

GM-HFIT

(Greater Manchester Heart Failure Investigation Tool)

Primary Care Heart Failure Project

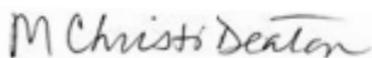
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Foreword

The work reported here represents a partnership between primary care practices in Manchester and the NIHR Collaboration for Leadership in Applied Health Research and Care for Greater Manchester (GM CLAHRC) with the intent of improving care for patients with heart failure (HF). General practice physicians, practice nurses and managers collaborated with the GM CLAHRC heart disease team in a programme that included heart failure register validation, case finding, and an evidence-based skills audit using the GM-Heart Failure Investigation Tool (GM-HFIT), formal and informal education, support for practice change, and re-audit. The GM CLAHRC heart disease team included knowledge transfer associates (KTAs) and heart failure specialist nurses (HFSNs), who brought specific expertise in HF and the facilitation of change, to the practices.

The results show an increase in the numbers of patients with HF appropriately on the HF register, and an impressive improvement in the care provided to patients. Although practices varied in their initial audit scores, all practices improved at the time of the 9-12 month re-audit, and work currently in progress would be expected to continue and enhance the advances made. These results demonstrate the value of collaborative work, and using a facilitated model to help practices implement evidence-based care.

We would like to thank the practices for their hard work and desire to improve their management of patients with HF, and congratulate them on their achievements.



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Table of Contents

| | |
|--|-----------|
| Executive Summary | 6 |
| Project Design..... | 6 |
| Quantitative Outcomes | 6 |
| Qualitative Outcomes | 7 |
| 1. Introduction..... | 8 |
| 1.1 Demographics | 9 |
| 2. GM-HFIT | 10 |
| 2.1 Project background..... | 10 |
| 2.2 Aim | 11 |
| 2.3 Objectives..... | 11 |
| 3. Project Design..... | 12 |
| 3.1 GM-HFIT (verification)..... | 13 |
| 3.1 (a) HF Skills Audit | 13 |
| 3.1 (b) HF Register Verification..... | 15 |
| 3.2 GM-HFIT (case finding) | 15 |
| 3.3 Clinical Educational Session | 16 |
| 3.4 Feedback Session..... | 16 |
| 3.4 (a) Development Pack..... | 16 |
| 3.5 Re-audit | 17 |
| 3.5 (a) GM-HFIT (lite)..... | 17 |
| 3.5 (b) GM-HFIT (checker)..... | 17 |
| 3.6 Final Feedback Session..... | 17 |
| 4. Evaluation | 18 |
| 4.1 Outcome Measures | 18 |
| 4.2 Demographics | 18 |
| 4.3 GM-HFIT (verification) and GM-HFIT (lite)..... | 20 |
| 4.3 (a) Accuracy of HF Register | 20 |
| 4.3 (b) Traffic Light Score | 21 |
| 4.3 (c) Confirmed Diagnosis | 22 |
| 4.3 (d) Medication – ACE-I..... | 23 |
| 4.3 (e) Medication – Beta Blocker | 25 |
| 4.3 (f) Heart Failure Care..... | 26 |
| 4.4 GM-HFIT (case finding) | 27 |
| 4.5 HF Prevalence | 28 |
| 4.6 GM-HFIT (case finding) – Specificity and Sensitivity | 29 |

| | |
|---|-----------|
| 5. Practice Case Studies | 31 |
| 6. Conclusions..... | 36 |
| 7. Recommendations | 37 |
| | |
| Appendix 1 | 38 |
| Interview Schedule – Community Nursing (Active Case Manager/Community Matron) | |
| Appendix 2 | 39 |
| Interview Schedule – Secondary Care (Patient Flow Manager/Ward Nurses) | |
| Appendix 3 | 40 |
| Interview Schedule – Secondary Care (Heart Failure Specialist Nurse) | |
| Appendix 4 | 42 |
| Interview Schedule – Primary Care (Nurse Practitioner) | |
| Appendix 5 | 43 |
| Interview Schedule – Community Care (Heart Failure Specialist Nurse) | |
| Appendix 6 | 44 |
| Interview Schedule – Primary Care (General Practitioner) | |
| Appendix 7 | 45 |
| Plan Do Study Act Template | |
| Appendix 8 | 46 |
| Clinic Rationale for GM-HFIT (verification) Performance Indicators | |
| Appendix 9 | 54 |
| EMIS PCS/LV Read Codes and Search Criteria for GM-HFIT (case finding) | |
| Appendix 10..... | 55 |
| GM-HFIT Action Plan Provided to Practice Teams | |

Executive Summary

Project Design

- A twelve month project was undertaken by the Collaboration for Leadership in Applied Health Research and Care for Greater Manchester (GM CLAHRC) in NHS Manchester. The aim of the project was to improve the quality and equity of service and care for people with heart failure (HF). Areas for improvement had been identified as: inaccurate HF registers, problems with Read coding and a lack of knowledge and skills within primary care in relation to the management of HF patients. The project was implemented in thirteen practices: five in North Manchester, six in Central Manchester and two in South Manchester.
- GM-HFIT (verification) and (case finding) are Microsoft Excel based templates that were developed as a resource to guide the audit process. GM-HFIT (verification) was used to undertake an evidence based HF skills audit and a verification of the HF register. The HF skills audit collected baseline data and generated a '*Traffic Light Score*' for each practice based on their performance. GM-HFIT (case finding) utilised a set of nineteen register searches; it was developed to identify patients with a diagnosis or potential diagnosis of HF who had not been placed on the practice HF register.
- Both GM-HFIT (verification) and (case finding) processes were performed manually by a heart failure specialist nurse (HFSN). This was followed by a half day education session for a general practitioner (GP) and practice nurse (PN) from each practice, feedback sessions were arranged where findings were discussed with each practice team. A development pack containing audit results and HF resources was also provided. Throughout the project members of the GM CLAHRC team were available in a facilitative role to support practices in any improvement work undertaken.
- Nine to twelve months after the initial baseline audit the HF registers were re-audited to identify any improvements in HF management. However due to changes in funding arrangements re-audit data is only available from ten of the original thirteen practices.

Quantitative Outcomes

- At re-audit 78.96% (n=259) of patients were appropriately on the HF register, this represents a proportional increase of 32.19%. The number of patients who did not have HF and therefore should not be on the register was only 2.74% a decrease of 85.15%. The number of patients requiring investigation was 18.29% (n=60) a decrease of 16.02%.
- All practices increased their '*Traffic Light Scores*' at re-audit with four practices improved from a score of amber to green. The mean increase was 10 points with the highest percentage increase being 91.5%.
- There was an improvement in the prescribing patterns for ACE inhibitors (ACE-I) and beta blockers (BB) for patients with left ventricular systolic dysfunction (LVSD).
- Re-audit data shows 59.45% (n=195) of patients with LVSD were prescribed an ACE-I, this is an increase of 30.53%. Only 4.57% (n=15) of LVSD patients were not prescribed an ACE-I, a decrease of 25.97%. The percentage of patients documented as contraindicated or where ACE-I therapy was being up-titrated increased by 27.91% and 11.74% respectively.
- The results were similar for BB use with 47.26% (n=155) of patients with LVSD prescribed a BB at re-audit, this is an increase of 35.08%. Only 7.01% (n=23) patients with LVSD not prescribed a BB, a decrease of 45.58%. The percentage of patients documented as contraindicated or where BB therapy was being up-titrated increased by 97.95% and 8.61% respectively.

- The number of HF reviews performed in primary care increased by 216.72% and the number of patients attending HF specialist services decreased by 25.82%.
- The nineteen searches identified a total number of 2,015 patient records. Of these 237 had a confirmed diagnosis of HF and needed to be added to the HF register, 123 patients needed a GP review to assess their HF status, 43 patients required referral for echocardiogram (ECHO), 46 needed a copy of their ECHO report requesting from secondary care and 12 patients required referral to a specialist HF clinician.
- Of the ten practices re-audited the overall HF prevalence increased from 0.56% to 0.67%. If these figures are broken down further, prevalence in North Manchester increased from 0.56% to 0.84% (a 50% increase) compared to Central Manchester where prevalence increased from 0.46% to 0.48% (a 5% increase). It is suggested that as the project started in North Manchester the GM CLAHRC team were able to build stronger relationships and were more involved in the facilitation of any improvement work undertaken.

Qualitative Outcomes

- Semi-structured interviews were conducted with six GPs and four practice managers (PM), a number of case studies were developed from the findings.
- As a direct result of undertaking the GM CLAHRC HF project Practice A decided to implement long term condition reviews that incorporated HF, rather than individual disease reviews. Health care assistants now conduct introductory clinics where blood tests and observations are performed. The patient is then allocated an appointment with a GP who undertakes a comprehensive long term condition review.
- As a direct result of undertaking the GM CLAHRC HF project Practice B implemented a new coding system to ensure all ECHO reports were coded and the correct Read codes used for HF patients. Undertaking the HF project highlighted their coding problems; as a consequence they decided to undertake a review of their entire coding system.
- Practice D requested further tailored HF education and the GM CLAHRC team provided one to one coding training for non clinical staff. The GM CLAHRC team also facilitated the improvement work offering advice about the most effective way to approach it. This practice improved their '*Traffic Light Score*' from amber to green and their prevalence increased by 54% from 0.61% to 0.94%

1. Introduction

HF affects around 900,000 people in the UK and is particularly common amongst older people, with prevalence expected to increase over the next 20 years¹.

HF can be extremely debilitating and there is evidence that people with this condition have a poorer quality of life than those suffering from most other chronic conditions. As a result, HF impacts significantly on the availability of hospital beds, the number of emergency admissions and re-admissions to hospital. HF accounts for 2% of NHS inpatient days and 5% of all medical admissions to hospital; it is the largest single reason for emergency bed days due to a chronic condition. Re-admission rates are also amongst the highest for any common condition in the United Kingdom.

However, there is evidence to support that appropriate diagnosis, treatment and ongoing support for this group of patients can improve quality of life, help reduce morbidity and mortality, along with reducing hospital admission². In addition, meta-analysis data illustrate that HF admissions can be reduced by 34 – 50%, with the use of tailored interventions involving multi-faceted programmes³. Numerous clinical trials have shown the benefit of ACE-I, angiotensin receptor blockers (ARB) and BBs titrated to optimal doses for patients with HF⁴. As reviewed in international guidelines, clinical trials demonstrate relative risk reductions in hospitalisation for HF of 20 – 36% in patients given ACE-I compared to placebo, and when beta-blockers are added to conventional therapy (ACE-I or ARB). ACE-I and BBs remain the cornerstone of HF therapy; ARB may be substituted for ACE-I without loss of effect³.

There is good evidence to suggest that optimal care improves survival and quality of life for people with HF¹. However, to ensure that these patients receive regular reviews and evidence based treatment, as outlined above, it is important that practice HF registers are accurate. These registers can be used proactively to improve the care of patients with HF by guiding ongoing treatment and management, resulting in the provision of appropriate clinical support and education. An accurate HF register can also assist clinicians to determine the progression of the disease and its impact on the broader health economy. However, evidence shows that the accuracy of HF registers is variable.^{1,5} This is comparable with the results of register verification work undertaken by the Collaboration for Leadership in Applied Health Research and Care for Greater Manchester (GM CLARHC) in thirteen General Practices in Manchester and forms the basis for this project.

For the effective management of HF, it is essential that primary care clinicians have the necessary skills to care for people with HF. In line with current evidence base the 'GM-HFIT Primary Care Heart Failure Project' utilised tailored, multifaceted implementation approaches⁶, such as clinical audit and feedback, academic detailing, interactive educational sessions, visual aids and materials, targeting multiple barriers⁷, for example, knowledge, skills and beliefs about capabilities. The outcome data and findings of this project demonstrate that this approach has been highly effective in achieving best clinical practice.

¹ Health Care Commission (2007) *Pushing the Boundaries: Improving Services for People with Heart Failure*, London, Health Care Commission

² NHS Information Centre (2010) *National Heart Failure Audit*, London, NHS Information

³ Yu DS, Thompson DR, Lee DTF. 'Disease management programmes for older people with heart failure: crucial characteristics which improve post-discharge outcomes'. *European Heart Journal*. 2006; 27: 596 – 612.

⁴ Dickstein K, Cohen-Solal A, Filippatos G, McMurray JJV, Ponikowski P, Poole-Wilson PA, Stromberg A, van Veldhuisen DJ, Atar D, Hoes AW, Keren A, Mebazaa A, Nieminen M, Priori SG, Swedberg K. European Society of Cardiology guidelines for the diagnosis and treatment of acute and chronic heart failure. *European Heart Journal*. 2008; 29: 2388 – 2442

⁵ Bhatia GS, Sosin JS, Patel JV, Hughes EA, Gibbs R, Russel CD (2007) Evaluation of B-type Natriuretic Peptide for validation of heart failure registers in primary care, *BMC Cardiovascular Disorders* <http://www.biomedicalcentral.com/1471-2261/7/23>

⁶ Grol, R. and Grimshaw, J., 1999. *Evidence-based implementation of evidence-based medicine*. *Journal on Quality Improvement*, 25(10), pp.503-513

⁷ Michie, S.F, Johnston, M, Abraham, C, Lawton, R, Parker, D, Walker, A., 2004. *Making psychological theory useful for implementing evidence based practice: a consensus approach*. *Quality and Safety in Health Care*, 12, pp. 26-33.

1.1 Demographics

NHS Manchester is divided into three sectors; this report will focus upon the implementation of the project in thirteen practices, five in the North sector, six in the Central sector and two in the South sector. However due to new funding arrangements, full follow up and evaluation data is only available for ten practices, five in North Manchester and five in Central Manchester.

The resident population of Manchester is 483,831 with an estimated 161,974 residing in the Central sector, 156,716 in the North sector and 156,359 residing in the South of the city. The ethnicity breakdown of the Central sector is 62.6% all white groups and 37.4% non-white groups, for the North sector 81.5% all white groups and 18.5% non-white groups and for the South it's 86.6% all white groups and 13.4% non-white groups. The deprivation score for the Central sector is 47.47, for North and South its 39.16 and 36.79 respectively; with NHS Manchester as a whole having a score of 41.13 (the higher the score the more deprived the area), please see Table 1 for more information^{8,9,10}.

TABLE 1

| | Population | % of resident population | | | | | | Deprivation |
|-------------------|------------|--------------------------|-------|-------|-------|-----------------|-----------|-------------|
| | | All white | Mixed | Asian | Black | Chinese & Other | Non white | |
| North | 156,716 | 81.5 | 2.6 | 7.3 | 2.9 | 5.9 | 18.5 | 47.47 |
| Central | 161,974 | 62.6 | 4.2 | 15.5 | 11.5 | 8.3 | 37.4 | 39.16 |
| South | 156,359 | 86.6 | 2.9 | 5.3 | 2.4 | 3.3 | 13.4 | 36.79 |
| Manchester | 483,381 | 76.5 | 3.3 | 9.6 | 5.8 | 5.9 | 23.5 | 41.13 |

As illustrated in Table 1, the differing sectors of Manchester have varying demographics. Table 2 identifies that differences between the ages of residents exists across the sectors of Manchester.

TABLE 2

| | Age Group | | | | |
|-------------------|----------------|-----------------|-----------------|----------------|----------------|
| | 0-15 | 16-29 | 30-44 | 44-64/59* | 65/60+** |
| North | 28,117 (17.9%) | 48,109 (30.8%) | 33,600 (21.4%) | 26,282 (16.8%) | 20,608 (13.1%) |
| Central | 30,706 (19%) | 64,357 (39.7%) | 36,096 (22.3%) | 22,621 (14%) | 16,986 (10.5%) |
| South | 26,489 (16.9%) | 49,962 (32%) | 32,393 (21.1%) | 25,911 (16.6%) | 21,604 (13.8%) |
| Manchester | 85312 (17.6%) | 162,418 (33.6%) | 102,079 (21.1%) | 74,814 (15.5%) | 59,198 (12.2%) |

* 16-64 for males, 16-59 for females ** 65 and over for males, 60 and over for females

The national prevalence for HF is 0.7%, for the North West of England 0.8% and for NHS Manchester 0.5%¹¹. However, according to the British Heart Foundation (BHF) these figures appear low, with actual prevalence being cited as between 1 and 2% of the population¹². HF prevalence increases with age; 1% of men and women aged under 65 are affected by HF, this rises to between 6% and 7% of those aged 65 – 84, with the incidence further increasing to between 12% and 22% for the over 85 age group.

⁸ Public Health Manchester Intelligence Team (2011) *A Picture of Progress: Compendium of Statistics 2011 North Manchester*, Manchester City Council; Manchester

⁹ Public Health Manchester Intelligence Team (2011) *A Picture of Progress: Compendium of Statistics 2011 Central Manchester*, Manchester City Council; Manchester

¹⁰ Public Health Manchester Intelligence Team (2011) *A Picture of Progress: Compendium of Statistics 2011 South Manchester*, Manchester City Council; Manchester

¹¹ The NHS Information Centre Quality Outcomes Framework 2010/2011 online database <http://www.qof.ic.nhs.uk/>

¹² British Heart Foundation Statistics website Prevalence of heart failure statistics www.heartstats.org/datapage.asp?id=1125

2. GM-HFIT

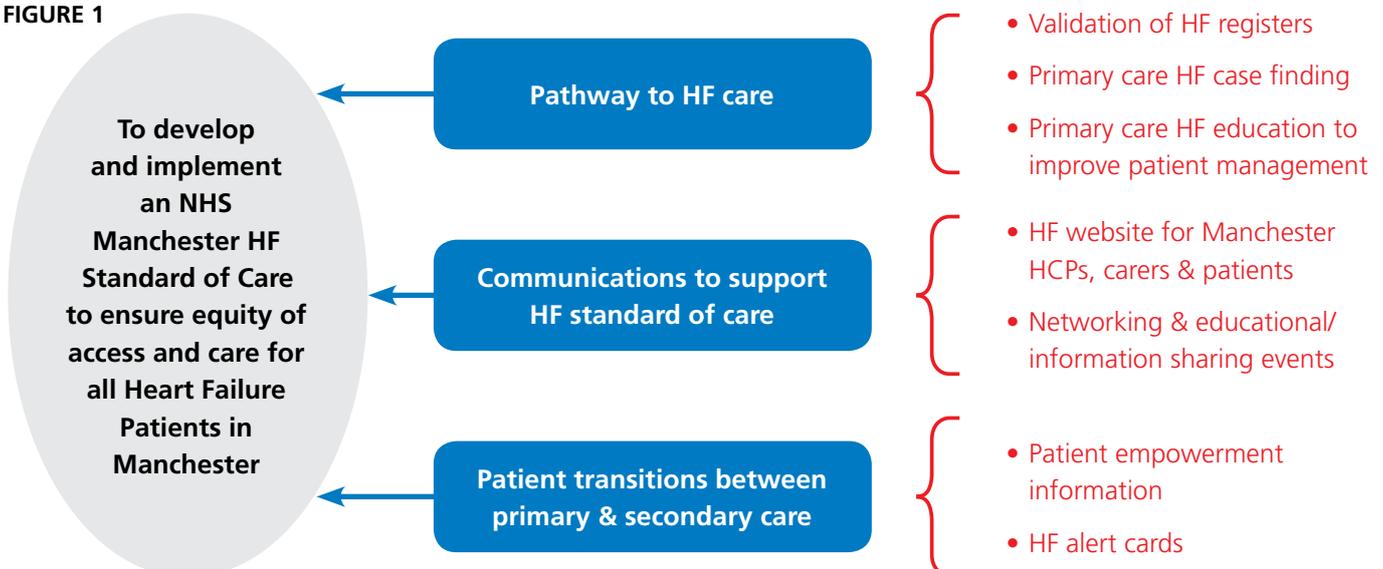
2.1 Project Background

A scoping exercise was undertaken within NHS Manchester during 2009 to gain an overview of and map existing HF pathways and services. Interviews were conducted using semi-structured interview schedules (see *Appendix 1-6*) with twenty two health care professionals (HCP) working along the HF pathway, these included;

- Community and secondary care heart failure specialist nurses (HFSN)
- Community matrons (CM)
- General practitioners (GP)
- Advanced practitioners (AP)
- Ward managers
- Practice nurses (PN)
- Patient flow managers

The interviews were conducted to elicit their views about the existing HF service and processes, and how any improvements could be made. In addition to the interviews, an audit of fifty secondary care patient records was performed. This compared the actual patient journey with the perceptions of HCPs working in HF care. The findings from the scoping exercise were presented at a stakeholder event (September 2009) and a common consensus to develop and support the delivery of an evidence based '*NHS Manchester Standard for Heart Failure Care*' was reached. The programme aimed to ensure equality of provision across NHS Manchester for HF patients through the development and implementation of an evidence based best practice.

FIGURE 1



This project was developed to address the pathway to HF care and was part of a programme which included the production of a '*NHS Manchester Heart Failure Website*' and the introduction of a '*Heart Failure Alert Card*' (these have been evaluated separately). The programme driver diagram in Figure 1 highlights the various projects, which make up the '*NHS Manchester Standard for Heart Failure Care*'.

2.2 Aim

The overarching aim of the project was to improve the quality and equity of service and care for people with HF within NHS Manchester.

2.3 Objectives

In order to realise the overarching aim of the project, a number of objectives were identified:

- To ensure patient care is consistent with evidence based guidelines from the National Institute for Health and Clinical Excellence (NICE) and the European Society of Cardiology (ESC)
- To improve the knowledge and skills of HCPs in relation to HF
- To improve data quality and the standardisation of documentation
- To increase the prevalence of HF
- To increase the number of patients that receive the appropriate medical therapy, including the commencement of medication and its titration to optimal tolerated dose.

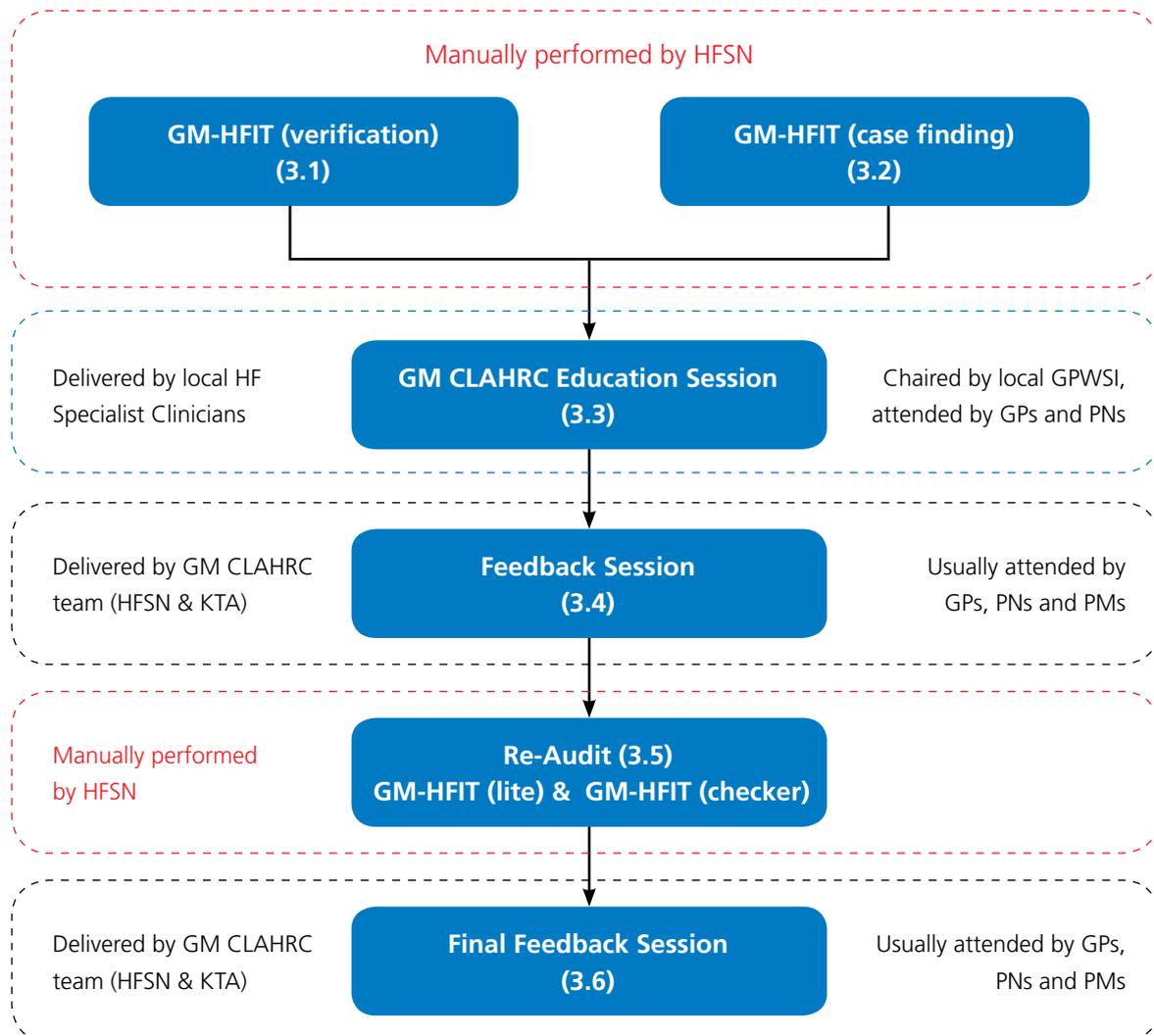
3. Project Design

For the effective management of HF, it is essential that primary care clinicians have the necessary skills to care for people with HF.

In line with the current evidence base the 'GM-HFIT Primary Care Heart Failure Project' utilised tailored, multifaceted implementation approaches¹³, such as clinical audit and feedback, academic detailing, interactive educational sessions, visual aids and materials, which targeted multiple barriers¹⁴, for example, knowledge, skills and beliefs about capabilities. A knowledge transfer associate (KTA) was available to support and facilitate any improvement work undertaken by practices, through the use of Plan Do Study Act (PDSA) cycles aimed at identifying and testing small scale changes. The improvement skills gained by practices could then be sustained and transferred to other areas of practice.

Figure 2 outlines the different stages of the project design

FIGURE 2



¹³ Grol, R. and Grimshaw, J., 1999. *Evidence-based implementation of evidence-based medicine*. Journal on Quality Improvement, 25(10), pp.503-513

¹⁴ Michi, SF, Johnston M, Abraham, C, Lawton R, Parker D, Walker A., (2004) *Making psychological theory useful for implementing evidence based practice: a consensus approach*, *Quality and Safety in Health Care*, 12, pp. 26-33.

This project utilised a process of clinical audit, Brown and Fleisher describe the process of clinical audit as being ‘bi-cycle’¹⁵. The findings from the initial data audit collection are used to change practice; another cycle of data collection is then undertaken to highlight if the change in practice has resulted in improvements¹⁶. This project has used an initial clinical audit to identify and stress the current HF management performance; education and training interventions were subsequently initiated. In order to ascertain the impact of such interventions, the literature suggests that the second or successive stages of data collection must be part of the original audit and that repeating data collection is essential¹⁵. A re-audit was performed between nine and twelve months with practices, to re-assess the HF management indicators as part of the practices ‘*Traffic Light Score*’. The design and development of a number of tools to assist with the audit process has been integral to the project.

3.1 GM-HFIT (verification)

GM-HFIT (verification) is a Microsoft Excel based audit template, originating from the work of NHS Bolton which was designed to perform a HF skills audit. GM-HFIT (verification) has been further developed by the GM CLAHRC team. A pilot study with seven GP practices already involved with an existing Locally Enhanced Service (LES) for HF was undertaken, to test out the appropriateness and feasibility of the audit process. During the pilot GM-HFIT (verification) was developed and enhanced utilising the evidence based PDSA cyclical improvement process (see *appendix 7*)¹⁷. The initial plan was to perform two separate audits; one to assess the performance of practices in relation to HF management and then to follow this with a review of all patients on the HF register to ascertain appropriateness for inclusion on the register by a HFSN. However during the pilot project, it became evident that these separate processes should be combined into one. Therefore GM-HFIT (verification) was developed with dual functionality; it provides a platform for a HF skills audit and HF register verification which is performed manually by a HFSN.

3.1 (a) HF Skills Audit

The skills audit element of GM-HFIT (verification) involves the use of HF performance management audit criteria, these are based on the current guidance from NICE and the ESC around HF patient management (see Figure 3). The tool generates a ‘*Traffic Light Score*’ for practices based on their performance.

Each patient record on the HF register was manually audited by a HFSN and practices were awarded a score of between zero and four for each indicator (except for vaccinations where a score of between zero and two was awarded), depending on their performance. This is calculated using the percentage of patients currently on the HF register, who received the associated element of care in the past twelve month period.

The maximum score which practices could achieve was eighty. The ‘*Traffic Light Score*’ level breakdowns are displayed in Figure 4.

¹⁵ Brown CR Jr, Fleisher DS. The bi-cycle concept — Relating continuing education directly to patient care. In Stearns NS, Getchell ME, Gold RA, editors. *Continuing Medical Education in Community Hospitals: A Manual for Program Development*. N Engl J Med 1971;284(suppl):88–97

¹⁶ Dixon, N. and Pearce, M. 2011. *Guide to Using Quality Improvement Tools to Drive Clinical Audit*. Health Quality Improvement Partnership

¹⁷ Langley GJ, Nolan KM, Norman CL, Provost LP, Nolan TW: *The Improvement Guide*. San Francisco: Jossey-Bass

FIGURE 3

| Audit data | <20% | 20-39% | 40-59% | 60-79% | >=80% |
|--|------|--------|--------|--------|-------|
| Diagnosis confirmed using echocardiogram | 0 | 1 | 2 | 3 | 4 |
| Aetiology investigated / confirmed | 0 | 1 | 2 | 3 | 4 |
| Functional capacity assessed / severity using NYHA | 0 | 1 | 2 | 3 | 4 |
| Heart failure review | 0 | 1 | 2 | 3 | 4 |
| Weight done at review | 0 | 1 | 2 | 3 | 4 |
| Ankle oedema checked | 0 | 1 | 2 | 3 | 4 |
| BP recorded | 0 | 1 | 2 | 3 | 4 |
| Pulse rate checked | 0 | 1 | 2 | 3 | 4 |
| Pulse rhythm checked | 0 | 1 | 2 | 3 | 4 |
| Has an ECG been performed | 0 | 1 | 2 | 3 | 4 |
| ACE use or contraindicated in LVSD patients | 0 | 1 | 2 | 3 | 4 |
| Treated to target dose of ACE-I or ARB* | 0 | 1 | 2 | 3 | 4 |
| Beta blocker use or contraindicated in LVSD patients | 0 | 1 | 2 | 3 | 4 |
| Treated to target dose of BB* | 0 | 1 | 2 | 3 | 4 |
| Screening for depression | 0 | 1 | 2 | 3 | 4 |
| Smoking status checked | 0 | 1 | 2 | 3 | 4 |
| Alcohol intake checked | 0 | 1 | 2 | 3 | 4 |
| Nutritional information given | 0 | 1 | 2 | 3 | 4 |
| Flu vaccine given | 0 | 0.5 | 1 | 1.5 | 2 |
| Pneumococcal vaccine given | 0 | 0.5 | 1 | 1.5 | 2 |
| Self care / education material given | 0 | 1 | 2 | 3 | 4 |
| Total Score | | | | | |

* of LVSD patients who are on such medication (includes up-titrating)

As part of the HF skills audit, additional data were also collected, this largely involved co-morbidity information and more specific information around the performance indicators. See Appendix 8 for the evidence upon which these indicators are based.

FIGURE 4



3.1 (b) HF Register Verification

As part of the project each patient record on the HF register was manually audited by a HFSN to identify if patients were either appropriate, inappropriate or required further investigation, to be on the HF register. Patients were classed as appropriate for the HF register if a diagnosis had been confirmed by either ECHO or specialist clinician. A rationale was provided for each patient by the HFSN and where required, recommendations for their management.

3.2 GM-HFIT (case finding)

GM-HFIT (case finding) is a Microsoft Excel based manual audit tool that was developed to identify patients with a diagnosis or potential diagnosis of HF but absent from the HF practice register. The GM-HFIT (case finding) tool combines a set of nineteen practice register searches and was developed by utilising PDSA cyclical improvement methodology.

TABLE 3

| Search No. | Search Criteria |
|------------|---|
| 1 | Spironolactone BUT not on HF register |
| 2 | Eplerenone BUT not on HF register |
| 3 | Metolazone BUT not on HF register |
| 4 | ECHO on CHD register BUT not on HF register |
| 5 | ECG abnormal and left bundle branch block, on CHD register BUT not on HF register |
| 6 | Angina & ECHO BUT not on HF register |
| 7 | Previous MI & ECHO BUT not on HF register |
| 8 | Atrial fibrillation, Atrial flutter & ECHO BUT not on HF register |
| 9 | Cardiomyopathy BUT not on HF register |
| 10 | ECHO shows LVSD BUT not on HF register |
| 11 | Suspected heart failure BUT not on HF register |
| 12 | LVSD BUT not on HF register |
| 13 | Impaired left ventricular function BUT not on HF register |
| 14 | ECHO shows diastolic dysfunction BUT not on HF register |
| 15 | ECHO abnormal BUT not on HF register |
| 16 | Bi ventricular pacemaker BUT not on HF register |
| 17 | NYHA classification BUT not on HF register |
| 18 | History of heart failure BUT not on HF register |
| 19 | Cardiomegaly & ECHO BUT not on HF register |

At project initiation, it was envisaged that the search criteria would also include signs and symptoms of HF, for example, breathlessness, oedema or nocturnal dyspnoea, to identify patients who had not yet been diagnosed. However, as part of the PDSA process it became evident that this would not be possible due to the complexities of the primary care Read code system, and the time required to manually filter through the 'free text' of patient electronic records. The main focus

of GM-HFIT (case finding) is the identification of patients already diagnosed with HF, although patients with signs and symptoms indicative of HF are sometimes found. The appropriate Read codes for the nineteen searches can be found in Appendix 9.

Each patient electronic record generated by the nineteen searches, was manually checked by a HFSN to identify if the patient had HF. The results were inputted onto the GM-HFIT (case finding) tool, along with a rationale for any patients that were identified as having HF, requiring an ECHO, requiring an ECHO report to be requested, requiring a referral to a specialist, or requiring a GP review, together with recommendations for their further management.

As part of the continuous PDSA improvement process five additional searches were trialled during the project, these are highlighted in Table 4. However, four of these were rejected, due to their poor yield of possible HF patients; only the 'ACE and Beta Blocker but not on HF register' search has been retained.

TABLE 4

| Search No. | Search Criteria |
|------------|---|
| 20 | Furosemide and ECHO BUT not on HF register |
| 21 | Digoxin BUT no AF patients and not on HF register |
| 22 | Carvedilol BUT not on HF register |
| 23 | Nebivolol BUT not on HF register |
| 24 | Ace and Beta Blocker BUT not on HF register |

3.3 Clinical Educational Session

A GP and PN from each practice were invited to a half day educational session delivered by HFSNs. The aim of the session was to improve the skills of primary care clinicians in the diagnosis, treatment and management of HF. The interactive session included information and guidance on Brain Natriuretic Peptide (BNP), diagnosis, treatment and management of HF, and palliative care. The session was chaired and facilitated by a local GP with a special interest in heart failure (GPwSI), enabling an interactive case study approach, focussing on HF patients likely to present in primary care.

3.4 Feedback Session

The GM CLAHRC team, consisting of the HFSN who performed the audit and a KTA, visited each practice to present and discuss the findings of GM-HFIT (verification) and GM-HFIT (case finding) with the practice teams responsible for leading the HF work. The practice teams varied, but usually consisted of a PM, GP and a PN. Practices were provided with a development pack, areas for improvement were identified and informally discussed, actions were agreed. Where additional training was identified, for example, assistance with HF coding or further clinical training, this was provided to both clinical and administrative practice staff by the appropriate member of the GM CLAHRC team.

3.4 (a) Development Pack

All practices were provided with a development pack containing the data from GM-HFIT (verification) and GM-HFIT (case finding). The data were displayed in a variety of ways, utilising a data dashboard, 'Traffic Light Score' and colour coordinated actions. The development pack was also a reference resource for practices, to aid their HF patient management. Local and national guidelines including; NICE HF guidance, Greater Manchester and Cheshire Cardiac and Stroke Networks (GMCCSNs) Pathways for Cardiology guidelines, Lancashire and Cumbria Cardiac and Stroke Networks HF Fact Sheet,

GM CLAHRC HF Read Code Guide, and British Society for Echocardiography Guidance, along with accredited patient information from the British Heart Foundation.

3.5 Re-audit

Nine to twelve months after the initial audit, the HF registers were re-audited utilising the Microsoft Excel based GM-HFIT (lite) and GM-HFIT (checker). The re-audit enabled data to be collected to illustrate that improvements to HF patient management had occurred. The re-audit was performed by a combined process involving KTA and HFSN.

3.5 (a) GM-HFIT (lite)

This was developed as a shorter version of the GM-HFIT (verification); only including the performance indicators that contributed to the *'Traffic Light Score'* and the patients' appropriateness for the register. Each patient record on the HF register was manually audited, and inputted onto GM-HFIT (lite). The practice's level of HF management was re-assessed and comparisons with baseline performance indicators and the baseline *'Traffic Light Score'* were made. The appropriateness of patients for the HF register was re-assessed, as with GM-HFIT (verification), patients on the HF register were identified as being appropriate, inappropriate, or requiring further investigation.

3.5 (b) GM-HFIT (checker)

This was developed as a platform to ascertain if the 'actions' from GM-HFIT (case finding) had been completed by practice teams. All patients initially identified by GM-HFIT (case finding) who required adding to HF register, referral for ECHO, an ECHO report requesting, referral to specialist, or GP review, were manually audited to determine if the action had been performed.

3.6 Final Feedback Session

The GM CLAHRC team, consisting of the HFSN and a KTA, visited each practice to present and discuss the findings of the re-audit. The re-audit findings were added to the development pack and an action plan (see *Appendix 10*) was created. This highlighted areas of improvement, good practice, and areas requiring further improvement.

4. Evaluation

This project focussed on the HF management of all patients on the practice lists of the thirteen participating GP practices. Patients were assessed by a HFSN via the GP practices clinical IT systems to determine their current level of HF management; patients were not seen face to face. Initial audit data is displayed for all thirteen practices. However, follow up re-audit data for only ten practices is discussed.

4.1 Outcome Measures

Combinations of both quantitative and qualitative outcome measures were developed to evaluate the impact of the project on the management of HF patients:

TABLE 5

- An initial HF register skills audit using GM-HFIT (verification) to provide a baseline '*Traffic Light Score*' (based on current HF management performance indicators)
- A follow up skills assessment after nine to twelve months to ascertain if improvements to HF management and the '*Traffic Light Score*' have occurred, utilising GM-HFIT (lite)
- An assessment of the number of patients on the HF register that have an accurate diagnosis of HF, using GM-HFIT (verification)
- A follow up assessment after nine to twelve months to demonstrate if there has been an improvement in the accuracy of HF registers, utilising GM-HFIT (lite)
- An initial measurement of the practice HF prevalence, to provide a baseline
- A follow up assessment after nine to twelve months to ascertain if the practice HF prevalence has increased
- An assessment of the number of definite and possible HF patients that are currently not on the HF register, using GM-HFIT (case finding).
- A follow up assessment after nine to twelve months to ascertain if the definite and possible HF patients, previously not on the HF register have been added, utilising GM-HFIT (checker)
- Interviews with HCPs involved in the project, to gather their views and reflections about all aspects of the multi-faceted project.

4.2 Demographics

The demographic data in Table 6 represent the information from all patients (n=469) on the HF register at the time of the initial GM-HFIT (verification) assessment, of the thirteen practices involved with the project. The demographic data do not take into account the appropriateness of the patients.

TABLE 6

| Variable | All Patients (n=469) | Seen only in primary care (n=357) | Under specialist care & primary care (n=112) | P Value |
|-----------------|----------------------|-----------------------------------|--|---------|
| Mean Age (s.d.) | 73.2 (14.4) | 74 (14.4) | 70 (13.7) | 0.007 |
| Female | 45% | 49% | 32% | 0.002 |
| Male | 55% | 51% | 68% | |
| LVSD | 58% | 47% | 93% | <.001 |
| Diabetes | 32% | 33% | 27% | 0.436 |
| CKD | 29% | 28% | 33% | 0.308 |
| Hypertension | 64% | 66% | 59% | 0.184 |
| COPD | 18% | 18.2% | 18% | 0.933 |
| IHD | 46% | 44.5% | 52% | 0.18 |
| Previous MI | 23% | 21% | 29.5% | 0.064 |
| AF | 36% | 37% | 35% | 0.68 |
| Depression | 10% | 11% | 9% | 0.601 |

According to the above data the mean patient age was 73, with 77% of patients being in the 65+ age group. There were more males (55%) than females (45%), however when this is broken down it is evident that the ratio of males to females that are solely seen in primary care is almost equal (51% male - 49% female). The significant difference is the percentage of males (68%) and females (32%) that were attending specialist HF service or had been discharged from specialist HF services in the previous twelve months.

The data also highlight that HF patients are likely to have multiple co-morbidities, the three most common being hypertension (64.2% of patients), ischaemic heart disease (46.4% of patients) and atrial fibrillation (36% of patients). This is consistent with latest data from the National Heart Failure Audit, which states that most HF patients have or have had hypertension, and that atrial fibrillation and renal dysfunction are precipitating factors of HF¹⁸.

TABLE 7

| No. of Co-morbidities | No. of HF Patients | Percentage of HF Cohort (n=469) |
|-----------------------|--------------------|---------------------------------|
| 0 | 20 | 4.3% |
| 1 | 74 | 15.8% |
| 2 | 127 | 27.1% |
| 3 | 130 | 27.7% |
| 4 | 83 | 17.7% |
| 5 | 27 | 5.8% |
| 6 | 5 | 1.1% |
| 7 | 2 | 0.4% |
| 8 | 1 | 0.2% |

Table 7 shows the percentage of patients with multiple co-morbidities. The majority of patients had two (27.1%) or three (27.7%) co-morbidities with only 4.3% of patients having no other long term condition other than HF.

¹⁸NICOR. 2012. *The National Health Failure Audit: April 2010 – March 2012*. UCL

4.3 GM-HFIT (verification) and GM-HFIT (lite)

For the purpose of evaluation, the data from the initial GM-HFIT (verification) and the follow up GM-HFIT (lite) are displayed together, enabling comparative analysis to be performed. The data are taken from ten practices; due to the financial restructuring of the GM CLAHRC, it was not possible to perform follow up evaluation with three of the initial project practices.

4.3 (a) Accuracy of HF Register

FIGURE 5

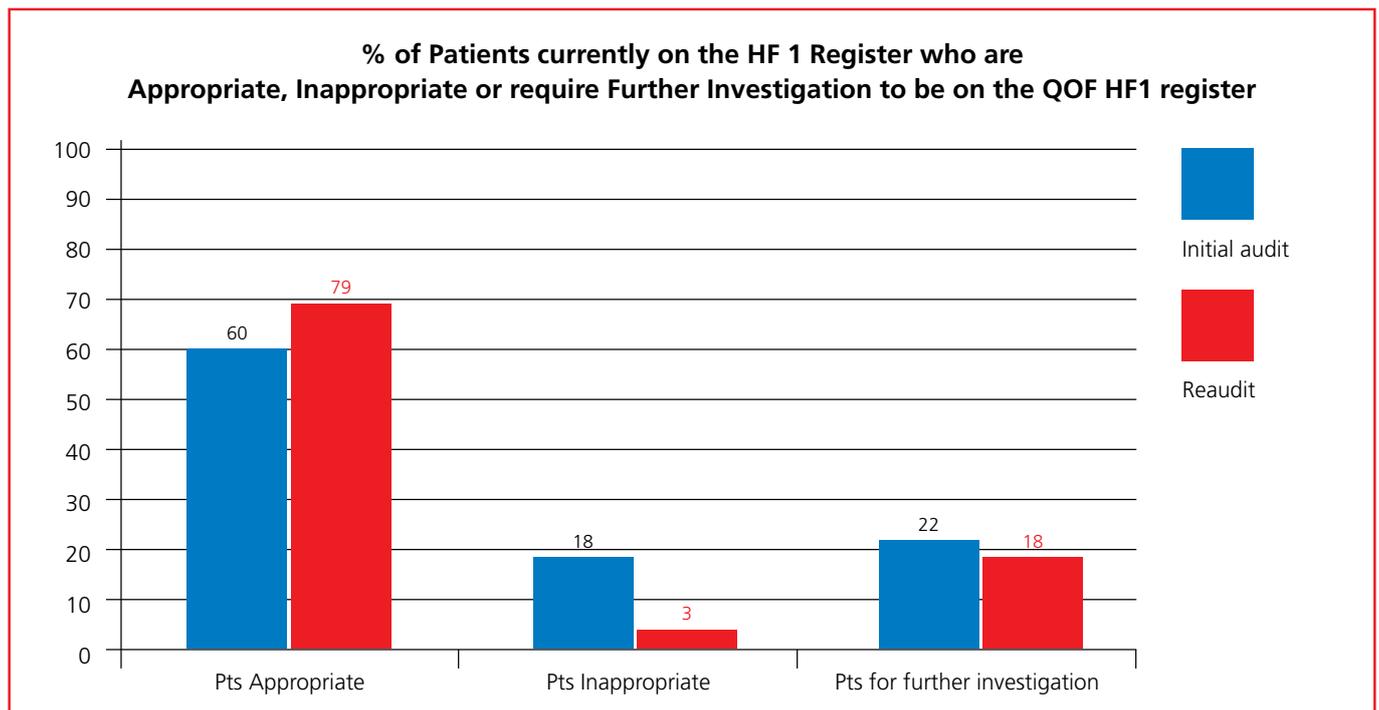


Figure 5 represents the percentage of patients currently on the practice HF registers who are appropriate, inappropriate or requiring further investigation.

TABLE 8

| Verification | Initial Audit (n=303) | Re-audit (n=328) | Percentage Change in proportion |
|-----------------------|-----------------------|------------------|---------------------------------|
| Appropriate | 181 (59.74%) | 259 (78.96%) | 32.19% (increase) |
| Inappropriate | 56 (18.48%) | 9 (2.74%) | 85.15% (decrease) |
| Further investigation | 66 (21.78%) | 60 (18.29%) | 16.02% (decrease) |

The figures are broken down further in Table 8 this shows that at re-audit there was a 32.19% increase in the proportion of patients who were appropriately on the HF register. The number of patients who did not have HF and therefore should not be on the register is 2.74% (n=9) a decrease of 85.15%. The number of patients requiring further investigation to establish if they should be on the HF register has decreased by 16.02%. However, GPs may make a clinical decision not to investigate patients further, for example not to refer an individual for an ECHO. Therefore it is possible that the percentage change for this cohort is actually much higher.

4.3 (b) Traffic Light Score

FIGURE 6

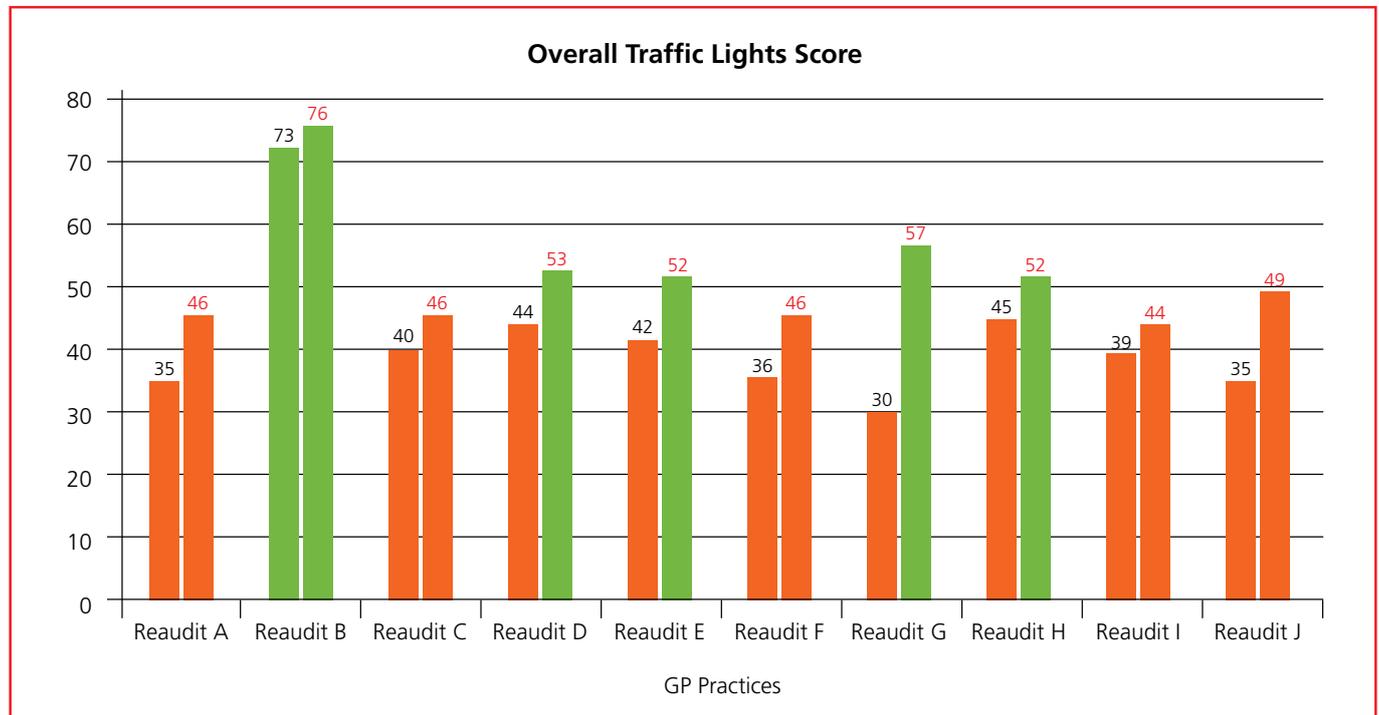


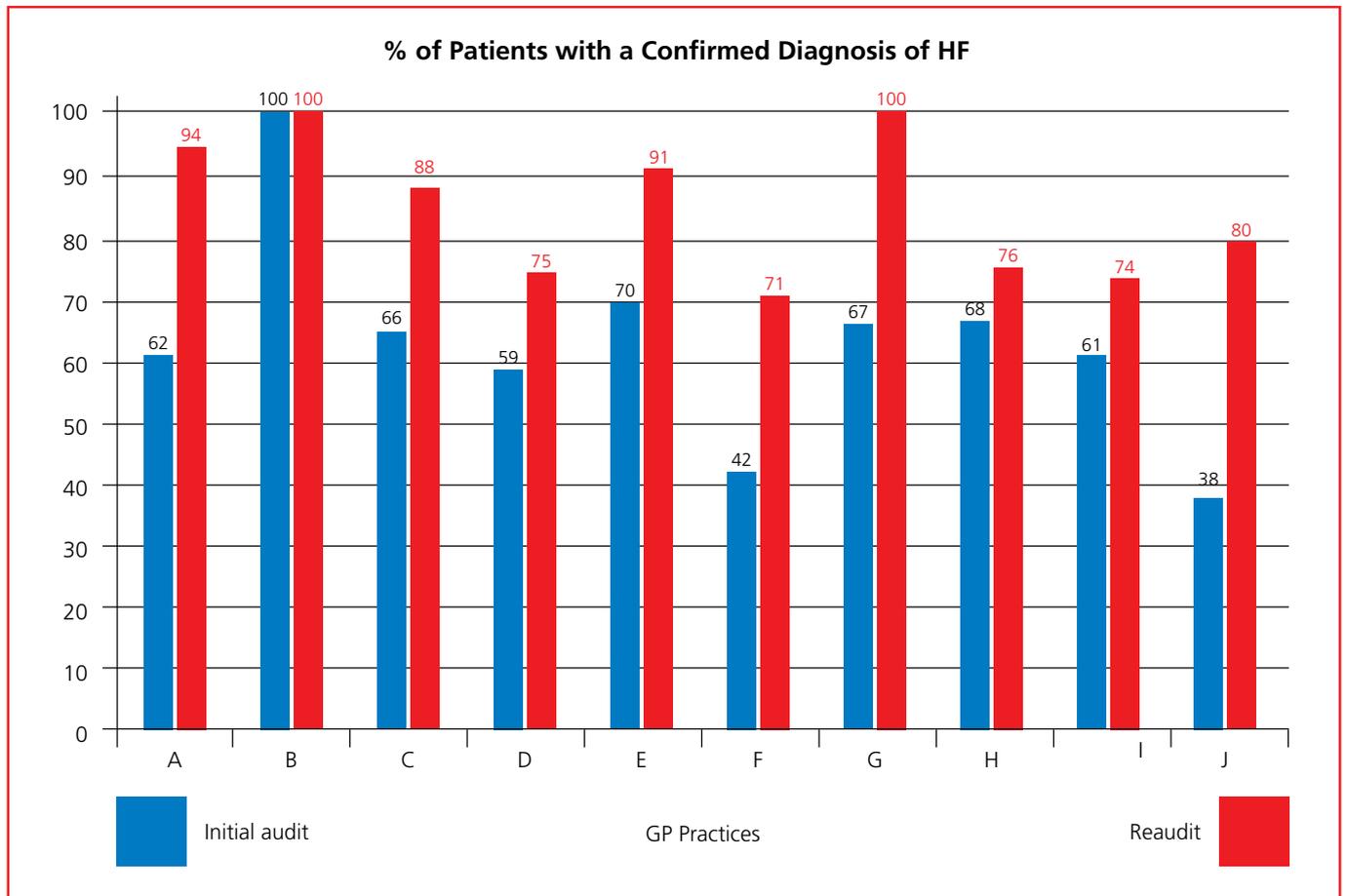
Figure 6 and Table 9 show the baseline 'Traffic Light Scores' and the re-audit 'Traffic Light Scores' by GP practice. All practices increased their 'Traffic Light Scores' at re-audit, four practices improved from a score of amber to green, this indicates they were providing a high quality of care for their HF patients. The mean increase in 'Traffic Light Score' was 10 points, the highest increase being 91.5% and the lowest 4.1%. However, the practice with the lowest increase, had the highest baseline score, they were initially awarded green status, suggesting they already provided high quality care for their HF patients.

TABLE 9

| Traffic Light Score | Initial Audit | Re-audit | Under specialist care & primary care (n=112) |
|---------------------|---------------|----------|--|
| Practice A | 35 | 46 | 33.3% (increase) |
| Practice B | 73 | 76 | 4.1% (increase) |
| Practice C | 40 | 46 | 13.8% (increase) |
| Practice D | 44 | 53 | 19.3% (increase) |
| Practice E | 42 | 52 | 22.6% (increase) |
| Practice F | 36 | 46 | 27.8% (increase) |
| Practice G | 30 | 57 | 91.5% (increase) |
| Practice H | 45 | 52 | 15.6% (increase) |
| Practice I | 39 | 44 | 13.0% (increase) |
| Practice J | 35 | 49 | 40.6% (increase) |
| Overall | 41.7 | 51.8 | 24.2% (increase) |

4.3 (c) Confirmed Diagnosis

FIGURE 7



It is important to have a confirmed diagnosis of HF as many of the symptoms are similar to other conditions¹⁹. Figure 7 shows that all practices achieved an improvement in the number of patients on their HF register with a confirmed diagnosis, with two practices achieving 100%.

¹⁹NICE (2010), *Management of Chronic Heart Failure in Adults in Primary and Secondary Care*, London, NICE

4.3 (d) Medication – ACE-I

FIGURE 8

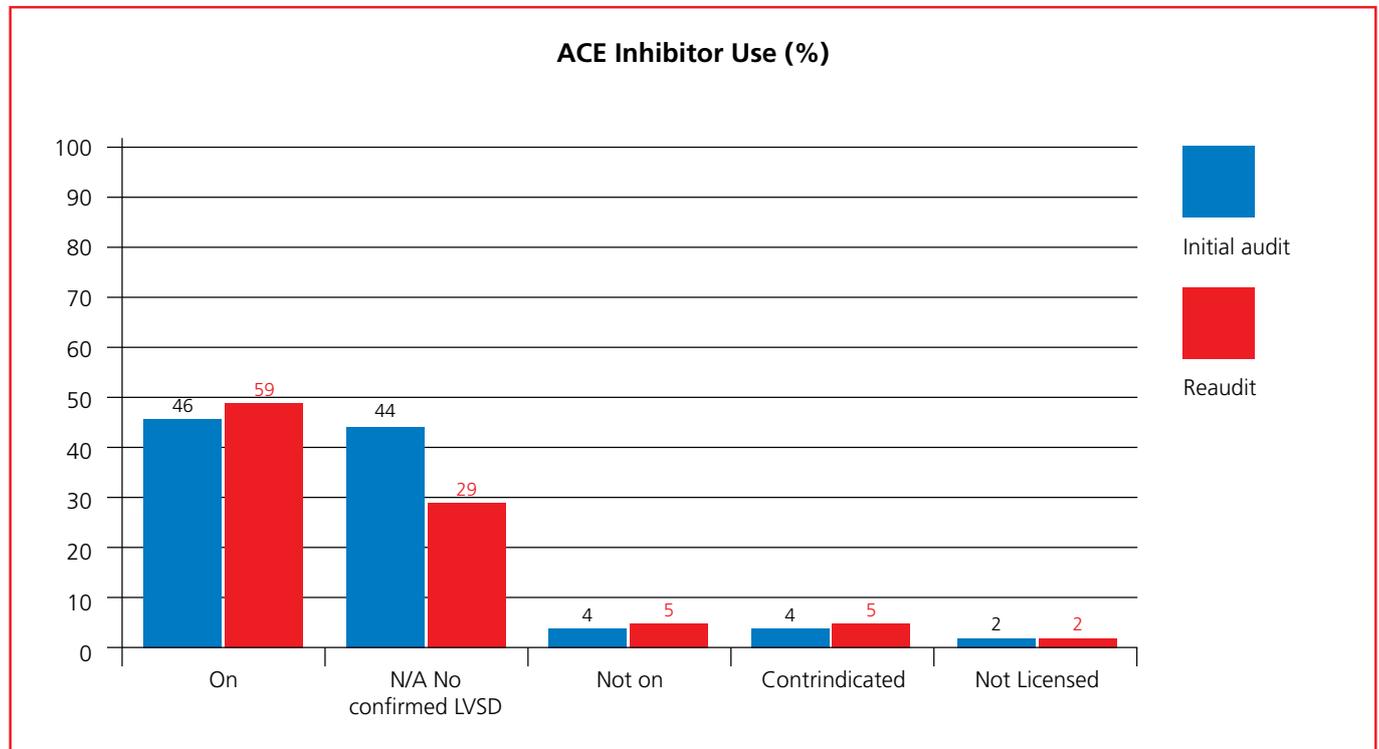


TABLE 10

| ACE-I use | Initial Audit (n=303) | Re-audit (n=328) | Percentage Change: |
|-----------------|-----------------------|------------------|--------------------|
| On | 138 (45.54%) | 195 (59.45%) | 30.53% (increase) |
| Not on | 11 (3.63%) | 15 (4.57%) | 25.97% (increase) |
| Contraindicated | 13 (4.29%) | 18 (5.49%) | 27.91% (increase) |
| Not Licensed | 7 (2.31%) | 6 (1.83%) | 20.82% (decrease) |
| N/A no LVSD | 134 (44.22%) | 94 (28.66%) | 35.20% (decrease) |

The data in Table 10 and Figure 8 represent the prescribing patterns for ACE-Is at baseline and re-audit. According to NICE guidelines an ACE-I licensed for HF should form part of the first line treatment for HF due to LVSD¹⁹. Encouragingly the re-audit data show an increase in the percentage of patients with LVSD prescribed with an ACE-I licensed for HF, an increase in the percentage of patients who are documented as contraindicated, a decrease in the percentage not prescribed an ACE-I and also a decrease in the percentage of patients prescribed an unlicensed ACE-I.

¹⁹NICE (2010), *Management of Chronic Heart Failure in Adults in Primary and Secondary Care*, London, NICE

FIGURE 9

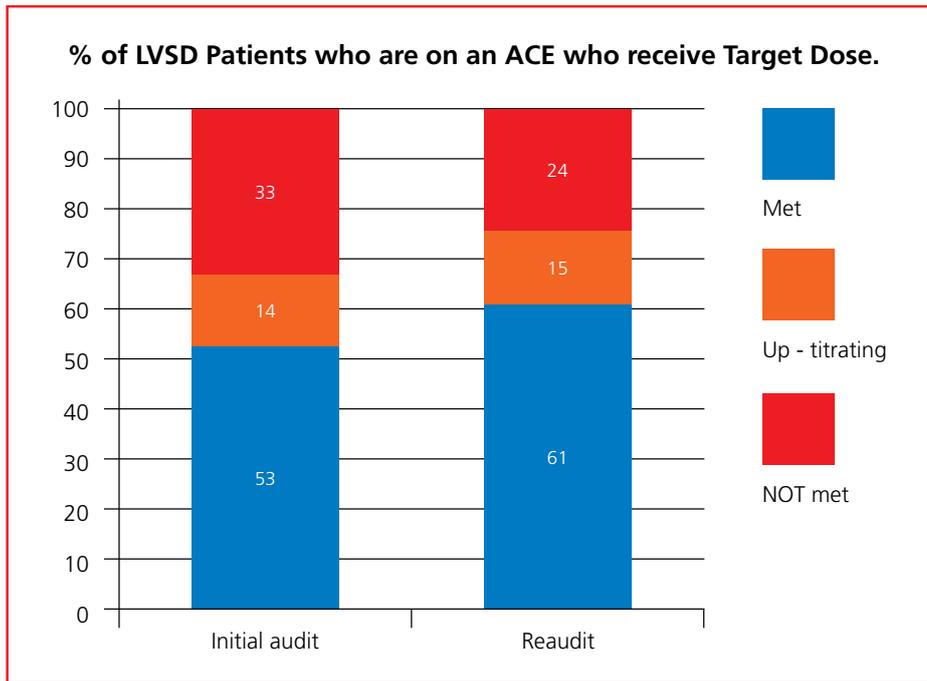


TABLE 11

| ACE Target | Initial Audit (n=138) | Re-audit (n=195) | Percentage Change |
|--------------|-----------------------|------------------|-------------------|
| Met | 73 (52.90%) | 118 (60.51%) | 14.39% (increase) |
| Up-titrating | 19 (13.77%) | 30 (15.38%) | 11.74% (increase) |
| Not Met | 46 (33.33%) | 47 (24.10%) | 27.69% (decrease) |

Table 11 and Figure 9 show the percentage of patients where ACE-I has been titrated to an optimal level, the percentage of patients being up-titrated and the percentage of patients who are not on optimal therapy. The percentage of patients on optimal therapy and in the process of up-titration has increased, with a slight increase in the number of patients who are not on optimal therapy.

4.3 (e) Medication – Beta Blocker

FIGURE 10

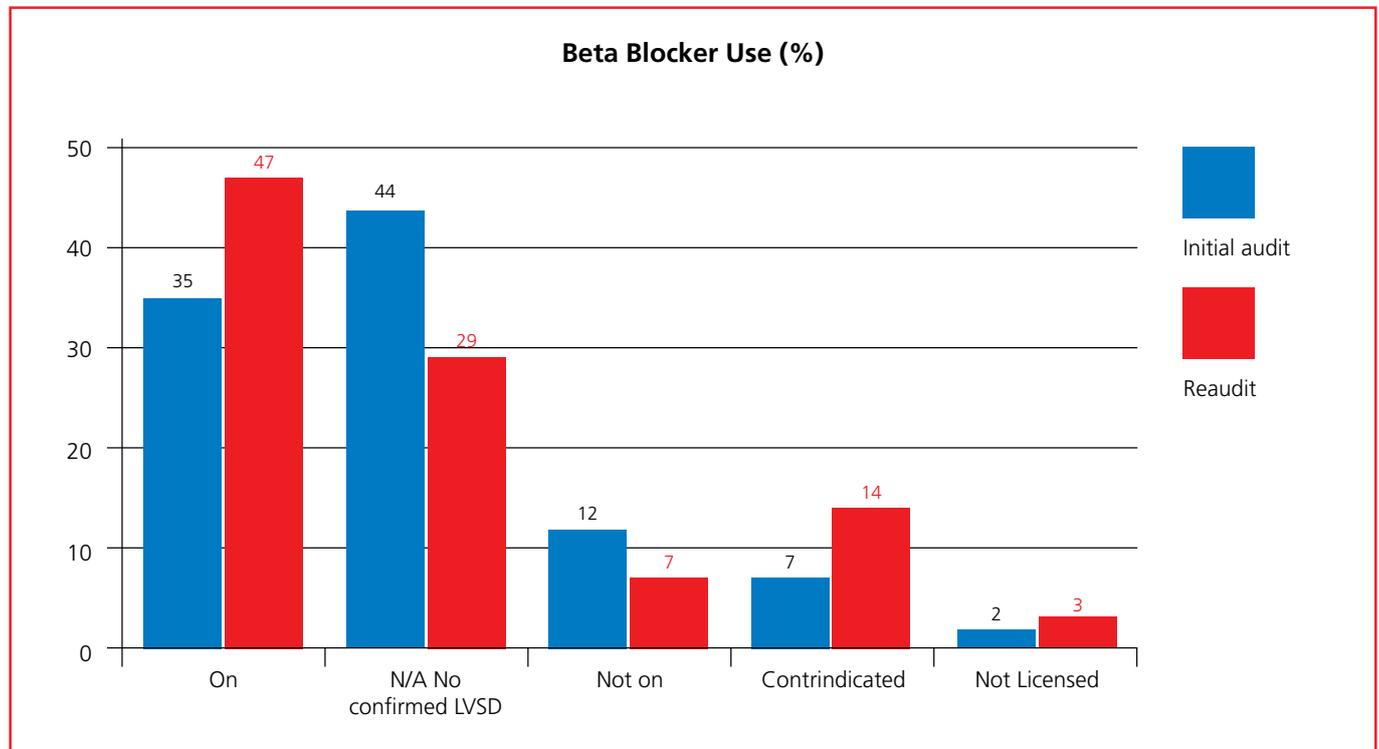


TABLE 12

| BB use | Initial Audit (n=303) | Re-audit (n=328) | Percentage Change |
|-----------------|-----------------------|------------------|-------------------|
| On | 106 (34.98%) | 155 (47.26%) | 35.08% (increase) |
| Not on | 37 (12.21%) | 23 (7.01%) | 42.58% (decrease) |
| Contraindicated | 21 (6.93%) | 45 (13.72%) | 97.95% (increase) |
| Not Licensed | 5 (1.65%) | 10 (3.05%) | 84.76% (increase) |
| N/A no LVSD | 134 (44.22%) | 95 (28.96%) | 34.51% (decrease) |

The data in Table 12 and Figure 10 focus on the prescribing patterns for BBs at baseline and re-audit. NICE guidance states that BBs licensed for HF should be offered to all patients with a diagnosis of HF due to LVSD¹⁹. The results are similar to those of ACE-I with an increase in the percentage of patients prescribed BBs, an increase in those documented as contraindicated and a decrease in the percentage of patients who are not prescribed a BB.

¹⁹NICE (2010), *Management of Chronic Heart Failure in Adults in Primary and Secondary Care*, London, NICE

FIGURE 11

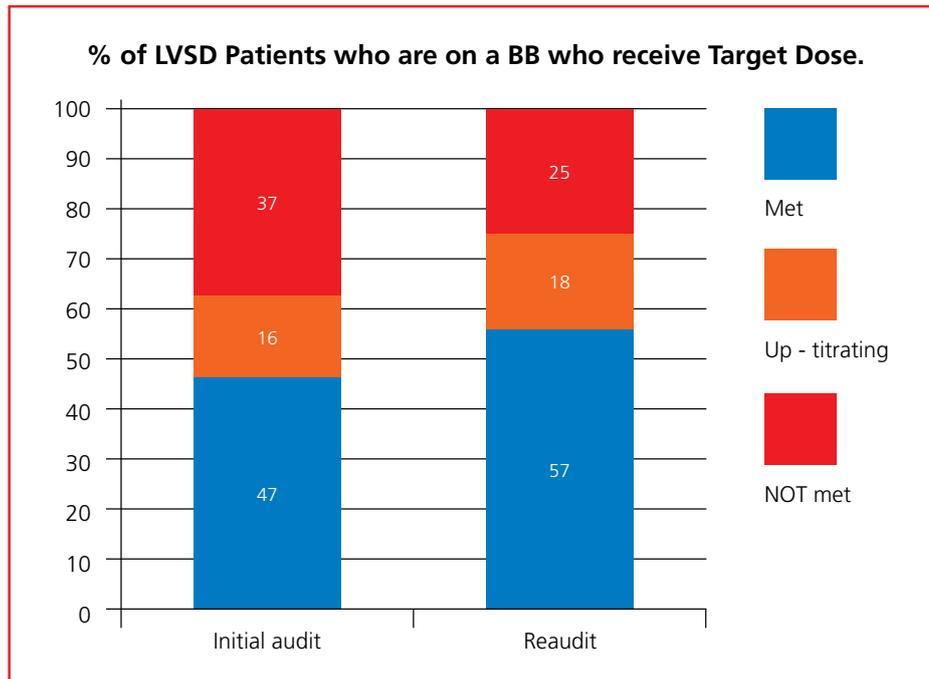


TABLE 13

| BB Target | Initial Audit (n=106) | Re-audit (n=155) | Percentage Change |
|--------------|-----------------------|------------------|-------------------|
| Met | 50 (47.17%) | 88 (56.77%) | 20.36% (increase) |
| Up-titrating | 17 (16.04%) | 27 (17.42%) | 8.61% (increase) |
| Not Met | 39 (36.79%) | 39 (25.16%) | 31.61% (decrease) |

The data in Table 13 and Figure 11 show the percentage of patients prescribed optimal BB therapy, the percentage of patients being up-titrated and the percentage of patients not on optimal BB therapy. The results indicate that practices have improved, with an increase in the percentage of patients on optimal BB therapy, an increase in the percentage of patients being up-titrated and a decrease in the number of patients whose therapy is not optimised.

4.3 (f) Heart Failure Care

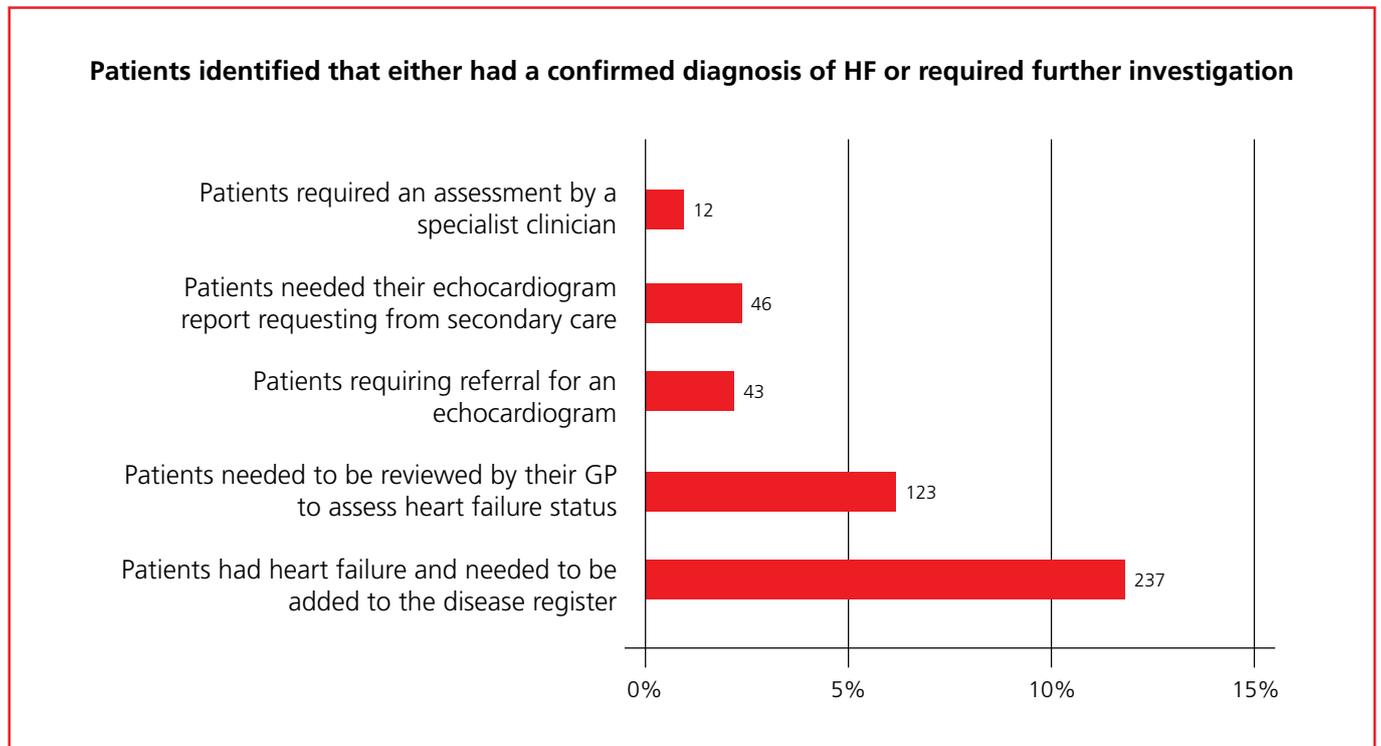
TABLE 14

| HF care | Initial Audit (n=303) | Re-audit (n=323) | Percentage Change |
|---------------------|-----------------------|------------------|--------------------|
| Under specialist | 66 (21.78%) | 53 (16.16%) | 25.82% (decrease) |
| Primary care review | 21 (6.93%) | 72 (21.95%) | 216.72% (increase) |

Table 14 demonstrates that at the time of re-audit there had been a 216.7% increase in the number of HF reviews performed in primary care and there was a slight decrease in the percentage of patients attending HF specialist services.

4.4 GM-HFIT (case finding)

FIGURE 12



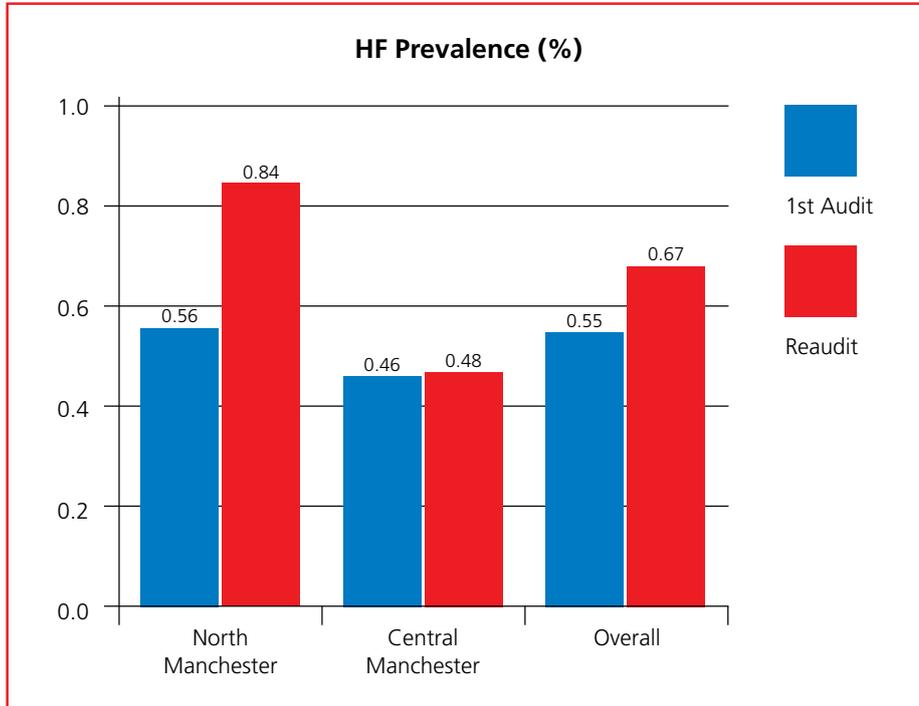
The nineteen discrete case finding searches found a total number of 2015 patients. Figure 12 shows the number and percentage of patients identified that either had a confirmed diagnosis of HF or required further investigation to determine if they had HF:

- 237 patients had HF and needed to be added to the disease register
- 123 patients needed to be reviewed by their GP to assess HF status
- 43 patients required referral for an ECHO
- 46 patients needed their ECHO report requested from secondary care
- 12 patients required an assessment by a specialist clinician

Not all of the actions illustrated in Figure 12 were in direct correlation to the patients' HF status, occasionally the recommendations for patients to have a GP review or a specialist referral may have been due to other underlying medical issues.

4.5 HF Prevalence

FIGURE 13



The above data are based on the ten practices that were re-audited, demonstrating an increase in HF prevalence from 0.55 to 0.67. Interestingly, if these figures are broken down into locality, North Manchester achieved a much higher increase in HF prevalence from 0.56% to 0.84% (a 50% increase) compared to Central Manchester where prevalence increased from 0.46% to 0.48% (a 5% increase). As the North Manchester practices were the first to be recruited, the GM CLARHC team were able to build stronger relationships and were able to act as facilitators to guide the improvement work. This was not possible in Central Manchester due to the changes in funding and it is suggested that this is reflected in the results.

4.6 GM-HFIT (case finding) – Specificity and Sensitivity

The data are based upon the 1506 patients identified by searches 1-19 of GM-HFIT (case finding), for 10 practices. The data focus on 'actions', this means the patient had HF, required an ECHO, required an ECHO report being requested, required a referral to a specialist, or required a GP review.

The list of searches in Table 15 identified the largest number of patients who required an action:

TABLE 15

| Search | No. of actions |
|--|----------------|
| 15. ECHO abnormal, but not on the HF register | 95 |
| 7. Previous MI and ECHO but not on the HF register | 84 |
| 1. Spironolactone but not on the HF register | 66 |
| 8. Atrial fibrillation, atrial flutter & ECHO but not on HF register | 64 |

The list of searches in Table 16 identified the least number of patients who required an action:

TABLE 16

| Search | No. of actions |
|--|----------------|
| 3. Metolazone but not on HF register | 1 |
| 16. Biventricular pacemaker but not on HF register | 2 |
| 17. NYHA classification but not on HF register | 2 |
| 10. ECHO shows LVSD but not on HF register | 8 |
| 2. Eplerenone but not on HF register | 10 |

In all of the audits, **no patient records** were found by searches 11 (suspected HF but not on the HF register) and 18 (history of HF but not on the HF register) and therefore there have been no actions as a result of these.

The list of searches in Table 17 identified a high percentage of patients requiring an action in comparison to the total number of records found:

TABLE 17

| Search | No. of records found | No. of actions | % of records found |
|---|----------------------|----------------|--------------------|
| 12. LVSD but not on HF register | 11 | 11 | 100% |
| 14. ECHO shows diastolic dysfunction but not on HF register | 12 | 12 | 100% |
| 16. Biventricular pacemaker but not on HF register | 2 | 2 | 100% |
| 17. NYHA classification but not on HF register | 2 | 2 | 100% |
| 10. ECHO shows LVSD but not on HF register | 9 | 8 | 88.9% |
| 13. Impaired left ventricular function but not on HF register | 13 | 11 | 84.6% |
| 2. Eplerenone but not on HF register | 14 | 10 | 71.4% |
| 9. Cardiomyopathy but not on HF register | 46 | 28 | 60.9% |

The list of searches in Table 18 identified high numbers of records but had a lower percentage of patients who required an action:

TABLE 18

| Search | No. of records found | No. of actions | % of records found |
|---|----------------------|----------------|--------------------|
| 5. ECG abnormal and left bundle branch block, on CHD register, but not on HF register | 80 | 15 | 18.8% |
| 19. Cardiomegaly & ECHO but not on HF register | 65 | 15 | 23.1% |
| 1. Spironolactone but not on HF register | 284 | 66 | 23.2% |
| 4. On CHD register, had an ECHO but not on HF register | 105 | 27 | 25.7% |
| 6. Angina & ECHO but not on HF register | 186 | 48 | 25.8% |
| 8. Atrial fibrillation, atrial flutter & ECHO but not on HF register | 223 | 64 | 28.7% |

The majority of patients identified by the list of searches in Table 19 were more likely to be unique to that particular search and did not appear in any of the other searches (they find patients requiring actions who would not have been found in any of the other searches):

TABLE 19

| Search | No. of records found | No. of actions | % of records found |
|---|----------------------|----------------|--------------------|
| 3. Metolazone but not on HF register | 1 | 1 | 100% |
| 15. ECHO abnormal but not on HF register | 95 | 66 | 69.5% |
| 7. Previous MI & ECHO but not on HF register | 88 | 59 | 67% |
| 14. ECHO shows diastolic dysfunction but not on HF register | 12 | 8 | 66.7% |
| 12. LVSD but not on HF register | 11 | 7 | 63.6% |

The majority of patients identified by the list of searches in Table 20 had already been found on other searches (they find patients requiring actions who would have been found in the other searches):

TABLE 20

| Search | No. of records found | No. of actions | % of records found |
|--|----------------------|----------------|--------------------|
| 4. On CHD register, had an ECHO but not on HF register | 27 | 3 | 11.1% |
| 19. Cardiomegaly & ECHO but not on HF register | 15 | 3 | 20% |
| 2. Eplerenone but not on HF register | 10 | 3 | 30% |
| 10. ECHO shows LVSD but not on HF register | 8 | 3 | 37.5% |
| 6. Angina & ECHO but not on HF register | 48 | 18 | 37.5% |

5. Practice Case Studies

Semi-structured interviews were conducted with six GPs and four PMs and a number of case studies were developed from the findings.

FIGURE 14

Practice A

Context

Practice A, was a single handed practice with an enthusiastic GP and two PMs that were keen to improve the management of their HF patients. The practice did not have a qualified nurse, but they had two health care assistants (HCAs) that were responsible for a number of clinics and assisting the GP. The practice was located in an area of high unemployment and deprivation. At project initiation there were twenty nine patients on the HF register, with a practice HF prevalence of 0.62%.

Register verification & case finding

The baseline practice '*Traffic Light Score*' was 40 (amber), indicating that they provided good care but there were areas to improve. The register verification identified: eighteen patients who were appropriately on the HF register, four patients who needed further investigation, and seven patients who were inappropriately on the register.

The case finding audit identified: twenty-two patients to add to the HF register, nine patients that required an ECHO to confirm HF, six patients where it was documented that a previous ECHO confirmed HF but more information needed to be requested from secondary care before the patients could be added to the HF register, and six patients required a GP review to decide if they should be added to the HF register.

Facilitation process

During the feedback and action planning meeting, practice staff asked if additional education for their HCAs and support staff could be provided. A two hour in house education session was provided by a GM CLARHC HFSN, to the HCAs on the topics of HF management and understanding ECHO reports. Group and one to one sessions were also provided in relation to clinical coding with all practice staff responsible for coding. A GM CLAHRC KTA and HFSN also made regular contact with the practice to facilitate and discuss progress.

Re-audit results & final feedback

The practices '*Traffic Light Score*' remained amber, but the score increased by 5.5 points (14%) to 45.5 points. All patients on the HF register were appropriate and HF prevalence increased by 18% to 0.76%, which is slightly higher than the national prevalence. As a result of undertaking the HF project the practice has decided to implement long term condition reviews that incorporate HF, rather than individual disease reviews. The HCAs will conduct introductory clinics where blood tests and observations are performed; the patient is subsequently allocated an appointment with a GP who will undertake a comprehensive long term condition review.

FIGURE 15

Quotes

“There are two circumstances that crop up. First will be pre-existing HF patients; they will be swept up by the health care assistants and they will do all their bloods and make them an appointment with us (GP) and our side of it is to optimise the drugs and make sure whatever should be done has been attempted” GP

“So where your work is most useful, particularly with the new patients, we have a model that we can follow and that we can draw from a resource. So it’s great” GP

“We’ve benefitted well, really well, it’s really provoked a lot of thought... from my point of view the clinical training was excellent, as there were questions I wasn’t sure about and issues I wasn’t sure about. But the work that GM CLAHRC has done has helped to clarify it” GP

FIGURE 16

Practice B

Context

Practice B was a partnership of three GPs with two PNs. The senior partner agreed for the practice to take part in the project, as their HF prevalence was low in relation to the demographics of their practice population. At project initiation there were twenty six patients on the HF register, with a prevalence of 0.50%.

Register verification & case finding

The baseline practice '*Traffic Light Score*' was 34.5 (amber), indicating that they provided good care but there were areas to improve. The register verification identified: sixteen patients who were appropriately on the HF register, four patients who needed further investigation, and six patients who were inappropriately on the register.

The case finding audit identified: thirty four patients to add to the HF register, two patients that required an ECHO to confirm HF, two patients where it was documented that a previous ECHO confirmed HF but more information needed to be requested from secondary care before the patients could be added to the HF register, and two patients who required a GP review to decide if they should be added to the HF register. During the case finding process it became evident that the practice did not code ECHO reports on their IT system. Therefore, it was not possible to identify patients using the ECHO related GM-HFIT disease register searches. The ECHO element was disregarded for the searches, resulting in a large number of individual patient records being manually reviewed by the HFSN, with assistance from a KTA.

Facilitation process

All three GPs and the PM attended the feedback session. The issues related to ECHO coding were raised; the PM agreed to address this issue through developing a structured system. The GPs also considered how they were going to review the patients identified by the case finding and verification process; they decided to work together as a team, standardise how they performed the reviews and work through them systematically.

The senior partner revealed that they had already changed their practice, as a direct result of the GM CLARHC HF education session. Previously, they were reluctant to prescribe BBs and as soon as patients complained of any side effects, stopped their medication immediately. They explained that this was due to their initial GP training and the attitude and prescribing patterns of their mentor. However, since attending the education session they were much more tolerant towards BB prescription. They had also started to explain to patients that certain side effects were normal and that these should improve, rather than immediately stopping their medication. The senior partner also started to increase the involvement of patients in their own care, by empowering them; one example of this was the introduction of weight diaries, patients were asked to keep a diary of their daily weights and to contact him/her if their weight started to increase.

Re-audit results & final feedback

The practice '*Traffic Light Score*' remained amber, but the score increased by 11.5 points (33%) to 46 points. All patients on the HF register were appropriate and their HF prevalence increased by 51% to 0.76%. At the final feedback session the practice manager discussed how they have implemented a new coding process to ensure that all ECHO reports are coded and the correct Read codes are used to code HF patients. Undertaking the HF project highlighted their coding problems; as a consequence, they were undertaking a review of their entire coding system. The project also enabled their GPs to become more aware of the importance of documentation. They are now trying to ensure that everything is documented for example, rate and rhythm when performing a pulse check.

FIGURE 17

Quotes

"We have benefitted one hundred percent because our issue at the beginning was a Read code problem so the project first of all identified it and then enabled us to put all Read coding in place and then when you re-audited it showed that we had done it and had been missing things off and we have just continued to work on coding so yes it was good" PM

"....they (GPs) have changed the way they treat them (HF patients) because before if they came in for something other than HF nothing was popping up to say this person had HF please check this or that. Whereas now it does pop up so we can look at things and link them. The GPs have taken the project on and have divided the patients up between all the doctors so they can review the patients that need one." PM

FIGURE 18

Practice C

Context

Practice C was the largest practice with seven GPs and a nurse practitioner. The senior partner had agreed to undertake the GM CLAHRC HF project and had identified a junior GP and nurse practitioner to lead the work. The PM wanted to ensure the HF register was accurate and was very keen to support the GM CLAHRC project team if required.

Register verification & case finding

The baseline 'Traffic Light Score' was 42, which was amber indicating that the practice was providing good care for their HF patients but this could be improved upon. The register verification identified: forty seven patients who were appropriately on the HF register, fourteen patients who needed further investigation and nine patients who had been inappropriately placed on the register. The case finding audit identified: forty five patients to add to the HF register, eleven patients who required an ECHO to confirm they had HF, ten patients where it was documented that they had previously had an ECHO confirming HF but this was not available in the notes, and needed to be requested from secondary care before the patients could be added to the HF register, and thirteen patients who required a GP review.

Facilitation process

The feedback session was attended by the GP and nurse practitioner who were leading the HF work and both were very motivated. They had developed a systematic approach to the work and were going to start by removing any inappropriate patients from the HF register and adding any patients who had been found to be appropriate from the case finding audit. After this they decided to invite any patient who needed to be reviewed for a consultation.

Re-audit results & final feedback

At re-audit the practice's 'Traffic Light Score' had increased by 9.5 points to 52.5 which was now green indicating the practice was providing a very high standard of HF care. All patients on the HF register were appropriate and HF prevalence had increased by 25% to 0.94%. At the final feedback session the team leading the practice team had managed to complete all the work presented to them in the initial development pack.

FIGURE 19

Practice D

Context

This was a large practice with five GPs and two PNs. The PM had agreed that the practice would take part in the project and was the main point of contact for the team. There were initially forty one patients on the HF register and the practice prevalence was 0.61%.

Register verification & case finding

The baseline 'Traffic Light Score' was 44 indicating that the practice was providing good care for their HF patients but this could be improved upon. The register verification identified: twenty four patients who were appropriately on the HF register, ten patients who required further investigation to ascertain if they should be on the HF register, and seven who had been inappropriately placed on the HF register. The case finding audit identified: twenty seven new patients to add to the HF register, nine cases to refer for ECHO to establish if they had HF, one case where a previous ECHO report needed to be requested from secondary care to confirm a diagnosis of HF, one patient who needed to be referred for a specialist review and eight patients who required a GP review to determine if they should be added to the HF register.

Facilitation process

All GPs and PNs attended the feedback session; one GP and one PN were identified as the team who would lead the HF work with administrative assistance from the PM. The team requested assistance with coding issues and also additional tailored HF education. The GM CLAHRC team provided one to one coding training with non-clinical staff and the PN was invited to attend an educational session by a GM CLAHRC HFSN at a neighbouring practice. A KTA also provided the PM with advice about the most effective way to approach the improvement work.

Re-audit results & final feedback

At re-audit the practice 'Traffic Light Score' had increased by 8.5 points to 52.5 and was now green indicating that the practice was providing a very high standard of HF care. There were two patients who were inappropriately on the HF register and HF prevalence had increased by 54% to 0.94.

FIGURE 20

Quotes

"The GM-HFIT project was excellent... GPs and nurses are now much more aware of correctly coding and identifying patients with HF" PM

"The GM-HFIT project was a very useful exercise; it has made the clinical team much more aware of heart failure, in general, and the needs of the patient. Very interesting feedback was given by the GM CLAHRC project team, in an easy and understandable format." PM

6. Conclusions

In conclusion the HF project achieved its aims, specifically:

- There was an increase in the number of patients receiving evidence based care.
- Interviews from clinicians demonstrate that they consider their HF knowledge and skills have improved by attending the initial HF education session and also by tailored education delivered in house by the GM CLARHC team.
- Data quality has been improved with the introduction of standardised Read codes for use in practices. This has been reinforced by a Read code resource developed by the GM CLARHC team and also education aimed at non-clinical staff.
- The HF prevalence in the ten practices re-audited has increased from 0.55% to 0.67%
- There has been an increase in the number of patients prescribed appropriate medical therapy and an increase in the number of patients receiving optimal medical therapy or whose medication is in the process of being up-titrated.

7. Recommendations

- Establishing ownership of the project at practice level is important. Identifying a HF lead or team who will champion the work is essential.
- The results have identified that a facilitated approach is effective in assisting practices with any improvement work they undertake.
- It is important to gain support from the relevant clinical commissioning group (CCG) to support the process of recruiting practices to the project.
- CCG support is crucial for the sustainability of the project, with implementation of annual HF educational updates to maintain skill levels in practice.
- It is recommended that a HF IT template is developed to guide the assessment process. This would need to be supported by the local data quality team, who can assist with development and uploading onto practice IT systems.

Appendix 1

Interview Schedule - Community Nursing (Active Case Manager/Community Matron)

General Information

- Approximately how many people with HF do you have on your caseload – remember co-morbidities?
- Where do you receive your referrals from?
- Do you follow a HF care pathway?
- Do you see patients younger than 50?
- Do you have a HF pathway?
- Do you prescribe medication for HF patients?
- If yes – what prescribing patterns – do you have capacity to titrate?
- Can you refer directly to the HFSN – (how do you refer, who do you refer)?
- Do you receive referrals from HFSN's – (primary, secondary or tertiary – who is referred)?
- Would you liaise with the HFSN for advice/information?
- Can you refer/obtain advice from the Heart Failure Clinic in Central hub?
- Yes – why would you refer?
- Do you have access/can you refer to relevant step up care to avoid admission if appropriate – how effective is the service?
- Are District Nurses directly involved in the care of HF patients?

Follow Up Care

- Are you notified when a caseload patient is admitted/discharged from hospital – how?
- No – How do you find out?
- Do you always receive a management plan post discharge?
- Would you liaise with secondary care when a patient is admitted?
- Do you share an integrated care plan with secondary care (is it completed, would one be useful, is it standardised across NHS Manchester)?
- Do you attend inpatient MDT discharge planning meetings – what is your role?
- Do you have community based MDT follow up for HF patients (who's involved, roles, frequency)?
- Can you access rehab for suitable HF patients – how, where P, S or T?
- Is there a community based post discharge education programme/who delivers it/content?
- Can you easily access palliative care services?
- Do you use proactive telephone follow up post discharge – details?
- Do you think communication between primary and secondary care could be improved – why/how?

Education

- Have you had any specific training in caring for HF patients - what?
- How do you keep updated?
- Do you feel adequately supported?

Communication Methods

- Are there communication links between the 3 NHS Manchester areas?
- If no does this cause problems?
- What do you think would be the best way to share ideas and practice?
- Is there anyone else who you think it would be useful for us to speak to?

Appendix 2

Interview Schedule – Secondary Care (Patient Flow Manager/Ward Nurse)

Admission Process

- Do you have any idea of the number of HF patients admitted per week?
- Which physicians would admit HF patients?
- Do you have a HF care pathway/ICP is it used?
- Do you notify the HFSN when a patient on their caseload is admitted?
- Can you identify if a patient is on the HFSN caseload?
- Are all patients with a diagnosis of HF referred to a cardiologist?
- Would you liaise with the HFSN for advice, information?
- Does the HFSN visit the ward – have input into care?
- Is there anyone who identifies HF patients and co-ordinates care?

Discharge Process

- Do you have an integrated care plan is it used?
- Do you have a HF inpatient education programme?
- Do you have information leaflets to give to patients and carers?
- Is it easy to access palliative care services?
- Would you notify the HFSN when a patient is discharged?
- Are all HF patients given an appointment to attend the HF clinic on discharge?
- Do all HF patients have multi-disciplinary input into discharge planning?
- What about the community nurses would they be involved in MDT meetings?
- Did you know that South is the only area in NHS Manchester to have HFSN's?
- Do you think continuity between primary and secondary care could be improved?

General information

- Do you have any specific training related to heart disease and heart failure?
- Is there a heart failure link nurse on the ward?

Appendix 3

Interview Schedule – Secondary Care HFSN

Clinic information

- How long has clinic been established?
- How many patients on the case load?
- Where is the clinic situated i.e. primary or secondary care?
- Who funds the service?
- How many clinics are provided including times/how many appointments?
- Geographical locations of the clinics?
- Patient catchment area?
- Waiting times?
- Do you have cover for sickness/holidays?

Referral information

- Who can make referrals?
- Can patients self refer?
- Where do most of your referrals come from?
- What are the reasons for referral?
- Are there patients who you should see that are not referred?
- Is there a formal way of tracking patients who are not referred?
- Do you have many DNA's – is this a particular group?
- What happens to patients who DNA?
- Does the referral system work well?

How are HF clinics evaluated?

- What data do you collect?
- How is it used?
- Where is it sent?

Information about the role of a specialist nurse?

- What clinics/services do you provide (e.g. IV diuretics)?
- Do you prescribe medications?
- Do you liaise with HCP in primary care – GPs, practice nurses, community matrons?
- Is communication effective/could it be improved?
- Have you any overall frustrations?
- Is there any part of your role/service that you would change?

Discharge Process?

- Are you notified when a patient is admitted/discharged from hospital?
- Do you have any input into inpatient care?
- Is there a comprehensive discharge planning process?
- Do you have any involvement in discharge planning?
- Is there an inpatient education programme/who delivers it?
- What is your involvement in follow up care?
- Are you a prescriber?
- Do you use proactive telephone follow up?

- Do you perform home visits?
- Is there multi disciplinary follow up in the community?
- Are there any HF care pathways?
- Do you have a integrated care plan – is it used?
- Do you think continuity between primary and secondary care could be improved?

Communication Methods

- Are there communication links between the 3 NHS Manchester areas?
- Are there any regular HFSN meetings – are these effective?
- What do you think would be the best way to share ideas/practice?

Appendix 4

Interview Schedule – Primary Care (Nurse Practitioner)

Clinic information

- Where is the clinic situated?
- Do you run any specific heart failure clinics?
- Are you a nurse prescriber?
- Do you prescribe medication for HF patients?

Diagnostic information

- Does the surgery have an ECG?
- Do you use BNP testing?
- Do you have direct access to echo services or do you need to refer to a cardiologist?
- What are the waiting times for echo – how does this affect patient care?
- Have all the patients on your HF register had an echo to determine diagnosis – is the cause of HF always determined?

Referral information

- Do you ever contact HFSN's for advice?
- Can you refer directly to HFSN's?
- Does the HFSN make referrals to you?
- Can you refer/obtain advice from the HF Clinic in Central hub?
- Do you have access to relevant step up care to avoid admission if appropriate – how effective is the service?
- Do you refer HF patients to ACM/community matrons?
- Do you have easy access to palliative care services – who, where?

Follow up care

- Do you share an integrated care plan with secondary care?
- Do you receive a patient discharge letter within 72 hours – who receives it?
- Does the discharge letter always contain enough information?
- Do you always receive a management plan post discharge?
- Could this process be improved?
- Are you involved in post discharge follow up care (would you invite patients to clinic, proactive telephone calls, visit patients at home)?
- Do you have multi-disciplinary follow up care in the community?
- Is there a community based post discharge education programme?
- Can you refer suitable HF patients for cardiac rehab?
- Do you think communication between primary and secondary care could be improved – why/how?

Education

- Have you had any specific training to deal with HF patients?
- Do you feel adequately supported?

Communication methods

- Are there communication links between the 3 NHS Manchester areas?
- What would be the best way to share ideas and practice?
- Are there any rapid access clinics in primary care?
- Is there anyone else who you think it would be useful for us to speak with?

Appendix 5

Interview Schedule – Community Care (HFSN)

Service information

- How long has clinic been established?
- Where is the service situated i.e. primary or secondary care?
- Do you make domiciliary visits?
- How many clinics are provided including times?
- Patient catchment area?
- Do you have cover for sickness/holidays?

Referral information

- Who can make referrals?
- Can patients self refer?
- What are the reasons for referral?
- Are there patients who you should see who are not referred?
- Is there a formal way of tracking patients who are not referred?

How is the clinic evaluated?

- What data do you collect?

Role of the HFSN

- How many patients do you have on your caseload?
- Do you have many DNAs?
- What services are offered in clinic, home e.g. IV diuretics?
- Are you a nurse prescriber?
- Do you liaise with HCP?
- Is communication effective?
- Is there any part of your role that you would change?

Discharge Process

- Are you notified when a patient is admitted/discharged from hospital?
- Is there a comprehensive discharge planning process?
- Do you have any involvement in discharge planning?
- What is your involvement in follow up care?
- Do you use proactive telephone follow up?
- Is there multi disciplinary follow up in the community?
- Are there any HF pathways
- Do you think continuity between primary and secondary care could be improved?

Communication Methods

- Are there communication links between the 3 NHS Manchester areas?
- Are there regular HFSN meetings are these effective?
- What do you think would be the best way to share ideas/practice?

Appendix 6

Interview Schedule – Primary Care (General Practitioner)

Clinic information

- Do you run any specific heart failure clinics?
- How do you review heart failure patients on your register?
- How do you plan to monitor the up titration of beta blockers with QOF?
- How do you think the introduction of personal care plans will affect patient care?
- Are your records electronic?

Diagnostic information

- What is the procedure for access to ECG's?
- What are your views on BNP testing?
- What is the waiting time for echo?
- Have all the patients on your register had an echo?
- Do you think your heart failure register is accurate?

Referral information

- What contact do you have with the HFSN's?
- Do you refer patients to the HFSN and do they refer to you?
- Would community matrons be involved in this?
- What contact do you have with the Heart Failure Clinic in Central – Ivan Benett's?
- Is this the HF clinic run by Ivan Bennett in Central in the community?
- Do you have access to relevant step up care if required?
- What access do you have to palliative care services?

Follow up care

- Do you think it would be useful to have an integrated care plan with secondary care?
- Do you receive a patient discharge letter within 72 hours and how good is the information?
- Do you always receive a management plan?
- Do you have multi-disciplinary follow up in the community?
- Is there a community based post discharge education programme?

Communication

- Do you think communication between primary and secondary care could be improved?
- How would you get the cardiologist to do this?
- Are there communication links between the 3 NHS Manchester Hubs?
- What would be the best way to share ideas and practice?

Appendix 7

Plan, Do, Study Act Template

Plan, Do, Study Act (PDSA) cycles are an evidentially led improvement tool, designed to test small scale changes over a period of time, assessing the impact of the change. This approach is widely used within change management; however it is unusual in a healthcare setting because traditionally, new ideas are often introduced without sufficient testing

Objective (overall goal) of the test:

| | | | |
|--------------|---|--|---|
| Plan | What will you do to achieve your objective? | Who will lead this test? | How will you measure success? |
| | | What is your timescale? | |
| | | | |
| Do | What was the effect of running the test? E.g. How many patients have you diagnosed/coded as a result? | What were the challenges you faced and the benefits to your practice of the outcome? | |
| | | | |
| Study | What did the measures show against your expectations? | Act | What will you do next? Adopt, Adapt, Abandon? |
| | | | |

Appendix 8

Clinical Rationale for GM-HFIT (verification) Performance Indicators

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|---|---|---|
| 1. Diagnosis | | |
| <p>Has the patient had an echocardiogram?</p> <p>Has HF been confirmed by ECHO, angiography or specialist?</p> <p>When was HF confirmed?</p> | <p>Clinical guidelines emphasise the importance of having a confirmed diagnosis of heart failure (HF) because many of the symptoms suggestive of HF are similar to those of other conditions. Echocardiogram is recommended as the gold standard diagnostic test in the evaluation of patients with HF, providing extensive information relating to left ventricular ejection fraction (LVEF), left ventricle (LV) size, wall thickness and valvular function. Clinical guidelines require all patients with suspected HF and previous MI, and patients with suspected HF and BNP/NTproBNP levels indicative of HF, to be referred for an echocardiogram to confirm or refute a diagnosis of HF. Alternative diagnostic tests (e.g. radionuclide angiography or cardiac MRI) can be considered when a poor image is provided by echocardiography. Specialist input is recommended in the initial diagnosis of HF.</p> | <p><i>NICE</i> <i>ESC</i> <i>ACCF/AHA</i></p> |
| <p>Does the patient have asthma?</p> <p>Does the patient have PVD?</p> <p>Does the patient have diabetes?</p> <p>Does the patient have CKD?</p> <p>Does the patient have hypertension?</p> <p>Does the patient have IHD or CHD?</p> <p>Does the patient have COPD?</p> | <p>Multiple cardiovascular and non-cardiovascular co-morbidities are common in HF and complicate care for many patients, particularly the elderly. Co-morbidities can contribute to the progression of the disorder, affect response to treatment and result in polypharmacy. For example, complexities exist in the use of beta-blockers with HF patients who have concomitant respiratory conditions (e.g. COPD and asthma), they are contraindicated in asthma, but not a straight rule out in COPD, where as selective beta-1 blocker is preferred.</p> | <p><i>NICE</i> <i>ESC</i></p> |
| <p>Has the patient had a previous MI?</p> | <p>If a patient with a previous MI presents with symptoms consistent with HF, there is a high likelihood that the patient has HF. In accordance with NICE guidelines, such patients should be referred directly for an urgent echocardiogram, without the need to test BNP/NTproBNP first. Ischaemic heart disease is a common cause of HF.</p> | <p><i>NICE</i> <i>ESC</i></p> |
| <p>Does the patient suffer from depression?</p> | <p>Depression is highly prevalent in patients with HF, with prevalence increasing sharply with increasing severity of HF symptoms. Depression leads to poorer outcomes for patients with HF, including increased risk of poor functional status, hospital readmission and death.</p> | <p><i>NICE</i> <i>ESC</i></p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|---|---|-----------------------------|
| 2. Aetiology | | |
| Has aetiology been investigated/ established? | When a clinical diagnosis of HF is made, clinical guidelines highlight the importance of identifying cardiac and non-cardiac disorders that might have caused HF or that may accelerate the progression of HF, as the aetiology may require specific treatment or could be correctable. | NICE ACCF/AHA |
| What type of heart failure has been established? | There are two main types of HF: (1) LVSD (Left Ventricular Systolic Dysfunction) caused by impaired LV contraction, usually characterised by a reduced LVEF and (2) HFPEF (Heart Failure with Preserved Ejection Fraction) associated with impaired left ventricular relaxation, rather than left ventricular contraction, characterised by a normal or preserved LVEF. There is also a cohort of patients that have right-sided HF secondary to another condition (e.g. pulmonary hypertension). Clinical guidelines state the importance of identifying the type of cardiac dysfunction present. The evidence based surrounding HF management is primarily related to LVSD and therefore patients who present with other aetiologies should be managed by cardiology or a management plan sought from a specialist. | NICE ACCF/AHA |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|--|--|-----------------------------|
| 3. Functional capacity and symptom severity | | |
| <p>Has functional capacity been assessed using NYHA functional class (in the past 12 months)?</p> | <p>Patients with HF may have a number of symptoms, the most common being breathlessness, fatigue, exercise intolerance and fluid retention. One of the primary symptoms of HF is breathlessness, which can be exertional or occur at rest. The degree of exertion require to elicit breathlessness may be used to grade the severity of symptoms into one of four function classes. The functional class tends to deteriorate unevenly over time and the severity of symptoms does not necessarily equate with the severity of the underlying heart problem. Changes in medication and diet can have very favourable or adverse effects on functional capacity in the absence of any measureable change in heart function, however, the severity of symptoms may fluctuate even in the absence of changes in medication. Clinical guidelines recommend that patients' functional capacity should be regularly monitored and that an assessment should be made at each visit of the ability of the patient with HF to perform routine and desired activities of daily living.</p> | <p>NICE ACCF/AHA</p> |
| <p>What is their NYHA functional class?</p> | <p>The New York Heart Association (NYHA) classification grades the severity of heart failure symptoms as one of four functional classes, on the basis of symptoms and exercise capacity. The classification is used internationally in clinical practice and in research, as it provides a standard description of the severity that can be used to monitor progression of the condition, assess response to treatment and guide management.</p> <p>Class I: No limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation or dyspnoea. Class II: Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation or dyspnoea. Class III: Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity in fatigue, palpitation or dyspnoea. Class IV: Unable to carry on any physical activity without discomfort. Symptoms at rest. If any physical activity is undertaken discomfort is increased.</p> | <p>NICE ACCF/AHA</p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|---|---|-----------------------------|
| 4. Management and review | | |
| <p>Does the patient have a scheduled heart failure review?</p> <p>How often is the heart failure review carried out?</p> <p>Does the patient have any other disease specific reviews?</p> <p>What are these?</p> | <p>HF is a progressive disease characterised by high re-hospitalisation rates and complications that can lead to a decline in renal, hepatic and neurological function. Monitoring facilitates continuing education for patients and their carers and improved communication between the patient and the HF team enabling earlier detection of complications, including anxiety and depression. Early intervention may reduce re-hospitalisation and enables adjustment of therapy to accommodate change in patient's clinical condition.</p> <p>All patients with chronic HF require monitoring. This monitoring should include a clinical assessment of functional capacity, fluid status, cardiac rhythm (minimum of examining the pulse), cognitive status and nutritional status. A review of medication should also be undertaken, including assessment of the need for changes and possible side effects. Serum urea, electrolytes, creatinine and eGFR should also be measured.</p> <p>The frequency of monitoring should depend on the clinical status and stability of the patient. The monitoring interval should be short if the clinical condition or medication has changed, but is required at least 6-monthly for stable patients with proven HF.</p> | <p>NICE</p> |
| 5. Fluid status assessment | | |
| <p>In relation to heart failure, was the patient weighed (in the past 12 months)?</p> <p>In relation to heart failure, has the patient been assessed for ankle oedema (in the past 12 months)?</p> | <p>As the heart's pumping becomes less efficient, the body tries to compensate for it, often by increasing blood volume via fluid retention in the kidneys. Blood and fluid pressure results in excess fluid entering the lungs and other body tissues. Symptoms associated with fluid retention include shortness of breath and oedema. Diuretic therapy is likely to be required to control congestive symptoms and fluid retention. Increases in body weight are often associated with deterioration of HF and fluid retention. Clinical guidelines emphasise the importance of routine clinical assessment of fluid status and weight.</p> | <p>NICE ACCF/AHA</p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|--|--|----------------------------------|
| 6. Blood pressure and pulse | | |
| <p>Has blood pressure measured (in the past 12 months)?</p> <p>What was BP?</p> | <p>High blood pressure is a major cause of HF and a significant risk factor for CVD. It is important to control and monitor the blood pressure of HF patients, particularly during the up titration of beta blockers and ACE-I to avoid side effects such as symptomatic hypotension. The patient's blood pressure may also influence the decision as to whether to introduce beta blockers or ACE-I (or both) first. In hypertensive patients with evidence of LV dysfunction systolic and diastolic blood pressure should be controlled with a therapeutic target of $\leq 140/90$ and $\leq 130/80$mmHg in diabetic and high risk patients. In hypertensive patients with HFPEF, more aggressive treatment is recommended.</p> | <p>NICE ACCF/AHA ESC</p> |
| <p>Was pulse measured?</p> <p>Was rate recorded?</p> <p>What was the rate?</p> <p>Was rhythm recorded?</p> <p>What was the rhythm recorded?</p> <p>Has the patient had an ECG?</p> <p>What was the patient's rhythm on the ECG?</p> <p>What was the QRS duration on the ECG?</p> | <p>While it is no longer recommended as part of the diagnostic pathway for HF, an ECG should be part of the general assessment of a patient in whom HF is suspected to determine the patient's rhythm, heart rate control (optimal 70 bpm or below), the presence of conduction abnormalities, the duration of the QRS complex, to assess suitability for drug therapy options and to monitor HF patients having their beta blocker doses up-titrated. Clinical assessment of cardiac rhythm (minimum of examining the pulse) should form part of routine monitoring.</p> | <p>NICE</p> |
| 7. Optimal medication | | |
| <p>Is the patient on an ACE-I or ARB?</p> <p>Are target doses of ACE-I or ARB met?</p> <p>Drug and dose</p> <p>Is the patient on a beta blocker?</p> <p>Are target doses of BB met?</p> <p>Drug and dose</p> | <p>ACE-I and beta blockers licensed for HF are first line therapy for HF and should be offered to all patients with HF due to LVSD unless contraindicated. ACE-I therapy should be started at a low dose and titrated upwards at short intervals until the optimal tolerated target dose is achieved. Beta blockers should be introduced in a 'start low, go slow' manner, with heart rate, bp and clinical status being assessed after each titration. Stable patients who are already taking beta blockers for comorbidities and who develop HF due to LVSD should be switched to a beta blocker licensed for HF. ARBs licensed for HF should be considered as an alternative to ACE-I for patients with HF due to LVSD who have intolerable side effects with ACE-Is.</p> | <p>NICE ACCF/AHA ESC</p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|--|---|---|
| 8. Psychosocial assessment | | |
| <p>Has the patient been screened for depression (in the past 12 months)?</p> | <p>Depression is highly prevalent in patients with HF, with prevalence increasing sharply with increasing severity of HF symptoms. Depression leads to poorer outcomes for patients with HF, including increased risk of poor functional status, hospital readmission and death. NICE guidelines state that the diagnosis of depression should be considered in all patients with HF.</p> | <p><i>NICE</i> <i>ACCF/AHA</i> <i>ESC</i></p> |
| <p>Is smoking status recorded (in the past 12 months)? What is their smoking status (cigarettes per day)?</p> | <p>Smoking is a known modifiable risk factor for cardiovascular disease and can significantly exacerbate HF symptoms such as breathlessness and limited functional capacity. All HF patients should be strongly advised not to smoke and referral to smoking cessation services should be considered.</p> | <p><i>NICE</i> <i>ACCF/AHA</i> <i>ESC</i></p> |
| <p>Is alcohol status recorded (in the past 12 months)? What is their alcohol status (units per week)?</p> | <p>Excessive alcohol consumption is a known modifiable risk factor for cardiovascular disease. Alcohol may have a negative inotropic affect in patients with HF and may be associated with an increase in blood pressure and the risk of arrhythmias. Excessive use may be deleterious. Patients suspected of having alcohol-induced cardiomyopathy should abstain from alcohol completely. Healthcare professionals should discuss alcohol consumption with the patient and tailor their advice appropriately to the clinical circumstances.</p> | <p><i>NICE</i> <i>ACCF/AHA</i> <i>ESC</i></p> |
| 9. Nutritional status | | |
| <p>Has information been given on nutrition, diet, fluid and salt intake?</p> | <p>Clinical or subclinical malnutrition (cardiac cachexia) is common in patients with severe HF and is an important predictor of reduced survival. Fluid and sodium restriction to 2 GM/daily is recommended in patients with symptomatic HF to prevent fluid retention and weight reduction in obese persons should be considered in order to prevent the progression of HF, decrease symptoms, improve well being and reduce overall CVD risk. Guidelines state that HF patients' nutritional status should be routinely assessed.</p> | <p><i>NICE</i> <i>ACCF/AHA</i> <i>ESC</i></p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|--|--|---|
| 10. Immunisation | | |
| <p>Has the patient had an influenza vaccination (past 12 months)?</p> <p>Has the patient had the pneumococcal vaccination?</p> | <p>Pulmonary congestion is present in most patients with HF and predisposes them to respiratory infections, including influenza. HF patients are also at high risk of suffering serious complications if they develop pneumococcal disease or catch influenza. NICE therefore recommends that patients with HF should be offered an annual vaccination against influenza and vaccination against pneumococcal disease (only required once).</p> | <p><i>NICE</i> <i>ESC</i></p> |
| 11. Self care and patient information | | |
| <p>Has the patient received education in relation to HF and advice regarding medication and self management?</p> | <p>Self care management is a part of successful HF treatment and can significantly impact on symptoms, functional capacity, well being, morbidity and prognosis. Self care can be defined as actions aimed at maintaining physical stability, avoidance of behaviour that can worsen the condition and detection of the early symptoms of deterioration. Clinical guidelines recommend that healthcare professionals should ensure that the HF patient and carer are fully informed about their medication to promote compliance and that patients who wish to be involved in monitoring their condition should be provided with sufficient education and support from their healthcare professional to do this, with clear guidelines as to what to do in the event of deterioration.</p> | <p><i>NICE</i> <i>ACCF/AHA</i> <i>ESC</i></p> |
| 12. Secondary Care | | |
| <p>Is the patient being seen in a specialist HF clinic?</p> | <p>Specialist care (e.g. cardiology or specialist heart failure services) for patients with HF is associated with reduced mortality, improved health-related quality of life, better prescribing and better outcomes. However, only a minority of patients with HF are seen, or followed up, by a specialist service (23%).</p> <p>NICE guidelines indicate that patients should be referred to a specialist multidisciplinary HF team for the initial diagnosis of HF and the management of severe HF (NYHA class IV), HF that does not respond to treatment and HF that can no longer be managed effectively in the home setting.</p> | <p><i>National Heart Failure Audit 2010</i> <i>NICE</i></p> |

| Audit Field | Clinical Rationale | Source of recommendation(s) |
|---|--|-----------------------------|
| 13. Monitoring | | |
| Have U&Es and Creatinine been done? | A routine diagnostic evaluation of patients with suspected HF should include a complete blood count, serum electrolytes, serum creatinine, eGFR, glucose, liver function tests and urinalysis. Reduced renal function is common in patients with mild to moderate HF, especially in patients treated with diuretics and ACE-I/ARB/aldosterone antagonist therapy. Appropriate laboratory monitoring is essential during the initiation, titration and follow up phases in patients receiving drug therapy for HF. NICE guidelines state that serum urea, electrolytes, creatinine and eGFR should be routinely monitored in all HF patients. | <i>NICE</i> <i>ESC</i> |

Appendix 9

EMIS PCS/LV Read Codes and Search Criteria for GM-HFIT (case finding)

| Search No. | Search Criterion & EMIS codes |
|------------|--|
| 1 | Spironolactone BUT not on HF register (exclude G58) |
| 2 | Eplerenone BUT not on HF register (exclude G58) |
| 3 | Metolazone BUT not on HF register (exclude G58) |
| 4 | ECHO on CHD Register BUT not on HF register (6A2; 662N; 9Ob0) + (5853-1; OSHEAEC1; CAPEKEC1; EMISNQDO2) + exclude (G58) |
| 5 | ECG abnormal and left bundle branch block, on CHD Register BUT not on HF register (3217; R1431; 329A; G562-1) + (6A2; 662N; 9Ob0) + exclude (G58) |
| 6 | Angina & ECHO BUT not on HF register (G33; G311-3) + (5853-1; OSHEAEC1; CAPEKEC1; EMISNQDO2) + exclude (G58) |
| 7 | Previous MI & ECHO BUT not on HF register (G30; G32; G30-5) + (5853-1; OSHEAEC1; CAPEKEC1; EMISNQDO2) + exclude (G58) |
| 8 | Atrial fibrillation, Atrial flutter & ECHO BUT not on HF register (G573; 3272; 662S) + (5853-1; OSHEAEC1; CAPEKEC1; EMISNQDO2) + exclude (G58) |
| 9 | Cardiomyopathy BUT not on HF register (G55) + exclude (G58) |
| 10 | ECHO shows LVSD BUT not on HF register (585f) + exclude (G58) |
| 11 | Suspected heart failure BUT not on HF register (1J60) + exclude (G58) |
| 12 | LVSD BUT not on HF register (G5yy9) + exclude (G58) |
| 13 | Impaired left ventricular function BUT not on HF register (33BA; G581-3) + exclude (G58) |
| 14 | ECHO shows diastolic dysfunction BUT not on HF register (585g; G5yyA) + exclude (G58) |
| 15 | ECHO abnormal BUT not on HF register (58531; R1320; EMISHGT41; EMISHGT42) + exclude (G58) |
| 16 | Bi ventricular pacemaker BUT not on HF register (ZV45M) + exclude (G58) |
| 17 | NYHA classification BUT not on HF register (662f; 662g; 662h; 662i) + exclude (G58) |
| 18 | History of heart failure BUT not on HF register (14A6) + exclude (G58) |
| 19 | Cardiomegaly & ECHO BUT not on HF register (G5y3) + (5853-1; OSHEAEC1; CAPEKEC1; EMISNQDO2) + exclude (G58) |

Appendix 10

GM-HFIT Action Plan provided to practice teams



MANCHESTER
1824
The University of Manchester



National Institute for
Health Research

Collaboration for Leadership in
Applied Health Research and Care
(CLAHRC) for Greater Manchester

GM-HFIT Results Overview

GP Surgery:

| GM-HFIT Verification | |
|----------------------------------|--|
| TOTAL NUMBER OF PATIENTS AUDITED | |
| Appropriate | |
| Require further investigation | |
| Inappropriate | |

| GM-HFIT Case Finding | |
|----------------------------------|--|
| TOTAL NUMBER OF PATIENTS AUDITED | |
| Add to HF register | |
| Refer for echo | |
| Request echo report | |
| Refer to specialist | |
| GP review | |

Heart Failure Management (skills audit)

Your traffic light score was ***** This means that you are providing good care, but that there are some areas that require improvement.

Areas of Good Practice

Areas for Improvement

Recommended Actions

The Collaboration for Leadership in
Applied Health Research and Care for Greater Manchester,
is a partnership between the Greater Manchester NHS Trusts and
the University of Manchester and is part of the
National Institute for Health Research.

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