

Evaluation of Direct Access Diagnostics (Radiology) Service

Final Report, October 2011

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Executive Summary

This evaluation of the current Direct Access Diagnostics for radiology (DAD) service in Wirral sought to examine aspects of the patient pathway in the service, the clinician and patient experience and the quality of the service. Evidence was collected and synthesized from radiology department data, a GP survey and patient interviews. The evaluation was led by the NHS Wirral R&D team.

The current DAD service accounts for around 24% of the radiology department workload in WUTH and 10% in CCO. Against a backdrop of increasing clinical demand for complex diagnostics, DAD has contributed a relatively constant proportion of that demand. Together with the clinical indications reported by GP users of the service and reported situations where the service would not be used, this indicates a proportionate and appropriate use of the DAD service.

An exception to this pattern of use is an increasing demand for MRI that appears to be arising as a result of DAD. DAD MRI orders represent a large proportion of all spinal and musculoskeletal requests to the WUTH service and this may indicate a shift of management of joint derangement and neuropathy from secondary to primary care as a result of the service.

In general, the DAD service is most often used to prevent avoidable referral to secondary care and to improve the quality of diagnosis made before an unavoidable referral to a specialist. There are very low levels of repeated diagnostic ordered by another clinician following a DAD order. This again indicates appropriate use of the service, although there is some uncertainty expressed by GPs in interpreting reports from less familiar techniques.

In the opinion of the GPs participating in the evaluation, reassurance to a patient that there is nothing seriously wrong is a common outcome of an ordered test, perhaps reflecting evolving clinical practice as a result of the availability of new technologies. Although representing an increased demand on diagnostic services, there is no evidence here to suggest that incidental findings arising from complex diagnostics were creating significant new demand on specialist care.

The service is very popular with GPs and patients and shows consistent improved timeliness and completion of diagnostic order when compared with diagnoses ordered from secondary care. There is satisfaction that DAD allows GPs to better manage patients in primary care and patients appreciate the speed and convenience. There appears to be some disconnect between GP and patient views on how much choice is available within the service, although choice does not appear to be a widespread issue amongst the patients interviewed. There were also some concerns raised around specific administrative aspects of the service, in particular reporting times of X-ray results and the process of inviting patients for appointments.

There is a diversity of service use amongst practices with some suggestion that both clinical variation as well as service model preference or awareness may contribute to this. However, there is an overall trend of increasing use across consortia and the Wirral, rather than a minority of practices contributing a large chunk of the workload through DAD. The GP survey did not reveal any obvious reasons for the diversity in terms of GP view or experience with the service.

In summary, the DAD service is largely achieving its commissioned aims, but there is some diversity of use in terms of practice uptake and the circumstances in which a diagnostic is ordered. In light of increasing demand, a more consistent and managed

use of the service across consortia may contribute to a sustainable service with more equitable access for patients across Wirral. This could include a review of the guidance given to GPs around ordering diagnostics and further consortium-level investigation into the reasons for variation in practice uptake of the service.

This report is a summary of the evidence collected. Full data are available from the R&D team or the commissioning manager for the Direct Access Service.

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1. Introduction

A cross sectional survey of 380 GPs in North Thames Region in the mid 1990's demonstrated that a third of GP referrals to a consultant were to access diagnostic procedures not available to GPs¹. In 24% of cases, a referral was made to provide reassurance either to the GP or to the patient and their family. The same survey reported that 96% of the GPs had direct access to ultrasound, 29% to a CT scan and that 33% carried out x-rays before referral to an outpatient clinic¹. Although almost all patients considered their referral to a consultant 'essential', the study concluded that there were greater efficiencies to be made in shifting the balance of care from secondary to primary care, including more complex diagnostics.

In 2004, the NHS Modernisation Agency published 10 high impact changes that would impact the quality of patient experience and outcomes². These included the improvement of patient 'flow' through the NHS system as a result of improved access to diagnostic tests. These direct access diagnostic pathways were designed to reduce delays for patients in getting a diagnosis (so facilitating earlier treatment) and reduce the need for hospital attendances (including emergency admissions).

Past reviews of condition-specific direct access approaches have demonstrated reduction in diagnostic waiting times with no associated drop in referral quality, but also identified an early reluctance in primary care to take on full investigation from specialists³. In some specific cases, this may have contributed to lower than expected uptake of the service amongst GPs, despite high satisfaction with the service amongst patients and practitioners⁴.

A recent evidence review into the quality of GP practice highlighted the importance of good clinical relationships between primary and secondary care, good patient experience, efficient use of resources and minimising delay in further investigation and onward management of conditions as key aspects of high quality diagnostic practice⁵.

There has been a GP Direct Access Diagnostic Service for radiology (DAD) commissioned in Wirral since 2008. The aims of this service were to avoid unnecessary secondary care referral and/or treatment for patients and to minimise delays in further investigation and onward management of cases that did require referral. This service formed part of NHS Wirral strategy to reduce waiting times and maintain the 18 week Referral to Treatment target.

NHS Wirral has sought to introduce an element of choice for this service, thus commissioning a range of local providers including Wirral University Teaching Hospital NHS Foundation Trust (WUTH), Clatterbridge Centre for Oncology (CCO), Countess of Chester NHS Foundation Trust (CoC) and Peninsula Health (a local LLP).

This evaluation sought to gather and appraise a variety of evidence that would inform the performance and value of the current service to its users. In particular, we were interested to examine:

- **The Pathway** of direct access diagnostics, including the time involved and the outcome of order
- **The Experience** of the current service from the perspective of providers, clinical users and patients
- **The Quality** of the service

The domains of diagnostic investigated were computerised tomography (CT), non-obstetric ultrasound (NOUS), magnetic resonance imaging (MRI), x-ray and nuclear medicine (NM: only provided by CCO) and focussed on the two main providers of the service, WUTH and CCO.

2. Methods

The evaluation was undertaken by the NHS Wirral R&D team between June and September 2011 on behalf of the DAD Task and Finish group, which included DAD commissioners, GPs representing each Clinical Commissioning Group and service providers from WUTH and CCO. Five methods of evidence collection were used for this project. The approaches taken in collecting data (including survey content) were developed in consultation with the Task and Finish group and, at times, with Chairs of the respective Clinical Commissioning Groups.

- 2.1 Radiology Department Data** – where available, we analysed performance data from the two main providers of the DAD (WUTH and CCO). Data were extracted by NHS Wirral Performance and Intelligence Team. Descriptive analyses included the time spent by individual patients in the diagnostic pathway, the identification of any repeat radiology diagnostics, the volume of demand for the service and the outcome of diagnostics ordered.
- 2.2 GP Survey** - the GP survey was developed with reference to published studies⁶, piloted and revised through the Task and Finish Group and distributed in both document and online versions (see Appendix). After one week, information and a reminder about the GP survey was included in the Wirral GP Bulletin, which is circulated fortnightly via email to Wirral GPs. GPs were encouraged to contact NHS Wirral R&D Team if they would like further information about the evaluation. The survey was completed by 22 of the 62 GP practices approached. Descriptive statistics are used to present the data as the sample size is too small to allow meaningful inferential analysis. Open questions have been analysed thematically and examples of these responses are reported here.
- 2.3 Primary Care Data** – for a sample of patients identified through the analysis of Radiology Department data, we sought information on the clinical management outcome of the diagnostic and the time taken for diagnostic reports to become available to the ordering GP. These aspects of the service were highlighted as issues in the survey above. The timescale of the project and other pressures on the capacity to extract practice data meant that these data in the end could not be obtained
- 2.4 Consultant Interviews** – in-depth interviews were used to gather evidence from Radiology Consultants employed by the two main providers regarding the proportion of repeated diagnostics and aspects of the quality of the service. An interview discussion guide was developed with reference to the overarching evaluation questions and five Radiology Consultants invited (by email) to participate in the evaluation. Consultants were encouraged to contact the research team if they wanted any further information about the evaluation. Invitations were followed up with a telephone call by the research team and the supply of a Participant Information Sheet and the interview questions. Only one consultant agreed to take part and was interviewed over the telephone at a pre-arranged time. The interview was digitally recorded using a telephone adaptor for the sole use of the researcher conducting the

interview. Data have been analysed thematically and key points presented here.

2.5 Patient Interviews – short, semi-structured interviews were used to collect information from patients regarding their experiences and perceptions of the DAD service and exploration of their choice of appointment location and time. A discussion guide was developed with reference to the overarching evaluation questions and patients approached in the Radiology Department waiting room at Arrowe Park, WUTH. The chosen approach and the discussion guide was approved by the Radiology Clinical Service Manager, the Head of Clinical Trials and the Clinical Divisional Manager for Radiology at WUTH. Two separate interview sessions were arranged in advance between the researcher and the Radiology Service Manager at WUTH: a Saturday morning clinic for patients who were referred directly to Radiology by their GP, and a Monday morning clinic including a mix of patients who were referred either by their GP or by a Consultant. On the day of the data collection, the Radiology Service Manager introduced the researcher to the staff in the Radiology Waiting Room reception, and patients were approached as they waited for their appointment. Interviews lasted between five and 20 minutes.

3. Results

3.1 DAD Service Pathway

3.1.1 Impact of DAD on diagnostic department workload

Between Quarter 2 of 2009 and Quarter 1 of 2010, there was a sustained quarterly increase in the numbers of diagnostics ordered from WUTH Radiology Department (Table 3.1). However, overall orders have followed a downward trajectory since then, and by March 2011 were at very similar levels (59,275 orders) to those recorded in June 2009 (59,081), largely accounted for by a reduction in the numbers of X-rays done (Table 3.1).

	2009Q1	2009Q2	2009Q3	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4
CT	4869	4832	4695	4964	5118	5124	5024	5255
MRI	2186	2229	2444	2669	2860	2826	3122	3107
NOUS	9531	9079	9439	9603	10201	10365	10398	10607
XRAY	42495	41212	42055	43166	44137	43909	42493	40306
Total	59081	57352	58633	60402	62316	62224	61037	59275

Table 3.1 Quarterly orders for radiology in WUTH, April 2009 to March 2011, including direct access orders

For all other domains, there has been a more consistent increase in quarterly orders (Table 3.1) and numbers of DAD orders have also increased since the introduction of the service in 2008 (Figure 3.1). For almost all domains analysed, the rate of increase in DAD orders reflected the overall increase in clinical demand for the service, and the proportion of orders coming through DAD has therefore remained relatively constant in the past 2 years (Figure 3.1). An exception is the ordering of MRI that shows a consistently increasing share of activity originating from the DAD service, increasing from 17% (316/1821) of all MRI orders in 2008Q1 to 36.7%

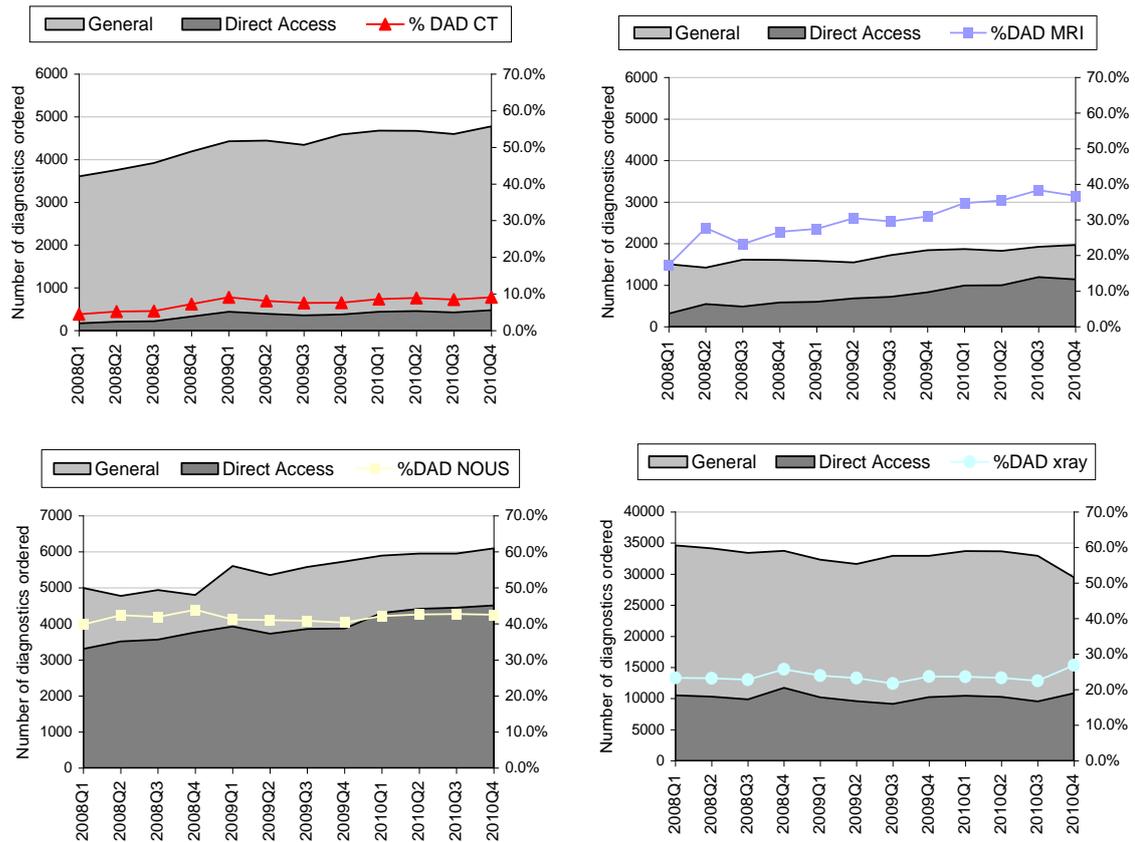


Figure 3.1 Total numbers of diagnostics ordered from WUTH Radiology Department, showing Direct Access orders (DAD) as compared to all other orders (general) (by Quarter, April 2008 to March 2011) and split by domain. The proportions of each diagnostic domain that was ordered through DAD over the same period are shown as lines.

(1141/3107) in 2010Q4 (Figure 3.1). Ultrasound was the domain with the highest share accounted for by DAD, consistently between 41-42% of all NOUS orders, with a slight increase over the period (Figure 3.1). The lowest share was for CT, where a consistent 8-9% of all CT orders were accounted for by DAD. Overall (including X-rays), DAD accounts for between 23% and 24% of all radiology orders in WUTH each quarter.

These findings were supported by the survey of GPs using the DAD service. Almost all GPs responding had used DAD for each of the domains at some point. However, the frequency of use of US, MRI and CT were ranked in the same order in which they appear to contribute to the overall workload of the WUTH department (Table 3.2) with only plain film x-rays being more frequently ordered. The volume of X-rays also ordered through secondary care means that the share of workload from direct ordering is no more than the average share of the DAD service for this domain.

Please rank in order of radiology service you most refer to						
Answer Options	Most Referred	Second	Third	Fourth	Fifth	Response Count
Computerised Tomography	0	0	2	17	0	19
Magnetic Resonance Imaging	0	1	17	1	0	19
Ultrasound	6	13	0	0	0	19
Plain Film	13	5	0	0	0	18
Nuclear Medicine	0	0	0	0	15	15
					<i>answered question</i>	19
					<i>skipped question</i>	3

Table 3.2 GP view of which radiology domain is most commonly referred to through the Direct Access service

For CCO, MRI was the predominant domain for which there was demand through DAD. Overall, DAD accounted for 10% (1,622/16,072) of all ordered CT, MRI, X-ray and nuclear medicine diagnostics in 2009-10 and this was very similar in 2010-11 (Table 3.3). MRI was the most common domain to be ordered through DAD and accounted for around 25% of all MRI ordered in both years. The biggest change in demand for the CCO service was for nuclear medicine, although in 2010-11 tests ordered through direct access only represented 4.8% of all nuclear medicine tests performed in the Trust and the numbers remain low (Table 3.3).

Domain	2009-10			2010-11		
	DAD	other	%DAD	DAD	other	%DAD
CT	286	6956	3.9%	302	7144	4.1%
MRI	1263	3782	25.0%	1276	3903	24.6%
NucMed	58	1895	3.0%	83	1646	4.8%
Xray	15	1817	0.8%	11	1787	0.6%
Total	1622	14450	10.1%	1672	14480	10.4%

Table 3.3 Numbers of orders for radiology diagnostics made to CCO, 2009-2011, showing the proportion made through the direct access service

Key Finding 1: the current DAD service accounts for around 24% of the radiology dept workload in WUTH and 10% in CCO and this has remained very similar since 2009. Although US accounts for the largest demand on WUTH services as a result of direct access, this demand has been relatively stable since 2009. It appears that MRI is the only domain where there is a sustained increase in demand as a result of DAD. MRI demand also predominates in CCO although nuclear medicine diagnostics are increasingly sought by GPs.

3.1.2 Reasons for current use of DAD

All GPs responding to the survey use the DAD service to prevent avoidable hospital referrals and almost all use it to improve their diagnostic accuracy in order to make decisions about referral ('work up') (Table 3.4). Only around half of GPs use the service to decrease waiting time for an appointment and a third to improve timeliness of a diagnostic report.

Under what circumstances would you refer a patient to the Direct Access Diagnostics for Radiology Service? (Please tick as many as you feel appropriate)		
Answer Options	Response Percent	Response Count
To "work up" the patient in primary care	94.7%	18
To enable treatment for a patient outside hospital	78.9%	15
To prevent avoidable hospital referral	100.0%	19
To decrease waiting time for an appointment	52.6%	10
To decrease waiting time for outcome report	31.6%	6
	<i>answered question</i>	19
	<i>skipped question</i>	3

Table 3.4 GP view of the reasons why they would make use of the Direct Access service

Around 84% (16/19) of GPs felt there were circumstances where they would not use the DAD service in preference to the usual route of diagnostic referral. Reasons given included uncertainty, timing, and management. Some examples of reasons given are provided below:

Uncertainty (6 responses)

"Diagnostic doubts as to which is the best test"

"Some imaging tests are not familiar, such as advantages of MRI over CT in various complaints"

Timing (2 responses)

"If it will not change my management e.g. if I was going to refer anyway and the delay is not an issue"

"If patient needs 2 week wait referral"

Appropriate management (6 responses)

"If the condition requires Consultant led management"

"If a diagnostic test is only part of the package needed"

"If onward referral is obviously needed and further investigation is likely to be more appropriately organised through secondary care i.e. interpretation of results more specialist in nature"

"Because we are blocked from referring as they don't fulfil age criteria etc set for test"

Key Finding 2: the current DAD service is most often used by GPs to prevent avoidable hospital referral for a diagnostic and to improve the strength of diagnosis and potential treatment options in primary care. This use, however, is tempered by the majority of GPs by considerations of appropriate ongoing management as well as some uncertainty around unfamiliar diagnostic techniques

3.1.2.1 CT use - The most common clinical indication for referring patients for a CT scan (in GPs' opinion) was headache, with memory loss, neurological deficit and pain also mentioned by nearly half of those responding (Table 3.5). There was a diversity of opinion, however, and lumps, head injury and neuropathy were also mentioned as

indications by a minority of respondents. In the 'other' category, 2 GPs mentioned that they would order a CT scan to clarify findings on an X-ray or ultrasound, one on the advice of a radiologist.

In your experience, what are the 4 most common clinical indications for referring your patients for a CT scan? (Please rank: 1= most common, 2=second, 3=third, and 4=fourth) Please tick 4 ONLY

Answer Options	Most Common	Second	Third	Fourth	Response Count
Neuropathy or Radiculopathy	3	0	0	0	3
Pain	2	2	1	2	7
Headaches	9	2	2	2	15
Injury	0	0	1	0	1
Neurological Deficit	2	3	2	1	8
Memory Loss	2	2	2	2	8
Head Injury	1	1	1	0	3
Lump or Swelling	2	1	1	0	4
Other	0	3	0	0	3
					<i>answered question</i> 18
					<i>skipped question</i> 4

Table 3.5 GP view of the frequency of clinical indications that would prompt their use of the Direct Access service for CT

This qualitative response was in part supported by data available from WUTH indicating that around 49% (795/1615) of all DAD ordered CT scans in 2010-11 were for the head region. These scans equated to 12% of all CT scans to the head ordered from WUTH in 2010-11, a slight increase from 2009-10 (Figure 3.2). However, there was also a significant workload through DAD for scans to the chest, abdomen or pelvis that are not perhaps expected from the qualitative results above, unless these relate to scans ordered for pain and lumps.

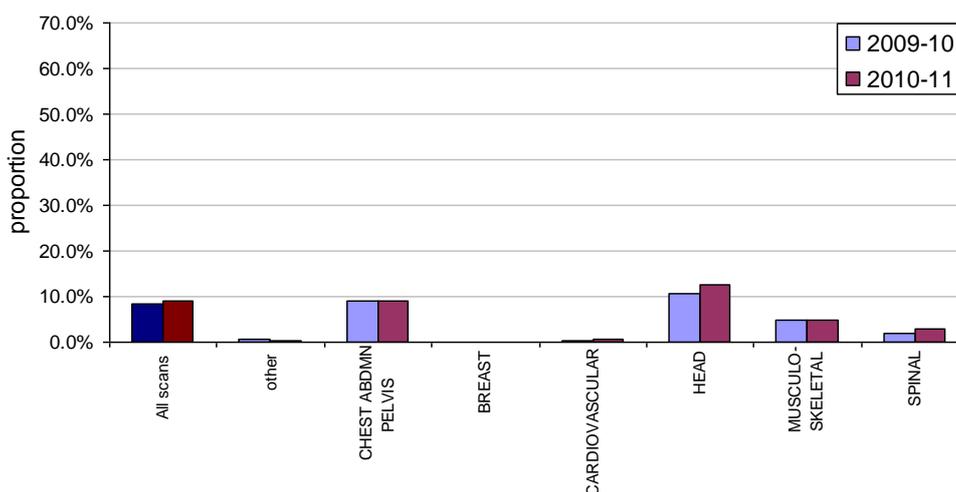


Figure 3.2 The proportion of CT diagnostic orders for WUTH Radiology Department that were ordered through DAD, by year and order type. 'All scans' shows the overall proportion of CT scans ordered through DAD, regardless of type. Cancelled orders are excluded from these data.

Key Finding 3: the current DAD CT service in WUTH is most often used for diagnoses of headache and neurological function and contributes a growing proportion of head scans within the department. A similar volume of CT scans for the chest, abdomen or pelvis are also ordered by direct access but the specific indications for these in primary care are less clear

3.1.2.2 MRI use - The most common clinical indication in primary care for referring patients for MRI was neuropathy or radiculopathy, with almost all GPs referring for this reason and over half regarding this as the most common indication for referral (Table 3.6). Joint derangement, neurological deficit and pain were also common clinical indications, but as with CT, there was a diversity of opinion with several other indications mentioned by smaller numbers of GPs (Table 3.6).

In your experience, what are the 4 most common clinical indications for referring your patients for an MRI? (Please rank 1= most common, 2=second, 3=third, 4= fourth) Please tick 4 ONLY

Answer Options	Most common	Second	Third	Fourth	Response Count
Neuropathy or Radiculopathy	11	3	3	0	17
Pain	2	5	0	1	8
Joint Derangement	5	4	3	1	13
Headaches	0	1	1	2	4
Injury	0	1	0	1	2
Neurological Deficit	1	4	2	1	8
Skeletal Abnormality	0	0	3	1	4
Memory Loss	0	0	1	0	1
Head Injury	0	0	0	0	0
Lump or Swelling	0	0	3	2	5
Endometriosis	0	0	0	0	0
Any other	0	0	0	0	0
			<i>answered question</i>		19
			<i>skipped question</i>		3

Table 3.6 GP view of the frequency of clinical indications that would prompt their use of the Direct Access service for MRI

This pattern of use is clear from the radiology department data, where 96% of all DAD ordered MRI scans are for musculoskeletal sites, spine or head. In terms of contribution to the workload of the radiology department, 57% of all spinal MRI scans came through direct access in 2009-10 and this increased to 65% in 2010-11 (Figure 3.3). A similar increase was seen for MRI of musculoskeletal sites. Although very small numbers of breast MRI scans are done in WUTH, these orders represent the largest increase in activity through the direct access service, with DAD orders contributing 4% (2/45) of all breast MRI in 2009-10, increasing to 15% (12/82) in 2010-11 (Figure 3.3).

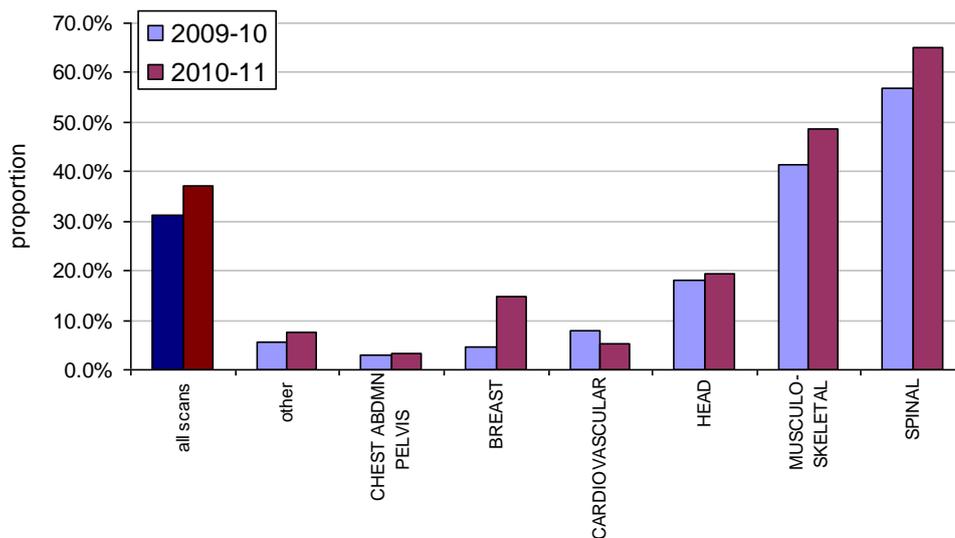


Figure 3.3 The proportion of MRI diagnostic orders for WUTH Radiology Department that were ordered through DAD, by year and order type. 'All scans' shows the overall proportion of MRI scans ordered through DAD, regardless of type. Cancelled orders are excluded from these data.

Key Finding 4: the current DAD MRI service in WUTH contributes a large and growing demand for spinal, head and other musculoskeletal scans to facilitate better primary care diagnosis of neuropathy and joint derangement as well as general pain and neurological deficit. The DAD service has also brought a small but growing demand for breast scans

3.1.2.3 US use - The most common clinical indications in primary care for referring patients for US were abnormal liver/renal function, gynaecological investigations and urinary symptoms, although there was greater diversity of opinion (than for MRI) as to which constituted the most common indication for a scan (Table 3.7). Half the GPs responding to the survey would also use US to investigate lumps and gastrointestinal symptoms, but with less frequency than the indications mentioned (Table 3.7).

In your experience, what are the 4 most common clinical indications for referring your patients for an Ultrasound? (Please rank 1= most common, 2=second, 3=third, 4=fourth) Please tick 4 ONLY					
Answer Options	Most common	Second	Third	Fourth	Response Count
Pain	1	1	0	3	5
Gynae Symptoms	4	7	6	1	18
Mass/Lump	1	0	3	5	9
Abnormal Liver/Renal Function	9	5	3	2	19
Urinary Symptoms	1	4	4	2	11
Cardiac Symptoms	0	1	0	1	2
Injury	0	0	0	0	0
Gastrointestinal Symptoms	3	1	2	3	9
Other	0	0	0	1	1
				<i>answered question</i>	19
				<i>skipped question</i>	3

NHS Wirral Eva **Table 3.7** GP view of the frequency of clinical indications that would prompt their use of the Direct Access service for US

This diversity of opinion was reflected in WUTH radiology department data where the DAD service contributes significant proportions of the workload for many of the order categories recorded, including 'other', which corresponded to thyroid scans ordered directly (Figure 3.4). As with breast MRI above, there is an apparently growing demand for US of the spine as a result of DAD, but these numbers are very small, accounting for 44% (19/43) of all US scans of the spine ordered from WUTH in 2010-11.

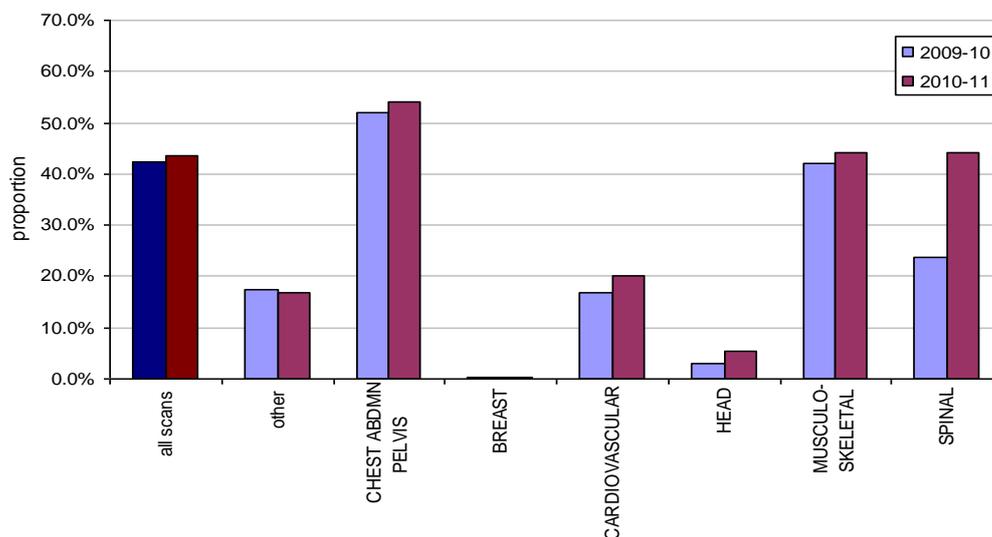


Figure 3.4 The proportion of US diagnostic orders for WUTH Radiology Department that were ordered through DAD, by year and order type. 'All scans' shows the overall proportion of US scans ordered through DAD, regardless of type. Cancelled orders are excluded from these data.

3.1.2.4 X-ray use - The most common clinical indications in primary care for referring patients for X-ray were injury, pain, cough and chest infection, although diversity of opinion was even wider than for US with no single indication being reported by more than three quarters of GPs as a reason to refer through DAD (Table 3.8). This is perhaps curious given that this domain of diagnostic is associated with the highest volume of orders.

In your experience, what are the 4 most common clinical indications for referring your patients for Plain Film Radiography? (Please rank, 1= most common, 2=second, 3=third, 4=fourth) Please tick 4 ONLY					
Answer Options	Most common	Second	Third	Fourth	Response Count
Cough	4	2	4	1	11
Chest infection	3	6	1	0	10
Pain (including joint and back pain)	7	3	3	0	13
Injury/trauma	0	1	3	9	13
Any other	3	2	0	1	6
<i>answered question</i>					17
<i>skipped question</i>					5

Table 3.8 GP view of the frequency of clinical indications that would prompt their use of the Direct Access service for X-ray

Although 82% (32,575/39,623) of the X-rays ordered through DAD in 2010-11 were for chest, abdomen or pelvis or for musculoskeletal sites, the WUTH data makes clear that the DAD service has made greatest impact on the request for spinal X-rays. Around 66% of orders for spinal X-ray in 2010-11 came through DAD, in comparison to an overall 25% of all X-ray orders (Figure 3.5). This either represents additional burden for the department as a result of the DAD service or shows a greater shift of management of back pain to primary care.

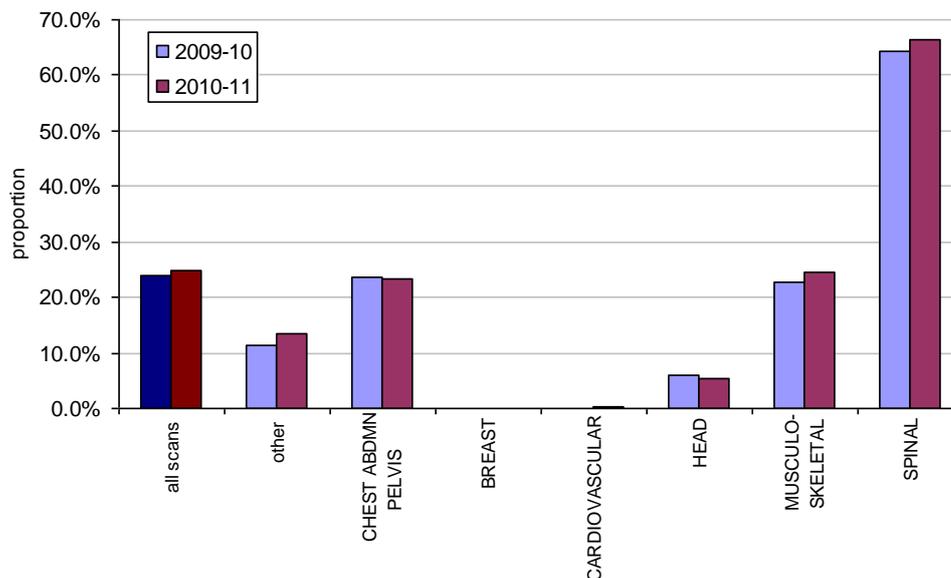


Figure 3.5 The proportion of X-ray diagnostic orders for WUTH Radiology Department that were ordered through DAD, by year and order type. 'All scans' shows the overall proportion of X-ray scans ordered through DAD, regardless of type. Cancelled orders are excluded from these data.

Key Finding 5: ultrasound and X-ray seem to be ordered for a wider diversity of indications than CT and MRI. For X-ray in particular, there is less clinical consensus as to when an order might be appropriately made through DAD. In terms of disproportionate activity in radiology services, X-rays of the

spine are far more likely to have been ordered through direct access than expected from the overall contribution of DAD to X-ray workload

3.1.3 Range of use of DAD by Practice

As described above, almost all GPs surveyed had used different diagnostic domains of the DAD service at some stage. However, there was a diversity of use amongst practices.

Described in terms of a financially derived 'fair shares' formula, there were clearly some practices utilising the DAD service more or less than would be expected given their overall spend on secondary care and characteristics of their registered populations (Figure 3.6). For those practices in which there was the greatest positive or negative discrepancy in fair share, this discrepancy was apparent for all domains of the service, suggesting a preference with regards to the general concept of DAD.

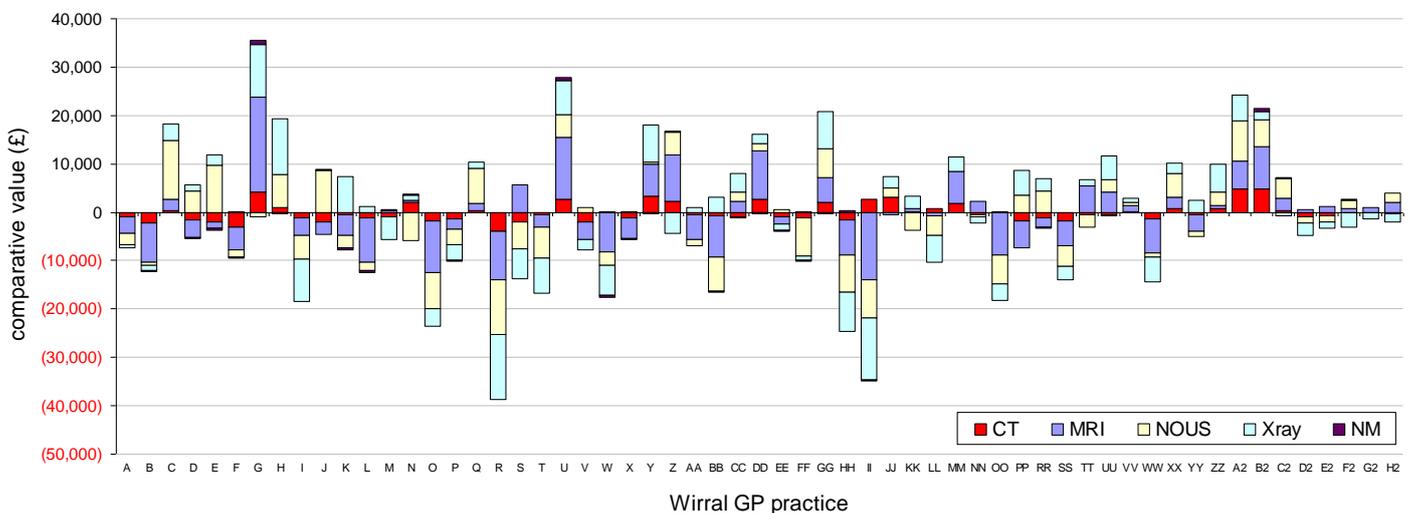


Figure 3.6 Comparative value of radiology services in WUTH and CCO (combined) used by individual practices through the DAD service, expressed as fair shares. Fair shares are calculated on the basis of weighted scores for acute care use, maternity rates, mental health, prescribing and deprivation of each member of a practice population. Bars below the x axis represent apparent under use of services

However, there were some practices where a particular domain (e.g. CT) was used above fair share but all other domains were used below fair share, suggesting diversity of clinical practice with regard to radiology diagnostics (Figure 3.6). Fair share was very similarly distributed amongst practices of the two largest Clinical Consortia (with overall use being above fair share), but members of the NHS Alliance were almost all under-users of the DAD service in terms of fair share (data not shown).

Where GPs stated the practice to which they belonged in the GP survey (n=14), we analysed their responses in relation to whether they used greater or less than fair share of DAD ordered radiology. There were no differences in the pattern of responses between these two groups in terms of reported use of the service, confidence in interpretation of results, clinical indications for ordering, etc.

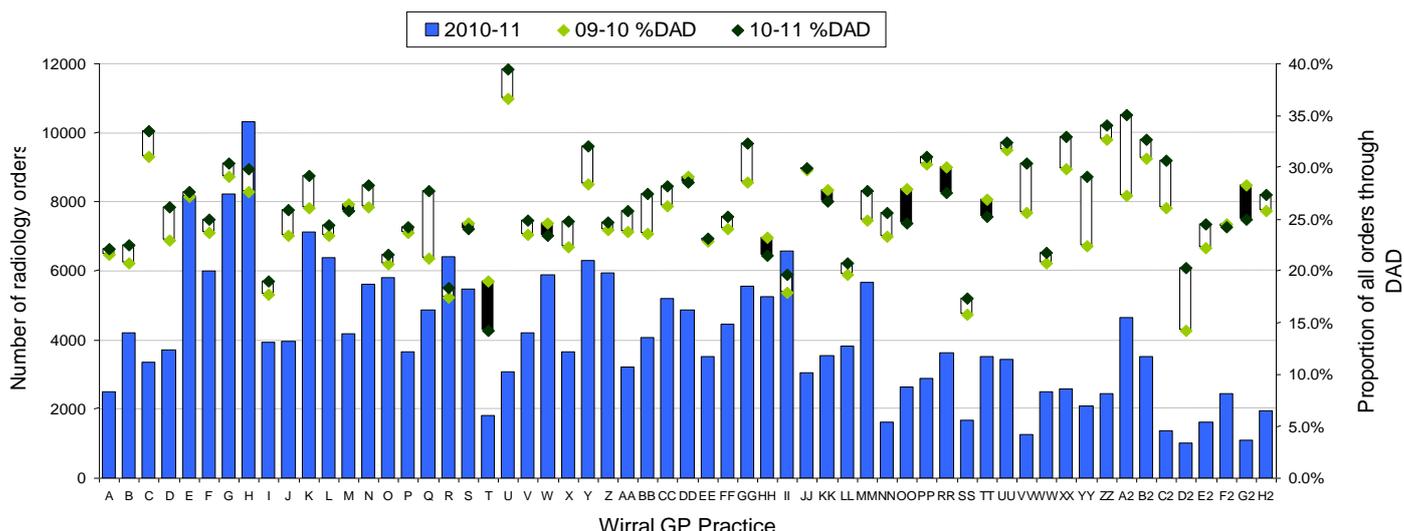


Figure 3.7 Comparative use of WUTH radiology services by registered patients of individual practices (2010-11), showing the proportion of orders which came through the DAD service in two subsequent years. The numbers of orders are shown by the bars and the proportion of these that were ordered through DAD shown by diamonds (pale green for 2009-10 and dark green for 2010-11). The two point estimates of DAD use are linked by an open box where the proportion increased and a filled box where it decreased

Despite the apparent variation in expected use of the service between practices, the majority increased their use of the service between April 2009 and March 2011 (Figure 3.7). The range of use (in WUTH) by individual practices in 2010-11 was between 14% and 39% of all a practice’s patients receiving a radiology scan had the scan ordered through DAD. The greatest increase for a practice over the time period was from 27% of scans ordered through DAD in 2009-10 to 35% in 2010-11. The average use and change in use were very similar for each of the clinical consortia. The majority of practices decreasing use have a lower than average use of radiology services in general for their patients (Figure 3.7).

Key Finding 6: there is a diversity of service use amongst practices with some suggestion that both clinical variation as well as service model preference or awareness may contribute to this. However, there is an overall trend of increasing use across consortia and the Wirral rather than a minority of practices contributing a large chunk of the workload through DAD. The GP survey did not reveal any obvious reasons for the diversity in terms of GP view or experience with the service

3.1.4 Timeliness of DAD service

One of the key aims of the service as commissioned was to reduce waiting times for diagnostic procedures and subsequent report, although no more than 50% of GPs surveyed cited these as reasons to refer a patient through DAD as opposed to a consultant route (Table 3.4).

For all domains, the average time between a test being ordered and a result being verified (‘completion’) was less for outpatients referred through the DAD than for all other outpatients in the last quarter of data presented (Figure 3.8). There has been some variation in this since April 2009, but for most domains, the DAD pathway has been consistently quicker than the specialist pathway for receiving a verified result

over the past two years. The biggest difference is for CT scans where on average, DAD ordered scans have been verified twice as quickly as specialist ordered scans (average 13 days compared with 25) (Figure 3.8).

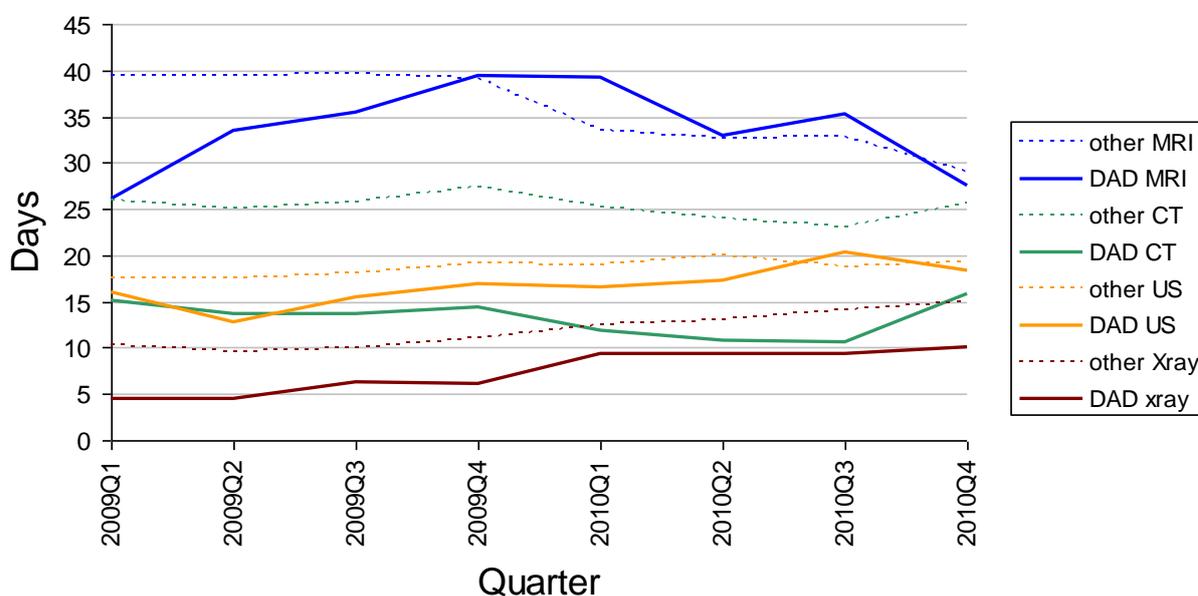


Figure 3.8 Average days between order and verification of result for all completed diagnostics in WUTH Radiology Department, showing Direct Access orders (DAD) as compared to all other orders (by Quarter, April 2009 to March 2011). These data only refer to outpatient orders that were not subsequently cancelled.

At some point in the period since April 2009, all domains have shown an increase in time of completion, most consistently for X-rays (Figure 3.8). For MRI scans, this increase was only seen for DAD ordered scans, which for a few quarters became slower in average completion than specialist ordered scans. This trend has been reversed in more recent quarters, perhaps as a result of reported improvements in management of the scanner and the use of mobile scanner resources to boost capacity. Time to completion for MRI was slightly quicker again for DAD ordered scans in the final quarter reported. Although CT scans have recently increased in time of completion (through the disruption to service resulting from installation of a new scanner), this is against a back drop of improved timeliness up until December 2010 (Figure 3.8).

The differences described were corroborated by the consultant interview undertaken, in which a growing “two tier system” was described.

“...turnaround times for GPs are actually shorter than they are for our inpatients at the moment, so we could be doing outpatient GP stuff ahead of possibly clinically more urgent things”.

To make the timeliness analysis as comparable as possible, inpatients were excluded from the analysis presented in Figure 3.8, but it is a true perception that even when inpatient orders are included, DAD orders have a faster turnaround for CT and X-ray (data not shown).

Outpatient interviews at WUTH also suggested that those referred by a consultant had waited slightly longer for their test than those referred through DAD, although ultrasound was the only domain where this comparison could be made between the groups.

Data for CCO were provided in a different format. Average time to verification was not available but the proportion of orders verified within 4 weeks show a poorer performance for the DAD service in comparison to general referrals. Where 97% (10,191/10,471) general diagnostics were verified within 4 weeks between April 2009 and March 2011, only 61% (1482/2430) of DAD orders were verified within this time frame. There has, however, been a steady and rapidly improving performance of the DAD service at CCO since July 2010 and for the last quarter analysed, 95% (85/95) of DAD orders were verified within 4 weeks (Figure 3.9).

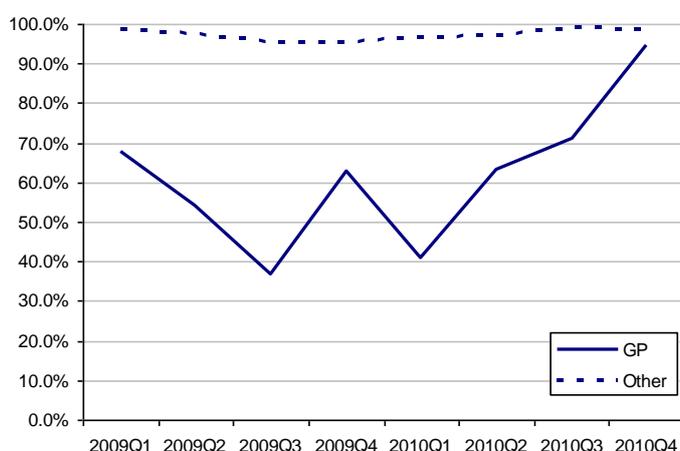


Figure 3.9 Proportion of CCO diagnostics ordered through DAD and all other referral routes that were verified within 4 weeks of order, by Quarter (April 2009 to March 2011)

Through the survey, GPs reported some delays in waiting times for some tests (especially X-ray with regards to receiving reports), however the majority of GPs felt that Wirral diagnostic providers had capacity to deal with DAD patients most of the time, with some GPs reporting that they always had capacity. One GP out of the 14 responding to the question, felt that DAD had not reduced waiting times for a test.

Key Finding 7: despite some variations in performance, the completion of scans ordered through DAD were consistently quicker on average for all domains at WUTH. Performance for X-rays and, to a lesser extent, ultrasound may require further attention either in terms of investment or system management. Scans ordered through DAD from CCO were more likely to be delayed, but timeliness has recently improved to be equivalent to orders through other routes. GPs had a general impression that there was usually capacity available to deliver from the providers

3.1.5 Outcomes for clinical management

The direct access service was most often used by GPs to reassure patients either that there was nothing wrong, or that no immediate intervention was required. This

was true of all domains, although the degree to which other outcomes were also involved varied.

The most frequently reported outcome of CT scans was that the patient was reassured that there was no problem. There was wide clinical consensus on this point, with over four fifths (14/16) of GPs surveyed stating this as the most common outcome (Table 3.9). Referral to a specialist was a secondary outcome, but again with wide agreement amongst GPs surveyed. Over two thirds also listed initiation of a programme of treatment in primary care as a relatively common outcome (Table 3.9).

Please rank in order of your most common CT scan outcomes (where 1 = most common, 4 = least common)					
Answer Options	Most Common	Second	Third	Fourth	Response Count
Reassure the patient that there was no problem	14	0	2	0	16
Reassure the patient and recommend "watchful waiting"	2	4	2	3	11
Initiate a programme of treatment in primary care	1	4	3	4	12
Refer to a specialist	0	7	5	3	15
					<i>answered question</i> 17
					<i>skipped question</i> 4

Table 3.9 GP view of the most common outcomes for patient management resulting from a direct access CT order

For MRI scans, the frequency of outcomes were more evenly spread between reassurance, onward referral and treatment than for CT (Table 3.10). This might be as expected given the indications and types of MRI scan ordered.

Please rank in order of your most common MRI scan outcomes (where 1 = most common, 4 = least common)					
Answer Options	Most Common	Second	Third	Fourth	Response Count
Reassure the patient that there was no problem	7	4	4	2	17
Reassure the patient and recommend "watchful waiting"	2	5	3	4	14
Initiate a programme of treatment in primary care	5	3	4	4	16
Refer to a specialist	4	6	5	3	18
					<i>answered question</i> 18
					<i>skipped question</i> 4

Table 3.10 GP view of the most common outcomes for patient management resulting from a direct access MRI order

Responses were roughly equally distributed between outcomes of reassurance, treatment and referral for ultrasound, although referral was considered the least common outcome by just over half of the respondents and reassurance of no problem the most common, also by half the respondents (Table 3.11).

Please rank in order of your most common Ultrasound outcomes (where 1 = most common, 4 = least common)					
Answer Options	Most Common	Second	Third	Fourth	Response Count
Reassure the patient that there was no problem	9	4	3	2	18
Reassure the patient and recommend "watchful waiting"	6	5	6	0	17
Initiate a programme of treatment in primary care	4	7	4	2	17
Refer to a specialist	0	3	5	10	18
				<i>answered question</i>	19
				<i>skipped question</i>	3

Table 3.11 GP view of the most common outcomes for patient management resulting from a direct access US order

As with US, responses for X-ray were equally distributed between reassurance, treatment and referral. However, there was a stronger consensus that reassurance of no problem was the most common outcome of the diagnostic ordered and referral was the least common (Table 3.12).

Please rank in order of your most common Plain Film Radiography outcomes (where 1 = most common, 4 = least common)					
Answer Options	Most Common	Second	Third	Fourth	Response Count
Reassure the patient that there was no problem	13	0	3	1	17
Reassure the patient and recommend "watchful waiting"	0	7	4	4	15
Initiate a programme of treatment in primary care	4	9	4	0	17
Refer to a specialist	0	1	6	10	17
				<i>answered question</i>	17
				<i>skipped question</i>	5

Table 3.12 GP view of the most common outcomes for patient management resulting from a direct access X-ray order

The use of the DAD to reassure patients was echoed by the consultant interviewed. Their view was that there was perhaps an unnecessary demand on the diagnostic services, where previously the reassurance would have come through clinical opinion rather than a radiology diagnostic:

“One of the areas around ultrasound of lumps and bumps which has a very low yield doesn't really take you any further forward, it's a lump, it doesn't really help doing this test but we do a huge number of them because GPs say 'well they have to do something' rather than 'actually it's just a little lump its nothing' “.

Appropriate use of the service is perhaps an area for constant review and ongoing guidance to GP users.

Key Finding 8: CT and MRI scans were most often used to reassure patients there was nothing wrong but also frequently resulted in referral to a specialist. Direct access US and X-ray scans resulted in reassurance,

treatment or onward referral for nearly all GPs responding. However, there was relatively strong consensus that referral to a specialist was the least common outcome for US and X-ray. The strongest consensus in these data was that reassurance of nothing wrong was the most common outcome of a CT or X-ray ordered through direct access. The consultant interviewed suggested this reassurance might not always require a test to be ordered.

3.1.6 Outcomes of saved secondary care

Just over three-quarters of GPs said they would have referred patients to secondary care before direct access CT or MRI became available (Table 3.13). For US, this proportion was slightly lower and for X-ray, referral would have been much less common when compared with management in primary care. Half of patients referred for nuclear medicine through direct access would formally have been referred, in the opinion of respondent GPs (Table 3.13).

What action would you have mostly taken with those patients you referred for a scan before the Direct Access to Diagnostics Service became available?					
Answer Options	CT	MRI	US	X-ray	NM
Refer to Secondary care	13	15	13	5	3
Manage the patient in primary care	4	4	6	8	3
Watchful waiting	0	0	0	1	0
Response Count	17	19	19	14	6

Table 3.13 GP view of the most common actions with regard to patient management before the availability of the DAD service for radiology

Overall, all GPs felt that DAD had enabled them to more fully manage their patients in primary care (thus preventing unnecessary secondary care). Respondents specifically highlighted themes of improved accuracy of diagnostic practice and a reduction in inappropriate referrals (examples below):

Aid Diagnosis (7 responses)

“Allows exclusion of certain diagnoses”

“Greater diagnostic accuracy”

“Better inform patient and allow alternatives to secondary care to be instigated. More confident in reassurance.”

Reduces inappropriate referrals (4 responses)

“Stops inappropriate referral to a specialist”

“We can investigate and only refer if necessary and assess urgency”

“Identification of those things which are not amenable to secondary care input, or allows primary care initiation of treatments eg physio/injections”

However, there were mixed views as to whether the service had facilitated earlier referral to specialists, where this referral became necessary. It was acknowledged that reducing unnecessary referrals should limit the demand on specialists (and

hence speed up referrals generally) but that there was also a risk that more detailed imaging might actually increase specialist demand.

It is clear from the analysis above that DAD frequently resulted in a referral to a specialist, but not clear as to how much of this referral is new as a result of the service and how much would have happened anyway in the absence of the service. One indication might be the frequency with which incidental findings arose from an ordered diagnostic test and how these are handled by GPs. In the GP survey, incidental findings were felt to be very (3/18 GPs responding) or quite (10/18) common, but there was little consensus on what action might be required as a result, with actions very much depending on the nature of the finding. Possible referral, or at least discussion with a consultant, was mentioned as possible outcomes by only one GP. Detailed case by case data were not able to be collected as hoped to clarify how incidental findings might have contributed to new demand for consultant follow up.

A consistent view expressed was that the service had not necessarily improved the *timing* of a necessary referral but had improved the *quality* of that referral:

“Patient is appropriately worked up so that when seen will be more productive and useful”

“I don't believe it has affected referral time. I believe it makes those referrals more informed”

In addition, better initial diagnostics have probably accelerated referral for urgent cases:

“Often clearer reason for referral so can stipulate urgent or routine more effectively.”

Key Finding 9: All GPs felt that DAD allowed them to more fully manage their patients in primary care and reduce inappropriate referrals. At least three quarters of GPs said they would mostly have referred CT or MRI patients to secondary care before the DAD service became available. This proportion was lower for US and X-ray. There were mixed views amongst GPs as to whether the system allowed earlier referral to a consultant or not. Where higher quality and more informed referrals could be made as a result of DAD, it was unclear whether the service was overall creating new demand for consultant appointments.

3.2 Experience of the DAD Service

3.2.1 Patient choice

Only one of the 19 GPs responding to the survey considered that patients did not have a choice where they were referred to and a further 9 felt patients only sometimes had a choice. In contrast, four GPs considered that patients did not have a choice of time or date and again, 9 felt they only sometimes had a choice. Six of the GPs reported that they did not provide information to patients to help them make decisions about diagnostic care.

The picture of choice amongst GPs seemed at odds with patient views. Only one of the 23 patients interviewed said they had been given a choice of location:

"I had the choice because my treatment has involved going to Clatterbridge, Aintree, had a colonoscopy at The Royal, and treatment at Arrowe Park so I was familiar with all these. Arrowe Park was most convenient."

This appeared to be because other centres had already been involved with their treatment (i.e. they already had some knowledge of alternative options) as no other patients reported being offered alternative locations. Of these, however, only two patients said they would have liked a choice and that another location was more convenient, suggesting that choice of location is not a major factor for the Wirral population.

Again, only one patient said they had had a choice of time and date for their appointment when they had made a specific request:

"Yes I had a urology appointment on the same day so requested if I could have this appointment on this date and they accommodated this"

Several others did express their awareness or experience of being able to phone to change appointments if needed but 9 said they would have liked to choose the time at the outset:

"Yes I'd like to choose, I had to change the time of this appointment and they were very accommodating which was great. So I'd liked to be able to choose straight away."

Patients at the general radiology clinic (a weekday) were more likely to express a desire to choose the date and time of their scan. Those attending the DAD specific Saturday clinic were generally very satisfied with the weekend option when asked about having a choice of time or date:

"No, would have liked this appointment. Saturday's are good, especially with work."

"No, it was convenient anyway so wouldn't have chosen differently. Saturdays are great."

"No, it was fine really cos I could ring and change anyway, and cos Saturday is great and I don't really mind what time"

Key Finding 10: GPs had the opinion that there was some element of choice for most patients in terms of location or time of their appointment. However, this was not supported through patient interviews and choice appears not so much to be offered as provided on request for those individuals who seek it. However, choice of location did not appear to be a priority for those patients interviewed and the desire for a choice of time seems to have been met for many through a weekend clinic

3.2.2 Confidence in use of service

Of the 19 GPs responding to the survey, all expressed some level of confidence in ordering a test through DAD, with 4 indicating there were occasions when they were not confident. Confidence for these GPs was related to uncertainty whether a particular test was the most appropriate and also the cost benefit of the more expensive tests. Where there was uncertainty, either a test would not be ordered or

the GP would consult available radiology guidance or seek a discussion with a colleague or radiologist.

There was less confidence in interpreting results of radiology diagnostics ordered through DAD, with over a third (7/18) of respondents saying they only sometimes felt confident interpreting the results and one GP stating no confidence.

When asked to explain their answer further (if they wished to), 13 GPs provided an explanation, even though only eight GPs responded with 'no' or 'sometimes' to the question. Only one of these explanations related to a GP who felt confident in their interpretation abilities, responding that:

"Reports provided are generally informative and aid decision making"

Some examples of difficulties mentioned in interpreting results included:

"Some CT or MRI reports can be confusing. Clinical advice with such reports is appreciated"

"Sometimes complex MRI reports can be difficult especially on spines; hard to correlate with symptoms and will end up referring anyway at times"

"Sometimes report unclear so have to clarify with colleagues or author of the report"

"Especially in recent months, some reports have not been GP friendly and we are left in a quandary over the significance, this may result in unnecessary referral to secondary care"

"Sometimes I do need clarification on some points but I am always able to discuss this with a radiologist"

"May be out of my knowledge area"

Key Finding 11: GPs were generally confident in ordering diagnostics, with one or two acknowledging some uncertainty as to the most appropriate test to order. There was a greater measure of uncertainty in interpreting radiology results, and the support of radiologists in this remains an important aspect of the DAD service for several respondents

3.2.3 Service management

The majority of GPs felt that the ordering system was good or excellent (Table 3.14) but several issues were also noted, including:

"Cannot always find what looking for - sometimes slow!"

"Need an option for more urgent requests"

"Some tests unavailable but suggested by consultants"

"More frequent updating of newly registered patients"

"Avoid repetition in completing clinical details when ordering a test e.g on other limb!"

"The lack of keyboard short cuts drives me mad! Several screens required to be accessed just to print off a fully organised test, instead of ctrl+P"

How do you feel about the system used to refer patients (Wirral Remote Ordering Communication System) (WROCS)		
Answer Options	Response Percent	Response Count
Excellent	44.4%	8
Good	50.0%	9
Satisfactory	5.6%	1
Poor	0.0%	0
Very Poor	0.0%	0
	<i>answered question</i>	18
	<i>skipped question</i>	4

Table 3.14 GP opinion of the system developed for ordering of direct access diagnostics

Nearly half the GPs responding to the survey (9/22) indicated specific improvements to the reporting system that they would value, with the remainder either happy with the service or not responding. Specific improvements mainly related to timeliness of reporting and improved clinical guidance:

“Guidance in understanding findings”

“Yes; very slow reporting times by radiology WUTH recently. Need to be turned around within 7 days. Also 2 recent incidents where reports not clearly worded and when films reviewed by senior consultant at WUTH the reports have been amended as 'normal'.”

“Concerns re suitability of the third party service WUTH have been using recently”

“Some Xray reports in recent months have taken much longer”

“Add guidance on more reports as in "suggest rescan" or “definite needs referral "aids in decision making process”

“Ensure reports received by practice within 5days”

“Results sent to requestor of that test, not to registered GP or last requestor”

“Avoid duplication of results sent to practices, via pathlinks/paper/other.”

Overall, the GP experience of the service was positive but there is some scope for improvement and this might be summarised by the following quote:

“It has been marvellous to be able to carry out more tests and manage more in the community. Some reporting is erratic - we rely on this and are not trained radiologists. It needs to be more helpful and directive towards GPs as it has been in the past.”

Patients were also very positive about the service, the speed of testing often being mentioned, as with the following example:

“Well yes it’s fast, great really to be so quick, I thought there might be a long waiting list or something!”

However, there were concerns raised about the administration of written invites and at least one instance where communication about cancelled appointments had been poor.

Patient sent for an ultrasound (using DAD):

“... I was referred for this test but the appointment didn't come through, so I had to go back and then got referred again. So I've not had the test before but I have been referred for it before

How long did you have to wait between being referred and having this test?

It was 8 weeks in total, I had to wait four weeks and then I got re-referred because my appointment hadn't come through. So the first referral didn't happen and then I went back to see the Doctor and they had to refer me again.

And what do you think about this?

Well anything could happen in 8 weeks, it's a long time. The problem I had could have gone away by now, or it could have got much worse, which might have been picked up earlier if I had been able to go to the first appointment”

Patient sent for a CT scan:

“I've been inconvenienced because my appointment with the Consultant has been changed and I think that a lot of patients don't attend appointments because of these changed appointments. I had an appointment for the 30th November and had it changed to the 12th December for no reason, there was no explanation for the change.....

“And I think the administration side of things needs to be looked at, there seems a lot of replication as some letters are duplicated ... it can confuse people, it's confused me before now. I've had two letters for the same date and time and it's made me think I've got two appointments that clash, and then my daughter looked and said oh no don't worry its the same letter. And I had a letter saying my appointment with the Consultant was changed and then I had another one and one time I'd had so many I lost track of when the appointment was and I ended up missing it, then I get a pointed letter saying I'd missed my appointment. So I rang them and I said maybe if you'd not changed it so often I'd of remembered when it was!”

Overall, patients viewed the service positively, reporting that they were glad of the service and appreciated the work of the Radiology service. Many patients welcomed the opportunity to express how happy they were with the services offered and the care received. Patients were particularly keen to praise the staff:

“The staff are fantastic, no problem there, just the admin side of things”

Key Finding 12: GPs and patients alike generally reported a positive view as to how the service was run. Specific criticism was made of the timeliness of reported results and some instances of poor communication with patients around appointments. Some GPs specifically requested better guidance around the interpretation of the diagnostic as part of the reporting system

3.3 Quality of the DAD Service

3.3.1 Repeat diagnostics

A question posed in the scoping of the evaluation was whether inappropriate ordering of diagnostics through DAD, or inadequate interpretation of the results, gave rise to avoidable repeat tests in secondary care. To investigate this, we analysed repeat scans (of the same diagnostic domain on the same body area) ordered through secondary care for patients who had previously been referred through DAD.

Over the two year period analysed, less than 0.25% of direct access CT, MRI and US scans were repeated within two weeks of an original DAD order (Table 3.15). The repeat rate for X-ray was unsurprisingly higher. Around 60% (757/1267) of these repeat orders were for inpatients, perhaps suggesting that they were an unavoidable result of a worsening clinical picture (Table 3.15). Within 60 days of original DAD order, MRI scans remained the least repeated but CT repeats increased to 1.4%, with an increasing proportion of outpatients being referred for repeat CT (Table 3.15).

	within 14 days				within 60 days				total scans, 2009-11
	IP	OP	total	% all DAD	IP	OP	total	% all DAD	
CT	7	3	10	0.24%	24	33	57	1.39%	4113
MRI	1	2	3	0.03%	5	3	8	0.09%	9002
US	37	30	67	0.17%	156	296	452	1.13%	39964
X-ray	712	475	1187	1.24%	2186	1818	4004	4.18%	95697

Table 3.15 Numbers of diagnostic tests ordered through secondary care that are considered to be repeats of DAD ordered tests, within 14 and 60 days of the original DAD order. Repeats were defined as completed orders of the same patient, same domain and same site (i.e. body area) as for a previously completed DAD order. Figures refer to the period April 2009-Mar 2011 and are shown by category of subsequent order (IP=inpatient, OP=outpatient). Numbers are also expressed as a proportion of all DAD orders for that domain

Almost a third of GPs (29.4%, 5/17) recalled that their CT patients were referred to a Consultant for a repeat diagnostic/assessment, although the examples given make clear that not all these instances involved a true repeat diagnostic as defined above:

“Malignancy discovered and patient admitted (appropriate) gallstones in another patient and referred to surgeon by Specialist Registrar (inappropriate)”

Do you think this could have been avoided? “Yes”

“Patient with Horners Syndrom who had CT brain and then referred on for MRI”

Do you think this could have been avoided? “If guidance given”

“Imaging done at CCO was not considered good enough for orthopaedic surgeons and were repeated”

Do you think this could have been avoided? “I just stopped referring to CCO”

“Specified pituitary scan required on request but not undertaken, patient even mentioned to scan staff! Patient had to return for rescan”

Do you think this could have been avoided? “To take notice of written requests in patient details by the ordering Dr”

Over a quarter of GPs (26.3%, 5/19) recalled that their Ultrasound patients were referred to a Consultant for repeat diagnostic/assessment for the following reasons:

“Gallstones”

“Sometimes interval scan done”

“If I have done on U/S and then refer as suspicious the consultants seem to do CT or MRI to further elucidate the cause of the problem”

“Findings may call for further investigations”

Over a third of GPs said their X-Ray patients were referred to Consultants for repeat diagnostics/assessments, with one GP stating that some patients go on to have CT scans, and this was unavoidable. Only two GPs recalled that their MRI patients were referred to a Consultant for a repeat diagnostic/assessment, with cord compression given as a reason.

There were very few instances recalled by patients interviewed where they had undergone a repeated diagnostic test, and the timescale for these repeats was more a matter of months than weeks. Patients did not consider that repeated tests were avoidable.

Key Finding 13: there appears to be a very low level of repeated diagnostic tests ordered following a DAD referral, suggesting that the service is being appropriately used. Where there was evidence of repeated tests, repeats largely appeared to be, or were thought to be, unavoidable

3.3.2 Cancelled diagnostics

Another measure of the quality of the DAD service might be the proportion of orders that were subsequently cancelled as a result of non-attendance or clinical error (e.g. inappropriate ordering of diagnostic). We compared data for outpatients in receipt of a scan through secondary care and DAD. DAD orders were consistently less likely to be cancelled for MRI, US and X-ray, though the cancellation rate for CT was about equivalent (Figure 3.10).

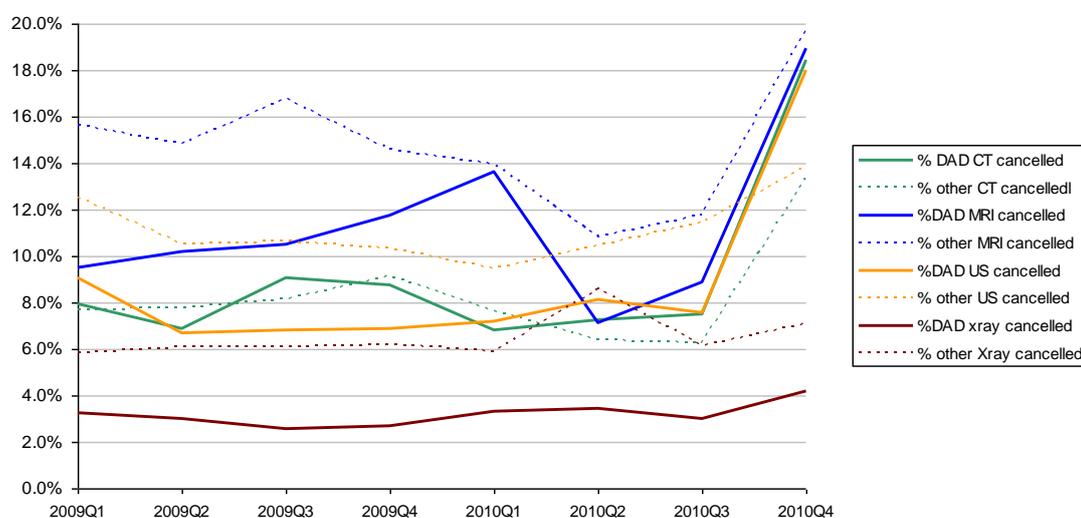


Figure 3.10 Proportion of WUTH outpatient diagnostics ordered through DAD and secondary care ('other') that were subsequently cancelled, by Quarter and domain (April 2009 to March 2011)

In the final quarter of the period studied, all domains showed a sharp increase in the proportion of orders cancelled (except X-ray) (Figure 3.9). This is most probably a result of transition to a new data management system that resulted in a large number of duplicate appointments that were subsequently recorded as cancelled. Otherwise, MRI scans were generally the most likely to be cancelled and X-rays the least likely (Figure 3.9).

Failure by a patient to attend an appointment is likely to contribute only a part of this cancellation rate but there was no way to disaggregate non-attendance from other reasons for appointment cancellation in WUTH data. Patients reported that they would normally change an appointment on the phone if they were unable to attend. The consultant interviewed estimated that around 5% of MRI appointments were not attended, with the figure for US more like 7-8%. They also estimated that only around 1% of orders would be refused by the department on the grounds of inappropriateness, with perhaps as much as 2% of CT orders being refused on account of the higher risks involved. It was felt that inappropriate orders could be addressed through better guidance to the GPs or an increased 'gatekeeping' role within the radiology department, though it was acknowledged that there were sensitivities around clinical opinion and patient expectation in taking this role.

For CCO, non-attendance is specifically recorded and analysis suggests that between April 2009 and March 2011, non-attendance was more frequent for DAD patients (7.1%, 157/2197) than those referred from other sources (4.1%, 833/20,247). However, analysis by time period shows that the rate of non-attendance for DAD patients has been on a downward trajectory since April 2009, where the rate for other referrals has remained similar (Figure 3.11).

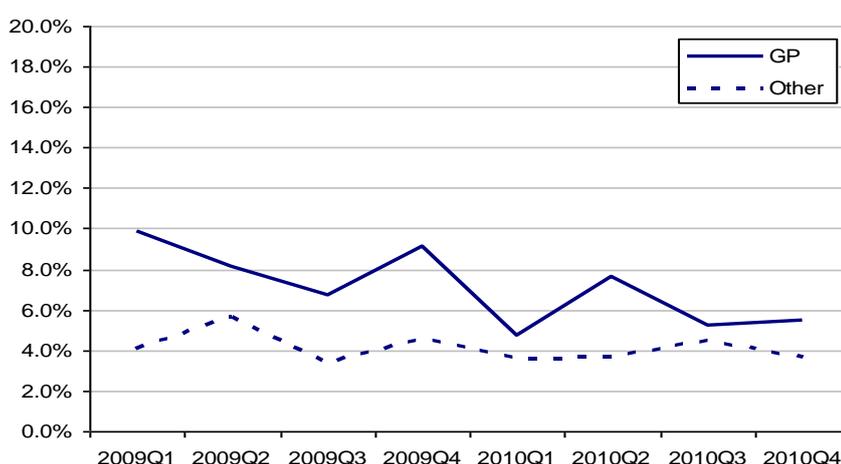


Figure 3.11 Proportion of CCO diagnostics ordered through DAD and all other referral routes that were subsequently cancelled, by Quarter (April 2009 to March 2011)

Key Finding 14: outpatients at WUTH radiology referred through DAD were generally less likely to have had their appointment cancelled than outpatients referred through secondary care. Part of the explanation for this cancellation rate may be a non-attendance by the patient but there is no evidence that the DAD service has increased non-attendance at the WUTH clinic. For CCO, non-attendance is more likely amongst DAD referred patients but there is a trend of improving performance where the difference between DAD and other referrals has decreased over time

4. Discussion

The evidence gathered through this evaluation demonstrates a positive impact of the Wirral direct access diagnostics service for radiology (DAD). This impact is apparent in the pathway, the experience and the quality of the service currently commissioned and a consistently positive view of the service was articulated by GP users, patients and a consultant in the service provider.

Although clearly a contribution to the demand for radiology diagnostics, there was good evidence that the service was being used proportionately and appropriately by GPs. In fact, use in Wirral was very similar to reported use of a recently audited direct access service in London⁶. There was some indication too that the additional demand was more than offset by saved referrals to secondary care that would have arisen before the service was commissioned. Despite an ordered diagnostic frequently resulting in a referral to a specialist, there was qualitative evidence suggesting that these referrals were much better informed than previously and potentially resulted in more appropriate use of a specialist's time.

The use of different domains of diagnostic revealed some diversity in terms of this demand. MRI was the only domain where a significantly increasing contribution to the providers' workload resulted from the DAD service. This demand particularly focussed on requests for scans of the spine and musculoskeletal sites in order to diagnose neuropathy and joint derangement. However, this probably partly represents a shift of management of such conditions from secondary to primary care rather than additional demand. This was demonstrated by a study in Lothian where the proportion of patients referred to a hospital specialist for spinal or brain investigation reduced from 90% to 52% with the introduction of a direct access MRI service, whilst diagnostic yield remained very similar⁷. GPs in Tayside reported that a direct access CT service for persistent headache had stopped a referral to secondary care in 88% of cases⁸. Although patient specific outcome data were not available to us for this project, the presented qualitative report of the Wirral service certainly echo these findings.

The evaluation does not definitively inform whether there is 'new' demand for radiology arising through DAD from previously unmet clinical need or simply as a response to the availability of new tests. The outcome of a large proportion of scans was to reassure the patient, an outcome that might arguably be reached in many cases through routine clinical practice without the aid of more complex diagnostic techniques. However, the increased availability of technology is always likely to modify clinical practice, regardless of whether the context is in primary or secondary care, and the largely stable contribution to demand arising from DAD reflects this. A study in Southern England reported that 43% of GPs had changed their request pattern for plain radiographs as a result of the introduction of a direct access MRI service⁹. Changed practice aside, there was no evidence here to suggest that incidental findings (which were commonly reported as a result of DAD) were creating significant new demand on specialist care.

Several published studies report an increased waiting time for diagnostics as a direct result of the introduction of a direct access service^{7,10,11}. For the Wirral DAD, it is clear that the timeliness of diagnostic process is generally good, though specific issues were raised in the management and administration of the service. For those referred through DAD, timeliness was actually better than for outpatients referred through secondary care (in WUTH) and data suggests that both main providers have successfully implemented approaches to address issues of timeliness for MRI.

There appears to be an increasing trend of time to verification for both US and X-ray, however, and specific issues of delay noted with the current X-ray service.

There was a diversity of use of the DAD service across Wirral practices. This probably reflects the baseline from which use of the service began more than a preference or awareness of the service as described in other studies³. For almost all practices, an increasing proportion of their patients who'd received scans had been referred through DAD between 2009-10 and 2010-11, suggesting widespread engagement with the service. However, there was some diversity in fair shares of use by specific domain and qualitative evidence suggested there was a place for increased specialist guidance or support for GPs in ordering and/or interpreting diagnostics. Attention to this aspect may result in greater equality of access for patients to the DAD service, although budgetary decisions in each practice will clearly also have a role.

Provision of choice was a key element of the service as originally commissioned but there is evidence that this is not entirely being realised. Although patients mainly felt confident to change location and time of appointments where necessary, it is clear that choice is not so much offered as occasionally sought. The GPs responding to the survey conducted felt there was a strong element of choice but this did not translate to patient experience. Having said that, there did not appear to be widespread demand from patients in terms of choice of location, but choice of time and date was more important to them and this was rarely promoted.

The quality of the service supplied through DAD was equivalent to that available to other outpatients. There was a very low level of repeat diagnostic ordered, suggesting that there were very few instances where diagnosis and management through the DAD was considered clinically insufficient. Where there were repeats ordered in secondary care, these often resulted from an inpatient episode, perhaps indicating a change in health state that demanded the repeat scan. Likewise, the rate of cancellation of appointment in WUTH (perhaps an indication either of non-attendance or of a test being refused on clinical grounds) was actually lower for users of the DAD service than all other outpatients. By the end of the period analysed, and initially higher non-attendance rate resulting from a DAD order to CCO was almost equivalent to all other orders.

5. References

1. Bowling A, Redfern J (2000). 'The process of outpatient referral and care: the experiences and views of patients, their general practitioners, and specialists'. *British Journal of General Practice*. 50:116–20
2. NHS Modernisation Agency (2004). 10 High Impact Changes for service improvement and delivery: a guide for NHS leaders. Gateway Ref: 3483. Available online at http://www.ogc.gov.uk/documents/Health_High_Impact_Changes.pdf (Accessed: Sept 2011)
3. Sibbald B (2009). Direct access to diagnostic services. *British Journal of General Practice*. 59 (562): 318 -319
4. Wilkes S, Murdock A, Steen N, *et al.* (2009). Open Access Tubal aSsessment for the initial management of infertility in general practice (the OATS trial): a pragmatic cluster randomised controlled trial. *British Journal of General Practice*. 59 (562): 329–335.
5. Foot C, Naylor C, Imison C (2010). The quality of GP diagnosis and referral. The Kings Fund. Available online at <http://www.kingsfund.org.uk/document.rm?id=8713> (Accessed: Sept 2011)
6. Wilson S, (2010). A study of the effect on patient management of GP direct access to diagnostic imaging tests – The London Outcomes Audit <http://www.londonnhsdiagnosticservice.com/silo/files/Outcomes%20Audit/SW%20Outcomes%20Audit%20Report.pdf>
7. White P, Halliday-Pegg J, Collie D (2002) Open access neuroimaging for general practitioners — diagnostic yield and influence on patient management *British Journal of General Practice* 52: 33-35
8. Thomas R, Cook A, Main G, *et al.* (2010). Primary care access to computed tomography for chronic headache. *British Journal of General Practice*. 60: 426–430
9. Apthorp L, Daly C, Morrison D, Field S. (1998). Direct access MRI for general Practitioners – Influence on patient management. *Clinical Radiology*. 53:58-60.
10. Chawda S, Watura R, Lloyd D. (1997). Magnetic resonance imaging of the lumbar spine: direct access for general practitioners. *British Journal of General Practice* 47: 575-576
11. Hawtin K, Hameed S, Ramachandran R, *et al.* (2010). Provision of a "same-day" ultrasound service in an inner-city NHS trust: report on experience and lessons learned after the first 2 years. *Clinical Radiology*. 65(1):40-6