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The team who delivered the work comprised Tracey Davies, Katrina Febry, Phillip Jones and Rachel Harries.

We welcome correspondence and telephone calls in Welsh and English. Corresponding in Welsh will not lead to delay. Rydym yn croesawu gohebiaeth a galwadau ffôn yn Gymraeg a Saesneg. Ni fydd gohebu yn Gymraeg yn arwain at oedi.

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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 radiologists¹ 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.

¹ 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)² 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)³, and **Orthopaedic Services** (June 2015)⁴ 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 stroke⁵, cancer⁶ and heart disease.⁷ 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 radiologist posts in the UK were unfilled, with 7%⁸ 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 whole⁹.

² Welsh Assembly Government, **The Future of Diagnostic Imaging Services in Wales, 2009**

³ Wales Audit Office, **Elective Care in Wales**, January 2015

⁴ Wales Audit Office, **Orthopaedic Services**, June 2015

⁵ Welsh Government, **Together for Health, Stroke Delivery Plan, 2012**

⁶ Welsh Government, **Together for Health, Cancer Delivery Plan, 2012**

⁷ Welsh Government, **Together for Health, A Heart Disease Delivery Plan, 2013**

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

⁹ 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 Hywel Dda University Health Board (the Health Board) between June and September 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 RADIS¹⁰ and PACS¹¹ 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 Glangwili General Hospital, Bronglais General Hospital, Prince Philip General Hospital and Witybush General Hospital. The radiology service is based within the Unscheduled Care directorate.

¹⁰ RADIS – Wales Radiology Information System

¹¹ PACS – Picture Archiving and Communications System

Our main findings

- 15 Overall, we concluded that while the service is well managed operationally, there are risks to current and future service delivery because of increasing demand, reporting backlogs, recruitment issues and an IT system that does not meet the Health Board's needs.

Exhibit 1: our main findings

Our main findings
<p>Patients have good and timely access the service, however, there are reporting backlogs and the service is not proactively seeking patients' views:</p> <ul style="list-style-type: none">• Patients have good access to in and out of hours radiology services, with the exception of ultrasound services, for which there is no out of hours service.• The time patients have to wait for their radiological examination has fallen over time, with no patients waiting longer than eight weeks.• Reporting time targets are regularly unmet, despite the Health Board outsourcing reports. Some sites and some modalities make greater use of reporting radiographers than others.• The Health Board regularly reviews some clinical activity but there are opportunities to strengthen the arrangements for planning and prioritising reviews across all areas of activity.• Processes are in place for recording and investigating incidents and complaints but patient views are not proactively sought and staff feedback highlights concerns about the patient environment at Glangwili and Bronglais.
<p>Difficulty in recruiting trained staff is having an impact on the Health Board's ability to meet demand. Outdated IT systems are preventing the service from working more efficiently:</p> <ul style="list-style-type: none">• The Health Board reports that demand for radiology services has increased but due to the difficulties in extracting management data from RADIS, it is not currently able to quantify this.• Written guidance is available for referrers although issues with the quality of referrals suggest that this is insufficient or not well used.• There is a process in place to ensure optimal use of appointment slots but IT systems that are not integrated across the Health Board mean that this is not as efficient as it could be.• Radiologist staffing levels have remained static although they have grown in the rest of Wales. This along with high radiologist and radiographer vacancy levels and an older workforce creates financial and service risks now and potentially in the future.• The Health Board has fewer radiologists but more radiographers in post than the Welsh average. Both groups are doing more examinations than the Welsh average.• Appraisal rates are generally good but compliance with mandatory and statutory training is poor.• The Health Board has more CT and MRI scanners and less US scanners per head of population than the Welsh average but their routine use for all modalities is limited to traditional opening hours.

Our main findings

The service has a draft strategy in place and while management structures are clear, Board and corporate oversight of the service could be stronger:

- There is a draft strategy for the service but no annual plan or workforce plan. The strategy does not adequately set out current and future demand for the service.
- Managerial arrangements are clear but have been in place for a relatively short time after a period of organisational instability.
- Service issues are discussed by key Health Board committees but the service could adopt a more proactive approach to ensuring committees are aware of the issues facing the service as a whole.
- In recent years the service has overspent against its budget and planned savings have not been achieved.
- The Health Board does not have an equipment replacement programme for radiology in place and although equipment is not an immediate concern the majority will need replacing within five years.
- Generally, radiology ICT systems do not service the Health Board's needs, which is exacerbated by problems with the underlying infrastructure.
- There is scope for the Health Board to improve the way it reports performance.

Recommendations

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

Exhibit 2: recommendations

Factors affecting patient experience

- R1 Over the next year assess whether the absence of an Ultrasound Out of Hours service has a negative impact on patient flow and outcomes. If a relationship is found the Health Board should undertake a cost benefit analysis exercise to inform the way forward.
- R2 Develop an action plan detailing how reporting backlogs will be managed sustainably. For example, by making a short term increase in outsourcing reports whilst workforce and training plans are developed.
- R3 Develop mechanisms to ensure that patients' views are routinely gathered.

Demand and capacity issues affecting service performance

- R4 To improve the quality of referrals, within the next year the Health Board should
- a review the different radiology referral processes in partnership with key stakeholders including primary care, in order to establish specific ways in which the processes could be more efficient and effective;
 - b agree a standardised Health Board wide approach to the referral process, including the types of conditions and concerns that should be referred;
 - c produce guidance and other supporting materials to clearly explain the updated approach to referrals;
 - d communicate the updated approach to all relevant staff and stakeholders, using a range of communication methods;
 - e keep a record of all inappropriate referrals including the name of the referrer, reason for inappropriateness and what action was taken; and
 - f routinely report inappropriate referral rates and any recurring concerns about inappropriate referrals back to key stakeholder groups.
- R5 Over the next year, continue to develop and implement consistent methods of recording activity, so that the Health Board is in a better position to take part in NHS Benchmarking Network.
- R6 Over the next year, increase appraisal rates for non-clinical radiology staff to at least the level of radiographers and ultrasonographers.
- R7 Over the next year, increase mandatory training rates for all radiology staff to at least 85%.

Extent to which radiology services are well managed

- R8 Over the next year, establish a baseline level of demand for the service so that the Health Board is in a position to better understand and quantify the challenges it faces.
- R9 Over the next year, develop an annual plan, or operational plan. The plan should identify the workforce required to meet its current baseline demand as well as future demand.
- R10 Over the next two years, develop an equipment replacement programme. The plan should include:
- equipment priorities, requirements and associated costs; and
 - outline the risks to the service/patients of not delivering the programme within the required timescales.
- R11 Strengthen performance management by:
- regularly producing performance reports and reporting them to the appropriate committee; and
 - widening the range of performance measures aligned to the business and service objectives to include: equipment downtime, vacancy levels, the number of unreported images, performance against internal referral and reporting times.

Detailed report

Patients have good and timely access to the service, however, there are reporting backlogs and the service is not proactively seeking patients' views

Patients have good access to in and out of hours radiology services, with the exception of ultrasound services, for which there is no out of hours service

- 17 Open-access services¹² 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 is unlikely to 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.
- 18 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. In the Health Board all modalities except breast and vascular referrals are open access, although only plain x-ray can be accessed without an appointment.
- 19 Where open access is not available, for example, for more complex imaging, the referral should specify the degree of urgency. Typically, referrals are classed as urgent (outpatient) or routine priority (outpatient). This ensures that the patients with the most critical needs are seen first. Urgent referrals will be seen as soon as they can be accommodated. For all other referrals, the patient will be added to the waiting list, with urgent referrals prioritised. The Health Board has three levels of priority; urgent, urgent suspected cancer and routine. The Health Board collects data on the number of urgent suspected cancer referrals and the number of patients on the cancer pathway. When the two are compared, the Health Board has found that there are more referrals than there are patients on the pathway, leading to concerns that some referrers may be using this as a method of ensuring their referrals are prioritised.

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

- 20 Patients with emergency health needs may need access to prompt radiology diagnostics and care outside standard radiology working hours. The Health Board has an emergency on-call service for CT scans across its four main hospital sites. For MRI scans, there is an emergency on-call service for spinal injuries at Glangwili Hospital, which other sites will refer patients to, but there is no out of hours service for ultrasound. Out of hours cover for interventional radiology is provided by Morriston Hospital, in the neighbouring Health Board area.

The time patients have to wait for their radiological examination has fallen over time, with no patients waiting more than eight weeks

- 21 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 magnetic resonance imaging (MRI), computed tomography (CT), and non-obstetric ultrasound (US), fluoroscopy, barium enema, and nuclear medicine. The Welsh Government target does not apply to plain film x-rays.
- 22 Since 2009, waiting times for radiological tests have also formed part of the referral to treatment target¹³. 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.
- 23 The all-Wales radiology waiting times¹⁴ for consultant and GP referrals show that for August 2016 there were 5,208 patients waiting for radiology diagnostic imaging at the Health Board: 46% for non-obstetric US, 28% for MRI, 25% for CT, and 2% for nuclear medicine imaging.
- 24 In August 2016, 1,478 patients were waiting for an MRI scan at the Health Board, of which none were waiting more than eight weeks ([Exhibit 3](#)).

¹³ 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**

¹⁴ **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

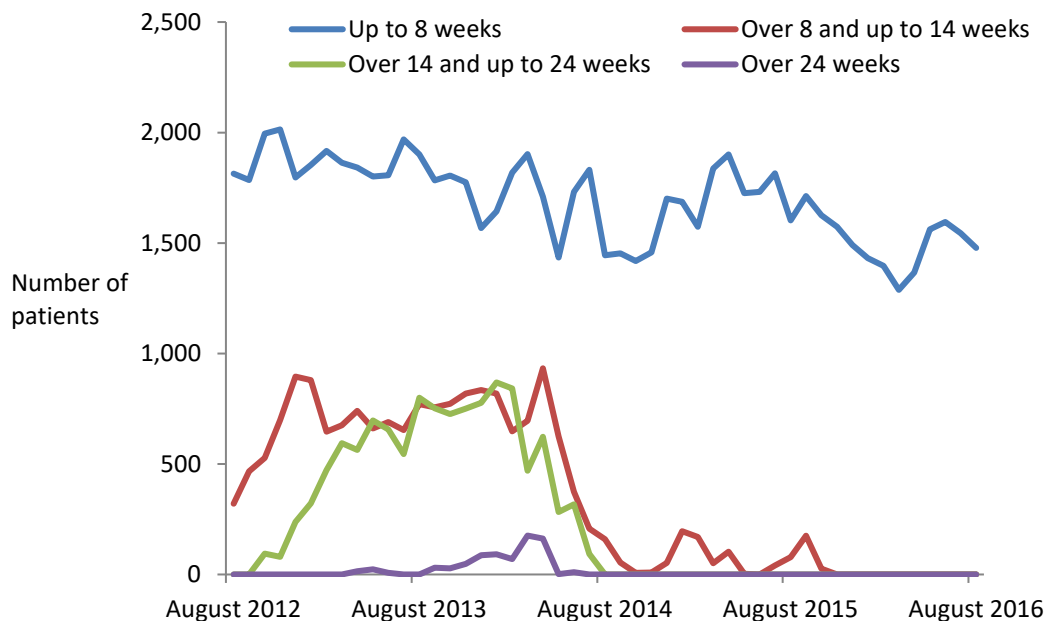
	Total number of patients waiting for an MRI scan					Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks	Total waiting	
Bronglais General Hospital	334	–	–	–	334	0%
Glangwili General Hospital	420	–	–	–	420	0%
Prince Philip Hospital	329	–	–	–	329	0%
Withybush General Hospital	395	–	–	–	395	0%
Hywel Dda University Health Board	1,478	–	–	–	1,478	0%
All Wales¹	11,662	913	66	163	12,804	9%

¹ 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)

26 The total number of patients on the waiting list for an MRI scan at the Health Board decreased by 44% between August 2012 and August 2016, and the percentage waiting more than eight weeks decreased from 15% to 0% in the same period (Exhibit 4).

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



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

27 In August 2016, 1,276 patients were waiting for a CT scan at the Health Board, of which none were waiting over eight weeks ([Exhibit 5](#)).

Exhibit 5: CT waiting times for August 2016

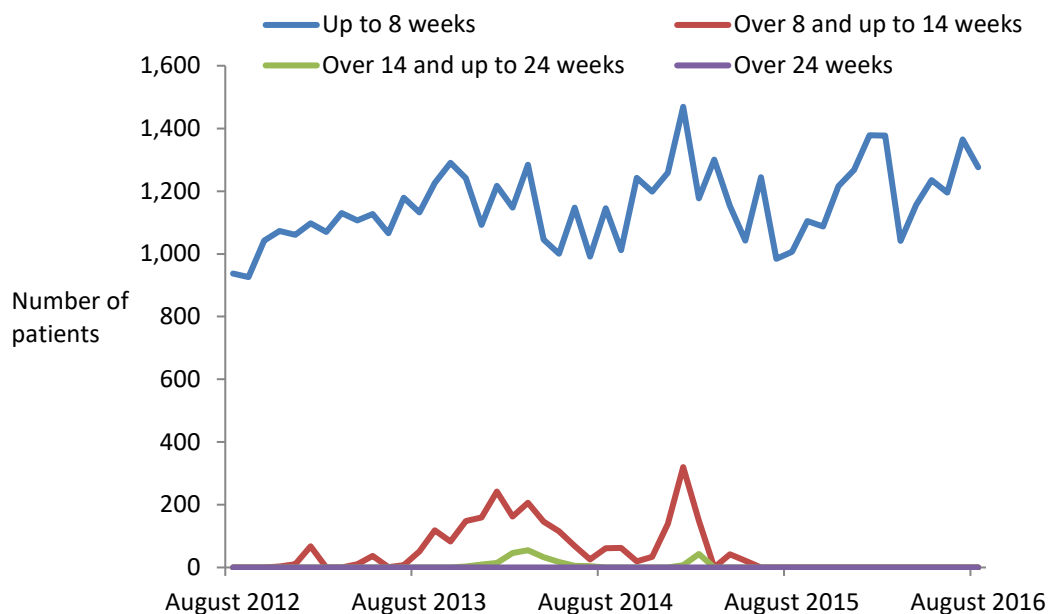
	Total number of patients waiting for a CT scan					Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks	Total waiting	
Bronglais General Hospital	168	0	0	0	168	0%
Glangwili General Hospital	331	0	0	0	331	0%
Prince Philip Hospital	340	0	0	0	340	0%
Withybush General Hospital	437	0	0	0	437	0%
Hywel Dda University Health Board	1,276	0	0	0	1,276	0%
All Wales¹	7,293	63	51	11	7,418	2%

¹ 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)

28 The total number of patients on the waiting list for a CT scan at the Health Board increased by 27% between August 2012 and August 2016. Despite this the percentage of patients waiting more than eight weeks was 0% in both August 2012 and August 2016 (Exhibit 6).

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



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

29 In August 2016, 2,375 patients were waiting for a non-obstetric US scan at the Health Board, none of whom were waiting over eight weeks (**Exhibit 7**).

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

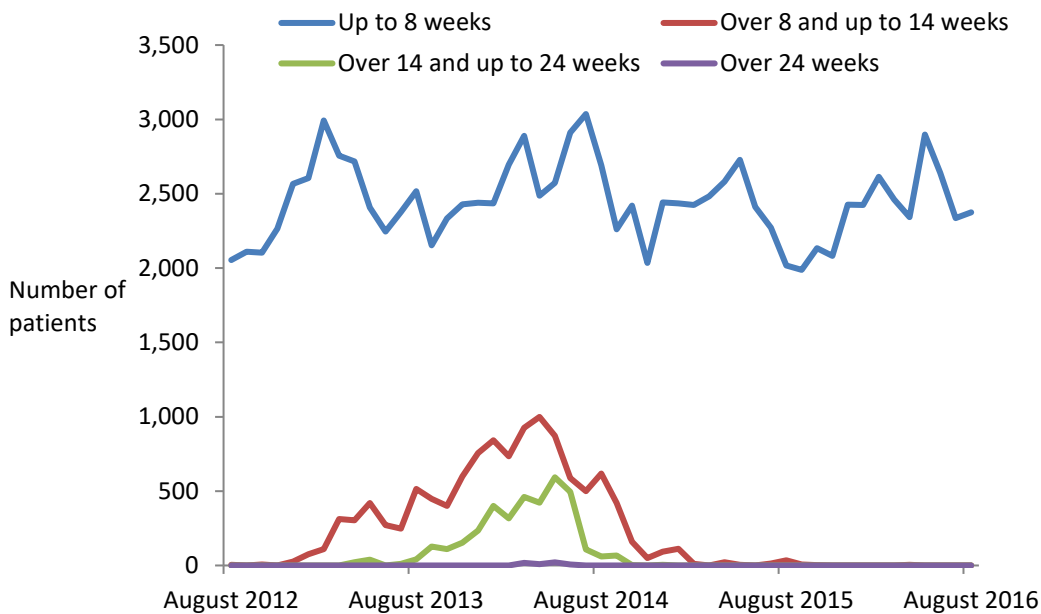
	Total number of patients waiting for a non-obstetric US scan					Percentage of patients waiting more than 8 weeks
	Up to 8 weeks	Over 8 weeks and up to 14 weeks	Over 14 weeks and up to 24 weeks	Over 24 weeks	Total waiting	
Bronglais General Hospital	284	0	0	0	284	0%
Glangwili General Hospital	746	0	0	0	746	
Prince Philip Hospital	614	0	0	0	614	0%
Withybush General Hospital	731	0	0	0	731	
Hywel Dda University Health Board	2375	0	0	0	2375	0%
All Wales¹	18,944	1,999	626	133	21,702	13%

¹ 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)

30 The total number of patients on the waiting list for a non-obstetric US scan at the Health Board increased by 13% between August 2012 and August 2016. Waiting times did increase during this time, reaching a high point of 999 people waiting more than eight weeks in April 2014 and 496 people waiting more than 14 weeks in June 2014. Since then waiting times have decreased significantly and the percentage of patients waiting more than eight weeks was 0% in both August 2012 and August 2016 ([Exhibit 8](#)).

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



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

Reporting time targets are regularly unmet, despite the Health Board outsourcing reports. Some sites and some modalities make greater use of reporting radiographers than others.

- 31 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.
- 32 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
- 33 The radiology service’s criteria for reporting times are endorsed by the National Imaging Board. Records are checked on a weekly basis for outstanding reports, although waiting times are not reported outside the department. The Health Board

finds the targets challenging due to staffing levels, particularly at times of sickness absence.

- 34 Our review found that while average reporting times for CT and MRI scans are consistent across the four hospital sites, there is greater variation for plain x-ray reporting. The average turnaround time for Glangwili hospital is 16 days, which is much higher than the average for Bronglais and Prince Philip hospitals (four days), and is outside the turnaround times set out in the Standards. The average turnaround time for x-ray at Withybush Hospital is also high at ten days.

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

	Average report turnaround time (days)				
	CT	MRI	Plain x-ray	US	
Bronglais General Hospital		2	4	4	0
Glangwili General Hospital		2	5	16	0
Prince Philip Hospital		3	6	4	0
Withybush General Hospital		4	7	10	0

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

34. The longest waiting times for CT and MRI scans are less than one month, with the exception of Withybush Hospital where one patient waited 65 days for a CT report. The longest turnaround times for plain x-ray are much higher, with the longest turnaround at Bronglais and Glangwili hospitals at around five to six months. Although Withybush Hospital had the longest turnaround time for a CT report, its longest turnaround time for plain x-ray was lower compared to the other hospital sites at 69 days.

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

	Longest report turnaround time ¹ (days)				
	CT	MRI	Plain x-ray	US	
Bronglais General Hospital		26	35	180	64
Glangwili General Hospital		29	34	167	2
Prince Philip Hospital	Not known	Not known	Not known		3
Withybush General Hospital		65	24	69	2

¹ Longest report times exclude any obvious outliers.

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

- 35 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 while 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.
- 36 Our review found that typically, extended practice radiographers make use of the skills for which they have received training. During training, extended practice radiographers are mentored by a consultant radiologist. When they start practising, there are a certain number of their reports that have to be double read. This is in addition to the monitoring arrangements that are in place for all reporters such as annual audits and there is also an errors and discrepancies process in line with national guidelines. Extended practice radiographers must produce a minimum number of reports over a time period in order to remain competent. If they fall below this number they have to complete refresher training before they can start reporting again. Our review heard that there are challenges associated with freeing up radiographers to do reporting rather than imaging and ensuring that they have suitable desk space available to them. Despite this, our review found only two trained radiographers who were not reporting regularly, so whilst ensuring that those who are trained to report are able to do so is a challenge for the Health Board, it is one that they are largely meeting.

37 **Exhibit 11** shows that between April 2015 and March 2016 the greatest proportion of scans reported by radiographers was in US at 81%, followed by plain x-ray at 37%, both of which are higher than the Wales average. The proportion of CT and MRI scans reported by radiographers is small in comparison at 2% and 1% respectively. Although the Health Board figures are in line with or above the Wales average, this is due to the higher than average proportion of reporting radiographers in Bronglais General Hospital. The overall figures for plain x-ray also mask variations between hospital sites; for example, the proportion of plain x-rays reported by radiographers in Withybush General Hospital is 74%, which is significantly higher than the overall figure of 37%.

Exhibit 11: percentage of scans reported by radiologists, radiographers and other staff between 1 April 2015 and 31 March 2016

		% of scans reported by		
		Radiologist	Radiographer ¹	Others ²
CT	Bronglais General Hospital	96%	4%	0%
	Glangwili General Hospital	100%	0%	0%
	Prince Philip Hospital	98%	2%	0%
	Withybush General Hospital	100%	0%	0%
	Hywel Dda University Health Board	98%	2%	0%
	Wales	98%	0%	2%
MRI	Bronglais General Hospital	96%	4%	0%
	Glangwili General Hospital	99%	1%	0%
	Prince Philip Hospital	99%	1%	0%
	Withybush General Hospital	100%	0%	0%
	Hywel Dda University Health Board	99%	1%	0%
	Wales	98%	1%	1%
Plain x-ray	Bronglais General Hospital	69%	25%	7%
	Glangwili General Hospital	62%	24%	15%
	Prince Philip Hospital	64%	20%	17%
	Withybush General Hospital	26%	74%	0%
	Hywel Dda University Health Board	53%	37%	10%
	Wales	63%	23%	14%
US	Bronglais General Hospital	32%	68%	0%
	Glangwili General Hospital	11%	86%	2%
	Prince Philip Hospital	25%	75%	1%
	Withybush General Hospital	11%	89%	0%
	Hywel Dda University Health Board	18%	81%	1%
	Wales	26%	71%	3%

¹ Radiographers includes ultrasonographers and medical physics technicians.

² 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**

38 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.

- 39 The Health Board is part of the all-Wales contract and outsources reports as a matter of course. The Health Board told us that the number of reports being outsourced has increased over time as staffing levels have not been able to keep pace with increased demand. The Health Board currently uses outsourced reporting mainly for MRI and CT scans. While plain x-ray reports have been outsourced in the past, this happens less often now that the Health Board has trained radiographers in place to report in this area. The Health Board outsources reports during normal hours as well as for emergency and out of hours reporting, but the extent to which it is used during normal hours varies according to staffing levels. It is very rare that reports for unscheduled patients during the day are outsourced as these are prioritised for local reporting but it does sometimes occur at times when staffing levels are lower than usual, for example, due to annual leave. In those circumstances the Health Board has agreed a one-hour turnaround time with the reporting company.
- 40 As part of the national contract the reporting company provides the Health Board with a monthly Quality Assurance report which sets out the minimum and maximum reporting times and reports performance against targets. This is automatically monitored by the reporting company's systems and the Health Board gets a rebate on any reports that have taken too long. It is part of the contract that for urgent referrals the company will provide a verbal as well as written report. In addition, each site has a spreadsheet of all patients waiting for a report. Returns are matched against the spreadsheet and any outstanding reports are identified this way. As part of the contract, the reporting company investigate any complaints and report their findings to the Health Board as well as Shared Services. Health Board staff did not tell us that they had any concerns with the quality of outsourced reports, although they did report that they were not always produced within the agreed timescales.
- 41 The Radiology Strategy notes that some Radiologists have indicated that they would be willing to undertake additional reporting from home, reducing the number of reports that would need to be outsourced, and the IT department are currently investigating this possibility.
- 42 The Health Board has undertaken satisfaction surveys of referrers in the past, but these have not been done for some years. Currently the department relies on individual feedback at Health Board meetings for information of this nature. Our review showed us that consultants were generally satisfied with the quality and timeliness of the reports they received and felt able to access additional information and advice if necessary. In primary care the picture was more mixed. Although GPs felt that the quality of the reports was generally good, they

highlighted some specific issues caused by the original request and the resulting report not being linked electronically, which relies on the GP to anticipate and look for the report. If the GP is away, or not anticipating the report because the request was made by someone else, the patient may experience delays in their treatment. GPs also noted that on some occasions a report will say 'no change from previous' but the GP does not have access to the previous report.

The Health Board regularly reviews some clinical activity but there are opportunities to strengthen the arrangements for planning and prioritising reviews across all areas of activity

- 43 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.
- 44 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.
- 45 Our review told us that the Health Board reviews a range of activities, including
- appropriateness of referrals;
 - appropriateness of urgent or out of hours referrals;
 - demand levels by GP/hospital staff; and
 - accuracy of reporting and reporting turnaround times.
- 46 However, only appropriateness of referrals and accuracy of reporting had been reviewed since April 2015. Quality of written requests, demand levels by time of day/day of the week and lost and late reports are not regularly reviewed. The Health Board told us that clinical audit is undertaken by consultant radiologists, but this is ad hoc with no formal plan in place. Longstanding consultant radiologist vacancies and irregular locum cover mean that the Health Board has not been able to put a plan for regular clinical audits in place.

Processes are in place for recording and investigating incidents and complaints but patient views are not proactively sought and staff feedback highlights concerns about the patient environment at Glangwili and Bronglais

- 47 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.
- 48 The Health Board records incidents on the Datix system. They are then investigated by the lead for the referring department, and reported to the Improving Experience Subcommittee and discussed in the Health Board monthly performance review. Incidents arising from misinterpretation or omission in a report are also discussed in regular Errors and Discrepancy meetings. In 2015, there were 68 reported incidents in diagnostic radiology departments across the Health Board, of which three were classed as moderate severity, and the rest classed as either low severity or causing no harm.
- 49 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. Its most recent annual report (2014-15) shows that the Health Board was inspected during this period. The report was positive overall, with some recommendations for improvements around standardising procedures across the four hospital sites, refining some detail of the Ionising Radiation Safety Policy and developing a more structured approach to clinical audit. The Health Board developed an action plan to address the recommendations. This was approved by HIW and the Health Board informed us that they had completed the required actions. The Health Board has reported only two incidents of over-exposure to ionising radiation over the last two years, which the inspection team initially identified as an area of concern, although following discussion with the Health Board they were satisfied that this was accurate.
- 50 Feedback from patients is a vital source of information for radiology services to understand and improve patient experience. The Health Board does not routinely monitor patient satisfaction. Satisfaction surveys are not consistently sent out and so the main source of feedback is from patients writing in to either compliment or complain about the service. Our review showed that the Health Board received low

numbers of both compliments and complaints, about the service across all hospital sites.

- 51 The radiologists we spoke to thought that overall, the facilities are not sufficiently patient focussed. For example, in Bronglais Hospital, the waiting room is a corridor and in Glangwili Hospital the department is situated a long way from outpatients and A&E; and the changing room facilities are poor. There is variation across the hospital sites, with the more modern hospitals, Prince Phillip and Withybush, able to offer better facilities.
- 52 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. The Health Board does not have ISAS accreditation and is not in the process of seeking it, although they would like to do so in the future.

Difficulty in recruiting trained staff is having an impact on the Health Board's ability to meet demand. Outdated IT systems are preventing the service from working more efficiently

The Health Board reports that demand for radiology services has increased but due to the difficulties in extracting management data from RADIS, it is not currently able to quantify this

- 53 The increasing role of radiology in clinical care has led to growing demand for radiological examinations, in particular for CT and MRI scans. While 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)¹⁵. The Royal College of Radiologists has predicted that by 2022 the number of radiological examinations carried out in England will be around 62 million¹⁶ per year driven by further innovation and demographic growth.
- 54 As well as the number of scans undertaken annually increasing, scans are also becoming more complex. The biggest percentage rise in volume for radiological

¹⁵ NHS England, [Annual Imaging and Radiodiagnostics Data](#), 2014

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

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)¹⁷. 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.

- 55 Those we spoke to at the Health Board noted that they perceived an increasing use of radiology as a diagnostic tool, in line with the increase in demand seen at other health boards, as set out in paragraph five. It was also noted that it is difficult and time consuming to extract management information from RADIS, the radiology department's main ICT system, and the information obtained is not always reliable, contributing to the department's difficulties in quantifying demand. The Radiology Strategy also references the increase in demand but it does not quantify this or outline the reasons behind it. The Strategy acknowledges that the Health Board does not currently have an understanding of what the baseline level of demand is.

Written guidance is available for referrers although issues with the quality of referrals suggest that this is insufficient or not well used

- 56 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' iRefer¹⁸ 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.
- 57 The Health Board uses national referral guidelines and provides written guidance for referrers. Our review found that out of the four consultant referrers we spoke to, two were aware of national or written guidance, although they had not read it recently. All four felt that the referral form itself was self-explanatory and no further guidance was necessary. The GPs we spoke to noted that there were different referral processes for different hospitals and it was their view that some of the referral forms were poorly designed. Radiology staff felt that the quality of referrals was often poor; for example, a referral might say 'injury to wrist' but the department needs to know how the injury occurred as this will affect the type of examination

¹⁷ Royal College of Radiologists, **Information submitted to Health Education England workforce planning and education commission round 2015-16**

¹⁸ iRefer is a radiological investigation guidelines tool from The Royal College of Radiologists.

they do and the focus of the radiological report. Often, practitioners will ask the patient for the missing information and add it to the form themselves. It was also suggested to us that imaging is increasingly being used as a diagnostic tool, which may or may not benefit the patient. For example, a Health Board audit found that during 2016 there had been a 20% increase in referrals for deep vein thrombosis in Prince Phillip Hospital, but no increase in the incidence of deep vein thrombosis. This suggests that in some instances the guidance currently provided is not sufficient to ensure that referrals are appropriate.

- 58 Referrals are paper based. Our review found that referrers generally found the forms to be self-explanatory and fit for purpose, although there were some issues such as there not being enough space on the form to explain complex cases. In contrast, radiographers told us that they often found that the form did not contain the information they needed.
- 59 Once a referral is made a radiologist or appropriately trained radiographer will justify (review) the referral for its appropriateness and to determine whether there is a sufficient benefit to the patient. Referrals may be declined or a more appropriate alternative investigation suggested. The process of justification helps to ensure that patients do not receive unnecessary exposure to radiation and that appointment slots are not wasted.
- 60 Our review found that if a referral is inappropriate, or if there is insufficient information provided, the department contacts the referrer for additional information, or to explain why the referral is inappropriate. The service does not keep a record of who they refer back to and why.
- 61 Referral guidelines are communicated to all new doctors and reiterated every six months. They are also communicated during training. If there are issues with a particular area, the radiographer would visit and speak to them directly. The Health Board has undertaken audits in the past, but this is not done at regular intervals. The results of the audit are reported to an audit meeting and have in the past led to a temporary improvement.

There is a process in place to ensure optimal use of appointment slots but IT systems that are not integrated across the Health Board mean that this is not as efficient as it could be

- 62 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 does not offer partial booking slots. Patients are prioritised based on the clinical information provided on the referral form and the department keeps some slots back for high priority patients. Patients are contacted by phone or letter with an appointment time and instructions on how to

contact the Health Board to rearrange the appointment if it is inconvenient. Between April 2016 and March 2017 the percentage of patients who did not attend their appointment varied slightly from a high of 3.8% in August 2016 to a low of 2.1% in February 2017.

- 63 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. The superintendent for each modality reviews the slots reserved for urgent non-scheduled patients on a daily basis. If they are not being used, s/he adjusts the appointments accordingly by contacting patients who have indicated that they are willing to attend at short notice. A list of these patients is kept in each modality. It is very rare that there would be unused slots and it is more likely that appointments would be overbooked. Staff are willing to stay after 5 pm if necessary to see everyone who is waiting. On occasion an unscheduled patient cannot be seen and needs to stay overnight. In these circumstances a member of staff will come in early the next day to see to them.
- 64 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.
- 65 A small number of specialist exams are assigned to a specific radiologist but in the main, booking is done locally, according to hospital rather than by radiologist or subspecialty. This is because the Health Board currently operates three separate instances of RADIS, which reflects the arrangements that were in place prior to reorganisation, six years ago. Until this is addressed, it is not considered practical to try and operate one waiting list across the Health Board.

Radiologist staffing levels have remained static although they have grown in the rest of Wales. This along with high radiologist and radiographer vacancy levels and an older workforce creates financial and service risks now and potentially in the future

- 66 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.
- 67 Our review found that the full-time equivalent (FTE) establishment¹⁹ staffing level of radiologists at the Health Board did not change between 2012 and 2016 (**Exhibit 12**), compared with a rise of 5.9% across Wales²⁰. The FTE establishment staffing level of radiographers at the Health Board has increased by 15.7% in the same period, compared with 10.2% across Wales. However, the Health Board has a number of vacancies and is currently operating at below establishment levels. The establishment is 17.6 whole time equivalent (WTE) radiologists and 123.1 WTE radiographers and sonographers, but the actual numbers in post are 9.5 WTE and 113.9 WTE respectively.

Exhibit 12: FTE establishment of radiology staff trend at the Health Board between 2012-16

	2012	2013	2014	2015	2016	Percentage change 2012-16
Radiologists	17.6	17.6	17.6	17.6	17.6	0%
Radiographers/ ultrasonographers	106.4	106.4	106.4	115.1	123.1	15.7%

Source: Wales Audit Office, **Radiology Health Board Survey**. Data is provided as at 31 March each year.

- 68 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

¹⁹ 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.

²⁰ The Welsh percentage increase figures for radiologists and radiographers/ultrasonographers are based on Abertawe Bro Morgannwg, Betsi Cadwaladr, Cardiff and Vale, and Hwyl Dda University health boards only, as these were the only health boards that could provide data for each year between 2012 and 2016.

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 UK²¹. Across Wales, there is a shortfall of consultant radiologists in interventional, breast, paediatric and nuclear radiology. Across the UK, the number of unfilled consultant radiologist posts in 2015 was 9%, with 7% in Wales²².

69 **Exhibit 13** shows that vacancy levels within the radiology establishment at the Health Board are high, particularly for Radiologists and particularly in Withybush Hospital. There are also vacancies for radiographers and ultrasonographers although proportionately they are not as high. Our review found that the Health Board has found it difficult to recruit for a number of years and has been operating below establishment levels for some time. Feedback from potential applicants who decide not to pursue their application suggests that the rurality of the Health Board is an issue, as is the outdated condition of Glangwili Hospital in particular. The service relies on the goodwill of staff alongside the use of overtime and locums, but sickness levels are increasing as the additional workloads have an impact.

Exhibit 13: FTE radiology vacancies, 31 March 2016

Number and percentage of FTE radiology establishment posts that are vacant

	Radiologists	Radiographers/ ultrasonographers	Other radiology staff
Bronglais General Hospital	1.6 (37%)	2.0 (8%)	0.1 (0%)
Glangwili General Hospital	2.0 (40%)	2.0 (5%)	0.0 (0%)
Prince Philip Hospital	0.5 (10%)	3.0 (11%)	0.8 (4%)
Withybush General Hospital	4.0 (80%)	1.0 (3%)	0.0 (0%)

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

70 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 over²³. To provide a future sustainable consultant radiologist

²¹ NHS Wales, **NHS Wales Health Collaborative Diagnostic Services Modernisation Programme**, December 2015

²² The Royal College of Radiologists, **Clinical radiology UK workforce census 2015 report**, 2016

²³ NHS Wales Workforce, Education and Development Services, **NHS workforce census data for June 2016**, 2016

workforce, NHS Wales needs to train radiologists and retain them in NHS Wales. The National Imaging Academy for Wales project is being developed in 2016-17 to achieve this aim.

- 71 Sixty per cent (six out of ten) of the consultant radiologists and 41% of radiographers (56 out of 80) at the Health Board are aged 50 and over and potentially within five years of retirement (**Exhibit 14**). This is above the Welsh average.

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

		Age					
		Under 39	40-44	45-49	50-54	55-59	60+
Consultant radiologists ¹	Hywel Dda University Health Board	1 (10%)	2 (20%)	1 (10%)	2 (20%)	3 (30%)	1 (10%)
	All Wales	29 (18%)	43 (27%)	28 (17%)	20 (12%)	20 (12%)	21 (13%)
Radiographers ²	Hywel Dda University Health Board	49 (36%)	20 (15%)	11 (8%)	23 (17%)	22 (16%)	11 (8%)
	All Wales	473 (45%)	106 (10%)	103 (10%)	170 (16%)	125 (12%)	74 (7%)

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

² NHS workforce definition: Staff bands 5 to 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

- 72 The Health Board's continued spending on locums and agency staff suggests that the number of staff currently in post is not sufficient to keep pace with demand. The Health Board has advertised a number of posts more than once and has made use of agency locums to attempt to address radiologist and radiographer vacancies. The most recent position as reported to the Audit Risk and Assurance Committee in December 2016 shows that agency staff account for six WTE radiographers and three WTE sonographers overall. This is just short of the number of vacancies (9.2 WTE) but does not account for long term absence due to sickness or maternity leave, so the service remains understaffed by seven posts overall. As a result of

spending on agency locums, the service is currently overspent by £233, 021. To try and address its recruitment issues the Health Board has offered posts to students subject to qualification and has created trainee sonographer posts in response to the national shortage of sonographers. However, the shortage of trained sonographers to mentor trainees means that they are only able to train one at a time. The first trainee to go through this process is due to qualify in June 2018.

The Health Board has fewer radiologists but more radiographers in post than the Welsh average. Both groups are doing more examinations than the Welsh average

- 73 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.
- 74 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)²⁴. **Exhibit 15** shows that the number of radiologists and radiographers relative to population is smaller than the all-Wales average for radiologists but larger than average for radiographers. The Health Board told us that they have been proactive in recruiting and training reporting radiographers, as a response to their ongoing recruitment difficulties at radiologist level.

²⁴ 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

	In-post FTE consultant radiologists ¹ per 100,000 population	In-post FTE radiographers ² per 100,000 population
Hywel Dda University Health Board	2.6	31.5
All Wales	4.8	27.2

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

² NHS workforce definition: Staff bands 5 to 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

- 75 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.
- 76 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.
- 77 For our audit, the Health Board had recorded data consistently, but as this is a recent change we cannot form a view on whether this is likely to be sustained in the long term.

78 **Exhibit 16** highlights that the number of examinations per FTE in-post radiologist is significantly higher than for other parts of Wales. There are a number of possible reasons for this. The Health Board has struggled to recruit radiologists and currently has fewer in post than the establishment allows for, so those who are in post are doing a higher than average number of examinations in order to meet demand. It may be the case that the Health Board is counting examinations in a different way to other health boards, resulting in a higher overall number for similar levels of activity.

Exhibit 16: number of examinations per FTE in-post radiologist 2015–16

	Number of examinations per in-post FTE radiologist		
	All examinations	CT	MRI
Hywel Dda University Health Board	32,106	5,360	1,781
All Wales¹	13,742	1,989	724

¹ 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**

79 **Exhibit 17** highlights that the number of examinations per FTE in-post radiographer/ultrasonographer is higher than for Wales, although the number of radiographers in post is higher than average. This suggests that demand for examinations is high.

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

	Number of examinations per in-post FTE radiographer/ultrasonographer			
	All examinations	CT	MRI	US
Hywel Dda University Health Board	2,924	488	162	638
All Wales¹	2,465	357	130	523

¹ 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**

80 The NHS Benchmarking Network (NHSBN) 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. However, as the Health Board has not to date participated in NHS benchmarking it is unable to use this as a benchmark.

Appraisal rates are generally good but compliance with mandatory and statutory training is poor

81 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.

82 All radiologists, 62% of radiographers and ultra-sonographers and 40% of other staff received an annual appraisal of their performance and a personal development plan in 2015-16.²⁵ The Health Board keeps a register of 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.

²⁵ 100% of radiologists, 62% of radiographers/ultrasonographers and 40% of other radiology staff received an appraisal of their performance and 100% of radiologists, 62% of radiographers/ultrasonographers and 40% of other radiology staff had a personal development plan using HB survey 3.2.1 and HB survey 3.2.2.

- 83 Radiographers told us that whilst training is available, there are a number of barriers that make access to training more difficult. For example, mandatory training is frequently cancelled due to trainers not being available, and staff are not able to apply for any additional training until the mandatory elements have been completed. Resources are limited, both in terms of providing the budget for training and in terms of being able to release staff to attend. There is no specific budget for training.
- 84 Compliance with mandatory and statutory training set out in the UK Core Skills and Training Framework (nine core skills) is very poor and presents corporate, operational and patient safety risks. Radiographers are the most compliant overall although less than half are compliant with four of the nine skills. Compliance for radiologists is extremely low. The highest rate of compliance is 8% but for the majority of the skills, (five out of nine) no radiologists are compliant.

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

	Radiologists	Radiographers/ ultrasonographers	Other radiology department staff
Equality, Diversity and Human Rights	8%	57%	25%
Health, Safety and Welfare	8%	70%	37%
Fire Safety	8%	34%	28%
Infection Prevention and Control	8%	78%	47%
Moving and Handling	0%	48%	31%
Safeguarding Adults	0%	46%	30%
Safeguarding Children	0%	53%	30%
Resuscitation	0%	43%	26%
Information Governance	0%	53%	26%

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

The Health Board has more CT and MRI scanners and less US scanners per head of population than the Welsh average but their routine use for all modalities is limited to traditional opening hours

- 85 The UK has a low number of scanners compared with other OECD countries. Across the UK there are eight CT scanners and seven 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 nine MRI scanners per million population²⁶. Data are not available for the separate countries in the UK.
- 86 **Exhibit 19** shows the number of scanners per million population for Wales in 2016. The Health Board has a higher number of CT and MRI scanners when compared to the Welsh average, but a lower number of US scanners. When compared to other OECD countries it has fewer CT and MRI scanners, with the exception of France which has fewer MRI scanners.

Exhibit 19: number of CT, MRI and US scanners per million¹ population as at September 2016

	CT	MRI	US
Hywel Dda University Health Board	10.4	10.4	36.5
All Wales²	10.1	7.5	46.1

¹ Exhibit expressed as scanners per million population to allow comparison with other countries.

² 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

- 87 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.

²⁶ Organisation for Economic Cooperation and Development, **OECD Health Statistics 2014 – Frequently Requested Data**, 2014

This factor has to be considered when assessing the potential for extending operating hours.

- 88 Data from 2014 (and updated in 2015) shows that on average, the Health Board operated their scanners for around eight hours on week days, but did not use their scanners at all on weekends (**Exhibit 20**), although the Health Board told us that CT scans are available 24 hours a day in all acute sites with emergency spinal MRI scans also available in Glangwili Hospital for referral from any Hywel Dda site. The Radiology strategy sets out the aspiration to extend opening hours but also sets out the challenges associated with recruiting additional staff to facilitate this, given the national shortage of Consultant Radiologists and the Health Board's previous difficulties in recruiting.

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

Type of scanner	Average number of operating hours per scanner on each day		Percentage usage of equipment ¹	
	Monday to Friday	Saturday to Sunday	Health Board	Wales average
CT	8.0	0.0	48%	52%
MRI	8.5	0.0	51%	66%
US	8.6	0.0	51%	46%

¹ 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.

- 89 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 234 CT scans, extra 111 MRI scans and an extra 1,152 US scans a week²⁷.

²⁷ 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, an MRI scan of 90 minutes, and a US scan of 30 minutes.

The service has a draft strategy in place and whilst management structures are clear, Board and corporate oversight of the service could be stronger

There is a draft strategy for the service but no annual plan or workforce plan. The strategy does not adequately set out current and future demand for the service

- 90 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.
- 91 The Health Board has developed a five year radiology strategy, which is currently in draft form. The strategy asks the question 'Where do we want to be in five years time?' and lists a series of practical aspirations in answer, such as delivering seven day working and implementing screening services' requirements. The section 'How do we get there?' touches on broader issues that will affect the Health Board's ability to implement its aspirations. These include staffing and equipment changes that will be needed to implement seven day working, changes to the estate to allow modern equipment to be installed and longer term responses to training and recruitment issues. The strategy acknowledges the changes and challenges to ways of working that increased demand for interventional radiology will bring and recognises the need to develop new ways of working in response. At the time of developing the strategy, a range of clinical referrers were invited to comment but only one clinician responded.
- 92 The strategy makes a number of references to demand, the increase in demand, and the challenges the Health Board faces in trying to meet demand, although it does not reference specific data to support this. It also references the need to establish its baseline demand. The strategy states that in order to meet current and future demand the Health Board will need to increase opening hours, which in turn will require an increase in staff. However, the Health Board has been unable to fill the vacancies in its current establishment.
- 93 The existence of a clear strategy for the Health Board's radiology service supports its ability to set out sound operational plans although the strategy could be clearer about what is strategic and what is operational, as well as making better use of data to make its case regarding increased demand.
- 94 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 does not have an annual plan or a workforce plan for the radiology service, although a workforce planning exercise undertaken for the IMTP is summarised in

Appendix two of the strategy. This sets out the need to take a longer term view and redesign of the workforce. This would mean recruiting or training a greater number of reporting radiographers to undertake work currently done by consultants, supported by assistant practitioners and radiographers. It takes account of more detailed issues such as the time required for staff to comply with standards, local and national strategies and plans or to attend meetings. We did not see any evidence of workforce contingency planning.

- 95 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, therefore, be appropriately involved in any decision making on service developments that will lead to an increase in the number of patients referred for radiology imaging, such as new consultant posts, clinics and services.
- 96 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, but that impact on radiology services. We received conflicting evidence about the extent to which radiology teams were involved in these types of decisions. The response to our survey told us that the radiology team were very involved in Health Board decisions to introduce a new or change an existing patient pathway, introduce a new service or clinic and introduce new interventional radiology procedures and the consultants we spoke to said that when they had made changes to the patient pathway, the radiology department has been consulted. However, radiographers we spoke to expressed a contradictory view. They gave examples of occasions when they felt they had not been consulted about changes and the resulting increase in demand had to be managed retrospectively.

Managerial arrangements are clear but have been in place for a relatively short time after a period of organisational instability

- 97 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.
- 98 The radiology service sits within the Unscheduled Care Directorate. There is a Radiology Manager and a clinical lead across the Health Board and the Unscheduled Care Director reports to the Deputy Chief Executive. Staff reported to us that management and accountability arrangements were clear to them, although the structure above the Radiology Manager had only been in place for 18 months, and had changed frequently before that.

99 The main fora for the radiology service are the Radiation Protection Committee and the Medical Exposures Committee, both of which are statutory. Efforts were made to convene a Radiology Strategy Group, but clinical demand meant that practitioners were unable to attend regularly and the group no longer exists. There is no specific committee that the radiology department reports to, although the Radiology Manager and/or clinical director provide representation at committee and Board meetings when asked to do so. The Radiology Manager and the clinical director regularly attend the Unscheduled Care Directorate meeting. The Radiology manager and the clinical lead for unscheduled care also attend the Health Board's performance and health and safety meetings.

Service issues are discussed by key Health Board committees but the service could adopt a more proactive approach to ensuring committees are aware of the issues facing the service as a whole

- 100 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, Safety, Experience and Assurance Committee (QSEAC), the Business Planning and Performance Assurance Committee (BPPAC) and the Audit Risk and Assurance Committee. Radiology should feature sufficiently often on committee agendas to help ensure wider awareness of the service and its issues.
- 101 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 was not routinely represented on the key board committees, although the radiology manager and the clinical director attend meetings when required and are regularly represented on the BPPAC. Risks are added to the directorate risk register, which is routinely discussed at service meetings with the general manager for unscheduled care. Where necessary, risks are escalated to the Acute Services Quality, Safety and Experience Subcommittee. Risks that score highly, which exceed tolerance, are also reported to the parent committee, the Quality, Safety and Experience Assurance Committee (QSEAC) as well as the Audit and Risk Assurance Committee (ARAC).
- 102 Our review found evidence that radiology issues have been discussed at the QSEAC and the BPPAC. Minutes of meetings from July 2015 to February 2016 show issues related to radiology being discussed, such as the action the Health Board is taking to minimise the number of missed fractures, the impact of Radiology staffing issues on the service and the Health Board as a whole and what the Health Board can do to address this. The (ARAC) received a report in December 2016 and January 2017 on the costs of locums. We did not find evidence that the service is able to take a more proactive approach to reporting, for example, by producing a report at least on an annual basis on all the key issues the service is facing.

In recent years the service has overspent against its budget and planned savings have not been achieved

103 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. Financial performance is reported to the monthly Health Board performance meeting, which is attended by the CEO, the Director of Operations and the Director of Finance. It is not clear whether additional reports are produced that would track financial data over a longer period of time, which would allow the Health Board to see trends and recurring issues. The report from August 2016 shows the service over budget by £394,000 at that time, although this is less of an overspend than the Health Board anticipated. Pay represents the largest proportion of the budget so it is not surprising that the majority of the overspend relates to agency and locum costs, despite other areas being underspent.

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

		2014-15	2015-16
Health Board	Budget (£ million)	£13.2	£14.4
	Expenditure (£ million)	£14.5	£15.2
	Variance	10.2%	6.2%

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

104 In 2014-15, the Health Board planned £297,740 of Cost Improvement Plan (CIP) savings, to be achieved through centralisation of radiology services to allow release of reporting radiographers and therefore reducing outsourced reporting. The Health Board also planned to replace a retiring band 8A radiographer with a Band 7 and make a non-recurring saving relating to the release of a maintenance contract as equipment had been replaced. £120,809 of savings were realised, a shortfall of £176,931. The centralisation of services was not approved because it would result in reduced availability of services in community hospitals.

105 In 2015-16, £222,861 savings were planned and £168,948 were realised, a shortfall of £53,918. It was planned that the savings would be achieved through employing additional radiographers to backfill reporting radiographers, thus reducing outsourcing, as well as extending the working day via flexible working in MRI and CT. Given the other evidence we have gathered, it seems reasonable to presume that the shortfall in savings is due to not being able to recruit as many radiographers as they would like, with the result that the Health Board has not been able to reduce its reliance on locums and outsourced reporting.

The Health Board does not have an equipment replacement programme in place and although equipment is not an immediate concern the majority will need replacing within five years

- 106 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.
- 107 There is no asset replacement programme for radiology imaging equipment. The Radiology Manager holds an inventory of equipment which lists its age, recommended lifespan and the type of patients they are used for. Every year the Radiology Manager submits a list of equipment to be replaced to the discretionary capital programme, which oversees all capital bids for the Health Board. Each item on the list is given a risk score, based on age, recommended lifespan and type of patient (eg, obstetrics is high risk because of the implications of abnormalities not being detected). The list is prioritised according to the risk score and the Radiology Manager is informed whether or not he can procure the item in question.
- 108 Overall, staff considered that the Health Board had the right number and mix of equipment but some of it is old and there is scope to make better use of it, by working more efficiently and increasing opening hours. Glangwili has only one CT scanner and if this breaks down, as it has twice during the past year, for a period longer than 24 hours, this creates a clinical risk. To minimise the impact, the Health Board pays an additional fee for weekend preventative maintenance. If the scanner is not working, the staff inform the ambulance service and patients are taken to a different hospital if necessary. Inpatients can be transferred to to the nearest available scanner by ambulance.
- 109 The Health Board has received funding from the Welsh Government in the past in order to purchase larger pieces of equipment, but typically this funding is provided at short notice, making it difficult to plan ahead and clinically evaluate all the options before purchase. A written report is produced for the Executive Team as part of the Health Board's capital programme. The information contained in the report is used by the Deputy Chief Executive and Director of Operations to identify the capital requirement for equipment across the Health Board and support bids to the Welsh Government for additional funding.
- 110 In December 2016, the Welsh Government announced additional funding for diagnostic imaging equipment. For Hywel Dda this will mean £2.25 million for a replacement MRI scanner for Bronglais hospital and cardiac diagnostic x-ray equipment for Prince Philip Hospital.

- 111 The European Society of Radiology²⁸ 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 requires replacement strategies to be in place; and
 - 11 or more years old requires replacement.
- 112 In November 2015, NHS Wales anticipated that 87% of imaging department scanners would require replacement by 2017²⁹. **Exhibit 22** shows that with the exception of the MRI scanner in Bronglais, which is due to be replaced, and the MRI scanner at Withybush, equipment is within the anticipated life expectancy. However, depending on the level of use, the majority of the equipment can be expected to reach its life expectancy within the next three to five years. All of the CT scanners and one of the MRI scanners are the same age, leading to the possibility that they may all need to be replaced within a short timeframe.

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

		CT	MRI	US
Age of scanners at the Hywel Dda University Health Board (years) ¹	Bronglais General Hospital	5	10	1, 4, 5
	Glangwili General Hospital	5	1	1, 1, 4, 5
	Prince Philip Hospital	5	5	1, 1, 4
	Withybush General Hospital	5	9	1, 1, 3, 8
Average device life expectancy based on utilisation (years)	High	8	8	7
	Mid	10	10	8
	Low	12	12	9

¹ Where there are more than five scanners, the average age has been provided.

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

²⁸ European Society of Radiology, **Renewal of Radiological Equipment**, September 2014

²⁹ Diagnostic Service Programme NHS Wales, **All Wales Gantry (MRI, CT, Gamma Camera and Ultrasound) Usage/Capacity**, November 2015

Generally, radiology ICT systems do not serve the Health Board's needs, which is exacerbated by problems with the underlying infrastructure

- 113 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.
- 114 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 also about the quality of the management reporting, limitations of the clinical reporting and management reporting functions.
- 115 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.
- 116 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 professionals³⁰. 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.
- 117 RADIS is in use across the Health Board. It is able to schedule appointments and generate patient letters, but there are concerns about accuracy, in particular in relation to waiting times. Management information is difficult and time consuming to produce, to the extent that the reporting and statistics module is not considered fit for purpose. It is possible to generate bespoke reports but this is quite difficult to do and only a limited number of people have the required knowledge. RADIS does not highlight long waiters and site leads have to do this manually on a weekly basis, which is time consuming.
- 118 Although RADIS is in use across the Health Board, there are three separate instances of RADIS in use which do not connect to each other; one for each county

³⁰ 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.

as used by the previous NHS Trusts that merged to form the current organisation. The Health Board asked the NHS Wales Informatics Service (NWIS) four years ago to integrate the three instances into one version that will cover all of the Health Board. Whilst this has been agreed in principle, no date has been given for the work to begin. NWIS has indicated that it does not have the resources to begin work before 2018 at the earliest. Therefore the Health Board is not in a position to work strategically across the Health Board in the way that it would like.

- 119 The Health Board does not have an electronic system to manage radiology requests. Referrals are made using paper forms, which increases the risk of errors and duplication.
- 120 PACS is available across the Health Board and our review did not identify any issues regarding quality of images or problems accessing reports. Although the Health Board reported that there were some initial difficulties in implementing it, these appear to have been largely resolved.
- 121 Our review identified that the voice recognition module of PACS is a source of significant frustration for staff. It often crashes and because it is possible to open more than one window at a time in PACS, it is possible that a report (dictated via the voice recognition software) could end up being associated with the wrong image and therefore the wrong patient. This has been raised with Fujifilm as a clinical risk. The staff we spoke to considered that the issues with the voice recognition software are due to the IT infrastructure within the Health Board being inadequate, rather than faults with the software itself. In general, PACS is slow and the connection to the server is not resilient.

There is scope for the Health Board to improve the way it reports performance

- 122 Effective monitoring and scrutiny of radiology service performance are 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.
- 123 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.³¹ The Health Board does not participate in NHS Benchmarking and so cannot compare its performance with that of other health boards.

- 124 The service does not produce a performance dashboard report. It does monitor and report information on access and demand data, finance and waiting times, but these are not brought together into one report. We did not see evidence of regularly produced reports on workforce issues or reporting backlogs.
- 125 The Health Board could significantly improve its understanding of the service's strengths and weaknesses by collating its performance information into one dashboard report covering all aspects of performance.

³¹ 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 2016 and October 2016 Details of these are set out below.

Exhibit 23: audit approach

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">• NHS Benchmarking Network radiology 2015 and 2016 data collection (data collection period 2 May to 8 July 2016)• The All Wales Equipment Capacity Report, NHS Wales Health Collaborative (December 2015)• Stats Wales: Radiology Diagnostic Waiting Times• National Reporting and Learning System (NRLS) data: Patient safety incidents• HIW IH(ME)R (Ionising Radiation (Medical Exposure) Regulations): diagnostic incidents by Health Board between 2010 and 2016

Method	Detail
Document request	<p>We requested and reviewed documents from the Health Board including:</p> <ul style="list-style-type: none"> • terms of reference and membership of the Health Board's main radiology group, together with a sample of minutes from the previous meetings; • examples of condition pathway documents (for stroke, cancer or heart disease) illustrating radiology service provision requirements; • relevant radiology papers to the board and committees along with operational papers including safety reports; • examples of the Health Board's main radiology service performance reports or performance scorecards from the past six months; • the most recent financial report showing progress towards the savings/cost improvement plan; • the radiology equipment replacement plan; • the radiology risk register; • guidance provided to hospital referrers and GPs on expectations when referring patients to the service; and • examples of any work carried out over the past two years to measure radiology patient experience.
Interviews	<p>We interviewed a small number of staff including:</p> <ul style="list-style-type: none"> • Radiology Manager • Clinical Lead for Radiology Services • Consultant Surgeon • Consultant Geriatrician • Consultant A&E • Consultant Physician
Focus groups	<p>We carried out focus groups as follows:</p> <ul style="list-style-type: none"> • radiographer focus group with representatives from Glangwili, Bronglais and Prince Phillip hospitals; • GP leads focus group

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 recommendations

Ref	Recommendation	Intended outcome/ benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R1	Over the next year assess whether the absence of an Ultrasound Out of Hours service has a negative impact on patient flow and outcomes. If a relationship is found the Health Board should undertake a cost benefit analysis exercise to inform the way forward.	Improved patient flow and outcomes.		Yes	Undertake audit allowing clinicians to identify instances where rapid access to ultrasound would permit discharge. Results to be analysed to assess impact. This analysis will be discussed and, if action is required, a costed plan submitted to the director of operations for consideration.	31 July 2017	Tony Clarey

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R2	Develop an action plan detailing how reporting backlogs will be managed sustainably. For example, by making a short-term increase in outsourcing reports whilst workforce and training plans are developed.	Reduce reporting backlog, leading to quicker reporting turnaround times, and reduce excessive long waits experienced by some patients.	Yes	Yes	Site lead radiographers to use radis to generate a daily list of unreported studies during periods of leave. This list is to be sent for remote reporting. In addition a weekly check of all unreported studies is to be sent to the radiology services manager. Actions and timeframe need to be balanced against budget and spend. Future workforce plans to include requirement for reporting radiographers.	30 April 2017	Tony Clarey
R3	Develop mechanisms to ensure that patients' views are routinely gathered.	Improved understanding of patients' views.		Yes	Health board-wide radiology questionnaire to be agreed and information gathered on quarterly basis. Results/findings to be developed into action plans to improve patient and user experience of the service.	31 May 2017	Tony Clarey

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R4	<p>To improve the quality of referrals, within the next year the Health Board should:</p> <p>a review the different radiology referral processes in partnership with key stakeholders including primary care, in order to establish specific ways in which the processes could be more efficient and effective;</p> <p>b agree a standardised Health Board wide approach to the referral process, including the types of conditions and concerns that should be referred;</p> <p>c produce guidance and other supporting materials to clearly explain the updated approach to referrals;</p> <p>d communicate the updated approach to all relevant staff and stakeholders, using a range of communication methods;</p> <p>e keep a record of all inappropriate referrals including the name of the referrer, reason for inappropriateness and what action was taken; and</p> <p>f routinely report inappropriate referral rates and any recurring concerns about inappropriate referrals back to key stakeholder groups.</p>	Improved quality of referrals, leading to a more efficient service and an improved experience for patients.	Yes	Yes	<p>Site lead radiographers to arrange local meetings at which the clinical director or lead can present concerns and guidance for discussion. Attendance will be open to primary and secondary care and include medical and non-medical referrers. Recommendations R4b, c and d will follow from this.</p> <p>Recommendations R4e and R4f will require input from NWIS so that RADIS can be interrogated to permit retrieval of declined referrals at referrer level. Radiology IT lead to take forward with NWIS at next RADIS Steering Group meeting.</p>	<p>R4a-d: Stage 1 (R4a): 30 June 2017 Stage 2 (R4b-d): 30 September 2017</p> <p>R4e,R4f: to be discussed at next RADIS Steering Group meeting (June 2017 – exact date yet to be confirmed by NWIS). Completion date dependent on NWIS.</p>	Tony Clarey

Ref	Recommendation	Intended outcome/ benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R5	Over the next year, continue to develop and implement consistent methods of recording activity, so that the Health Board is in a better position to take part in NHS Benchmarking Network.	The Health Board is able to understand its own performance within the national context.		Yes	Examination codes were revised to facilitate WAO review. HDUHB intends to participate in the 2017 benchmarking process.	31 December 2017	Sarah Perry
R6	Over the next year, increase appraisal rates for non-clinical radiology staff to at least the level of radiographers and ultrasonographers.	Motivated staff whose training and development needs are understood by the organisation.		Yes	Site lead superintendents are to inform the radiology service manager of appraisal rates and planned dates for appraisal. This is to be checked against Electronic Staff Record to ensure reliable recording. Monthly rates to be reported to RSM to ensure service is on target to achieve requirement. Additional appraisal time to be arranged if required.	31 March 2018	Tony Clarey

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R7	Over the next year, increase mandatory training rates for all radiology staff to at least 85%.	The Health Board is compliant with mandatory and statutory training, corporate, operational and patient safety risks are addressed and the quality of radiology services is maintained.	Yes	Yes	As R6	31 March 2018	Tony Clarey
R8	Over the next year, establish a baseline level of demand for the service so that the Health Board is in a position to better understand and quantify the challenges it faces.	Service planning is improved.	Yes	Yes	Requires input from NWIS to provide a reliable method of extracting accurate demand data. To be taken forward by radiology IT lead at next RADIS Steering Group meeting.	To be discussed at next RADIS Steering Group meeting (June 2017 – exact date yet to be confirmed by NWIS). Completion date dependent on NWIS.	NWIS/ HDUHB radiology IT lead

Ref	Recommendation	Intended outcome/ benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R9	Over the next year, develop an annual plan, or operational plan. The plan should identify the workforce required to meet its current baseline demand as well as future demand.	Service planning is improved.		Yes	IMTP to be updated and forwarded to the director of operations and the director of planning, performance and commissioning.	30 September 2017	Karen Miles/ Sarah Perry
R10	Over the next two years, develop an equipment replacement programme. The plan should include: <ul style="list-style-type: none"> • equipment priorities, requirements and associated costs; and • outline the risks to the service/patients of not delivering the programme within the required timescales. 	The Health Board has the equipment it needs now and in the future.		Yes	Existing report to be updated to include risks. Top five risks to be fully costed including design and enabling works.	30 May 2017	Tony Clarey/ Gareth Rees

Ref	Recommendation	Intended outcome/ benefit	High priority (yes/no)	Accepted (yes/no)	Management response Actions identified:	Completion date	Responsible officer
R11	<p>Strengthen performance management by:</p> <ul style="list-style-type: none"> regularly producing performance reports and reporting them to the appropriate committee; and widening the range of performance measures aligned to the business and service objectives to include: equipment downtime, vacancy levels, the number of unreported images, performance against internal referral and reporting times. 	Improved performance management		Yes	<p>Performance (including HR) reports to be included in radiology dashboard and submitted to bimonthly director of operations review.</p> <p>Site leads to record downtime of key modalities and submit monthly to the radiology services manager. Referral to examination times are currently measured to ensure compliance with national waiting time targets. Reporting times to be measured against national recommendations. These performance measures to be included in radiology dashboard as above.</p>	31 May 2017	Tony Clarey

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