

# Transforming Cardiac Diagnostic Services to Deliver 18 weeks

A Good Practice Guide



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June 2007

**DH INFORMATION READER BOX**

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## Foreword

The NHS is currently being challenged to ensure that patients move from referral to treatment in a maximum of 18 weeks. There is no doubt that this is a tough challenge. But let us put this into context. Only a few years ago patients were routinely waiting two years for heart surgery. Now no-one waits longer than three months. This is a huge achievement which has been brought about by improvement and redesign at all the relevant stages of the patient pathway, and by all of the different sectors of the NHS. And while cardiac services have been highlighted from the centre, with a PSA target and a National Service Framework (NSF), the underlying driver for all of this has been the need to improve services and outcomes for the patients whom the NHS exists to serve.

In the same way, the 18 weeks programme exists in order to improve access to services and outcomes for patients. Delivery of 18 weeks requires involvement and commitment and service redesign right along the patient pathway, facilitated by well-informed and imaginative commissioning.

This document aims to help commissioners understand where cardiac diagnostics need to fit into their local strategy to achieve and

maintain a maximum referral to treatment wait of 18 weeks. It sets out what is currently happening across the country, what potential and actual developments are taking place and how organisations such as the Heart Improvement Programme and the cardiac networks can help. It reminds commissioners of the need to keep an eye on the horizon for future technological developments: echocardiography accounts for today's biggest volume of cardiac tests but there are other non-invasive tests in the pipeline that may change that. Additionally newer more portable medical technology means that services can be delivered in different locations using different skills more effectively.

The NHS rose to the challenge of the CHD NSF and is rising now to meet the 18 weeks challenge. If it seems daunting, let us not forget the patient's perspective. 18 weeks may sound like a short time to the NHS, but to a patient with a potentially life-threatening condition, it is likely to look rather different. If you thought in June that you might have heart disease, would you be happy to wait until the middle of October to begin treatment? To change this requires concerted effort and a fundamental belief in the need to improve the experience of the patient.



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# Section 1: Vision for Cardiac Diagnostics Services

1. Cardiac Physiology is one of eight diagnostic specialties recognised in the National 18 week Physiological Measurement Programme together with:
  - Audiology
  - Gastrointestinal Physiology
  - Neurophysiology
  - Ophthalmic and Vision Science
  - Respiratory and Sleep Physiology
  - Urodynamics
  - Vascular Technology.
2. As outlined in the DH document 'What is Physiological Measurement?'<sup>1</sup>, the overall vision for the future of these diagnostic services, is that they should:
  - Be patient centred
  - Realise the benefits of new technology
  - Be streamlined and efficient within Referral to Treatment (RTT) pathways of 18 weeks by December 2008
  - Be delivered closer to home
  - Provide excellent patient information
    - Be accessible from primary as well as secondary care.
3. Cardiac physiology services involve the diagnosis and management of patients with known or suspected cardiac disease. An extensive range of both invasive and non invasive diagnostic procedures are performed which are outlined in the DH document 'What is Physiological Measurement?' and listed in annex A.
4. The vision for cardiac physiology services is that people with cardiac disease or suspected cardiac disease receive speedy access to diagnostics to ensure that they receive appropriate treatment as quickly as possible, or are reassured that cardiac disease has been excluded.
5. Delivering a maximum wait of 18 weeks from referral to the start of treatment by the end of 2008 is imperative for the NHS<sup>2</sup>. The goal for local health systems is to transform the experience of the cardiology service for all patients with a radical reduction in waiting times. For 18 weeks to be achieved it is vital that cardiac diagnostics are delivered as early as possible in the patient pathway.

1 'What is Physiological Measurement? A guide to the tests and procedures conducted by Physiological Measurement diagnostic services' DH (May 2007) Located at [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk) within the physiological measurement section

2 Tackling Hospital Waiting the 18 week patient pathway. An Implementation Framework published in May 2006. Located at 18 week website [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk)

6. The National Service Framework for Coronary Heart Disease<sup>3</sup> set out a 10-year plan for improvements in services and quality of care for cardiac patients. The 18 week target provides an opportunity for commissioners and healthcare providers to continue to drive forward the improvements already started as part of the NSF.
7. The Operating Framework for the NHS for 2007/08<sup>4</sup> has set challenging milestones for provider organisations to achieve in advance of the December 2008 target, which re-emphasise the need for continued and sustained improvement.
8. The key milestones to be achieved by the end of March 2008 for all cardiac pathways are:
  - >85% of pathways where patients are admitted for hospital treatments should be completed within 18 weeks; and
  - >90% of pathways that do not end in an admission should be completed within 18 weeks.
9. This document sets out an overview of the issues and challenges faced in commissioning and providing cardiac diagnostics and focuses on the improvements needed to transform the delivery of this critical part of the patient pathway. It contains examples of good practice that have been gathered from 13 Department of Health (DH) Cardiac Diagnostic Innovator sites and 8 DH NHS Physiological Measurement Development sites as well as from a number of cardiac networks in England (see annex B).
10. For transformation to be both achieved and, more critically, sustained, local health systems will need to apply the health reform mechanisms to the design and delivery of their cardiology services including:
  - Better commissioning and pathway redesign including the use of three 18 week cardiology commissioning pathways<sup>5</sup>

Integral to the achievement of these milestones is the delivery of timely and

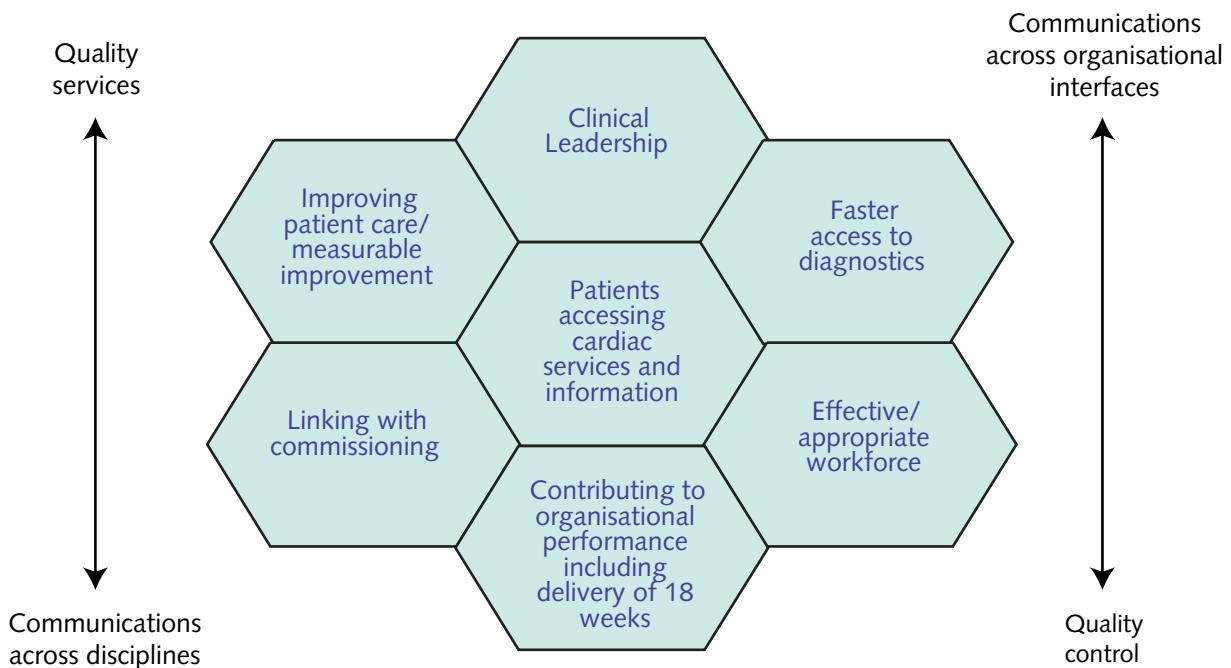
3 Coronary Heart Disease: National Service Framework for Coronary Heart Disease – Modern standards and service models. Published March 2000 Located at DH website [www.dh.gov.uk](http://www.dh.gov.uk)

4 The NHS in England: the operating framework for 2007/08, p20. Gateway reference 7408 Published Dec 2006. DH includes the diagnostic stage of treatment milestones.

5 Located at 18 week website in pathways section [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk)

- Offering choice and competition including choice of scan for echocardiography
  - Information including using the monthly cardiac diagnostics data and the quarterly diagnostics census data<sup>6</sup>
  - Applying incentives such as using locally unbundled tariffs.
- 11.** The key principles underpinning this guidance include:
- Doing what is best for patients
- Doing today's work today
  - A workforce with a 'can do' attitude
  - Good clinical leadership.
- 12.** This document aims to enable cardiac diagnostic services to achieve the key characteristics of good service providers which are shown in figure 1. It has been informed from the work with the NHS outlined in paragraph 9, the DH Cardiac Diagnostics Executive Board and the Physiological Measurement Strategy Group, which has included patient input.

**Figure 1: Characteristics of Good Diagnostics Service**



<sup>6</sup> Located at DH website Monthly and Quarterly/Biannual Data Census <http://www.performance.doh.gov.uk/diagnostics/index.htm>

13. Progress towards delivery of 18 weeks for cardiology pathways in general, and specifically the cardiac diagnostic component, will be achieved by:
  - Providing patients with information about what to expect, to allow them to participate fully and expedite their treatment and care
  - Providing diagnostic testing early in the patient journey, where possible in the primary care setting or through direct access secondary care services or in one-stop clinics
  - Greater collaboration across professional and organisational boundaries
  - Maintaining good communication between all parties
  - Having staff equipped and competent to deliver the service in a variety of settings
  - Recognising the importance of clinical leadership in driving innovation, redesign and sustainability
  - Introducing audit and quality control, if not already in place, to safeguard patient care
  - Fully exploiting knowledge, information management and technology.
14. A crucial way of spreading and implementing the good practice outlined in this document and ensuring that all providers demonstrate the characteristics outlined in figure 1, is through the continued use of the thirty cardiac networks in England. These networks already work across organisational boundaries (primary, secondary, tertiary and social care) and already engaged in service improvement work. Cardiac networks have strong leadership and good clinical engagement which is essential to achieve major change. These networks are a resource to service providers and commissioners and have an important role in improving whole patient pathways.

## Section 2: The scale of the challenge

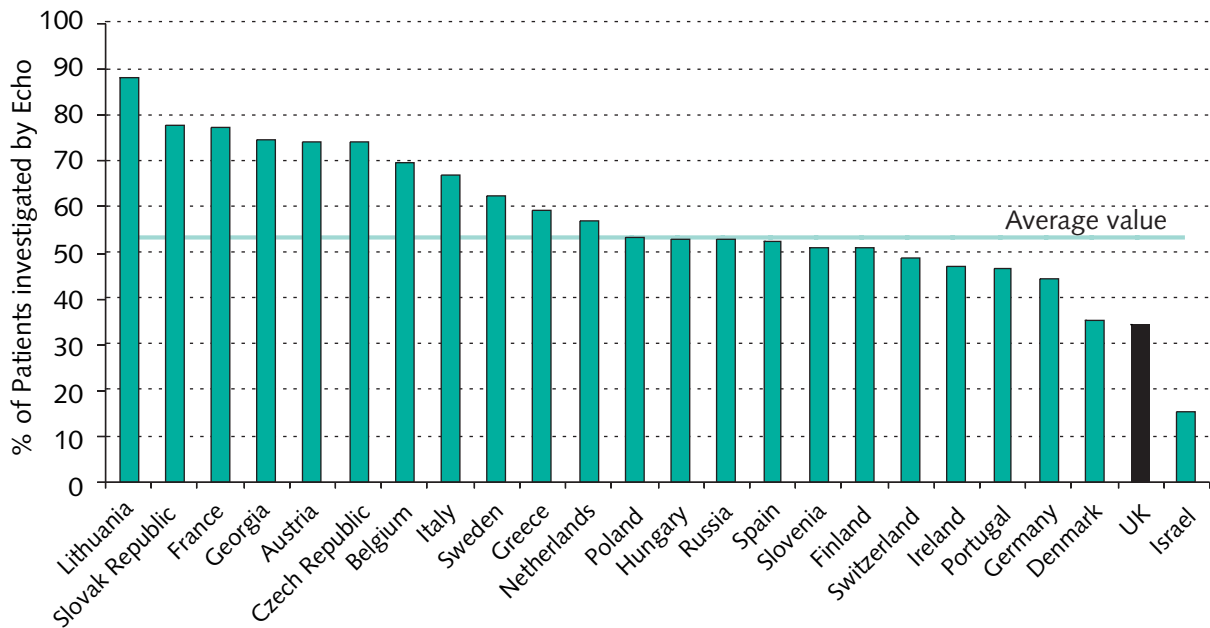
15. In England, despite remarkable improvements in treatment and mortality rates, it is estimated that cardiovascular disease is still responsible for around 100,000 deaths each year.
- 1.4 million people suffer from angina.
  - Heart failure accounts for 120,000 (at least 5%) of all medical and elderly care admissions to hospital.<sup>7</sup> It is estimated that 64,500 people develop heart failure each year and it is estimated that around 90,000 people are currently living with heart failure in the UK.\* These figures are set to rise over the next decade or so associated with demographic changes, an ageing population and an increase in obesity and diabetes and other co-morbid conditions that impact on the cardiovascular system.
16. Cardiac diagnostics play a key role in both the investigation of presenting symptoms and treatment when the latter is undertaken at the same time as the investigation. The demand for these non-invasive diagnostics is growing and the evidence suggests it will continue to increase.
17. The number of patients referred to hospital cardiology outpatients has doubled since 2000. While there is no nationally available activity data, anecdotally departments report an associated increase in demand and activity for ECGs, ambulatory ECGs and exercise tests.
18. The demand for echocardiography will continue to rise with an ageing population. The incidence of heart failure increases with age with the average age of onset being 73<sup>8</sup>. It is estimated that over 45,000 new cases of heart failure will be referred to hospitals each year in England. In addition, NICE guidance promotes greater use of echo in the detection and subsequent treatment of heart failure much earlier in the disease process. There is also an increased requirement for echocardiography to monitor the side effects of new drugs. For example, the use of Herceptin in the treatment of breast cancer is likely to increase demand for echo by 1%, and there are several similar cancer drugs due to come into regular use. The use of echocardiography is also likely to grow as more patients are living longer with congenital heart disease and require ongoing monitoring of their condition.
19. The current use of echo to investigate heart failure appears to be lower in the UK than in other European countries as shown in the data from the Euroheart study see figure 2.

7 McMurray and Dargie, BMJ 1994, 308: 321-328 29 January, Management of Chronic Heart Failure in adults in primary and secondary care

8 McMurray and Dargie, p 6 1998, Management of Chronic Heart Failure in adults in primary and secondary care

\* BHF-heartstats.org

**Figure 2: % Acute Heart Failure patients investigated by Echocardiography**



European Heart Journal (2003) 24, 442–463

- 20. The current intervention rates for echo in the UK are around 14 per 1000 head of population. Australia has an echo rate of 25 per 1000, Canada 45 per 1000 and the USA 50 per 1000. The UK rate appears low and while other countries' rates may be based on differing models of care, it seems likely that the UK intervention rate could increase. The British Society of Echocardiography has suggested future echo rates of 43-48 per 1000 head of population. However, it is important that local health systems determine the needs of their local populations.
- 21. The use of radiofrequency ablation for the treatment of conditions like atrial fibrillation has grown in recent years as

the technology has become more widespread. The number of atrial fibrillation cases referred for ablation looks set to grow further over the next few years as detection of atrial fibrillation increases and more cases are referred for ablation. Patients are usually referred straight for ablation with an Electrophysiological Study (EPS) carried out as part of the ablation session to cross-check that the ablation should go ahead. In rare instances, the EPS may suggest that ablation is not appropriate. The number of stand alone EPS studies carried out is less than 5% of the number of radiofrequency ablation procedures. The increase in atrial fibrillation detection and treatment – predicted at around 15%

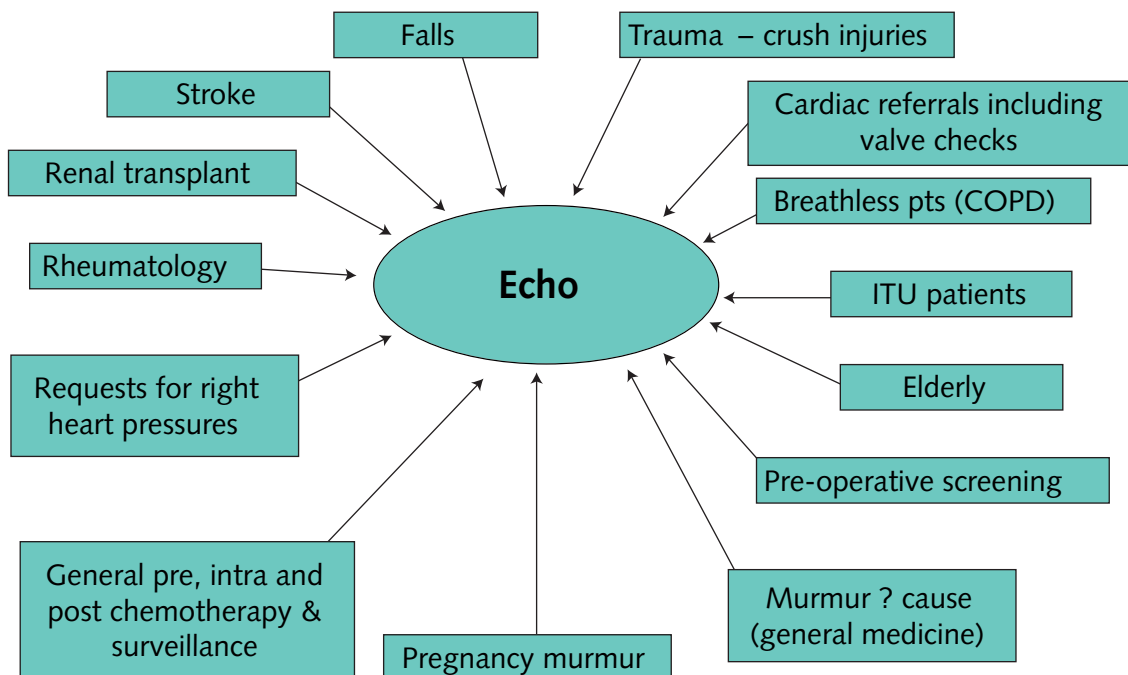
per annum for the next few years – may mean an increase in 'stand-alone' EPS of about 10%, but this will be 10% of a small number. It is the increase in radiofrequency ablation for atrial fibrillation cases that will produce the challenge to meeting the 18-week target for atrial fibrillation treatment.

- 22. An increasing proportion of coronary revascularisations are undertaken using angioplasty and coronary artery stents with fewer using surgical procedures. Demand for diagnostic cardiac catheters (angiography) has been rising – the numbers performed growing from 99,170 in 2000 to 154,661 in 2006 – a rise of almost 56% is set to continue.

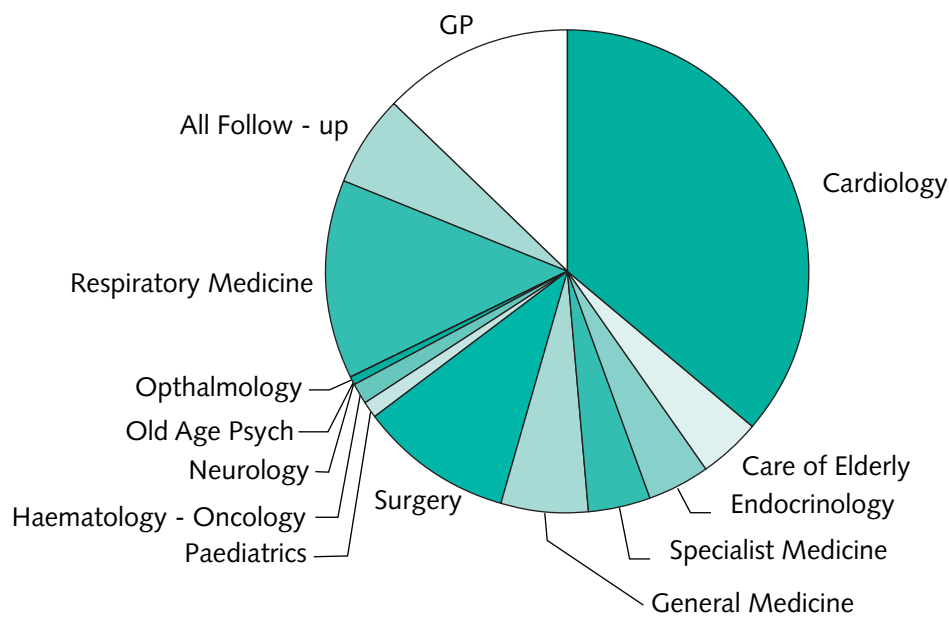
### The challenge of cardiac physiology services

- 23. The changing incidence and intervention rates for heart disease need to be seen alongside the demand for cardiac diagnostic provision from a wide range of other clinical specialities and for a number of different clinical reasons. This is not always recognised or understood by both commissioners and provider organisations.
- 24. Cardiac physiology services are not linked to a single specialty. In many departments up to 50% of referrals can come from other specialties. Common patient pathways into echocardiography are illustrated in figure 3 and reflect the use of these tests for a wide range of

Figure 3: Potential patient pathways flowing into echo



**Figure 4: West Suffolk Hospitals NHS Trust Echo Referrals**



presentations including heart failure and other heart disease such as valve disease.

- 25. Figure 4 shows a typical breakdown by referring specialty for echocardiography at a District General Hospital (DGH), demonstrating that a large percentage of referrals are non-cardiology patients.
- 26. Having the right level of cardiac diagnostic services is critical to the early detection and treatment of cardiac disease and can greatly improve outcomes for patients by getting them on the right pathway of care as soon as is clinically possible. This can be clearly demonstrated in the rapid access

chest pain clinics for chest pain sufferers, where fast access to cardiac diagnostics is available in almost all acute hospitals allowing 98% of patients to be seen in less than two weeks.

- 27. The situation is somewhat different for access to other cardiac diagnostics, as demonstrated in the national diagnostics data collection<sup>9</sup>. This is where data on numbers waiting, length of wait and activity is collected monthly for echocardiography and electrophysiology studies, with a wider range of cardiac tests being included in the quarterly census.

9 Located at DH website Monthly and Quarterly/Biannual Data Census <http://www.performance.doh.gov.uk/diagnostics/index.htm>

- 28.** This data shows that there are large numbers of people waiting for echocardiography and for cardiac catheters (angiography). Significant numbers of people are waiting for exercise tests, ECGs and ambulatory monitoring. A smaller number are waiting a long time for EPS, which is challenging as this is a lengthy complex procedure. There is also a marked variation in waiting times across the country.
- 29.** The data in figure 5 provides some indication of the challenge that needs to be faced to improve cardiac diagnostic services to achieve the diagnostic milestones outlined in paragraph 8. This challenge is set to grow as the predicted increase in demand continues.
- 30.** In addition, there are many people waiting under the 6 weeks milestone (for example 31,668 for echo in March 2007) who could be seen even sooner. In reality, the waiting times for many diagnostic tests may need to be well below the milestones to enable the whole pathway to be achieved in 18 weeks. This is particularly the case for some cardiac pathways which are complex. In order to deliver on 18 weeks cardiac diagnostic services will need to be transformed. This transformation needs to be driven by introducing innovative redesigned service models, using commissioning and the new reform mechanisms to manage demand and improve capacity.

**Figure 5: Numbers waiting main cardiac diagnostics tests at March 2007**

SHA	Source: National Monthly Diagnostics Data Collection				Source: QM08	
	Cardiology – echocardiography		Cardiology electrophysiology		Cardiology – Angiography	
	Over 6 weeks waits	Over 13 weeks waits	Over 6 weeks waits	Over 13 weeks waits	Over 6 weeks waits	Over 13 weeks waits
North East	363	0	0	0	269	47
North West	2,454	462	11	0	510	49
Yorkshire and the Humber	1,188	223	87	20	768	94
East Midlands	828	149	11	0	318	4
West Midlands	1,386	1	7	0	444	158
East of England	818	1	32	9	915	105
London	1,736	23	88	16	696	54
South East Coast	1,432	738	72	39	605	144
South Central	466	20	24	8	386	5
South West	2,237	620	29	5	788	137
England	12,907	2,237	361	97	5,699	797

## Section 3: Achieving the vision

31. Cardiac diagnostic services are commonly commissioned from acute hospitals and waiting times vary across the country as outlined in figure 5. Services could be transformed by using the wealth of existing knowledge of NHS systems and process, using innovative technology and planning and having a motivated productive workforce, as outlined in figure 6.

### Systems and Processes

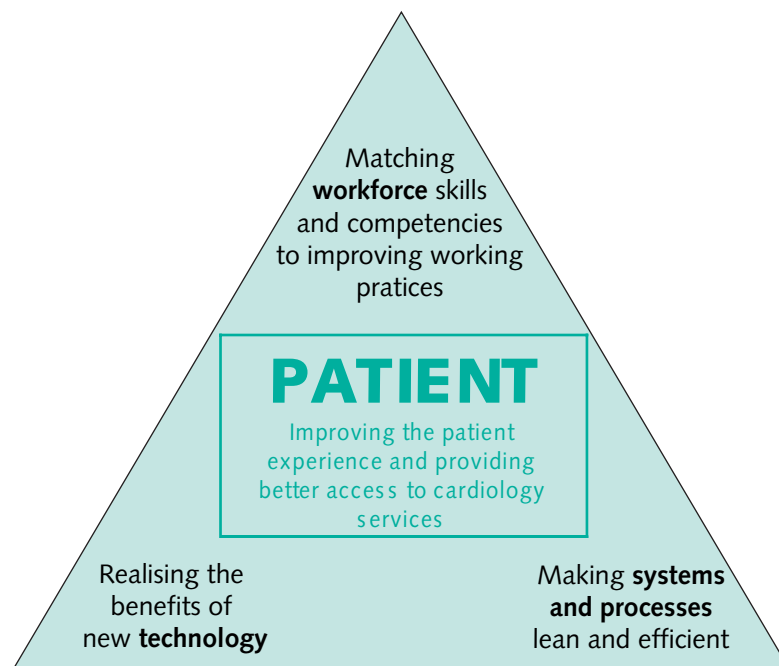
32. Waiting times for cardiac diagnostics can be radically reduced by getting the basic systems and processes right, through:

- Understanding the scale of the challenge locally and collecting

appropriate information to plan capacity

- Improving referral criteria and ensuring that they are consistently applied
- Better waiting list management and efficient scheduling, including managing 'Did Not Attend' (DNA) patients
- Utilising all the benefits of cardiology information systems and linking, where possible, with broader NHS patient management systems
- Adopting 'lean' thinking through a systematic approach to understanding processes and the value added steps in the patient pathway.

Figure 6



### Understanding the scale of the challenge using data and information to understand the local service delivery.

33. In order to understand the scale of the challenge for NHS services (see section 2), commissioners need to agree with providers in the following areas:

- Collection and analysis of demand data, against agreed lists, in order to determine the rate of referral, and to be aware of demand changes.
- Maintain data sets, which record the type of referral, referral source including speciality, referral date, appointment date, attendance record, waiting and/or clearance times.
- Patients on annual follow-ups (e.g. annual valve reviews) are not counted as waiting so that data returns are accurate.
- Understand and plan the demand and capacity of the service (encompassing all sessions and different types of referrals) knowing what is being referred in, the referral source along with what is actually being performed (activity). Knowing the number of diagnostic sessions and slots available

### Case study: West Suffolk Hospitals NHS Trust (WSH)

WSH have reduced their echo maximum waiting times from 21 weeks in July 2006 to 6 weeks by February 2007 which has been sustained. This has been achieved by a combination of simple steps and changes including:

- Implementing an improved scheduling system – separate machine for scheduled inpatient slots, creating more outpatient slots each day.
- Collecting and using data on demand and capacity to guide changes
- Proactively managing demand with adherence to referral criteria (with an escalation procedure).
- Improved use of skilled staff time – by employing a departmental support worker to assess and transfer inpatients.
- Strong departmental leadership and management support – empowering staff to take ownership and solve problems.

These positive changes have been achieved in a cramped department without the benefit of new equipment and with staffing below establishment and is a great example of the achievements possible with a positive approach to change.

for each test is essential and how this needs to alter to meet current demand and any fluctuations.

- Utilise data to inform service redesign and models of provision to ensure that access is improved and that patient flow is balanced into and out of the service.

### Improving locally agreed referral guidelines and auditing compliance to underpin improvements in service delivery and referral management.

**34.** Clear and consistently applied referral criteria to health services are a key element of service transformation processes. They help to support not only equitable provision, but also ensure that patients with defined symptoms flow into the most appropriate service. Standardised referral criteria across a network can assist with consistency and ensuring best use of valuable resources. One area of focus may be on pre-anaesthetic (pre-op) echo requests, as this is an area where requests for tests have increased in recent years (anecdotal reports from NHS clinicians). Having referral guidelines in place can help to ensure only

those patients that require an echo access this resource. In West Suffolk Hospital (see case study), proactively managing adherence to criteria has contributed to a reduction in waiting times.

**35.** Alongside referral criteria sits the importance of adequate patient information on the referral form. This will help to speed up processing and ensure the test can be completed without delay, including reporting and interpretation, to support informed clinical decision making.

### Better waiting list management and efficient scheduling to ensure maximum use of capacity.

**36.** It may be beneficial to keep the number of waiting lists held for cardiac diagnostic services to a minimum. Pooled waiting lists will assist with speeding up testing by avoiding delays generated by patients waiting for named consultants. This will also improve equity of access with appointment allocation based on date of referral and clinical priority, e.g. pooled waiting lists for angiography are run

### Case study: Bradford Health Community

Staff in the Bradford health community (Bradford Royal Infirmary and Bradford PCT) have developed a web based electronic common referral form for all cardiology referrals that ensures clinicians have relevant information when seeing the patient and significantly speeds up referrals. This has been jointly developed by clinicians from primary and secondary care. This common referral form is used for all cardiology referrals including diagnostics and this is attached in annex C.

successfully at the University Hospital Birmingham NHS Foundation Trust.

37. Reviewing existing internal paper-based referral systems and redesign will enable all diagnostic bookings to be made chronologically by date of referral and not date received by the department. This will avoid unnecessary delays.
38. Validating all waiting lists to eliminate any duplicate entries, will free up capacity which otherwise would be lost.
39. The NHS and all cardiology services, including cardiac physiology, are also encouraged to introduce a patient tracking list (PTL), which enters patients onto lists in priority order as they come into the system. This enables providers to prospectively manage their waiting lists on the basis of referral to treatment. Integral to this is ensuring that scheduling or booking arrangements are as efficient as possible and all available capacity is appropriately managed and utilised. An easy to follow guide is provided on the 18 week website<sup>10</sup> and could be used to keep lists, for example for echocardiography, ambulatory ECG, ETT and for invasive procedures.
40. To assist NHS service providers, the National Physiological Measurement Programme has developed a simple capacity planning and scheduling tool that is currently being tested by NHS partners and will be available shortly<sup>11</sup>. It is designed for use by services such as cardiac physiology.
41. Better management of waiting lists and scheduling includes:
  - Having a consistently applied policy to managing 'Did Not Attend' (DNAs) patients. Introducing systems like reminder phone calls or texts to patients can assist with significantly reducing the numbers of DNAs as demonstrated in the Bromley case study where a 40% reduction in DNA rates was seen.
  - Cancellations handled consistently and in line with the Trust's access or waiting list policy, e.g. by booking at short notice into cancelled slots, can improve capacity.
  - Offering extended hours of operation to enable more patients to be scheduled using the same physical resources.
  - Optimising slot capacity in all possible ways, this includes using diagnostic rooms flexibly. If rooms are empty for a session then consider whether you can utilise this spare capacity for another test by moving equipment around.

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<sup>10</sup> Located on 18 week website [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk)

<sup>11</sup> [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk)

### Case study: Bromley Hospitals NHS Trust

Poor data quality made it difficult to gain a completely accurate overview of waiting times for echo in Bromley. In October 2005 the average waiting time for a transthoracic echo was about 33 weeks. Long waits resulted in high numbers of follow up appointments required in cardiology outpatient clinics as results were not available in time for the initial appointment. The DNA rate was approximately 14%. This resulted in inconsistencies and inefficiencies within the service, longer waits for patients and frustration for staff.

By working in partnership with Bromley PCT, they undertook a detailed analysis of workload figures and waiting times from November 05 to January 06. This resulted in one-off PCT funding to telephone patients to remind them of their appointments and find out what the issues are for them being able/unable to attend. The result is a standard reminder letter being introduced which is now sent to all routine outpatients two weeks before their scheduled appointment for an echo. This has led to a 40% reduction in DNA rates.

### Utilising all the benefits of the cardiology Patient Management Systems and linking where possible with broader NHS Patient Management Systems

42. Many cardiac diagnostic departments have data management systems that are not currently being used to full capacity. These information systems could be used more fully in cardiac departments for reporting tests and capturing information. This can assist with making departments more efficient.
43. Electronic web based referral systems<sup>12</sup> are being used across a number of cardiac networks in England to transfer electronic referral requests for diagnostic tests and procedures. These have speeded up the patient's journey with a subsequent reduction in inter-hospital transfer times for those needing to move from a secondary care provider to another centre. This initiative has been developed to speed up the process for urgent care and has contributed to releasing significant numbers of bed days. Organisations are now looking to develop these systems to address routine referrals, with the 18 week target as a main driver.
44. When considering equipment purchase/upgrades it is essential to involve hospital IT expertise early on in the purchasing process. This will help to

<sup>12</sup> Report Web based Referral Systems for Interhospital Transfer located at Heart Improvement Programme website at [www.heart.nhs.uk](http://www.heart.nhs.uk)

ensure compatibility with existing IT infrastructure along with future proofing compatibility and/or connectivity with NHS Patient Management Systems being put into place as part of Connecting for Health solutions.

45. The DH is working with Connecting for Health (CfH) to develop the Choose and Book (CAB) system so that the functionality supports the full range of cardiac diagnostic tests and services. Other than the issue of compliance, there is nothing inherent in CAB that prevents direct booking for cardiac diagnostics referrals.
46. The clinical terminology on CAB is being developed so that providers can set up their Directory of Services (DoS) entries to standardise bookings for cardiac diagnostics services (and other Physiological Measurement services). This means GPs will know where to find the cardiac diagnostics services they require on the CAB system (prior to May, Trusts were listing services on different parts of the Directory).
47. From mid July 2007, CAB will contain four categories (known as Clinic Types) for cardiac diagnostics:
- 12 Lead ECG
  - 24 Hour Ambulatory ECG Monitoring

### Case study: Kettering General Hospital NHS Trust

#### GP referrals to a cardiologist are assessed for suitability for a one stop clinic

This is all undertaken using Choose and Book. All relevant tests are requested when the appointment is made and carried out immediately prior to the patient seeing the doctor or if requested at consultation.

This allows the cardiologist to make an informed decision regarding further treatment. Benefits include:

- Seeing the patient within two weeks of the GP referral.
- Improved quality of care.
- All results are available to the doctor during the consultation.
- Outcome letters faxed/posted to GP same day.
- Early intervention leading to earlier diagnosis.
- Patient only needs to visit the hospital once.

- Echocardiography
- Exercise tolerance test

A standard Request Form is being developed to support these referrals which will ensure that all referrals contain the right information to support bookings.

### Adopting “Lean” Thinking through a systematic approach to understanding processes and the value added steps in the patient pathway

48. Improvement work using lean methodology has been used to great effect in many parts of the NHS<sup>13</sup>. This way of thinking – pioneered in Japanese

and American manufacturing – aims to eliminate waste, avoid duplication and apply continuous improvement to processes.

49. Service model improvement stems from adopting a lean system design approach, removing unnecessary steps in the patient journey and fully using the resources that are available in cardiac diagnostic services. An effective way to attain this level of understanding is to undertake a local process mapping exercise. This should lead to improved workflow and greater efficiency of all staff, with better team working.

### Case study: Guy’s and St Thomas’ NHS Foundation Trust

#### Process mapping led to joint electronic waiting list for stress echocardiography

When reporting of diagnostics was first introduced it became evident that the system in place for managing stress echo waiting lists was inadequate. A process mapping exercise confirmed this. While the main echo waiting lists were on the Trust’s cardiology IT system and managed efficiently and centrally within the department, it transpired that the three consultants’ stress echo lists varied considerably in length, were on paper only, and were managed ineffectively by each individual consultant’s secretary.

A central joint stress echo waiting list was consequently developed on the department’s IT system. This joint waiting list has allowed for transparency and clarity in managing each stress echo list and monitoring of waiting times. It has increased the accuracy in diagnostic waiting time data reporting collected on a monthly basis and improved equity for patients in length of time waiting for a stress echo from one consultant to another.

13 Located in NHS Institute for Innovations and Improvement  
[http://www.institute.nhs.uk/quality\\_and\\_value/introduction/quality\\_and\\_value.html](http://www.institute.nhs.uk/quality_and_value/introduction/quality_and_value.html)

50. Undertaking a process mapping exercise provides an opportunity to bring all those involved in delivering the service together in one room. Identifying what currently happens and eliminating value-limiting steps can both improve the patient experience and also assist organisations to make more efficient use of resources.
51. Cardiac diagnostic services need to become more efficient. This means ensuring that diagnostic tests are not repeated unless there is sound clinical reason to do so. Applying this 'lean' thinking helps organisations to achieve improved efficiency. Prompt reporting of all diagnostic tests as they are completed and not waiting or 'batching' the reports improves efficiency. Where batching is unavoidable, then the aim should be to report all tests by the end of the same day. In the future, electronic transfer of these results should be used whenever possible. If this is not available then an efficient reporting process will ensure prompt delivery of the results to the referrer. Organisations may have to invest funding in systems in the short term, with the goal of increased efficiency in the future.
- and providers should consider the opportunity that technology brings to the efficient delivery of diagnostic investigations within the healthcare arena, whether this is in primary or secondary care.
53. Using new technology can transform services and bring benefits for both patients and clinical staff including:
- Quicker access for patients – helping to reduce patient anxiety by providing earlier diagnosis, which in turn will assist with faster treatment and better outcomes.
  - Front line staff – feel greater job satisfaction in providing patients with a more efficient service.
  - Service providers – more efficient and effective use of resources with less duplication and waste.
54. There is an opportunity to introduce new technology into cardiac diagnostic services to deliver innovative services. These are outlined below and shown in terms of opportunities and benefits for primary and secondary care in figure 7.

## Technology and Innovation

52. Using new and cutting edge technology and innovation (e.g. developments in medical science) is critically important in delivering cardiac diagnostic services for 21st century healthcare. Commissioners

Figure 7

Diagnostic Technology	Opportunities for primary care provision	Secondary care advantages
<b>Portable echo machines</b>	Portable, lightweight machines – take up less space and can support decision making earlier in patient pathway	Purchasing portable equipment enables the service to become more flexible. Machines can be easily moved from one room to another, and supports rapid response to urgent in-patient requests. This allows capacity to be maximised and opportunities for offering outreach services in the community.
<b>Provision of ECG in Primary Care and Utilising Tele-monitoring</b>	Supports diagnosis earlier in pathway and enables specialist interpretation to be made leading to informed clinical decision making	Less demands on clinical measurement services allows greater focus on more specialist tests
<b>BNP testing –making more appropriate use of echocardiography</b>	Supporting GPs in identification of appropriate patients for echo through rule out of negative BNP test	Assists with improved referral quality. Reduces the number of inappropriate requests.
<b>Electronic report and image transfer</b>		Reduces number of repeat tests required. Enables speedy management of patients needing transfer

## Portable echo machines

55. The latest advances in echocardiography include the introduction of portable machines which are very compact (the size of a laptop) and produce excellent quality images (equivalent to the standard platforms based in most acute hospitals). Some of these machines have as many modalities as their larger counterparts and are capable of being used for specialist investigations including trans-oesophageal echo. These machines can be used in a variety of locations, increasing the opportunity for service provision in a community setting by appropriately trained and competent practitioners.

## Provision of ECG in Primary Care and Utilising Tele-monitoring

56. The majority of patients with suspected cardiac diseases will require an ECG early in the pathway. ECG is easily performed in primary care but the interpretation may require additional expertise. New technology that allows ECG interpretation to be carried out over the phone can provide support to provision of ECG services in primary care. This can provide early accurate diagnosis and speed up access to treatment and may also assist with reducing emergency admissions.

### Case study: Lancashire and South Cumbria Cardiac Network

New technology to introduce groundbreaking ways of conducting ECG and event recording within GP surgeries, with swift results interpreted via phone by cardiology specialists, significantly reduced patient waiting times, providing positive flow-on effects for delivery of the 18 weeks pathway. In the period of evaluation this reduced hospital referrals by 16%. Further information is available in an evaluation completed in spring 2007<sup>14</sup>.

This technology is now being used across Greater Manchester and Cheshire Cardiac Network.

### BNP testing – making more appropriate use of echocardiography

57. B-type natriuretic peptide (BNP) testing is an example of an alternative approach to care of patients with suspected heart failure. The recently published 18 week commissioning pathway for breathlessness (heart failure), suggests that BNP could be commissioned and made available in primary care to assist primary care clinicians to refer more appropriately for echocardiography. Patients with a negative BNP test have a much reduced likelihood of a diagnosis of heart failure so the test can assist GPs with 'ruling out' patients who do not require an echo. This use of

BNP will ensure that the valuable resource of echo is more appropriately used for those patients who require a more detailed investigation of the function of their heart. The case study below illustrates how one organisation has used BNP to significantly reduce waiting times for echo.

### Case study: Kingston Hospital NHS Trust

Introducing BNP testing in primary care for patients referred for echo with suspected heart failure is now included in the outpatient protocol. Patients were invited to have a BNP test in order to exclude those with a negative BNP result, so that outpatient appointments were only used for those with positive BNP results. This assisted with reducing waiting time for echo from 26 weeks to 5 weeks.

### Electronic report and image transfer

58. One of the key challenges with diagnostics is to provide reports and sometimes images taken in one place and transfer them to another centre. Having technology available to do this is beneficial to patients and clinicians in speeding up decision making and reducing the need to repeat tests and duplicate work. To deliver 18 weeks it is essential that cardiac diagnostics services reduce dramatically the number of tests that are repeated simply because the clinician seeing the patient does not have

14 Located at Lancashire and South Cumbria Cardiac Network website [www.lscardiacnetwork.nhs.uk](http://www.lscardiacnetwork.nhs.uk)

access to either the report or the images, e.g. echocardiography, angiography. If electronic transfer is not available, then there needs to be a way to ensure that the test report and, if appropriate, test images accompany the patient on their pathway. The case study below from Bromley Hospitals NHS Trust illustrates how a relatively simple solution can be found to improving access to stored diagnostic data.

#### Case study: Bromley Hospitals NHS Trust

At Bromley Hospitals NHS Trust all echo images are now available within the hospital via the Trust's intranet. Department staff reported reduced demand for additional enquiries and reduced administrative work.

59. Challenges faced within organisations include the need to break with tradition/culture and apply a way of working that continues to look for a better way to deliver services to patients. This means keeping abreast of the changing technology, not only for its potential to transform patient care but also for the opportunities and challenges it raises for workforce development.

#### Cardiac Workforce

60. Although the number of staff working in cardiac diagnostic services has increased

over recent years, some departments are finding it less easy to respond to the pace of change<sup>15</sup>. There are variations in staffing levels and workforce profiles and even departments with similar staffing levels, profiles, and case mix do not deliver the same level of activity. In fact some of the more productive departments have lower staffing levels/grade mix.

61. For patients to have improved access to diagnostic services, providers need to make the best use of all available resources. Making sure the right people, with the right skills, do the right things is central to achieving 18 weeks and delivering a high quality service.
62. Critical to transforming cardiac services is working in new ways to provide services. Many roles have evolved in an ad-hoc fashion without structured review of the requirements of the service. There is a need for organisations to review the skill mix of their workforce to ensure that all grades of staff are undertaking roles appropriate to their knowledge, skills and competence and Agenda for Change banding for the expected level of output. It is, for example, inappropriate for a cardiac physiologist at band 7 to undertake duties more appropriate to a band 3 or 4 or for an individual to be banded at 7 or 8 for undertaking one advanced practice session per week, when

15 <http://www.ic.nhs.uk/statistics-and-data-collections/workforce/nhs-staff-numbers/nhs-staff-1996--2006>

the rest of their sessional commitments are routine and of a less highly specialist nature.

### Workforce Profiling – matching skills to required outputs

63. Cardiac diagnostics are performed by a wide range of staff, with variation in the level of staff who perform specific functions across the country. Figure 8 gives an overview of the procedures currently undertaken by the different professional groups involved. There are opportunities for practitioners to further develop skills and competencies which would benefit both patients and staff.
64. One NHS organisation, Calderdale and Huddersfield NHS Foundation Trust, has reviewed their total cardiac physiology workforce. By redesigning the workforce and introducing an associate practitioner role, the department has become more efficient and cardiac physiologists have been freed up to concentrate on more complex work. This has required supporting education and training.

#### Case study: Calderdale and Huddersfield NHS Foundation Trust

Calderdale Hospitals have redesigned their staff profile to make best use of their own staff and provide a range of opportunities for professional development. Working with the SHA Workforce Directorate, training at all levels is provided for staff, including an access course for health care scientists with an added module which increases the CATS points of the course and allows entry onto the BSc(Hons) Clinical Physiology course. Cardiac physiology courses can be accessed by students on a bursary or by employed members of staff with the option of a part time course. On completion of two years and one semester (HND) plus completion of Part 1 SCST, exam students can exit training into an associate practitioner role. This provides greater flexibility of the workforce with support roles in place to free up experienced physiologists to undertake more complex work.

Redesigning the workforce has provided the flexibility in the workforce to achieve a reduction in waiting times from 20 to 3 weeks.

65. This case study illustrates the importance of working closely with SHAs to ensure plans and commissioning arrangements support the needs of provider organisations.

Figure 8: Types of practitioners and roles

Procedure	Cardiographers and other support workers	Cardiac physiologists	Cardiac nurses	Cardiologists (including SpRs)	GPs with Special interest in cardiology
<b>ECG</b> – test procedure	Routine practice	Routine practice	Routine practice	Can undertake	Can undertake
– reporting	Opportunity to develop associate practitioner	Routine practice	Development opportunities	Routine practice	Current practice with opportunities for further development
<b>Ambulatory ECG</b> – test procedure	Current practice	Routine practice	Development opportunities	Can undertake but not usual practice	
– reporting	Opportunity to develop associate practitioner	Routine practice	Development opportunities	Routine practice	Development opportunities
<b>Exercise Tolerance testing</b> – test procedure	Assist with routine tests. Opportunities for development of associate practitioner	Routine practice or assist with higher risk patients	Development opportunities	Supervise for higher risk patients	Not usual but opportunities for development
– reporting	Not applicable	Routine practice	Development opportunities	Routine practice	
<b>Echocardiography</b> – test procedure	Opportunities for development of associate practitioners can be explored	Routine Practice	Development opportunities	Opportunity for greater use of SpRs in both testing and reporting once accredited	Development opportunities for GPwSI in both testing and reporting
– reporting	Not applicable	Advanced practice and opportunities for greater development of staff	Development opportunities		
<b>Cardiac catheters</b> – technical support	Opportunities for assistant/ associate practitioners to be developed	Routine practice with opportunities to develop generic skills	Routine practice with opportunities to develop generic skills	Not applicable	Not applicable
– perform procedure and reporting	Not applicable	Development opportunities	Development opportunities	Routine practice	Not applicable
<b>Electrophysiology</b> – technical support	Not applicable	Routine practice	Development opportunities	Special interest	Not applicable
– Perform procedure	Not applicable	Development opportunities need to be explored	Development opportunities to be explored	Special interest	Not applicable
<b>Implantable defibrillators</b> Clinic review	Not applicable	Routine	Development opportunities	Routine practice	Not applicable
<b>Cardiac arrhythmia assessment</b>	Not applicable	Development opportunities	Development opportunities	Special Interest	Development opportunities

66. Career pathways in many cardiac physiology departments have evolved instead of being designed to match skills to service needs. There are opportunities to introduce a more flexible career pathway, as the Calderdale case study demonstrates. The introduction of associate practitioners and other support roles, means cardiac physiologists and nurses can be freed up from routine duties. They can specialise in areas such as cardiac catheter laboratory work, practitioner led services and programming implantable cardiac rhythm management devices where there has been increased demand.
67. Addressing the 18 week agenda provides an opportunity to review traditional ways of working. The Department of Health is currently working with professional groups to explore broader skill sets. Flexible approaches to training need to be considered both within NHS organisations and academic institutions.
- Skill mix and new roles**
68. The challenges of increasing specialist areas of practice are requiring departments to consider how staff can be used differently and new skills developed and roles expanded. Cardiac Rhythm Management (i.e. pacemakers, implantable cardioverter defibrillators (ICD) and electrophysiology) is challenged two-fold. Firstly, it is an expanding area with a shortage of highly skilled staff and, secondly, the increase in numbers of rapid access chest pain and arrhythmia clinics are also leading to increasing demands on non invasive staffing in areas such as exercise testing and ambulatory ECG analysis. Development of support roles such as associate practitioners and other support staff will help to free up the more experienced staff to provide specialist roles.
69. Use of administrative staff to manage bookings and day to day coordination of the department further releases specialist staff to concentrate on more complex work. Making these changes to the skill mix provides a more affordable and productive option for future workforce.
70. Opportunities to use specialist registrars once accredited in their training, such as in echocardiography, will provide additional resource and free up other staff for different tests, which is illustrated in figure 9.
71. A range of new roles is evolving at all levels to provide creative solutions to providing cardiac diagnostic services. A selection of these roles is listed in the table below (figure 9) with details provided on both 18 week and Heart Improvement Programme websites.

Figure 9

Role	Impact	Organisation
GP and Nurse Consultant with special interest in cardiology	Allows most patients to be managed in primary care	Harrow PCT
Advanced Practitioner running rapid access arrhythmia clinics	Dramatic reduction in waiting times and released out patient capacity	United Bristol Hospitals NHS Trust
Specialist Practitioner working across disciplines in cardiac catheter labs (nursing, physiologist and radiographer roles)	Provide greater flexibility of workforce and cross cover of roles	Guys and St Thomas' and other London Hospitals
Associate practitioner generic cardiac catheter laboratory support role ambulatory ECG interpretation and 2nd person in exercise testing	Releases the cardiac physiologists and nurses to concentrate on their areas of specialist activity such as echocardiography and cardiac rhythm management	Papworth Hospitals NHS Foundation Trust
Cardiac support workers in cardiac investigations unit	Provision of routine work to release more experienced staff for complex roles	University Hospital Birmingham NHS Foundation Trust
Clerical staff	Manage the booking and appointments system	University Hospital of North Staffordshire NHS Trust

### Case study: University Hospital Birmingham NHS Foundation Trust

They have employed echo support workers to ensure the smooth flow through the echo department. These members of staff have several different roles from phoning and collecting patients to administrative roles in the processing of echocardiogram reports. It has ensured that the echocardiographer is not disturbed during scans and that there is a chaperone if required. They can also get results for clinicians and also give feedback on when scans are likely to be performed. A key part of the role is undressing and dressing patients.

72. Creative approaches to training and development need to be developed in order to achieve this flexibility in the workforce which may include use of e-based learning opportunities and a network wide approach to training. In addition, clinical supervision and governance arrangements need to be put in place for all levels of staff.

### Case study: Bristol Royal Infirmary, United Bristol Healthcare NHS Trust

Staff in Bristol pioneered the concept of a cardiac physiologist led cardiac arrhythmia clinic. GPs now refer any patients with suspected arrhythmias for testing by the physiologist prior to referral to a cardiology out patient appointment. Out of the first 100 patients referred only one required referral on to an out patient appointment. This has made a significant impact in improving the waiting times for patients and freeing up the cardiologist to manage patients with complex needs.

### New ways of working

**73.** Primary care based cardiac diagnostic models, usually led by a GP with a special interest in cardiology, are developing models of care. Successful services have GPs supported by other professionals, usually nurses and physiologists who take on specialist roles. Such practitioners with a special interest (PwSI) are in a position to provide care in the community for patients who otherwise might have to attend hospitals, either as new patient referrals or follow-up. These services can only be cost effective with a team approach and appropriate administrative and clinical support with mentorship.

**74.** Evidence suggests that these primary care services can be effective in:

- Being a filtering mechanism preventing, in some cases, over 60% of referrals to cardiology outpatients
- Stabilising patients in heart failure thus preventing unnecessary hospital admissions

### Case study: South Birmingham PCT

As part of the heart failure service operating between primary and secondary care there are weekly primary care diagnostic echocardiography clinics carried out by a GPwSI. There are also primary care based, heart failure specialist nurse led follow up clinics for commencement and up titration of medical therapy and patient education. Primary care clinics are also supported from secondary care by a consultant cardiologist with a special interest in heart failure who is available for advice and referral.

### Working practices

**75.** In the short term, additional workforce capacity can be generated by implementing more flexible working arrangements. In particular there are real opportunities to attract returners back to work, by using the following:

- Use of flexible working hours, where there are extended day time hours or weekend working

- Sessional working arrangements
- More creative contracts, such as term time contracts
- Bringing back returned staff to work sessional contracts

### Case Study: University Hospital Birmingham NHS Foundation Trust

Flexible working arrangements:

#### **Return to work after maternity leave**

An experienced echocardiographer returned to work after having triplets and it was agreed to reduce her hours to five hours per week whilst her family are young. This enables this echocardiographer to keep her skills up to date and contribute to service delivery. Discussions have already taken place with her so that when her children start school she will work term time only.

#### **Extended working hours**

Some members of staff now work four long days. There are advantages and disadvantages. There has been much pressure on the service to ensure that the out patient waiting list is kept minimal but to deliver the in patient service as well. With staff working longer hours in patient investigations are performed both before and after the out patient lists, i.e. echo lists run from 0800 to 1800 hours and there is time to ensure that all reporting is completed at the time.

## Leadership

76. There is strong evidence from the organisations cited in this document that one of the biggest success factors is due to inspirational leadership and a 'can-do' attitude. To achieve major change in workforce transformation, strong clinical and managerial leadership is essential.
77. Clinicians and managers play a key role in discussing how the service can be provided and it is important that all providers are involved with discussions relating to future provision.
78. Senior departmental staff have an opportunity to shape the local agenda by contributing to cardiac network diagnostic groups to share good practice and agree locally negotiated solutions to current and future challenges.

## Section 4: Delivering the vision

- 79.** To assist in delivering the vision for cardiac services, three high-level cardiac symptom based pathways<sup>16</sup> for breathlessness (heart failure), chest pain and palpitations (atrial fibrillation) are in development to support and enable commissioners to deliver the 18 week pathways. The purpose is to challenge existing practice, utilise service improvement tools and techniques, and maximise opportunities for transformational change.
- 80.** With the publication of these pathways, commissioners have a real opportunity to use their local infrastructure to get advice and guidance on commissioning new models of care. Apart from local organisations and strategic health authorities, they will have a local cardiac network that will be able to assist them with accessing evidence and getting clinical engagement in taking forward new initiatives. Moving care closer to the patient underpins all this work<sup>17</sup>.
- 81.** Cardiology services for the NHS need to be commissioned to provide patients with services that are responsive to their needs and that empower patients to be good partners in meeting those needs. The three cardiology 18 week commissioning pathways promote delivery of a service in which:
- Primary care provides a more active role in assessing patient need, determining whether there is a need for local management or referral to hospital services
  - Referral criteria is uniformly implemented and used to direct patients to the right referral streams
  - Wherever possible patients receive one-stop assessment and treatment, based on available technology and workforce
  - Diagnostics are provided early in the pathway.
- 82.** These new pathways are driving changes in the way in which cardiac diagnostics need to be performed and delivered in order to :
- Exclude those patients who do not have a cardiac problem, resulting in avoiding unnecessary out patient appointments and A&E attendances
  - Make an early diagnosis for patients with a cardiac problem, to optimise care and clinical outcomes
  - Ensure patients are put onto the correct treatment and management as soon as possible
  - Deliver tests in a location that is convenient for patients and close to home.

<sup>16</sup> Located on 18 week website at [www.18weeks.nhs.uk](http://www.18weeks.nhs.uk)

<sup>17</sup> Our Health. Our Care, Our Say located at DH website [www.dh.gov.uk](http://www.dh.gov.uk)

**Case study: Harrow PCT** has established a primary care based clinical assessment service including ECG, 24 hour tape, event monitoring, 24 hour BP and echo. Physiologists from St Mary's attend the clinic to perform the echo. Interpretation is completed back at the hospital at present. This arrangement is continuing to develop and improve.

Six clinics are held each month, run by three GPs with special interest in cardiology, a nurse consultant, two heart failure nurses and a health care assistant. All patients are seen within eight days of referral. Approximately 72% of patients seen are managed in primary care and do not require referral to out patients.

### **Case study: Lewisham PCT and University Hospital Lewisham**

#### **Delivering a Sustainable Model of Care For Ambulatory Blood Pressure Monitoring In the Community**

All patients requiring ambulatory blood pressure testing for diagnosis of hypertension were referred by their GP to the local DGH for a cardiology appointment as there was no direct access service. The range of waits was up to 48 weeks.

In Feb 2005, four ambulatory blood pressure monitoring clinics were set up as an enhanced service in GP surgeries, one in each neighbourhood locality. The equipment was provided by the PCT and staff from the surgeries manned the clinics. Training and a comprehensive resource pack were provided to the practices and the service was initially monitored as a pilot for one year. It has been continuously evaluated since. The clinics have been running successfully now for two years.

This remodelled pathway has reduced **waiting times for this particular diagnostic test from an average of 14 weeks to about 2 weeks**. This has facilitated earlier diagnosis and treatment for the patients concerned. It has also allowed the practices to identify their patients with hypertension more accurately.

The service is continuously evaluated by patients through completion of a patient satisfaction questionnaire. In a six month period, the results showed that 100% of patients were positive about the service. 88% rated the service as good and 12% felt it was satisfactory. No patients thought it poor/unsatisfactory. Patient quote from the Lewisham service:

'In my view the service is up to date at the moment and there should be nothing added or taken away'

### Models demonstrating how and when cardiac diagnostic tests might be delivered in the patient pathway.

83. A range of models is evolving that will help deliver the vision for cardiac services. Illustrations of these have been described in this document. Developing new service models can assist with speeding up the patient's access to diagnostics. This could be through the establishment of one stop services or direct access to diagnostics in primary or secondary care, or through an independent sector provider.

### One Stop Clinics

84. Using a one-stop approach, where diagnostics are held on the same day as the outpatient appointment, avoids delays and repeat attendances. This helps provide an improved experience for patients with early diagnosis and treatment in one visit.

#### Case study: One-stop shop at Queen Elizabeth Hospitals NHS Trust (QEH), Woolwich

By establishing a one-stop clinic with echocardiography, QEH have managed to reduce their waiting lists for echo from 25 to 2 weeks. To achieve this they made a number of service improvements including:

- Triaging all existing requests
- Addition of extra slots (3x) weekly, to see urgent referrals
- Increasing administration to resolve pending appointments and outstanding requests to OPD
- System for holding echo requests for clinics

No additional resources were used and this model has proved to be sustainable over a six month period.

### Case Study: Charing Cross Hospital, Hammersmith Hospitals NHS Trust

An innovative one-stop approach to cardiac care ensures that patients have access to a clinician, diagnostic investigations and treatment all on the same day.

Local GPs, A&E department and other hospital clinicians can refer patients with a new presentation of chest pain, palpitations and suspected cardiac-induced breathlessness to the rapid cardiology clinic at Charing Cross Hospital on a 'one-stop', no appointment basis.

The aim of the service is to promptly identify, diagnose and risk stratify new presentations of suspected cardiac disease and, where a positive diagnosis is made, immediately initiate effective management.

The clinic runs every weekday at Charing Cross with the core team consisting of a Specialist Registrar, Clinical Fellow, a senior nurse and a cardiac physiologist. The service is supervised by a Consultant Cardiologist.

Referrers provide a letter via either email, fax or by giving it direct to the patient to take to the clinic. No appointments are necessary. Patients are seen on the day of attendance which, for the majority, is also the day of referral.

All patients have a full history taken and have an examination and clinical assessment performed alongside all relevant non invasive investigations as part of a single assessment process.

The clinicians have utilised a number of technologies to improve the service; Use of 'tablet computers' (small hand held devices that can be 'written' on and downloaded at a later time). This allows the prompt entry of data and the creation of a patient record. The tablet computer allows the practitioner to write directly on it during the clinic. This converts electronically to a patient record document, which allows a clinic letter to be generated. This reduces the need for secretarial support to type up clinic letters. The process allows the GP to receive the clinic discharge letter earlier and the patient benefits from prompt management.

In a survey of patients, 87% reported a positive experience at the new clinic.

Further information: Tenkorang JN , Fox KF, Collier TJ, Wood DA.

A Rapid Access Cardiology Service for Chest Pain, Heart Failure and Arrhythmias accurately diagnoses cardiac disease and identifies patients at high risk: A prospective cohort study. Heart 2006; 92 1084

## ECG advice and interpretation

85. Other options include obtaining specific expertise to support local decision making such as ECG advisory and interpretation services, as mentioned earlier in the Lancashire and South Cumbria Cardiac Network case study. This allows patients to be seen in their own practice but gives the GP expert interpretation to support decision making.

### Case study: South Birmingham PCT

Consultant cardiology input is in place to support and regularly audit the ECG reporting in primary care. The results have been shown to be accurate and effective with very few cases of significant discrepancy. In addition, where interpretation of any ECG is difficult this can be sent in for a second opinion. This is also available for echocardiography results from the GPwSI-led echocardiography clinic in primary care. The annual audit from primary care and secondary care heart failure diagnostic echo clinics reveal an almost identical pick up rate for left ventricular dysfunction providing an index of internal quality control. Patients with significant cardiac disease diagnosed by echocardiography in the community clinics, i.e. significant valve disease, are also referred on into the hospital based part of the service.

## Bringing care closer to home

86. As previously described, with advances in technology, the use of portable machines provides an opportunity to undertake many diagnostic tests in a non hospital environment. PCT based services bring care much closer to the patient.
87. Service provision in the community may be provided and supported through a variety of models, including outreach sessions by physiologists from the local hospital, GPwSI or independent sector providers. The service can also be supported by secondary care providing quality assurance in audit.

## Commissioning issues

88. Cardiac diagnostic tests currently do not have a separate tariff but are bundled in the out patient tariff. Access to tests and interpretation requires local agreement with a negotiated fee. A number of organisations across the country have negotiated local tariffs for ECG, 24 hour tapes, BP, and echocardiography, either by a direct access to the hospital or providing the services in the community.

**Case studies:****Calderdale Hospitals NHS Foundation**

**Trust** have agreed a local tariff for direct access services for ECG, spirometry, 24 hour tape, 24 hour BP and Echo.

**Bristol Hospitals NHS Trust**

Have negotiated tariffs with commissioners – one tariff for new patients which includes all that is required in the one stop clinic and a separate tariff for follow up

89. Clinicians and managers need to be repeatedly reviewing services drawing together their collective wisdom to progress them to fit with the needs of today's, and, crucially, tomorrow's patients. Organisations will not be able to deliver by continuing to do things the same way. 18 weeks is not an old-style waiting list initiative and will not be met by those management techniques. More radical thinking is required in transforming provision including that of diagnostic services.

**Supporting implementation**

90. The NHS Heart Improvement Programme (HIP) have launched three tools<sup>18</sup> to help organisations specifically with the work on 18 weeks.

- A new Demand and Capacity tool which will help to calculate the real day to day demand for a service, and to calculate the capacity that is needed to meet that demand. Building on well established service improvement methods, this new automated tool will enable you to examine a number of different planning options to make better informed decisions.
- The Patient Pathway Analyser allows use of data from PAS and other systems to examine, on an individual basis, how patients move through a pathway.
- An interactive cardiac 18 week wait support tool.

The first two tools can be specifically applied to cardiac diagnostics and the third has a diagnostics section. Cardiac networks are well positioned to support the use of these tools.

**A Skills Based Framework for Practitioners with a Special Interest In Cardiology<sup>19</sup>**

91. This skills-based operational framework is for teams who want to use the PwSI approach to deliver cardiology services. Aimed at commissioners of cardiac services, current and potential cardiology PwSIs, and training providers, it is

<sup>18</sup> Located at Heart Improvement Programme website [www.heart.nhs.uk](http://www.heart.nhs.uk) in documents for sharing section

<sup>19</sup> Located at Heart Improvement Programme website [www.heart.nhs.uk](http://www.heart.nhs.uk) in documents for sharing section

produced by the NHS Heart Improvement Programme and endorsed by the DH and professional clinical bodies.

- 92.** Beside these and the NHS Heart Improvement Programme's wide range of good practice materials and resources for improving cardiac services, there is a battery of resources from the NHS Modernisation Agency and NHS Institute of Innovation and Improvement, geared more generally towards systems and processes including the 'No Delays Achiever'<sup>20</sup>.

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<sup>20</sup> Located at NHS Institute for Improvement and Innovation [www.institute.nhs.uk](http://www.institute.nhs.uk)

## Section 5: Supporting commissioners and providers

### Questions to ask when commissioning cardiac diagnostic services include:

- Do we know that this service will provide the tests that we require?
- Does the service provider have a good clinical governance structure?
- How will quality assurance be carried out?
- Will there be a regular audit?
- How will the provider communicate with the referrer?
- Is there a way to ensure that the test report and, if appropriate, test images follow the patient on their pathway?
- Will appropriately trained staff carry out the service?
- Have I had any clinical input into this decision?

### 93. Key actions for SHA/18 week leads

- Understand the demand for local services.
- Know what the current gaps are in cardiac diagnostics for delivery of 18 weeks and support organisations to close the gaps.
- Liaise with the local cardiac networks who can provide service improvement expertise and coordinate their input across organisations.

- Commission education and training provision to deliver a workforce fit for the future to deliver the 18 week pathway.

### 94. Key actions for PCTs/Commissioners

- Understand the demand in the local population to direct the right level of service to meet those needs.
- Communicate with cardiac networks or local clinicians and practitioners to support active clinical engagement in commissioning decisions.
- Develop a robust quality governance framework for provision of cardiac diagnostics, including the community and independent sector.
- Put mechanisms in place to commission appropriate workforce, including robust workforce planning, for the future to deliver new models of care.
- Provide a combination of service redesign and adequate capacity for the delivery of 18 weeks.

### 95. Key actions for providers

- Understand and manage the service, including demand, to ensure optimum use of all available diagnostic capacity.
- Put systems in place to reduce waste e.g. duplication of tests, DNAs,

cancellations, validation of waiting lists.

- Revisit the workforce options to match service functions and improve productivity by new ways of working and ensure the workforce is affordable and sustainable.
- Use clinical leadership to take forward change and ensure sustainability.
- Utilise technology to become more efficient.
- Develop robust clinical governance arrangements to safeguard patient care.
- Develop good communication with PCTs, commissioners, SHAs and cardiac networks.
- Utilise 18 week guidance on inter provider referrals.

96. Cardiac networks can be used as a powerful vehicle in supporting commissioners with the introduction of change. Networks have strong clinical engagement and patient involvement which will support working towards implementing and sustaining innovative patient focused solutions. The NHS Heart Improvement Programme, covering all the cardiac networks in England, has access to a vast amount of useful knowledge and information. They have expertise in systems and process redesign, technological and workforce development and a strong track record of patient engagement and involvement and engaging patients and users in service change.



## Conclusion

97. This good practice guide sets the vision and direction of travel to improve access and quality for patients through transforming cardiac diagnostic testing. It gives examples from NHS Innovator sites and other NHS organisations who have successfully improved their service using service improvement techniques, modern technology, workforce tools and, in some cases, new models of delivery. In order to achieve patient pathways of a maximum of 18 weeks from referral to treatment, access to diagnostics needs to happen early on in the pathway. Organisations should use all available levers such as Practice Based Commissioning (PBC) and tariff unbundling flexibilities to be in a position to deliver the 18 week patient pathway. Success will require good communication, a willingness to change, radical transformation in some areas, and strong clinical leadership to introduce and sustain improvement.

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## The Cardiology Diagnostic Project Team

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## The Cardiology Diagnostic Project Board (past and present)

Sue Hill – Chief Scientific Officer and National Clinical Lead for Physiological Measurement, Department of Health; Roger Boyle – National Director for Heart Disease and Stroke, Vascular Programme, Department of Health; Elizabeth Lynam – Branch Head, Vascular Programme Department of Health; Tessa Ing – Primary Care Lead, CHD Vascular Programme, Department of Health; Becky Farren, Physiological Measurement, Policy and Implementation Manager, Department of Health; Michael Davies – Consultant Cardiologist, University Hospital Birmingham, Strat Liddiard – General Practitioner Jacqui Howard – Cardiac Physiologist, Chesterfield; Phillippa Robinson – National Implementation Director, 18 week programme, Department of Health; Jenny Bareham – Head of Service Transformation, 18 weeks Programme, Department of Health; Lesley Burn – management consultant, Living Media; Adrian Pennington – Past Chief Officer, Heart Improvement Programme.

## The Clinical Reference Group

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Dr Iqbal Malik Consultant Cardiologist – St Mary's Paddington  
Chris Eggett Society of Cardiac Physiology and Technology  
Campbell Cowan Consultant Cardiologist  
David Hackett Consultant Cardiologist  
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## Department of Health Cardiology Diagnostic Project Innovator Sites

Greater Manchester and Cheshire Cardiac Network; Lancashire and South Cumbria Cardiac Network; Lewisham PCT and University Hospital Lewisham; Queen Elizabeth Hospital, Woolwich; Charing Cross Hospital, Hammersmith NHS Trust; Kingston Hospital; Harrow PCT, Princess Royal University Hospital, Bromley Hospitals NHS Trust; Guys and St Thomas' Foundation Trust; Papworth Hospital; Kettering General Hospital, Northamptonshire; West Suffolk Hospital, Royal Devon and Exeter Healthcare Trust. South Birmingham PCT

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Janet Ratcliffe, Greater Manchester and Cheshire Cardiac Network Director

Mark Cohen, Physiological Measurement Policy and Implementation, Department of Health

Janet Williamson, Interim Chief Officer, Heart Improvement Programme

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**Other stakeholders involved:**

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Tabinda Rashid-Fadel, United Bristol Healthcare NHS Trust

Leanne Hackshall, Papworth Hospital NHS Foundation Trust

Marie Herring, Northern Network of Cardiac Care

# Annex A: Cardiac Diagnostic Tests Summary

## ECHOCARDIOGRAPHY

Echocardiograms TTE

Echocardiograms Bubble study with or without Contrast

Echocardiograms Dobutamine Stress Echo

Echocardiograms GUCH

Echocardiograms TOE

Intraoperative TOE

## ELECTROPHYSIOLOGY

Electrophysiological Study (EPS)

EPS + Ablation

EPS + Carto Mapping +/- Ablation

VT Stim

## ECG & BLOOD PRESSURE RECORDING AND MONITORING

Electrocardiograms

Ambulatory ECG monitoring (Holter monitoring)

Patient activated ECG monitoring/event recorder

Ambulatory BP Monitoring

Exercise tolerance testing

Metabolic exercise testing (or Cardio-respiratory Exercise Testing)

Tilt testing and Autonomic Function

Pharmacological challenge

## CATHETER LABORATORY/ OTHER IMAGING PROCEDURES

Implantable devices: Pacemaker, Bi-ventricular pacemaker

Implantable devices: Defibrillator

Implantable ECG recorder

Pacemaker, Bi-ventricular pacemaker

Follow-up

Implantable Defibrillator: Follow-up

Implantable ECG recorder: Follow-up

Cardiac Biopsy +/- Right Heart Catheters

Cardiac Catheterisation: Diagnostic

Cardiac Catheterisation:  
GUCH/neonatal/paediatric/congenital

Invasive Cardiac Output Measurement

Stress thallium/radionucleide scans

Cardiac Magnetic Resonance Imaging (MRI)

Cardiac CT

# Annex B: Innovator and Physiological Measurement Sites

## Innovator sites

Hammersmith Hospitals NHS Trust  
Charing Cross Hospitals NHS Trust  
West Suffolk Hospitals NHS Trust  
Guy's and St Thomas' NHS Foundation Trust  
Bromley Hospitals NHS Trust  
Queen Elizabeth Hospitals NHS Trust, Woolwich  
Kingston Hospital NHS Trust  
Lewisham PCT and University Hospital Lewisham  
Kettering General Hospital NHS Trust  
Harrow PCT  
Royal Devon and Exeter NHS Foundation Trust  
Lancashire and South Cumbria Cardiac Network  
Greater Manchester and Cheshire Cardiac Network

## Other participating hospitals

United Bristol Healthcare NHS Trust  
Bradford Teaching Hospital NHS Foundation Trust  
Calderdale and Huddersfield NHS Foundation Trust  
Papworth Hospitals NHS Foundation Trust  
South Birmingham PCT

## Physiological Measurement Sites

East Kent Hospitals NHS Trust  
Leeds Teaching Hospitals NHS Trust  
Norfolk & Norwich University Hospitals NHS Trust  
Pennine Acute Hospitals NHS Trust  
Royal Devon & Exeter NHS Foundation Trust  
Royal Free Hampstead NHS Trust  
University Hospital Birmingham NHS Foundation Trust  
University Hospital of North Staffordshire NHS Trust

# Annex C: Bradford Unified Referral form

Bradford and Airedale Teaching   
Primary Care Trust

## Unified Cardiac Referral Form Urgent/Routine/Chest Pain Clinic

(Delete as appropriate)

PATIENT DETAILS		GP DETAILS			
<b>Name</b>		Name	Surgery		
<b>Address</b>		Tel	Fax		
<b>Post Code</b>		Name of Referring GP if different from above			
<b>DOB</b>		<b>GP Signature.....Date</b>			
<b>Tel/Contact</b>		Preferred Cardiologist			
<b>Male/Female</b>		Preferred Hospital (if applicable)		Previously seen Cardiologist? Yes/No	
<b>NHS Number</b>		Who?	Last Seen		
Presenting Feature/Symptom					
<b>Chest Pain</b> <input type="checkbox"/>	<b>Heart Failure</b> <input type="checkbox"/>	Murmur <input type="checkbox"/>	Hypertension <input type="checkbox"/>	Syncope <input type="checkbox"/>	Palpitations <input type="checkbox"/>
<b>Previous History (with dates)</b>			<b>Health Stats and Examination</b>		
<b>Confirmed Angina</b>	YES/NO	<b>Hypertension</b>	YES/NO	<b>FH Premature IHD</b>	YES/NO
<b>Prior MI</b>	YES/NO	<b>Palpitations</b>	YES/NO	<b>BMI</b>	.....kg/m <sup>2</sup>
<b>Cardiac Surgery</b>	YES/NO	<b>Atrial Fibrillation</b>	YES/NO	<b>Smoker</b>	YES/NO
<b>Please Specify</b>	.....	<b>CVA</b>	YES/NO	<b>Smoker</b>	.....cigs/day
<b>Heart Failure</b>	YES/NO	<b>Diabetes</b>	YES/NO	<b>Alcohol Intake</b>	YES/NO
<b>NYHA</b>	I / II / III / IV	<b>Hyperlipidaemia</b>	YES/NO	<b>Alcohol Intake</b>	.....units/Wk
<b>Asthma / COPD</b>	YES/NO	<b>BNP</b>	.....	<b>BP</b>	.....
				<b>Murmur</b>	YES/NO
<b>SERVICE (S) REQUIRED</b>					
Cardiology Clinic	<input type="checkbox"/>	Ambulatory Blood Pressure Monitoring	<input type="checkbox"/>	<b>Rapid Access Chest Pain Service</b>	<input type="checkbox"/>
Echocardiography	<input type="checkbox"/>	24 Hr Rhythm Monitoring	<input type="checkbox"/>	<b>Can patient walk on a treadmill</b>	<input type="checkbox"/>
Chronic Cardiac Pain Service	<input type="checkbox"/>	Exercise Tolerance Testing	<input type="checkbox"/>	<b>Known Aortic Stenosis/Murmur</b>	<input type="checkbox"/>
Cardiac Rehabilitation	<input type="checkbox"/>			<b>LBBB on ECG</b>	<input type="checkbox"/>

**Brief History/ Clinical Query.**

Attach a current medication list and if available please enclose a recent ECG and recent blood test  
\* Please ensure an up to date daytime telephone number is included

Fax For Rapid Access Chest Pain Clinic

Bradford 01274 382371

Airedale 01535 294340

Fax For All Other Services 01274 323216

\* Please ensure an up to date daytime telephone number is included









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