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# Radiology Service – Aneurin Bevan University Health Board

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# Summary report

## Background

- 1 Radiology is a key diagnostic and interventional service for the NHS and supports the full range of specialties in acute hospitals primary care and community services. Hospital-based clinicians, including consultants, other doctors, and in agreed circumstances, non-medical practitioners, often refer patients for radiology imaging, as do general practitioners.
- 2 Diagnostic radiologists employ a range of different imaging techniques and sophisticated equipment to produce a wide range of high-quality images of patients. Images include plain x-ray, non-obstetric ultrasound (US) and computed tomography (CT) as well as sophisticated techniques such as magnetic resonance imaging (MRI).
- 3 Clinical radiologists<sup>1</sup> are doctors who use images to help diagnose, treat and manage medical conditions and diseases. They have a key role in the clinical management of a patient's condition, selecting the best imaging technique to enable diagnosis and minimise radiation exposure. Interventional radiologists have a more direct role in treating patients. They use radiological imagery to enable minimally invasive procedures, such as stopping life-threatening haemorrhages, and day-case procedures such as oesophageal stenting and angioplasty. All radiologists work as part of the multidisciplinary teams which manage patient care.
- 4 Rapid advances in technology and understanding about how the features of disease present themselves on diagnostic images have allowed imaging to be used at earlier stages of the diagnostic process. Similarly, changes in the characteristics of disease with treatment can be better detected, and imaging is frequently used to monitor progress. From the patient's point of view, early radiological detection can improve the outcome of treatment and prevent unnecessary pain and suffering. It can also reduce the scale and cost of treatment.

<sup>1</sup> In this report, where reference to radiologists is made, this includes consultant radiologists, middle-grade doctors, specialist registrars and junior doctors. Where there is any variation from this, the report content will specify that, eg consultant radiologists.

- 5 Demand for radiology services continues to increase year on year. The increase is driven by a number of factors, including demographic changes, new clinical guidelines, lower thresholds for scanning and referral, surveillance work for surviving patients, a growth in screening, and increasing image complexity.
- 6 **The Future Delivery of Diagnostic Imaging Services in Wales** (2009)<sup>2</sup> showed that demand for some types of imaging had been increasing by 10% to 15% per year. Recent reports by the Auditor General on **NHS Waiting Times for Elective Care in Wales** (January 2015)<sup>3</sup>, and **Orthopaedic Services** (June 2015)<sup>4</sup> showed that the increasing demand for radiology services is resulting in long waits for radiological diagnostic procedures and that sustainable solutions were needed to address this.
- 7 The Welsh Government has introduced delivery plans to improve the treatment of major health conditions such as stroke<sup>5</sup>, cancer<sup>6</sup> and heart disease<sup>7</sup>. The plans all highlight the importance of efficient and effective radiological services. The associated care pathways emphasise the need for rapid referral processes, rapid diagnostic testing at particular stages in the pathway, the right equipment and staff who are appropriately skilled.
- 8 While there is a need to deliver long-term solutions to manage and meet increasing demand for radiology services, there is general recognition that the UK consultant radiologist workforce is under significant pressure. In 2015, 9% of consultant radiologists' posts in the UK were unfilled, with 7%<sup>8</sup> of Welsh consultant radiologist posts unfilled. For the period 2015 to 2020, consultant workforce attrition due to retirement is likely to be higher in Wales than in any other part of the UK. Around 30% of consultants in Wales are expected to retire if the retirement age is 60, compared to 20% for the UK as a whole<sup>9</sup>.

<sup>2</sup> Welsh Assembly Government, **The Future of Diagnostic Imaging Services in Wales, 2009**

<sup>3</sup> Wales Audit Office, **Elective Care in Wales**, January 2015

<sup>4</sup> Wales Audit Office, **Orthopaedic Services**, June 2015

<sup>5</sup> Welsh Government, **Together for Health, Stroke Delivery Plan, 2012**

<sup>6</sup> Welsh Government, **Together for Health, Cancer Delivery Plan, 2012**

<sup>7</sup> Welsh Government, **Together for Health, A Heart Disease Delivery Plan, 2013**

<sup>8</sup> The Royal College of Radiologists, **Clinical radiology UK workforce census 2015 report, 2016**

<sup>9</sup> The Royal College of Radiologists, **Clinical radiology UK workforce census 2015 report, 2016**

- 9 The use of interventional radiology (IR) is growing. Such techniques rely on the use of radiological images to precisely target therapy. IR techniques can be used for both diagnostic and treatment purposes. The demand for these techniques is increasing and this places further pressure on already stretched radiology services' staffing resources. It is widely accepted by radiology professions that the numbers of interventional radiologists across Wales, similar to other parts of the UK, are too low. Within Wales, the National Imaging Programme Board (NIPB) has a programme of work which is considering interventional radiologist capacity and how it can be addressed.
- 10 The NIPB is the primary source of advice, knowledge and expertise for the planning of imaging services in Wales. It is made up of clinical and management representatives from organisations involved in the delivery of imaging services in Wales. In 2010 the NIPB was given delegated authority for developing and implementing a programme of strategic work for radiology through to 2016, and for adopting all-Wales standards and protocols for imaging services in NHS Wales. Although progress is being made at national level, a number of significant challenges are yet to be fully addressed. For example, there are ongoing difficulties in recruiting general and specialist radiology staff and concerns about the information systems that support radiology services.
- 11 Given the challenges set out above, the Auditor General decided that it was timely to undertake a review of radiology services across all Health Boards in Wales. The work examined the actions Health Boards are taking to address the growing demand for radiology services, and the extent to which these actions are providing sustainable and cost-effective solutions to the various challenges that exist. The review also examined key radiology imaging techniques, or modalities, as well as interventional radiology in acute settings. It excluded therapeutic radiology.
- 12 We undertook the fieldwork at the Aneurin Bevan University Health Board (the Health Board) between June and August 2016. [Appendix 1](#) provides more details of the audit approach and methodology.
- 13 In addition to this local audit work at the Health Board, the Auditor General for Wales is conducting a value-for-money examination of the NHS Wales Informatics Service, which will, amongst other things, look at the implementation of RADIS<sup>10</sup> and PACS<sup>11</sup> across Wales. The findings from that work are due to be published in late spring 2017.
- 14 The Health Board's radiology service (the service) provides a range of imaging and interventional procedures across several sites; the main departments are based at Royal Gwent Hospital in Newport and Nevill Hall Hospital in Abergavenny. The Health Board also has imaging facilities at the following hospitals:
- County Hospital Pontypool

<sup>10</sup> RADIS – Wales Radiology Information System

<sup>11</sup> PACS – Picture Archiving and Communications System

- Ysbyty Aneurin Bevan Ebbw Vale
- Ysbyty Ystrad Fawr Ystrad Mynach
- Chepstow Hospital
- St Woolos Hospital

15 The radiology service is based within the Therapies and Health Sciences Directorate.

## Our main findings

16 Overall, we concluded that the Health Board faces risks in meeting current and future demand for radiology services due to staffing challenges, increasing waiting time backlogs and inconsistent engagement with staff and stakeholders.

### Exhibit 1: our main findings

Table detailing our main findings

Our main findings
<p>Generally, access to radiological services in hours, and processes for learning from incidents and complaints are good, however, waiting times and reporting turnaround times need improvement:</p> <ul style="list-style-type: none"> <li>• patients have appropriate access to in hours radiology services, with limited out of hours access but the prioritisation of referrals are not always consistently applied;</li> <li>• waiting time targets are not being met, with particular concerns for MRI and ultrasound scanning;</li> <li>• imaging time targets are unmet, longest turnaround times are significant across modalities, and the service would benefit from greater use of reporting radiographers and outsourcing;</li> <li>• there is regular and proactive clinical audit for the service but the clinical audit programme is not widely understood by staff; and</li> <li>• the service has clear processes in place for investigating complaints but its process for capturing and demonstrating learning from wider patient experience is not fully developed.</li> </ul>

## Our main findings

The Health Board's ability to manage increasing demand on the service is exacerbated by staffing challenges:

- the Health Board closely monitor and attempt to manage demand for radiology services which continues to increase;
- the service does not consistently engage with staff and stakeholders to reduce inappropriate demand;
- the service's booking system is patient focused and prioritises appointments according to urgency and clinical need;
- ongoing staff shortages and recruitment issues within the radiology department are resulting in an over-reliance on the use of locum doctors;
- the radiology department has fewer members of staff than the all-Wales average for its population yet staff conduct and report greater numbers of scans than the all-Wales average;
- while staff appraisal and PDP rates are high, training opportunities for staff are limited because of operational time pressures; and
- data relating to number of scanners per head of population was not submitted, but the percentage usage of scanners is higher at the Health Board than the all-Wales average.

While the Health Board is taking some proactive steps in managing the service such as upgrading the requesting system, there are weaknesses in strategic and financial planning:

- the Health Board does not have a radiology strategy although there is a clear operational plan which covers most key areas and a workforce plan, however there is inconsistent stakeholder engagement in strategic planning;
- leadership structure arrangements are relatively new and have not yet had time to mature and attendance and consistency of key radiology groups are limiting effective management of the service;
- radiology issues are effectively escalated to the Board but radiology is not represented on key Committees or the Board;
- there is regular financial monitoring of the service, but its approach to identifying cost pressures and savings is not fully mature;
- the service has an effective equipment replacement programme using a project team approach, yet the programme does not currently comply with some regulations;
- staff expressed frustrations with the current radiology information systems although a recent upgrade to support electronic requesting is a positive step forward; and
- the Health Board regularly reviews and discusses the performance of the service and significant concerns are escalated.



## Recommendations

- 17 As a result of this work, we have made a number of recommendations which are set out in [Exhibit 2](#).

### Exhibit 2: recommendations

Table outlining our recommendations to the Health Board.

<b>Factors affecting patient experience</b>	
R1	Develop an action plan detailing how waiting times targets will be achieved in the short term, and how the radiology service will sustain a reduction in waiting times going forwards, setting out: <ul style="list-style-type: none"><li>• an approach for the use of locums;</li><li>• an approach for the use of outsourcing of examinations;</li><li>• how it can ensure consistency in the prioritisation applied by referrers to forms; and</li><li>• any other actions that will help the Health Board achieve targets.</li></ul>
R2	Develop an action plan detailing how reporting backlogs will be managed sustainably. For example by making short-term use of outsourcing whilst developing a medium to long term strategy to address the delays.
<b>Demand and capacity issues affecting service performance</b>	
R3	Communicate and liaise with referring clinicians both: <ul style="list-style-type: none"><li>• when developing and reviewing referral guidance. Ensure all radiology staff and referring clinicians can easily access an up to date version of guidance;</li><li>• on an ongoing basis. Strengthen ongoing communication between radiology and referring clinicians in particular GPs by setting out an engagement plan by 2018. This plan should ensure there is adequate forum for regular discussion of service changes that may affect the service and referral feedback to support demand management.</li></ul>
R4	The Health Board should look to further develop its collection of patient experience information across its sites and seek to identify any common trends that can be actioned to improve the service.
<b>Extent to which radiology services are well managed</b>	
R5	Over the next 12 months develop, in consultation with radiology staff and services that impact on radiology, a radiology strategy which sets out: <ul style="list-style-type: none"><li>– where the service is now in terms of its demand, capacity and available resources;</li><li>– where the service needs to be; and</li><li>– how the service will achieve its aims.</li></ul>

### Extent to which radiology services are well managed

- R6 By mid-2017 review the groups that routinely discuss radiology issues relating to radiology to consider how each contributes to the service including:
- Weekly performance group;
  - Radiology Operational Group;
  - Radiology Protection Committee;
  - Consultants Meeting groups;
  - Directorate of Radiology; and
  - Radiology Management team.
- The service should establish a Terms of Reference for each group that clearly sets out the membership, regularity and scope and governance of each group.
- R7 Review radiology performance reports to ensure that they provide sufficient information to the groups and committees that receive them to ensure that group and committee members are fully sighted of key issues relevant to the service. The service should consider the inclusion of:
- demand and capacity data;
  - explanation for variation in performance since previous position; and
  - benchmarking data.
- R8 Further develop its equipment replacement programme to ensure that it complies with IR(ME)R requirements to include an equipment list which details the manufacturer, serial number, year of manufacture and year of installation.
- R9 The Health Board should review the G2 speech system in use by radiologists to identify ways to improve its reliability and to manage the risks that arise when the system does not work as intended.

# Detailed report

**Generally, access to radiological services in hours, and processes for learning from incidents and complaints are good, however, waiting times and reporting turnaround times need improvement**

**Patients have appropriate access to in hours radiology services with some limited out of hours access, but the prioritisation of referrals are not consistently applied**

- 18 Open-access services<sup>12</sup> are widely recognised as a means to reduce the time it takes for patients to access imaging. However, the approach can lead to demand management challenges, particularly when used for more complex imaging. It also has the potential to raise patient expectations and encourage over testing. For example, if a patient with lower back pain has an x-ray, it will not improve their condition. They may insist that the GP refers them for an x-ray because they feel as though something is being done for them. The decision to refer may not be supported when the radiology department or other referral screening service reviews the request. This can lead to a tension between patient expectations and the correct professional response.
- 19 While most radiology departments offer some form of open access to services, the extent of access varies. Typically, it is limited to plain x-ray only, such as a chest x-ray. If the referring medical professional has determined that a plain film x-ray is necessary, they complete a request form which the patient takes to the radiology department during opening times to receive, if appropriate, the requested x-ray.
- 20 The Health Board offers open access to its patients for plain x-ray only. A patient is given a request form by their GP or consultant. They must then submit this to the radiology department in order to get an appointment. During January 2017 the Health Board were in the process of enabling referrers to undertake electronic requesting of scans, to replace paper-based forms by mid-2017.
- 21 Where open access is not available, eg for more complex imaging, the referral should specify the degree of urgency. Typically, the service classes referrals as urgent (outpatient) or routine priority (outpatient). This ensures that the service sees the patients with the most critical needs first and urgent referrals as soon as they possible. For all other referrals, the service will add the patient to the waiting list, with urgent referrals prioritised. The Health Board use three priority levels for referrals: urgent, urgent suspected cancer and routine. However, consultants do

<sup>12</sup> Where an open-access service is provided, a GP can refer a patient to be seen that day by the relevant x-ray department.

not always apply these priority levels consistently, and will use a more urgent category in order for their patient to be seen more quickly, when they possibly do not have an urgent clinical need.

- 22 Patients with emergency health needs may need access to prompt radiology diagnostics and care outside standard radiology working hours. The Health Board provide limited emergency radiology services in out of hours, which run jointly between the Royal Gwent Hospital and Nevill Hall Hospital. The following cover is available during out of hours:
- CT scans – there are radiographers on site for particular cases with additional on-call cover for urgent and emergency cases;
  - MRI scans – scanning available for 8.5 hours on Saturday and Sunday which are run by staff that volunteer to undertake overtime and there is on-call cover for urgent and emergency cases;
  - nuclear medicine – occasional service on the weekend as a result of waiting list initiatives but otherwise no on-call cover
  - ultrasound scans – occasional service on the weekend as and when needed but otherwise no on-call cover; and
  - interventional radiology – on-call cover for emergency cases.

## Waiting time targets are not being met, with particular concerns for MRI and Ultrasound scanning

- 23 All NHS bodies in Wales are required to comply with the Welsh Government diagnostic waiting times target which states that no patients should wait more than eight weeks to receive their diagnostic test. The diagnostic waiting time target applies to all radiological interventions including magnetic resonance imaging (MRI), computed tomography (CT), and non-obstetric ultrasound (non-obstetric US), fluoroscopy, barium enema, and nuclear medicine. The Welsh Government target does not apply to plain film x-rays.
- 24 Since 2009 waiting times for radiological tests have also formed part of the referral to treatment target<sup>13</sup>. Health boards in Wales are required to ensure that 95% of all patients waiting for elective treatment, receive their treatment within 26 weeks from the point at which the referral was received. For many of these patients, diagnostic tests help decide which treatment is the best option.

<sup>13</sup> Welsh Health Circular (2007) 014 – **Access 2009 – Referral to Treatment Time Measurement**, Welsh Health Circular (2007) 051 – **2009 Access – Delivering a 26 Week Patient Pathway – Integrated Delivery and Implementation Plan** and Welsh Health Circular (2007) 075 – **2009 Access Project – Supplementary Guidance for Implementing 26-Week Patient Pathways**

- 25 The all-Wales radiology waiting times<sup>14</sup> for consultant and GP referrals shows that for August 2016 there were 10,562 patients waiting for radiology diagnostic imaging at the Health Board: 49% for non-obstetric US, 35% for MRI, 13% for CT, and 4% for nuclear medicine imaging.
- 26 The Health Board's performance for patients receiving their diagnostic test within the eight week target consistently deteriorated during 2016. In August 2016 an Executive Team paper highlighted ongoing issues with the rising number of patients 'breaching' their waiting time target. The Health Board also recognised the impact of diagnostic imaging delays on RTT performance for general surgery and on the length of cancer pathways.
- 27 In August, Welsh Government asked the Health Board to submit recovery profiles. They submitted two potential recovery trajectories, the first based on delivering all plans to achieve the IMTP performance profile, and the second assuming the Health Board was unable to secure external capacity. Despite its stated intention in November to deliver against the IMTP profile, papers submitted for the January 2017 Board meeting noted that the Health Board is unlikely to deliver that profile by year end and is now working toward a significant improvement to current performance.
- 28 The Health Board have put additional equipment and staff capacity in place to achieve this improvement. For example, the service commissioned mobile scanners at Nevill Hall Hospital in October 2016 and sourced an additional MRI scanner in January 2017 to increase the capacity of the service.
- 29 In August 2016, 3,071 patients were waiting for an MRI scan at the Health Board, of which 594 (16%) were waiting over eight weeks (**Exhibit 3**).

<sup>14</sup> **NWIS Diagnostic and Therapy Services Waiting Times – NHS Wales Informatics Services** (accessed via StatsWales on 30 October 2016)

### Exhibit 3: MRI waiting times for August 2016

Table showing that the Health Board has a higher percentage of patients waiting over eight weeks for an MRI scan compared to the all-Wales figures

	Total number of patients waiting for an MRI scan				Total waiting	Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks		
Community referrals	1,856	68	-	-	1,924	4%
Nevill Hall Hospital	449	186	1	-	636	29%
Royal Gwent Hospital	441	151	2	-	594	26%
Ysbyty Ystrad Fawr	325	186	-	-	511	36%
<b>Aneurin Bevan University Health Board</b>	<b>3,071</b>	<b>591</b>	<b>3</b>	<b>-</b>	<b>3,665</b>	<b>16%</b>
<b>All Wales<sup>1</sup></b>	<b>11,662</b>	<b>913</b>	<b>66</b>	<b>163</b>	<b>12,804</b>	<b>9%</b>

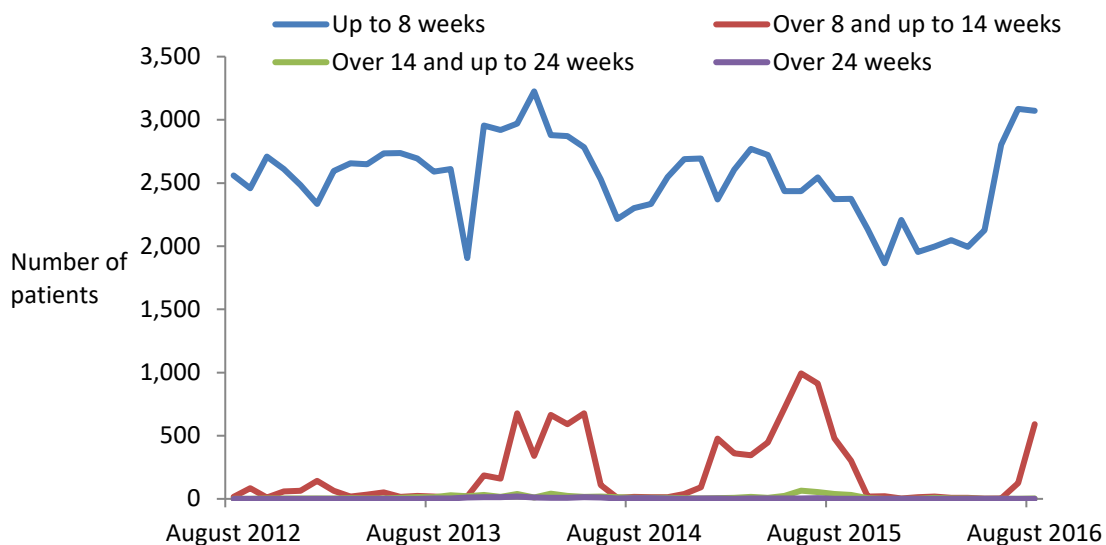
<sup>1</sup> All-Wales figures include all patients waiting for a diagnostic scan at Welsh Health Boards

Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed StatsWales, on 30 October 2016)

- 30 The data shows that the percentage of patients waiting more than eight weeks is considerably high at the three main hospitals within the Health Board. The percentage of patients waiting more than eight weeks is four times the national average at Ysbyty Ystrad Fawr, three times higher at Nevill Hall Hospital and just under three times higher at the Royal Gwent Hospital.
- 31 The total number of patients on the waiting list for an MRI scan at the Health Board increased by 30% between August 2012 and August 2016, and the percentage waiting more than eight weeks increased from 1% to 16% in the same period (Exhibit 4).

#### Exhibit 4: MRI waiting times trend from August 2012 to August 2016

Graph showing fluctuating MRI waiting times with significant peaks for patients waiting up to eight weeks over the last five years. However, number of patients waiting over 14 weeks are relatively low and no patients waited over 24 weeks.



Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed via StatsWales, on 30 October 2016)

32 In August 2016, 1,341 patients were waiting for a CT scan at the Health Board, of which 30 (2%) were waiting over eight weeks. (Exhibit 5).

**Exhibit 5: CT waiting times for August 2016**

Table showing that the Health Board has a percentage of patients waiting over eight weeks for a CT scan that is consistent with the all-Wales figure.

	Total number of patients waiting for a CT scan				Total waiting	Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks		
Community referrals	557	-	-	-	557	0%
Nevill Hall Hospital	266	2	1	1	270	1%
Royal Gwent Hospital	308	7	9	10	334	8%
Ysbyty Ystrad Fawr	180	-	-	-	180	0%
<b>Health Board</b>	<b>1,311</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>1,341</b>	<b>2%</b>
<b>All Wales<sup>1</sup></b>	<b>7,293</b>	<b>63</b>	<b>51</b>	<b>11</b>	<b>7,418</b>	<b>2%</b>

<sup>1</sup> All-Wales figures include all patients waiting for a diagnostic scan at Welsh Health Boards

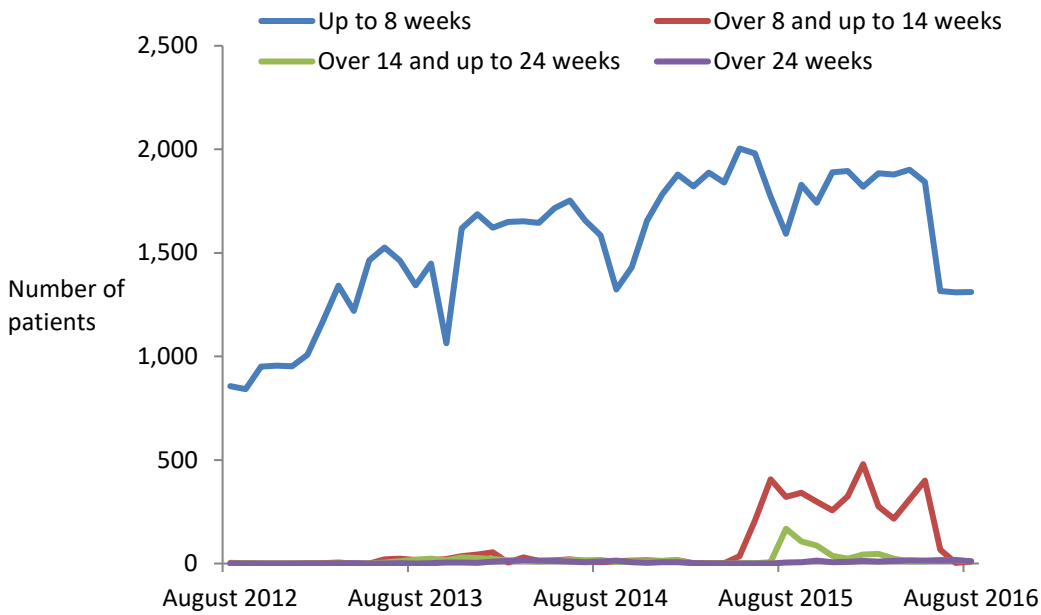
Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed via StatsWales, on 30 October 2016)

33 The total number of patients on the waiting list for a CT scan at the Health Board increased by 36% between August 2012 and August 2016, and the percentage of patients waiting more than eight weeks increased from 0% to 2% in the same period (Exhibit 6).



**Exhibit 6: CT waiting times trend from August 2012 to August 2016**

Graph showing a growth in the numbers of patients waiting for a CT scan up until summer 2016. During 2015-16 the number of patients waiting between 8 and 24 weeks increased but decreased again by August 2016.



Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed via StatsWales, 30 October 2016)

- 34 In August 2016, 5,162 patients were waiting for a non-obstetric US scan at the Health Board, of which 1,276 (25%) were waiting over eight weeks ([Exhibit 7](#)). Further analysis shows that just under one in four (24%) of the total number of patients waiting for a US scan across Wales can be attributed to the Health Board.

### Exhibit 7: non-obstetric US scan waiting times for August 2016

Table showing that the Health Board has a higher percentage of patients waiting over eight weeks for non-obstetric US scan compared to the all-Wales figures.

	Total number of patients waiting for a non-obstetric US scan				Total waiting	Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks		
Community referrals	2,499	1,023	2	0	3,524	29%
Nevill Hall Hospital	475	58	20	2	555	14%
Royal Gwent Hospital	786	64	77	1	928	15%
Ysbyty Aneurin Bevan	31	4	4	0	39	21%
Ysbyty Ystrad Fawr	95	18	3	0	116	18%
<b>Aneurin Bevan University Health Board</b>	<b>3,886</b>	<b>1,167</b>	<b>106</b>	<b>3</b>	<b>5,162</b>	<b>25%</b>
<b>All Wales<sup>1</sup></b>	<b>18,944</b>	<b>1,999</b>	<b>626</b>	<b>133</b>	<b>21,702</b>	<b>13%</b>

<sup>1</sup> All-Wales figures include all patients waiting for a diagnostic scan at Welsh Health Boards

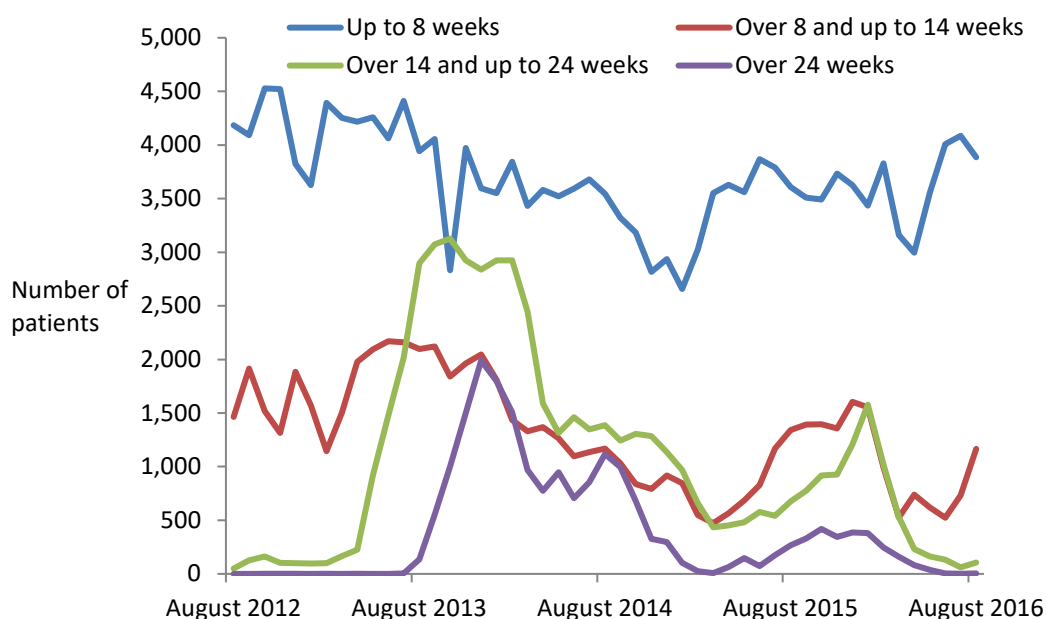
Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed StatsWales, 30 October 2016)

- 35 The total number of patients on the waiting list for a non-obstetric US scan at the Health Board decreased by 10% between August 2012 and August 2016, and the percentage of patients waiting more than eight weeks only decreased two per cent, (from 27% to 25%) in the same period ([Exhibit 8](#)).

36 The number of Ultrasound scans undertaken at community hospitals is significantly higher than at acute hospitals due to the additional space available. The Health Board have made a conscious decision to encourage outpatients to have their scans at community hospitals in order to manage waiting lists for inpatients and outpatients more effectively at their acute sites. While this approach is understandable, the Health Board must be mindful of the impact this has on those patients waiting at the community hospitals, and is managing any risks this can create for seeing patients according to clinical need.

**Exhibit 8: non-obstetric US scan waiting times trend from August 2012 to August 2016**

Graph showing fluctuating US scan waiting times over the past five years. It shows a general decrease in the number of patients that have waited up to eight weeks for their scan.



Source: **Diagnostic and Therapy Services Waiting Times**, NHS Wales Informatics Services (accessed via StatsWales, 30 October 2016)

## Imaging reporting time targets are unmet, longest turnaround times are significant across modalities, and the service would benefit from greater use of reporting radiographers and outsourcing

- 37 Effective management of patient care requires timely reporting of radiology images, by a qualified authorised practitioner, generally a radiologist. The report is a record of the interpretation of the scan, used to make further decisions on the care of the patient. Any delays in reporting can adversely affect patient outcomes.
- 38 All images must be reported and provided to the referring clinician in appropriate time in accordance with the patient's needs and clinical condition. The Welsh Reporting Standards for Radiology Services 2011 (the Standards) were produced in order to clarify previous guidance and regulations. The Standards set out that radiology should aim to provide reporting turnaround times as follows:
- urgent – immediately/same working day
  - inpatient – within one working day
  - A&E – within one working day
  - GP – within three working days
  - outpatient – within ten working days.
- 39 The Health Board use the Welsh Reporting Standards for Radiology Services as its guidelines for reporting. The department regularly review reporting of turnaround time and lost and late reports. Each week clinical leads within the hospital receive a list on unreported reports specific to their modality. Information relating to these are considered during weekly performance meetings and by a number of key groups related to radiology eg cancer assurance group, Referral To Treatment Group, Directorate Managers Meetings and the Radiology Operational Group.
- 40 Our review found that there is a substantial difference between the average report turnaround time (**Exhibit 9**) and the longest report turnaround time (**Exhibit 10**) for CT, MRI and Plain x-ray scans, with some patients waiting over 6 months for a report. The Health Board were unable to provide us with the details relating to the longest report turnaround time for ultrasound scans. The number of lost reports are shown in **Exhibit 11** and suggests that only a small proportion of reports expected by the department are unreported after 10 days.

### Exhibit 9: average report turnaround time as at 31 March 2016

Table showing that average report turnaround times for reports at the Health Board are generally consistent between hospitals, with the longest for plain x-ray and the shortest for ultrasound.

	Average report turnaround time (days)			
	CT	MRI	Plain x-ray	US
Nevill Hall Hospital	3	5	6	1
Royal Gwent Hospital	2	4	5	1

Source: Wales Audit Office, **Health Board Survey**

### Exhibit 10: longest report turnaround time as at 31 March 2016

Table showing that longest turnaround times for CT, MRI and plain x-ray reports are generally consistent between the main hospitals of the Health Board, and each are between five and a half and six and a half days. No data was submitted to us regarding the longest turnaround time for Ultrasound reports at the Health Board.

	Longest report turnaround time <sup>1</sup> (months)			
	CT	MRI	Plain x-ray	US
Nevill Hall Hospital	5.7	6.1	5.6	data not submitted
Royal Gwent Hospital	6.3	5.9	6.0	data not submitted

<sup>1</sup> Longest report times exclude any obvious outliers

Source: Wales Audit Office, **Health Board Survey**

**Exhibit 11: number of examinations not reported between 1 April 2015 and 31 March 2016**

Table showing that the number of examinations not reported at the Health Board for CT, MRI and US scanning during this period were relatively low, but are much higher with regard to plain x-ray.

	Number of examinations not reported <sup>1</sup>			US
	CT	MRI	Plain x-ray	
Nevill Hall Hospital	37	10	102	2
Royal Gwent Hospital	31	12	66	19

<sup>1</sup> Unreported examinations are those that have remained unreported more than 10 days since the examination date

Source: Wales Audit Office, **Health Board Survey**

- 41 We note that performance reports on reporting lists between February and August 2016 indicate poorer performance for unreported reports than is shown by the above data. For example, the July 2016 report notes that at that time there were 67 unreported Ultrasound reports, 593 unreported CT scan reports, 182 MRI scan reports and 5036 unreported Plain x-ray reports. This is due to variations in reporting capacity between March and July 2016. The data for Plain x-ray indicates a particular issue, with the performance report stating the average report turnaround times as follows:
- Inpatient – within eight working days;
  - A&E – within two working days;
  - GP – within nine working days; and
  - Outpatient – within fifteen working days.
- 42 In December, Finance and Performance Committee papers noted that the Health Board put in place extra Radiologist reporting capacity to speed up the reporting of scan results of USC patients. There are a number of ways in which the Health Board is attempting to increase this capacity. The Health Board has introduced home working for its radiologists, is attempting to increase its number of reporting radiographers and is using external contract reporting.
- 43 Extended practice radiographers receive extra training to interpret and report some types of images, typically less-complex scans, such as plain x-rays. For patients attending the emergency department and receiving a plain x-ray in normal hospital hours, the use of extended practice radiographers increases the likelihood that a report will be produced whilst the patient is still in the department. Where x-rays are reported by radiologists only, the formal report may not be produced until

hours, and sometimes days, after the patient has left the hospital. In these instances, x-rays will be initially assessed by a clinician with no formal radiology training. The use of extended practice radiographers can help to reduce the number of patient recalls caused by initial incorrect x-ray interpretation.

- 44 The Health Board's IMTP references a need for extended roles for radiographers. The department sought invitations for radiographers to access training during June 2016. Currently, the Health Board have ten reporting radiographers with another in training and plans for another two to begin training soon. However, those working in the service feel that the capacity and resources available to release staff to undertake prolonged training, both internal and external, is limited. As a result the service is not able to release as many staff as it would like to undertake such training.
- 45 **Exhibit 12** shows that between April 2015 and March 2016 radiologists reported on the vast majority of CT scans and all MRI scans. This is similar to the all Wales reporting percentage, which show that very few, if any radiographers report on these two modalities. The all-Wales percentages show that across Wales just under 25% of radiographers report on plain x-ray. At the Health Board 29% of radiographers reported on plain x-ray. The percentage of Ultrasound reporting by radiographers are lower at the Health Board than at an all-Wales level. The percentage of scans completed by those classed as 'others' are consistent with the all-Wales percentages across all modalities.

Exhibit 12: percentage of scans reported by radiologists, radiographers and other staff between 1 April 2015 and 31 March 2016

Table showing that between April 2015 and March 2016 the majority of CT and MRI scans were reported by radiologists. Just under a third of radiographers report on Plain x-ray and just under two thirds report on US which are broadly consistent with all-Wales percentages.

		% of scans reported by		
		Radiologist	Radiographer <sup>1</sup>	Others <sup>2</sup>
CT	Nevill Hall Hospital	100%	0%	0%
	Royal Gwent Hospital	100%	0%	0%
	<b>Aneurin Bevan University Health Board</b>	<b>100%</b>	<b>0%</b>	<b>0%</b>
	<b>Wales</b>	<b>98%</b>	<b>0%</b>	<b>2%</b>
MRI	Nevill Hall Hospital	99%	0%	1%
	Royal Gwent Hospital	100%	0%	0%
	<b>Aneurin Bevan University Health Board</b>	<b>100%</b>	<b>0%</b>	<b>0%</b>
	<b>Wales</b>	<b>98%</b>	<b>1%</b>	<b>1%</b>
Plain x-ray	Nevill Hall Hospital	51%	28%	21%
	Royal Gwent Hospital	51%	30%	19%
	<b>Aneurin Bevan University Health Board</b>	<b>51%</b>	<b>29%</b>	<b>20%</b>
	<b>Wales</b>	<b>63%</b>	<b>23%</b>	<b>14%</b>
US	Nevill Hall Hospital	33%	67%	0%
	Royal Gwent Hospital	35%	62%	3%
	<b>Aneurin Bevan University Health Board</b>	<b>34%</b>	<b>64%</b>	<b>2%</b>
	<b>Wales</b>	<b>26%</b>	<b>71%</b>	<b>3%</b>

<sup>1</sup> Radiographers includes ultrasonographers and medical physics technicians.

<sup>2</sup> Others category also includes auto-reported and non-reported images. (Auto-reporting is performed by the referring clinician rather than the radiology team.)

Source: Wales Audit Office, **Health Board Survey**

46 Constraints on the availability of radiologists led to the introduction of a national contract to provide extra, outsourced radiology in November 2014. The contract, awarded to Radiology Reporting Online Limited (RROL), was to provide outsourced reporting capacity across Wales, initially for two years, with an option to extend the contract for an additional year. The contract value across Wales was for



£1.5 million (excluding VAT) for both years. But, increasing demand, particularly in CT and MRI reporting, meant that usage has been significantly in excess of the predicted levels. The NIPB has estimated that the actual spend will be almost double the original contract value.

- 47 The radiology department outsources a small proportion of its reporting to support it in meeting demand. During 2015-16 only 3% of reports for CT scanning during out of hours at Nevill Hall and the Royal Gwent Hospital were outsourced and 15% of MRI scans at Nevill Hall outsourced. Some staff members we spoke to felt that the service should make greater use of outsourcing in order to address reporting backlogs.
- 48 The Health Board receive monthly quality reports on reports provided by the external RROL contract. We found that generally consultants that refer to radiology services feel that the outsourced service provide an efficient and timely service, but that there is some variation between the quality and detail of reports provided by in-house radiologists and reports produced from the external contract. We heard of examples of consultants raising queries regarding the quality of externally produced reports with their in-house radiologists. Often in these cases the in-house radiologists will dispute the external report. While it is positive to note that referring consultants can discuss such queries, it is important for the service to remain vigilant of any such quality issues by continuing to engage in dialogue with referring consultants and by monitoring the quality of external reports.

### There is regular and proactive clinical audit for the service but the clinical audit programme is not widely understood by staff

- 49 Radiology services must ensure that clinical performance always meets the appropriate standards for patient treatment and care. They need to comply with the National Diagnostic Imaging Framework (NDIF). The NDIF draws together a wide range of standards that apply and have relevance to radiology, such as waiting times targets, Healthcare Standards for Wales, and national delivery plans for specific conditions.
- 50 Radiology departments need to monitor clinical performance to ensure compliance with standards and maintain a clear programme of clinical audit. The Royal College of Radiologists' **Good Practice Guide for Clinical Radiologists** sets out good practice in relation to the design and delivery of clinical audit. This includes AuditLive, a tool which sets out a collection of audit templates, providing a framework identifying best practice in key stages of the audit cycle, covering over 100 radiology topics.
- 51 There is a programme of clinical audit within the radiology department. The department undertake regular review of aspects relating to radiology with the exception of reviewing demand for the service throughout the day. During 2016 eleven clinical audits were presented to the Radiology Directorate Meetings. A further four audits were presented to the Radiation Protection Group. These audits

covered a range of aspects from head injury to audit of paediatric body CT dose across the Health Board.

- 52 While we found reference to clinical audit within Board papers eg audit of inappropriate referrals, staff we spoke to were unclear about the programme of clinical audit within the department. In addition, clinical audit is separated between radiographer and radiologist staff, and we found limited evidence of the two groups working together on the audit programme.

### The service has clear processes for investigating complaints but its process for capturing and learning from wider patient experience is not fully developed

- 53 Radiology services must ensure that their practices are safe. For example, patients should always be offered appropriate radiological techniques which balance any inherent risks with the potential benefits from diagnosis and treatment. The service should ensure that patients receive the correct radiation dose, and staff should be monitored and protected so that they are not exposed to dangerous doses of radiation in the course of their work. Where errors or incidents are identified, Health Boards should act decisively and openly to learn lessons and prevent such incidents reoccurring.
- 54 The radiology service uses the Royal College of Radiologists (RCR) Standards for Learning from Discrepancies. The Health Board encourages the reporting of both clinical and operational incidents to facilitate learning within the radiology department and there is a robust complaints process in place. Formal complaints are submitted to a complaints board. The Clinical Quality Committee oversees any flagged incidents and is chaired by a clinical director.
- 55 In 2015, there were 142 reported incidents in diagnostic radiology departments across the Health Board, of which six were classed as moderate severity, and the rest classed as either low severity or causing no harm.
- 56 Radiology staff must ensure they protect patients and staff members from the risks of radiation. The Ionising Radiation (Medical Exposure) Regulations 2000 (IRMER), and subsequent amendment regulations in 2006 and 2011, provides a set of regulations for medical staff referring patients to radiology, those justifying the examination and those operating the equipment. Healthcare Inspectorate Wales (HIW) is responsible for monitoring compliance against IRMER. It's most recent annual report (2014–15) shows that the Health Board was not inspected during this period.
- 57 The service's Radiation Protection Supervisors Group and Quality Assurance Committee meets every quarter to monitor and review issues surrounding patient safety and radiation levels. This group reports to the Radiation Protection Committee and any issues are escalated into the Radiology Directorate Group.

- 58 Feedback from patients is a vital source of information for radiology services to understand and improve patient experience. The Health Board does collect compliments as well as complaints from its patients. The radiology departments provide patient satisfaction and complaints forms within their waiting areas. During 2015-16 the Health Board received 21 compliments from patients at Nevill Hall and Royal Gwent hospitals. Positive feedback is reported back to staff within the department. However, this information is not widely shared with staff in other sites that provide radiology services to identify any common strengths or weaknesses or with referrers across the Health Board.
- 59 The service has not undertaken any recent work on patient satisfaction or experience to capture wider information than those who choose to complete forms in the waiting rooms. The National Radiology Board is planning a Wales wide radiology questionnaire and survey, which at the time of this review was being approved by stakeholders. The Health Board will be able to use feedback collected through this survey to inform discussions in future.
- 60 Despite some limitations due to the age and lack of resources available for some of the facilities, particularly at Nevill Hall Hospital, radiographers feel that the spaces are appropriate and accessible by staff and patients. There are a good number of waiting rooms at most sites for the Health Board with the exception of Nevill Hall Hospital due to its design and size. In addition, there are separate children's waiting rooms at the Royal Gwent Hospital.
- 61 The Imaging Services Accreditation Scheme (ISAS) is a patient-focused accreditation scheme that helps imaging services to manage the quality of their services and make continuous improvements. In Wales, the introduction of ISAS is being overseen by the NIPB. However, there is recognition that progress at individual health bodies has been limited by a lack of staff resources to enable coordination of the work associated with the accreditation process.
- 62 The Health Board are at an early stage in preparing towards ISAS. An update report produced in November 2016 categorised progress as 'amber' on a RAG scoring system. The Health Board have taken some steps towards the ISAS such as developing a job description for a specific post to progress this work with plans to begin mapping ISAS standards to health and care standards in Quarter 3 of 2016-17. There is regular oversight of progress against the ISAS during radiology quality, safety and experience/effectiveness and at radiology senior management team meetings.

## The Health Board's ability to manage increasing demand on the service is exacerbated by staffing challenges

### The Health Board closely monitor and attempt to manage demand for radiology services which continues to increase

- 63 The increasing role of radiology in clinical care has led to growing demand for radiological examinations, in particular for CT and MRI scans. Whilst figures are not available for Wales, the most recent data available for England shows that there was a 42% increase in the number of radiology examinations undertaken per year between 2003 (28.8 million scans) and 2014 (40.9 million scans)<sup>15</sup>. The Royal College of Radiologists has predicted that by 2022 the number of radiological examinations carried out in England will be around 62 million<sup>16</sup> per year driven by further innovation and demographic growth.
- 64 As well as the number of scans undertaken annually increasing, scans are also becoming more complex. The biggest percentage rise in volume for radiological examinations has been for CT and MRI scans as they play an increasing role in the early diagnosis of many diseases. The Royal College of Radiologists predicts that the biggest percentage increase in examinations up to 2022 is expected to be for MRI scans (from 2.7 million scans per year in 2014 to 7.8 million in 2022) and CT scans (5.2 million scans per year in 2014 to 12.3 million in 2022)<sup>17</sup>. MRI and CT scans are complex data examinations, which generally include multiple images, and therefore, per patient examination, are more labour-intensive for radiologists interpreting images than less-complex scan types, such as plain x-ray.
- 65 Those we spoke to in the Health Board highlighted a number of national factors contributing to an increase in demand and knock-on effects, for example:
- public health campaigns – the recent 'lung cancer detection' campaign is causing an increase in chest x-ray demand for the service;
  - clinical trials and advances in interventional radiology – whilst positive, both add pressure to an already stretched service. Growth in these areas have a knock on effect on scheduling diagnostic patients and waiting lists;
  - litigation and patient expectation - a culture of GPs 'making sure' and higher patient expectation has led to an increase in demand.

<sup>15</sup> [Annual Imaging and Radiodiagnostics Data](#), NHS England, 2014

<sup>16</sup> Royal College of Radiologists, [Information submitted to Health Education England workforce planning and education commission round 2015-16](#)

<sup>17</sup> Royal College of Radiologists, [Information submitted to Health Education England workforce planning and education commission round 2015-16](#)

- 66 The Health Board is aware of the capacity and demand issues facing the service and undertake regular and close monitoring of demand in order to support them to meet the needs of the service.
- 67 In addition, the Health Board have targeted some areas to assess inappropriate demand and ways to improve pathways that affect radiology. In November 2015 the Board received a paper which included a sub-section relating to overuse of diagnostic imaging and inappropriate testing including MRIs on knees, scans for patients with headaches and pre-operative chest radiography. Additionally, in May 2016 a Board paper looked at inappropriate shoulder scan referrals. The review looked at the heavy burden being placed on radiology because of volume of primary care ultrasound requests. It highlighted the impact unnecessary referrals were having on the waiting list as well as on patient care. This piece of work has resulted in a project looking to reduce demand. It is too soon to tell the impact of this work as of yet and the Health Board recognise that there is still more to do across a number of pathways to identify trends in inappropriate demand.

### The service does not consistently engage with staff and stakeholders to reduce inappropriate demand

- 68 GPs and consultants refer patients to radiology. Ensuring that patients are referred for the most appropriate diagnostic investigation depends on clear guidance and standards. Guidance should be based on the Royal College of Radiologists' iRefer<sup>18</sup> tool and support medical professionals referring patients to the service to select the most appropriate imaging investigation(s) or intervention for a given diagnostic or imaging problem. Each inappropriate investigative image performed is, in effect, an appointment slot wasted which adversely affects the service's ability to meet NHS waiting times targets and patient need in a timely way.
- 69 The Health Board uses iRefer: Making the best use of clinical radiology guidance. Some radiology staff members also noted that national guidelines are in place for specific cases eg National Institute for Health and Care Excellence (NICE) guidelines for head injuries. However, guidance is not easily accessible on the departments' intranet nor has it been shared recently within the department. The Health Board does not currently produce its own guidance with regard to referring patients to receive radiology services.
- 70 Similarly, those we spoke to that refer patients for radiology services such as GPs and consultants could not recall receiving referrals guidance from the Health Board. While referrers must complete a template in order to refer patients to radiology, there is little information that is readily available to them to ensure understanding of appropriate and inappropriate referrals. Some referring departments have sought guidance independently, using sources such as the

<sup>18</sup> iRefer is a radiological investigation guidelines tool from The Royal College of Radiologists.

Royal College of Radiology, to inform their decisions. While it is positive to note that referrers actively seek referral guidance, direct discussion between the service and referring consultants would promote better consistency and engagement.

- 71 Referring consultants we spoke to told us of the pressures of increasing patient expectation and the tendency to refer patients as it is often quicker to do so than to refuse. A number of GPs told us that if they were able to cite specific policies or guidelines in their refusal, they would feel more confident in doing so, enabling better management of inappropriate demand.
- 72 The Health Board have recognised the potential of electronic requesting in further support the service to manage and reduce inappropriate referrals and are currently moving its systems from paper-requesting to electronic requesting. Once complete, this should prove very useful to the Health Board in discouraging inappropriate referrals. Staff told us paper request forms can be manipulated in order for consultants to refer patients when a scan is not necessary. While referrals are reviewed by a radiologist or appropriately trained radiographer for its appropriateness and can be declined, it is not always a robust systems. A number of staff we spoke to told us how in many cases it is quicker to complete a scan than it is to explain to the referrer why a scan has been refused. While this is understandable, it prioritises short-term solutions and will not be sustainable in the context of continuously increasing demand. The new electronic requesting system being rolled out across the Health Board should, if implemented correctly, support both referrers and radiologist staff to manage demand more effectively.
- 73 The Health Board have stated that an open door policy in radiology is no longer sustainable. The Health Board has identified that in order to manage and reduce demand they must work on referral routes and guidelines, ensuring pathways are up to date and appropriate and prioritising work that makes the greatest difference in addressing the patients' needs. The recently completed update for the Health Board's knee and lower back pain pathway has been an important step for the Health Board. However, setting out an independent pathway takes time. The Health Board must ensure that it engages in ongoing dialogue with its referring departments to address immediate as well as future demand.
- 74 The Health Board has already been successful in working with some specific referring departments to feedback issues around inappropriate referrals. These efforts have thus far been mainly concentrated in secondary care. Staff told us that, with the exception of some reluctant individuals, this work has been well-received by referring consultants. However, the Health Board still has work to do to engage remaining referring departments, particularly GPs.
- 75 There is evidence of ongoing tension between GPs and the radiology department with GPs feeling that they need greater guidance and dialogue. GPs we spoke to told us of how they have requested repeatedly to have feedback on the referrals they make and to get advice and guidance from the department. Making greater use of forums, such as GP cluster meetings to discuss performance and referral

issues could provide useful for the Health Board in addressing inappropriate demand.

## The service's booking system is patient focused and the service takes a systematic and coordinated approach to managing its waiting lists

- 76 Health boards should ensure that all appointment slots are made use of by keeping patient did not attend rates (DNAs) to a minimum. Some Health Boards operate partial booking systems. This means that when the patient nears the top of the waiting list, rather than allocating the patient with a set appointment time, the patient is asked to contact the Health Board to choose a time and (if possible) a place to suit the patient. Services offering partial-booked appointments typically see lower DNAs. The Health Board provides patients referred for radiology services with a choice about the date, time and location of their appointment. This is done by telephone and letter. The booking service is open in-hours Monday to Friday. During 2016 the rates of those that did not attend their appointment was consistently below 5%.
- 77 Health boards must build in flexibility to the appointment timetable to ensure that emergency referrals for scans can be accommodated. Some modalities, such as MRI scans, take 30 to 40 minutes; therefore, health boards need to be able to accommodate any emergency referrals, but without leaving so many free appointment slots that it impacts negatively on the capacity to see routine referrals.
- 78 The number of scanning slots made available are determined by the weekly demand and capacity modelling that the service undertakes. The service identifies trends during weekly performance meetings and discusses any resulting changes that need to be made to appointment slots. The system prioritises bookings for patients that have been waiting the longest or for those with the most urgent clinical need. Therefore, if the service is experiencing a shortage of urgent appointment slots, these are increased and the number of routine appointment slots are reduced. When the demand for urgent appointment slots decreases, the number of routine appointment slots are increased.
- 79 The service minimises the possibility of unused appointment slots through its centralised booking system. The booking team have complete control over what slots are available and where they are, and make every effort to fill any cancelled booking slots. The booking team will contact patients with urgent and inpatient appointments in order to have them seen sooner to fill empty slots. It is only when a patient cancels at the very last minute or does not attend their appointment that a slot becomes unused.
- 80 Health boards should reduce unnecessary ring fencing of appointments, other than to ensure that emergency and urgent referrals can be accommodated. Ring fencing of appointments is where some or all appointments are reserved for specific sub-groups of patients (for example where referrals are grouped by the

type of scan, such as gynaecological scans, breast scans etc). This leads to the waiting list being split into sub-lists which increases the likelihood that some patients will wait longer, as sub-lists will differ in length. Similarly, using a single central booking office for the whole health board (rather than for individual hospitals), can help patients to be allocated to the next available appointment rather than potentially waiting longer for a slot to become available at a particular hospital.

- 81 The PACS system operated at the Health Board is used by a single central booking office. This office is where all scanning appointments are booked. The booking system pools waiting lists for most modalities. For Ultrasound scanning the service operate separate waiting lists by specific radiologists. Other modalities are generic sessions, not influenced by which radiologists are available.

### Ongoing staff shortages and recruitment issues within the radiology department are resulting in an over-reliance on the use of locum doctors

- 82 Radiologists, radiographers, nurses, technical and administrative staff work together to deliver imaging services. It is important to have the right number and skill mix of staff to deliver these services.
- 83 For our review, we asked the Health Board to provide the full-time equivalent (FTE) establishment<sup>19</sup> staffing level of radiologists at the Health Board between 2012 and 2016. The Health Board was only able to provide data for 2016 which presents problems in identifying longer-term trends for the service. Across Wales the FTE establishment staffing level of radiologists increased by 5.9%, between 2012 and 2016, and the FTE establishment staffing level of radiographers increased by 10.2% in the same period.
- 84 The continued increase in demand for complex imaging (CT and MRI scans) has outstripped service capacity across the UK. The mismatch in demand and capacity has been exacerbated by difficulties recruiting radiologists and other staff such as ultrasonographers. NHS Wales has historically had difficulty attracting radiology consultants from outside Wales and traditionally loses two out of every five trainee posts to England or outside of the UK<sup>20</sup>. Across Wales, there is a shortfall of consultant radiologists in interventional, breast, paediatric and nuclear radiology.

<sup>19</sup> The staffing establishment is the level of staff that the Health Board has determined it needs to provide services and for which funding has been made available.

<sup>20</sup> NHS Wales, **NHS Wales Health Collaborative Diagnostic Services Modernisation Programme**, December 2015



Across the UK, the number of unfilled consultant radiologist posts in 2015 was 9%, with 7% in Wales<sup>21</sup>.

85 **Exhibit 13** provides the vacancy levels within the radiology establishment at the Health Board 31 March 2016. The table shows that the Health Board had vacancies across its radiology workforce at that point in time. This consisted of three Full Time Equivalent (FTE) radiologist vacancies, 15 FTE vacancies in radiography and 13.6 FTE vacancies in other radiology staff. In addition, during our fieldwork we heard that radiologist vacancies had increased to four FTE vacancies, with a long-standing struggle to attract applicants. The number of FTE vacancies within the radiology department, particularly with regard to radiographers, are of concern.

#### Exhibit 13: FTE radiology vacancies, 31 March 2016

Table showing that the Health Board had a number of FTE vacancies across its radiologists, radiographers/ultrasonographers and other radiology staff during 2016.

	Number and percentage of FTE radiology establishment posts that are vacant		
	Radiologists	Radiographers/ ultrasonographers	Other radiology staff
Nevill Hall Hospital	1.0 (20%)	7.0 (14%)	8.6 (18%)
Royal Gwent Hospital	2.0 (8%)	8.0 (10)%	5.0 (7%)

Source: Wales Audit Office, **Hospital Survey**

86 The Health Board is currently facing a number of recruitment issues common to those faced by radiology departments across Wales. In addition, during interviews some staff voiced concerns that the staffing establishment is not sufficient and therefore that the vacancy figures fails to capture the real shortage of staff needed to manage demand.

87 The Health Board have been looking to alternative methods to address recruitment issues such as head-hunting staff and even students that are due to qualify from other areas across Wales, as well as looking to attract applicants from overseas. However, other Health Boards employ this strategy and all are in effect competing with each other to fulfil their staffing needs.

<sup>21</sup> The Royal College of Radiologists, **Clinical radiology UK workforce census 2015 report, 2016**

- 88 Across Wales, the service is likely to lose many older and experienced members of its workforce to retirement in the very near future as 38% of consultant radiologists are aged 55 or over<sup>22</sup>. To provide a future sustainable consultant radiologist workforce, NHS Wales needs to train radiologists and retain them in NHS Wales. The National Imaging Academy for Wales project is being developed in 2016-2017 to achieve this aim.
- 89 At the Health Board, 34% of consultant radiologists and 33% of radiographers at the Health Board are aged 50 and over and potentially within five years of retirement (Exhibit 14). There is real concern across the department about the ageing workforce and the challenges of undertaking succession planning with such shortages of staff.

**Exhibit 14: number and percentage of consultant radiologists and radiographers by age as at June 2016**

Table showing that the profile of consultant radiologists are slightly younger in the Health Board than they are at an all-Wales level. The profile of radiographers is largely consistent with the all-Wales level.

		Age					
		Under 39	40–44	45–49	50–54	55–59	60+
Consultant radiologists <sup>1</sup>	Aneurin Bevan University Health Board	6	9	4	5	2	3
		(21%)	(31%)	(14%)	(17%)	(7%)	(10%)
	<b>All Wales</b>	<b>29</b> <b>(18%)</b>	<b>43</b> <b>(27%)</b>	<b>28</b> <b>(17%)</b>	<b>20</b> <b>(12%)</b>	<b>20</b> <b>(12%)</b>	<b>21</b> <b>(13%)</b>
Radiographers <sup>2</sup>	Aneurin Bevan University Health Board	76	13	15	22	17	13
		(49%)	(8%)	(10%)	(14%)	(11%)	(8%)
	<b>All Wales</b>	<b>473</b> <b>(45%)</b>	<b>106</b> <b>(10%)</b>	<b>103</b> <b>(10%)</b>	<b>170</b> <b>(16%)</b>	<b>125</b> <b>(12%)</b>	<b>74</b> <b>(7%)</b>

<sup>1</sup> NHS workforce definition: staff with consultant grade code or job role working in radiology – note this includes both diagnostic and therapeutic radiologists.

<sup>2</sup> NHS workforce definition: Staff bands 5–9 with a diagnostic radiography occupation code (S\*F).

Source: NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016

<sup>22</sup> NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016

- 90 The Health Board relies heavily on locums to address its staffing shortages. The use of locums is frequent enough in the department that the staff can recognise and are well-acquainted with the locums they use. The use of locums in radiography is across most modalities including sonography, CT and MRI. Staff told us that at times the use of locums is so heavy that they represent 50% of the radiography workforce.
- 91 The heavy reliance on locums by the Health Board, while necessary to ensure adequate coverage, is also having a negative impact. There is a perception within the radiography department that locums are difficult to manage and are given the power to dictate pay due to the need for their services. Despite this, the Health Board have established processes to ensure locums provide safe care. New locums are monitored closely by the radiographers until they are assessed to be safe and the Health Board have rejected locums in the past because of inadequate skills.

### The radiology department has fewer members of staff than the all-Wales average for its population yet staff conduct and report greater numbers of images than the all-Wales average

- 92 We reviewed the numbers of FTE radiologists and radiographers in-post at each of the Health Board's main hospital sites, relative to both population and workload. Such measures provide an overall guide to the appropriateness of the number of staff to meet demand. However, these measures do not take account of the complexity of the imaging undertaken, and thus need to be treated with the appropriate caution.
- 93 The number of FTE consultant radiologists per 100,000 people in the UK in 2015 was 4.8 (4.8: Wales, 4.7: England, 5.4: Scotland, and 6.2: Northern Ireland)<sup>23</sup>. **Exhibit 15** shows that the number of radiographers relative to population and workload is smaller than the all-Wales average, suggesting a less generous staffing establishment when compared to the all-Wales position. Added into this consideration is the fact that the Health Board also receives some patients from Powys, which would not be calculated in the figures below. Therefore the measure based on local population for this Health Board needs to be treated with caution.

<sup>23</sup> The Royal College of Radiologists, **Clinical radiology UK workforce census 2015 report**, 2016

**Exhibit 15: FTE of in-post radiologists and radiographers, per 100,000 population, June 2016**

Table showing that compared to the all-Wales average, the Health Board has fewer numbers of radiographers and marginally fewer radiologists per 100,000 population.

	In-post FTE consultant radiologists <sup>1</sup> per 100,000 population	In-post FTE radiographers <sup>2</sup> per 100,000 population
Health Board	4.6	22.9
All Wales	4.8	27.2

<sup>1</sup> NHS workforce definition: staff with consultant grade code or job role working in radiology – note this includes both diagnostic and therapeutic radiologists.

<sup>2</sup> NHS workforce definition: Staff bands 5–9 with a diagnostic radiography occupation code (S\*F).

Source: NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016; and Welsh Government, **Local Authority Population Estimates for Wales**, 2015, accessed 20 October 2016

- 94 When measuring radiology activity, care is needed to ensure that comparisons are like for like. A single image may count as one unit of activity; however, where a patient receives complex or multiple images this may count as one or more units depending on the Health Board’s view. There is no standardised activity measurement in use in radiology in Wales or the UK.
- 95 In the absence of standard activity count, the medical classification system – the Systematised Nomenclature of Medicine Clinical Terms (SNOMEDCT) – has enabled some activity measurement. SNOMEDCT allows clinical data to be recorded in a consistent way, as it uses a standardised set of clinical terminology and codes. NHS England is adopting SNOMEDCT as the universal classification and terminology for all health organisations and for all aspects of health. However, in Wales it has only been adopted in radiology and a small number of other specialties. SNOMEDCT provides a standardised way of describing radiology examinations, and automatically applies multiplication for some activities depending on the coding applied. However, comparisons of radiology activity between radiology departments has to be treated with caution as any count of activity is reliant on organisations recording activity using SNOMEDCT consistently. Currently in Wales radiology activity is not consistently recorded which makes it difficult to provide a true comparison of activity.

96 The Health Board measures activity using a system that is based on the National Interim Procedure Code with plans to use SNOMEDCT in the near future. **Exhibit 16** highlights that the number of examinations per FTE in-post radiologist is higher than for All Wales.

**Exhibit 16: number of examinations per full-time equivalent in-post radiologist 2015-16**

Table showing that number of examination per in-post FTE radiologist is higher across all modalities (all examinations, CT and MRI) at the Health Board compared to at an all-Wales level.

	Number of examinations per in-post FTE radiologist		
	All examinations	CT	MRI
Aneurin Bevan University Health Board	13,957	3,127	842
<b>All Wales<sup>1</sup></b>	<b>13,742</b>	<b>1,989</b>	<b>724</b>

<sup>1</sup> All-Wales figures excludes Powys Teaching Health Board.

Source: NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016; and Wales Audit Office, **Radiology Health Board Survey**

97 **Exhibit 17** highlights that the number of examinations per FTE in-post radiographer/ultrasonographer is higher than for Wales. Again, this could be attributed to the fact that there are fewer radiographers per 100,000 population at the Health Board than there are at an all-Wales level.

### Exhibit 17: number of examinations per full-time equivalent in-post radiographer/ultrasonographers 2015-16

Table showing that number of examination per in-post FTE radiographer/ultrasonographer is higher across all modalities (all examinations, CT, MRI and US) at the Health Board compared to at an all-Wales level.

	Number of examinations per in-post FTE radiographer/ultrasonographer			
	All examinations	CT	MRI	US
Aneurin Bevan University Health Board	3,006	674	181	767
<b>All Wales<sup>1</sup></b>	<b>2,465</b>	<b>357</b>	<b>130</b>	<b>523</b>

<sup>1</sup> All-Wales figures exclude Powys Teaching Health Board.

Source: NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016; and Wales Audit Office, **Radiology Health Board Survey**

98 The NHS Benchmarking Network (NHSDN) annual radiology survey compares around 80 radiology departments including large teaching hospitals each year. The audit uses various measures to compare staffing with establishment, other than staff in-post, as the workforce measure. For example, bed days and outpatient activity are used as the denominator. The Health Board should draw on various workforce measures, including NHS benchmarking data to determine how the radiology staffing compares to inform their workforce planning.

### While staff appraisal and PDP rates are high, training opportunities for staff are limited because of operational time pressures

99 Annual appraisals of staff performance, and continuing professional development reviews are an important part of ensuring that the quality of radiology services is maintained and that staff training needs are properly addressed. Most staff at the Health Board received an annual appraisal of their performance and received a personal development plan in 2015-2016, with figures between 95-100% all registered practitioners and operators engaged to carry out medical exposures, including the date the training was completed and the nature of the training undertaken. The Health Board routinely checks registration at six-month intervals.

100 All staff must undertake a regular PDR to ensure they have the skills and have SMART objectives that recognise the training needs of staff. However, currently there is no central fund for training within Directorate. This means that the

radiology department must finance training themselves or negotiate for funding on a case-by-case basis.

- 101 Once funds are available, the difficulty lies in releasing staff to undertake training. The Health Board want to develop internal staff and recognise that this needs to be done as it is much more cost efficient than using locums. While courses are available, the Health Board find it challenging to enable staff to take time away from work to undertake them. The department offer internal training, but again, the time pressures for staff to conduct training means that the number of opportunities are limited.
- 102 **Exhibit 18** shows that compliance rates for radiographers / ultrasonographers with mandatory training are high, consistently between 95-100% across each module. The rates for other radiology department staff are more variable, with figures at 50%-75% for most modules. The Health Board did not submit the compliance rates for radiologists against mandatory training modules therefore these figures are not included in the Exhibit below.

**Exhibit 18: percentage of staff compliant with statutory and mandatory training modules, as at July 2016**

Table shows high rates of compliance by radiographers/ultrasonographers with mandatory training modules, highly variable rates for other radiology department staff and missing information with regard to radiologist staff.

	Radiographers/ ultrasonographers	Other radiology department staff
Equality, Diversity and Human Rights	90%	50%
Health, Safety and Welfare	95%	75%
Fire Safety	100%	100%
Infection Prevention and Control	100%	50%
Moving and Handling	100%	100%
Safeguarding Adults	95%	50%
Safeguarding Children	95%	50%
Resuscitation	100%	50%
Information Governance	100%	100%

Source: Wales Audit Office, **Radiology Health Board Survey**

**Data relating to number of scanners per heard of population was not submitted, but the percentage usage of scanners is higher at the Health Board than the all-Wales average**

- 103 The UK has a low number of scanners compared with other OECD countries. Across the UK there are 8 CT scanners and 7 MRI scanners per million population; Germany has 19 CT scanners and 11 MRI scanners, Spain has 17 CT scanners and 15 MRI scanners, and France has 14 CT scanners and 9 MRI scanners per million population<sup>24</sup>. Data are not available for the separate countries in the UK.
- 104 **Exhibit 19** shows the number of scanners per million population for Wales in 2016, however, the Health Board did not provide data to our review. However, in 2014, the Health Board had 6.9 CT scanners, 5.2 MRI scanners and 32.7 US scanners per million population<sup>25</sup>. The Health Board did not provide us with data relating to the number of scanners they have in place. Therefore we cannot comment on whether the Health Board compares favourably or unfavourably with the all-Wales and OECD position.

**Exhibit 19: number of CT, MRI and US scanners per million<sup>1</sup> population as at September 2016**

Table shows that the Health Board did not provide us with any data relating to the number of scanners they have in place.

	CT	MRI	US
Health Board	not available <sup>2</sup>	not available <sup>2</sup>	not available <sup>2</sup>
<b>All Wales<sup>3</sup></b>	<b>10.1</b>	<b>7.5</b>	<b>46.1</b>

<sup>1</sup> Exhibit expressed as scanners per million population to allow comparison with other countries.

<sup>2</sup> The Health board did not provide this information.

<sup>3</sup> The All Wales figure is based on five health boards.

Source: Wales Audit Office, **Radiology Equipment Age Survey**; and Welsh Government, **Local Authority Population Estimates for Wales**, 2015, accessed 20 October 2016

<sup>24</sup> Organisation for Economic Cooperation and Development, **OECD Health Statistics 2014 – Frequently Requested Data**, 2014

<sup>25</sup> NHS Wales All-Wales Gantry Usage/Capacity Report, November 2015. Data based on the operating hours in 2014.



- 105 One way for health boards to ensure that patients waiting for diagnostic radiography scans wait as short a time as possible is to maximise the opening hours. The longer the opening hours, the more patients can be seen; however, there are extra costs associated with longer operating hours. Operating longer results in increased staff costs and scanning equipment lifespans are shortened. This factor has to be considered when assessing the potential for extending operating hours.
- 106 Data from 2014 (and updated in 2015) shows that on average, the Health Board operated their scanners for between 7 and 12 hours on week days, but made less use of scanners on weekends ([Exhibit 20](#)). The percentage usage of equipment is higher for CT and MRI scanning at the Health Board than it is at an all-Wales level, but is slightly lower for Ultrasound scanning.

**Exhibit 20: percentage usage of CT, MRI and US scanners, 2014 (verified and updated in 2015).**

This table shows that CT, MRI and US scans are open for between 7 and 12 hours on weekdays but that only the MRI scanner is available on weekends for a limited time. The percentage usage of equipment at the Health Board is higher than at an all-Wales average.

Type of scanner	Average number of operating hours per scanner on each day		Percentage usage of equipment <sup>1</sup>	
	Monday to Friday	Saturday to Sunday	Health Board	<b>Wales average</b>
CT	10.3	0.0	61%	<b>52%</b>
MRI	12.0	6.0	86%	<b>66%</b>
US	7.4	0.0	44%	<b>46%</b>

<sup>1</sup> Based on the planned operating hours as a percentage of potential operating hours (seven days a week and 12 hours a day).

Source: **NHS Wales All-Wales Gantry Usage/Capacity Report**, November 2015. Data based on the operating hours in 2014, and the data was verified and updated in 2015.

- 107 If hospitals at the Health Board were operating 12 hours a day and seven days a week, we estimate that it may be possible to undertake at least an extra 175 CT scans, 20 MRIs scans and 1,600 US scans a week<sup>26</sup>.
- 108 In 2014, two out of three MRI scanners at the Health Board were in use for 9 hours on both Saturday and Sunday, with the remaining scanner not in use. For CT and US scanning, there was no weekend service. The updated position as at January 2017 is that MRI scanners are available for 8.5 hours on Saturday and Sunday, but these are run by staff that volunteer to do overtime, as opposed to substantive staff. Ultrasound waiting lists are run on the weekend as and when they are needed. For CT scanning there are radiographers on site to run scans for specific cases.

## While the Health Board is taking some proactive steps in managing the service such as upgrading the requesting system, there are weaknesses in strategic and financial planning

### The Health Board does not have a radiology strategy although there is a clear operational plan which covers most key areas and a workforce plan, however there is inconsistent stakeholder engagement in strategic planning

- 109 The Health Board should have a clear strategic plan that sets out how it will meet current and future demand for radiology services. The plan should set out how the Health Board will meet current and future demand for radiology services. The Health Board do not currently have a strategy in place.
- 110 Each radiology service should have an agreed documented annual operational/delivery plan. The plan should clearly identify service demand, the workforce and equipment capacity required to meet this demand as well as the finances available and required to deliver the service safely, efficiently and effectively. The Health Board have an operational delivery plan, which they update periodically.
- 111 The operational plan provides clear a summary of the service's current position and its 2016-17 plans. It details the performance situation relating to each area of radiology and covers reporting, risks, demand and capacity, innovation plans, and

<sup>26</sup> The time a scan takes depends on the nature of the scan required. CT scans can take between 10 and 45 minutes, MRI scans between 15 and 90 minutes, and US scans between 15 and 30 minutes. Therefore our estimation is based on a CT scan length of 45 minutes, a MRI scan of 90 minutes, and a US scan of 30 minutes.

cross-cutting issues across the Health Board. However, the plan does not reference Health Board objectives in terms of linking to IMTP or other corporate objectives. It provides limited discussion of wider services that affect radiology and according to staff was not developed through consultation with referring departments.

- 112 The service has a workforce plan in place for 2015-18. Updates to the plan are reported to the workforce planning group that meet to discuss requirements relating to the Health Board's IMTP. The plan takes into account demand for services and known upcoming pressures eg impact of stroke delivery plan. It also takes into account the need for greater training opportunities and places in order to meet demand and provide an adequate skill mix.
- 113 Radiology operational plans should be informed by service changes and developments in the wider organisation. Almost all clinical specialties rely heavily on radiology to help diagnose, treat or monitor disease or injury. Radiology staff should be appropriately involved in any decision making on service developments that will lead to an increase to the number of patients referred for radiology imaging, such as new consultant posts, clinics and services.
- 114 Across Wales our review found that there was variation in the degree to which radiology teams were involved in decisions made outside of the team that impact on radiology services. This was also the case at the Health Board, with radiology staff feeling that they were more closely engaged with some referring departments than others. There was also feelings of better engagement for some modalities than others.
- 115 The service's survey response reflected that within radiology staff felt they were rarely involved in discussions to introduce a new or change in existing patient pathways or to introduce a new service/clinic. However, they did feel involved in decisions to introduce new interventional radiology procedures. Staff elaborated further by stating that services can respond to the pressures they face by re-designing the way they work and fail to anticipate the unintended impact such changes have on radiology. Changes can vary from services moving their services across sites or employing extra clinicians which then has significant implications radiographer and radiologist workloads. Another example cited was the rise in demand for radiology services due to new NICE cancer diagnostic guidance which aims to increase early diagnosis through greater imaging. There was no formal discussion with radiologists at the Health Board about how the change would impact across the departments involved. Staff admit that some services are better than others but that engagement between each service and radiology could improve.

## Leadership structure arrangements are relatively new and have not yet had time to mature and attendance and consistency of key radiology groups are limiting effective management of the service

- 116 Effective leadership and clear lines of accountability are vital components of any healthcare service. Radiology is a complex service, which comprises radiologists, radiographers and nursing staff working together to produce and interpret images. For a health board to deliver effective radiology services, it needs clear executive leadership, a designated overarching service lead, and a clear operational and professional management structure with clear lines of accountability. It also needs to have sufficient capacity to meet service demand and need in a safe and effective way.
- 117 The radiology department sits within the Directorate of Therapies and Health Sciences. While the leadership structure is clear to the management team other staff are less clear about who they should report to, partly due to the recent recruitment of a new interim Directorate Manager. In addition, a number of staff outside of radiology have recently been given project lead roles for projects within the service. These arrangements are new and it is too soon to say what impact they have had.
- 118 There are a number of sub-groups related to radiology that feed up into quarterly Directorate of Radiology meetings. These include:
- weekly Performance Group;
  - six-monthly Radiation Protection Committee;
  - quarterly Radiology Operational Group; and
  - monthly Consultants Group.
- 119 These groups also feed into monthly Radiology Management Team meetings which are ultimately reported to the Health Board's Scheduled Care Group. While some of these groups have documents detailing their membership, they do not have up-to-date Terms of Reference setting out their areas of responsibility, but the interim Director of Radiology has plans for these to be developed.
- 120 Staff we spoke to praised weekly the performance meetings, noting that discussions at these meetings are constructive and helpful. However, staff also noted that a number of sub-groups, including the Radiology Operational Group, and Consultant Meetings, were not as well attended and were not held regularly during 2016. Some raised concerns about the membership of groups, particularly the Directorate of Radiology meetings, noting that there is an imbalance of radiographers and radiologists. In addition, staff said that they often find it difficult to attend meetings because of operational pressures and expressed a desire for meetings to be scheduled when the in hours service is not running to enable greater consistency of attendance by staff.

## Radiology issues are effectively escalated to the Board but radiology is not represented on key Committees or the Board

- 121 If radiology is to have sufficient profile within the Health Board, radiology staff should have a regular presence on key Health Board committees such as the Quality and Patient Safety Committee and the Finance and Performance Committee. Radiology should feature sufficiently often on committee agendas to help ensure wider awareness of the service and its issues.
- 122 Across Wales, we found variation in the degree of radiology team representation on key board committees. We found that the radiology service in the Health Board is not represented on the Board nor on key board committees for Quality and Patient Safety and the Finance and Performance Committee. There are sub-committees of the board that radiology feeds into eg ultrasound governance committee and scheduled care group.
- 123 The radiology team highlights issues and risks appropriately to the Board or other committees through links to the Executive Team and Unscheduled Care group. Document reviews of Board and Committee reports show that they discussed radiology during a number of meetings during 2015-16. Such discussions include scrutiny of inappropriate referrals, and updates on regional and national initiatives as well as waiting list and RTT performance.

## There is regular financial monitoring of the service, but its approach to identifying demand cost pressures and savings are underdeveloped

- 124 Ongoing financial monitoring is necessary for radiology services to ensure that the service is operating within budget, to anticipate potential budget overspend, and to take remedial action where necessary.
- 125 The service financial plan outlines the previous year's budget and expenditure, the forecasted budget and expenditure for the current year and underlying deficit. Planning assumptions are not clearly outlined. It appears as though the financial plan is mainly informed by the previous year's expenditure. The plan does consider the impact of inflation on pay and non-pay expenditure as well as the impact of ongoing local cost pressures such as the PACS contract. While the plan does have a section relating to the impact of demand and service growth, for 2015-16 this section remained blank.
- 126 The service actively and regularly monitors in-year spend with the financial plan and reports this each month to the Radiology Management Team meeting which includes representatives responsible for Workforce and Finance.
- 127 As **Exhibit 21** shows, in 2014-15 the service had a very small underspend but in 2015-16 the service overspent by 5%. During quarter one of 2016-17 the service identified that it would spend beyond its budget due to demand and capacity issues

and locum staff pay. Papers from an August 2016 Executive Team meeting show that radiology was anticipating an overspend of £691,000 at year end.

### Exhibit 21: radiology service budget comparison with expenditure (£ million) 2014-15 and 2015-16

Table showing that while the department's expenditure was within budget last year for 2015-16 the department overspent by £0.9m

		2014–15	2015–16
Aneurin Bevan	Budget (£ million)	£17.1	£17.3
University	Expenditure (£ million)	£17.1	£18.2
Health Board	Variance	-0.1%	5.0%

Source: Wales Audit Office, **Radiology Health Board Survey**

128 The radiology savings plan for 2015-16 was not particularly well developed or articulated. The identification of savings were not made during the preparation of the department's financial plan. Any savings relating to the service were therefore not detailed in the financial plan and were excluded from the Health Board's standard reporting mechanisms during the financial year. The savings plan for 2016-17 mainly relates to the pay-related savings gained from increased reporting of scanning by radiographers as opposed to radiologists.

### The service has an effective equipment replacement programme using a project team approach, yet the programme does not currently comply with some regulations

129 NHS bodies need to have comprehensive arrangements in place for the maintenance and replacement of radiology imaging equipment. Older imaging equipment has a higher risk of failure and maintenance costs increase, and the image quality declines with age. Radiology equipment more than ten years old is typically considered to no longer be state of the art and technical advances will render the equipment obsolete. The lifespan of equipment shortens with increased use.

130 There is an equipment replacement programme in place at the Health Board which describes the bids in place for equipment replacement between 2016 and 2020. It details the title of the bid, it covers which piece of equipment is due for replacement and at which site. It also details the funding intended to be used to cover replacement, the status of funding (ie has it been approved or not) and who the project manager for the replacement is. While the equipment programme does not go into detail about the factors considered that lead to replacement, such as

the age, intensity of use of equipment or the availability of spare parts. Staff told us that the department schedules equipment replacement is based mainly on the age of machinery, eg MRI has to be replaced every eight years. However, as previously noted, the Health Board did not provide us with details of the age of their current machinery. It is therefore unclear whether it is age considerations that drive the department's equipment replacement programme.

- 131 While the capital expenditure programme does not provide detail of costs, this is included in the wider Health Board Capital Expenditure Scheme. The equipment replacement programme and capital expenditure scheme are updated annually. However, neither of these documents comply with Ionising Radiation (Medical Exposure) Regulations IR(ME)R which requires that there is a list of equipment which provides the manufacturer, serial number and year of manufacture and installation.
- 132 During 2016-17 there were five major projects underway within the service to replace key pieces of equipment. The Directorate Manager set up separate working groups to manage each project. The regularity of the working group meetings depend on the level of complication involved in the project. They report progress to the Directorate Manager at the end of every month and the programme is overseen at a high level by a Project Board.
- 133 In order to mitigate the impact of equipment shortages and failures on performance, the service has utilized mobile scanners during 2016. The service commissioned one mobile scanner at Nevill Hall Hospital in October 2016 and sourced an additional MRI in January 2017 while an existing MRI is replaced. The scanners are brought in with outsourced radiographers to operate them. This is effective in addressing waiting list issues but is an expensive method that incurs significant overspends for the department.
- 134 This year, Welsh Government announced £16m investment for scanning equipment across. Aneurin Bevan UHB will receive the second highest amount of funding in Wales under this new investment, £2.65m and is prioritising the replacement of MRI and mammography rooms at Nevill Hall Hospital and Royal Gwent Hospital during 2017-18.
- 135 The European Society of Radiology<sup>27</sup> advocates that equipment aged:
- up to five years old reflects the current state of technology, and can be upgraded;
  - between six and ten years old is fit to use if properly maintained, but require replacement strategies to be in place; and
  - eleven or more years old requires replacement.

<sup>27</sup> European Society of Radiology, **Renewal of Radiological Equipment**, September 2014

136 In November 2015, NHS Wales anticipated that 87% of imaging department scanners would require replacement by 2017<sup>28</sup>. Exhibit 22 shows the average device life expectancy of radiology scanners, unfortunately the Health Board did not provide us with the age of scanners as at September 2016.

**Exhibit 22: age of CT, MRI and US equipment at the Health Board as at September 2016**

Table shows the average device life expectancy for CT, MRI and US based on utilisation. The Health Board did not provide us with the data relating to the age of scanners within the department.

		CT	MRI	US
Age of scanners at the Aneurin Bevan University Health Board (years) <sup>1</sup>	Nevill Hall Hospital	data not provided	data not provided	data not provided
	Royal Gwent Hospital	data not provided	data not provided	data not provided
Average device life expectancy based on utilisation (years)	High	8	8	7
	Mid	10	10	8
	Low	12	12	9

<sup>1</sup> The Health Board did not provide the data to our review

Source: Wales Audit Office, **Radiology Equipment Age Survey**; and European Society of Radiology, **Renewal of Radiological Equipment**, September 2014 (average device life expectancy)

**Staff expressed frustrations with the current radiology information systems although a recent upgrade to support electronic requesting is a positive step forward**

137 Having effective IT systems plays a central role in delivering efficient radiology services. In Wales, the Radiology Information System (RADIS) is a national system created and run by NHS Wales Informatics Service. It is used by all health boards. RADIS supports the scheduling of radiology investigations, provides a clinical record of scans received by patients and allows health boards to generate reports and statistics on performance. Other systems link to RADIS to provide additional functionality; these different systems must integrate well with each other to ensure that information easily transfers and updates between systems.

<sup>28</sup> Diagnostic Service Programme NHS Wales, **All Wales Gantry (MRI, CT, Gamma Camera and Ultrasound) Usage/Capacity**, November 2015



- 138 Our review found that across Wales, health boards have mixed views on RADIS. Some health boards told us they felt that RADIS is adequate in terms of patient scheduling, clinical reporting and management reporting. However, some health boards expressed concerns that RADIS does not integrate with other systems in use by health boards, and about the quality of the management reporting, limitations of the clinical reporting and management reporting functions.
- 139 Electronic requesting systems can enable clinicians referring patients for diagnostic imaging to request and receive updates and the outcomes of radiology requests quickly. In Wales, the functionality of request software is generally limited to providing a template for a request which then has to be emailed to the radiology service.
- 140 All health boards use Picture Archiving and Communications Systems (PACS). PACS software acquires and archives radiology images electronically, and enables the safe distribution of the image with other health professionals<sup>29</sup>. The report and the scan image together comprise the clinical record of the image. When reporting on images, radiologists can choose to use voice-activated dictation systems to record their report.
- 141 Aneurin Bevan UHB are currently using RADIS Version 2.2.500 which is the core system in radiology used across the Health Board. RADIS allows for most aspects of patient scheduling from request vetting to cancellation and DNA letters. The Radiology department is able to interrogate the core data in RADIS to extract detailed management information and automatically schedule the system to run reports daily, weekly and monthly to support the day-to-day processes in Radiology. The system can also highlight longest waiters and unreported examinations to the department.
- 142 The system supports report generation, transcription, validation and the distribution of these reports electronically to recipient systems such as GP practices, PACS, and clinical portals. However, RADIS does not fully link to PACS at the Health Board. It also does not support double reporting, blind reporting or reporting at an examination level. It also does not have an integrated electronic method of delivering report notifications and receipt of report notifications.
- 143 During our fieldwork, we found some frustration amongst staff toward RADIS. For example, staff were eager for the system to support electronic requesting of scans across the Health Board, in order to minimise the possibility of lost requests leading to potentially harmful delays. There was also a strong appetite amongst staff for the system to notify consultants and GPs when a report has been completed, which again could streamline the treatment time for a patient. A business case for broadening the use of electronic requesting across services was

<sup>29</sup> PACS is provided by a third party, Fujifilm. Fujifilm supplies hardware and software to health boards for the provision of PACS services, including voice recognition and full disaster recovery solutions. Each health board provides the necessary infrastructure to run those services, including networks and server space.

submitted to the Health Board in June 2016. In November 2016, the Health Board updated the RADIS system to support electronic requesting across the Health Board. While this new system is currently still embedding across services, it is a positive step forward for the service.

- 144 The PACS system in place at the Health Board is accessible out-of-hours from home for the full range of modalities. Service users within the same hospital and at other hospital sites within the Health Board can access images, although there is limited access to NHS staff outside the Health Board and no access for GPs. Radiologists use PC equipment supplied by the Health Board to access images from home. However, the Clinical Director noted a number of issues with the screens that affect the ability of radiologists to view and report on scans.
- 145 The Radiology department currently use the G2 Speech system for its voice recognition and dictation needs. The system is not integrated with the RadIS system but is integrated with the PACS system. The reporting workflow is driven from PACS. Generally, the system works well but staff told us that the system often freezes during dictation, which can result in partial or complete loss of the recording. It also crashes frequently during use. In addition, if a user uses the skip command on a report in PACS, the corresponding message is not transferred to the G2 system. As a result, the previous patient's data is retained with the possibility that the radiologist reports on the wrong patient. Staff we spoke to told us that these issues lead to them being unable to fully trust the system to support them in their work.

## The Health Board regularly reviews and discusses the performance of the service and significant concerns are escalated

- 146 Effective monitoring and scrutiny of radiology service performance is important in assessing if the service is supporting delivery of the organisational goals and objectives, and identifying the need to take remedial action. Health boards should use performance data and audit results to monitor and evaluate outcomes delivery and the performance of the radiology departments. Performance monitoring and review should take place at all levels within the organisation, from the operational level up to board level. Performance should be analysed, assessed and monitored at an operational level and reported to and scrutinised by relevant health board committees and the board.
- 147 Benchmarking enables health organisations to improve performance through comparison with other similar organisations. One source of comparative data that health boards have access to is NHSBN radiology data. The NHSBN collects and analyses radiology data from health organisations across the UK annually and

publishes an analysis of its findings. All health boards and trusts in Wales are members of the NHSBN but not all participate in each audit<sup>30</sup>.

- 148 The Health Board report performance for radiology service through weekly performance reports. The data is presented in a clear way and provides some comparison on the change since the last report in commentary form. However, reports do not include information on demand and capacity data or provide explanation for performance. It also does not include benchmarking data, despite the Health Board participating in NHSBN benchmarking audits. These performance reports are monitored and discussed during weekly performance meetings, quarterly Directorate Manager meetings as well as the unscheduled care group, which have been escalated relating to radiology, such as waiting time, to the Board on a number of occasions.

<sup>30</sup> Hywel Dda University Health Board and Powys Teaching Health Board do not participate or provide data to the radiology module.

# Appendix 1

## Audit approach

We carried out a number of audit activities between June and August 2016. Details of these are set out below.

### Exhibit 23: audit approach

Table outlining audit approach used for this review.

Method	Detail
Information and data collection	<p>We used health-board-level and hospital-site-level survey forms to capture data and information on radiology services, which were completed by the Health Board.</p> <p>We also utilised data and information from a number of other sources, including:</p> <ul style="list-style-type: none"><li>• NHS Benchmarking Network radiology 2015 and 2016 data collection (data collection period 2 May to 8 July 2016);</li><li>• The All Wales Equipment Capacity Report, NHS Wales Health Collaborative (December 2015);</li><li>• Stats Wales: Radiology Diagnostic Waiting Times;</li><li>• National Reporting and Learning System (NRLS) data: Patient safety incidents; and</li><li>• HIW IH(ME)R (Ionising Radiation (Medical Exposure) Regulations): diagnostic incidents by Health Board between 2010 and 2016.</li></ul>

Method	Detail
Document request	<p>We requested and reviewed documents from the Health Board including:</p> <ul style="list-style-type: none"> <li>• examples of condition pathway documents (for stroke, cancer or heart disease) illustrating radiology service provision requirements;</li> <li>• relevant radiology papers to the board and committees along with operational papers including safety reports;</li> <li>• examples of the Health Board's main radiology service performance reports or performance scorecards from the past six months;</li> <li>• the most recent financial report showing progress towards the savings/cost improvement plan;</li> <li>• the radiology equipment replacement plan; and</li> <li>• the radiology risk register.</li> </ul> <p>In addition, we requested the documents below from the Health Board but were told they are not currently available:</p> <ul style="list-style-type: none"> <li>• terms of reference and membership of the Health Board's main radiology group, together with a sample of minutes from the previous meetings;</li> <li>• guidance provided to hospital referrers and GPs on expectations when referring patients to the service; and</li> <li>• examples of any work carried out over the past two years to measure radiology patient experience.</li> </ul>
Interviews	<p>We interviewed a small number of staff including:</p> <ul style="list-style-type: none"> <li>• Radiology manager (at Royal Gwent hospital)</li> <li>• Radiology clinical director (at Royal Gwent hospital)</li> <li>• Executive lead for radiology (operational)</li> <li>• Executive lead for radiology (clinical)</li> <li>• a sample of consultants selected by the Health Board from: <ul style="list-style-type: none"> <li>– Accident and Emergency;</li> <li>– Cardiology; and</li> <li>– General Surgery.</li> </ul> </li> </ul>
Focus groups	<p>We carried out focus groups as follows:</p> <ul style="list-style-type: none"> <li>• Radiographer focus group (at Royal Gwent hospital)</li> <li>• GP leads focus group.</li> </ul>

## Appendix 2

### The Health Board's management response to the recommendations

The following table sets out the recommendations from the report and the management response

Exhibit 24: The Health Board's management response to the report recommendations

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
R1	<p>Develop an action plan detailing how waiting times targets will be achieved in the short term, and how the radiology service will sustain a reduction in waiting times going forwards, setting out:</p> <ul style="list-style-type: none"> <li>• an approach for the use of locums;</li> <li>• an approach for the use of outsourcing of examinations;</li> </ul>	<p>Reduce waiting time backlog, leading to patients receiving their examinations in a timely way.</p> <p>Efficient use of available radiology workforce and skills.</p>	Yes	Yes	<p>The Radiology sustainability plan which has received executive approval addresses the mismatch between demand and capacity for the main modalities within Radiology for 17/18.</p> <p>This includes provision for locums with a plan to reduce reliance over time, and the outsourcing of out of hours reporting in order</p>	March 2017	Directorate Manager - Radiology

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
	<ul style="list-style-type: none"> <li>• how it can ensure consistency in the prioritisation applied by referrers to forms; and</li> <li>• any other actions that will help the Health Board achieve targets.</li> </ul>				<p>to increase core reporting capacity. Outsourcing ultrasound scanning via a Community Based service is a proposal under development which involves collaboration between Primary care and Radiology.</p> <p>The consistency of prioritisation is difficult to assess as different clinicians treat patients of varying acuity. Analysis undertaken of trauma and orthopaedic referrals indicated significant variation which could be explained by this.</p> <p>Requests for patients that are on an urgent suspected cancer pathway or that have confirmed cancer, are checked by Cancer Services to ensure that the</p>		

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
					correct prioritisation is applied for these.		
R2	Develop an action plan detailing how reporting backlogs will be managed sustainably. For example by making short-term use of outsourcing whilst developing a medium to long term strategy to address the delays.	Reduce reporting backlog, leading to patients receiving imaging results in a timely way.  Efficient use of available radiology workforce and skills.	Yes	Yes	The sustainability plan includes approaches to increasing core reporting capacity, including the introduction of home reporting and the conversion of on-call into reporting. This additional capacity has reduced all reporting waits. There remains some ongoing requirement for additional sessions to meet demand.	March 2017	Clinical Director for Radiology
R3	Communicate and liaise with referring clinicians both: <ul style="list-style-type: none"> <li>when developing and reviewing referral guidance. Ensure all radiology staff and referring clinicians can easily access an up to date version of guidance;</li> <li>on an ongoing basis. Strengthen ongoing communication between radiology and referring</li> </ul>	Referring clinicians have better access to radiology referral guidelines.  Staff have regular opportunities to share information and work together to manage demand	Yes	Yes	The Radiology directorate recognise the need to engage with referring clinicians. To this end the following has taken place:  6 monthly meetings with the unscheduled care division to discuss and agree changes to improve patient flow and reduce inappropriate demand	April 2017	Directorate Manager for Radiology



Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
	<p>clinicians in particular GPs by setting out an engagement plan by 2018. This plan should ensure there is adequate forum for regular discussion of service changes that may affect the service and referral feedback to support demand management.</p>	<p>and improve the service.</p>			<p>Involvement of requesters when developing the e-requesting tool</p> <p>In March 2017 a meeting with the Directorate Manager, Clinical Director and representatives from the Local Medical Council took place. This reinforced the need for stronger links with Primary Care.</p> <p>The Clinical Director is evaluating options to provide access to advice and guidance. This will form part of the Primary Care engagement plan.</p>	<p>June 2017</p>	<p>Clinical Director for Radiology</p>
R4	<p>The Health Board should look to further develop its collection of patient experience information across its sites and seek to identify any common trends that can be actioned to improve the service.</p>	<p>Planned improvements that are based on patient feedback</p>	<p>Yes</p>	<p>Yes</p>	<p>A radiology patient satisfaction questionnaire is currently being developed for use across each site.</p>	<p>May 2017</p>	<p>Research Radiographer</p>

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
R5	<p>Over the next 12 months develop, in consultation with radiology staff and services that impact on radiology, a radiology strategy which sets out:</p> <ul style="list-style-type: none"> <li>• where the service is now in terms of its demand, capacity and available resources;</li> <li>• where the service needs to be; and</li> <li>• how the service will achieve its aims.</li> </ul>	Improved strategic and business planning of the radiology service.	Yes	Yes	<p>The sustainability plan addresses these questions for 17/18. Further work is required on the longer term Clinical Futures workforce modelling to take into account changes in clinical guidance and availability of each Radiology staff group. Together with this, further work is required to expand demand management. This will be undertaken alongside Primary Care and the Musculoskeletal programme.</p>	Oct 2017	Directorate Manager for Radiology and Clinical Director for Radiology
R6	<p>By mid-2017 review the groups that routinely discuss radiology issues relating to radiology to consider how each contributes to the service including:</p> <ul style="list-style-type: none"> <li>• Weekly performance group;</li> <li>• Radiology Operational Group;</li> <li>• Radiology Protection Committee;</li> <li>• Consultants Meeting groups;</li> </ul>	Clearly set out and understood roles and responsibilities for radiology groups.	Yes	Yes	<p>Terms of reference for each of the groups will be reviewed/created with the attendees as appropriate. Where any overlap in scope is identified, this will be reviewed to ensure that confusion is minimised.</p>	July 2017	Directorate Manager for Radiology

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
	<ul style="list-style-type: none"> <li>• Directorate of Radiology; and</li> <li>• Radiology Management team.</li> </ul> <p>The service should establish a Terms of Reference for each group that clearly sets out the membership, regularity and scope and governance of each group.</p>						
R7	<p>Review radiology performance reports to ensure that they provide sufficient information to the groups and committees that receive them to ensure that group and committee members are fully sighted of key issues relevant to the service. The service should consider the inclusion of:</p> <ul style="list-style-type: none"> <li>• demand and capacity data;</li> <li>• explanation for variation in performance since previous position; and</li> <li>• benchmarking data.</li> </ul>	Wider pool of performance information from which to identify and strengthen service weakness.	Yes	Yes	<p>Weekly performance reports are distributed to the relevant members of staff within the Division. Performance is reported in the Divisional Management Meeting.</p> <p>An activity tracking tool is being developed to support monitoring of the sustainability plan. This will address the variation in performance.</p> <p>The directorate has recently participated in the Radiology benchmarking exercise undertaken by NHS Benchmarking Network. A summary of the results is being prepared for sharing</p>	<p>Ongoing</p> <p>May 2017</p> <p>May 2017</p>	<p>Radiology Clinical IT Systems Manager</p> <p>Radiology Clinical IT Systems Manager</p>

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
					within the directorate, with a view to identifying further opportunities for improvement within the service.		Radiology Services Manager
R8	Further develop its equipment replacement programme to ensure that it complies with IR(ME)R requirements to include an equipment list which details the manufacturer, serial number, year of manufacture and year of installation.	Fully developed equipment replacement plan to inform strategic and business planning.	Yes	Yes	Radiology has a comprehensive replacement programme in place to ensure that significant capital and project requirements are planned. The document used for this will be updated to meet IR(ME)R requirements. An in-house asset tracking database has been developed for Theatres. The use of this to replace the current documentation will be investigated.	June 2017	Radiology Services Manager  Procurement Business Support Office
R9	The Health Board should review the G2 speech system in use by radiologists to identify ways to improve its reliability and to manage the risks that arise when the system does not work as intended.	Improved use of technology to support the service	Yes	Yes	The Directorate's Radiology Clinical IT Manager liaises closely with IT and Fuji to minimise disruption caused by G2. There is a marked improvement in reliability due to the replacement of specific computers. The service is evaluating a new version of G2	Ongoing	Radiology Clinical IT Systems Manager

Ref	Recommendation	Intended outcome/ benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
					which is expected to eliminate the causes of the issues that have been reported. Implementation of the new version will involve considerable integration work with RadIS.		

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