

DHSSPS Review of Imaging Services

Radiology Workstream



Paper 3 of 4: Gap Analysis

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Abbreviations

DHSSPS	Department of Health, Social Services and Public Safety
HSCB	Health and Social Care Board
ERG	Expert Reference Group
RCR	Royal College of Radiologists
SCoR	Society and College of Radiographers
MRCN	Modernising Radiology Clinical Network
NIPACS	Northern Ireland Picture Archiving and Communications System
RIS	Radiology Information System
SBA	Service and Budget Agreement
PGC	Post Graduate Certificate
PGD	Post Graduate Diploma
OOH	Out Of Hours
NOUS	Non-Obstetric Ultrasound
MRI	Magnetic Resonance Imaging
CT	Computerised Tomography
MDT	Multi-Disciplinary Team
PET	Positron Emission Tomography
ISAS	Imaging Services Accreditation Standard
UKAS	United Kingdom Accreditation Service
ED	Emergency Department
RMPS	Regional Medical Physics Agency
WTE	Whole Time Equivalent

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, and established a number of Workstreams to take forward the substantive work in each of the core areas. At its first meeting in February 2014, the Project Board requested each Workstream to produce a series of four papers (listed below):
- **Paper 1: Current service:** *where we are now* – 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 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 Workstream was presented to the Project Board in January 2015 and it challenged us to design an exemplar imaging service to support the needs of the health service in Northern Ireland for the next ten years. The paper provided a narrative under a range of key themes to present the views of the group on what an exemplar imaging service would look like. At the end of each section was a list of key statements reflecting what the service of the future would look like which have been used as the basis to undertake the gap analysis.
- 1.4 Paper 3 required the Workstream to undertake a gap analysis to identify what is needed to get from where we are now (Paper 1) to where we want to be (Paper 2). This has arguably been the most challenging paper for the Workstream to develop as it has the potential to expose so many gaps in that it would seem an impossible task to address them all. To mitigate this, we have attempted to be explicit about the benefits to be gained by addressing these gaps and to be clear about the impact on the quality and effectiveness of patient care.
- 1.5 There is no doubt that the needs of the modern health service will require more medical imaging, performed faster and available for many more hours per week. In identifying the gaps which must be addressed, and what is needed to address them, we have essentially designed an Action Plan for the development of imaging services over the next 10 years. The Workstream is aware of the financial constraints in NI at

this time; however it is important to emphasise that Paper 3 is not a “wish list”. These are real gaps which have developed due to a lack of sustained recurrent investment in both the imaging service and its infrastructure.

- 1.6 It is critical that the findings of this paper are formalised into a regional “invest to save” plan, with clear commitment and leadership from the DHSSPS, HSCB and HSC Trusts to ensure its delivery. It is recognised that in parallel with investment, a programme of continuous improvement which reflects best practice internationally is required and the MRCN has already commenced work in this direction.
- 1.7 The authors gratefully acknowledge advice and input from Dr Eddie Gibson, Dr Adam Workman, Nicky Harvey and the Modernising Radiology Clinical Network (MRCN) in the development of this paper.

2.0 Follow Up on early Recommendations from Radiology Workstream Paper 1

- 2.1 Paper 1 from the Radiology Workstream outlined three 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 and to support the expected continuing increase in demand for imaging services in the coming decades
 - 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 On 20th April 2015, formal confirmation was received that the Minister had approved the appointment of two additional trainee radiologist posts per annum. The Workstream and Radiology Network acknowledge this as a positive step and will continue to present the case for further expansion in the number of radiology training places in line with the remainder of the UK to address the imaging workforce needs.
- 2.4 In relation to NIPACS, work has commenced regarding options for integration. This is now a formal project being taken forward via the E-Health Project Board.
- 2.5 In relation to ISAS, the Department formally requested the Board to consider through the commissioning process, the establishment of an accreditation scheme for imaging in NI. A meeting was held on 29th May 2015, with leads from the RCR, SCoR, ISAS, UKAS and representatives from the imaging review and HSCB to discuss options and agree the way forward. A paper outlining the options for NI and costs is being prepared by UKAS and will be presented for consideration within the next month.
- 2.6 The Radiology Workstream and the Radiology Clinical Network 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 Feedback from Expert Reference Group

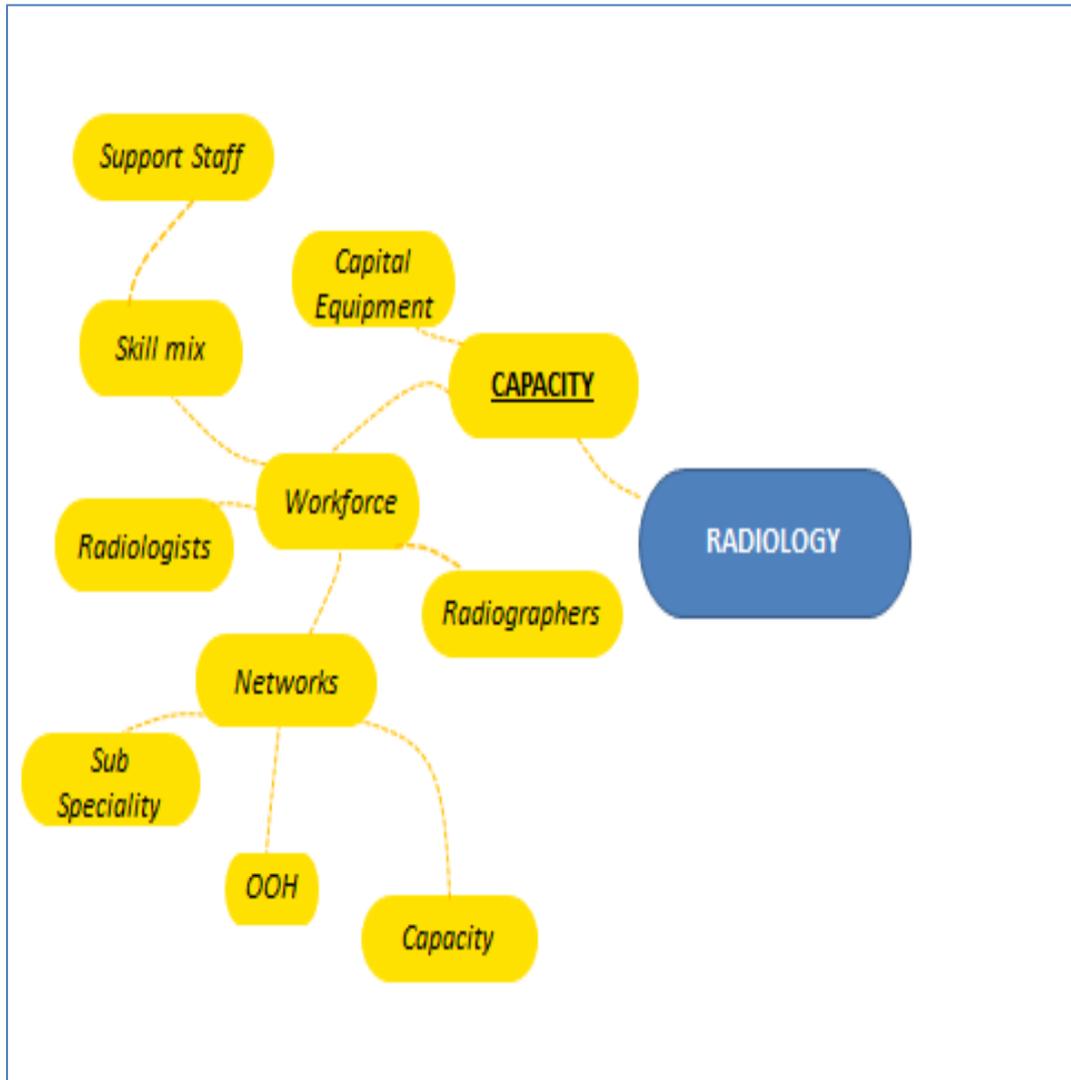
- 3.1 Following production of Papers 1 and 2, a number of the Workstream Leads had the opportunity to meet with the Expert Reference Group (ERG) which supports the Imaging Review. This group comprises experts in the field of imaging services, nationally and internationally and membership is attached in **Appendix 2**.
- 3.2 The ERG and Workstream Leads met in February 2015, and also had discussion with the Chief Medical Officer and senior review leads to discuss progress to date and provide advice and support for the remainder of the review.
- 3.3 The ERG expressed their support for the three early recommendations outlined by the Radiology Workstream in Paper 1, namely:
- Need for an increase in the number of radiology training numbers
 - Need for a single NIPACS
 - Need for accreditation of imaging services
- 3.4 The following areas were identified as needing further consideration within Workstreams in Papers 3 and 4:
- The links with primary care
 - More clarity on the patient voice and patient centred service delivery
 - More clarity on how imaging benefits the whole health economy and how invest to save can be achieved, including maximising capacity, controlling and responding to demand, optimisation of skill mix and enhancing underpinning systems and processes
 - Use of the recently retired radiology workforce to support the core service
- 3.5 A useful radiology mind map (overleaf) was provided and this has been used to design the framework for Paper 3. Each section will be structured as follows:
- Introduction
 - Description of the gap
 - Impact of gap on current service
 - What is needed to address the gap
 - Benefits of addressing gap / risks of not addressing the gap
 - Assessment of achievability
 - Acceptability of gap (to patients, carers and families / clinician / public)
 - Priority

Figure 1: Radiology Mind Map¹



¹ Courtesy of Pete Cavanagh, Expert Reference Group, Imaging Review 2015

4.0 CAPACITY



4.1 Funded Capacity within Imaging Services

Introduction

- 4.1.1 The HSCB has undertaken a baseline assessment of funded capacity against historic demand and the projected demand to 2019/20. For the past number of years, in-year pressures above funded capacity have been addressed using non-recurrent funding to commission additional scanning / reporting from the Independent Sector or via in-house waiting list initiatives.
- 4.1.2 However, the amount of funding has been largely insufficient to fully address gaps and its non-recurrent nature prevents proactive management of capacity and demand pressures.

Description of the gap

- 4.1.3 Table 1 below outlines the recurrent activity gap to 2015/16 between demand and funded capacity across the region in the four main modalities for which there are Service and Budget Agreements in place (SBAs). There is a demonstrable gap between recurrently funded capacity (SBA) and demand across the four main imaging modalities across the region, with degrees of variation between Trusts.
- 4.1.4 Table 1 also projects what the recurrent gap is likely to be for the period 2016/17 to 2019/20. Essentially, both of these gaps need to be funded in order to fully meet demand for imaging services over the next five years. These gaps take account of planned investments known at the time of writing.

Table 1: Imaging Gaps to 2015/16 and predicted for 2016/17 – 2019/20

	Historic Recurrent Gap to 2015/16	Projected Recurrent Gap 2016/17 to 2019/20	Total projected demand 2015/16 and 2016/17 - 2019/20
MRI	14,600	16,000	30,600
CT	31,900	36,800	68,700
NOUS	40,100	51,700	91,800
Plain Film	97,100	160,600	257,700

Impact of gap on current service

- 4.1.5 The impact of recurrent funding gaps on the service includes:
- Level of non-recurrent funding insufficient to fully meet demand
 - Lack of ability to adequately manage patient flow within unscheduled care
 - Non-recurrent funding cannot be used flexibly or sustainably and does not encourage innovation or support optimisation of skill mix
 - Increase in the number of people waiting in excess of waiting time standards. At 31st March 2015, there were 6,706 patients waiting longer than nine

weeks for an imaging test in MRI, CMR, CT, and Non-Obstetric Ultrasound. This compares with 3,331 at the same period last year. The reasons for this are complex and whilst availability of funding is a key contributor, it is not the only reason. Lack of specialist skill in key areas such as GA / Paediatric MRI, CTC etc. and under-delivery of some commissioned volumes are also factors.

What is needed to address the gap?

- 4.1.6 As part of the Regional Plan for imaging, a series of Investment Proposal Templates (IPTs) have been written which will ask Trusts to develop plans to close the recurrent gaps for current and future demand. A recurrent funding source to close the historic gap and address future demand is required.
- 4.1.7 Where capital development plans are in place, the SBAs are adjusted in line with the associated recurrent investment and the gap reduced accordingly. SBAs are also uplifted to support the imaging consequences of developments in other specialties (e.g. ENT / Orthopaedics) where required. These have been factored into the above gap calculations and will continue to be in the event of future investment.
- 4.1.8 At the time of writing, work to address the priorities identified to improve patient flow has quantified the additionality required to deliver 7-day access to imaging, including extended days to support same day / next day scanning and reporting in respect of the 5 Category 1 ED sites. Pending confirmation of funding, the recurring gaps above will reduce further.

Benefits of addressing gap / risks of not addressing the gap

- 4.1.9 Investing recurrently will significantly increase the resilience of imaging services, allow them to operate more flexibly to meet demand, deliver 7-day access and achieve improved waiting times for patients.
- 4.1.10 Services that are recurrently funded are more able to optimise skill mix and provide backfill to facilitate trained staff to practice. It will further optimise use of the capital equipment base by increasing the sessional utilisation of each scanner.

Assessment of achievability / Acceptability

- 4.1.11 This will depend on the availability of a recurrent funding source to enable staff recruitment, notwithstanding the challenges of recruitment of consultant radiologists. Time will be needed for training / skilling of radiography workforce. However, recurrent funding will allow this to be planned in a robust and managed way and will provide a more acceptable solution to the imaging service.

4.2 Capital Equipment

Introduction

- 4.2.1 The current physical scanning infrastructure has been assessed to assist with appropriate prioritisation of capital investment over the next five years.
- 4.2.2 Table 2 below provides a baseline analysis of the 2014/15 funded sessions in MRI, CT and NOUS modalities, against an optimum utilisation of 19 sessions per week (based on 5 x 3 session weekdays and 2 x 2 session weekend days).

Table 2: Funded Sessions on Capital Equipment Base 2014/15

	MRI		CT		NOUS	
	no. scanners	% sessions funded	no. scanners	% sessions funded	no. scanners	% sessions funded
BHSCT	7	49%	9	45%	20	32%
NHSCT	1	84%	4	47%	9	46%
SEHSCT	2	71%	4	51%	10	51%
SHSCT	1	100%	3	54%	10	42%
WHSCT	2	68%	4	49%	12	53%
TOTAL	13	74%	24	49%	61	43%

4.2.3 The HSCB has agreed investment for four additional scanners as follows:

- 2015/16:
 - RBHSC MRI scanner: Capital costs were funded from charitable donations Implementation planned for July/Aug 2015.
 - SHSCT MRI Scanner: Due for implementation June 2015.
- 2016/17
 - NHSCT MRI Scanner: Due for implementation April 2016
 - SHSCT CT Scanner: Due for implementation April 2016
- 2016/17
 - As part of the development of cancer services, an MRI scanner will be installed at the new Radiotherapy Centre at Altnagelvin Area Hospital, which will support both the radiotherapy and diagnostic imaging service.

Description of the Gap

- 4.2.4 Currently, expansion of imaging in NI is more constrained by its workforce rather than its equipment base and there would appear to be sufficient capacity on current scanners to enable service delivery up until 2019/20.
- 4.2.5 There may be instances where demand at Trust level does not indicate the need for further capital, but it does at site level due to geographical distance between available scanners (e.g. WHSCT is in discussion regarding provision of a second MRI

scanner at Altnagelvin). This will continue to be monitored and planned for accordingly.

- 4.2.6 As referenced in Paper 1, there are 12 hospital sites with single CT scanners, of which six currently provide ED services. It is recognised that there are serious implications for the ability of a hospital to deliver ED services in the event that a scanner loses operational function. The reliance on CT by acute hospitals is such that there is a strong argument that CT must always be available and by implication, acute hospitals should have at least two CT scanners to provide resilience and ensure business continuity. Essentially, 2nd scanners may be needed for resilience purposes only, even though they are not indicated in terms of demand.
- 4.2.7 Paper 1 alluded to the Transforming Your Care programme which anticipated a major restructuring of how acute services are delivered by current hospitals. The Donaldson Review went further, referencing a situation in which Northern Ireland has more inpatient units than is usually justified the size of the population, and the expense of maintaining them impedes provision of other services that would represent better value for money and more appropriately meet the needs of the population.
- 4.2.8 If the current hospital configuration remains unchanged, the implications for CT (even as a minimum) are clear. A further six new CT scanners would be required purely to provide resilience. The capital cost of 1 x new CT scanner can vary between £500k and £1.2m exc. building works. The indicative revenue costs are in region of £600k upwards based on a staffing for a basic 10 session week. Furthermore, these six scanners would then enter the capital programme for ongoing replacement / maintenance. Clearly, this requires significant investment, which is not indicated in terms of demand. If this is required, it will severely restrict investment opportunities in more pressured modalities where funding could be more effectively spent.
- 4.2.9 Critically, the geographical pattern of the current configuration has led to specialist expertise being too thinly spread and it is therefore not possible to deliver the same quality of care in all locations, at all times of the day / week.
- 4.2.10 Whilst there is no current gap in scanning equipment, this could change if there is a requirement to resource all locations with appropriate levels of scanners for the purposes of resilience. The Workstream would urge the Project Board to consider the recommendations of the Donaldson Review with respect of the location of acute hospital units, with particular reference to the consequences for the imaging service if the current configuration does not change.

Imaging Workforce

The needs of the imaging workforce must be considered holistically in order to ensure that services are provided in a way that enhances the skills and contributions of both the medical and non-medical teams. The previous papers have outlined the frameworks and structures within which imaging teams currently operate and the following provides an assessment of the key areas of deficit within the radiology and radiography components. The Workstream has endeavoured to highlight specific gaps within each and has done so with the needs of the overall imaging service underpinning them.

4.3 Radiology

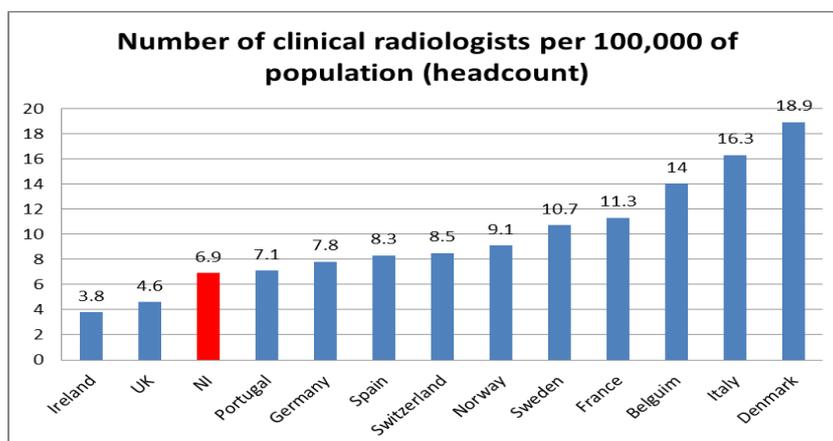
4.3.1 As in the rest of the UK, there is a shortage of radiologists in NI. Information collated by the Workforce Sub-Group indicates that there are approx. 18 wte funded vacant consultant radiologist posts at April 2015. Some of these positions have been advertised on multiple occasions without suitable applicants. Further growth in demand for imaging and imminent retirements indicates that this gap will grow in the next few years. This presents challenges not just for the general radiology workload, but for certain sub-specialist areas.

Description of the gap

4.3.2 In June 2012, the RCR presented a paper outlining the case for an increase in the clinical radiology workforce in the UK in light of the role of imaging in modern healthcare and to illustrate how the clinical radiologist is a vital part of the majority of patient's diagnostic pathways².

4.3.3 The paper refers to the UK as having a lower than average rate of the use of imaging, which is reflected in the low numbers of clinical radiologists per head of population compared with its European counterparts. The RCR data outlining the number of clinical radiologists per 100,000 population is presented in Table 3 below, into which the relevant figures for NI have been inserted for illustrative purposes.

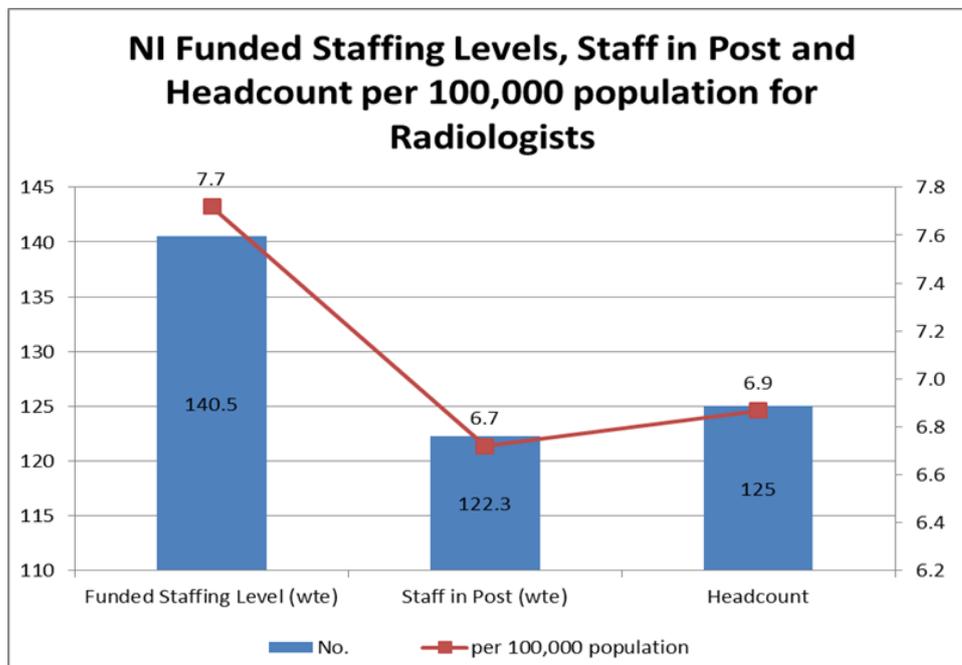
Table 3: Number of clinical radiologists per 100,000 population (headcount)



² "Investing in the Clinical Radiology Workforce – The Quality and Efficiency Case" RCR June 2012

- 4.3.4 The range of variation is clear. NI has 6.9 consultants per 100,000 population which ranks us in the bottom three compared with other European countries. The UK rate is marginally lower, reflecting a significantly higher use of private facilities (in addition to the independent sector) than in Northern Ireland. Suffice to say, the collective UK rate is the European outlier. Furthermore, the NI imaging rate is lower than the UK average (as detailed in Paper 1) which indicates that there will be continued and sustained demand for services.
- 4.3.5 From information collated by the Workforce Sub-Group, Table 4 outlines the current staff in post and funded staffing levels (WTE) and headcount per head of population. NI is funded to deliver 7.7 wte consultant radiologists per 100,000 population, but due to the current vacancies, there are only 6.7 wte in post.

Table 4: NI Funded Staffing Levels, Staff in Post and Headcount per 100,000 population



Impact of gap on current service

- 4.3.6 The reporting consequences of the increased demand for imaging have been the prime motivator for this review of imaging services. Increasingly, and reflecting the UK trend, many imaging departments cannot meet their workload requirement within contracted hours and many pay overtime to help get through the reporting workload. The increased demand on radiologists comes in a number of forms:
- Increased number of attendances
 - Increased diversity of investigations
 - Increased complexity of imaging studies
 - Increased access to diagnostic services (24/7)
 - Increased input of clinical radiologists to the multi-disciplinary team

- Increased need for interventional radiology
- Increased access from primary care
- Variability in the number of imaging examinations having a formal radiology report. This gap presents a clinical risk if films remain unreported or a financial risk if a high percentage of films are reported.

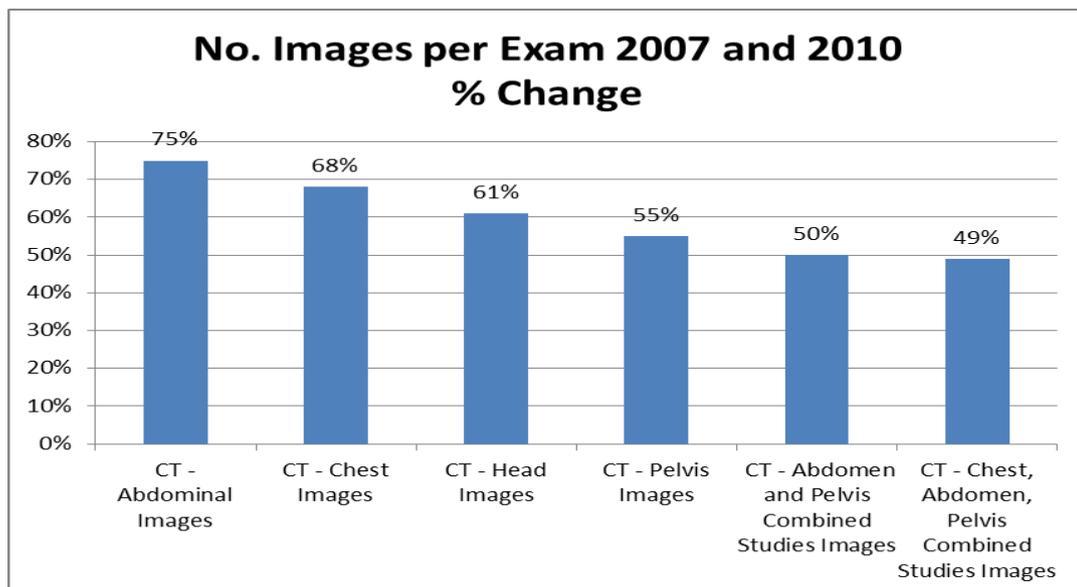
4.3.7 This has resulted in:

- Increased waiting times, delaying patient diagnosis and treatment
- Media reported crises and patient harm due to unreported studies
- Use of expensive and poorly integrated Independent Sector services, from out sourcing and Waiting List Initiatives (WLI).
- Use of agency locums which has proven to be significantly more expensive than an in-house solution
- Difficulties with recruitment into less popular specialties
- Stress/burnout of radiologists

4.3.8 The increase in demand for imaging is well documented, but it needs to be understood that although there has been an increase in most imaging modalities, the biggest rise is in the more complex tests or those which are the most labour intensive.

4.3.9 New technology has enabled significant enhancement of diagnostic information. Although the imaging equipment gets faster, the number of images to be reviewed in an individual cross-sectional imaging study has vastly increased³ (see Table 5) and this has a direct impact on the clinical radiology workload.

Table 5: No. Images per exam 2007-2010 - % Change over 3-year period



4.3.10 Notwithstanding the challenges of meeting imaging demand and the workforce shortages, the Workstream is clear that patients have a right to expect that

³ "Investing in the Clinical Radiology Workforce – The Quality and Efficiency Case" RCR June 2012

investigations will be seen and accurately reported as quickly as is required to meet clinical need. Plain film produces the major volume of work and a small percentage increase can mask significant reporting challenges. For example, a 1% rise in a Trust reporting 200,000 per annum generates work equivalent to 1 wte radiologist reporting plain film only. It is accepted that a balance needs to be set between quality and timeliness of reporting and that the whole patient pathway should be improved to support this, including optimising the ability of advance practice radiographers to report plain film. The current Diagnostic Reporting Turnaround Time Targets require 100% compliance and need to be reviewed and replaced with interim standards and assessment of available reporting capacity.

- 4.3.11 As referenced in Papers 1 and 2, the impact of MDTs on consultant radiologist time is significant, and increasing in parallel with the projected increase in cancers. The RCR estimated that for an average DGH of 13 consultant radiologists, approximately 1.25wte time per week was required to support MDTs⁴. There are 140.5wte funded consultant posts in NI, which would equate to 14wte required per week for MDTs. As previously outlined, there are 18wte vacant posts so the pressure to support the requirements of MDTs is clear and significant. The RCR paper was produced in 2012 and the time requirement will have increased since then (and will need to take account of travel etc.), but it is useful nonetheless to provide a reasonable quantification of the time commitment involved. Trusts also quote increasing complaints from within the service, when radiologist cover cannot be secure for MDTs 52 weeks per year and that the workload covered in an MDT meeting is increasing significantly above that originally intended to be per session.
- 4.3.12 The demand for biopsies to support oncology is also increasing, as is the management of these within the red flag pathways. They are time consuming procedures which require dedicated time on day lists and beds.

What is needed to address the Gap

- 4.3.13 For the reasons detailed previously, it was accepted that an immediate increase in the number of trainee radiologists was required and this was the highest priority of the three early recommendations made by the Workstream. As a result of this and thanks to intervention by the Minister, an extra 2 training places were made available to the training scheme for the new intake this year and recurrently thereafter. This increase is welcomed, but it remains considerably short of the level required to begin to positively impact on the radiological workforce shortages. It is imperative that there is a commitment at Departmental level, to further similar increases each year until NI is on a par with the rest of the UK⁵.
- 4.3.14 Work is continuing to optimise skill mix opportunities, however the present position is such that further initiatives are required to close the workforce gap and increase the complement of radiologists. Initiatives aimed at promoting Northern Ireland as a

⁴ "Investing in the Clinical Radiology Workforce – The Quality and Efficiency Case" RCR June 2012

⁵ In March 2015, Richard Fitzgerald, Vice-President RCR announced that the NHS agreed to fund at least 22 additional radiology registrar places (England 16 and Scotland 6).

workplace for radiologists currently employed elsewhere in the UK and from the rest of the world is required, along with processes and strategies intended towards retention of our present workforce, counteracting the recent net loss to UK, ROI and further afield. Given shortages in other specialties, this could be part of a larger DHSSPS initiative, promoting an inflow of specialists.

- 4.3.15 The External Reference Group advised that there is a useful cohort of recently retired radiologists who could be encouraged to report imaging studies in a contracted / per item basis. A regional approach is required to facilitate this and DHSSPS / Trust Human Resources teams need encouragement to take this forward.
- 4.3.16 All Trusts are utilising either internal or external waiting list initiatives to support core reporting. Via the MRCN, plans are in place on a cross-Trust basis to increase the general and specialist workload and service continuity through the use of agreed reporting networks, particularly in the NIPACS locale in the first instance. Regular additional programmed activities could be offered across Trusts to allow for reporting of a specified number studies per year (as defined by MRCN reporting numbers). This output based rather than time based way of working would be cost efficient compared to present WLI procedures. Similar methods would be useful in attracting recently retired radiologists.

Benefits of addressing Gap / risks of not addressing the Gap

4.3.17 The benefits of addressing the gap in the consultant radiological workforce are clear and include:

- Cost savings relative to continued use of out-sourcing and WLI
- Continued development of local services and interaction between referrers and radiologists
- Reduction in time from referral to report improving primary and secondary healthcare processes
- Improved patient satisfaction and confidence in health service as a whole
- Stability and development of sub-specialist imaging to support these services
- Reduction in stress and burnout of radiologists
- Development of 7 day services

4.3.18 Similarly, the risks of not addressing gap are also clear and include:

- Increase in waiting times leading to healthcare inefficiencies
- Breakdown of local specialist services
- Loss of public confidence and satisfaction with health service
- Further loss of radiologists to more attractive areas
- Loss of opportunity to develop the imaging team as a whole and promote skill mix
- Potential to jeopardise plans for accreditation due to lack of available consultant input / support

Assessment of achievability / acceptability

4.3.19 There is a UK-wide shortage of radiologists both generally and in sub-specialist areas. No single measure is sufficient to close the gap that exists and it is likely that reliance on the independent sector will continue for many years to come. Increase in training numbers should allow for a gradual increase in consultant radiologist numbers assuming that the present workforce can be retained. Without promotion of the region and improved employment conditions, it is unlikely that many trained radiologists will be attracted to Northern Ireland and further loss of staff to other areas or the private sector is likely. However, although it is unlikely the reporting gap will be filled in the next 5-10 years, minimisation of the gap is required both in terms of service quality and economic efficiency.

Priority

4.3.20 Given that there are generally sufficient radiographer numbers (albeit challenges within advanced practice) and adequate equipment provision, the radiologist deficit in Northern Ireland is the limiting factor in imaging activity in this region. Future retirements and continued demand indicates that the reporting gap is likely to increase. Radiologist training, skill mix, promotion overseas and retention of the workforce are of the highest priority to reduce IS reliance and allow development of healthcare.

4.4 Imaging Workforce (Radiography)

Introduction

- 4.4.1 The College and Society of Radiographers (SCoR) and the Royal College of Radiologists (RCR) believe that appropriately constructed skill mix initiatives will benefit patients and their care by ensuring scarce workforce resource is appropriately focussed.
- 4.4.2 Drivers such as increased demand and workforce shortages have resulted in a need to make best use of available skills, whilst maintaining standards.
- 4.4.3 However, skill mix and role development within imaging departments in NI has tended to be pragmatic, opportunistic and driven by local champions. This has resulted in enhanced local provision of service, maximising skill mix and harnessing radiography skills. Much of this extended scope practice has developed at Trust level without necessarily assuring and transferability of the extended roles and skills or equality of opportunity at regional level. This readiness and willingness to embrace advanced practice roles within radiography has led to an inequity of opportunity for career progression within the profession, as evidenced by the variation across the five Trust areas.

Description of the Gap: Plain Film Reporting by Advanced Practitioner Radiographers

- 4.4.4 Radiographers who undergo specific training in the reporting of plain film images can become reporting radiographers. Plain film reporting radiographers are well established in many sites in England although adoption of this practice has been slower within Northern Ireland.
- 4.4.5 Radiography staff must undergo a PGD in reporting and along with mentorship and assistance from Radiologists, must be assessed and signed off as competent to report independently. This training takes approximately two years.
- 4.4.6 The service offered by reporting radiographers is essential in meeting the demand for plain film reports within Minor Injury units and Emergency Departments. Although dedicated hours may be allocated to trained staff for reporting, this may vary from week to week depending on demands from the service.
- 4.4.7 The Scottish Managed Diagnostic Imaging Clinical Network (MDICN) produced a paper entitled *“Improving Reporting Capacity within Diagnostic Imaging in Scotland: Facing the Challenge”*⁶. This paper scoped the demand and options facing imaging teams and showed that significant consultant time was spent doing work that Advanced Practice Radiographers can do and that significant Advanced Practice Radiographer time is not used to its intended purpose. They concluded that in relation to Plain Film examinations, the potential scope of radiographer reporting should be conservatively estimated at a minimum of 20% of overall plain film activity. Further integration of the role could increase this to 40%. This is an example of how Advanced Practitioner Radiographers could be used within Northern Ireland with appropriate training, mentorship and backfill to release them from general radiographic duties.
- 4.4.8 The Workstream has undertaken analysis on the utilisation of plain film reporting radiographers within Trusts. In NI, approximately 1.1 million plain film x-rays were performed in 2014/15. If the Scottish benchmarks were applied, it would indicate that in the region of 220,000 to 440,000 films could be reported by advanced practice radiographers per annum.
- 4.4.9 The following methodology was developed to better understand the potential within the current workforce for utilisation of existing reporting skills and to indicate what is needed to deliver radiography plain film reporting to the Scottish benchmark of 20%-40%. The Workstream developed a methodology in respect of 1wte radiographer as outlined in Table 6. The average films reported per session is based on the SCoR guidance for radiographer reporting.

⁶ *“Improving Reporting Capacity within Diagnostic Imaging in Scotland: Facing the Challenge”*. Jim Cannon (MDICN Network Manager), Dr Iain Robertson (MDICN Clinical Lead), Dr Hamish McRitchie (CMO Radiology Advisor) 2012.

Table 6: Productivity assumptions from 1wte PF reporting radiographer

WTE	Available Reporting sessions per week per WTE	Hours per session	Available Reporting Hours per week	Average Films reported per session	No. PF 1 x WTE can report per week	No. PF per WTE can report per year (44 weeks)
1	6	3.75	22.5	40	240	10,560

4.4.10 Data collected as part of the Workforce Sub-Group of the Imaging Review indicates that there are approximately 18.05wte radiographers trained to report plain film in NI. It should be noted that if the radiographers have not been using these skills for a period of time, it may be necessary to undergo a period of refresher training. If the productivity assumptions outlined in Table 6 were applied, there would appear to be capacity in the current system to report 190,000 plain films as illustrated in Table 7 below. It is noted that the geographic spread of these radiographers is not even across the region and some Trusts do not have any and will require support for training and backfill.

Table 7: NI Trained PF Reporting Radiographers

Capacity based on Trust WTE modelling assumptions above							
REGION	WTE	Available Reporting sessions per week per WTE	Hours per session	Hours per week	No. films which can be reported per session	No. PF can be reported per week	No. PF per WTE can report per year (44 weeks)
	18.05	108.3	3.75	406.13	40	4,332	190,608

Position based on Trust Info				
Actual Hours per week spent reporting	Equivalent WTE spent reporting based on hours spent	Equivalent sessions pw	Equivalent scans reported pw	Equivalent scans reported per year
209.00	9.29	56	2229	98,091

4.4.11 However, from the information provided by Trusts on the hours their staff currently spend reporting, and applying the same productivity assumptions, the picture is somewhat different. With the time allocated to them, they can only deliver 98,000 plain film reports. This indicates that the advance practice radiographers are unable to secure the time required to undertake these reporting duties, due to the requirements of general radiography and the historic lack of backfill to support radiography development.

4.4.12 Table 8 shows that there were 1,125,533 plain films undertaken in 2014/15. When the productivity assumptions are applied, this tells us that we had sufficient trained staff in the system to report 16.9% of all plain films undertaken last year. However, with the hours allocated to reporting, this reduced to 8.7%.

Table 8: Theoretical capacity for reporting PF 2014/15

	Plain Film Activity 2014/15	Capacity in system if radiographers operated to optimum reporting capacity	Optimum as % of total 2014/15 activity
REGION	1,125,533	190,608	16.9%

Capacity in system based on current hours spent reporting	Capacity as % of total 2014/15 activity	Actual PF reported	Actual %
98,091	8.7%	46,787	4.2%

***methodology by M Wright/J Robinson Radiology Workstream 201.*

4.4.13 From the information available, it is estimated that only 4.2% of all plain films were actually reported by radiographers in 2014/15. We know that some trained staff are on S/L, but we can also reasonably deduce that trained staff are not able to spend even the limited time allocated to them in their job plans for plain film reporting.

4.4.14 The following is an estimate of the resources needed if NI was to deliver 20%-40% of plain film reported by advanced practice radiographers (in line with Scottish benchmark). This assumes that the reporting radiographers are able to operate at the levels proposed in Table 6.

- **BASELINE** 18.05 wte to achieve 16.9%
 - Backfill of a minimum of 8wte radiographers is required to enable the current trained workforce to report to optimal levels
- 21.5 wte needed to achieve 20%
 - An additional 3.45wte above baseline
- 31 wte needed to achieve 30%
 - An additional 12.95wte above baseline
- 42 wte needed to achieve 40%
 - An additional 23.95wte above baseline

4.4.15 The provision of additional radiographer capacity will require commitment from the Commissioner to support training and backfill costs, as well as commitment from Trusts to support and encourage this approach. The utilisation of currently trained, but not practising, reporting radiographers may incur some time requirement to top-up skills.

Post Graduate Training

4.4.16 On an annual basis, the radiography profession is required to prioritise regionally agreed post-graduate training requirements, based on clinical service need and to ensure that current clinical practice is safe and evidence based.

- 4.4.17 When prioritising extended practice roles within a particular area, cognisance needs to be given to the impact on other service areas. For example, an increased demand for reporting radiographers may leave a deficit in CT training numbers. To fully maximise the skill currently available within the radiography workforce across NI will require an increase in Band 5 radiographers to backfill the release of staff. This should be co-ordinated regionally and will require engagement with the regional recruitment process.
- 4.4.18 At present, there is a preference within the radiography profession to attend post-graduate training outside NI. To sustain a cost effective model of post-graduate training and ongoing refresher training, efforts to explore NI based training are needed. Training outside NI is expensive, due partly to the travel and accommodation costs and prohibits access to training for those staff who are unable to travel due to other commitments.

Current Reporting by Advanced Practitioner Radiographers within NI

- 4.4.19 In addition to plain film, breast screening, fluoroscopy and ultrasound reporting, there is also scope for advanced practitioner radiographers to be developed in the areas of MRI, CT and Nuclear Medicine reporting. As the remit of the Imaging Review is to consider the needs of the NI imaging service in 10 years' time, it is reasonable to consider the potential for use of advanced practice radiographers in these areas, as is currently the practice in the other UK regions.

Fluoroscopy Reporting

- 4.4.20 Throughout NI, radiographers are engaged in the performing and reporting of fluoroscopic examinations, such as barium enemas, micturating cystograms and hysterosalpingograms. This could be extended to other fluoroscopic examinations such as barium meals as the demand for barium enemas declines in preference for CT Colonography. This requires PGD training and mentorship from consultant radiologists. Further analysis of the current workforce figures is required to ensure that the training requirements of radiography staff within each area is matched to the clinical demand for fluoroscopic examinations.

MRI

- 4.4.21 There are established courses for radiographer reporting in MRI for IAM, knee and lumbar spine examinations. These examinations are amongst the 5 highest frequency examinations carried out across MRI. In addition, musculoskeletal (MSK) reporting has been identified as a particular pressure in some Trusts. This training takes approximately 18mths – 2 years and requires substantial support and mentorship from consultant radiologists.
- 4.4.22 Anecdotal information suggest that there are approximately 50 radiographers undertaking MRI reporting in England, with many more having trained and not currently practising. In Scotland, a 2010 survey revealed only 1 trained MRI reporting radiographer, who was not practising. In Northern Ireland at the time of writing there are no trained MRI reporting radiographers.

CT

- 4.4.23 There are UK established courses for radiographers reporting on CT brain and performing / reporting on CT Colonography. As CT Colonography continues to replace barium enema, demand is increasing and places new and sustained pressure on the CT service. This training takes approximately 18mths – 2yrs and requires and mentorship and support from consultant radiologists.
- 4.4.24 Radiographer reporting of CT is more established in the rest of the UK than in NI. There is currently 1 trained radiographer who reports CT heads on one site in NI. Due to the large number of CT heads currently scanned in NI, the development of more CT reporting radiographers would significantly reduce waiting times and increase development of patient pathways.

Nuclear Medicine

- 4.4.25 There are established UK courses for radiographers reporting in nuclear medicine, lung and bone scans. This training takes approximately 18mths – 2yrs and requires substantial support and mentorship from consultant radiologists.

Reporting Summary

- 4.4.26 Although plain film reporting will be the priority for role extension within NI for advance practice radiography, the impact of radiographer reporting within other modalities should not be underestimated. Radiographer reporting in CT, MRI and Nuclear Medicine will make significant gains in flexibility and improve patient pathways throughout NI. We also need to recognise the current role of radiography reporting within modalities such as Breast, Ultrasound and Fluoroscopy. We need to investigate how these reporting skill can be progressed in order to meet clinical demand
- 4.4.27 For all of the reasons outlined in the Workstreams' papers to date, NI would gain from further exploring all opportunities for development of skill mix for the advanced practitioner radiographic workforce.

Description of the Gap: Specialist Radiographer Workforce

- 4.4.28 Radiographic imaging includes a wide range of diagnostic examinations. The Workforce Sub-Group has collated information on the current workforce and the areas in which they are currently utilised. This information was an initial step towards understanding the current workforce of radiographers within NI, the skills available and how they are utilised. A much more detailed analysis, linked to a planning process, is required to enable imaging services to plan meet the diagnostic imaging requirements for NI, including 7-day working arrangements in all modalities.
- 4.4.29 The general radiography workforce are autonomous practitioners in all areas of general radiography and undertake the majority of examinations referred by ED, wards, GPs, outpatient and minor injuries units. In light of the need to optimise the

use of trained and skilled staff, this section focuses on the specialist radiographic workforce who have typically undergone additional training.

CT Radiographers Band 6

4.4.30 These are radiographers who undertake specific training in CT to enable them to perform CT examinations (PGC level). Their role is to ensure that a CT service is available 24/7 and for 365 days per year. CT examinations vary greatly, e.g. brain scans for querying stroke, staging for cancer patients to localise tumours and in-depth visualisation of fractures that are not clear on plain film. Demand for more specialist CT examinations such as CT Urograms, CT Colonography and Cardiac CT is on the increase, all of which incur increase scanning time. Whilst there is scope for radiographers to progress in this area, consideration always needs to be given to the complexity and the need to minimise risk and ensure patient safety.

4.4.31 In addition to PGC trained CT radiographers, staff not trained to PGC level also work within CT departments. Table 9 below outlines the number of trained and total staff currently working in CT departments. It shows the time spent in CT and the time in other specialist areas. The remainder is the time spent in non-specialist, general radiographic work or admin which could be converted to specialist tasks if backfill was available. It should be noted that further analysis of the workforce radiographers data is required to take into consideration staff who may have been trained in CT but then promoted to a management / governance role.

Table 9: Trained and Total Staff working in CT Departments

CT	WTE	WTE spent in CT	WTE spent in other specialist areas	WTE spent in other non-specialist areas <i>Potential conversion to specialist work</i>
Trained CT Staff	86.99	40.1	14.29	32.6
All Staff working in CT Departments	166.82	60.39	32.29	74.1

4.4.32 As can be seen, there is the equivalent of 32.6wte of specialist trained CT radiographer time currently spent on non-specialist work. If the total CT workforce is considered, this rises to 74.1wte of time which could be converted to specialist task. The backfill requirements, although significant, would facilitate more specialist work to be undertaken in-house and optimise the skills of the existing CT radiographic workforce.

MRI Radiographers Band 6

4.4.33 These are radiographers who undertake specific training in MRI. Some radiographers undertake the PGC in MRI, whilst others have been working in MRI before courses were introduced. MRI services are not currently offered 24 hours per day as the clinical indications for this examination are not usually life threatening.

4.4.34 Radiographers undergo specific training for 3-6mths within the MRI department and then complete a PGC which takes 18mths.

4.4.35 As in CT, both trained and non-trained staff work in MRI departments. Similar analysis is presented in Table 10 for MRI. It should be noted that MRI comes under the definition of cross-sectional imaging and radiography staff are occasionally trained and work in both areas.

Table 10: Trained and Total Staff working MRI Departments

MRI	WTE	WTE spent in MRI	WTE spent in other specialist areas	WTE spent in other non-specialist areas <i>Potential conversion to specialist work</i>
Trained MRI Staff	44.96	26.73	4.69	13.5
All Staff working MRI Departments	65.35	39.42	7.69	18.2

4.4.36 As can be seen, there is the equivalent of 13.5wte of specialist trained MRI radiographer time currently spent on non-specialist work. If the total MRI workforce is considered, this rises to 18.2wte of time, within which there is the potential to better resource skill task and equivalent backfill is required to facilitate this development.

Ultrasonographers Band 7

4.4.37 These are radiographers who are trained to perform and report on ultrasound scans. They need to complete an approved PGD in ultrasound, which is completed whilst the staff member is training within the department. Training takes 2 years, after which training commences in reporting. Ultrasound services are currently available during core hours only, although the demand for 7-day working is a high priority. Ultrasound is required for many acute emergencies e.g. stroke / TIA, DVT, acute abdominal pain and urgent red flag referrals.

4.4.38 As in CT and MRI, similar analysis is presented in Table 11 for Ultrasound.

Table 11: Trained and Total Staff working in Ultrasound Departments

Ultrasound	WTE	WTE spent in Ultrasound	WTE spent in other specialist areas	WTE spent in other non-specialist areas <i>Potential conversion to specialist work</i>
Trained Ultrasound Staff	137.38	65.88	12.21	59.3
All Staff working Ultrasound Departments	140.91	68.91	13.52	58.5

4.4.39 As can be seen, there is the equivalent of 59.3wte of specialist trained Ultra-sonographer time currently spent on non-specialist work. There is potential to optimise this skill base if sufficient backfill was available.

What is needed to address the Gap

4.4.40 Skills mix developments, whether in reporting or specialist practice, need to be set within a coherent strategic vision for the clinical imaging service across Northern Ireland. A clear understanding of the deployment, education and training of practitioners at all levels, together with the associated resource implications is needed.

4.4.41 This requires a “whole system” review of evolving service needs and planning for succession as individuals move to new or other roles. Clearly, significant backfill is required to ensure that the skills of specialist staff can be optimised and address gaps in key modalities. This must be built around a team approach to service delivery and communication. Addressing the gap for radiography will enable service needs to be met more rapidly whilst additional radiology trainees are progressing. Given the rapid increase in demand for imaging, which is not expected to slow down or disappear, the service could fall further behind if the radiographic workforce is not utilised, with assistant practitioner support, as rapidly as possible.

4.4.42 Agreements and local policies promoting skills mix developments must identify the legal and ethical framework within which practice will operate. Professional relationships, lines of accountability and transparent systems for delegation, transference and referral should be identified. Explicit, documented detail of extended roles and responsibilities will be required for each service.

4.4.43 A structured career progression pathway for radiographers is also required, through specialist training in specific areas and at all levels.

Benefits of addressing the Gap / Risks of not addressing Gap

4.4.44 The Workstream believes that the benefits of addressing the gaps in the radiographic workforce are apparent on every level:

- Investing in the registered and assistant levels of staff as well as admin and clerical staff, has the potential to deliver significant efficiencies within the system, to facilitate the existing skill base to be better utilised.
- The move to 7-day services would be better supported
- Gaps in key specialist modality areas could be reduced or eliminated
- Position the service to respond to peaks and troughs in demand and provide enhances resilience
- Better use of radiologist time

Achievability

- 4.4.45 As previously indicated, funding to support skill mix is required. There may also be cultural issues regarding referrers' acceptance of radiographer reporting, particularly in more complex areas. However, this should be compared with developments in role extension such as nurse practitioner colonoscopy.
- 4.4.46 Crucially, there is a need to ensure that a radiographic delivered reporting service is resilient. The aim should be that the numbers trained should be such that the service does not fall back onto radiologists due to leave / staffing shortages. This will have implications for funding of backfill and availability of training opportunities etc. but ultimately this is a key strategic development within the imaging service of the future in Northern Ireland.
- 4.4.47 Developments in radiographic reporting also need to be cognisant of the ramifications on radiologist training, particularly in plain film and ultrasound.

Assistant Practitioners (Band 4)

- 4.4.48 The role of Assistant Practitioners within radiography departments cannot be underestimated. As part of their duties, they perform limited clinical imaging examinations under the supervision of registered radiographers. The range of examinations varies in accordance with locally identified service needs. Regionally, assistant practitioners are currently undertaking plain film examinations, including mammograms, and assist with meeting the demand created by increased theatre sessions.
- 4.4.49 General education requirements are provided by the NVQ Level 3 in Health. However, additional education related to the safe use of ionising radiation is required to enable Assistant Practitioners to perform identified imaging examinations, to a high standard of radiography of the upper and lower limbs etc. This is provided in a college of further education / university and takes up to 18 months.

Consultant Radiographers

- 4.4.50 A sustainable and trained workforce is essential to deliver modern healthcare. A four-tier structure is the ideal model for the profession. A 4th tier would see consultant radiographers in post and would provide a focus for regional development, training and oversight of up skilling radiographers for extended roles. There is a clear absence of research in radiography and a radiographer-driven service improvement and a focussed approach by a motivated consultant radiographer workforce would support this development.

Summary Radiography Workforce

- 4.4.51 Paper 1 detailed the 4-tier skills mix model for radiography services and in subsequent papers, the Workstream has endeavoured to illustrate both the progress made and the direction still to be followed for optimisation of skill mix. All 4 tiers of the model are associated with clinical roles and is primarily designed to encourage clinical role development, flexible working within teams and lifelong learning in support of a career path that remains clinically focussed.
- 4.4.52 Imaging services recognise the constant evolution in the role of a professional practitioner and what is needed to support them. In future, the direction that an individual's clinical career takes should be constrained only by the needs of the clinical team and the aspirations of the practitioner. This flexibility in role and professional development provides the incentive to remain in clinical practice longer, continuing to deliver the benefit of years of training and experience to patients.

4.5 Commissioning

Introduction

- 4.5.1 As referenced in previous papers, the Local Commissioning Groups, in conjunction with colleagues in the HSCB and PHA, commission diagnostic imaging services which are funded via block contracts to form Service and Budget Agreements (SBAs) with Health and Social Care Trusts. SBAs outline the resources which have been invested in respect of scanning and reporting of images and as outlined in Section 4.1, there is gap between funded baselines and current demand. Trusts are required to achieve reporting turnaround times and are monitored against standards for urgent and routine tests.
- 4.5.2 The HSCB has been working to develop a more informed understanding of imaging services, although this is impeded by the lack of a single NIPACS system. Case mix is now more easily identifiable at regional level and information is now being captured for key exam types within modalities and for scheduled and unscheduled work to better support understanding of demand and patient flow.
- 4.5.3 As part of the intelligence gathering for the Imaging Review, a questionnaire was developed by the Workstream and disseminated widely across the imaging community, including clinical directors of services to seek their views on a range of imaging related issues. The questions posed were listed in Appendix 4 of Paper 1 and responses reflected collective opinion and have been used where relevant to inform the Workstreams' work to date. In relation to commissioning, the following questions were posed:
- *Is the current method of commissioning fit for purpose?*
 - *Should tariff or cost & volume based methods be considered?*

Description of the Gap / Impact on the current service

- 4.5.4 In Paper 1, the Workstream expressed support for a move towards payment by results type models, which it was felt would better meet the needs of the service.
- 4.5.5 Section 4.1 of this paper described the recurrent funding gaps for imaging services in NI, up to 2015/16 and beyond and illustrated the impact this has had on the service in terms of waiting times for patients and lack of flexibility within the system to optimise its available resources.
- 4.5.6 The current commissioning arrangements in NI were also examined as part of the Donaldson Review in December 2014. The report highlighted alternatives such as creation of a tariff to include a strong quality component or devolution of budgetary responsibility to the Trusts. It was not within the remit of the Donaldson Review to recommend a commissioning model, however it made a recommendation that the issue is addressed:

Recommendation 2: Strengthened Commissioning

“We recommend that the commissioning system in Northern Ireland should be re-designed to make it simpler and more capable of reshaping services for the future. A choice must be made to adopt a more sophisticated tariff system, or to change the funding flow model altogether.”⁷

- 4.5.7 In response to the Donaldson Review, the DHSSPS has initiated a review of commissioning arrangements, which will:
- (a) Undertake an assessment of how the commissioning process facilitates the delivery of high quality and efficient health and social care services in NI, with particular reference to:
- Assessing the health and social wellbeing needs of the population of NI
 - Strategic planning to prioritise needs within available resources, including the use of financial and other levers, to reshape services to meet future needs
 - Engaging patients, users, carers / families and other key stakeholders at a local level in the commissioning of health and social care services
 - Securing, procuring, incentivising and agreeing high quality, value for money service provision to meet the assessed and prioritised needs of the population
 - Ensuring the delivery and outcomes from services commissioned
 - Evaluating impact of health and social care services and feeding back into the commissioning process in terms of how needs have changed
- (b) Bring forward recommended options to improve the effectiveness of the delivery of health and social care services in NI

⁷ *“The Right Time, The Right Place”*: An expert examination of the application of health and social care governance arrangements for ensuring the quality of care provision in Northern Ireland. Sir Liam Donaldson, Dr Paul Rutter, Dr Michael Henderson. December 2014

- 4.5.8 The DHSSPS is currently considering the details of how the Commissioning Review will be taken forward and it is expected that the Review will report in the summer of 2015. There is no further information at this stage.
- 4.5.9 The Workstream is not in a position to comment what the outcome might be, but is clear that in light of the gaps in funding the current commissioning process needs to be redesigned to meet the needs of the imaging service. The Imaging Review Project Board and Commissioning Review Team are asked to consider alternative approaches which have quality, safety and responsiveness as core components.

Acceptability / Priority

- 4.5.10 Identification of recurrent funding to close historic gaps and plan for the future, combined with intelligent and case-mix sensitive commissioning, are key priorities.

4.6 Imaging Networks

Introduction

- 4.6.1 Diagnostic imaging has a key role in modern clinical care and comprises of image acquisition and image reporting. Traditionally, each hospital has its own radiology service employing its own radiologists to support its own service, providing a variable level of local primary care imaging access. In the current NI radiology service model, the overall activity within the services is limited by reporting capacity rather than the capacity for image acquisition.
- 4.6.2 Mostly, image reporting is done by radiologists, although some images are viewed by other medical practitioners by formal local arrangements. Some images are reported by advanced practitioner radiographers e.g. ultrasound, breast screening and some plain film examinations, however radiologists are required for more complex and time consuming examination e.g. CT and MRI scans.

Description of the Gap / Impact on the current service

- 4.6.3 Each HSC Trust manages the reporting of scans undertaken for their patients. In addition, work is either outsourced to the Independent Sector or undertaken as in-house additionality. There are a number of hidden drawbacks to the outsourcing model which are increasingly apparent with greater use.
- 4.6.4 Most work is reported in-hours but the level of reporting undertaken out of hours has increased significantly, not least because there are approximately 18 vacant radiologist posts across the region.
- 4.6.5 At present, radiology on call is provided in each Trust independently with either single or two tiered rotas. It is our understanding that all consultant radiologists in NI have home access or the opportunity to have home access to live PACS systems for image reporting. There are no cross-Trust rotas, with the exception of radiology

registrars being shared by SEHSCT and BHSCT and some temporary cross cover of paediatric radiology.

- 4.6.6 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 MRI, which has far outstripped the ability of the current service to cope.
- 4.6.7 The challenge of recruitment to consultant radiologist vacancies has further compounded the ability of the service to cope. This puts the imaging service under significant pressure and results in increasing delays in reporting of images with potential delay in diagnosis of serious conditions, including cancers. Out of hours radiology is increasingly as complex as in-hours imaging and similar levels of expertise should be available.
- 4.6.8 Extension in working hours and the number of working days of an imaging department leads to a reduction in on call time and an increase in imaging capacity. As such, extended day and 7-day working must be linked to both an increase in reporting capacity and more effective ways of delivery.

What is needed to address the gap

- 4.6.9 The current model requires change as there are inherent risks in the system with gaps in key areas and continual operational challenges to ensure quality and safety issues.
- 4.6.10 The use of the IS as an outsource model has been unavoidable for some HSC Trusts in order to meet demand / waiting time targets and in the absence of recurrent investment. However, apart from this expensive option for Trusts and the Commissioner, there are many drawbacks, including fragmentation of the patient care pathway and as a result, a fragmented service in which clinicians' seek second opinions locally, resulting in duplication and further inefficiency.
- 4.6.11 Radiologists working in the IS often report on images without having access to all relevant previous images and clinical information, which drives a more defensive practice resulting in greater frequency of repeat or additional tests. Similarly, recent SAIs have raised questions on the quality of reports from the IS, leading to Radiology Network discussions on the need for alternatives.
- 4.6.12 At the Radiology Network, the concept of combining the resources of radiologists and reporting radiographers across the region emerged and there is willingness to work as part of a reporting network staffed by HSC staff. In the first instance, this will serve to bring back plain film reporting from the IS through formation of reporting networks staffed by HSC staff.
- 4.6.13 The RCR has outlined the case for a similar new model for imaging services in the UK, which is centred on the formation of networks of expertise serving larger populations than at present. This was presented in Paper 2 of the Radiology Workstream of the imaging review as the way forward. In addition, the Expert Reference Group which currently advises the DHSSPS Review of Imaging services has also indicated that the relative size and HSC structure of NI gives a unique potential

for collaborative / network solutions to local problems that would prove more challenging in the rest of the UK. Therefore, there is clear support and encouragement from the radiology clinical leadership for regional networks / approaches.

Benefits of addressing the Gap

4.6.14 The benefits from regional reporting networks include:

- A coordinated and collaborative approach centred on more efficient use of current resources and expertise.
- Improvement in the quality and timeliness of imaging reports
- Understanding of different issues being experienced across Trusts
- Cross-Trust reporting of specialist cases supporting specialist radiologist shortages
- Increased local flexibility and responsiveness which will result in a much improved service for patients
- Mutual support and 2nd opinion reading of difficult cases, especially in specialist areas
- Increased uniformity in radiology practice regarding studies reported ensuring that patients have their images reported to the same standard across NI
- Development of referral guidelines / pathways
- Potential to bring back work currently reported in the IS and reinvest funding into core services in the first instance
 - i. Potential to move to specialist networks
 - ii. Optimum potential to have regional reporting as standard and replace Trust specific reporting arrangements.
- Much improved resilience
- Equitable service

4.6.15 The Network approach requires data sharing across Trusts for timely reporting and as such, a single NIPACS system is critical to provide basic infrastructure for data transfer. Work is ongoing to explore options for the integration of NIPACS, but in the interim, it is possible to start with those 4 Trusts on NIPACS and add on the Belfast Trust sites in due course. Whilst this would allow the model to be tested etc. the full benefits of the model cannot be realised until integration is achieved.

4.6.16 The aim is for a true network approach rather than hub and spoke model and each Trust will have equivalent status within the network. Hospitals will maintain their own imaging services, including the equipment base and staff. The only part of the service in which networking is proposed is in the reporting of acquired images.

4.6.17 It should be noted that there will likely be continued support from the IS required whilst recurrent gaps are addressed and plans for bringing work outsourced back in-house is being developed.

Assessment of Achievability

4.6.18 Work has already commenced and a paper outlining the plans for a regional radiology reporting network for plain film in the first instance was endorsed by the HSCB Senior Management Team in May 2015, and the approach is included in the Board's Commissioning Plan for 2015/16.

4.6.19 A project team and working group have been established to take forward this work, which will:

- Design the model with a view to bringing back IS image reporting in the first instance
- Address the IT infrastructure, management, governance arrangement, capacity within Trusts, including rota arrangements, cover during holidays period etc. financial implications.
- Further develop the model to include sub-specialty networks e.g. Paediatric radiology, out of hours on-call network and other potential arrangements.

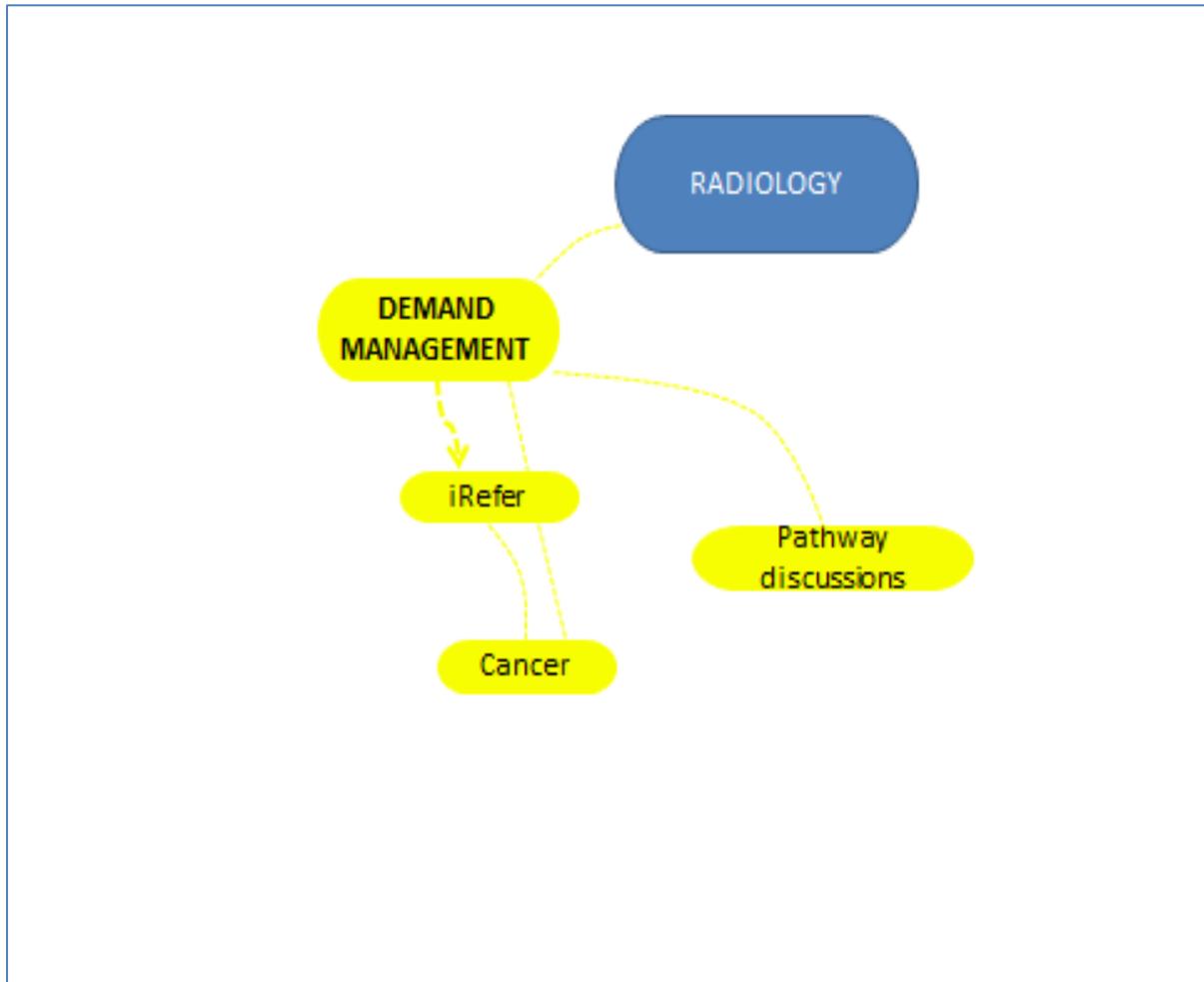
4.6.20 The key principles of collaboration are:

- Improving patient care
- Reporting of scans can take place at any location
- All Trusts support the network approach
- Outcome focussed

Acceptability

4.6.21 The model will succeed if there is clinical buy-in and it is seen to be a better alternative than the current system. The clinical leadership within the MRCN will be key drivers in the success of this regional approach.

5.0 DEMAND MANAGEMENT



5.1 Referral Pathways and Guidance

Introduction

5.1.1 The development of referral pathways, developed from best practice resources such as IRefer and NIHCE, for management of common conditions, has the potential to improve the use of imaging services in Northern Ireland both in terms of timeliness and economy.

Description of the Gap

5.1.2 There is currently no agreed method for the imaging service to engage in meaningful dialogue with its referrers. Input from referrers (whether primary care or ED physicians etc.), specialists, AHPs, commissioners and patient representatives is vital in understanding the issues and developing the best affordable service for the patients. Agreeing pathways for the region rather than at Trust level will reinforce the legitimacy of the guidelines or pathways established.

Impact of the Gap on current services

5.1.3 Without meaningful and ongoing engagement, service design may not necessarily take into account the needs of referrers and this can result in inconsistent and inappropriate referrals. In the current climate of funding restrictions and workforce shortages, this leads to avoidable waste and duplication and inequity for patients.

What is needed to address the Gap

- 5.1.4 In order to develop these guiding principles, appropriate advisory panels of interested parties need to be established to validate present IRefer and NIHCE guidelines (unless there is very good reason not to do so) and to look at the place of imaging in common conditions such as non-traumatic shoulder pain, scrotal abnormalities, headache and assessment of soft tissue lumps.
- 5.1.5 Depending on the condition, either guidelines for referral for imaging or the place of imaging in an investigation and treatment pathway should be instituted. Advisory panels in high volume specialties should be established first, with motivated representatives who will help inform and educate their colleagues through appropriate specialist bodies. Support from commissioning bodies would also be expected.
- 5.1.6 Agreed regional pathways and guidelines should be immediately available to referrers. Intranet access to these guidelines will need to be accessible at the point of electronic referral.
- 5.1.7 Similarly, development of treatment or investigation processes by bodies outside of imaging needs to be ratified by advisory panels and the MRCN when these processes impact on imaging.

Benefits of addressing the gap / risk of not addressing the gap

5.1.8 The driving purpose of this initiative is the better use of a service under pressure. Uniformity of imaging use across the region, aiding commissioning and referrer expectations, will enable:

- Focused use of valuable resources for patient benefit
- Increased decision support for referrers
- Faster access to imaging when required
- Cross specialty and primary care understanding
- Potential for pathway led, appropriate and timely primary care access to complex imaging
- Multi-disciplinary informed support for commissioning decisions allowing best use of resources

5.1.9 The financial implications of convening specialist panels is likely to be more than balanced by the reduction of imaging misuse and the benefits, both financial and in terms of quality, to the health service as a whole.

Assessment of achievability

5.1.10 Clinicians will be required to work collaboratively and across sectors to reduce variation, work better and agree how best to refer patients to imaging. This will require strong leadership from senior clinicians to motivate and encourage staff. Primary care staff may be required to change historic referral practice in line with newly agreed guidance.

5.2 Direct Access

Introduction

5.2.1 The Expert Reference Group identified the primary care interface as a key component of an effective imaging service and an area which should be further explored in Paper 3. In addition to the work needed on IRefer outlined in Section 5.1, the Workstream was asked to be more explicit in relation to the current variation of direct access across primary care.

5.2.2 We know that many positive developments are in place in relation to direct access, particularly those delivering rapid reporting services to local primary care services. Through their programme of work, the MRCN has also been able to support the development of a number of initiatives aimed at improving the primary care interface. For example, radiology input was provided to the development of the Clinical Communication Gateway (CCG) in support of electronic referrals and is working regionally to support results acknowledgement and links via NIPACS to the ECR. The benefit of working together as a modernising clinical network is that a region-wide approach can help identify and reduce variation as well as explore the opportunities to do things better.

Description of the gap

- 5.2.3 Paper 1 of the Workstream outlined the current arrangements for direct access to imaging across Trusts and the extent of variation is clear.
- 5.2.4 Direct access may have been restricted in the past in an attempt to “manage” demand from primary care and has resulted in patients having to be referred to secondary care consultants to make the imaging request. However, experience in England where direct access has been attempted, has not resulted in unmanageable demand.
- 5.2.5 There is support for an increase in the level of access from primary care, however this needs to be managed to include:
- Clarity on services for which direct access arrangements are in place, with the aim of consistency across the region
 - Development of referral pathways to support increased access, which have been designed by both primary and secondary care
 - A clear communication strategy on the level of access and arrangements for referral
 - A phased, incremental approach so that impact on demand can be considered and addressed

What is needed to address the gap?

- 5.2.6 Where closer dialogue between primary care and radiology services takes place around direct access at local level, some services have seen improvement in general demand management and there could almost be an argument for direct access as a means to control demand.
- 5.2.7 Two GP representatives have now been invited to join the MRCN to help move forward on improving primary care access and development of pathways. All Trusts have further expanded the range of examinations offered to primary care since Paper 1 was written.

5.3 Oncology Imaging

Introduction

- 5.3.1 Oncology referrals, including those from haematological services, comprise a significant proportion of referrals for imaging. These referrals are usually for complex imaging modalities including CT, MRI and nuclear medicine with interventional techniques increasingly important for diagnosis, treatment and maintenance of treatment.

Description of the Gap

5.3.2 Discussion with oncology users has indicated a number of issues of particular importance to them. These include:

- Timing of examination and need for reports in a short time window to fit in with treatment schedules
- Structuring of reports and use of RECIST criteria to aid decision making
- Difficulties with tracking referrals to aid clinic scheduling
- Lack of integration of PACS between the cancer centre and other imaging centres
- Need for agreed imaging protocols across the region
- Value of radiologists at Oncology MDMT and the need for supporting technology
- Development of IMRT (Intensity Modulated Radiotherapy) and the need for technology and radiologist support
- Increase in cancer diagnoses by 30% by 2030 with a disproportional demand for imaging
- Opening of new radiotherapy unit in 2016 with increase in activity overall

What is needed to address the Gap

5.3.3 The issues for delivery of an excellent imaging service to support an excellent oncology service are in many ways similar to those required for imaging as a whole, i.e. predominantly manpower, processes and integrated electronic systems.

5.3.4 The main development issues for oncology imaging simply reinforce the need for workforce growth/resilience and a unified PACS for NI. Continued PACS integration with ECR will ensure better requesting systems and result management.

5.3.5 The value of oncology MDMTs has been proven both in terms of outcomes and public confidence and the appropriate time required for radiology staff preparation and attendance at these meetings must be protected and recognised in job planning exercises⁸. Where suitably skilled advanced and consultant practitioner radiographers are able to cover MDTs, they can be very effective in spreading the burden on radiologists. In any event, whoever attends MDTs should have preparation time factored into job plans.

5.3.6 Looking to the future, imaging developments and new technologies are most likely to occur around oncology diagnosis and follow up. Progress in MRI and PET towards routine functional and molecular imaging will occur in the next decade. Independent of this, demand for PET is such that a further PET/CT or PET/MRI scanner will be required.

⁸ Cancer Multidisciplinary Team Meetings – Standards for Clinical Radiologists BFR15/14. Royal College of Radiologists

Benefits of addressing the Gap

- 5.3.7 Northern Ireland has an excellent reputation for cancer diagnosis and treatment. A high quality and reactive imaging service is integral to this. However, there are significant risks to the current and future provision of imaging related cancer services in light of the imaging workforce crisis, particularly in breast radiology. Closing the gap on cancer diagnosis does more than rescue or preserve the NI reputation, it creates a tangible, economic benefit.
- 5.3.8 Support for cancer research in NI and improved outcomes for patients.
- 5.3.9 Improved patient confidence in the service.

Assessment of Achievability

- 5.3.10 Oncology imaging is well developed and it is expected that considerable efforts will be made to support this further. Continued improvement will occur if MDMs are supported by trusts and HSCB, and the expected changes in PACS occur.
- 5.3.11 Paper 2 outlined the current arrangements for PET CT. Following investment, a new SBA was agreed for the PET service which provided for anticipated growth in the service. This will however need to be refreshed in due course as demand increases. As previously stated, there is one PET CT scanner in NI, located in the Belfast Trust. The lead time for implementation of a 2nd PET scanner will be considerably longer and potentially more complex than for other imaging equipment. As we already know our baseline capacity and demand, prospective planning must now recommence way to ensure the needs of the oncology and other patient groups who require PET CT services can be met and that resources are identified and secured.

5.4 Development of Medical Physics support to meet the future demands of Imaging Services

Introduction

- 5.4.1 As outlined in Paper 1 “Current Context”, the Regional Medical Physics Service (RMPS) provides scientific and technical support services for medical imaging services across the HSC Trusts. The requirement for many of the services provided is set out in statutory legislation [see References 1-6] and guidance [7-10] and Trusts are subject to inspection by relevant enforcing bodies HSE (NI), RQIA, NIEA and MHRA. Medical physics services play an important role in assisting imaging services to meet legislative requirements, practice standards and guidelines, and help assure the quality and safety of imaging equipment and procedures. **See Appendix 3.**
- 5.4.2 Paper 2 “Where we want to be” emphasised that it was essential that safeguarding and clinical governance underpinned imaging services and that the achievement of ISAS for imaging services in NI was an objective to help ensure this. A well-resourced

and responsive RMPS will play a key role in ensuring ISAS accreditation is achieved and maintained. Furthermore, the forthcoming Academy for Healthcare Science Improving Clinical Engineering and Physical Sciences Services (iCEPSS) initiative will identify a range of additional medical physics service standards which may require additional resources to ensure compliance.

- 5.4.3 This section outlines a range of factors that will influence the demands for medical physics services and highlights the necessary developments to ensure that medical physics services continue to remain capable of appropriately supporting imaging services. The principal resource required for the delivery of RMPS is specialist scientific and technical staff. The specific details on workforce requirements will be developed through the Workforce Planning stream of the Imaging Review and only the main issues affecting the development of the service will be highlighted in this paper.

Description of the Gap / Factors affecting demand for RMPS

- 5.4.4 **Imaging services capacity and the installed equipment base:** As outlined in paper 1, there has been a large growth in the number of imaging systems in NI since 2000, with particularly large changes in MRI and CT and the almost universal introduction of digital radiography which was non-existent at the turn of the millennium. Also, there has been the introduction of PET to clinical imaging. The increase in imaging systems is projected to continue in the coming years as the demand for imaging increases. Coupled with this growth, there will be on-going technological developments which will increase the capability of imaging systems and lead to the introduction of new imaging techniques. Growth in these areas will increase the demand for RMPS.
- 5.4.5 **Legislation and standards:** A number of pieces of UK legislation govern the use of radiation in Medical Imaging procedures and are designed to protect patients, staff and members of the public from the effects of ionising radiation. In December 2013 the European Union adopted a revision of the Basic Safety Standards Directive [11]. It is expected that this will be implemented into UK law by early 2018 with a revision and updating of the legislation applicable to ionising radiation. The exact nature and requirements of any new UK legislation are not known at this time. However, the new directive does put a greater emphasis on the role of the Medical Physics Expert (MPE) in ensuring the safe and optimal use of radiation in diagnostic and therapeutic procedures and includes the need for member states to put in place processes for the certification of the MPE.
- 5.4.6 Imaging techniques such as MRI and Ultrasound do not use ionising radiations and are therefore not subject to the requirements of the Ionising Radiation Regulations. However, good governance requires that these imaging systems and techniques should also meet applicable standards [12-15] and that there is sufficient oversight to ensure the optimal and safe use in the clinical environment. The RMPS provides services to assure the quality and safety of techniques and environment for MRI. However, no such complimentary service is in place or commissioned for Ultrasound imaging services / devices.

5.4.7 **Technological developments:** Advances in medical imaging technology will continue to significantly change the delivery of modern healthcare. The introduction of novel imaging technologies into clinical use will require sound evaluation of their clinical and cost effectiveness along with systems to ensure their safe and optimal use. Medical Physics will play an important role in ensuring that such technology adoption is safe, optimised and effective. Other technological developments will improve the efficiency of processes and enable different ways of working

What is needed to address the Gap / Developments in RMPS to support imaging services

5.4.8 **Development of the Medical Physics workforce:** The RMPS has developed a Workforce Plan, the objectives of which are:

- to ensure the continuity and future delivery RMPS to HSC bodies
- to ensure a suitably trained and qualified workforce is enabled to exploit and respond to changes in medical technology for the benefit of the population
- to ensure the optimum number and skill mix of staff to meet the challenges and deliver medical physics services.

5.4.9 The Workforce Plan identified an increasing gap between the staff resource available to the RMPS and that required to provide and develop the service to meet the increasing demand for RMPS. This is particularly evident in medical imaging, where the gap had arisen mainly from the significant increases in the medical imaging equipment base.

5.4.10 Anticipated changes to Ionising Radiation Regulations are as yet unclear, but it is likely that these will result in additional demands for RMPS. There are a number of recent developments at EU and national level designed to support the implementation of the EU Directive in member countries that need to be taken into account. In 2014, the European Commission published RP174 [16] which presented guidelines on the role and training of the Medical Physics Expert (MPE). This publication also included guidance on MPE staffing in three defined specialities (Diagnostic and Interventional Radiology, Nuclear Medicine and Radiotherapy). The first two areas are directly relevant to imaging services. Application of this guidance indicated that in some specialities there is a significant local shortfall in medical physics staffing levels.

5.4.11 It is essential that workforce planning recommendations for staffing are implemented and an approach developed for commissioning RMPS which is responsive to changes in demand.

5.4.12 The staffing and filling of posts in medical physics has traditionally been difficult due to the specialised nature of the services and the specialist training required. The Modernising Scientific Careers (MSC) initiative describes training and career pathways for healthcare science staff. Included in this are higher training and career development pathways (Accredited Expert Scientific Practice) [17]. To ensure future sustainability of RMPS, including those required for the new radiotherapy centre at Altnagelvin Area Hospital, it is essential that a regional approach to the commissioning of medical physics trainees is put in place.

5.4.13 **Regional Service for quality assurance and scientific support for ultrasound imaging systems:** As part of an effective governance system professional and other interested scientific bodies recommend the implementation of quality assurance programmes and the availability of scientific advice relating to the safe use of ultrasound equipment. As outlined above there is presently no regional scientific support or quality assurance for Diagnostic Ultrasound services / devices.

5.4.14 A model based on national guidance would comprise the following and should be developed and implemented on a regional basis:

- Regular routine testing undertaken by the system users
- Annual ultrasound equipment performance testing by Regional Medical Physics Service
- Provision of specialist advice and expertise on equipment imaging performance and safe use
- Ensuring the service keeps up with developments in equipment, techniques and performance standards in medical ultrasound

5.4.15 **Electronic Patient Dose management system:** The recording and audit of patient radiation doses has been a legislative and good practice requirement for some time. This helps ensure that patient doses are not excessive and assists in optimisation of exposures. Recent developments in standardising the reporting of patient doses by imaging modalities have prompted the development of electronic systems to manage the recording and analysis of this data. Such systems potentially provide greater efficiency in the process of dose audit and will further promote the development of improved exposure optimisation strategies. Furthermore there may be a drive in the near future, determined by regulatory or accreditation bodies, to ensure that institutions regularly submit dose audit data to national patient dose registries. This process will be greatly facilitated with the availability of a patient dose management system. It is proposed that such a system is introduced on a regional basis.

5.5 Breast Radiology

Introduction

5.5.1 There is a current crisis in the provision of symptomatic breast services across NI and all Trusts are struggling to meet demand. This has led to provision of services with non-recurrent funding, often managed on a monthly basis, in an attempt to keep on top of waiting times.

5.5.2 At its meeting on 25th March 2015, the MRCN asked Dr Eddie Gibson to write a section for Paper 3 outlining the particular difficulties in breast radiology by 30th April 2015. Due to this extremely tight timeframe, only high level information could be collated and not all Trusts responded. However, key findings are presented here for consideration in the wider imaging discussions arising from the Imaging Review.

Description of the Gap

- 5.5.3 In order to provide an accurate picture of the level of service provision and quantify the gaps, all Trusts were asked to provide data. All Trusts responded.
- 5.5.4 Information was collated in the following areas and is presented in Tables 12 to 18 in Appendix 4.
- 5.5.5 This information outlines the current level of services provision for breast radiology. Some useful data is provided on staffing levels and how clinics are managed to meet waiting time targets. The workload varies slightly across the five Trusts. Clearly, each Trust has slightly different methods of how best to manage the service provided at Breast Clinics. Some rough conclusions can be drawn, but further discussion will be required about how best to manage this service provision in future.

Impact of the Gap on the current service.

- 5.5.6 Capacity in the Breast Symptomatic Service has been exceeded. Northern, South Eastern and Southern Trusts meet the waiting time targets for Routine and Red Flag referrals only through additionally funded clinics. These additional clinics appear to be provided out of hours with the same staff that are stretched to cover the in-hours workload. In light of the economic benefits of investing in cancer diagnosis referenced above, it is essential that this situation is immediately addressed.

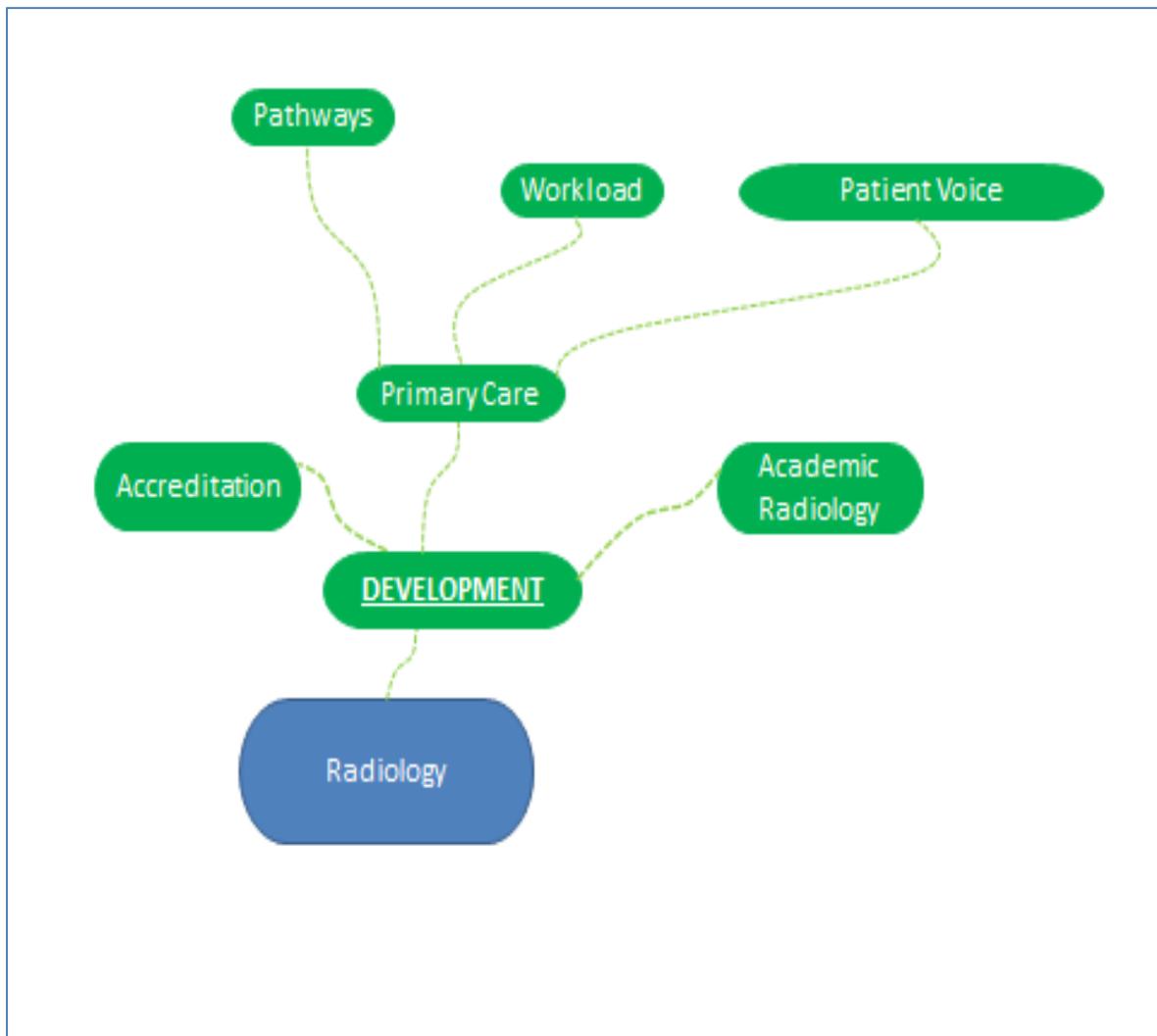
What is needed to address the Gap

- 5.5.7 The total cost of maintaining these additional clinics is not known, but it would be reasonable to assume that a more cost efficient solution would be to establish sufficient recurrent funding to provide symptomatic services at the required level, thereby negating the need for additionality.
- 5.5.8 It would be useful to establish the cost of providing the current service and to meet demand at both regional and local levels and compare with the funded baseline to better quantify the funding gap. Inevitably, there will be a gap.

Risks of not addressing the Gap

- 5.5.9 Continuing to address gaps with non-recurrent monies is considered an ineffective approach to a key service which diagnoses approximately 1,139 Breast Cancers per annum across the four Trusts included. A recurrent funding source is required.

6.0 DEVELOPMENT



6.1 Primary Care

Introduction

6.1.1 As referenced in Section 5, the primary care interface is recognised as a key component of modern and effective imaging services and the service as a whole is challenged to find the most effective way of engaging with GP colleagues in primary care.

Description of the Gap

6.1.2 There was no agreed mechanism for imaging services to effectively engage with primary care.

What is needed to address the Gap

6.1.3 This was discussed in detail at the March 2015 meeting of the Imaging Review Project Board, following which, the DHSSPS contacted the Director of Integrated Care at HSCB to seek advice on the most effective way of engaging with family practitioners to ensure that the needs of primary care were reflected in the radiology strategic framework of the imaging review. The Director of Integrated Care suggested, in the first instance, that the Workstream should engage with the leadership of the GP profession, via the HSC Board – NIGP Committee Forum. At its meeting on 28th April 2015, the co-chair of the Workstream attended the Forum and formal engagement has now commenced. Two GP representatives have been identified and invited to join the MRCN. Work is also ongoing with LCGs to access the primary care expertise on these groups.

Benefits of addressing the Gap / risks of not addressing the Gap

6.1.4 Knowing what the primary care issues are will better inform the design and future development of imaging services and the Workstream sought feedback on the following key areas.

- Thoughts on Papers 1 and 2 of the Imaging review which the Workstream can address over the remainder of the Review
- Advice regarding changes in primary care needs over the next 10 years with special reference to TYC
- Clarification regarding need for specialist imaging access from non-specialists, management of complex reports and commissioning of increased access
- Need for “urgent” radiology
- Seek volunteers to represent primary care in specialist area advisory panels to establish regional pathways for common conditions
- How communication processes between radiology and primary care can be improved at Trusts and regional level
- Development of educational fora towards better use of imaging
- How to optimise use of electronic request and results management systems and IRefer.

Assessment of achievability

- 6.1.5 The process has now effectively commenced with the April 2015 meeting, and two H GP representatives have joined the MRCN.

6.2 Imaging Services Accreditation Scheme (ISAS)

Introduction

- 6.2.1 In Paper 1, the Workstream presented a comprehensive case for the introduction of imaging accreditation in NI. Following this, in November 2014, Wales announced that they are embarking on a formal country-wide programme to achieve accreditation. In February 2015, the Expert Reference Group supported the need for accreditation as one of the three early recommendations from the Review.

Description of the Gap

- 6.2.2 There is no programme of accreditation for imaging services in N Ireland Northern Ireland.

Impact of the Gap on current services

- 6.2.3 Effectively there is no process for Trusts, the Commissioner or DHSSPS to be independently assured of the quality and robustness imaging services.
- 6.2.4 There are inherent risks, as evidenced by recent Serious Adverse Incidents (SAIs).
- 6.2.5 There is wasted opportunity to identify efficiencies through focussed examination of custom and practice.

What is needed to address the Gap

- 6.2.6 The MRCN has been driving the case for ISAS regionally and via the Imaging Review. The HSCB has been in ongoing discussions with ISAS / UKAS and a meeting took place on 29th May 2015 to scope (without prejudice) a proposal for NI accreditation, for consideration by the DHSSPS / HSCB with regard to funding options.
- 6.2.7 A NI wide programme of accreditation will require both recurrent and non-recurrent funding. The scoping paper will identify these costs which will need to be considered and a funding source agreed.

Benefits of addressing the Gap

- 6.2.8 Introduction of a programme of ISAS accreditation to NI would provide evidence that safe, effective, and quality services are being delivered.

- 6.2.9 As evidenced in other areas where accreditation has been achieved (such as pathology), accreditation assist with identification and reduction of risk and should reduce the number of imaging related SAIs.
- 6.2.10 Standardisation of practice would be achieved which would serve to optimise utilisation of resources, reduce variation, and drive improvements in quality and safety.
- 6.2.11 NI would join other health communities in the UK who have become accredited and are able to demonstrate the benefits of undergoing rigorous and independent review.

Assessment of Achievability / Acceptability

- 6.2.12 Via the MRCN, all Trusts have signed up to the principle of ISAS accreditation and there is a willingness to work collaboratively across the region for a NI-wide programme. 6.2.13 Colleagues from UKAS are now preparing a formal scoping proposal for consideration by HSCB / DHSSPS for introduction of a regional process of ISAS accreditation for Northern Ireland. Funding to ensure that time can be dedicated to this to deliver the benefits is critical to its success.

6.3 Patient Experience of Imaging Services

Introduction

- 6.3.1 It has been recognised that when a patient presents to an imaging department they are often in a vulnerable state and can experience a scan in a number of ways. It is the role of the radiographer to produce a high quality image for diagnosis, whilst at the same time facilitate patient care throughout the process. All health professionals involved with imaging need to be aware of the different ways each patient may experience imaging. They need to understand patient's vulnerability and recognise how to deal with this.

Description of the Gap / Impact on current service

- 6.3.2 The Expert Reference Group asked the Workstream to better represent the views of the patient in its work and ensure that mechanisms are in place so that patients are involved and can share their experiences to inform the imaging review.
- 6.3.3 If there is no avenue for patients to have input, services end up being designed around the needs of staff, not patients. There is also a lack of opportunity to educate patients or manage expectations.

What is needed to address the Gap

- 6.3.4 The Patient and Client Council (PCC) was established to provide a powerful independent voice for people and each Trust has its own Patient/Client Liaison Group. The Radiology Workstream Leads met with Professor John E Moore from the PCC to discuss and agree on the best way for patients to have input to the imaging review and the development of imaging services. Three methods of recording patient experience and ongoing involvement have been agreed:

1. Patient questionnaires.
 - a. It is hoped that results from these will demonstrate the diverse ways in which people experience medical imaging.
2. Attendance from Lead Radiographers, on a regular basis, to Patient/Client Liaison meetings.
 - a. Feedback from patients can be gained through these meetings and recommendations can be put into place resolving any issues patients may be experiencing with diagnostics.
3. Feedback from The Patient Client Council on the completed review.
 - a. Discussion regarding recommendations for future diagnostic services.

6.3.5 The outcomes of the feedback will be correlated and integrated into the reports of the imaging review and its subsequent Framework document.

6.3.6 In addition to the engagement with the Patient and Client Council, there is an opportunity to provide a focus on the patient experience through implementation of the Imaging Services Accreditation Standard (ISAS). The Patient Experience is one of the four domains and provides a strengthened focus on patient safety and quality of the care experience. Implementation of ISAS in Northern Ireland is one of the three early recommendations from the Radiology Workstreams as referenced in this and previous documents.

6.3.7 A service user representative from the PCC will be invited to join the MRCN.

Benefits of addressing the Gap

6.3.8 The main benefit of proactively engaging with service users is that services can be designed or redesigned to take account of their views and improve patient's experience of imaging services. Clinical staff have the interests of the patient at the centre of what they do, and strong engagement demonstrates this in a very practical way.

Achievability

6.3.9 A plan has been agreed between the PCC and the Workstream on how to best gather the required information via the questionnaire. There are approximately 15,000 service users available as a resource for feedback. A meeting is being set up to progress this key area.

6.4 Academic Radiology

Introduction

6.4.1 Academic medicine can be defined as the capacity of the healthcare system to think, study, research, discover, evaluate, learn and improve. The support and nurturing of academic radiologists in training must be a key element in attaining the goal of providing the best possible medical services to the NI population.

Description of the Gap

6.4.2 In Paper 2, the Workstream identified the need for consideration of the impact of clinical trials on the development and resourcing of imaging services. This has led to wider discussion on the need for specific consideration of the role of academic radiology and research.

6.4.3 Clinical governance and increased public scrutiny of the health professions have increased pressure to improve and maintain healthcare, emphasising the need for clinical and basic research. Training of radiologists with an interest in research is critical to the future of biomedicine in general and more specifically, imaging services.

6.4.4 Academic radiologists who are also clinician-scientists have a critical, unique role to play in biomedical advances by imaging and studying patients and their diseases; they help in taking observations from the bedside into the laboratory, make basic discoveries in the imaging sciences and translate these discoveries into new methods for diagnosis, treatment and prevention of disease that are based on or aided by newer imaging techniques.

6.4.5 The development of a professorial chair in medical imaging at Queen's University would be advantageous for undergraduate medical and nursing curricula in encouraging more informed use of medical imaging and for cognisance of risks and benefits of techniques. There would also be the potential of cross-over to development of the medical physics undergraduate curriculum. It would be advantageous to encourage medical imaging postgraduate research.

Impact of the Gap on current service

6.4.6 Due to time constraints in producing the papers for the review, the Workstream has not been able to scope the needs of academic research for imaging, but it has initiated work to do so. Although not timely for this review, academic research will form part of future plans for the development of the service.

Medical Physics and Imaging Research

6.4.7 Clinical Scientists (Medical Physicists) working in Imaging have a scientific and technical understanding of imaging systems and the imaging process including the physical processes represented by the image, the nature of the acquired image data and its processing and presentation and imaging performance techniques and metrics. This makes them ideally positioned to evaluate and contribute to developments in Medical Imaging. The combination of the expertise and understanding of the clinical scientist (medical physicist) and the clinician (radiologist) in an academic radiology department has the potential to significantly catalyse the development of Imaging and Radiology research in Northern Ireland.

This may be best facilitated by the development of joint academic and NHS appointments

- 6.4.8 There are a number of areas where Medical Physics have strengths and expertise and could make significant contributions to the development of Radiology and Imaging Research in Northern Ireland.

The development of quantitative and novel imaging techniques

- 6.4.9 The future direction of developments in imaging will result in increased use of quantitative output measures from imaging studies as opposed to largely qualitative outputs. This area provides huge potential for research and development in areas including:-

- The development of novel quantitative image and signal analysis tools for the use in both clinical and R&D environment.
- Development of tools for image based guidance and therapy monitoring for therapeutic agents and procedures.
- Development of novel medical imaging devices and procedures.

Evaluation of the new and developing imaging techniques

- 6.4.10 The rapid development in imaging technologies and techniques, and their introduction and use in the clinical environment, necessitates their evaluation and optimization prior to clinical use. This presents research and development opportunities including:

- Development of Health Technology Assessments and efficacy studies for medical imaging devices and procedures.
- The development of the use of image and imaging system modelling in the optimization of imaging techniques.

Research Infrastructure support

- 6.4.11 Scientific and technical support for the clinical trials of medical devices and drugs that involve imaging including

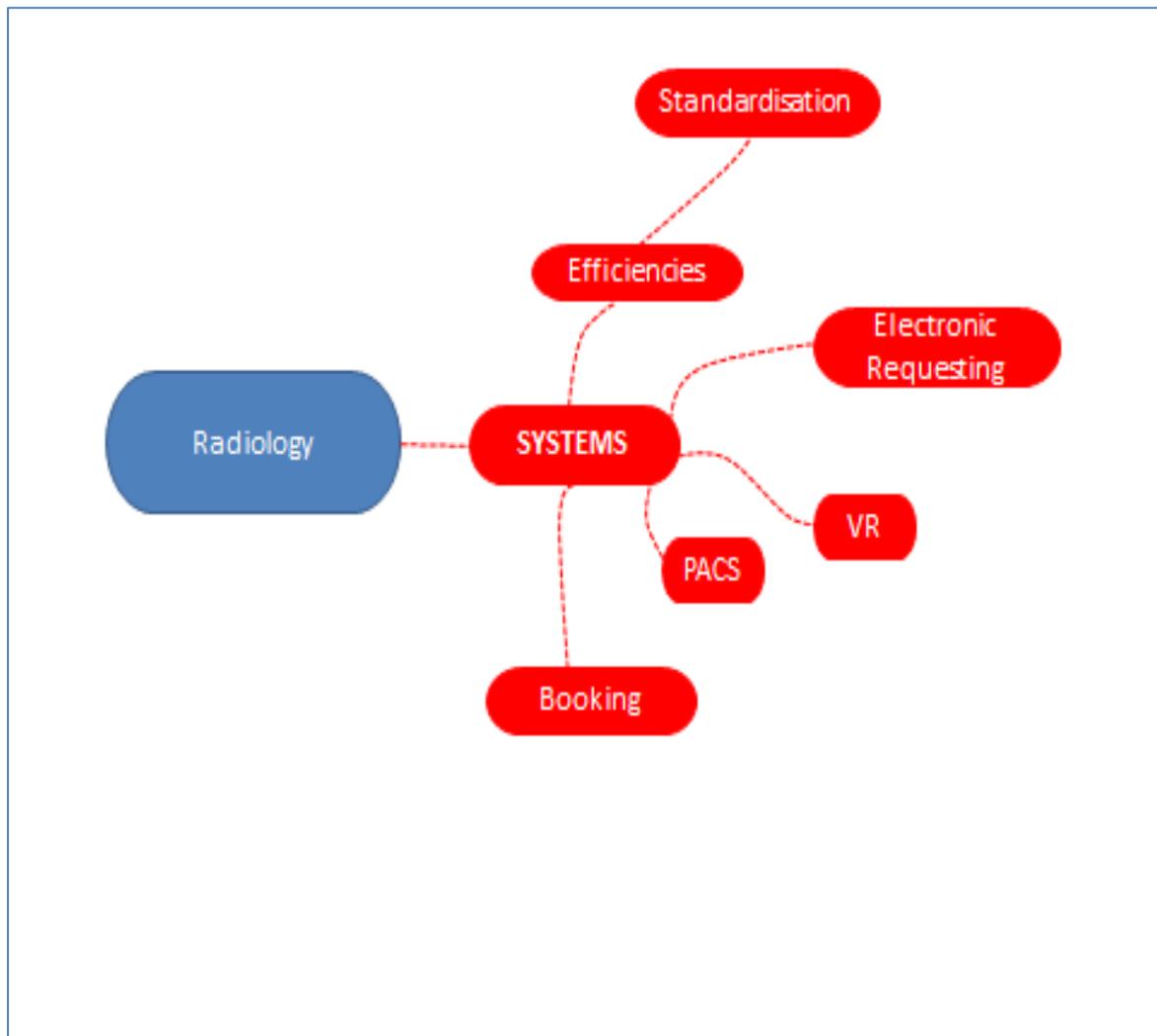
- Support for statutory and governance functions such as support from Radiation Protection Adviser, Medical Physics Expert, Magnetic Resonance Safety Expert etc.
- Ensuring equipment performance meets recommended standards and performance is optimized for the required imaging task.

- 6.4.12 Medical Physics also contribute to academic teaching and training

- Provision of specialist teaching and training (e.g. specialist imaging related modules, FRCR etc.)

- Post graduate supervision involving other departments (e.g. physics, computer science, medicine etc.).

7.0 SYSTEMS



7.1 Single RIS/PACS

Introduction

7.1.1 Within NI and the Belfast Trust, there are 3 RIS (Radiology Information System) and PACS (Picture Archiving and Communication System) systems. Each RIS / PACS is stand-alone and does not currently interface with the others and each system is supplied by different vendors. The NIPACS solution supplied by Sectra is used by 27 sites within NI. The Belfast City Hospital site uses GE and the Royal Victoria Hospital site uses Philips (due for replacement summer 2015 with HSS CRIS RIS).

Impact of the Gap on the current service

7.1.2 The impact on the imaging system across NI in working with 3 different RIS/PACS systems is significant. Key issues include:

- Reduced patient safety due to an incomplete radiological history available on any one system and inability to compare images across different systems
- Duplication of examinations carried out to clinician and / or radiology department being unaware of exams already undertaken on another system
- Inefficiency due to the inability to standardise workflows across NI, to include urgent, critical or unexpected finding workflow
- Inefficiency of MDT meetings if relevant imaging is on different systems
- Inability to realise many regional initiatives referenced in the Workstream papers, which are considered essential for a modern, efficient imaging service of the future

What is needed to address the gap

7.1.3 There is a need to rollout a single RIS/PACS to the region. This is being taken forward as a project by the e-Health Directorate, within the HSCB to explore options for integration and to report to the Imaging Review and HSCB with resource implications once these are determined.

7.1.4 The obvious choice is Sectra as this will only require a change to the two Belfast sites and infrastructure is already in place to facilitate the transition. There is a requirement for additional storage, hardware and software.

Benefits of addressing the Gap

7.1.5 The benefits of a single RIS/PACS for NI include:

- Improved patient safety
- Increased efficiency of both radiological and clinical workflow across the region
- Reduction in the need for training
- Easier access to 2nd opinion both in and out of hours
- Better quality of data for planning, adoption of best practice, benchmarking and performance management
- Easier integration within ECR and other 3rd party systems e.g. data warehouse and Image Exchange Portal

- Supports regional reporting networks
- Increased efficiency of MDTs

7.2 NIPACS Integration with NIECR

Introduction

7.2.1 To improve patient pathways and quality of care, there is need to ensure RIS/PACS integration with the NI Electronic Care Record. Currently, all three RIS systems reports are available within ECR and there are three projects ongoing:

- Access radiological images through ECR portal. This is due to be piloted with NIPACS images via Sectra Liteview and is planned for GE and Philips
- Results Acknowledgement. This is also currently being piloted. It requires governance issues to be regionally agreed and the process to be mandated for all reports across the region
- Regional radiology request ordercomms. This is being developed and is currently being tested with NIPACS integration. A pilot is due to start in June 2015 and with a full roll out completed by end of September 2015. Integration with GE will then start, to be followed by Philips.

Description of the Gap / Impact on the current Service

7.2.2 To achieve maximum efficiency, there should be integration with just one RIS system. Therefore, all of the projects listed above need to be fully implemented.

7.2.3 There needs to be access to ECR with patient contextual linking via RIS and PACS systems.

7.2.4 There is potential for single portal access to all medical images outside of radiology, e.g. endoscopy, dermatology, medical photography, pathology etc. using the ECR and current NIPACS infrastructure. This would provide the same storage and sharing benefits for non-radiological images that NIPACS provides for imaging

7.2.5 Currently, images are stored in a variety of ways, e.g. in patients' notes, standalone software packages, CDs etc. This makes access to all relevant images for patient diagnosis and management extremely difficult, if at all possible and reduces efficiency of MDT meetings. Patient safety can be compromised.

What is needed to address the Gap

7.2.6 A formal project is needed to:

- Explore areas that would benefit from regional image storage and sharing
- Identify priority areas
- Assess the number of images and identify costs of hardware, software and implementation
- Report to the Imaging Review and HSCB once resource implications are known

Benefits of addressing the Gap

7.2.7 The benefits of addressing the gap include:

- Improved access to full imaging history to help facilitate and improve clinical management and decision making
- Improved governance by storing of images in a safe and secure format
- Facilitate 2nd and expert opinions regionally and nationally
- Improved patient safety with use of results acknowledgement and region wide radiological requesting ordercomms

Assessment of achievability

7.2.8 The technology and infrastructure is available to facilitate this work. Funding would be required but could be taken forward in a phased-project based on clinical need.

7.2.9 There needs to be regional agreement on governance issues regarding who is responsible for request sign off and a regional mandate that process must apply to 100% of reports, supported by rigorous monitoring process.

7.3 PACS Workstations

Introduction

7.3.1 Workstations are included within NIPACS contract and are managed by Sectra. The monitors undergo a full IPEM quality assurance programme and are recalibrated or replaced as required. Within the contract, they are replaced every 5 years as part of the technical refresh. Within NIPACS, there is currently a technical refresh to include workstations. By summer 2015, internet, StatDX⁹, 3rd party links should all be available on NIPACS workstations.

Description of the Gap

7.3.2 Radiologists increasingly spend many hours in front of a workstation and the design needs to be ergonomically friendly to avoid RSI, back pain and absenteeism. While the workstations are provided within the NIPACS contract, the desk, chair and reporting environment are the responsibility of each Trust and as such, the quality of the reporting environment varies across Trusts.

What is needed to address the Gap

7.3.3 A formal project is required and a standard for the quality of PACS workstations agreed regionally. A scoping exercise is required to determine what is currently in place and how it meets the standard. Financial implications would need to be assessed to bring Trusts to the required standard if necessary and form part of local capital development plans.

⁹ StatDX: Diagnostic Decision Support for Radiology

Benefits of addressing the Gap

- 7.3.4 The benefits include an increase in productivity, reduction in lost time at work, reduction in absenteeism and improved health and safety for reporting staff.

7.4 IS Access to Imaging History / Upload to NIPACS

Introduction

- 7.4.1 The HSC currently commissions activity from the Independent Sector (IS) to support delivery of waiting times and to meeting reporting requirements. Until IS support is no longer required, it is important to ensure that the service they provide is of the same quality as that expected in the HSC hospital environment.

Description of the Gap

- 7.4.2 Currently, each Trust has their own contract arrangement with the IS, with variations both technically and in the workflow. There is no uniform access to imaging history or ability to upload images taken back into NIPACS.
- 7.4.3 Radiologists working in the independent sector have variable access to the imaging history in NIPACS and the other PACS in the Belfast Trust. This leads to inaccurate and indeterminate findings on IS reports, time consuming re-reporting or repeating of studies within the NHS and ultimately, delays in reporting.
- 7.4.4 Waiting list studies performed in the independent sector need to be manually uploaded onto NHS PACS. This results in long delays in updating the imaging history leading to potential risk. Studies tend to be returned on discs quite some time after the procedure is performed and reported. Uploading these discs (and reports if available) is a time consuming, manual task.

What is needed to address the Gap

- 7.4.5 A regional specification is required to include both the technical and clinical aspects with reference to how images are available in NIPACS, appropriate response times, ensuring reporters have access to full imaging history and thorough quality assurance and audit of reports.
- 7.4.6 Trusts could then utilise this as required to ensure standardisation and quality of service provided across the region, irrespective of vendor.
- 7.4.7 Where an independent sector provider is regularly performing studies for the NHS, there should be a streamlined method to allow direct access to NIPACS for radiologist reporting these studies in a reporting environment as good as those in the Trusts. IS providers should be asked (and would be willing) to pay for NIPACS connection and integration. This would improve the quality of IS reports, reducing the need for repeat examinations and ensuring that the medical imaging record remains complete.

7.4.8 Trusts need to ensure that patients referred for imaging to the IS have a robust mechanism to ensure that images and reports are subsequently uploaded to their PACS. This would ensure that that they would be available to their clinicians thwne the patient returns to the HSC for further treatment and follow-up and avoid unnecessary repeat of examinations in the IS. Contracts therefore need to be explicit about the requirements to provide both report and image and resources must be identified within the Trust for the necessary administration. Robust monitoring arrangements need to be in place to ensure compliance.

Benefits of addressing the gap

7.4.9 The benefits of addressing the gap include:

- Improved patient safety
- Improved efficiency for outsourced HSC patients
- Standardisation across NI
- Reduction in time spent by local radiologists given 2nd opinions
- More efficient tender process and contract management for the Trust

7.4.10 This project could potentially be taken forward via the MRCN and once the specification was agreed, report to Imaging Board and HSCB. It would require resource time, but would have minimal financial implications.

7.5 NIPACS and Monitoring of Total Radiation Exposure

Introduction

7.5.1 The practice of monitoring, recording and auditing of patient dose dates back more than 30 years and has clear regulatory requirement. Historically, data collection for national patient dose audit is paper based. This has its limitations, is disruptive and consuming for all involved.

Description of the Gap

7.5.2 There is no firm proposal for a national dose registry, but there are suggestions that a new BSS EU directive may make this a requirement. If so, this cannot be achieved with current processes and IT systems.

7.5.3 Modalities are now required to provide relevant dose information in a standard format. Dose management systems can produce reports that can be utilise by Trust staff and the Regional Medical Physics Service to facilitate local, regional and national registries.

7.5.4 It is important that the dose management product is PACS vendor neutral for future proofing.

What is needed to address the Gap

7.5.5 The following is required:

- A project group of stakeholders to include Medical Physics, ICT, NIPACS and Radiology Management
- Request main vendors to present and submit a document detailing comparison of features, specification and cost
- Trial the shortlisted options on a trial basis
- Explore funding possibilities

Benefits of addressing the Gap

7.5.6 The benefits of addressing the gap include:

- Increased patient safety as equipment can be more closely monitored for radiation dose and any changes
- Increased patient safety as radiation incidents can be investigated and any equipment or staff training issue identified quickly
- Increased efficiency and reduction in time taken to gather required information for both Trust and Medical Physics staff
- Ability to meet new regional and national guidelines
- More efficient and effective information
- Ability to run high level reports for Trust staff, and low level detailed reports for Medical Physics

7.6 Fully Functional viewing / reporting stations in Radiologists' Homes

Introduction

7.6.1 Currently, each Trust has a solution to facilitate radiologist reviewing and reporting examinations out of hours. As this was outside the NIPACS contract in 2008, this varies within Trusts in relation to the workstations provided and how the images can be retrieved.

Description of the Gap

7.6.2 Ideally, radiologists should have the same functionality and quality of workstation as they do within the hospital environment. The requirement for radiologists to access images at home has increased and similar functionality is essential for any regional on call rotas and region wide reporting approaches.

7.6.3 The status of the current home-based workstations needs to be assessed, including availability of voice recognition, method of access (i.e. loading images via internet or viewing from a virtual environment). Agreement should be reached as to the standard required and the resource implications.

Impact of the Gap on the current service

- 7.6.4 If there is no change in the level of functionality and no regional standardisation, there is a clinical risk due to sub-optimal viewing and reporting facilities. There is a decrease in efficiency and effectiveness of radiologists' time.
- 7.6.5 Trusts need to move towards utilising a virtual environment to view images which does not depend on sending large files (images) through an internet connection which can be slow depending on factors outside of HSC control which could constitute a clinical risk during an on call situation.

Benefits of addressing the Gap

- 7.6.6 The benefits of addressing the gap include:
- Increased patient safety
 - Better utilisation of clinical time
 - Increased efficiency to provide more accurate reports
 - Ability to support regional on call rotas
 - Easier access to 2nd and expert opinion in and out of hours

7.7 PACS ability to monitor / manage MDT time

Introduction

- 7.7.1 Radiologist time is increasingly required to provide 2nd opinions and attend / hold MDTs. Currently, PACS is unable to record this time commitment.
- 7.7.2 Future development of RIS / PACS is required so that the time can be recorded in an efficient manner and the date retrieved when required. Sectra are currently working towards this functionality, but timescales or costs are unknown at this time.

8.0 Conclusion

- 8.1 In preparing Paper 3, the Workstream has endeavoured to build on the work of Papers 1 and 2 and has outlined what we believe to be the key gaps in imaging services between where we are now and where we would like to be. The paper aims to inform the Framework Document which will draw together the products of the respective workstreams into the future strategic direction for imaging services in Northern Ireland.
- 8.2 Some of the areas highlighted will require further scoping or development, whilst others are already being taken forward; it was considered important not to “stand still” during the period of the Review. However, it is essential that all of the areas highlighted are considered collectively to inform the strategic view as they all play a part in the complex adaptive system that is imaging. It is now that the underpinning workstreams of workforce, ICT, capital etc. are to perform a vital role in taking this to the next level of intelligence to aid translation into viable business cases to compete for limited resources.
- 8.3 The imaging workforce is central to the delivery of efficient and effective services. They have responded to increases in demand placed upon the service as well as the requirements for extended day and weekend working. New roles have been developed and existing roles extended and these developments need to continue to enable imaging services to respond to future challenges. We hope that this gap analysis goes some way to consolidating what is needed to take the imaging service from where we are now to where we would like to be.
- 8.4 Perhaps more than any other clinical service, diagnostic imaging has been transformed by developments in information technology and digital electronics over the last thirty years. A service then largely based on film, now uses computers to calculate digital medical images for a range of scanner types which literally provide a window into any part of the body making use of the physical properties of magnetic resonance, x-ray absorption radionuclide emissions and ultrasound reflection in tissue. This has enabled earlier, more accurate diagnosis and more appropriate interventions for almost all major health conditions and supports seamless care for patients across primary and secondary care sectors. However, the technological advances remain dependent upon the human resources to optimise their potential.
- 8.5 The availability of training will be essential to support both core service provision and continued progress and ensure that staff are appropriately trained to keep up with rapid developments in imaging technology and practice. The need for further expansion of radiologist training places and more effective methods of recruitment must not be under-estimated.
- 8.6 The Workstream has clearly demonstrated the pivotal role that imaging has in the delivery of modern healthcare. Through the Review process, there has been increasing collaboration between regional and local imaging services and it is vital that this relationship is further developed to enable key developments to continue. The Review of Imaging Services is a unique opportunity to drive the modernisation required to support imaging services over the next decade.

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 John Lawson	Consultant Radiologist / Clinical Lead of the DHSSPS Imaging Review	BHSCT
Mrs Maria Wright	Service Improvement Programme Manager / MRCN Network Manager	HSCB
Dr Peter Flynn	Clinical Director and Consultant Neuroradiologist	BHSCT
Mr David Wallace	Radiology Services Manager	NHSCT
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
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
Dr 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

Membership of Expert Reference Group of DHSSPS Imaging Review

EXPERT REFERENCE GROUP OF DHSSPS REVIEW OF IMAGING	
NAME	JOB TITLE
Dr Pete Cavanagh	Retired Consultant Radiologist
Mr Richard Evans	Chief Executive, Society and College of Radiographers
Dr Richard Clements	Consultant Radiologist
Dr Beattie Crawford	Retired International Radiologist

Appendix 3

References – Regional Medical Physics Service

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2. Ionising Radiation (Medical Exposure) Regulations (NI) 2000 (and 2010 amendment).
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7. Safety guidelines for Magnetic Resonance Imaging Equipment in Clinical Use. MHRA, 2014.
8. Medical and Dental Guidance Notes. IPEM, 2002.
9. Recommended Standards for the Routine Performance Testing of Diagnostic X-ray Imaging Systems. IPEM Report 91, 2007.
10. Quality Control of Gamma Camera systems. IPEM Report 86, 2003
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15. Guidelines for professional working standards: Ultrasound practice, UK Association of Sonographers, 2008.
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17. Accredited Expert Scientific Practice Curriculum, Medical Physics Expert. Academy for Healthcare Science, 2014.

Appendix 4

Breast Radiology: Tables 12-18

	Radiologists	Radiographers	Assistants / Helpers	A&C
BHSCT	6 x consultants = 2.4wte.	18 x radiographers = 14.3wte. Provide screening and symptomatic services. 3 x wte funded for symptomatic services which is below the rise in capacity over last 8 years. An additional symptomatic clinic proposed for year end. An IPT has been submitted for staffing which may offset the 3wte funding positively.	2 x assistant practitioners = 1wte. 1.6wte helpers	3 x admin = 1wte.
NHSCT	5 x consultants. 9 x sessions pw to symptomatic services.	10.26 wte.	1.6 wte helpers	8.73 wte
SEHSCT	4 x consultants (3.9wte).	8.6 wte	0.3 wte B3 helpers	0.3wte
An additional breast clinic was implemented in September 2014. Funding was requested for the following, but the recurrent funding provided was significantly less than requested.				
	0.3wte x consultant	0.6wte B6 mammographer / 0.6wte ultrasonographer		0.3wte B2
SHSCT	2 x perm consultants = 1 session each pw. 1 x part time consultant at 1 x PA pw.	10.54 wte for screening / symptomatic	2wte x B4 assistant practitioners	1wte x B4 / 2wte x B3 / 2 wte x B2.
WHSCT	1.54 consultants. 11 sessions pw, of which 4.5 are dedicated to symptomatic.	2 wte	0.8wte assistant practitioner / 0.7 B3 helper	1.8wte

	Equipment (may be shared between screening / symptomatic services.)	Breast Sessions
BHSCT	2 x mammography units (Siemens Mammomat Inspirations / core biopsy attachment x 2). 1 x GE mammography unit (Seno Essential + contract enhanced mammography / GE salient single head injector pump). 4 x Sectra reporting stations / BREIS tables. 3 x GE healthcare ultrasound LOGIQ (E9 = S8 = S8). 1 x single Vacuum biopsy device (Hospital services Ltd Hologic Suros vacuum / ATEC sapphire).	
NHSCT	2 x Hologic Selenia and 2 x Siemens Inspiration Mammography units. 2 x Toshiba Xaria Ultrasound machines.	Breast MRI (symptomatic) is not separately identified in the SBA or recurrent gap, but approx 2-3 cases (0.5 sessions) per week are performed. Dedicated Breast MRI sessions have been identified as part of the business case for the 2nd MRI scanner in 2016/17.
SEHSCT	1 x Mammography unit. 3 x Ultrasound machines.	0.5 Breast MRI sessions pw
SHSCT	2 x Hologic digital Mammography units. 2 x Toshiba Ultrasound machines.	0.5 Breast MRI sessions pw
WHSCT	2 x Siemens Inspiration static Mammography units for symptomatic patients. 2 x Toshiba Ultrasound machines.	Approx 2 x Breast MRI cases per week

	Routine Clinics	Red Flag Clinics	Review Clinics	Other Clinics
BHSCT	2 x routine clinics per week.	3 x one stop RF clinics pw		1 x low risk clinic per week. 1 x family history clinic per week
NHSCT	2 per week, of which 1 is out of hours. Radiology cover provided / average 15 patients per clinic.	3 per week. 15-20 red flag and 5 review patients per clinic. NR funding used to provide 1-3 additional RF clinics.		2 low risk clinics per week (inc. self-directed follow up patients and moderate risk family history). 1 x family history clinic per week
SEHSCT	3 x clinics per week. Mixture of referral categories. 1 x family history clinic per week. 6 additional NR clinics required per month			
SHSCT	6 per month with NR funding to meet waiting times.	3 x red flag clinics per week. 21 patients per clinic.		1.5 family history clinics per week.
WHSCT	1 x routine clinic per week with triple assessment	3 x red flag clinics per week with triple assessment	2 x review clinics per week. No radiologist cover. Mammography undertaken and read by radiologists later.	0.5 family history clinics pw (1 every other week). 1 x session pw for family history and surgical review. Mammography only provided - mammograms read at another time. 2 x oncology clinics per week. Examinations from this clinic are booked for a later date and include some mammography.

	Red flag	Routine	Other
BHSCT	Approx 600 per month from Ops.		200 other per month (self directed aftercare / oncology review / family history)
NHSCT	225 per month (seen within 2 weeks). NR funding used to meet waiting time targets.	197 per month (seen within 6 weeks). NR funding used to meet waiting time targets	100 other (self-directed aftercare / oncology / review / family history).
SEHSCT	204 per month.	400 per month	48 family history per month.
SHSCT	230 per month (seen within 2 weeks).	100 per month. Seen in NR clinics within 13 weeks.	
WHSCT	204 per month (seen within 2 weeks)	110 per month (seen within 9 weeks).	23 other per month, including family history.

	BHSCT	NHSCT	SEHSCT	SHSCT	WHSCT
U/S guided FNA	379	420	331	124	247
U/S guided Core biopsies	274	490	137	479	346
U/S Vacuum assisted biopsies (VAB)	4	10	52	14	2
U/S Localisations	119	125	72	150	78
Stereotactic core biopsies	90	0	0	38	93
Stereotactic VAB	23	110	52	8	0
Stereotactic Localisations	30	11	1	15	5
MRI VAB, Localisations	n/a	19	0	0	0
U/S guided aspiration	n/a	n/a	n/a	n/a	47
Ultrasound marker insertions	20	n/a	n/a	n/a	n/a

	Mammograms	Digital Breast Tomosynthesis	Ultrasounds	Breast MRI
BHSCT	5980	56	2995	100
NHSCT	5550	To commence May 15.	4188	261
SEHSCT	2917	0	2143	183
SHSCT	4836	1573	4726	25
WHSCT	4765	68	2115	51

	Symptomatic	Screening	TOTAL
BHSCT	317	120	437
NHSCT	218	88	306
SEHSCT	total		219
SHSCT	total		230
WHSCT	155	74	229