NHS

Heart Improvement Programme

Web-based Referral Systems for Interhospital Transfers:

A review and comparison of systems in English cardiac networks

September 2006

Contents

Introduction

In May 2006 the Heart Improvement Programme published the results of a repeat national audit of the interhospital transfer arrangements for non-elective inpatients in cardiology, at the British Cardiovascular Society meeting in Glasgow.

Our report, 'Making Moves', outlines the results of this work and gives details of approaches taken by organisations to address delays in transferring patients. It is available online at www.heart.nhs.uk/documents.

As a result of this work a number of cardiac networks have become involved in developing web-based referral systems. These systems address the management and communications issues surrounding the referral and transfer of these patients between referring and interventional centres for diagnostic and interventional cardiology, surgery and Electrophysiological Studies (EPS).

The focus of the systems varies. Some models initially focus on cardiology while others cover cardiac surgery.

On the 5 July 2006 the Heart Improvement Programme hosted a meeting in London to share the knowledge and experience from those networks which are developing and using web-based referral systems.

In total, seven systems were identified and four networks were asked to share the 'look and feel' of their systems and the potential for scalability to other networks. In addition we sought to evaluate the commonalities between the systems and consider the opportunity to develop a core common data set. The group began to explore the feasibility and benefit of data flow between Central Cardiac Audit Database (CCAD) and other complementary data sets to support the potential for clinical audit.

This report contains a summary of these systems so that other networks considering a web-based solution can review the alternatives:

- To maximise the value of these enterprises.
- To assist those who have not developed these systems.

The presentations from the meeting can be retrieved from the document store in Rapport at www.improvement.nhs.uk

The appendices at the end of this report contain a quick comparative guide to the various features of these systems.

Please note that the Heart Improvement Programme does not specifically favour or endorse any one of the following systems. The information provided in this report is purely to give an overview of the attributes of the existing systems. Networks or other organisations considering working with any of these providers should satisfy themselves that any system they are considering meets their local needs.

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1: North West London Cardiac Network

Web-based Cardiac Patient Transfer System

Background

'Paper based referrals are prone to illegibility, getting lost, and, when problems arise, arguments can occur about when and how the referral was made.'

Dr Iqbal Malik from St Mary's Hospital, London has worked with Hugh Scott from TeleoLogic and Maria O'Brien from the Cardiac Network to develop an electronic web-based referral system for ACS, EPS and surgical in-patient transfers. It is now used routinely across North West London Cardiac Network, an area covering four tertiary centres and up to 20 referring hospitals.

The advantages of the system include being able to add extra hospitals as needed, the ability to use it for all ACS admissions (to allow complete audit of patients who are not for intervention) and the adaptability for local use.

Their vision has always been to reduce multiple data entry. Having been involved with MINAP data collection, and then for primary angioplasty, being part of NIAP, there was overlap in many filed sets. Add to that the requirements for BCIS, BPEG etc, and the solution has to be to link to CCAD directly. This will be the next stage of the project.

As well as the powerpoint slides giving an overview of the functionality and benefits of the system there is access to a demonstration site which is available via the following link: *www.objectshop.co.uk/transfers/default.htm* (user name: transfers - password: cardiac).

Costing and infrastructure

The web-based transfer system (WBTS) runs on a server at one of the receiving hospitals within the cardiac network. At this hospital a server must be provided running Microsoft Windows 2003 with Microsoft SQL Server 2000 or later.

All other referring and receiving hospitals connect to the WBTS using an encrypted connection over NHS Net (N2) or N3 – no software needs to be installed at these hospitals.

A WBTS system administrator must be appointed who will support the end-users and provide end-user training.

To implement the WBTS, the following are required:

- North West London WBTS software licence.
- Teleologic Content Store server system.
- Customisation/installation/commissioning services including system implementation, configuration, agreed customisation, and training for the WBTS system administrator.

The total cost is around £24,500 (optional - to cover upgrades), with around £3,600 for annual support and maintenance.

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2: South East London Cardiac Network

Web-based Cardiac Patient Transfer System

Background

The system for South East London is same as NW London, with the system designed by Teleologic. South East London have made some minor adaptations to the system used in NW London's system.

The system is currently under development and roll out is anticipated to begin in September 2006.

For full details on the functional and clinical aspects of the system, please see NW London's information.

Costing and infrastructure

An IT trainer will be seconded for 12 months (3 days per week in first 6 months, 2 days per week in last 6 months). The post holder will train staff within referring and receiving hospitals in SE London and after this has been up and running successfully for a while, there will be a second phase working with other referring hospitals in Kent, Sussex and Surrey. The job description is currently going through Agenda or Change, a copy can be sent once this has been matched. The trainer post is approx £15k for one year part time.

The system will cost approx £25k (Teleologic, fee to NW London, server etc), as per standard quotation from Teleologic.

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3: Northern Network of Cardiac Care

Newcastle upon Tyne Hospitals NHS Trust Electronic Referral System

Background

Each year 1,800 patients are transferred to the Freeman Hospital cardiology unit for urgent treatment which is a huge logistical and communication challenge. The previous paper-based referral system required them to be telephoned or faxed through to the coronary care unit at the tertiary centre from the DGH's.

As a consequence time was wasted by front-line medical and nursing staff making and receiving referrals. Paper based referrals created risk of referrals being lost, misfiled, miss-faxed or deficient in information. In addition the paper based system didn't generate the ability for the referring clinicians to feedback to patients on waiting times, or audit the referrals being made or received.

The aims of the project were to:

- Address deficiencies in urgent cardiology IHT by developing a web-based electronic referral system.
- Create a secure password protected system accessible from any NHS computer.
- Track patient journey for audit and clinical governance.
- Feedback on waiting times to patients/carers and referring centres.

The original concept and strategy for the system came from the Freeman Hospital, who drafted the programme design and functionality. The operational detail was refined through multi-disciplinary consultation and planning with medical, nursing, administration and IT staff, facilitated by the Northern Network Cardiac Team.

A demonstration site is available via the following link: *http://nww.psci.nhs.uk/CoronaryCare_UKDemo/Login.aspx* (user name: demo - password: demo).

E-referral: how does it work?

Each user logs on at any NHS web computer to a dedicated secure web-site. They are required to complete the referral form "live" which takes approx in 5-10 minutes. As the information is entered it can be viewed instantly via the web at the tertiary centre. The waiting lists for referrals are available to both DGH and FRH staff, which provide information on patient status, likely waiting time and treatment available online.

A 4-month pilot was run from December 2005 between the Royal Victoria Infirmary (secondary) and the Freeman Hospital (tertiary) trust hospitals, this included 110 consecutive patient referred during the pilot period. The pilot identified problems, and allowed the developers to plan the operational detail. Following the results of the pilot the website was refined, and further fields added to ensure robust data collection for audit.

Implementation

The system was rolled out live across all hospitals in Northern Network from 3 April 2006.

It was piloted in one DGH, then two and now rolled out to all 8 DGH's in Northern Network of Cardiac Care (NNCC). The operational process was managed internally by the Freeman Hospital with the service improvement managers from the NNCC facilitating this across the network.

Support was established at the initial visit with the super-user and was then dependent on local needs, between two and five visits weekly. Meetings were held with the Consultants, Registrars, Nursing staff in each DGH.

Contact has gradually been reduced by SIMs to the DGH as the super-users have gained skills and knowledge to deal with problems internally. The key contact support now is from the Freeman Hospital IT Development Manager, via telephone contact and email.

From 3 April until the 14 July 450 patients have been transferred using electronic data only. Faxed referrals have ceased to be sent unless there is a local IT problem in the DGHs. There have been no lost referrals; those that are incomplete or not accepted are returned to DGH for additional information to be added. Super-user group meeting has indicated high satisfaction among staff and the primary aims of the system have been met.

The system provides a robust audit trail for all urgent cardiology admissions to the Freeman Hospital. The referral process saves time of front-line staff, whilst at the same time, improving patient safety and communication through completeness of clinical information and no lost referrals.

Infrastructure

A minimum of one super-user was identified in each DGH plus or minus a SIM dependent on local needs. The roles and responsibilities were defined at the initial super-user group meeting and drafted into an operational policy.

They provided cascade training in their own trust and have access to all of system for own DGH to enable them to change status of users as the junior doctors rotate between wards and departments. They are also responsible for implementation of the policies relating to the system and for monitoring and policing local use.

An 'Idiots Guide' support document was drafted by the project manager as an aide-memoir to making referrals, which takes the reader through a step by step process of making referrals.

Other supporting documents include:

- Downtime policy
- Operational Policy
- Super-user role and responsibilities
- Step by step audit guide
- Step by step referral guide
- Step by step super-user guide

Security

- NWW Secure site
- Certificate for site - £399 for 2 years
- Different levels of users – Super/Access
- Caldicott Guardian in each trust contacted and formally agreed to site
- IT departments in each DGH contacted
- Operational policy for terms and conditions of use.

Scalability and Costs

Our flexible and robust system is suitable for implementation across other hospital networks UK wide. Cost would be determined on an individual basis depending on the level of support required by users to establish and maintain the system.

Benefits of the Freeman Hospital E-referral System

- All data available instantly via any NHS web computer
- Complete and continuous data collection for interhospital transfers
- Clear communication with permanent electronic record
- Local and network-wide reports available via a reporting tool
- Robust data for audit of complete patient journey
- Electronic discharge summaries available via e-mail or instant online viewing
- PAS link established for instant demographics
- Datasets available for all cardiac transfers including EP and pacing
- Dummy system website will be available from September.

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4: Greater Manchester and Cheshire Cardiac Network

Cardiac Acute Transfer System

Background

The aim of the web based referral system or Cardiac Acute Transfer (CAT) system was to use an IT solution to facilitate the resolution of some of the problems experienced across the Network with regard to interhospital transfers. The issues included, sharing information relating to list size and waiting times amongst all the stakeholders, use of resources, trying to achieve a single waiting list between the two specialist centres, ensuring patient fitness to transfer and capturing robust data on which to base future planning and as a means of auditing outcomes.

The CAT system was launched in September 2005. Since this time all referrals made for non-emergency ACS patients needing transfer for tertiary care have been entered on the system. However during the pilot phase only the three pilot sites referred and entered data directly onto the system whilst the remaining sites had their data entered retrospectively. The system is now being rolled out to the remaining referral sites (14 in total). The system is held within the referral booking and management service (RBMS) at Stockport PCT and is managed by two administrative co-ordinators and overseen by our Patient Care Advisor with clinical expertise. These co-ordinators are also working on the patient choice programme and split their time between the two programmes however we would anticipate that as this method of referral management becomes more culturally acceptable the administrative function that they provide will lessen.

Clinical aspects and benefits

- Shared single list, openly accessible, ensures equity and facilitates clinical decision making. Encourages optimal use of capacity.
- Real time information available
- Document Library, holds all related protocols and documents.
- Whole and complete patient record (which is archived and kept) between multiple organisations, with facility to compare ongoing tests, and view ECG's and other attachments e.g echocardiogram reports. All communication is recorded and archived with the record.
- The system allows the list to be managed with patients prioritised clinically and in time order based on parameters set by clinicians.
- Utilising a traffic lights model the system acts as a prompt for referring organisations to prepare the patient optimally for invasive procedures.
- Real time status of referrals according to clinical 'fitness' for transfer, e.g. active list, further information required list and inactive. This encourages collective responsibility for the referral and ongoing management of the patient.
- Allows for clinician prioritising specific cases on the list.
- Clinical leadership in future development of system.
- Based on agreed and standardised protocols thus providing equity of care across the Network

Functional aspects and benefits

- Rich data source:
  - audit waiting/transfer times by organisation.
  - reveals referral patterns.
  - archives and stores whole patient record
  - provides a foundation for educational feedback meetings.
  - enables planning of future service development.
  - Records, monitors and stores outcomes (in hospital currently)
  - All data collected via the referral can be audited.
- Improved communication and developing relationships in both individual organisations and across the Network. This has been achieved by the use of data harvested from the system including individual patient case studies.
- Secure and confidential. Varied access levels according to need.
- Provides an overview of the entire network as well as by individual organisation.
- Single shared waiting list for tertiary care, allowing for patient and clinical choice.
- Training module available.
- Training manual in development.
- Already in use by 14 DGH and 2 tertiary centres.

Costing implications

The costs involved with the start up of the CATS was minimal. In-house expertise conceived and developed the system with stakeholder involvement at every opportunity. In terms of rolling out to all the sites, again the financial impact was minimal, with every organisation already having suitable workstations in appropriate areas. The only additional costs incurred were obtaining a secure certificate at a cost of £40 and scanners; each organisation was allocated one at a cost of approximately £100 each.

The system requires a server to host it and this will vary depending on what resources or systems are already in place. Ours is hosted within a current framework, buying a server can cost up to £4,000.

Funding has been secured to develop this further and in terms of the IT team we have calculated that this will cost us £17,148. This money will give us dedicated IT expertise for 3 days per week for a year. However, it should be noted that this will also encompass an additional image transfer project. We are currently considering what will be required for future development and support and would anticipate any organisations or networks wishing to use our system would contribute to this.

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5: North East London and Essex Cardiac Networks

Network Referrals System

Background

The network referrals system is a secure website, run inside NHS net, which facilitates both the making of referrals between institutions in the NHS and the recording and subsequent reporting of those referrals. The website is developed and hosted by Data Transparency Ltd and is the result of a collaboration with the North East London and Essex Cardiac networks.

Recent government targets have presented the NHS with a unique challenge in terms of cross institution monitoring of the patient pathway. Patients may enter the system by a variety of methods. They may be referred directly by their general practitioner, arrive at a walk-in centre or at an accident and emergency department or they may be internally transferred from another specialty as a result of an incidental finding or mistaken initial diagnosis. Whichever entry route the patient pathway itself may be extremely complex, involving a large number of institutions, from satellite clinics of a district general hospital to tertiary centres. Patients may need to travel to distant sites for specialist imaging and again to yet other sites for specialist diagnostic procedures before being ready for review by a multidisciplinary team.

Whatever the patient pathway, the institutions involved need to have clear records of the patient journey for the purposes of audit and assessment of target compliance. Credit may then rightly be attributed to the various portions of the patient pathway. Steps can then be taken to praise and fine tune best practice and highlight areas found to act as bottlenecks.

While the simplest pathways may be handled by a single institution and can be monitored straightforwardly, many clinical activities have much more complex pathways and their monitoring would benefit from a network based approach. It is clear that existing technology rarely captures all of the patient referrals, allows referrals on the basis of inadequate information and generally fails to provide even rudimentary cross network monitoring.

What does it do?

In collaboration with the North East London and Essex Cardiac networks, Data Transparency has developed a flexible NHS net web based solution that aids the referral process while monitoring the metrics of the patient's journey. This approach minimises staffing costs and provides real time management data. Potential breaches can be predicted and dealt with in good time.

The solution functions as a central system for managing referrals between institutions. It facilitates the making of the referral as well as the receiving and subsequent management of that referral at the receiving centre. Users at any authorised institution can log on the website and create, manage and track referrals that they or their colleagues have made.

Each destination centre has a customised referral wizard that facilitates the making of electronic referrals to them. This wizard ensures that the referring party submits a full set of validated information with the referral. The wizard guides the referrer though the sometimes complicated set of information required to make a referral and even allows incomplete referrals to be saved and then resumed by the user or a colleague at a later time. Once the referral wizard is complete the referral is sent to the receiving institution where it is then prioritised and managed using the website through the acceptance and transfer processes.

Files such as test results or letters from a GP may be attached to the referral and transmitted along with it to the receiving centre. The status of the referral is can be kept up to date by the receiving institution and is available at the sending institution so that they are always up to date with the referrals progress.

The Network Referrals System is fully scaleable and can handle anything from simple inpatient referrals between specialities within a unit to the whole patient pathway from general practitioner to tertiary centre. This may include any number of diagnostic pathways through a host of diverse medical units. The system handles the auditing of the whole process including "Stopping the Clock" for legitimate reasons.

Users designate an administrator to manage the system by assigning rights to each user from admin to read only. Bed managers and clinical staff can view individual patient reports while management can access reports summarising pathway performance and highlighting potential breaches of national targets. This enables the instigation of prompt action to prevent such problems.

Off the shelf referral modules are available as they are or can be customised to requirements. Users can start with a small system to help with a problem area and add to it later.

Wherever the organisation is positioned in the patient pathway this system monitors activity and manages patient flow. However, the greatest benefits are achieved with network wide systems which allow referring organisations to monitor the onward progress of their patients.

The main benefits of the Network Referrals system are:

- Fast reliable referrals between institutions.
- Validated data.
- Automatic risk scoring and prioritisation.
- Referral management and feedback to the referring institution.
- Good quality live and retrospective data on referrals between institutions.
- Scheduled as well as live metric reports, data exporting and advanced analysis.

Costing and infrastructure

Any institution with a connection to NHSnet can use the system. No firewalls have to be opened and there is no software to install and manage.

The system is available as a yearly subscription with the following costs per referral type per institution. This includes training and support. No additional hardware is required within the organisation.

Ability	Cost
Send referrals	£425
Receive referrals	£950

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6: Anglia Cardiac Network

Papworth Web-based Referral System

Background

Papworth is a tertiary hospital and provides services for eight District General Hospitals.

In the past all referrals for non-elective urgent admissions were referred by fax. These at times caused problems such as details not being readable, referring hospitals not knowing if the fax had been received, the referral form not being sent at time of writing and fax machines not working properly. All of these problems were potential reasons for a delay in the patient being transferred across to Papworth for their procedure and resulted in numerous phone calls both from Papworth and the referring hospitals.

It was agreed that to try and eliminate some of these potential problems we would introduce a web-based electronic transfer referral system.

Initially this involved Dr Sarah Clarke, a consultant cardiologist working closely with IT to develop the referral fields. Papworth used their own IT department to develop the database.

A cardiac transfer co-ordinator was then employed to be responsible for introducing the database to the first hospital. This person had a clinical background and was able to review all the referrals made. In addition the transfer co-ordinator was responsible for informing the IT department of any changes that were deemed necessary, rolling out the database to the rest of the hospitals, providing training to the users, monitoring the database usage, and to act as a contact person for any problems that occurred in the initial period.

The format took into account all the aspects that are involved in clerking a patient, including:

- Patient details and GP
- Referring DGH
- Alerts and allergies
- Present history – brief history including symptoms, coronary risk factors, abnormal clinical findings and results of investigations.
- Past medical history – incorporating all systems of the body.
- Medication – includes prompts of when to stop anti-platelets and metformin.
- Referring hospital diagnosis.
- Procedure requested – coronary angiograms, PCI, surgery, ICD, PPM, EPS and TOE, with the facility to request other procedures not mentioned.
- Blood results.
- Radiology images
- Patient summary – All information entered is summarised producing a detailed and formatted referral summary page.

Some fields are mandatory but are limited to make it more user-friendly.

Most of the fields are tick box but some free text is necessary to ensure the information is kept individual to each patient.

Other functions available on the database include:

- A list of all patients referred in alphabetical order.
- A whiteboard which is colour coded to indicate where the patient is in the system i.e. accepted, procedure date given or not fit for procedure.
- All referring DGHs are able to see the number of patients awaiting transfer into Papworth via the whiteboard. They only have access to the type of procedure and not patient details or hospital referring.
- A message facility which is used to clarify any details or problems.
- A patient review field – indicates whether the patient is fit for procedure and the reason why they may not be considered fit.
- Details can be edited if the patient needs/condition changes.

Since introducing the database hospitals have reported that communication between them and Papworth has improved. They are able to relay information to patients quicker and they are able to estimate how long the patient may have to wait by looking at where their patients are on the whiteboard.

By formalising the process we have been able to identify areas for improvement. It has proven that there does need to be an individual to co-ordinate the whole transfer process and communication between Papworth and referring hospitals has been notably improved.

Costing and infrastructure

It is hard to quantify the financial implications as this has been an ongoing process. The initial programme took two months to develop a programme that was ready to pilot.

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7. North Central London Cardiac Network

North Central London Cardiac Network Database

Background

The North Central London IHT database was set up by Dr Allan Harkness at the Royal Free Hospital in 2005 as part of the NCL Cardiac Network IHT pilot project. The aim of the project was to reduce the length of time patients wait to transfer into receiving centres, and to help improve equity of access across the sector. The database is administered by the IHT co-ordinator, and the faxed referrals are inputted into this database.

This database clinically prioritises patients according to a list of items agreed by the IHT task group. This includes: ECG changes, bloods results, cardiac history, cardiac risk factors, any ongoing pain, and how long they have been waiting in hospital.

Costing and infrastructure

In January 2006 the database was launched online at nww.royalfree.nhs.uk (a secure Royal Free site). The online waiting list is a mirror image of the Microsoft Access IHT database Dr Harkness created. The online list is 'live' and was created by the IT team at Royal Free Hospital by Danny Behrman and Giorgio Capisani. The development of the online waiting list has allowed the referring hospitals and the tertiary centres to view the shared non-elective PCI waiting list at anytime throughout the day. This online system was created by the good will of the Royal Free Hospital IT department, and therefore did not incur a cost to the network or the hospitals within NCL. Dr Allan Harkness also created the original database in his own time.

Access to the database is only given to staff from participating hospital trusts who need to monitor information about the patients waiting for transfer. Usernames and passwords are obtained from the IHT co-ordinator.

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The online waiting list can be accessed at the following hospital trusts to 'view' only:

- The Heart Hospital
- Royal Free Hospital
- Barnet and Chase Farm Hospitals
- North Middlesex Hospital
- The Whittington Hospital.

Within the online system there is a copy of the terms of reference for the IHT task group. Clinicians can also access the referral form at this site.

One of the limitations of this online IHT system, is that referrals cannot be made online. Referrals are still hand written by the cardiology teams and faxed across to the IHT co-ordinator who is based at the Royal Free Hospital.

In the future, NCL Cardiac Network are looking towards adopting a web-based referral system. This would coincide with other cardiac networks within England and allow for benchmarking in the future.

Key NHS Contacts

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Future Developments

The Heart Improvement Programme is sponsoring further work to agree a core common data set extract for these systems. This could enable:

- Real-time national audit
- Cross-boundary referrals captured
- Potential to link into CCAD
- Potential to link elements of CCAD to provide a whole-life patient pathway

There is enormous potential clinical benefit from an agreed core common data set. This will support the ability to compare local and national data and keep a common development platform for other health communities looking to seek similar solutions.

We hope to agree common data definitions and explore the steps necessary to establish data flow with the CCAD database and other complementary data sets with a view to creating opportunity for clinical audit across the whole patient pathway. Complementary datasets include those from the Myocardial Infarction National Audit Project (MINAP) and the British Cardiac Intervention Society (BCIS).

The teams involved in each of the web-based systems have provided information about the data fields and definitions they currently collect within their own systems. Joint work between the NHS Heart Improvement Programme and Dr David Cunningham from CCAD will establish the common core of the datasets and the differences.

A small steering group of clinicians from these networks will meet with CCAD at the end of the Summer to develop and seek agreement on a common data set and to establish the process that needs to be in place to establish dataflow and reporting between the different complementary clinical data sets

The wide spread adoption of web-based referral systems has the potential to achieve the following outcomes:

- Reduction in avoidable bed days. Based on the activity from the 2005 audit there is potential for a further 180,000 bed days to be saved.
- Reduced inequities of access, with improvement in networks showing long waiting times
- Networks and constituent organisations will have a reliable and robust data collection and monitoring tool available to support patient management and audit purposes
- Improvement in network-wide approaches to management of transfer patients
- Links to CCAD to support clinical audit.

Appendices

Quick Reference Comparative Guide

Network	North West London Cardiac Network	South East London Cardiac Network	Northern Network of Cardiac Care	Greater Manchester and Cheshire Cardiac Network	North East London & Essex Cardiac Networks	Anglia Cardiac Network	North Central London Cardiac Network
Live system	Oct 05	Sept 05	Dec 05	Sept 05	Sept 06	Sept 05	2005
Scope	Angio/PCI	Angio/PCI	Angio/PCI	Angio/PCI	Angio/PCI	Angio/PCI	Angio/PCI
	Surgery	Surgery	-	Surgery	Surgery	Surgery	Surgery
	EPS	EPS	EPS	EPS	-	EPS	EPS
	-	-	Pacing	Pacing & devices	-	-	Pacing
No. of Tertiary Centres	4	2	1	2 plus 2 DGH labs	1	1	2
No. of Referring Centres	20	4	8	14	10	8	4
System Administrator	Network Coordinator/ Data Manager	IT System Trainer & Administrator (1 year only)	Freeman Hospital IT Development Manager	Patient Care Advisor - 2 Admin Coordinators (1 FTE)	Designated Administrator	Cardiac Transfer Coordinator	IHT Coordinator
Development							
Internal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
External	Teleologic Ltd	Teleologic Ltd	-	-	Data Transparency Information Consultancy	-	-
Set up Costs							
	Software licence + server + implementation = approx £25,000. Annual support & maintenance approx £3,600	£25,000	Not yet available	Secure certificate £40. Scanner per organisation £100 each.	Yearly subscription - Per referring centre £425. Per receiving centre £950.	Not quantified	Not quantified

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Quick Reference Comparative Guide (continued)

Network	North West London Cardiac Network	South East London Cardiac Network	Northern Network of Cardiac Care	Greater Manchester and Cheshire Cardiac Network	North East London & Essex Cardiac Networks	Anglia Cardiac Network	North Central London Cardiac Network
Training							
Training module	Yes	Yes	Integral tutorial	Yes	-	-	-
Training manual	Yes	Yes	Yes	In development	-	-	-
Trainer		One year per post p/t £15k	Super users cascade training	Training provided by Network Support Team via formal training sessions and by organisation (on request)	Data Transparency Information Consultancy	Cardiac Transfer Coordinator	-
Features							
Referral	Online	Online	Online	Online	Online	Online	Fax
	-	-	PAS link	-	-	-	Read ONLY waiting list
Security	NHS net	NHS net	NHS net	NHS net	NHS net	NHS net	NHS net
Password protected - varying levels of access	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Caldicott	Yes	In progress	Yes	-	-	-	-
Planned expansion	-	Referring hospitals outside of cardiac network: Kent, Surrey	Roll out to Coast 2 Coast Cardiac Network. Expanded to cardiac surgery. Audit/ reporting facility. Other speciality areas. Instant electronic discharge	Image transfer project and adoption of system by Northern Ireland Cardiac Network	Other tertiary centres, Basildon in 2008	-	Looking to move to a web based referral system

Overview

	Demographics	Referring hospital	Clinical assessment	Medical history	Investigations	Risk score	Reason for referral	Accept/not	Transfer details	Planned procedure	Discharge from receiving hospital	Return	Discharge/outcome
North West London	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South East London	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Northern Network	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
Greater Manchester and Cheshire	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
North East London	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Anglia	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No
North Central London	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No

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