Greater Manchester & Cheshire Cardiac and Stroke Network

Wireless Telemedicine in Primary Care

Phase 1 Report

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Introduction

This project is the result of a successful bid to the old Greater Manchester Strategic Health Authority (SHA) Invest to Save Capital Budget. The Greater Manchester & Cheshire (GM&C) Cardiac Network secured £100,000 each year for 3 years commencing 2005 / 06, although due to changes in the financial regime not all funding was released.

The aim of the Wireless Telemedicine Project is to provide enhanced primary care cardiology services to GP practices in an effort to support the reduction in the SMR rate from coronary heart disease (CHD) across the GM&C Cardiac Network using new wireless telemedicine systems for diagnostic and interpretation services. The pilot will evaluate how such technology can enhance patient care and provide a saving in resources for service provision. The project was to define the benefits (or not) of the use of wireless telemedicine in primary care for diagnostic purposes for both healthcare professionals and to identify potential savings.

The pilot built on and complemented existing work undertaken by the GM&C Cardiac Network, the Greater Manchester diagnostics project, existing primary care cardiology development and the advanced cardiac training currently underway.

Supported and facilitated by the GM&C Cardiac Network the project provided the opportunity for Primary Healthcare professionals to access diagnostics via wireless telemedicine technology. Clinical governance, risk management and project evaluation underpinned this process.

Objectives

- Improve access to certain diagnostics for primary healthcare professionals
- Reduce referrals to secondary care
- Reduce number of re-attendances at GP surgeries
- Increase expertise of primary care staff
- Evaluate technology:
    - ease of use
    - quality of diagnostic test
    - service received from provider
    - cost effectiveness
    - benefits to patients

Method

The GM&C Cardiac Network worked with the Greater Manchester Collaborative Procurement Hub (GMCPH, now the North West Collaborative Procurement Hub) to ensure a robust tendering process was adhered to. The GMCPH sought expressions of interest from potential service providers. A number of organizations expressed an interest and these were short listed to 4 companies according to the criteria set out in the service specification.

The GM&C Cardiac Network then sought expressions of interest from Primary Care Trusts (PCTs) who were interested in participating in phase one of the project. 5 PCTs expressed an interest:

- Bury
- North Manchester
- Central Manchester
- South Manchester
- Stockport

(North, Central and South Manchester are now merged into Manchester PCT but were independent at the start of the project).

Clinical and managerial representatives from each of the participating PCTs were invited to attend presentations from each of the short listed service providers. Following the presentations South Manchester PCT decided to pilot the Welch Allyn service and the remaining PCTs decided to pilot the Broomwell Healthwatch service. Once contracts were signed equipment was delivered and training was undertaken by the service providers.

It was agreed by the participating PCTs that all users of the service would complete an evaluation form for each test requested. (Appendix 1) The evaluation form was designed to establish the number of referrals deflected from secondary care.

South Manchester PCT was funded to provide equipment for 5 practices and the remaining PCTs were funded to provide equipment for 12 practices per PCT. The difference in numbers of practices per PCT was based on the cost of the service from the different service providers. The set up costs for phase 1 of the project are attached. (Appendix 2)

Service Provided

Broomwell Healthwatch and Welch Allyn provided ECG equipment to each participating practice and provided training in its use. ECG recordings are sent wirelessly via a telephone line to the relevant call centre for interpretation. Broomwell offer an immediate response and interpretation whilst Welch Allyn guarantees a response and interpretation within 24 hours.

In addition to the ECG equipment Broomwell Healthwatch also supplied an arrhythmia recognition watch to each practice. This equipment is loaned to patients presenting with palpitations enabling the patient to record a single lead ECG when symptoms occur. The equipment is then returned to the GP and is transmitted to the call centre for interpretation.

Audit and Evaluation

The GP practices were asked to complete a brief audit form each time they used the service (appendix 1). For each referral, the practices were asked to record what would have happened had the service not been available. Practices were asked to indicate if the patient would have been referred to secondary care for an out-patient appointment (OPA), a diagnostic test appointment (DTA), or something else (Other). One objective of the audit was to count the total number of referrals to secondary care that were saved.

Each PCT was asked to provide the baseline cost for referral to secondary care for either an OPA or DTA. For phase 1 of the project all PCTs agreed that the baseline cost was £151. All savings in this report are calculated using this figure. When a practice indicated "other" or left a blank response, no cost savings have been calculated.

Headline Results

PCT	Provider	ECGs	Arrhythmia watch	Audit forms returned	Referrals to secondary care prevented
Bury	Broomwell	586	76	469	352
Central	Broomwell	598	23	262	194
North	Broomwell	894	21	349	216
Stockport	Broomwell	1181	27	668	254
Broomwell Totals		3259	147	1748	1016
South	Welch Allyn	326	N/A	312	298
Project Totals		3585	147	2060	1314

Analysis of Audit Forms

Data from the service providers

The chart below (figure 1) shows the total number of ECG and arrhythmia watch tests referred to the service providers. South PCT (highlighted in a lighter shade) used a different service provider to the others which only offered an ECG interpretation service and only five GP practices took part in the pilot.

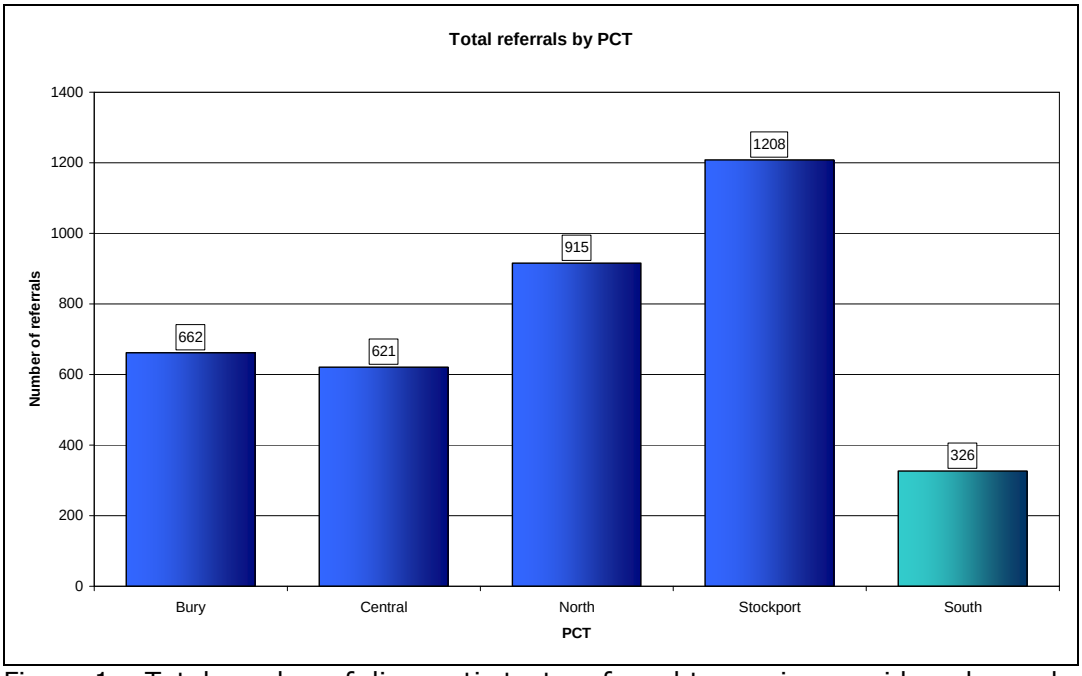

Figure 1 – Total number of diagnostic tests referred to service providers, by each PCT.

The chart shows considerable variation in utilisation of the service between the different PCTs, with Stockport referring nearly twice as many cases as Central Manchester. This may be due to some practices in some of the PCTs not using the service, whereas all the practices in Stockport used the service. Also, most of the

practices in Stockport used the service extensively, with nine out of the twelve referring more than 100 patients each.

ECG Activity

Figure 2 shows the number of ECG referrals by each PCT per month. After the initial month, as staff were becoming familiar with the service, the number of referrals increased. Bury, Central and South Manchester had fairly constant numbers of referrals for the duration of the pilot. Referrals from Stockport rose sharply, reaching a peak of 155 ECGs in March 2007. North Manchester had similar numbers of ECG referrals as Bury and its fellow Manchester PCTs until June 2007, whereupon demand for the service rose sharply, reaching a peak of 114 referrals in the last month of the pilot.

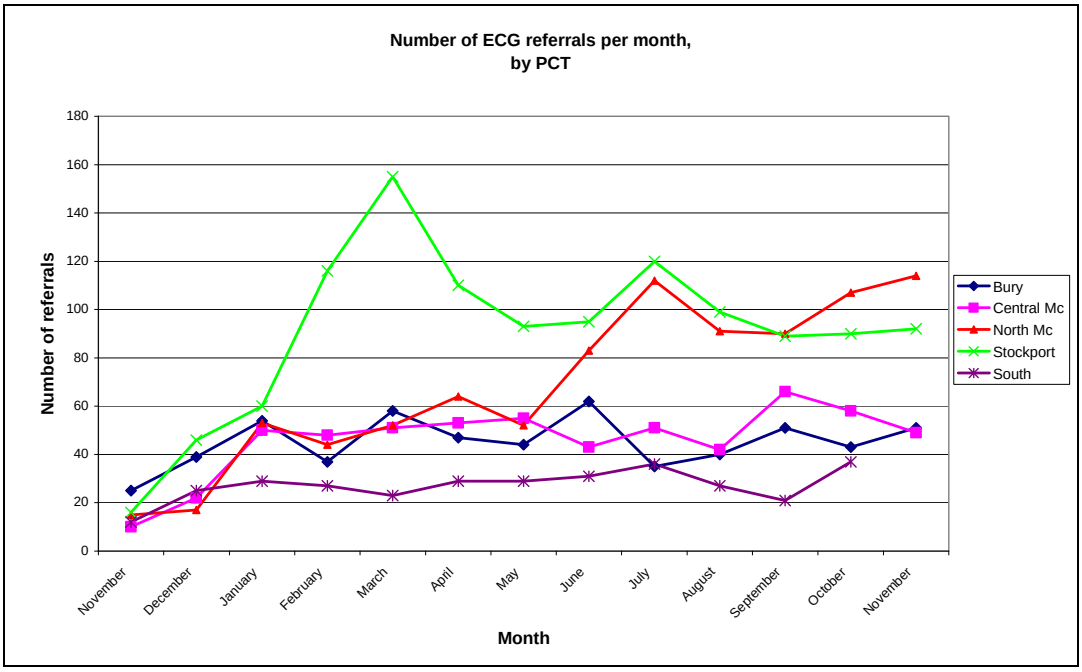

Figure 2 – Number of ECG referrals per month by PCT

Arrhythmia Watch Activity

Bury, Central and North Manchester, and Stockport all opted to use the Broomwell service provider. Part of the package of service that Broomwell supplied was an arrhythmia test using a one lead ECG in the form of a wrist-watch style device.

Figure 3 shows the number of arrhythmia watch tests performed each month by the PCTs using the Broomwell service. Although the numbers are small, Bury PCT showed higher use of the test than the other PCTs.

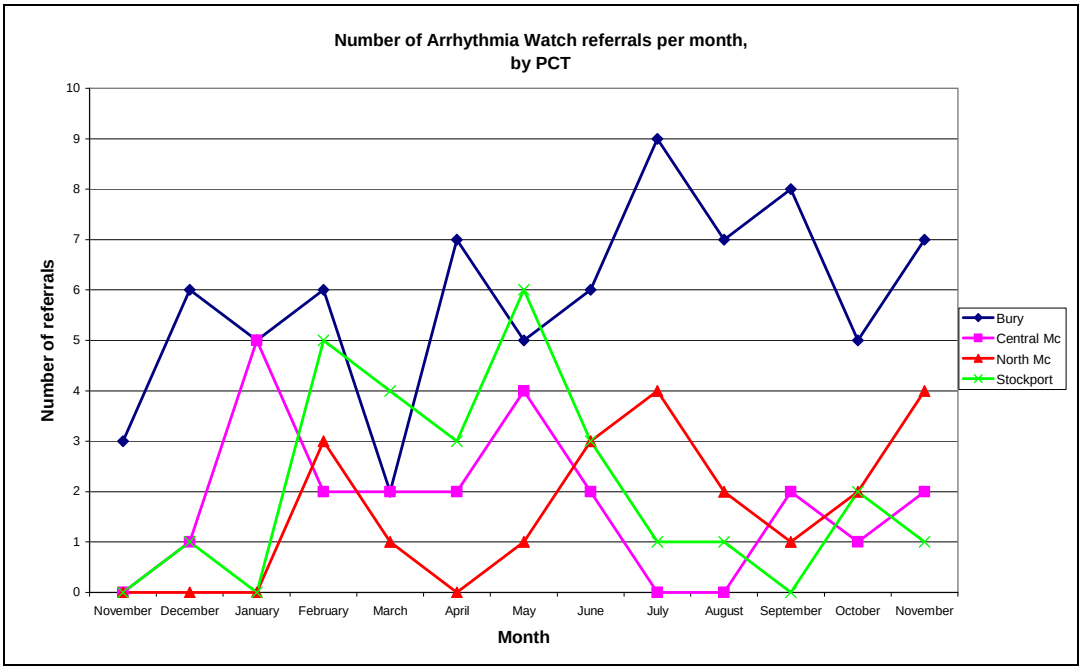

Figure 3 – Number of Arrhythmia Watch referrals per month by PCT

Referral Feedback from Broomwell

While each service provider gave interpretation and feedback to the GP practices for each test referred, Broomwell also returned data for each referral to their service. Each referral was classified as from either a symptomatic patient or a non-symptomatic patient. They then recorded their recommended action for this patient based on the diagnostic test and clinical history given over the phone. The outcome categories were "No action", "GP referral", "Cardiology referral", and "A&E referral".

Non symptomatic patients were patients who required an ECG as part of a routine check up or for monitoring purposes.

Figure 4, shows the referral recommendations for symptomatic patients. For the majority of referrals (70%), Broomwell recommended that the patients' GPs could manage their treatment.

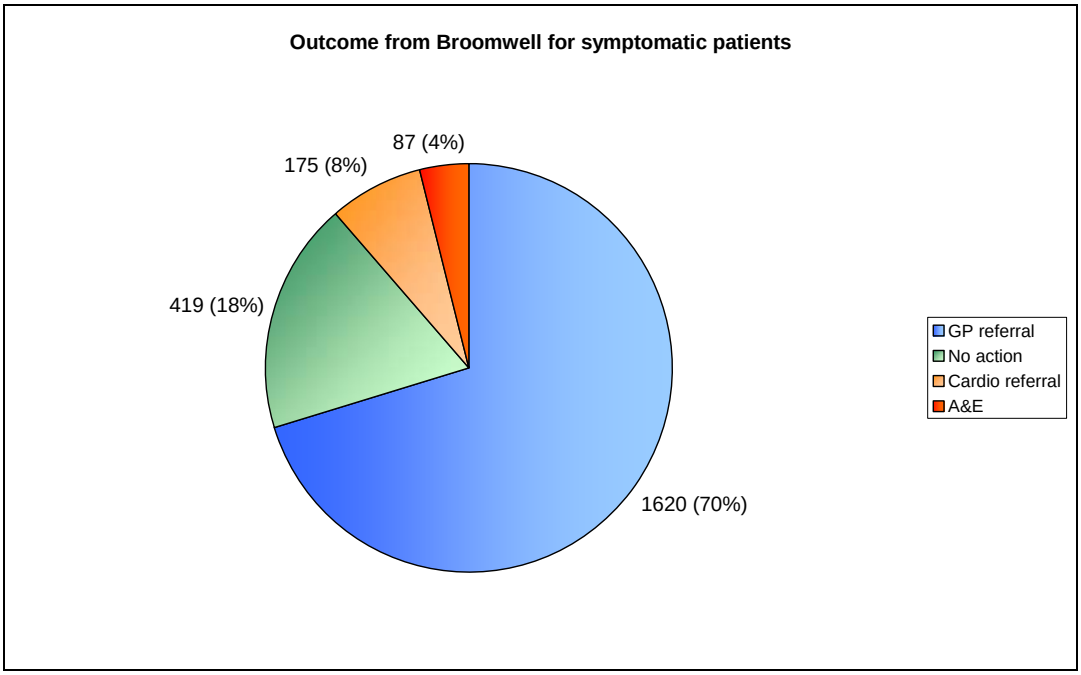

Figure 4 – Referral recommendation data from Broomwell for symptomatic patients.

Figure 5, shows the referral recommendations for non-symptomatic patients. With this group of patients, the majority of referral recommendations were still for GP led care (53%).

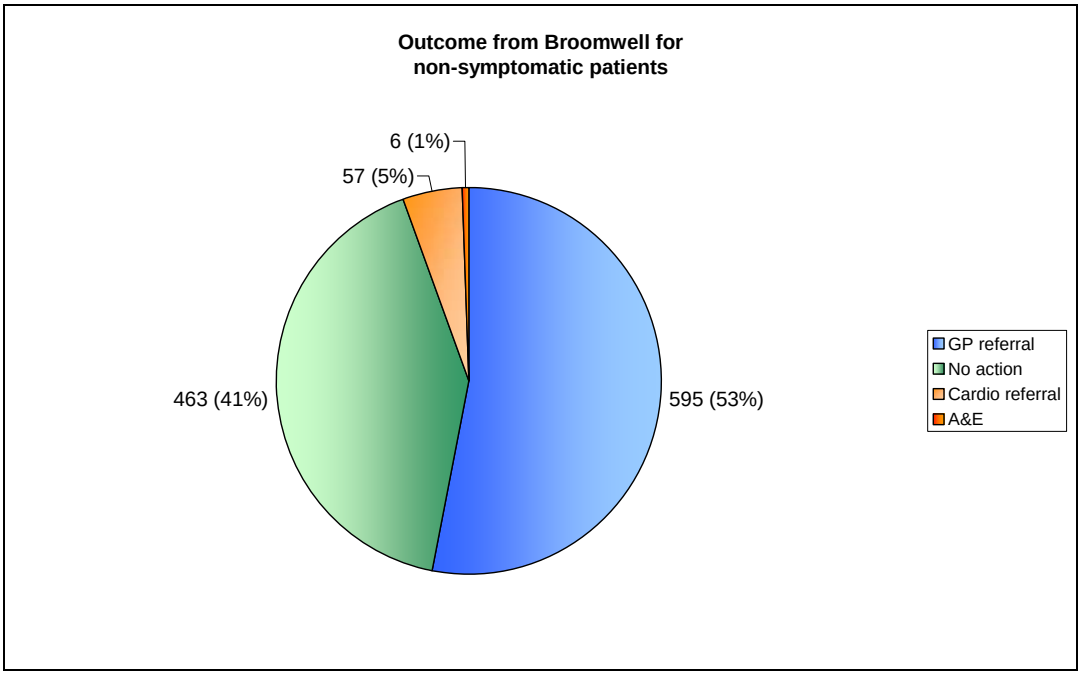

Figure 5 - recommendation data from Broomwell for non-symptomatic patients.

Audit Results

Figure 6, highlights the proportion of audit forms returned for each PCT. Of the five practices in South Manchester PCT recruited to take part in the pilot, three of these used the service and returned 96% of their audit forms. The two practices who did not return audit forms had been part of a previous pilot with Welch Allyn and were familiar with the equipment. They were also able to interpret their own ECGs and therefore used the equipment but not the interpretation service.

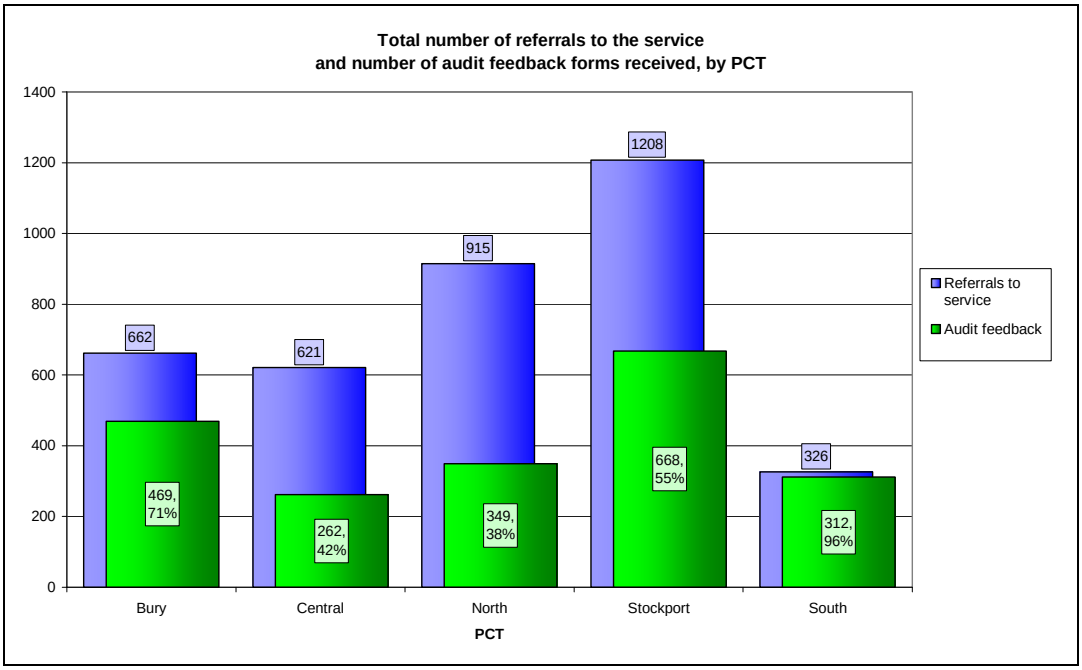

Figure 6 – Number of feedback forms returned compared to the total number of referrals for each PCT

Breakdown of Audit Results

Figure 7 delineates the breakdown of audit results by PCT. Practices were asked to indicate if the patient would have been referred to secondary care for an out-patient appointment (OPA), a diagnostic test appointment (DTA), or something else (Other). It is interesting to note that while Stockport practices returned the most number of feedback forms, the majority of these were classified as 'other'. From the breakdown, it is apparent that practices in Bury PCT saved the most number of referrals to secondary care.

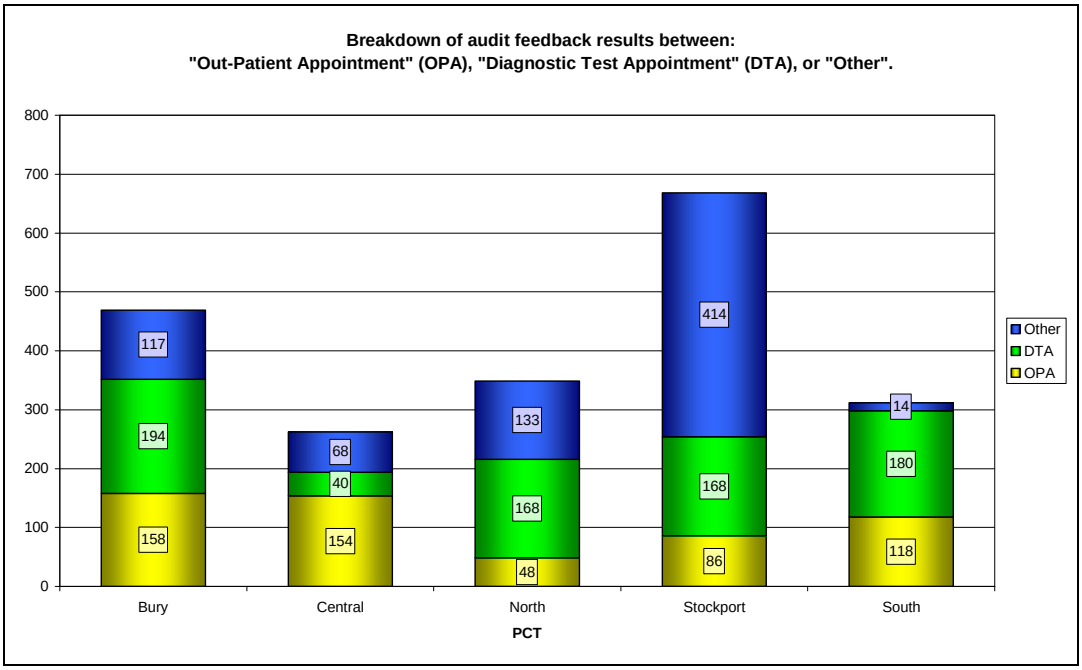

Figure 7 – Breakdown of audit feedback

"Other" responses

If a DTA or OPA was not indicated on the audit form, space was provided to give brief details explaining why. Figure 8 shows the breakdown of 'other' responses on the audit forms. Disappointingly, 439 (59%) audit forms either did not provide a reason why a DTA or OPA would not have taken place, or that that section of the form was left blank.

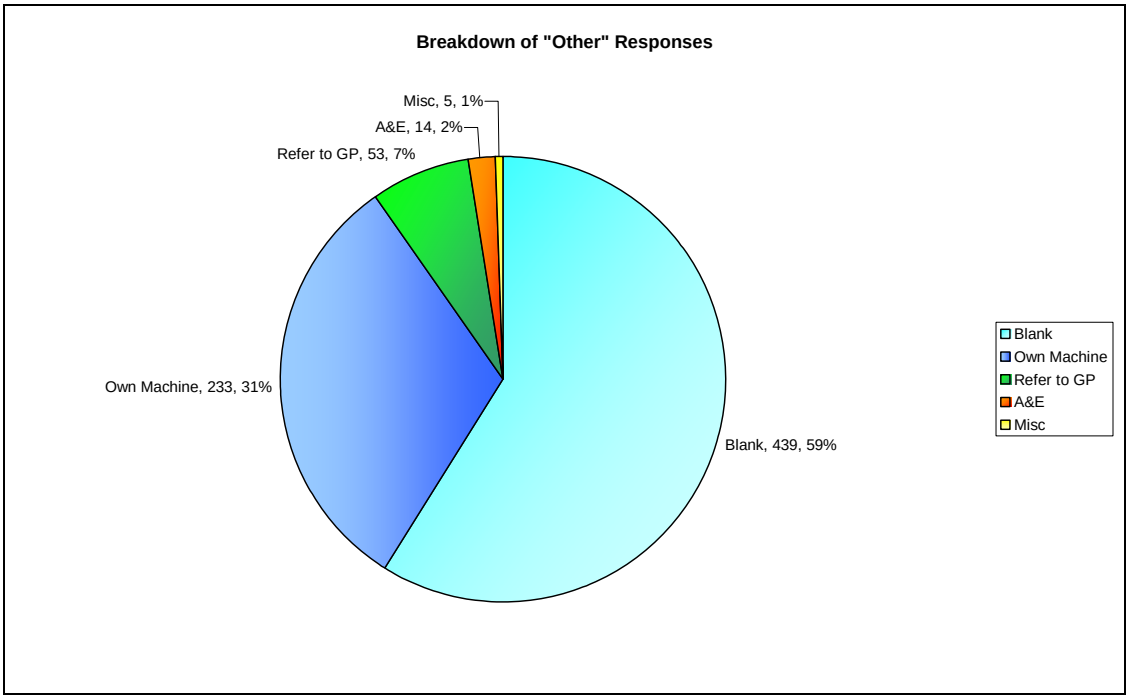

Figure 8 – Breakdown of "Other" responses on audit forms

Financial savings
Note: The financial savings for the project are based on the tariff for an out-patient appointment and diagnostic test appointment at the time of the pilot (2006/2007). The funding for the pilot included the cost of calls and as such cost savings are not representative of operational costs for rolling out the service beyond the pilot.

The following analysis looks at the financial savings for the pilot. Any future plans would have to be based on current tariffs and negotiated costs for the service with the provider.

Gross Cost Savings
Based on the tariff quoted for out-patient appointments (OPA) and diagnostic test appointments (DTA), and from the number of out-patient appointments and diagnostic test appointments recorded on the audit forms, the following gross cost savings are calculated for each PCT.

PCT	OPAs	DTAs	Tariff	Gross Savings
Bury	158	194	£151	£ 53,152
Central	154	40	£151	£ 29,294
North	48	168	£151	£ 32,616
Stockport	86	168	£151	£ 38,354
South	118	180	£151	£ 44,998
Total	**564**	**750**	**£151**	**£198,414**

Net savings of the project
The cost of the pilot for each PCT is shown below, and the net savings for each PCT and the project as a whole.

PCT	Cost of project	Gross savings	Net savings
Bury	£ 18,000	£ 53,152	£ 35,152
Central	£ 18,000	£ 29,294	£ 11,294
North	£ 18,000	£ 32,616	£ 14,616
Stockport	£ 18,000	£ 38,354	£ 20,354
South	£ 24,000	£ 44,998	£ 20,998
Total	**£ 96,000**	**£198,414**	**£ 102,414**

Extrapolated savings based on the sample of audit forms returned
The above savings were calculated from the sample of audit forms that were returned. However, what could the savings have been if all the audit forms were returned?

Working from the assumption that the sample of audit forms returned was representative of the whole project, the following calculation applies the percentage of referrals to secondary care that were prevented from the sample to the whole project.

Total audit forms returned*:* **2,060**

Referrals to secondary care prevented: **1,314**
Percentage of referrals to secondary care prevented: **63.7%**

Confidence intervals (on crude percentage):
Standard error: √(63.7 x (100 – 63.7) / 2060) = 1.06
Standard error x 1.96 (for 95% Confidence interval): 1.06 x 1.96 = 2.08%
Projected percentage of referrals to secondary care prevented: 63.7% (95% CI: 61.6%, 65.8%)

Total referrals to service: **3,732**

Applying percentage from audit sample to entire pilot referrals: 3,732 x 63.7% (61.6%, 65.8%) = **2,377** (2,299; 2,456)

Extrapolated gross savings
Extrapolated prevented referrals to secondary care: 2,377 (2,299; 2,456)
Tariff: £151
Extrapolated gross savings for project: **£358,927** (£347,149; £370,856)
Cost of project £96,000

Extrapolated net savings for project: £262,927 (£251,149; £274,856)

Service User Questionnaire
A questionnaire (appendix 3) was sent to all service users in phase 1 of the project. 43% of these were completed and returned. The aim of the questionnaire was to ascertain the views of the service users in relation to the service provided. The results are listed below.

Question 1.2
Does anyone in your practice have formal ECG training?
If yes, please outline designation of staff and details of training.
11 of the returned questionnaires stated that some one within their practice had received ECG training.
This training ranged from practice nurses being trained to take but not interpret ECGs through a variety of sources including – in house training, external training and training from people installing ECG machines in the practice.
5 practices indicated that they had staff trained in the interpretation of ECGs but not all had received recent updates.

Question 2.1
Before the introduction of the project, how were ECGs managed in your practice?
Figure 9 shows where ECGs were managed before the project. Of the practices that responded, twelve would send all their patients to the local trust for their ECG. Four GP practices were able to perform all their ECGs in house and six practices would do both. One questionnaire was completed by the practice nurses and they indicated "other", but that they would refer the patient to the GP for an ECG.

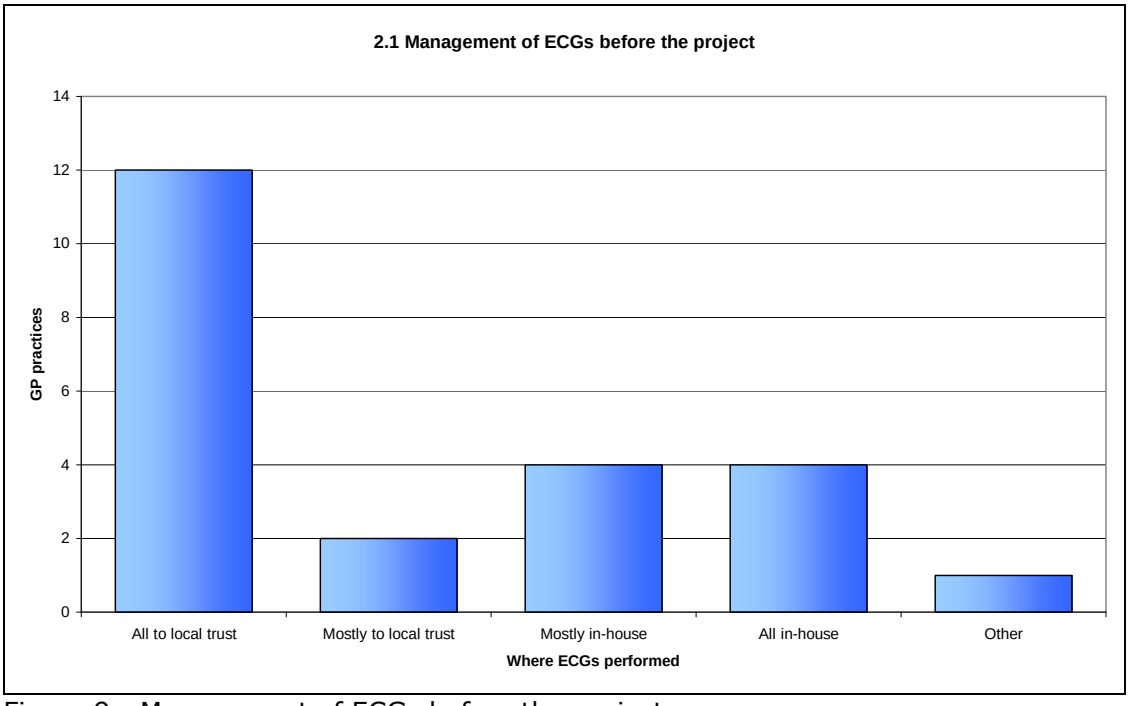

Figure 9 - Management of ECGs before the project

Question 2.2
Before the introduction of the project, what format did the reports take?
The aim of this question was to explore the format that ECG reports took before the project, compared to having all reports clinically interpreted with the Broomwell service.

Figure 10 shows that eight GPs did not usually receive clinically interpreted reports for their ECGs, and that 21 practices did receive a clinically interpreted report.

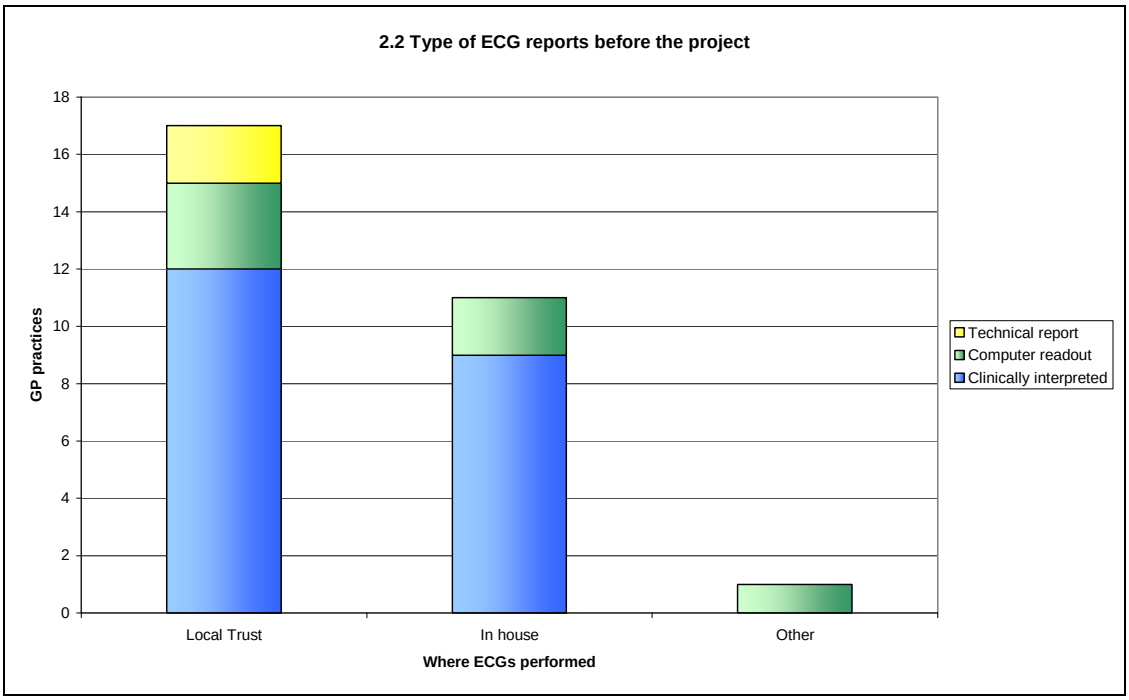

Figure 10 - Type of ECG reports before the project

Question 2.3
On average, how long did it take to receive the results from making the referral / ordering the test?
Figure 11 shows that those practices that performed their ECGs in house would receive their reports straight away, however, those referring to the local trust would experience a delay. Five GPs would receive their reports within the week but two could wait up to nearly two months.

Where a practice indicated a large range in times where they would wait for the report, the practice has been categorised according to the longest time limit.

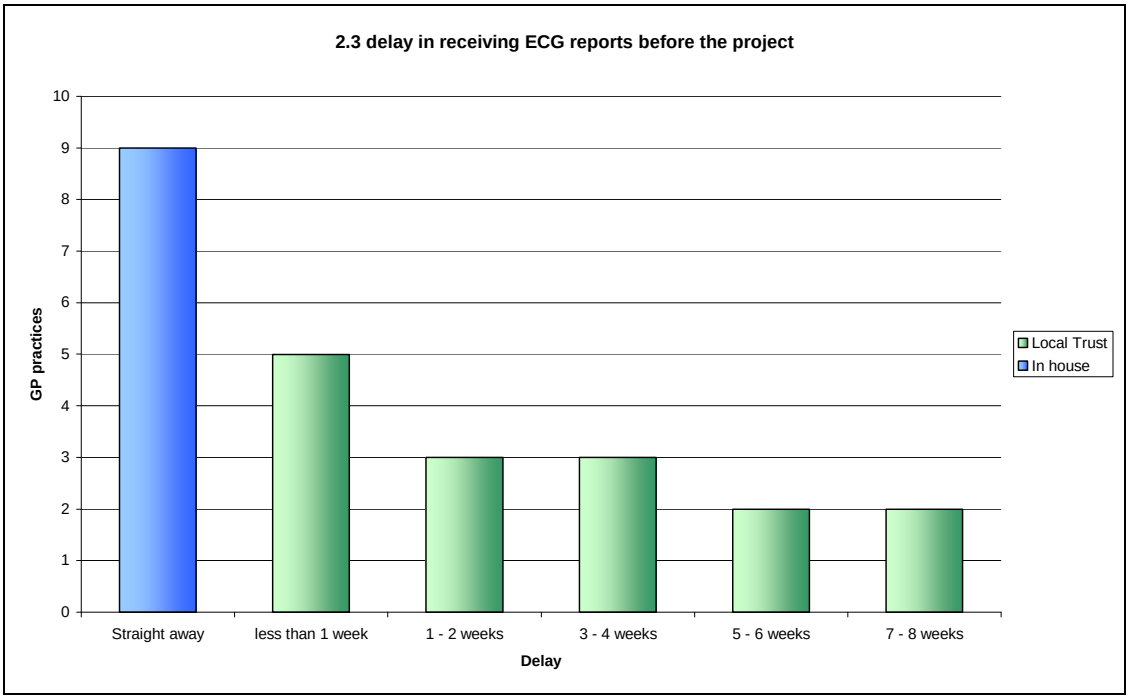

Figure 11 - Delay in receiving ECG reports before the project

Question 3.1
What would you say the good / bad points of the service are?
Good: Selection of comments from returned questionnaires:

- It can reduce unnecessary admissions and referrals to secondary care.
- Patient satisfaction very popular amongst patients and ease of use.
- Good career development for Health Care Assistants.
- Speedy results that can be relayed directly to the patients without delay.
- Can be used in any room in the building.
- Excellent failsafe procedures in place to prevent data mistakes.

Bad: Selection of comments from returned questionnaires:

- Cost of consumables and nurse time
- Can become deskilled but can use ECGs as a learning tool.
- Minutiae of detail on reports
- Can be time consuming if immediate action required.

Question 3.2
If you were used to performing ECGs in house, do you feel that you have learnt anything by having external interpretations from the service provider?
Comments from returned questionnaires:

- understanding of the finer abnormalities
- a learning tool to support clinician interpretation
- learnt a lot from detailed reports with further management advice from Broomwell – would not be able to make decisions without this support.

Question 3.3
If the service was discontinued at the end of the pilot how would you manage your patients?

All the practices that replied indicated that they would return to the service they used prior to the project (See question 2.1).

Question 3.4
Have you had any particular problems with the service?
Comments from returned questionnaires:

- Some problems with equipment but immediately sorted out by Broomwell and box replaced.
- Arrhythmia recognition watch battery ran out on a number of occasions and patients had to be recalled.
- Occasional e-mail attachments would not open but once resent were OK.
- Initial problems with terminology and quality of reports which have now been addressed and are of an excellent quality.
- Difficult to decide on management plan when ECG demonstrates changes but patient well and asymptomatic.

Question 3.5
Please give any other general feedback
Comments from returned questionnaires:

- Excellent quality ECGs allowing us to perform ECGs in surgery and patients home.
- Very polite and efficient staff always ready to help.
- Very knowledgeable staff
- Many verbal and written positive feedback from patients
- Very keen to continue with the service.
- Very successful – a delight to use
- Excellent but would like extra training to support the service.
- Own ECG skills have improved but would prefer to continue with Broomwell.
- Concerns about long term cost.
- Majority of ECGs could have been interpreted as normal by us.
- PCTs should invest in practice staff training to keep care closer to home.

Issues and Challenges
One of the main challenges associated with the project was the compliance by service users in relation to returning audit forms. Only 60% of audit forms were returned. This figure varied greatly between PCTs. PCT leads were proactive in encouraging service users to complete and return the audit forms. This lack of compliance means that we are unable to accurately demonstrate the cost savings.

Some GP practices did not utilize the equipment they received. The reasons for this were explored by both the service providers and the PCT leads. In some cases changes in staffing had led to the equipment not being used and this was addressed by the service providers by offering further training to new starters. Some GPs were using the equipment to record ECGs but did not use the interpretation services instead choosing to interpret the ECG themselves. This unfortunately was not addressed during the pilot.

During the course of phase 1 of the project several PCTs were merged into one resulting in personnel changes and at times a lack of focus on the project. This also resulted in several PCTs not having exit strategies in place by the end of the pilot. For PCTs working with Broomwell Healthwatch this was addressed by extending the current service for a period whilst an exit strategy was developed.

Limitations of the project
PCTs could not provide details of numbers of patients waiting and / or referred for ECGs and therefore we are unable to demonstrate reduction in waiting times as a result of the project.

The cost of a referral to secondary care for an ECG changed for many PCTs during the time of the project. Where possible the figures would have been changed to address this however at the time PCTs were able to provide accurate new baseline figures.

It was not within the scope of the project to collect or analyze outcome data. Therefore we cannot state how many of the patients prevented from an initial referral to secondary care were subsequently referred at a later date. Anecdotally service users say that if patients are subsequently referred to a secondary care clinician the GP is able to provide more comprehensive information to the cardiologist.

Future Plans
North division of the Manchester PCT has commissioned the service for all GPs in their area. Stockport, Bury and Central PCTs are currently working on business cases to support the roll out across their areas.

Five PCTs are currently taking part in phase 2 of the project Salford, Heywood, Middleton & Rochdale, Oldham, Central & Eastern Cheshire and Ashton Leigh & Wigan. Each of these PCTs identified Broomwell Healthwatch as their preferred service provider using the ECG and arrhythmia recognition equipment.

Recommendations & Learning from Phase One
- PCTs should undertake analysis of current numbers and referral pathways for ECGs prior to commissioning this service. This is important as depending on numbers of ECGs required there are benefits in either leasing or purchasing the equipment.

- Need to develop a better understanding and analysis of what is meant when a service user completes the 'other' on the audit form.
- Some GPs are currently interpreting their own ECGs and there is a need to establish the consistency of this approach and the appropriateness of them using the Broomwell service.
- Phase 2 of the project should analyze costs associated with GPs interpreting their own ECGs
- All PCTs wishing to commission or roll out this service should do so via the GMCPH who have negotiated roll out costs on behalf of the phase 1 PCTs.
- Further training for GPs to manage some of these patients in the primary care setting with the support of the ECG interpretation service may be of benefit.

Appendices

Appendix 1 – GP audit form

Appendix 2 – Phase 1 expenditure

Appendix 3 – GP questionnaire

Appendix 4 – Tender

Appendix 5 – Copy of contract

Appendix 1

Audit form for clinical staff to complete when ECG/Arrhythmia equipment used within the Diagnostics Project (version 2)

Participating Practice:_____

Participating PCT:_____

Date	Time (use 24 hr clock)	Piece of equipment used. Please state ECG or Arrhythmia watch	Name of clinician taking ECG/Arrhythmia	Clinical reason for taking ECG/Arrhythmia	What intervention would the practice have made if this service was not available? Please tick as appropriate. If 'other' please specify		
					Outpatient referral	Diagnostics referral	If other please specify

Appendix 2

Greater Manchester & Cheshire Cardiac and Stroke Network

Summary of Wireless Telemedicine Project
Phase 1 Expenditure

Broomwell Healthwatch
Participating PCTs: Bury, Stockport, North and Central Manchester.

12 lead ECG and Arrhythmia:	
Cost per kit and unlimited calls:	£1,226 (£26 inc.
Total cost per PCT (12 practices):	delivery)
Total cost per PCT (12 practices) inc. VAT	£14,712
Total cost for all 4 participating PCTs inc. VAT	**£17,286.60**
	£69,146.40

Welch Allyn
Participating PCTs: South Manchester

12 lead routine ECG for South Manchester PCT:	£1,242
Cost per kit:	£400
Installation cost per unit:	£306
Software/License cost per unit:	£1,948
Total cost per unit:	£2,100
Total cost per calls (based on 25 calls per month)	£4,048
Total cost per practice:	**£23,782**
Total cost for PCT (5 practices) inc. VAT	

Total cost of diagnostic project

The following costs are rounded up to the closest one thousand and include VAT to aid in dispersion of funds from the Strategic Health Authority to participating PCTs.

Bury PCT (12 practices using Broomwell):	£18,000
Stockport PCT (12 practices using Broomwell):	£18,000
Central Mcr PCT (12 practices using Broomwell):	£18,000
North Mcr PCT (12 practices using Broomwell):	£18,000
South Manchester PCT (5 practices using Welch Allyn):	£24,000
	£96,000
Total capital cost for project	**£100,000**
Total capital available for first year of project	

Appendix 3

Questionnaire

Wireless Telemedicine Pilot Evaluation

Assessment of Broomwell/Welch Allyn ECG interpretation service

1 Practice details

1.1 Name of practice: _____

1.2 Does anyone in your practice have formal ECG training?
Yes / No

If yes, please outline designation of staff and details of training

2 Management of ECGs before project

2.1 *Before* the introduction of the project, how were ECGs managed in your practice?

(Please indicate percentage of total ECGs performed)

	Percentage of ECGs
Referred to local trust	
In house	
Other	

2.2 *Before* the introduction of the project, what format did reports take?

(Please tick)

	Clinically interpreted report	Computer interpreted report	Technical report
Referrals to local trust			
In house			
Other			

2.3 On average, how long did it take to receive the results from making the referral / ordering the test?

(Please indicate if 'straight away' or if results took a number of days to be returned - how long. Best guess will do!)

	Straight away (tick)	Delay (Please state how long)
Referred to local trust		
In house		
Other		

3 Views on the project

3.1 What would you say the good/bad points of the service are?

Good:

Bad:

3.2 If you were used to performing ECGs in house, do you feel that you have learnt anything by having external interpretations from the service provider? Yes / No / Not applicable

If yes, please make any comments:

3.3 If the service was discontinued at the end of the pilot how would you manage your patients?

	Please indicate (tick)
Referred to local trust	
In house	
Other	

3.4 Have you had any particular problems with the service?

If yes, please make any comments:

3.5 Please give any other general feedback:

Thank you for taking the time to fill in this questionnaire. Please return to: ……..

Appendix 4

Greater Manchester
Collaborative Procurement Hub

3rd Floor
Sandringham House
Windsor Street
Salford
M5 4DG

Document No 1

21st December, 2005..

Invitation to Offer for the Supply of a Telemedicine System.

Period:

Tender reference TR/GMAS/CPH/13/05.

Offers are invited, subject to the Terms of Offer (Document No 2) for the supply, in accordance with the NHS Terms and conditions of contract (Document No 3), of the goods detailed in the Specification / Offer Schedule (Document No 5).

The Greater Manchester Collaborative Procurement Hub does not bind itself to accept the lowest or any Offer and reserves the right to accept an Offer either in whole or in part, each item being for this purpose treated as offered separately.

This Invitation comprises the following documents:

Document No 1	Invitation to Offer
Document No 2	Terms of Offer
Document No 3	Conditions of Contract (copy on request)
Document No 4	Operational Requirement
Document No 5	Specification / Offer Schedule
Document No 6	Form of Offer
Document No 7	Deed of Guarantee

Should any documents be missing, please contact the undersigned immediately.

Yours faithfully

Kevin Beattie
Category Manager
Greater Manchester Collaborative Procurement Hub

Document No 2

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System.
Tender reference TR/GMAS/CPH/13/05.

4 TERMS OF OFFER

INFORMATION

1.1 Information supplied to Offerors as part of the procedure is supplied in good faith. However, Offerors must satisfy themselves as to the accuracy of such information and no responsibility is accepted for any loss or damage of whatever kind or howsoever caused, arising from the use by Offerors of such information.

1.2 All information supplied in connection with this Invitation shall be regarded as confidential.

1.3 This Invitation and its accompanying documents are and shall remain the property of The Greater Manchester Collaborative Procurement Hub and must be returned on demand.

1.4 The Greater Manchester Collaborative Hub cannot be held responsible for any potential costs incurred by offerors in relation to the preparation of their offer or any subsequent post offer clarification.

PRICES

2.1 Prices must be submitted using the Specification / Offer Schedule (Document No 5). Offers should state the period that they remain open for acceptance until.

2.2 Prices submitted must be firm for the period of the contract as stated in the Invitation to Offer (Document No 1).

OFFER DOCUMENTATION AND SUBMISSION

3.1 Offers may be submitted for all products/services or for selected items.

3.2 Products/services offered should be strictly in accordance with the Specification / Offer Schedule (Document No 5). Alternative products/services may be offered but all differences between such items and the Specification must be indicated in detail on the Offer Schedule (Document No 5).

3.3 Offers must comprise:

a) the Specification / Offer Schedule (Document No 5);

b) the Form of Offer (Document No 6);

c) where the Offeror is a subsidiary company the Authority may require the parent company to execute a Deed of Guarantee (Document No 7);

e) a statement of prompt settlement discounts, if available

f) an uncosted specification breakdown for each model offered, including all optional equipment;

g) a duplicate copy of your full offer documentation.

3.4 The Form of Offer must be signed by an authorised signatory. In the case of a partnership by a partner for and on behalf of the firm, and in the case of a limited company by an officer duly authorised, the designation of the officer being stated. In every case the signature is to be witnessed.

3.5 The Form of Offer and accompanying documents must be fully completed. Any Offer which:

a) contains gaps, omissions or obvious errors; or

b) contains amendments and such alterations have not been initialled by the authorised signatory; or

c) is received after the closing time;

may be rejected. Therefore if you have any queries please contact the following for:

Commercial Enquiries: Kevin Beattie
Tel: 0161 212 3723

3.6 If and when this requirement is offered to tender, this may be done in whole or in part via electronic means using the internet and may be through the medium of an electronic reverse auction."

CONTRACT AWARD CRITERIA

4.1 The contract will be awarded on the basis of the most economically advantageous offer judged on

price, delivery date, running costs, profitability, quality, aesthetic and functional characteristics,

technical merit, after-sales service, and technical back-up.

Document No 3

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System.
Tender reference TR/GMAS/CPH/13/05.

4.1.1.1.1.1.1 Conditions of Contract

4.1.1.1.1.1.1.1 NHS Conditions of Contract for the Purchase of Goods and Services

The above conditions of contract are available on request from the commercial contact in document 2, section 3.5.

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System
Tender reference TR/GMAS/CPH/13/05.

Document No 4

.

Operational Requirement

4.1.1.1.1.1.2

INTRODUCTION

You are invited to submit offers for the supply of a Telemedicine System to the Greater Manchester Collaborative Procurement Hub (Acting on behalf of the Cardiac Network).

The contract period is anticipated to commence on 1st June 2006 and is to run for a period of 12 months with an option to extend for a further 24 months to be reviewed annually.

Funding for this pilot scheme has been awarded for the 3 year period but will be reviewed on an annual basis as the Cardiac Network in conjunction with the Primary Care Trusts participating in the scheme may wish to change the Practices where the system is being used.

Timescale: Award of business anticipated by end of May 2006.

The Greater Manchester Collaborative Procurement Hub consists of all NHS bodies in Greater Manchester
along with other public bodies which may elect to participate from time to time and which will be identified to successful supplier (s).

Any areas of non-compliance with the specification must be stated in the Offer Document No.5.

0fferors must confirm in writing that the specification meets the trust's requirements, including delivery timescales.

UPGRADES AND NEW DEVELOPMENTS

Pre-production models and options, upgrades or new developments must be clearly identified and should be priced as optional items unless previously discussed and agreed as being essential. Specification and delivery date must be stated for all such options.

The supplier (s) must inform the trust in writing of any new products which the contractor wishes to include on the contract for consideration/evaluation by any of the member trusts.

The supplier (s) must inform the GMCPH in writing of any proposed changes to the specification of the goods being supplied against the contract, including proposed changes to packaging, quantity or format, for consideration by the GMCPH. Notification of any such proposals shall be made at least three months prior to the proposed implementation of any changes.

Any new products or changes in specification shall be subject to the agreement of the trust in writing.

If, during the term of the contract, new technology (as defined by clinicians affiliated with the GMCPH) for a product/service becomes available from any source, including suppliers, that

(i) offers significant technological advancements, or
(ii) would significantly improve clinical outcomes, or
(iii) would significantly streamline work processes

as compared to existing products, then the commitment requirements set forth in the contract, if any, do not apply and the GMCPH has the right to evaluate and contract with another supplier so that trusts have access to new technology at all times. If supplier(s) cannot offer new technology at comparable prices, the commitment requirements set forth in the contract, if any, do not apply and the GMCPH has the right to contract with other suppliers for new technology. A trust's purchases of new technology are excluded from their commitment requirements, if any.

Should a supplier begin to sell a similar product not listed on the contract schedule, the supplier shall notify the GMCPH within 30 days of governmental approval or the supplier's release of the product. The GMCPH shall promptly amend the contract schedule within 60 days of governmental approval, or the suppliers release of the product, to add the new product(s) at a similar discount level to those products currently listed on the contract schedule. As new technology products (as defined above) become government approved, and after consultation with the relevant clinical departments, the

GMCPH and the supplier shall promptly amend the contract schedule to add new technology products to the contract at a similar discount level to those products currently listed on the contract schedule.

CUSTOMER SERVICES

The supplier (s) shall provide a responsive customer service which enables a representative of a member trust to resolve issues, over the telephone, within a maximum 24 hour timescale.

MAINTENANCE

It is the responsibility of the successful supplier (s) to maintain any equipment provided as part of the system within the contract period and any offer must include this as standard along with continued IT support to all participants as and when required.

SERVICE, QUALITY AND MONITORING

Providers of the service will be expected to ensure that any component of the service e.g. equipment or patient management treatment plans are carried out in accordance with good clinical practice and should meet National Minimum Standards, guidance issued by National Institute for Clinical Effectiveness, any relevant professional body and or national or local protocols.

Any staff carrying out the service identified in this document on behalf of the organisation awarded the service contract: -

- Shall be made aware and informed by the contract provider of any standards of performance required and should be able to meet these standards
- Shall be routinely monitored by the contract provider to ensure these standards are upheld
- All services provided by the contract provider should be delivered to high standards demonstrated by audit carried out by the contract provider
- Comply in all aspects with all legal obligations or duties imposed on them by any legislation or all future legislation relevant to the operation of the service described in this document.

In the event of any serious untoward incident and adverse patient incidents these should be reported immediately and national guidance on Adverse Patient Incidence Reporting should be adhered to. Locally incidents will be dealt with by the individual PCT and the provider depending on the individual incident and where it occurred for example:

- Incidents within a GP practice and or ICATS provider will be managed by the PCT
- Incidents relating to the equipment, transfer of data will be managed jointly by the PCT and the service contract provider
- Issues relating to the delivery of the service directly related to patient management treatment plans, timeliness of advice or equipment will be dealt with

the contract service provider, however the PCT should be informed in writing within 7 days of any incident with full reporting provided in a timely manner.

DATA QUALITY

All data supplied by the PCT and the service contract provider will conform to national NHS standards regarding definitions, codes, classifications and field lengths and formats.

In addition for monitoring purpose the completion of a database of activity will be provided by the service contract provider to the PCT. This will provide an electronic summary of the level of activity on a monthly basis and quality indicators, no more than one month after the period being reported on, for the following indicators:

- How many patients have been reviewed by the service by diagnostic type and outcome for example advised management in primary care, treatment plan provided
- How many and what type of diagnostics have been carried out
- Any clinical incidents or complaints relating to the provision of the service provided by supplier/suppliers under the agreement of the contract

The reporting mechanism will be agreed between the individual PCT and the service contract provider. Any further reporting requirements will be agreed jointly in discussions between the PCT and service contract provider.

Supplier (s) software analysis should be able to demonstrate that it is as accurate as a Cardiologist's interpretation (audit data will be required).

Data must be encrypted and protected in the appropriate way in order to satisfy Caldicott.

Failure to comply with the terms and standards identified within the contract will result in the issuing of a performance notice followed up by a service review meeting.

PROVISION FOR DISRUPTION OF SERVICE

The contract service provider will provide the service and will maintain staffing cover in the event of long term staff vacancies, absences or other causes of disruption.

COMPLAINTS

Any complaints received in relation to the delivery of the service will be subject to Stockport PCT complaints procedure and dealt with accordingly. The contract service provider will inform the PCT of any complaints received by themselves in relation to the delivery of the service. Complaints will be reviewed and appropriate action taken with the aim of maximising the quality of the service.

Both parties will agree to comply with the NHS complaints procedure.

TRAINING / EDUCATION

The supplier (s) must offer training / education to all participants in the scheme in the following areas as an added value service to the contract: -

- Use of equipment / software applicable
- Capturing of data
- Recording of data
- Interpretation of data

ARRYTHMIAS

Patients are given a device to record their Heart Rhythm when they experience palpitations.

BLOOD PRESSURE MONITORING

Patient Ambulatory Blood Pressure Monitored from home using (transmitting) Blood Pressure gauge (sphygmomanometer) that the Primary Care Clinician can communicate 24 hrs with the monitoring centre

The successful supplier will arrange the monitoring centre where qualified staff eg. Consultant Cardiologist / other clinician will interpret the data and provide feedback / management plan as part of their offer. The staff must be able to interpret the diagnostic reports transmitted to the centre and report back.

This can be done either by the supplier employing the staff or by using a third party eg. a hospital facility willing to offer such a service.

2 AWARD CRITERIA

2.1 The contract will be awarded on the basis of the supplier who offers the most economically advantageous offer to meet the Trust's specific needs as defined.

1.2 In evaluating offers, the key areas that will influence any award decision will include:

- cost of all necessary equipment / software
- as near as possible a supplier (s) meeting the specification (s)
- quality / life value of products
- the maintenance of all necessary equipment / software
- provision of initial and ongoing training in use of equipment / software
- company commitment to the end – user
- development of new / advanced technology

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EQUIPMENT FOR THE USE OF: -	METHOD OF CARE	PRICE OFFERED (excl. VAT)
ECG MONITORING Patient monitored from home by use of a (transmitting) 12 lead ECG and being able to communicate 24 hrs with the monitoring centre. GPs using (transmitting) 12 lead ECG in Surgeries or on House Calls with an immediate 'response / evaluation' by the (24 hrs) monitoring centre. 24 hr Ambulatory ECG 7 Day Life Trace Equipment required for the above: - 12 Lead digital ECG recorder, with suitable electrodes A suitable software program that: - links with a true 12 lead ECG with diagnostic capacity and comprises a secure encrypted system which allows two-way communication and transmission of data (this must comply with the Data Protection Act 1988 and the principles of Caldicott) **All equipment to meet or exceed the minimum requirements of IEC 60601-2-51 (2003).**	Data transmitted (from device provided by supplier) to external provider (eg Cardiologist) to assess data, report back and provide where possible a report and or a management plan.	**£** **Price should include the cost of any diagnostic equipment necessary along with any relevant software necessary, licences required and the cost of transmitting the data. You may wish to show a breakdown of price for each component.**
EQUIPMENT FOR THE USE OF: -	**METHOD OF CARE**	**PRICE OFFERED (excl. VAT)**
ARRHYTHMIAS Patients are given a device to record their Heart Rhythm when they experience palpitations. Equipment provided must be able to	Data transmitted (from device provided by supplier) to external provider (eg Cardiologist) to assess data, report back and provide where	**£**

detect and analyse arrhythmias and ST segment deviation, analyses of R-R intervals, WRS-T morphology including late potentials, Q-T dispersion and T-wave over 24-48 hours **All equipment to meet or exceed the minimum requirements of IEC 60601-2-51 (2003).**	possible a report and or a management plan.	**Price should include the cost of any diagnostic equipment necessary along with any relevant software necessary, licences required and the cost of transmitting the data. You may wish to show a breakdown of price for each component.**
BLOOD PRESSURE MONITORING Patient Ambulatory Blood Pressure Monitoring from home using (transmitting) Blood Pressure Gauge (sphygmomanometer) that the Primary Care Clinician can communicate 24 hrs a day with the monitoring centre. **All equipment to meet or exceed the minimum requirements of IEC 60601-2-51 (2003).**	Data transmitted (from device provided by supplier) to external provider (eg Cardiologist) to assess data, report back and provide where possible a report and or a management plan.	**£** **Price should include the cost of any diagnostic equipment necessary along with any relevant software necessary, licences required and the cost of transmitting the data. You may wish to show a breakdown of price for each component.**

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System.
Tender reference TR/GMAS/CPH/13/05.

Deviations from requested specification/operational requirement

ITEM	DETAILS OF DEVIATION

Signed: _____

Date: _____
For and on behalf of: _____

OFFER SCHEDULE - ADDITIONAL DISCOUNTS

Please state any additional discount offered for early or prompt payment within the stated number of days of the date of delivery or the submission of an invoice, whichever is the later.

Net 7 days ..... %

Net 14 days ..... %

Net 21 days ..... %

Net 30 days ..... %

Please state any additional discounts should your offer be accepted for more than one item, or any combination of equipment:

Equipment (please state):	Additional Discount:
.....	..... %
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Document No 6

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System.
Tender reference TR/GMAS/CPH/13/05.

FORM OF OFFER

I/We .....(the Offeror)

of .....
.....
.....

AGREES

1. that this Offer and any contract arising from it shall be bound by the Conditions of Offer, NHS Conditions of Contract for the Purchase of Goods/Services, and Supplementary Conditions of Contract issued with the Invitation to Offer; and

2. to supply goods/services of the exact quality, sort and price specified in the Offer Schedule in such quantities and to such extent and at such times and locations as ordered.

3. that this offer is made in good faith and that we have not fixed or adjusted the amount of the offer by or in accordance with any agreement or arrangement with any other person. We certify that we have not, and we undertake that we will not

   (a) communicate to any person other than the person inviting these offers the amount or approximate amount of the offer, except where the disclosure, in confidence, of the approximate amount of the offer was necessary to obtain quotations required for the preparation of the Offer, for insurance purposes or for a contract guarantee bond;

   (b) enter into any arrangement or agreement with any other person that he shall refrain from making an offer or as to the amount of any offer to be submitted;

Dated this ..... day of ..... 200 *.

Name (print) .....

Signature .....

Title .....

Document No 7

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System.
Tender reference TR/GMAS/CPH/13/05.

DEED OF GUARANTEE

THIS Deed of Guarantee is made the ..... day of .....
BETWEEN ..... PLC/Limited, whose registered office is situated at ..... (hereinafter called "the Guarantor") of the first part and Greater Manchester Collaborative Procurement Hub of the second part.

WHEREAS

(1) ..... PLC/Limited, whose registered office is at ..... (hereinafter called "the Contractor") has submitted a Offer dated ..... for the provision of …… as offered to Greater Manchester Collaborative Procurement Hub which Offer has been accepted;

(2) By the Conditions of Offer the said Offer together with Greater Manchester Collaborative Procurement Hub acceptance thereof constitute a binding Agreement between Greater Manchester Collaborative Procurement Hub and the Contractor that the Contractor shall hereafter execute a formal written Agreement upon the terms and conditions stipulated in the Invitation to Offer.

Now therefore by this Deed the Guarantor agrees with Greater Manchester Collaborative Procurement Hub and the Authorities as follows:

1. If the Contractor (unless relieved from the performance by any terms of the said Agreements (or of any other them) or by the statute or by the decision of a tribunal of competent jurisdiction) shall in any respect fail to execute the said Agreements (or any of them) or shall commit any breach of any of the Contractor's obligations there under, the Guarantor will upon demand indemnify Greater Manchester Collaborative Procurement Hub against all losses, damages, costs and expenses which may be incurred by NHS Supplies or by reason of any default on the part of the Contractor in performing and observing the provisions of the said Agreements (or of any of them).

2. The Guarantor shall not be discharged or released from this Guarantee by any arrangement made between the Contractor and Greater Manchester Collaborative Procurement Hub without the assent of the Guarantor, or by any alteration in the obligations undertaken by the Contractor or by any forbearance whether as to payment, time, performance or otherwise.

In Witness whereof the Guarantor has executed this Deed the day and year above.
Executed as a Deed by……..Director
The Guarantor
……Secretary or Director

Appendix 5

Greater Manchester Collaborative Procurement Hub
Tender for the supply of a Telemedicine System,
Tender reference TR/GMAS/CPH/13/05/Broomwell.

Summary Specification.

Contract period – 1st September, 2006 to 31st August, 2009 (to be reviewed annually with a view of identifying alternative or additional PCT's who may wish to participate in the use of the system).

Notice period – the Cardiac Network will notify Broomwell Healthwatch which PCT's will participate in the use of the system in year 2 of the project by month 10 of the first year and if any changes will be necessary they will advise what in the way of further equipment purchases will be required for the additional PCT's.

Basic service scope: –

UPGRADES AND NEW DEVELOPMENTS

Pre-production models and options, upgrades or new developments must be clearly identified and should be priced as optional items unless previously discussed and agreed as being essential. Specification and delivery date must be stated for all such options.

The supplier (s) must inform the trust in writing of any new products which the contractor wishes to include on the contract for consideration/evaluation by any of the member trusts.

The supplier (s) must inform the GMCPH in writing of any proposed changes to the specification of the goods being supplied against the contract, including proposed changes to packaging, quantity or format, for consideration by the GMCPH. Notification of any such proposals shall be made at least three months prior to the proposed implementation of any changes.

Any new products or changes in specification shall be subject to the agreement of the trust in writing.

If, during the term of the contract, new technology (as defined by clinicians affiliated with the GMCPH) for a product/service becomes available from any source, including suppliers, that

(i) offers significant technological advancements, or

(ii) would significantly improve clinical outcomes, or
(iii) would significantly streamline work processes

as compared to existing products, then the commitment requirements set forth in the contract, if any, do not apply and the GMCPH has the right to evaluate and contract with another supplier so that trusts have access to new technology at all times. If supplier(s) cannot offer new technology at comparable prices, the commitment requirements set forth in the contract, if any, do not apply and the GMCPH has the right to contract with other suppliers for new technology. A trust's purchases of new technology are excluded from their commitment requirements, if any.

Should a supplier begin to sell a similar product not listed on the contract schedule, the supplier shall notify the GMCPH within 30 days of governmental approval or the supplier's release of the product. The GMCPH shall promptly amend the contract schedule within 60 days of governmental approval, or the supplier's release of the product, to add the new product(s) at a similar discount level to those products currently listed on the contract schedule. As new technology products (as defined above) become government approved, and after consultation with the relevant clinical departments, the GMCPH and the supplier shall promptly amend the contract schedule to add new technology products to the contract at a similar discount level to those products currently listed on the contract schedule.

CUSTOMER SERVICES

The supplier (s) shall provide a responsive customer service which enables a representative of a member trust to resolve issues, over the telephone, within a maximum 24 hour timescale.

MAINTENANCE

It is the responsibility of the successful supplier (s) to maintain any equipment provided as part of the system within the contract period and any offer must include this as standard along with continued IT support to all participants as and when required. Should any equipment be beyond repair by the supplier within a 24 hour period it should be replaced by the supplier so no effect on the service occurs.

SERVICE, QUALITY AND MONITORING

Providers of the service will be expected to ensure that any component of the service e.g. equipment or patient management treatment plans are carried out in accordance with good clinical practice and should meet National Minimum Standards, guidance issued by National Institute for Clinical Effectiveness, any relevant professional body and or national or local protocols.

Any staff carrying out the service identified in this document on behalf of the organisation awarded the service contract: -

- Shall be made aware and informed by the contract provider of any standards of performance required and should be able to meet these standards
- Shall be routinely monitored by the contract provider to ensure these standards are upheld
- All services provided by the contract provider should be delivered to high standards demonstrated by audit carried out by the contract provider
- Comply in all aspects with all legal obligations or duties imposed on them by any legislation or all future legislation relevant to the operation of the service described in this document.

In the event of any serious untoward incident and adverse patient incidents these should be reported immediately and national guidance on Adverse Patient Incidence Reporting should be adhered to. Locally incidents will be dealt with by the individual PCT and the provider depending on the individual incident and where it occurred for example:

- Incidents within a GP practice and or ICATS provider will be managed by the PCT
- Incidents relating to the equipment, transfer of data will be managed jointly by the PCT and the service contract provider
- Issues relating to the delivery of the service directly related to patient management treatment plans, timeliness of advice or equipment will be dealt with the contract service provider, however the PCT should be informed in writing within 7 days of any incident with full reporting provided in a timely manner.

DATA QUALITY

All data supplied by the PCT and the service contract provider will conform to national NHS standards regarding definitions, codes, classifications and field lengths and formats.

In addition for monitoring purpose the completion of a database of activity will be provided by the service contract provider to the PCT. This will provide an electronic summary of the level of activity on a monthly basis and quality indicators, no more than one month after the period being reported on, for the following indicators:

- How many patients have been reviewed by the service and the timescales for reporting from receipt of data to time sent back to primary care.
- Reporting on quality, nature and number of problems of use of equipment in primary care i.e., user error.
- A summary of outcomes of diagnostics i.e., treatment plans for management in primary care, further diagnostics advised and referrals to secondary care.
- Any clinical incidents or complaints relating to the provision of the service provided by supplier/suppliers under the agreement of the contract

The reporting mechanism will be agreed between the individual PCT and the service contract provider. Any further reporting requirements will be agreed jointly in discussions between the PCT and service contract provider.

Supplier (s) software analysis should be able to demonstrate that it is as accurate as a Cardiologist's interpretation (audit data will be required).

Data must be encrypted and protected in the appropriate way in order to satisfy Caldecott.

Failure to comply with the terms and standards identified within the contract will result in the issuing of a performance notice followed up by a service review meeting.

PROVISION FOR DISRUPTION OF SERVICE

The contract service provider will provide the service and will maintain staffing cover in the event of long term staff vacancies, absences or other causes of disruption.

COMPLAINTS

Any complaints received in relation to the delivery of the service will be subject to PCT complaints procedure and dealt with accordingly. The contract service provider will inform the PCT of any complaints received by them in relation to the delivery of the service. Complaints will be reviewed and appropriate action taken with the aim of maximising the quality of the service.

Both parties will agree to comply with the NHS complaints procedure.

TRAINING / EDUCATION

The supplier (s) must offer training / education to all participants in the scheme in the following areas as an added value service to the contract: -

- Use of equipment / software applicable
- Capturing of data
- Recording of data
- Interpretation of data
- Provide ongoing training of staff where appropriate
- Work closely with PCT's to address issues of quality

ECG

GPs using (transmitting) 12 lead ECG in Surgeries or on House Calls with an immediate 'response / evaluation' by the (24 hrs) monitoring centre.

ARRYTHMIAS

Patients are given a device to record their Heart Rhythm when they experience palpitations and these
recordings will then be interpreted via the monitoring centre.

PRICING STRUCTURE

Description of Product	Purchase Cost	Delivery Charge
12 Lead ECG Device and service / maintenance associated	£800.00 (excl. vat)	£13.00 (excl. vat)
Arrhythmia Device and service / maintenance associated	£400.00 (excl. vat)	£13.00 (excl. vat)
The combined costs include an unlimited number of calls for the 12 month period commencing 1st September, 2006 until 31st August 2007 as submitted within the tender documentation	**£1,200.00 (excl. vat)**	**£26.00 (excl. vat)**

The above pricing (purchase cost of equipment and service) will be held firm for the 3 year period of the agreement and will be available to additional PCT's should they become part of the pilot scheme in years 2 and 3.

ADDITIONAL INFORMATION / ADDED VALUE

The prices offered will be held firm for the three year period of the contract and the participating PCT's will be reviewed on an annual basis.

Broomwell Healthwatch will on a monthly basis send to the Cardiac Network and the GMCPH a report on the activity received through the call centre by referring GP practice. The report must contain information on the number of transmissions received and the number of acute referrals the system has avoided.

Greater Manchester Collaborative Procurement Hub consists of all NHS bodies in Greater Manchester, along with any other public bodies which may participate from time to time and which will be identified to contractors. Should the volumes in the contract change considerably during the period of the contract then the Hub reserves the right to review the current pricing structure.

NHS Conditions of Contract for the Supply of Services apply at all times for the duration of this Contract unless otherwise notified. NHS Terms and Conditions of Contract for the Provision of Services are available upon request.

PARTICIPATING PRIMARY CARE TRUSTS IN YEAR 1 OF THE PROJECT WHO WILL BE USING THE BROOMWELL SYSTEM: -

Bury PCT: Main contact – Yvonne Rispin

Signed on behalf of Trust: ……..
Name: …….

Central Manchester PCT: Main contact – Karen O'Brien

Signed on behalf of Trust: ……..
Name: …….

North Manchester PCT: Main contact – Alex Johnstone

Signed on behalf of Trust: ……..
Name: …….

Stockport PCT: Main contact – Alison Tonge

Signed on behalf of Trust: ……..
Name: …….

Please sign and return one copy of this letter to Kevin Beattie of the Greater Manchester Collaborative Procurement Hub at the above address as confirmation of acceptance of the contract

On behalf of Broomwell Healthwatch: -

Signed: …….. Name: ……. Position: ……

Yours Sincerely,

Peter Akid
Chief Executive
Greater Manchester Collaborative Procurement Hub