five. The PACS systems of the hospitals are connected by an IT Hub for ease of image transmission throughout the network. There is a facility for linking with a teleradiology resource for extra capacity of reporting.



The components

- **The hospitals**

The model illustrates a true network and not a hub and spoke model. It is envisaged that each “member” has equivalent status within the network. The hospitals may be from one geographic area but this is not essential and in fact there could be advantages in a geographic spread throughout the UK. The hospitals will all maintain their own imaging service, including equipment base and staff. The only part of the service in which networking is proposed is in the reporting of acquired images.

- **The IT Hub**

The hospital PACS and RIS systems would link all the participating hospitals for ease of image transfer. In addition this hub would be “managed” by the introduction of a set of “rules” which would guide images to their correct location. These rules would be agreed by the network as a group and implemented on their behalf by the Hub manager. Rules would be divided into two categories -

- Generic
- Hospital specific

Rules could be open ended or time limited.

Examples of a generic rule could be:

- *All CT scans acquired after 10.00pm to be sent to the receiving imaging department in line with the agreed 24/7 rota*

An example of a specific rule could be:

- *All Hospital As hand and feet MRI scans to go to an appropriate MRI radiologist between 02/03/2015- 15/08/2015 (due to maternity leave)*

Variations on this could include rules introduced by individual hospitals that set thresholds for when images would be transferred for reporting e.g

- *All outpatient MRI scans waiting more than 48 hours for a report to be transferred for reporting.* This might vary between different hospitals.

The “Hub manager” would then set up the appropriate protocols to ensure correct direction of images and would provide audit data on effective implementation of the rules.

- **The teleradiology resource**

To ensure that the network could deliver the reporting workload in a timely fashion it would need to ensure that it has the appropriate capacity and capability. Each network would have differing needs and priorities. Each hospital would need to identify its reporting needs and its current capacity.

The needs of some hospitals might be in specific expertise e.g. paediatrics, head and neck etc. One advantage of the network is that by working together the need for individuals with such skills might be reduced. At times of leave etc. images could be transferred elsewhere within the network.

The other more generic need would be related to the current shortage of radiologists. Again it is possible that by combining into a larger workforce the network would be able to mitigate against the peaks and troughs in smaller services.

However, it is likely that the network would need to be able to flex capacity. This could be provided by a teleradiology resource, either by the use of an existing teleradiology provider as a partner in the venture or by management of the in-house radiologists utilising their non-contracted hours.

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