HEART FAILURE SERVICE BLUEPRINT

Produced by the
Birmingham Heart Failure Steering Group

(VERSION 2 – AMENDED JANUARY 2003)

Birmingham and The Black Country Health Authority
CONTENTS

Foreword

1. Introduction 1

2. What is Heart Failure? 1

3. Burden of Heart Failure 2-3

4. Current Situation 4-7

5. Outline Heart Failure Service Model 8-10


7. Estimation of Demand and Capacity 14-17

8. Heart Failure Service Benchmarks 18-20

9. Primary Care Heart Failure Management Guideline 21-41

10. Hospital Heart Failure Management Guideline 42-48

11. Palliative Care needs 50-52

12. Summary and Recommendations 53

13. Example Service Models 54-67

14. Heart Failure Specialist Nurse Services 68-73

15. References 74-75

16. Acknowledgements 76

17. Appendices:
   1. Heart Failure Group Membership 77
   2. Primary Care Building Heart Failure Register Guide 78
   3. Heart Failure Treatment Guide 80-81
   4. Patient Group Directions – Heart Failure 82
   5. Diagnostic Criteria for LV Dysfunction by Echocardiography 83
   6. New York Heart Association Classification of Heart Failure 84
   7. Echocardiogram Referral Form 85

11/11/2003
**FOREWORD**

Heart failure is an extremely common condition with a high morbidity and mortality. It is frequently undiagnosed or misdiagnosed due to a lack of availability of objective assessments. In addition patients with the condition are frequently under treated particularly in terms of effective drug prescription in effective dosages. The commonest cause of heart failure is ischaemic heart disease and therefore heart failure has an appropriate prominent place in the National Service Framework (NSF) for Coronary Heart Disease. This NSF represents a considerable opportunity to develop and enhance the diagnostic and management services for the large numbers of patients with this debilitating condition. Specific requirements regarding the availability of appropriate investigations and the institution of effective therapies reducing both morbidity and mortality are specified in the NSF.

In view of these requirements this document has been produced to meet the needs of the NSF in this area and to produce models of care, which will allow targeting of investigations and management as soon as the necessary resources are available. The work has been undertaken by a subgroup of clinicians, nurses, technicians and managers from organisations in primary and secondary care across Birmingham (a full list of the subgroup membership can be found in Appendix I). The specific elements of the recommendations will vary from practice to practice and Trust-to-Trust but such variations should be minor dependant on local circumstances rather than on the inherent principles, which have been carefully formulated to provide an achievable and effective implementation across the many different groups of patients requiring the services.

Adoption of the recommendations will result in considerable improvements in the diagnosis and management of patients with effects in quality of care being observed almost immediately. By necessity the heart failure services outlined in the document requires the participation of multidisciplinary teams all elements of which need to be in place to provide a cross-sectional and complete pathway of care. It is no longer satisfactory to have only the minority of patients investigated both in primary care and during their hospital admission. Similarly, it is not acceptable to have confirmed patients under-treated.

The document therefore provides a comprehensive blueprint for the management of patients in the community and in hospital and the importance of developing the services in both areas in parallel.

Dr. Michael Davies

Consultant Cardiologist and Chair of the Birmingham Heart Failure Steering Group

Chair of the British Society of Heart Failure - Member of the National Heart Failure Working Group

11/11/2003
1. **INTRODUCTION**

1.1 The National Service Framework (NSF) for Coronary Heart Disease (CHD) was published in March 2000 and aims to improve access and quality of care for patients with cardiovascular disorders including heart failure, by establishing standards for early detection & diagnosis and effective treatment and rehabilitation.

1.2 To support successful implementation Birmingham CHD Local Implementation Team established a city-wide Heart Failure subgroup, responsible for the review of Chapter 6 of the NSF (Heart Failure) and translation of its requirements into local plans for review and implementation by local CHD Networks and their member hospital and primary care groups/trusts.

1.3 This paper has been produced to summarise the recommendations of the Birmingham Heart Failure group in the planning and development of heart failure services. Birmingham and the Black Country Health Authority, Primary Care Trusts and NHS Trusts are asked to recognise the significance of heart failure and to support the recommendations of the steering group, ensuring immediate action is taken to address these via local CHD, HIMP and Commissioning Plans.

2. **WHAT IS HEART FAILURE?**

2.1 Heart failure is a common, serious and disabling disease.

2.2 The term heart failure is commonly used as a diagnostic label but it is not a diagnosis per se. It refers to a syndrome – a collection of physical signs and symptoms – resulting from a reduction in the pumping ability of the heart.

2.3 It is characterised by breathlessness, fatigue and fluid retention (peripheral oedema and an elevated jugular venous pressure) resulting from cardiac dysfunction.

2.4 Heart Failure has many causes. The commonest cause is ischaemic heart disease - myocardial dysfunction, which is most commonly systolic (reduced left ventricular contraction and emptying). Usually this abnormality results from ischaemic heart disease and there is often a history of myocardial infarction and/or hypertension.

2.5 Valvular problems and atrial fibrillation may also present as heart failure. All other causes are much rarer. Careful consideration must be given to identifying the underlying cause of the condition in order that optimum treatment can be provided.

2.6 Heart failure can be hard to diagnose as there are few clinical features in the early stages and many features are not organ-specific, yet early diagnosis is important because there are effective treatments available. The diagnosis is very frequently inaccurate based on the history and examination alone and can only be accurately confirmed and the cause identified by echocardiography.

2.7 Heart Failure is treated in several ways. The aims are to reduce the progression of the disease, improve patients quality of life, reduce hospitalisation, and extend life.

2.8 A key aspect of treatment is dealing with the underlying cause, such as angina or high blood pressure. ACE Inhibitors are the most important drugs used to treat heart failure.
3. **BURDEN OF HEART FAILURE**

3.1 It is estimated that between 1% and 2% of the total population in the UK suffer from heart failure, with a tenfold increase in the elderly. Accurate quantification is complicated by the fact that some patients with early heart failure have few symptoms and some patients with typical symptoms are shown on investigation not to have heart failure. One study has found that 50% of patients in a GP setting labelled as suffering from heart failure on clinical grounds, do not have heart failure demonstrated on echocardiography.

3.2 Prevalence of heart failure increases with age and our population is ageing, with an approximate doubling with each decade of ageing.

It affects 3-20 individuals per 1000 in general population. In those aged 65 years and over it affects between 100+ individuals per 1000 population.

Annual incidence of heart failure is 1-5 per 1000 and the relative incidence doubles for each decade of life after the age of 45 years.

As the treatment of CHD improves, the overall incidence is likely to increase in the future because of both an ageing UK population and more patients surviving myocardial infarction and more myocardial infarctions are prevented. As a consequence, the number of people with CHD will increase in the community, with a corresponding increase in the number of people suffering from heart failure.

3.3 Prognosis is poor. At a time when deaths from CHD are declining, morbidity and mortality from heart failure is increasing with heart failure carrying a worse prognosis than many cancers. (65% -75% probability of death within 5 years of diagnosis).

3.4 Quality of life is severely affected and deteriorates with increasing severity. It is impaired in all aspects traditionally measured (Emotions, Sleep, Energy, Pain, Mobility, Social Life, Family Life and Sex Life.

3.5 Approximately 1% of NHS Expenditure is currently spent on Heart Failure, with most of these costs relating to hospital admissions.

3.6 Heart failure accounts for around 5% of all medical admissions and 25 – 30% of heart failure patients are readmitted every year.

3.7 The cost of heart failure is increasing with an estimated UK expenditure in 1996 of £465 million (£556 m if you include costs of community health services and nursing homes). The increasing rates of hospitalisation make it likely that these reported estimates fall short of the current economic burden.
### Percentage of HOSPITAL ONLY Healthcare expenditure in Six Industrialised Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>% Hospital-based expenditure</th>
<th>Study</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>74%</td>
<td>1996</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>60%</td>
<td>1996</td>
<td>£360 million</td>
</tr>
<tr>
<td>France</td>
<td>64%</td>
<td>1990</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>71%</td>
<td>1989</td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>67%</td>
<td>1988</td>
<td></td>
</tr>
<tr>
<td>NZ</td>
<td>74%</td>
<td>1988</td>
<td></td>
</tr>
</tbody>
</table>

The cost of chronic heart failure compared with total healthcare expenditure in six industrialised countries. % represents the proportion of expenditure relating to hospital-based costs.

#### 3.8 Impact on Health Services
Heart failure accounts for at least 5% of admissions to general medical and geriatric wards in British hospitals and admission rates in a number of European countries has doubled in the past 15 years.

#### 3.9 Factors contributing to readmission include:
- Non-compliance with treatment
- Poor patient education
- Intercurrent infections
- Adverse reactions to treatment or use of detrimental drug therapies
- New medical problems
- Social care problems
- Short durations of hospital stay with poor discharge planning

Readmission is suggested to be avoidable in 40%+ of patients, particularly when the following is in place:
- Effective clinical management
- Adequate rehabilitation
- Social assessment
- Careful discharge planning and links with social services
- Help and support available to the patient and family

#### 3.10 In elderly patients with HF, with readmission rates from 29-47% with 3-6 months of the initial hospital diagnosis, adequate treatment can reduce readmission and overall costs despite drug expenditure.

#### 3.11 Heart Failure is important because it is common, costly, disabling and deadly.

#### 3.12 It is also treatable. However, effective management needs to be based on accurate diagnosis.

#### 3.13 Improved diagnosis and management in general practice should reduce rates of admission, although the extra costs of drugs such as ACE Inhibitors are likely to negate any savings in the acute sector.
4. CURRENT SITUATION

4.1 Diagnosis

4.1.1. Improved diagnosis and management in general practice should reduce rates of admission, although the extra costs of drugs such as ACE Inhibitors are likely to negate any savings in the acute sector.

4.1.2. Diagnosis on clinical grounds is problematic with at least a 50% inaccuracy. A clinical suspicion of heart failure is essential in determining who should undergo further evaluation and investigation.

4.1.3. Echocardiography is the single most important investigation in the evaluation of a patient with suspected heart failure. It is safe, non-invasive and gives valuable information on the structure and function of the heart. It often confirms the diagnosis and at the same time identifies the underlying cause of the problem.

4.1.4. Appropriate referral for echocardiography requires suitable selection of patients. **GP assessment should include Electrocardiography (ECG) and Chest X-Ray.** If these are normal - the diagnosis of heart failure is virtually excluded and if diagnostic uncertainty persists, the patient should be referred to a relevant specialist rather than only requesting an echocardiogram. This can and will reduce the numbers being referred.

4.1.5. Availability of ECG machines, which are ‘reliable’, varies from practice to practice – there is a need to assess local need and preferred models to ensure that all GPs have good access to timely ECG and CXR testing. There is also a need to examine models of service for the provision of expert interpretation of ECG results by PCT.

4.1.6. Training needs of GP and other primary care clinicians related to ECG testing and ECG interpretation should be assessed.

4.1.7. Echocardiography services are provided at Birmingham /Black Country Acute Hospitals. Historically, Out-patient Echocardiography has only been accessible via referral to a Consultant Cardiologist or Consultant Physician. Waiting times for consultant outpatient clinics have grown significantly resulting in poor access for General Practitioners and leading to the diagnosis of heart failure based on clinical assessment alone.

4.1.8. In many hospitals, the echocardiography technical services are grossly inadequate to meet the increasing demand for outpatient and in-patient echocardiography (echo) in heart failure in addition, to echo for other conditions.

New models for improving access includes:

a) **Open Access Echocardiography Service**

   This provides the investigation by a trained technician and a report sent to the GP. In an ideal world, an expert clinical opinion would be available at the same time as the Echo, but the predicted numbers involved make this unlikely for all patients.

b) **One-Stop Diagnostic Heart Failure Services**

   This provides clinical assessment by a Consultant Cardiologist and an echo if required. A report with findings and recommendations can be made available to the GP within days via fax.
4.1.9. The role of mobile echocardiography either as part of an outreach service or as open access should also be explored.

4.1.10. Echo studies should only be performed on high-resolution equipment. The quality and age of equipment varies by trust, with some capital investment from national monies in 2000.

A regional capital investment plan for high-resolution equipment should be outlined.

4.1.11. Local CHD networks should consider the recommendations for the provision of, and access to, echocardiography to be identified as a development priority within local CHD action plans. (In-patient and Out-Patient services).

4.1.12. Technician led echocardiography should only be performed by experienced operators trained to standards set by the British Society of Echocardiography.

There is a local and national shortage of BSE trained Technicians.

West Midlands Region has commenced a recruitment and training programme, which will yield results in 2006. Limitation of technician availability will be a key factor when agreeing models of care between 2001-2005.

The Birmingham and Black Country Strategic Health Authority should review workforce plans and submit proposals to the Workforce Confederation.

4.2 Optimisation of therapy

4.2.1. The General Practitioner would normally undertake optimisation of therapy following open access echocardiography.

There is recognition that the early management and stabilisation of the heart failure patient is often complex and time-consuming.

Access to specialist advice and support day to day, for GPs and their teams should be improved.

Cardiologist resources are limited and should be maximised to the full.

4.2.2. The role of the PCT Heart Failure Specialist Nurse is developing across the UK providing a service for local GPs for patients following discharge or following diagnosis at open access echo services.

4.2.3. Networks should support the appointment of Heart Failure Specialist Nurses to work in the community to ensure the provision of a community based Heart Failure Specialist Nursing Service. Ideal models ensure an integrated service across primary and secondary care and include the rotation of specialist nurses across both settings.

4.3 Management Protocols

4.3.1. Local Hospital and PCT teams are required to agree a protocol for the management of heart failure across the patient pathway. (Primary/Secondary/Primary).

PCTs and hospitals via the CHD Local Networks are in the process of agreeing protocols for the management of heart failure.

Networks should also agree joint drugs and therapeutics policies for Heart Failure.
4.4 Follow-up care in General Practice

4.4.1. Heart failure is the leading cause of hospital admissions for patients over the age of 65 years in the UK. Factors contributing to readmission include lack of clinical management (e.g. use of inadequate or sometimes detrimental drug therapy) and lack of patient education achieved by the regular follow-up of patients.

4.4.2. There is evidence to suggest that many people with heart failure are not receiving optimal treatment. In particular, many patients are not prescribed ACE Inhibitors or adequate doses of ACE inhibitors are not used, despite robust research demonstrating their clinical and cost effectiveness.

4.4.3. PCTs should ensure baseline audit of ACE Inhibitor prescribing is undertaken from which targets for prescribing of effective medication can be agreed with all practices.

4.4.4. There are also numerous patient related factors contributing to admission and readmission, these include non-compliance with treatment regimen, adverse reactions to medication and problems with caregivers etc.

4.4.5. The CHD NSF states that all primary care teams should put in place models of care so that they use a systematic approach to provide structured care to heart failure patients.

4.4.6. Striving to meet these standards will mean a significant increase in work for practices who have already committed significant time and resource to the establishment of effective CHD registers and secondary prevention for those with proven CHD.

4.4.7. A training needs analysis should be undertaken for clinical staff in general practice from which PCTs can agree training priorities for investment plans.

4.4.8. The resource implications of the heart failure programme in primary care should be assessed.

4.4.9. The recruitment/retention and training requirements of clinical staff, in particular primary care nurses and General Practitioners should be assessed and a workforce plan outlined by the Workforce Confederation.

4.5 Palliative care

4.5.1. The focus of services concerned with coronary heart disease is on damage limitation and secondary prevention. The National Service Framework recognises that “not everyone can recover good health” and that many people die; some from a sudden event but many after a period of increasing debilitation. It is recommended that the principles of palliative care are applicable to patients with advanced left ventricular systolic dysfunction whose symptomatic profile is similar to those with advanced terminal cancer.

4.5.2. The decision to discontinue ‘active’ treatment and to adopt a palliative approach is rarely encountered but changing emphasis from treatment of the condition to treatment of symptoms is important to acknowledge. The dying trajectory of heart failure patients is less well defined than for some forms of cancer and identification of the point of transition to a terminal phase may be very difficult. There is also an higher prevalence of unpredictable sudden death which may impact on physician/carer dynamics and clearly has organisational implications for ‘Do Not resuscitate’ protocols. There is a dearth of specific information on heart failure in this context and physician attitudes and experience may impact on access to palliative care support. For patients who have heart failure the ongoing care and management may be best managed by the integrated approach of practitioners in Primary Care, Cardiologists/General Physicians and Palliative Care Specialists.
4.5.3. Specialist Palliative care services which serve the Birmingham population comprise:

- Acute Hospital Specialist Palliative Care Teams
- Voluntary sector hospices, St. Mary's, Warren Pearl Marie Curie Centre and St. Giles (Provide in-patient, home care and day care facilities)
- NHS Hospice Unit, John Taylor (this does not accept referrals for heart failure patients).

With the exception of the Warren Pearl Marie Curie Centre, the admission rates for patients with heart failure have been in single figures annually. This may reflect a reluctance of palliative care physicians to accept these patients because of anxieties about handling an unfamiliar condition or the constraints imposed by constitutional charters or funding bases of the hospice organisations.

4.5.4. It is important that palliative care services and cancer networks include provision for patients with end-stage cardiac failure and that services to help these patients are developed in conjunction with existing services and staff.

4.5.5. There are lessons to be learnt from examining models of palliative care across the UK.

4.5.6. There is national recognition that Palliative Care Services in the UK are inadequate. New Opportunity Funding has been identified and has highlighted the important of Non-Malignant Palliative Care service needs.

4.5.7. In the Autumn 2002, PCTs will be asked to submit bids for NOF Funding which should include making adequate provision for Non-Malignant disease as part of their overall planning for local Palliative Care services.

All PCTs are asked to support this recommendation and to work with the relevant Cancer networks to ensure these are included within their bids.
## 5. OUTLINE HEART FAILURE SERVICE MODEL

<table>
<thead>
<tr>
<th>Goal</th>
<th>Service</th>
<th>Requirements</th>
<th>Costs</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving access to Echo and Pre-echo Investigation</td>
<td>GP Assessment and Pre-echo Investigation Resting ECG CXR</td>
<td>ECG Facilities to be made available to all practices. ECG Interpretation facilities to be made available to all General Practitioners Training on ECG interpretation for GPs</td>
<td>Determined by the current situation and the preferred model of service.</td>
<td>Finance Equipment Interpretation Training</td>
</tr>
<tr>
<td>Establishing an early and accurate diagnosis</td>
<td>Open Access Echo only service based at each acute trust</td>
<td>Hospital Requirements: Dedicated equipment Dedicated Technician Medical overview IM&amp;T requirements Service can run in parallel with consultant clinic to provide medical overview and support to technical staff.</td>
<td>Actual costs determined by current level of service provision at each trust.</td>
<td>Availability of Dedicated high resolution equipment Dedicated technician Finance Equipment Technician IM&amp;T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Care requirements</td>
<td>Adoption of the Primary Care Guideline including referral criteria. Simple referral form Effective optimisation of therapy and management /follow-up by GP team Training needs of GPs and Nurses Increased consultations IM&amp;T requirements</td>
<td>Nil</td>
<td>Impact on PCT Drug Budgets Resources to staff HF clinics Resources for training</td>
<td>Recruitment and retention of staff to undertake heart failure programmes. Training need particularly for practice nurses</td>
</tr>
<tr>
<td>Goal</td>
<td>Service</td>
<td>Requirements</td>
<td>Costs</td>
<td>Constraints</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Establishing an early and accurate Diagnosis II | One-Stop Diagnostic Service at Hospital | Hospital Out-Patient Service requirements Consultant led Service which provides expert clinical assessment of all:  
   - Suspected HF patients  
   - Those who are deteriorating  
   - Follow-up of those who with complex needs  
   Supported by Full-time HF Specialist Nursing team. | Costs determined by level of service required.  
   (Minimum 3-4 sessions per wk?)  
   Costs:  
   - Capital expend.  
   - Equipment  
   - IM&T  
   Recurrent revenue:  
   - Technician | Technician availability  
   Medical/Nursing staff availability  
   Consider  
   Process mapping echo services  
   Demand and capacity exercise  
   Redesign  
   - Investment |
| Early diagnosis, effective discharge planning and reduced length of stay | In-Patient Services at local District General Hospitals | Hospital In-Patient Services requirements Consultant led service, which provides expert clinical care to all patients diagnosed with Heart Failure.  
   Supported by Heart Failure Specialist Nurse who can outreach to all wards within the hospital.  
   Team also provides review of complex cases i.e. rapid assessment of patients with worsening symptoms.  
   Including fast track admission | Staffing  
   - Medical input  
   - Nursing input  
   H Grade HF Nurse per Trust  
   (min) £35K per 1 wte | Availability and costs of specialist medical and nursing service, and technical service IM&T requirements |
| Early Discharge and Optimisation of Therapy in the newly diagnosed | Community Heart Failure Specialist Nurse service Based in each PCT linked to HF Specialist service via care pathway | Primary Care Trusts  
   Wte H Grade Nurse per 150,000 population.  
   Provision of service for GPs – pick up of hospital discharges, initiation/titration of therapy, intensive education and support, home visiting.  
   Helpline for patients and their carers (and professionals)  
   Rotate into hospital for professional support, training and mentorship | £35K per nurse  
   Min 1 Nurse per PCT  
   > 1 Nurse per 150,000 population | Availability of trained H.F. Nurses.  
   Pre-recruitment strategy needed-  
   Linked to hospital training programmes. |
<table>
<thead>
<tr>
<th>Goal</th>
<th>Service</th>
<th>Requirements</th>
<th>Costs</th>
<th>Constraints</th>
</tr>
</thead>
</table>
| Effective follow-up in General Practice to prevent readmission | General Practice based follow-up of HF Patients | Development of Heart Failure Registers  
GP/PN Shared service  
Access to Specialist Support – HF Nurse when required  
Fast Track protocol for review by Specialist service (in or out)  
Fast Track protocol for review by Palliative Care Services | Resources to be assessed | Availability of GP and Practice Nursing resource |
| Good Access to Palliative care services | Palliative care service available for referral by primary care and/or Hospital spec. team | Development of a Birmingham Heart Failure Palliative Care strategy.  
Development of a Birmingham HF Palliative Care service.  
Opportunity to ensure HF is integrated into main-stream Palliative care services. | Bid for NOF Funding August 2002 led by all PCTs | Funding  
Availability of trained skilled staff.  
Hospice care |
| Improving local access to echo | Community based Open Access Echo service | Primary Care Trusts  
Pilot community based/mobile echo services/  
Evaluation of service  
Potential roll-out of service  
*Pilot underway in South Birmingham | To be assessed | To be assessed |

Assessing the situation  
A template for completion by each CHD LIT follows this section.  
The aim is to ensure all LITs have reviewed the current service provision by GOAL from which they can identify the gaps and agree the service  
Model required to achieve the goals.
6. **ACTION PLANNING**

- Should be clinically driven by front-line staff – from effective joint working between GP leads and Hospital Consultants
- Should be undertaken by the CHD LIT – to ensure that all key players are in agreement regarding the vision for service expansion and the service models required
- Should be supported by PCT and Trust commissioning and business managers
- Plans should be based on
  a) a review of the current service – including use of modernisation agency techniques
  b) the identification of key issues and key gaps
  c) the identification of areas for redesign
  d) agreement on service investment priorities
  e) linkage to the 3 year investment plans
- Should be timely – ensuring linkage to the HIMP/Commissioning frameworks
<table>
<thead>
<tr>
<th>Patient journey</th>
<th>Current Model</th>
<th>Preferred Model</th>
<th>Plan</th>
<th>Resource Requirements</th>
<th>Funding sources</th>
<th>Investment Plan</th>
<th>Workforce Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishing a Diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-patient care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early discharge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient journey</td>
<td>Current Model</td>
<td>Preferred Model</td>
<td>Plan</td>
<td>Resource Requirements</td>
<td>Funding sources</td>
<td>Investment Plan</td>
<td>Workforce Requirements</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>------</td>
<td>-----------------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Effective Mgt of the in Newly diagnosed in Primary Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up in G. Practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast track service /acutely ill HF patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative services Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. ESTIMATIONS OF DEMAND AND CAPACITY

7.1 OUTPATIENTS

1ST PRIORITY – NEW SUSPECTED HEART FAILURE PATIENTS

Average Incidence whole population - >35 years = 6 cases per 1000 or 600 per 100,000

Assuming >35 years equates to half of the population = 300 per 100,000

Assuming 50% inaccuracy of referral = 600 per 100,000

Example A: District General Hospital population e.g. 250,000 = 1,500 New Patient Echo Referrals

Example B: District General Hospital population e.g. 350,000 = 2,100 New Patient Echo Referrals

Example: Total Birmingham Population = circa 1 million = 6,000 New Patient Echo Referrals

\[
6,000 \div 50 \text{ weeks} = 120 \text{ Echo referrals per week - Birmingham}
\]

\[
= 30 \text{ Echo referrals per Trust per week}
\]

2ND PRIORITY – PREVIOUSLY DIAGNOSED SUSPECTED HF CASES

- Valvular heart disease
- Previous MI
- Angina
- Atrial Fibrillation

Demand for this should be assessed by the LIT / Network

3RD PRIORITY – THOSE AT HIGHEST RISK OF DEVELOPING HEART FAILURE

- Previous MI
- Clinical diagnosis of angina
- Diabetes
- Hypertension

Demand for this group should be assessed by the LIT / Network

NB: 1 and 2 should be concurrent priorities
7.2 IN-PATIENTS

A survey of referrals for in-patients with Heart Failure who required Echocardiography was undertaken across the 4 Birmingham Acute Trusts in 2001 as follows:

Birmingham Trusts – Total In-Patients requiring Echo = 220 cases

Approximately 55 in-patient referrals per Trust.

7.3 TOTAL DEMAND – 1ST PRIORITY GROUPS

Typical DGH serving a population of 350,000

<table>
<thead>
<tr>
<th>Priority</th>
<th>Annual Estimated Demand</th>
<th>Weekly Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Priority</td>
<td>New Cases from Primary Care – Out-Patients</td>
<td>2100</td>
</tr>
<tr>
<td>1st Priority</td>
<td>Hospital In-Patients</td>
<td>2860</td>
</tr>
<tr>
<td>Total Demand</td>
<td></td>
<td>4960</td>
</tr>
</tbody>
</table>

7.4 CAPACITY

Capacity varies from Trust to Trust and is a fragile commodity determined by the availability of trained technicians and specialist doctors and nurses.

There is a grossly inadequate level of service in many Trusts to meet the needs of patients who need Echocardiography and in particular, the needs of those with Heart Failure who need early diagnosis and effective treatment.

The LIT/CHD Networks should work collaboratively to assess the requirements to meet the demand/capacity requirements set out this document.
7.4.1. Capacity Planning to reduce length of stay

Example: District General Population serving 350,000 Population

Step 1
Assess current length of stay OR
Assume average length of stay = 14 days

In many hospitals there is a considerable delay in access to in-patient echocardiography. This does increase the length of stay.

Step 2
Assess what works.

a) Reduction of Hospital Length of Stay could be achieved by:
   - Increasing inpatient access to Echo
   - Benchmark: 2 working days (from referral to result back to ward)
   - Trust wide Protocol for Heart Failure ensuring consistent high quality care across all wards
   - Appointment of Trust Heart Failure Specialist Nurse who is notified of all admissions by ward and provides outreach to the ward
   - Effective discharge planning and access to an effective Community based Heart Failure Specialist service from the point of discharge

Step 3
Assess potential outcomes.

Research studies demonstrated a 9-day reduction in average length of stay to total 5 days.

Example based on research studies which demonstrated a 9 days reduction in average length of stay to total of 5 days.

Local Assessment – An example

Average DGH (350,000) has 2860 inpatients per year

Average length of stay: 14 days

Can be reduced to: 5 days by effective intervention (as above)

Save 9 days = 2860 x 9 days
         = 25,740 days
         = 70 beds at full occupancy
         = 82 beds (assuming 85% occupancy)

e.g. Multiply up = 70 x 2.4m BBC Health Economy
                = 168 beds

11/11/2003 Page 16
Capacity Planning to reduce Readmission

Example: District General Population serving 350,000 Population

Recommended Action:

1. Estimate Hospital annual inpatient demand OR
2. Assume 2860 in-patients - average DGH for population of 350,000
3. Assume 25% readmitted annually
4. Effective intervention to prevent readmission include:
   - Development of Hospital/Community Integrated Heart Failure service, which includes
   - Community Heart Failure Specialist Service (which includes home visiting)

Potential Outcome:

4% Total General Medical Bed Days released

Local Assessment – An example

Average DGH (350,000 population) = 2860 admissions
Assume 25% readmissions per year
Assume length of stay = 9 days saved (14 reduced to 5 days)

Bed days – 2860 pts x 9 days x 25% readmissions = 6435

Beds = 6435 / (365 days x 85%) = 20 beds

Gross up for BBC Health Economy = 39 x 2400 / 390 = 142

BBC = Assume 4000 medical beds = 4%. Medical bed days released
## 8. HEART FAILURE BENCHMARKS (For use by PCT, CHD LIT, Local Network Group)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients referred for echocardiography have pre-referral screening in general practice, which includes ECG and CXR.</td>
<td></td>
</tr>
<tr>
<td>High quality ECG equipment facilities are available for all General Practitioners and teams</td>
<td></td>
</tr>
<tr>
<td>Clinical staff required to interpret ECG results should have undergone specific education and training where competence has been assessed.</td>
<td></td>
</tr>
<tr>
<td>GPs have access to echo or echo and clinical assessment via a Open Access Echo, One-Stop Diagnostic Heart Failure Service or both Using agreed referral criteria</td>
<td></td>
</tr>
<tr>
<td>Echocardiography should be the standard means of assessing cardiac structure and function in the assessment of a patient with suspected heart failure.</td>
<td></td>
</tr>
<tr>
<td>Technician led echocardiography should only be performed by experienced operators trained to standards set by the British Society of Echocardiography</td>
<td></td>
</tr>
<tr>
<td>Echocardiography studies should only be performed on high resolution equipment</td>
<td></td>
</tr>
</tbody>
</table>
**Benchmark**

<table>
<thead>
<tr>
<th>A structured reporting system for echo reports or consultant reports, which provides agreed information in a helpful format should be in place.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical staff involved in the care and management of patient with heart failure should have undergone specific education and training, and have regular updating.</td>
</tr>
<tr>
<td>All new patients with confirmed systolic heart failure should receive a package of care which includes:</td>
</tr>
<tr>
<td>• Home based assessment</td>
</tr>
<tr>
<td>• Medication review and adjustment</td>
</tr>
<tr>
<td>• Close monitoring of blood chemistry</td>
</tr>
<tr>
<td>• Pharmacological education and treatment compliance</td>
</tr>
<tr>
<td>• Specific education, advice and support about chronic heart failure</td>
</tr>
<tr>
<td>• Effective links to professional help/advice</td>
</tr>
<tr>
<td>• Immunisation against Flu/pneumonia</td>
</tr>
<tr>
<td>• Promotion of self-management and lifestyle changes</td>
</tr>
<tr>
<td>• Specific diet/fluids/weight management advice</td>
</tr>
<tr>
<td>All patients with proven Heart Failure should receive ACE Inhibitors (unless contraindicated) in addition to appropriate symptomatic treatment</td>
</tr>
<tr>
<td>All practices have developed and maintained a Heart Failure register</td>
</tr>
<tr>
<td>Heart failure care in general practice is structured using an electronic clinical protocol or template</td>
</tr>
<tr>
<td>Benchmark</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Heart failure care in general practice is audited at least annually and includes:</td>
</tr>
<tr>
<td>• No. &amp; % Registered population with a diagnosis of Heart Failure</td>
</tr>
<tr>
<td>• No. &amp; % people with echo confirmed heart failure prescribed an ACE Inhibitor</td>
</tr>
<tr>
<td>A protocol for the management of Heart Failure is established and agreed with the local CHD Network</td>
</tr>
<tr>
<td>A protocol for the management of hospital based services for heart failure is agreed –Trust wide</td>
</tr>
<tr>
<td>All Trusts have a designated Cardiology lead for Heart Failure</td>
</tr>
<tr>
<td>All patients admitted with heart failure are notified to the heart failure specialist nursing service (care across all wards)</td>
</tr>
<tr>
<td>All patients discharged from hospital have received a comprehensive discharge assessment</td>
</tr>
<tr>
<td>All patients with end-stage heart failure have access to palliative care services</td>
</tr>
<tr>
<td>Patients and carers have received detailed information on:</td>
</tr>
<tr>
<td>Local services available</td>
</tr>
<tr>
<td>Voluntary support agencies</td>
</tr>
<tr>
<td>Heart Failure</td>
</tr>
</tbody>
</table>
9. IDENTIFICATION OF PATIENTS AT RISK OF HEART FAILURE

Risk factors for heart failure include: CHD, AF, Diabetes and Hypertension

Practices require a systematic approach to:

- Identification of those at risk of developing heart failure.
- Offering advice and treatment to reduce the risk.

9.1 Disease Registers

Continuously updated lists of patients with chronic diseases that increase the risk of heart failure will improve the ability of practices to target relevant interventions to reduce the risk of coronary events.

9.2 Prevention of Coronary Events

9.2.1. Smoking

Smoking significantly increases the risk of occlusive arterial disease. Stopping smoking reduces the risk of a coronary event within 2-3 years to that of a non-smoker.

It is recommended that practices:

- Record smoking status of the practice population.
- Offer brief cessation advice to smokers.
- Refer motivated patients to an intermediate smoking cessation service.

9.2.2. Targeting Interventions

Within available resources, practices are recommended to deliver evidence-based systematic care to reduce the risk of coronary events in the following order of priority:

First Priority: Patients with established occlusive arterial disease (CHD, CVA, PVD)

Second Priority: Patients without established occlusive arterial disease, who have a 30% or greater risk of a coronary event within 10 years.

Third Priority: Patients without established occlusive arterial disease, who have a 15% or greater risk of a coronary event within the next 10 years.

In addition to antiplatelet drugs and statins, ramipril (and other ACE Inhibitors if a class effect can be established) should be considered for the prevention of coronary events in these groups.\(^2\)

NB: 1 and 2 should be concurrent priorities

9.2.3. Diabetes

Poor control of blood glucose and blood pressure in diabetics increases the risk of coronary events.

It is recommended that practices ensure diabetic patients receive evidence-based systematic care to achieve target levels of HbA1c and blood pressure.
9.2.4. **Hypertension**

The majority of patients with heart failure have hypertension and/or CHD.\textsuperscript{3}

It is recommended that practices aim to provide systematic care for hypertensive patients to reduce their risk of coronary events.
10. PROVIDING AND DOCUMENTING THE DELIVERY OF APPROPRIATE ADVICE AND TREATMENT TO PATIENTS WITH HEART FAILURE

10.1 Building a Heart Failure Register

A continuously updated list of patients with heart failure will enable the practice to ensure that all patients who may benefit from systematic care are identifiable.

An initial patient list may be constructed by:

- A search of the repeat prescribing register for patients taking combinations of:
  - Thiazide or loop diuretics with ACE Inhibitors.
  - Thiazide or loop diuretics with K-sparing diuretics.

The first combination may include some patients with hypertension and the second combination may include some older patients with stasis ankle oedema.

Opportunistic identification of heart failure patients at consultations for review or for other reasons.

- Searching computerised databases for relevant Read codes:
  - G58 Heart failure
  - G581-3 Left ventricular dysfunction
  - 58531 Echocardiogram abnormal

The list of patients generated is the validated by searching the patient’s medical record for:

- Hospital correspondence stating the diagnoses of heart failure or left ventricular (LV) dysfunction.
- Hospital correspondence identifying impaired LV function by echocardiography or LV angiography.
- Consultation records, ECG and CXR evidence that supports the clinical diagnosis.

It is recommended that patients with a hospital diagnosis are termed “confirmed heart failure” and those who have had a diagnosis made on clinical grounds within Primary Care are termed “suspected heart failure”.

Patients in both groups are then entered on the computerised heart failure register using the Read code G58 to ensure the delivery of care to all those who may benefit.

10.2 Maintaining the Heart Failure Register

It is important that chronic disease registers are regularly updated by trained administrative staff who have protected time for the task.
New diagnoses of confirmed heart failure may be identified from:

- Hospital discharge summaries and outpatient correspondence.
- Specialist heart failure clinic correspondence.
- Open access echocardiography reports.

New diagnoses of suspected heart failure may be identified from:

- Consultations with the GP or nurse.
- New patient medicals at which past medical history is disclosed.

Patients are removed from the register following:

- Removal from the practice registration list.
- No impairment of ejection fraction and no other cause for heart failure identified, i.e. AF/valvular disease, etc.

10.3 Service Delivery Models

Community and hospital based heart failure clinics, utilising the skills of heart failure nurse specialists, have been developed to complement and support the delivery of systematic care by practices.

It is important that PCTs seek to develop the capacity and capability of practices to deliver systematic care through relevant training and improvements to infrastructure, as well as commissioning specialist nurse-led heart failure clinic services.

The choice of service model for practice-based care will depend on factors both internal and external to the practice organisation. Important external factors are availability of resources to develop practice services (training, opportunity costs etc) and the availability of open-access diagnostic services.

Key features to consider when developing heart failure services are:

- Equity of access.
- NSF aims of investigation and treatment are met.
- Provision of evidence-based, cost-effective interventions.
- Patient group directives and electronic (or paper) templates to support and structure care.
- Integrated, seamless care across service boundaries.
- Capture of data for clinical audit.
- Capture of data to inform future commissioning needs.
- Inter-agency working to meet social, cultural and health needs.
10.4 Diagnosis and Investigation

10.4.1. Diagnosis

Although characteristic of heart failure, symptoms of dyspnoea, ankle swelling and fatigue are not specific to this disease.

Signs of venous congestion (ankle oedema, raised JVP and hepatomegaly), tachycardia, a third heart sound and pulmonary crackles are not reliable predictors of heart failure, particularly in non-specialist settings.\(^4\)

A community-based heart failure study has demonstrated inaccuracy of clinical diagnosis in up to 50% of cases.\(^1\)

For these reasons it is necessary to validate the clinical diagnosis of heart failure through appropriate investigation.

10.4.2. Investigation

The aims of investigation are to:

- Confirm or refute the diagnosis of heart failure.
- Assess LV function.
- Identify cause.
- Identify conditions that exacerbate.
- Estimate cardiac risk and prognosis.

It is recommended that the initial investigation of suspected heart failure includes:

1. Blood tests: FBC, U&E, Creatinine, LFTs, TFTs, FBS, lipid profile.
2. Resting 12 lead ECG.
10.4.3. **The ECG**

If the resting ECG is normal there is >90% probability that the patient does not have heart failure. The ECG may show evidence of ischaemia or arrhythmia e.g. AF.

Suspected heart failure patients with CHD whose ECGs show abnormal anterior Q waves and left bundle branch block have a high probability of LV systolic dysfunction.

10.4.4. **The Chest x-ray**

A chest x-ray report of cardiomegaly or pulmonary congestion increases the likelihood of heart failure in patients with a clinical diagnosis and with ECG abnormalities.

10.4.5. **Echocardiography**

The European Society of Cardiology recommends echocardiography as the preferred method for assessing cardiac dysfunction at rest.

Echocardiography may be part of specialist heart failure clinic services, or be directly accessed from Primary Care.

**Referral Criteria**

1. **Inclusion**

It is recommended that suspected heart failure patients are referred for diagnostic echocardiography if they have ECG abnormalities and/or a chest x-ray report of cardiomegaly or pulmonary congestion.

2. **Exclusion**

Patients with suspected heart failure, who have a normal ECG and a chest x-ray without signs of cardiomegaly or pulmonary congestion, are very unlikely to have LV dysfunction on echocardiography.

Other diagnoses than systolic heart failure should be considered.

10.4.6. **Prioritising Referrals**

The 2-3% prevalence of heart failure in the community indicates the necessity to manage the demand for access to echocardiography services while developing capacity.

The referral process for echocardiography has therefore been prioritised into 3 groups.

**Groups 1-3** Apply to open access services and Groups 1 and 2 to clinic services:

**Group 1**

All new suspected cases.

**Group 2**

Previously diagnosed suspected cases in order of:

i. Valvular heart disease.
ii. Previous MI.
iii. Angina.
iv. AF.
Group 3  All those at high risk of developing heart failure, in order of:

i. Previous MI.
ii. Angina.
iii. Diabetes.
iv. Hypertension.

10.4.7. Recording Investigation Results

It is recommended that the result of an echocardiogram is recorded in the patient’s computerised record. This will enable the practice to identify patients on the heart failure register have yet to have this investigation. The relevant Read codes are:

- Echocardiogram Normal – 58532
- Echocardiogram Abnormal – 58531

10.4.8. Clinical Assessment

The assessment of heart failure patients aims to identify their physical, social and psychological needs.

History taking aims to document:

- Severity of dyspnoea and functional limitations.
- Presence and severity of ankle swelling.
- Recent weight loss or gain.
- Compliance with therapy and adverse treatment effects.
- Symptoms due to physical and psychological co-morbidities.
- Relevant socio-economic factors.

Physical examination aims to document:

- Weight (and height for BMI calculation).
- Pulse and blood pressure.
- Signs of heart failure.
- Signs of valvular heart disease.

An important aim of assessing the severity of dyspnoea is to enable the classification of the heart failure patient according to New York Heart Association (NYHA) criteria. The NYHA classification (see Table 1 below) correlates well with prognosis, facilitates communication between healthcare professionals and determines choice of therapy.
Table 1. New York Heart Association Classification.

<table>
<thead>
<tr>
<th>NYHA CLASS</th>
<th>SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Asymptomatic on ordinary activity</td>
</tr>
<tr>
<td>II</td>
<td>Dyspnoea or fatigue with ordinary activity</td>
</tr>
<tr>
<td>III</td>
<td>Dyspnoea or fatigue with less than ordinary activity</td>
</tr>
<tr>
<td>IV</td>
<td>Dyspnoea at rest</td>
</tr>
</tbody>
</table>

10.4.9. Treatment

The aims of treatment may be defined as:

- Improve symptoms.
- Reduce mortality.
- Reduce risk of cardiac events.
- Reduce hospital admissions.
- Avoid adverse treatment effects.
- Improve end-of-life experience for patients and carers.

Key factors in the delivery of these aims are:

Patient and carer education.

- Social care to support independent living.
- The delivery of systematic care by practices.
- Specialist heart failure services.
- Palliative care services.

The systematic care of heart failure aims to meet the social, psychological and physical health needs of patients.

Non-drug therapy of heart failure and co-morbidities involves:

- Patient and carer education supported by behavioural change strategies. Referral may be indicated to a dietician, an exercise therapist, cardiac rehabilitation, or intermediate smoking cessation service.
- Identification of co-morbid psychological problems with referral, as necessary, to psychiatric services.
- Breaking bad news and supporting patients and carers through stages of reactions to loss associated with first diagnosis, deteriorating function, onset of refractory heart failure and death.
• Referral may be indicated to counselling or palliative care services.
• Social services referral to support independent living, particularly during periods of worsening illness.
• Provision of aids and appliances to support independent living.
• Referral, as necessary, to occupational therapy.
• Carer support. Referral to social services for respite care.

10.4.10. **Patient and Carer Education**

It is recommended that wherever possible, carers are present at consultations with patients and that verbal information is reinforced with relevant literature such as British Heart Foundation booklets or videos (For a publications list send large SAE to: British Heart Foundation, 14 Fitzhardinge Street, London W1H 4DH).

Sufficient time should be allocated to consultations to permit information giving, checking of understanding and development of an agreed, preferably written, and management plan.

Topics to cover in education sessions are:
• What is heart failure?
• Symptoms and signs.
• Benefits of lifestyle risk factor reduction.
• Benefits of controlling blood pressure and glycaemia for diabetic patients.
• Benefits of blood pressure control for hypertensive patients.
• Strategies to enable changes in behaviour.
• Self-management in heart failure.
• Drug therapy including compliance and reporting adverse effects.
• When and how to call for help.

Topics that may require consideration:
• Sexual Health.
• Travel.

10.4.11. **Dietary changes**

1. Salt restriction 4,7

*Mild – moderate heart failure*  
No added salt at the table.

Avoid processed foods with high salt content (e.g. cheese, sausages, chocolate, crisps, cured meats and tinned foods - except fruit).

No salt added to cooking for patients with higher diuretic requirements.
**Severe heart failure**

In addition to above, consider sodium content of all foods with aim of restricting sodium intake to about 2.0g/day.

**NB:** Do not substitute potassium-based salts (e.g. Lo-Salt) for table salt due to the risk of hyperkalaemia.

2. **Weight reduction**

Patients whose BMI exceeds 25 should be encouraged to change their eating behaviours so as to sustain a steady weight loss of 0.25-0.5 kg/week, with an initial target weight loss of 10%. Motivated patients whose BMI exceeds 28 may benefit from drug therapy such as orlistat.

3. **Co-morbidities**

It is important to ensure that evidence-based dietary changes are implemented that reduces the risks associated with co-morbidities such as diabetes, CHD, hypertension and hyperlipidaemia.

10.4.12. **Fluid restriction**

Patients with severe heart failure needing large doses of diuretics, and patients during exacerbations of heart failure, benefit from fluid restriction to 1.5 – 2 litres/day.

10.4.13. **Exercise**

Supervised exercise training in chronic, stable patients performing stationary cycling can significantly improve functional capacity, reduce hospital readmissions and reduce mortality. On the basis of this and other studies it is recommended that:

- All NYHA Class II – IV patients who may benefit are referred to an appropriate supervised exercise programme.

Where supervised programmes are unavailable, and to prevent the adverse physiological effects of exercise avoidance in heart failure patients, all patients should be encouraged to undertake a regular (preferably daily) progressive exercise programme.

Currently, there is an absence of evidence to support specific recommendations for exercise undertaken by heart failure patients outside of a supervised setting.

Recommendations for unsupervised exercise by NYHA Class I – IV patients with CHD may reasonably follow the recommendations for CHD patients in general, i.e. at least half an hour of exercise per day, sufficient to moderately elevate heart rate, on five or more days out of each week.

Suitable exercise would involve cycling, walking and swimming, and patients should:

- Gradually build-up their exercise capacity.
- Exercise without causing angina, undue dyspnoea or excessive fatigue.

10.4.14. **Alcohol**

Patients with alcoholic cardiomyopathy should abstain from drinking.

There is no evidence that alcohol consumption within safe limits is harmful and may even be beneficial. Beer-drinking may be associated with rapid increases in fluid load.
10.4.15. **Smoking**

It is recommended that all patients who smoke are:

- Assessed regarding their motivation to stop.
- Provided with brief cessation advice.
- Referred as appropriate to an intermediate cessation service.

10.4.16. **Sexual Health**

There are no guidelines regarding sexual activity. The risk of cardiac decompensation triggered by sexual activity is moderate for NYHA Class II patients and high for NYHA Class III patients. Patients with angina may benefit from the use of prophylactic GTN.

Pregnancies in women with NYHA Class III – IV heart failure carry a high risk of maternal morbidity and mortality.

Contraceptive advice should be offered to all women of childbearing age. This may include the use of low dose combined contraceptive pills, as these are associated with a relatively low risk of venous thrombo-embolism.

10.4.17. **Travel**

The European Cardiology Society makes the following recommendations:

- Short flights are preferable to long flights, due to increased risk of DVT, dehydration and worsening ankle oedema.
- Short flights are preferable to longer journeys by another means of transport.
- Avoid very hot or humid climates and high altitudes.
- Adjustment to the dose of diuretics and vasodilators (including ACE Inhibitors) may be necessary in hot, humid climates.

10.4.18. **Immunisation**

Unless contra-indicated, patients with heart failure should be offered a single lifetime dose of pneumococcal vaccine and annual influenza vaccination.

10.4.19. **Self - Management**

The aims of self - management are:

- The early detection of deterioration and adjustment of therapy.
- To reduce the likelihood of hospital admission.
- To empower patients and carers.

Patients or carers are requested to:

- Make a daily record of the patient’s nude weight.
• Report an increase in body weight of > 2 kg (5 lb) over a period of 1-3 days.
• Adjust loop diuretic dose and monitor progress in accordance with instructions.

10.4.20. Drug Treatment

The prescription of thiazide or loop diuretics is based on the presence of symptoms or signs of fluid retention. Thiazides may be added to loop diuretics in resistant heart failure. All other evidence-based prescribing in heart failure is dependent on NYHA Class. A brief overview of evidence-based prescribing in heart failure is presented in Table 2.

<table>
<thead>
<tr>
<th>NYHA CLASS</th>
<th>DRUG</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I - IV</td>
<td>ACE Inhibitors₈</td>
<td>↓mortality, ↓morbidity, ↓admissions</td>
</tr>
<tr>
<td>I - IV</td>
<td>Angiotensin Receptor Blockers₉</td>
<td>↓morbidity, ↓admissions</td>
</tr>
<tr>
<td>II - IV</td>
<td>Loop diuretics</td>
<td>↓morbidity, ↓admissions</td>
</tr>
<tr>
<td>I - IV</td>
<td>Beta-blockers₁₁⁻¹₄</td>
<td>↓mortality, ↓morbidity, ↓admissions</td>
</tr>
<tr>
<td>III - IV</td>
<td>Spironolactone₁₅</td>
<td>↓mortality, ↓admissions</td>
</tr>
<tr>
<td>II - III</td>
<td>Vasodilators₁₆,₁₇</td>
<td>↓mortality</td>
</tr>
<tr>
<td>II - IV</td>
<td>Digoxin₁₈,₁₉</td>
<td>↓morbidity, ↓admissions</td>
</tr>
</tbody>
</table>

Table 2. Evidence-based prescribing in heart failure.

10.4.21. ACE Inhibitors

It is recommended that all suspected and confirmed cases of heart failure and all cases of asymptomatic LV dysfunction are prescribed an ACE inhibitor, unless contra-indicated.

Patients likely to require hospital admission for initiation of therapy:¹ ⁷

• Severe (NYHA Class IV) or decompensated heart failure.
• Systolic BP < 100 mm Hg.
• Resting tachycardia (> 100 beats/min).
• Serum Na < 130 mmol/l.
• Serum Creatinine > 150 umol/l.
• Other vasodilator therapy.
• Valvular disease as primary cause of heart failure.
• Cor pulmonale.
Moderate renal insufficiency (creatinine up to 250 umol/l) is not a contraindication to ACE Inhibitor therapy. Heart failure patients with elevated serum creatinine have a higher mortality and particularly benefit from ACE Inhibitor therapy.

Potassium-sparing diuretics should be discontinued and if the patient is already taking loop diuretics, these should be reduced or stopped for 24 hours prior to the first dose of ACE Inhibitor. After the first dose the patient should be recumbent for 2-4 hours due to the risks of hypotension and for this reason bedtime dosing may be preferred.

When prescribing ACE Inhibitors the aim is to achieve the target dose used in large clinical trials (see Table 3) and if this cannot be achieved, the maximum tolerated dose.

Hypotension and renal impairment due to ACE inhibitors are dose-related effects and therefore initial doses are small and step-wise increments in dose are made in association with monitoring of blood pressure and renal function.

Table 3. Recommended doses for ACE Inhibitors.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (EVERY 2-4 WEEKS)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captopril</td>
<td>6.25 mg tds</td>
<td>12.5 / 25 / 50 mg tds</td>
<td>25-50 mg tds</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5 mg bd</td>
<td>5 / 7.5 / 10 mg bd</td>
<td>10 mg bd</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>2.5 mg od</td>
<td>5 / 10 / 15 / 20 / 25 / 30 / 35 mg od</td>
<td>20-35 mg od*</td>
</tr>
<tr>
<td>Perindopril</td>
<td>2 mg od</td>
<td>4 mg od</td>
<td>4 mg od</td>
</tr>
<tr>
<td>Quinalapril</td>
<td>2.5 mg od</td>
<td>5 / 7.5 / 10 mg bd</td>
<td>10 mg bd</td>
</tr>
<tr>
<td>Ramipril</td>
<td>1.25 mg od</td>
<td>2.5 / 5 mg od or 2.5mg bd then 7.5mg od</td>
<td>10mg od or 5 mg bd</td>
</tr>
<tr>
<td>Trandolapril</td>
<td>0.5 mg od</td>
<td>1 / 2 / 4 mg od</td>
<td>4 mg od</td>
</tr>
</tbody>
</table>

*The higher dose of lisinopril is associated with a lower rate of hospital admissions for heart failure.20

When initiating ACE Inhibitor therapy, it is recommended that blood pressure and renal function are monitored as follows:4

- Prior to starting an ACE Inhibitor.
- 1-2 weeks after starting therapy and after each increment.
- Prior to an incremental dose when there has been a significant delay in the timing of the next increment since the patient was last monitored. This will avoid problems due to drift in renal function or clinical status over time.
- At 3 months after starting therapy and at 3 monthly intervals thereafter.
- More frequently if patients have renal dysfunction or electrolyte imbalance.
Initiation of ACE Inhibitor therapy is contra-indicated if serum K>5.5 mmol/l and requires specialist management if serum creatinine > 250 umol/l.

Upward dose titration is discontinued if creatinine exceeds 200 umol/l or symptomatic hypotension develops.
10.4.22. **Angiotensin Receptor Blockers**

The current evidence indicates that Angiotensin Receptor Blockers (ARBs) are of benefit when used as an alternative to ACE Inhibitors for patients in whom ACE Inhibitors are contra-indicated or not tolerated. ARBs have similar adverse effects on renal function to ACE Inhibitors, but are associated with a lower incidence of rash and cough.

Sub-set analyses of two clinical trials indicate that the combination of ACE Inhibitor, ARB and beta-blocker may increase mortality and further trials are in progress to clarify this area of concern. Until these trials report, it is recommended that:

- Combinations of an ACE Inhibitor, an ARB and a beta-blocker are not used.

Although no ARBs are currently licensed for use in heart failure, they are the only recommended alternative to the prescription of an ACE Inhibitor. Current evidence would support the choice of either losartan or valsartan for NYHA Class II-IV heart failure patients. The table below offers dosing regimens for all available ARBs as it is thought likely that there is a class effect. Monitoring recommendations are as for ACE Inhibitors.

**Table 4. Dosing recommendations for ARBs.**

<table>
<thead>
<tr>
<th>DRUG*</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (every 2-4 weeks)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candesartan</td>
<td>2-4 mg od</td>
<td>4 / 8 / 16 mg od</td>
<td>16 mg od</td>
</tr>
<tr>
<td>Epr_osartan</td>
<td>150 mg od</td>
<td>300 / 450 / 600 / 800 mg od</td>
<td>600-800 mg od</td>
</tr>
<tr>
<td>Irbesartan</td>
<td>75 mg od</td>
<td>150 / 225 / 300 mg od</td>
<td>300 mg od</td>
</tr>
<tr>
<td>Losartan</td>
<td>12.5 mg od</td>
<td>25 / 10 / 75 / 150 mg od</td>
<td>150 mg od</td>
</tr>
<tr>
<td>Telmesartan</td>
<td>20 mg od</td>
<td>40 / 60 / 80 mg od</td>
<td>80 mg od</td>
</tr>
<tr>
<td>Valsartan</td>
<td>20 mg od</td>
<td>40 / 80 / 160 mg od</td>
<td>80-160 mg od</td>
</tr>
</tbody>
</table>

(40mg if Age>75)

10.4.23. **Beta-Blockers**

The results of beta-blocker trials in heart failure indicate that for NYHA Class II – IV patients with heart failure of any cause, bisoprolol and carvedilol reduce mortality from all causes and sudden death, and reduce hospital admissions. Carvedilol also reduces mortality in post MI patients with asymptomatic LV dysfunction, although it is not currently licensed for this use.

All trial patients were stable and on standard therapy including an ACE Inhibitor.

Class IV patients did not have a great excess of fluid and were not receiving intravenous treatments.

Although clinical trials with metoprolol have shown benefits similar to bisoprolol, metoprolol is not licensed in the UK for the treatment of heart failure.
It is recommended that for the following patient groups the guidance of a heart failure specialist be sought with regard to initiation of beta-blocker therapy:

- Stable NYHA Class II – IV heart failure of all causes on standard treatment including an ACE Inhibitor (or ARB).
- Post MI patients with LV dysfunction who have stable symptoms and are receiving an ACE Inhibitor (or ARB).

Due to the risk of worsening heart failure, beta-blockers are initiated in very small doses. The dose is increased every 2-4 weeks, if the previous increment was well tolerated, with the aim of achieving target doses used in large clinical trials (Table 4).^4

### Table 4. Recommended dosages of beta-blockers.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (every 2-4 weeks)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisoprolol</td>
<td>1.25 mg od</td>
<td>2.5 / 3.75 / 5 / 7.5 / 10 mg od</td>
<td>10 mg od</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125 mg bd</td>
<td>3.125 / 6.25 / 12.5 / 25 mg bd</td>
<td>25-50 mg bd*</td>
</tr>
</tbody>
</table>

Most patients may be managed as outpatients or within Primary Care using the European Society of Cardiology recommendations:^4

- Monitor patients, during titration and thereafter, for heart failure symptoms and signs, hypotension and bradycardia.
- For worsening symptoms: increase diuretic or ACE Inhibitor dose and if problems persist, decrementally reduce beta-blocker dose.
- For hypotension: reduce vasodilator dose and if problems persist, decrementally reduce beta-blocker dose.
- For bradycardia: reduce or stop drugs that may exacerbate bradycardia and if problems persist, decrementally reduce beta-blocker dose.
- Only stop beta-blocker if absolutely necessary. Do not withdraw abruptly.
- Consider reintroduction or up-titration of beta-blocker when patient stable.

Contra-indications to beta-blockade in heart failure patients are:

- Significant deterioration likely in co-morbid respiratory disease.
- Symptomatic bradycardia or hypotension.
10.4.24. **Spironolactone**

Patients with NYHA Class III or IV heart failure on standard treatment including diuretics and an ACE inhibitor (or ARB), with or without a beta-blocker, benefit from prescription of spironolactone in a dose of 12.5 – 50 mg od.\(^\text{15}\)

It is recommended that:\(^4\)

- Renal function is monitored:
  - Before starting spironolactone and prior to an increment.
  - 4-6 days after starting therapy and after an increment.
  - After 1 month and then every 3 months.
- If serum K < 5.0 mmol/l, initiate therapy with spironolactone 25mg od.
- If at any time serum K > 5 but < 5.5 mmol/l, reduce the dose of spironolactone by 50%.
- If symptoms persist after 1 month therapy with spironolactone 25mg od, the dose is increased to 50mg od.
- Spironolactone is stopped if:
  - Serum K > 5.5 mmol/l.
  - Painful gynaecomastia occurs.

10.4.25. **Vasodilators**

The Vasodilator Heart Failure Trial (V-HeFT I) demonstrated a 34% mortality reduction in the group receiving a daily combination of hydralazine 300mg + isosorbide dinitrate 160 mg compared with placebo.\(^\text{16}\) There was no effect on hospital admissions for heart failure. When the next trial, (V-HeFT II),\(^\text{17}\) compared the hydralazine-isosorbide combination with enalapril 20mg daily, the 2 year mortality was 28% lower in the enalapril group and enalapril was better tolerated.

It is recommended that:

- The combination of hydralazine with isosorbide is considered for patients with severe renal dysfunction in whom ACE Inhibitors and ARBs are contra-indicated.\(^7\)
- Long acting nitrates are considered for the control of angina where there is co-existing LV systolic dysfunction.\(^7\)

10.4.26. **Digoxin**

Digoxin is of benefit to patients of all NYHA Classes with atrial fibrillation by reducing ventricular rate and thereby improving ventricular function.\(^\text{18}\)

In a study of NYHA Class II – III patients in sinus rhythm receiving therapy with diuretics and an ACE Inhibitor, digoxin improved symptoms and reduced hospital admissions by 28%. There was no reduction in overall mortality (a reduction in heart failure deaths was balanced by an increase in MI deaths and sudden deaths). The greatest benefit was seen in patients with more severe symptoms, lower ejection fractions and greater left ventricular dilatation.\(^\text{19}\)
The absence of evidence that digoxin reduces all cause mortality in NYHA Class II - III heart failure patients in sinus rhythm, reduces the usefulness of digoxin in these patients to an additional treatment in those who remain symptomatic despite appropriate prescription of an ACE Inhibitor (or ARB), beta-blocker and spironolactone.

It is recommended that:

- Renal function is monitored prior to starting digoxin.
- Digoxin is started after correction of any hypokalaemia.
- The initial dose of digoxin is 0.25 mg od for patients with a normal serum creatinine who are aged < 70 years or who are aged > 70 years and whose weight exceeds 85kg.
- The initial dose of digoxin is 0.125 mg od for patients aged > 70 years with normal serum creatinine whose weight is less than 85 kg, and 0.0625 mg od for patients of any age with renal dysfunction.
- Digoxin levels are performed after 5-10 days in patients with renal dysfunction or after initiation of other therapy that may increase digoxin levels.

Digoxin is contra-indicated in patients with:

- Bradycardia and sick sinus syndrome without pacemaker support.
- Second and third degree A-V block without pacemaker support.
- Wolff-Parkinson-White syndrome.
- Hypertrophic Obstructive Cardiomyopathy (HOCM).

10.4.27. **Anticoagulation**

The annual risk of stroke in Stroke Prevention of Atrial Fibrillation (SPAF) study was 7.2% for patients with non-valvular atrial fibrillation and recent (within 3 months) onset of congestive heart failure. The additional presence of hypertension and/or previous thromboembolism increased this annual risk to 17.6%.21

Oral anticoagulants reduce the risk of stroke in heart failure patients with atrial fibrillation.22

Patients with dilated, poorly contractile hearts and those with mobile intra-cardiac thrombus have a higher risk of arterial thromboembolism, although the benefits of oral anticoagulation remain uncertain.4,7

It is recommended that anticoagulation is considered for patients with:

- Atrial fibrillation and asymptomatic or symptomatic left ventricular dysfunction.21,22
- Mobile intra-cardiac thrombus.7
- Severe cardiac impairment.7
10.4.28. Palliative Care

Heart failure patients and their families experience reactions to loss at the time of diagnosis and during the progress of the disease. Associated co-morbidities may also cause events that threaten survival e.g. MI or CVA.

End-stage heart failure symptoms, such as intractable dyspnoea, may be particularly distressing to patients and carers.

Referral to palliative care services may be necessary to:

- Manage reactions to loss of health.
- Reduce barriers to communication within families.
- Manage end-stage symptoms.
- Manage anticipatory grief.
- Offer respite care.

There is a growing national focus around palliative care for heart failure patients that recognises current knowledge gaps and the need to increase the provision of care within hospices for those with non-malignant diseases.

Although access criteria to local palliative care services are yet to be defined, it is recommended that palliative care advice is sought whenever necessary.

10.4.29. NSF Clinical Audit Requirements

By April 2003, practices should aim to have clinical audit data no more than 12 months old that identifies:

- The number and % of patients with a diagnosis of heart failure.
- The number and % of patients with confirmed heart failure or LV dysfunction currently prescribed an ACE Inhibitor.
INVESTIGATION OF SUSPECTED HEART FAILURE

SYMPTOMS

SIGNS

PMH of CHD, DM, HYPERTENSION OR VALVULAR DISEASE especially in ELDERLY increases probability of heart failure

SUSPECTED HEART FAILURE

SEARCH MEDICAL RECORD

PREVIOUS HOSPITAL INVESTIGATIONS

REDUCED LVEF ON CORONARY ANGIOGRAM

HEART FAILURE CONFIRMED

EVIDENCE-BASED HEART FAILURE MANAGEMENT

REFER FOR ECHOCARDIOGRAM

ECG

All suspected cases, unless recently done and unlikely to show new changes

ECG NORMAL

CHEST X RAY

DYSPNOEA with or without CHEST SIGNS

ECG ABNORMAL

EVIDENCE-BASED HEART FAILURE MANAGEMENT

CHEST X RAY INDICATES HEART FAILURE

HEART FAILURE VERY UNLIKELY

CHEST X RAY NORMAL OR SHOWS NON-CARDIAC PATHOLOGY

PMH of CHD, DM, HYPERTENSION OR VALVULAR DISEASE especially in ELDERLY increases probability of heart failure
11. HOSPITAL HEART FAILURE MANAGEMENT GUIDELINE

Commissioners and providers should establish both open access echocardiography service and open access heart failure services. The former provides echocardiography only the latter echocardiography in conjunction with a medical opinion and the other routine investigations if not already carried out.

Open access echocardiography service requirements

- Dedicated high quality echocardiography machine
- Dedicated echocardiographer (MTO 4 minimum)
- Medical overview of reporting

Open access heart failure service requirements

- Dedicated high quality echocardiography machine
- Dedicated echocardiographer (MTO 4 minimum)
- Medical review of patient at each session
- Range of other investigations offered i.e.:
  - ECG
  - CXR
  - Routine laboratory investigations

Both services requirements:

- Medical records officer input
- Heart failure specialist nurse (H Grade)

11.2 CLINIC INPUT

- New patients with suspected HF - (Direct GP referral with pre-referral ECG/CXR screening)
- Patients with a previous clinical diagnosis of HF
- (Direct GP referral with pre-referral ECG/CXR screening)
- New acute admissions with suspected/clinical diagnosis of heart failure.
- All new admissions to CCU with a diagnosis of myocardial infarction or angina (unstable/acute/stable).
- Referrals from consultants' outpatient clinics with a suspected or clinical diagnosis of heart failure.
- Patients with high risk conditions for heart failure (Direct GP referral with ECG/CXR screening)
11.2.2. **Options for the identification of in-patients with heart failure or suspected heart failure:**

- Monitor admissions daily via heart failure service specialist nurse and/or heart failure service echocardiographer and/or bed manager for patients with a clinical diagnosis of heart failure on admission.

  &/or

- Liaise with Pharmacy department for all in-patients being prescribed a loop diuretic.

  &/or

- Monitor discharge codes (for heart failure/myocardial infarction/angina) — although this would be retrospective case identification and would delay diagnosis and initiation of appropriate therapy.

11.2.3. **Clinic operation**

It is recommended that in order to maximise the medical cover available, Open Access Echo services should run in parallel with Specialist led Heart Failure clinic services (medical and nursing).

The number of sessions required will depend on predicted demand by trust, and the level of medical cover available:

- Daily.

- First part of clinic for CCU echocardiograms to identify new post MI and unstable angina patients with symptomatic and asymptomatic LV dysfunction.

- Second part of clinic for newly identified in-patients with suspected heart failure.

- Third part of clinic for open access services.

*Estimated numbers*

- based on 5% of admissions - heart failure
- 10-12 echocardiograms possible each day.

- Daily new in-patients with suspected heart failure 2-3
- New MI’s and in-patient angina patients 3-4
- Open-access referrals available therefore 3-4

11.2.4. **Clinic output**

**GP open access referrals**

- LV dysfunction confirmed: Suggest appropriate ACE inhibitor-diuretic treatment and refer for follow-up in heart failure follow-up clinic and refer back to GP- some cases may need short-term follow-up in specialist led (nurse or consultant) Heart Failure follow-up clinic. Include patient education from heart failure specialist nurse at this visit. Liaison with primary care via heart failure specialist nurse.

- Patients at the severe end of the spectrum should be considered for regular follow-up by Heart Failure service.
• Significant valvular disease: Refer directly to general cardiology outpatients.
• Primary AF: Refer back to GP
• Non cardiac: Refer back to GP
• Refer for follow-up to GP/or HF Specialist Nursing service

In-Patients
(acute admissions general and CCU)
• LV dysfunction confirmed: provide treatment recommendations re: diuretics, ACE inhibitors, beta-blockers.
• Significant valvular disease: refer cardiology.
• Primary AF: standard treatment recommendations
• Non cardiac: further non cardiac investigations under general medicine.
12. HOSPITAL PROTOCOL FOR NON-VALVULAR HEART FAILURE PATIENTS

12.1 In all patients:

- Bed rest
- Monitor daily weight aiming for weight loss of 1kg per day (consider fluid balance chart in addition at least during acute/unstable phase).
- Fluid restrict to 1-1.5L per day
- Restrict salt intake (no added salt, avoid high salt content foods)
- Ensure all routine investigations complete ie: U & E, FBC, TFT’s, ECG, CXR.
- Ensure on adequate loop diuretic ie frusemide 40-120mg daily. For acute heart failure switch to iv use. For chronic resistant heart failure consider oral bumetanide instead of frusemide.
- When stable and if U & E are satisfactory start ACE inhibitor:
  - Enalapril 2.5mg od
  - Lisinopril 2.5mg od
  - Ramipril 1.25mg od
- Check daily U & E and if satisfactory up-titrate ACE dosage, If creatinine increases >20% or reaches >180 reduce diuretic dose if possible but if creatinine still >180 reduce ACE dosage.
- If ACE inhibitors are contraindicated or not tolerated then consider an All blocker (losartan or valsartan) or hydralazine + nitrates.
- When stable and in NYHA class II-III heart failure add a beta blocker

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoprolol SR</td>
<td>12.5mg – 25mg od</td>
<td>200mg od</td>
</tr>
<tr>
<td>Bisoprolol</td>
<td>1.25mg od</td>
<td>10mg od</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125mg bd</td>
<td>25mg bd</td>
</tr>
</tbody>
</table>

And titrate up slowly according to data sheet.

If not stable after ACE inhibitor commence ent and signs of fluid retention do not start beta blocker and consider spironolactone 25mg od monitoring K+ daily. If signs of fluid retention remain and weight loss inadequate add metolazone 2.5mg od and monitor U & Es daily reducing dose to alternate days when diuresis starts then to twice weekly.
• If concomitant AF anticoagulate long term.
• If symptomatic palpitation due to high-grade arrhythmias add amiodarone and consider implantable defibrillator as per NICE guidelines.
• Avoid NSAIDs as these offset the efficacy of ACE inhibitors.
• Aim to discharge on maximum tolerated ACE dose, appropriate loop diuretic dose and on beta blockade with appropriate life-style advice. On discharge liaise with GP re further treatment and future monitoring. If appropriate arrange follow-up in heart failure clinic/general cardiology OPD.
• In patients with concomitant chest pain oral/transdermal nitrates and/or amlodipine may be helpful and consider exercise testing (?revascularisation possibilities) for diagnosis of aetiology and objective measure of exercise capacity.
• Complete audit sheet.
13. HEART FAILURE TREATMENT PATHWAY AND PROTOCOL

13.1 **Admission**
- NYHA class II-III - Admit to Designated ward
- Consider admission to CCU if NYHA class IV or if arrhythmia (AF, VT) responsible.
- Admit to CCU if heart failure is due to recent/new MI.

13.2 **Refer to Heart Failure Service**
Refer patient at earliest opportunity to heart failure service via ECG department for echocardiography

**CCU staff to telephone heart failure specialist nurse at 0845 each day with names of patients admitted in preceding 24 hours with a diagnosis of myocardial infarction (Q-wave or non Q-wave) or angina.**

**Admitting team to telephone heart failure specialist nurse at 0900 each day with names and location in hospital of patients admitted in preceding 24 hours with a presumptive diagnosis of heart failure.**

**Bed manager to telephone heart failure specialist nurse at 0915 each day with names and location in hospital of patients admitted in preceding 24 hours with a presumptive of heart failure.**

Heart failure specialist nurse and heart failure echocardiography times for each patient in order of CCU patients' first and general patients second.)

13.3 **Urgent Echocardiogram**

All patients should have an echocardiogram within 24 hours of admission.

13.4 **Treatment Protocol**

13.4.1. In patient treatment recommendations for **CCU Patients**:
- Follow in patient protocol as above but note:

  - If clinical/radiographic evidence of heart failure: Commence ACE inhibitor when haemodynamically stable (BP>100mmHg, HR < 100 bpm, urine output > 600mls/24hours, creatinine < 170). This can precede but not replace the results of echocardiography.

  - If systolic dysfunction post MI: Commence ACE inhibitor when haemodynamically stable (BP > 100mmHg, HR < 100 bpm, urine output > 600mls/24 hours, creatinine <170).

  - If systolic dysfunction in angina: Commence ACE inhibitor when haemodynamically stable (BP >100mmHg, HR < 100 bpm, urine output > 600mls/24 hours, creatinine <170).

  **NOTE:** ACE inhibitor therapy can precede – but in most patients – will follow beta blocker therapy in CCU patients.
13.4.2. Ensure all other investigations and treatment recommendations as in management protocol above completed including liaison with heart failure specialist nurse.

- In patient treatment recommendations for Ward Patients

13.4.3. Follow management protocol as above

Notes: Refer to cardiology patients where heart failure is secondary to acute/chronic valvular disease, suspected myocarditis or where patients have resistant heart failure or deteriorating heart failure despite medical treatment.

In patients with resistant heart failure consider the addition of metolazone to loop diuretic, the use of intravenous dobutamine and dopamine.

In patients with heart failure due to ischaemic heart disease consider additional long acting nitrate therapy and/or amlodipine and aspirin.

Consider formal exercise testing when stable with view to revascularisation.

In patients with heart failure and AF consider oral anticoagulation and DC cardioversion.

Consider beta-blocker therapy/amiodarone/implantable defibrillator for patients with symptomatic high-grade ventricular arrhythmias and impaired LV function.

When stabilised on medical treatment refer to heart failure specialist nurse (via ECG department) for patient education – all patients would be seen prior to discharge.

Aim to discharge on maximum tolerated ACE dose, appropriate loop diuretic dose and on beta blockade with appropriate life-style advice. On discharge liaise with GP re: further treatment and future monitoring. If appropriate arrange a follow-up in heart failure clinic/general cardiology OPD.

Complete heart failure audit sheet.

13.5 Recommendations for hospital service

A dedicated echocardiogram is available at each Trust

A dedicated MTO4 or above echocardiographer is employed at each Trust

A specialist heart failure nurse is appointed for each Trust – H Grade recommended

A lead cardiologist with a specific interest in heart failure is identified/appointed in each Trust to lead the clinical service with sufficient fixed sessions (probably minimum 4) to deliver the service for in patients, out patients and direct referrals (minimum 0.4 wte Consultant).

The primary care service is open access echocardiography but with 1 or 2 sessions for open access heart failure clinics (providing clinical opinion and other investigations other than just echocardiography).

0.3 wte Administration

Information and audit resource
PALLIATIVE CARE IN HEART FAILURE
14. PALLIATIVE CARE IN HEART FAILURE

The focus of services concerned with coronary heart disease is on damage limitation and secondary prevention. The National Service Framework recognises that “not everyone can recover good health” and that many people die; some from a sudden event but many after a period of increasing debilitation. It is recommended that the principles of palliative care are applicable to patients with advanced left ventricular systolic dysfunction whose symptomatic profile is similar to those with advanced terminal cancer.

14.1 Palliative Care Approach and Specialist Palliative Care

The palliative care approach aims to promote both physical and psychosocial well-being and should be considered as an integral part of all clinical practice by all health professionals in all care settings.

Key principles which underpin palliative care comprise:

- Focus on quality of life
- Good symptom control
- Whole person approach
- Respect for patient autonomy and choice
- Open and sensitive communication

Specialist Palliative Care is the total active care of patients who have advanced progressive disease with a limited prognosis and extends to the care of their families and carers. A multi-professional approach to care is adopted by a team who have undertaken specialist training in palliative care.

14.2 Palliative Care And Heart Failure

The decision to discontinue ‘active’ treatment and to adopt a palliative approach is rarely encountered but changing emphasis from treatment of the condition to treatment of symptoms is important to acknowledge. The dying trajectory of heart failure patients is less well defined than for some forms of cancer and identification of the point of transition to a terminal phase may be very difficult. There is also a higher prevalence of unpredictable sudden death which may impact on physician/carer dynamics and clearly has organisational implications for ‘Do Not Resuscitate’ protocols. There is a dearth of specific information on heart failure in this context and physician attitudes and experience may impact on access to palliative care support. For patients who have heart failure the ongoing care and management may be best managed by the integrated approach of practitioners in Primary Care, Cardiologists/General Physicians and Palliative Care Specialists.

- Needs of patients
  - Optimal management and monitoring of cardiac failure
  - Symptom control
  - Access to counselling, psychological, social and spiritual support
  - Dietary advice
  - Financial advice
14.3 Sensitive, Expert Care In The Terminal Phase

Support of family/carers during the illness and in bereavement

- Current situation in Specialist Palliative Care
- Specialist Palliative care services which serve the Birmingham population comprise:
  - Acute Hospital Specialist Palliative Care Teams
  - Voluntary sector hospices, St.Mary’s, Warren Pearl Marie Curie Centre and St.Giles (Provide in-patient, home care and day care facilities)
  - NHS Hospice Unit, John Taylor (this does not accept referrals for heart failure patients). With the exception of the Warren Pearl Marie Curie Centre, the admission rates for patients with heart failure have been in single figures annually. The may reflect a reluctance of palliative care physicians to accept these patients because of anxieties about handling an unfamiliar condition or the constraints imposed by constitutional charters or funding bases of the hospice organisations.

14.4 Guidance For Service Provision

1. Develop an Education Strategy for training a multidisciplinary health care team in the palliative care approach to advanced congestive cardiac failure.

2. Develop criteria for referral to specialist palliative care services e.g. specific to NYHA classes III or IV patients where there are more than one of the following:
   - Complex symptom control problems requiring advice
   - Complex psychological, social or spiritual issues
   - Where there are young children or elderly carers who need support
   - Admission to hospice is required
   - Advice in the terminal phase

3. Identify specialist palliative care services which are currently accessible, to maximise the use of underused resources and identify potential gaps in this service.

4. To anticipate a growing demand for further provision in response to the Coronary Heart Disease NSF directive.

5. To develop the funding strategy for this activity.

6. To promote equity of access to this support.

7. Ensure culturally sensitive information and literature on palliative care is available for patients and carers.

8. Develop a clinical audit monitoring tool.
15. **RECOMMENDATIONS**

1. The health community of Birmingham and the Black Country Health Authority are asked to recognise the significance of heart failure and agree local plans to address the recommendations from the Heart Failure steering group.

2. The establishment and development of CHD networks should improve the quality of care for patients with heart failure.

3. Provision for the full assessment in general practice of those with suspected heart failure should be addressed as a priority to promote appropriate referral for both open access echocardiography and consultant led heart failure clinic services.

4. Strategies should ensure the adequate provision of echocardiography as a priority.

5. Primary Care Trusts should agree plans to support the development of systematic care of heart failure in local general practices. This should include, recruitment, retention, training, information management, information technology, clinical protocols including prescribing, clinical audit.

6. Hospitals caring for heart failure patients as in-patients or out-patients must have the necessary professional and technical infrastructure to deliver a fast and efficient service to meet patient needs.

7. Standards for the expected level of equipment (primary & secondary), qualification of relevant staff have been established and should be adhered to. Local systems for purchasing, quality assurance and replacement of equipment are necessary.

8. Expert medical supervision of echocardiogram reporting by technicians should be in place.

9. Workforce planning implications of the heart failure service model should be developed with the support of the StHA and the Workforce Confederation.

10. Local CHD Networks/LITs should undertake a detailed assessment of the proposed service models and blueprint from which a network-wide action plan is outlined, including redesign and 3-year investment plans (capital/revenue) for 2002-2005.

11. Local CHD Networks should ensure that action plans are integrated with HIMP/SaFF plans.

12. PCTs should ensure that heart failure service developments are linked to other strategic planning including Intermediate care planning, Primary Care Centre development.

13. PCTs should ensure that palliative care service provision is accessible for all patients with end-stage heart failure who need it. This should be an integral part of general palliative care services. There should be clear links with local CHD networks/LITs.
EXAMPLE SERVICE MODELS
## EXAMPLE SERVICE MODELS

<table>
<thead>
<tr>
<th>Examples</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| 1. Primary Care ECG Service                                             | South Birmingham PCT  
Dr. John Wozniak – GP  
*Keith Poyntz – Sr Commissioning Manager  
*Tel: 0121 415 2124 |
| 2. One Stop Heart Failure Diagnostic Service                            | Sandwell Hospital Site  
Sandwell and West Birmingham NHS Trust  
Dr. Russell Davis – Cardiologist with Spec. Int  
*Jane Stubley – Specialist Nursing  
*Tel: 0121 607 3453 |
| 3. Community Heart Failure Specialist Nursing Service                   | The Glasgow Model  
The Glasgow Royal Infirmary  
Linda Blue – Glasgow HF Coordinator – Greater Glasgow PCT  
Tel: 0141 211 6302 |
| 4. Hospital Heart Failure Specialist Nursing Service                    | University Hospital Birmingham  
*Dr. Mick Davies – Cardiologist  
Kate Gee – NSF Coordinator  
*Tel: 0121 627 1627 x 3786 |
| 5. Integrated Hospital/Community Heart Failure Service                  | Walsall Hospital  
Dr. Mark Payne – Cardiologist  
Tel: 01933 710710  
Royal Wolverhampton Hospital  
Dr. Richard Horton – Cardiologist  
Elaine Harper - Nursing  
Tel: 01902 643069 |
17. PRIMARY CARE ECG SERVICE MODEL

17.1 AIMS

- To provide an easily accessible and efficient locally based Primary Care ECG recording and interpretation service.
- To perform an ECG recording at a time convenient to patients and provide a report of the results.
- To provide advice for local GPs

17.2 REFERRAL CRITERIA

- ECG recording in the pre-assessment of Suspected Heart Failure.
- ECG recording in the assessment of hypertension.
- ECG recording in other illness where the patient’s condition is stable.

17.3 QUALITY STANDARDS

- Offer the patient an appointment at a convenient time within 3 days of request.
- Perform the ECG and issue a report on the recording within 2 working days.
- An ‘on-call’ Dr or Nurse to discuss clinical problems and be able to offer appointments for more urgent recording if required.

17.4 SERVICE OUTLINE

The PCT will recruit an agreed number of practices who are willing to provide the Primary Care ECG service. Designated Doctors/Nurses will be asked to meet the:

- Eligibility criteria to be designated practice
- Quality specification
- Clinical Governance requirements

Some PCTs have agreed a number of Pilot Practices from which to test out the service – the pilots will determine future service provision.

17.5 COSTS

Costs will depend on the service model agreed:

Options:

- Annual payment per year
- Payment per ECG Recording and Interpretation
18. PROCEDURE

1. Practice will receive a request by fax for an ECG recording on a standard form
2. The patient is asked to ring the practice and make an appointment at a mutually convenient time, usually within 3 working days.
3. A suitably qualified doctor, examples the ECG recording and a report is issues to the referring practice by fax, with a copy in the post, usually within 2 further working days.
4. The practice will maintain copies of all ECG recording/reports for 6 months from the date of recording
5. Provision of ECG paper, electrodes and maintenance of ECG machines will be the responsibility of the PCT
6. The practice will arrange for a point of contact to be available to discuss more urgent requirements or clinical issues related to the recording or report.
7. Service Level Agreements should be for a set time period – e.g. 12 months and future agreements should depend on quality markers being met.
8. The practice will produce an audit of their activity at 6 months and at the end of the contract for assessment by the clinical governance lead at the PCT.

18.2 Clinical Governance

Joint working with the local Hospital Trusts Cardiology team, can be an important element to ensuring successful development of primary care ECG services.

General Practitioners should be provided with support and mentorship from a designated Consultant Cardiologist who can undertake the following:

- Specialist education and Training.
- Independent review of an agreed number of ECGs (e.g. 10th Recording sent on for review).
- Mentorship and support.

18.3 Entry Criteria to be designated GP Reporter

1. At least 6 months experience in a post registration hospital post involving regular reading of ECGs or similar equivalent experience.
2. Having completed a certified period of training on reading ECGs within the last 5 years.
3. To be able to demonstrate competence in reading ECGs

18.4 Quality Markers

1. At least 80% of patients offered an appointment to have the ECG recorded within 3 working days.
2. At least 80% of recording reported back to referring practice within 2 working days.
3. Completion of audit at 6 months and 12 months including breakdown of numbers of normal and abnormal ECGs by type.

4. Satisfy the Clinical Governance lead that the practice is suitable to continue providing the service.

Example: Amended from the outline model kindly provided by the former Selly Oak PCG – now South Birmingham Primary Care Trust.

Contact: Dr. John Wozniak/Keith Poyntz Tel: 0121 415 2124
19. ONE STOP DIAGNOSTIC SERVICE – HEART FAILURE

19.1 AIMS

To improve access to out-patient specialist review and diagnosis in patients with suspected HF.

To provide good access via a booking system.

To report the findings and recommendations back to the GP referrer by fax that day and a hard copy within 3 working days.

To link with a Community based Heart Failure specialist service in which the patients clinical and social needs are effectively managed.

19.2 SERVICE OUTLINE

- Consultant led or SpR clinic based at Hospital.
- Supported by Heart Failure Specialist Nurse.
- Operates for 3-4 sessions per week (depends on need).
- Eligibility criteria for referral to the service.
- Patient receives clinical assessment and Echo test (if relevant).
- Report with results is faxed back to the GP same day.
- Has agreed links to a Community based Specialist Service for further management, stabilisation and referral to GP based follow-up.

19.3 PROCEDURES

- Pre-assessment undertaken by GP.
- Booking system into one-stop Clinic using standard form –faxed
- Package includes:
  - Clinical assessment (SPR or Consultant)
  - Echo (if required)
  - Other tests as needed
  - Diagnosis
  - Review by Specialist Nurse
- Discharge summary reports faxed to GP within one working day.

It is anticipated that the majority of patients could be discharged into the care of the GP and referred immediately to the Community-based Heart Failure Nursing Service.
A smaller number of patients will be found to have more complex clinical needs and it is recommended that the clinical protocol supports their continuing under the care of the Hospital Team until deemed stable for discharge to the GP.

See: ‘Community Heart Failure Specialist Nursing Service’.

Example: Sandwell Hospital Service.

Contact: Dr. Russell Davis/Jane Stubley Tel: 0121 607 3453
20. OPEN ACCESS ECHO ONLY SERVICE

20.1 AIM
- To improve access to out-patient echocardiography in patients suspected of HF
- To provide General Practitioners with direct booking for key diagnostic tests which aid their diagnosis of Heart Failure
- To reduce the delays in GPs receiving diagnostic test results

20.2 SERVICE OUTLINE
- Pre-assessment undertaken by GP
- Standardised Echo Referral Criteria and Form
- Technician-led service
- Technician-led reporting
- On-call Cardiologist oversees (complex cases)
- Dedicated Echo machine – Outpatients
- Links to Heart Failure Specialist Nurse (Hospital)
- Reports faxed to GP within one working day
- Booking undertaken from GP surgery (later stage) (via Booked Admissions Programme).

20.2.2 Key considerations:
This service assumes Community based Heart Failure services are in place and therefore should be established alongside:
- Heart Failure Specialist Nursing Service (Community)
- Heart Failure Clinical Protocol

20.3 PARALLELL OPEN ACCESS ECHO AND ONE STOP DIAGNOSTIC SERVICE
- Supports diverse needs of GPs
- Acknowledges clinical complexity of this patient group and enables more effective referral.
- Provides good access to Echo
- Provides GP with good access to Specialist review of patient when needed
- Best use of Specialist time.
21. COMMUNITY HEART FAILURE SPECIALIST NURSING SERVICE

Can operate as outreach from the hospital team or be a community-based service.

21.1 COMMUNITY MODEL

21.1.1. AIMS

21.1.2. Reduce readmission

21.1.3. Improve the overall quality of life for patients

21.1.4. Assist GPs in the management of Heart Failure

21.1.5. Enable the reduction in the length of hospital stay with HF

- To provide a comprehensive community based service to primary care in the management of patients diagnosed with Heart Failure
- To support local General Practitioners in the management of newly diagnosed patients following in-patient discharge or following confirmation of diagnosis as an out-patient.
- To provide patients and their carers with intensive education and support
- To provide professionals with advice and guidance
- To review patients at home and link to Social Services as necessary

21.2 SERVICE OUTLINE

- Specialist HF nurse based in primary care
- Working to an agreed clinical protocol
- Accepts referral of newly-diagnosed HF patients from local GPs
- Accepts referrals of recently discharged HF patients
- Optimisation of HF therapy to agree clinical guideline in liaison with GP
- Provision of an agreed package of care which includes:
  - Patient education
  - Carer education
  - Home visit – social care assessment
- Accepts referrals of known HF patients who have worsening symptoms
- Linkage to Social Services
- Linkage to hospital-based team including regular rotation into hospital-based team for professional development
- Has links to a designated Consultant Cardiologist with an interest in HF
21.3 CLINICAL GOVERNANCE

- Joint working arrangements with the Hospital Cardiology team.
- Joint training and education
- Rotation into the Hospital Service
- Review of cases
- Peer review.

Example: The Glasgow Model – Glasgow Royal Infirmary

Contact: Linda Blue Tel: 0141 211 6302
22. HOSPITAL HEART FAILURE SPECIALIST SERVICE (IN-PATIENT SERVICES)

22.1 AIMS

- To provide an excellent in-patient clinical service for patients with Heart Failure
- To ensure good access to In-patient Echocardiography (in 2 days)
- To ensure care delivery is optimal across all wards and departments who manage patients with Heart Failure.
- To ensure good access to other investigations as necessary
- To investigate the underlying cause
- To ensure effective discharge planning to prevent readmission
- To ensure good linkage to community based HF services
- To ensure good communication to GP.
- To ensure fast track system for the admission of patients who are referred by the Community HF team

22.2 SERVICE OUTLINE

- A dedicated MTO4 or above echocardiographer is employed at each Trust.
- A specialist heart failure nurse is appointed for each trust – H Grade recommended.
- A lead Cardiologist with a specific interest in HF is identified or appointed in each trust to lead the service with sufficient sessions, as needed. (In-Patients, Out-Patients).

22.2.1 All Hospitals need to have established a Heart Failure Specialist Nursing Service.

- HF Nurse advised of all admissions with the diagnosis Heart Failure.
- Responsible for ensuring high quality care provision across all hospital wards.
- Initiates patient/carer education.
- Ensures effective communication to community-based HF service and GP.

22.2.2. All Hospitals need to have inpatient access to echo within 48 hours of admission and preferably 24 hours.

- Inpatient capacity established and matches demand – ‘Do today’s work today’.
- Reporting undertaken daily and faxed back to the relevant ward (or walked over).
- Junior medical staff are able to initiate therapy on the day echo report received through (a) training; (b) access to senior medical staff.
22.2.3. Patient’s treatment should not be delayed due to waiting for ward rounds.

22.3 All hospitals need dedicated echo machine to inpatient services.

*Example:* The Hospital Heart Failure Service – UHBT

*Contact:* Dr. Mick Davies Tel: 0121 627 1627 x 3786
23. INTEGRATED HEART FAILURE SERVICES (IN-PATIENT AND COMMUNITY BASED SERVICES)

23.1 AIMS

- Reduce length of hospital stay
- Reduce frequent re-admissions to hospital
- Improve access to diagnostic testing to confirm or refute the diagnosis of heart failure
- Identify where possible the underlying cause
- Provide evidence-based treatment
- Improve quality of life by improving symptoms or slowing their deterioration
- Reduce mortality
- Improve the end of life experience for patients and carers

23.2 SERVICE OUTLINE

A Heart Failure Service which works across the primary/secondary care interface.
A patient centred model involving multidisciplinary health care professionals working in partnership.

Includes:

23.2.1. Outpatient service

Heart Failure Assessment Clinic

- GP referrals of new patients with suspected heart failure
- Diagnosis of heart failure is confirmed or refuted
- Management Plan formulated which includes:
  - Home visit for education with ongoing contact and support
  - Further investigations to establish underlying cause
  - Evidence based treatment (Medication and Lifestyle)
  - Referral to multidisciplinary agencies as appropriate

23.2.2. Inpatient Service

- Multidisciplinary referral via telephone or fax accepted
- Education provided prior to discharge home to increase patient involvement and understanding, leading to empowerment and improvement in compliance
- Co-ordinating safe discharge home with appropriate multidisciplinary input
• Provision of ongoing support and follow up from the Heart Failure Team

23.2.3. **Community Service**

• Community-based Heart Failure Service which can pick patients up from hospital discharge and ensure early treatment and education prevention of readmission

• Education and training of primary care staff

• True partnership working

23.2.4. **Quality Markers**

• Improved access to service and evidence-based treatment

• Equity of provision

• Patient empowerment

• Informed choice

*Example: Wolverhampton Heart Failure Service*

*Winner Health & Social Care Award 2002*

*Contact: Dr. Richard Horton – 01902 643069*
GUIDANCE FOR THE DEVELOPMENT OF HEART FAILURE SPECIALIST NURSE POSTS
24. **HEART FAILURE SPECIALIST NURSE**

24.1 **PERSON SPECIFICATION**

24.1.1. **Essential**

At the very least, potential candidates for the position of specialist nurse in heart failure should fit the following profile:

- Professionally qualified as a nurse (Registered Nurse)
- At least 5 years’ experience overall
- At least 2 years of recent cardiology experience
- Excellent communication skills
- Experience in working in an autonomous position
- A proven ability to work effectively in a multidisciplinary setting
- Some computing skills
- Driving licence

24.1.2. **Desirable**

- Previous community experience
- Post-basic qualification in Cardiology
- Experience of research/audit
- IT literate

24.2 **Grading**

- A qualified and experienced Heart Failure Specialist Nurse would normally be graded as a H Grade Nurse.
- There are an increasing number of Heart Failure Nurse Consultant posts, which would be graded at I Grade.
Example Job Description

The Glasgow Heart Failure Specialist Nurse

POST: Heart Failure Liaison Nurse Specialist
GRADE: G
REPORTS TO: Nurse Co-ordinator Heart Failure Service

JOB SUMMARY

The Glasgow-wide Heart Failure Liaison Nurse service is provided by nurses specially trained in heart failure who manage patients in the community with deteriorating heart failure after hospital discharge.

Nursing staff in this service work closely with colleagues in Primary Care and Acute Trusts. The aim of the post is to improve the management of patients with chronic heart failure, to reduce unnecessary hospital re-admission and to provide seamless care between primary and secondary care.

DUTIES AND RESPONSIBILITIES

1. Be responsible for the assessment, planning, implementation and evaluation of nursing care of allocated patients and ensure safe, effective service provision.
2. To work to agreed nursing guidelines and medical therapy guidelines drawn up in conjunction with nursing colleagues, general practitioners and cardiologists.
3. To review medication regimes in conjunction with general practitioners to ensure patients are receiving appropriate therapy in effective doses.
4. To monitor the patient’s condition closely following medication changes.
5. Provide access for patients, families and carers to report changes in symptoms.
6. Ensure appropriate and effective communication between the heart failure liaison service, patients, carers, general practitioners, hospital consultants and nursing staff, social services and all other health professional involved with the patient’s care.
7. Refer patient to health care providers and other agencies as appropriate.
8. Empower patients to be actively involved in managing and monitoring their own care.
9. Provide patients, families and carers with appropriate education, advice and support.
10. Undertake health promotion to advise patients on lifestyle changes which would be advantageous to their condition.
11. Act as an information and educational resource to other health and social care professions involved with this patient group.
12. To assist in the implementation and evaluation of national and local guidelines.
13. To participate in monitoring, evaluation, audit and research activities within the service.
14. To comply with all statutory policies and procedures of the Trusts, GGH and UKCC Code of Professional Conduct and other professional guidelines.

11/11/2003 Page 70
15. To identify any complaints, problems, or gaps in the service and report these to the Nurse Co-ordinator for action.

16. To participate in activities aimed at development of own competence.

17. To participate cover for annual leave and sickness with Heart Failure Liaison Service.

18. Whilst this job description aims to outline the key responsibilities of the post, it is not exhaustive. The post-holder must expect to be flexible and adaptable in meeting new needs of the service.
Example Heart Failure Service Model

A Community based Heart Failure Specialist Nursing Service

This service aims to optimise the management of patients with chronic heart failure. In the Community. Specially trained nurses will work with both hospital and community-based healthcare professionals to achieve this goal. The nurses will implement agreed protocols, including medical prescription guidelines, drawn up in conjunction with leading general practitioners (primary care physicians) and cardiologists in the network/district. All protocols will be reviewed and approved by the appropriate authorising bodies.

Aims of the service

- To improve the post-discharge management of patients with chronic heart failure
- To improve the quality of life of patients with chronic heart failure
- To avoid unnecessary hospital readmission
- To provide seamless care between primary and secondary care

Patient-specific objectives

- To assess patients in their home environment and plan for their future needs in accordance with the service guidelines
- To review the prescribed medication regime to ensure that patients receive appropriate pharmacotherapy in effective doses.
- To work to agreed prescription guidelines drawn up in conjunction with general practitioners and cardiologists
- To monitor the patient’s clinical status and blood chemistry following medication changes
- To ensure appropriate and effective communication between the patient, general practitioner, carer, ambulance services, hospital, Social services, and all other health-care professionals in the patient’s care.
- To provide patients, families, and carers with tailored education, advice and support.
- To act as a resource for other health-care professionals involved with the patient.

To encourage patients (and their family or carers as appropriate) to be actively involved in managing and monitoring their own care.

- To provide easy access for patients, family, and carers to contact the specialist nurse in order to detect and treat early clinical deterioration before symptoms become severe.

Service-specific objectives.

- To ensure that the overall nursing and medical care provided keeps pace with research evidence (for example, effect of telemonitoring systems).
- To monitor, evaluate, and audit the service at regular intervals to ensure both a high standard of care and the effectiveness of the service as a whole in improving health outcomes to facilitate effective links with other health-care services relevant to the care of the patient with chronic heart failure (including palliative care services).
HEART FAILURE SPECIALIST NURSING
INTEGRATED SERVICE
Employment Guidance

Principal employer (community-based role)

The specialist nurse will be employed by the Primary Care Trust. This position will involve the following essential roles:

- Management of the patient with chronic heart failure in the community in conjunction with the patient’s general practitioner and cardiologist.
- Development of links with other community services, including community-based nurses, health visitors, community-based pharmacists, Social services, palliative and emergency care services.

Secondary employer (hospital role).

In addition to the above, the specialist nurse will also be based at the acute-care hospital servicing that particular community, in an honorary position allowing full access to hospital records and services. This position will encompass the following essential roles:

- Identifying hospitalised patients with chronic heart failure who meet the criteria for post-discharge specialist nurse management.
- Promoting the service with staff in whatever specialty or general units chronic heart failure patients are usually managed (medical, cardiology, coronary care, and geriatric units).
  - Liaising with ward staff regarding patient referral to the service and timing of discharge from hospital.
  - Accessing cardiology expertise for advice and clinical support.
  - Developing links with other important services (echocardiography, biochemistry, haematology, pharmacy, cardiac rehabilitation, and palliative care).
REFERENCES


ACKNOWLEDGEMENTS

Linda Blue at Greater Glasgow PCT

Dr. Russell Davis and the team at Sandwell Hospital

Dr. John Wozniak and Keith Poyntz at South Birmingham PCT

Dr. Richard Horton and the team at Royal Wolverhampton Hospital

Steve Allen, Head of Intelligence, BBCHA

Janet Mackinnon, Birmingham, Sandwell & Solihull CHD Programme Administrator
BIRMINGHAM HEART FAILURE STEERING GROUP

MEMBERSHIP

Dr. Michael Davies  Chair and Consultant Cardiologist – UHBT
Dr. James Beattie   Consultant Cardiologist – BH&ST
Karen Boylett      Heart Failure Specialist Nurse – UHBT
Jackie Burke       Cardiac Rehabilitation Spec. Nurse – S&WB
Trisha Castanheira Nurse Consultant Palliative Care – BH&ST
Julie Caulfield    Senior Technician – UHBT
Chris Fearn        Heart Disease Programme Lead – BBC HA
Dr. Liz Fielding   General Practitioner – James Preston HC
Kate Gee           NSF Co-ordinator - UHBT
Dr. Greg Lip       Consultant Cardiologist – S&WB
Dr. Phil Schuppler General Practitioner – Swanswell Medical Centre
HEART FAILURE REGISTERS

A Heart Failure Register is a continuously updated list of patients with heart failure that will enable the Practice to ensure that all patients who may benefit from systematic care are identified.

**BUILDING THE REGISTER**

- Search the repeat prescribing register for patients taking combinations of:
  - Loop/Thiazide diuretic + ACE Inhibitor
  - Loop/Thiazide diuretic + K-sparing diuretic
  - Avoid mislabelling patients who take these drugs for other reasons.
- Opportunistic identification of heart failure patients at consultations.
- Search computerised databases for relevant Read Codes:
  - G58 Heart Failure
  - G581-3 Left ventricular (LV) dysfunction
  - 58531 Echocardiogram abnormal

**VALIDATING THE REGISTER**

- Search the patient’s medical record for:
  - Hospital correspondence stating the diagnosis of heart failure or LV dysfunction.
  - Hospital correspondence identifying impaired LV function on echocardiography or LV angiography.
- Consultation records, ECG and CXR evidence that supports the clinical diagnosis.

It is recommended that patients with a hospital diagnosis are termed “confirmed heart failure” and those who have had a diagnosis made on clinical grounds within Primary Care are termed “suspected heart failure”.

Patients in both groups are then entered on the computerised heart failure register using the Read code G58.

**MAINTAINING THE REGISTER**

It is important that chronic disease registers are regularly updated by trained administrative staff who have protected time for the task.

New diagnoses of confirmed heart failure may be identified from:
- Hospital discharge summaries and outpatient correspondence.
- Specialist heart failure clinic correspondence.
- Open access echocardiography reports.

New diagnoses of suspected heart failure may be identified from:
- Consultations with the GP or nurse.
- New patient medicals at which past medical history is disclosed.

Patients are removed from the register following:
- Removal from the practice registration list.
- Exclusion of impaired LV function by echocardiography or other specific investigation.
## HEART FAILURE TREATMENT GUIDE 2002/3

<table>
<thead>
<tr>
<th>RECOMMENDED TREATMENT</th>
<th>NYHA CLASS INDICATION</th>
<th>ADVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt Restriction</td>
<td>II-III</td>
<td>No added salt at the table and avoid high salt content foods. If high doses of diuretic still needed, also advise no salt in cooking.</td>
</tr>
<tr>
<td>IV</td>
<td></td>
<td>Restrict sodium intake to c. 2.0g/day.</td>
</tr>
<tr>
<td>Fluid Restriction</td>
<td>III-IV</td>
<td>During exacerbations or if symptomatic on high doses of diuretic, restrict to 1.5-2.0 litres/day.</td>
</tr>
<tr>
<td>Unsupervised exercise</td>
<td>I-IV</td>
<td>Regular progressive exercise programme. For those with CHD, follow CHD exercise guidelines.</td>
</tr>
<tr>
<td>Supervised Exercise</td>
<td>II-IV</td>
<td>Refer to an appropriate programme.</td>
</tr>
<tr>
<td>Thiazide Diuretic</td>
<td>II</td>
<td>May be useful for symptoms and signs of fluid excess in older patients. Monitor renal function.</td>
</tr>
<tr>
<td>III-IV</td>
<td></td>
<td>Useful addition to a loop diuretic for resistant heart failure. Monitor renal function.</td>
</tr>
<tr>
<td>Loop Diuretic</td>
<td>II-IV</td>
<td>Adjust the dose according to symptoms and signs. Monitor renal function.</td>
</tr>
<tr>
<td>ACE Inhibitor</td>
<td>I-IV</td>
<td>Starting doses, increments and target doses as in Table 1. Observe recommendations for hospital referral when considering initiation of an ACE Inhibitor. Stop/reduce diuretic for 24 hours before giving the first dose in the evening. Measure renal function and BP before starting treatment, before increments and 1-2 weeks after each increment. Then monitor renal function quarterly or more often as indicated. Stop increasing dose if creatinine exceeds 200 umol/l or symptomatic hypotension develops. Therapy contra-indicated if serum K&gt;5.5 mmol/l.</td>
</tr>
<tr>
<td>Beta-blocker</td>
<td></td>
<td>Consult a heart failure specialist. Starting doses, increments and target doses as in Table 2. Monitoring and ADR management as in Table 3.</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>II-IV</td>
<td>Indicated for heart failure of all causes and all severities. Not yet licensed for post MI patients with asymptomatic LV dysfunction.</td>
</tr>
<tr>
<td>Bisoprolol</td>
<td>II-IV</td>
<td>Indicated for heart failure of all causes and severities.</td>
</tr>
<tr>
<td>ARB</td>
<td>II-IV</td>
<td>Consider when ACE Inhibitors contra-indicated. Initiation and monitoring advice as for ACE Inhibitors. Starting doses, increments and target doses as in Table 4.</td>
</tr>
<tr>
<td>Digoxin</td>
<td>I-IV</td>
<td>Consider for all heart failure patients with AF and as an additional therapy for class II-IV patients in sinus rhythm. Contra-indications, dosage and monitoring as in Table 5.</td>
</tr>
<tr>
<td>Vasodilators</td>
<td>II-IV</td>
<td>Consider Hydralazine + Isosorbide combination when ACE Inhibitors and ARBs contra-indicated. Isosorbide alone may be indicated for those with angina.</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>III-IV</td>
<td>Start at 25mg/day if serum K&lt;5.0 mmol/l. Monitor renal function: Before starting, 4-6 days after starting, before an increment and 4-6 days after an increment, after 1 month and then quarterly. Increase to 50mg/day if still symptomatic after 1 month and serum K&lt;5.0. Reduce dose by half if K&gt;5.0 but &lt;5.5 mmol/l. Stop if K&gt;5.5 mmol/l or if painful gynaecomastia develops.</td>
</tr>
<tr>
<td>Warfarin</td>
<td>I-IV</td>
<td>Consider for all patients with valvular and non-valvular AF, patients with mobile intracardiac thrombus and those with dilated, poorly functioning hearts.</td>
</tr>
</tbody>
</table>
### Table 1. Prescribing guidance for ACE Inhibitor therapy. See also BNF.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (EVERY 2-4 WEEKS)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captopril</td>
<td>6.25 mg tds</td>
<td>12.5 / 25 / 50 mg tds</td>
<td>25-50 mg tds</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5 mg bd</td>
<td>5 / 7.5 / 10 mg bd</td>
<td>10 mg bd</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>2.5 mg od</td>
<td>5 / 10 / 15 / 20 / 25 / 30 / 35 mg od</td>
<td>20-35 mg od</td>
</tr>
<tr>
<td>Perindopril</td>
<td>2 mg od</td>
<td>4 mg od</td>
<td>4 mg od</td>
</tr>
<tr>
<td>Quinapril</td>
<td>2.5 mg od</td>
<td>5 / 7.5 / 10 mg bd</td>
<td>10 mg bd</td>
</tr>
<tr>
<td>Ramipril</td>
<td>1.25 mg od</td>
<td>2.5 / 5 mg od</td>
<td>10 mg od/5 mg bd</td>
</tr>
<tr>
<td>Trandolapril</td>
<td>0.5 mg od</td>
<td>1 / 2 / 4 mg od</td>
<td>4 mg od</td>
</tr>
</tbody>
</table>

### Table 2. Prescribing guidance for beta-blocker therapy. See also BNF.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (EVERY 2-4 WEEKS)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisoprolol</td>
<td>1.25 mg od</td>
<td>2.5 / 3.75 / 5 / 7.5 / 10 mg od</td>
<td>10 mg od</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3 mg bd</td>
<td>3.125 / 6.25 / 12.5 / 25 mg bd</td>
<td>25-50 mg bd</td>
</tr>
</tbody>
</table>

* Higher dose for those >85kg BW.

### Table 3. Managing problems during beta-blocker therapy.

Monitor for problems during and after initiation of beta-blocker therapy. Only undertake second action if first action ineffective.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>FIRST ACTION</th>
<th>SECOND ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worsening heart failure symptoms.</td>
<td>Increase diuretic or ACE inhibitor.</td>
<td>Decrementally reduce beta-blocker dosage. Stop only if absolutely essential.</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Reduce dose of any vasodilator.</td>
<td></td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Reduce or stop drugs that may exacerbate bradycardia</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. Prescribing guidance for ARB therapy. See also BNF.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STARTING DOSE</th>
<th>INCREMENTS (EVERY 2-4 WEEKS)</th>
<th>TARGET DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candesartan</td>
<td>2-4 mg od</td>
<td>4 / 8 / 16 mg od</td>
<td>16 mg od</td>
</tr>
<tr>
<td>Eprosartan</td>
<td>150 mg od</td>
<td>300 / 450 / 600 / 800 mg od</td>
<td>600-800 mg od</td>
</tr>
<tr>
<td>Irbesartan</td>
<td>75 mg od</td>
<td>150 / 225 / 300 mg od</td>
<td>300 mg od</td>
</tr>
<tr>
<td>Losartan</td>
<td>12.5 mg od</td>
<td>25 / 10 / 75 / 150 mg od</td>
<td>150 mg od</td>
</tr>
<tr>
<td>Telmesartan</td>
<td>20 mg od</td>
<td>40 / 60 / 80 mg od</td>
<td>80 mg od</td>
</tr>
<tr>
<td>Valsartan</td>
<td>20 mg od</td>
<td>40 / 80 / 160 mg od</td>
<td>80-160 mg od</td>
</tr>
</tbody>
</table>

* No ARBs yet licensed for heart failure treatment.

### Table 5. Prescribing guidance for Digoxin. See also BNF.

<table>
<thead>
<tr>
<th>DOSE</th>
<th>INDICATIONS</th>
<th>CONTRA-INDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 mg od</td>
<td>Age &lt; 70 or Age &gt; 70 + BW &gt; 85 kg</td>
<td>Bradycardia and sick-sinus syndrome.*</td>
</tr>
<tr>
<td>0.125 mg od</td>
<td>Age &gt; 70</td>
<td>Second and third degree AV block.*</td>
</tr>
<tr>
<td>0.0625 mg od</td>
<td>Renal dysfunction</td>
<td>Wolff-Parkinson-White Syndrome.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hypertrophic Obstructive Cardiomyopathy.</td>
</tr>
</tbody>
</table>

**DIGOXIN LEVELS:** required after 5-10 days in patients with renal dysfunction or after initiation of drug therapy likely to increase digoxin levels.

* Digoxin not contra-indicated if pacemaker in-situ.
# PATIENT GROUP DIRECTIONS - HEART FAILURE

## Group Protocol for: The Primary Care assessment, investigation and management of adults with heart failure.

<table>
<thead>
<tr>
<th>CLINICAL DOMAIN</th>
<th>PROCEDURES</th>
</tr>
</thead>
</table>
| **ASSESSMENT**  | Identification and monitoring of symptoms and signs associated with:  
Heart failure.  
Co-morbidities.  
Treatment.  
Determination of NYHA Class.  
Identification and monitoring of lifestyle risk factors.  
Identification of social risk factors for admission or delayed hospital discharge.  |
| **INVESTIGATION** | Diagnostic blood tests, ECG and CXR.  
Diagnostic echocardiography (see Referral).  
Heart failure therapy baseline and monitoring blood tests.  
Co-morbidity diagnostic and monitoring tests.  
Identification of alternative diagnosis if heart failure excluded.  |
| **PATIENT EDUCATION** | Provide information about heart failure and co-morbidities including:  
Explanation of symptoms and signs.  
Lifestyle risk factor management.  
Investigation.  
Drug and non-drug therapy.  
Self-management.  
How to access advice and help.  
Use behavioural change strategies to manage lifestyle risk factors.  |
| **TREATMENT** | Heart failure  
Alter diuretic dose according to symptoms and signs of fluid excess.  
Prescribe evidence-based drug therapy according to NYHA Class.  
Offer vaccination against Pneumococcus and Influenza.  
Co-morbidities  
Prescribe evidence-based drug therapy to treat underlying cause and reduce risk of coronary events.  
Consider anticoagulation for all patients with AF and also cardioversion for patients with non-valvular AF.  |
| **REFERRAL** | Refer when necessary to:  
Diagnose and/or manage heart failure.  
Identify and/or manage the cause of heart failure.  
Manage lifestyle risk factors.  
Investigate and/or manage co-morbidities.  
Provide social support to patients and carers.  
Promote independent living.  
Improve end-of-life experience.  |
| **FOLLOW - UP** | Review every 3 months unless more frequent review clinically indicated due to:  
Deterioration of heart failure symptoms and signs.  
Changes to drug therapy.  
Adverse drug effects.  
Patient and carer support needs.  
Palliative care needs.  |
### DIAGNOSTIC CRITERIA FOR LV DYSFUNCTION BY ECHOCARDIOGRAPHY

<table>
<thead>
<tr>
<th>LV Function</th>
<th>Ejection Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely impaired</td>
<td>&lt; 40%</td>
</tr>
<tr>
<td>Borderline</td>
<td>40-50%</td>
</tr>
<tr>
<td>Normal</td>
<td>&gt; 50%</td>
</tr>
</tbody>
</table>

**Definite Heart Failure**
- Dyspnoeic patient (NYHA Class II or more)
- + Objective evidence of Cardiac dysfunction
  - (LV Ejection Fraction <40%)

**Probable Heart Failure**
- Patients with symptoms and borderline
- LV Ejection Fraction
# NEW YORK HEART ASSOCIATION
## CLASSIFICATION OF HEART FAILURE

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DEFINITION OF SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>No limitation; ordinary physical exercise does not cause dyspnoea</td>
</tr>
<tr>
<td>II&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Slight limitation of physical activity, dyspnoea or walking more than 200 yards or on stairs</td>
</tr>
<tr>
<td>II&lt;sup&gt;m&lt;/sup&gt;</td>
<td>Moderate limitation; dyspnoea walking less than 200 yards</td>
</tr>
<tr>
<td>III</td>
<td>Marked limitation of physical activity: Comfortable at rest but dyspnoea washing and dressing or walking from room to room</td>
</tr>
<tr>
<td>IV</td>
<td>Dyspnoea at rest with increased symptoms with any level of physical activity</td>
</tr>
</tbody>
</table>
## OPEN ACCESS HEART FAILURE ECHO CLINIC REFERRAL FORM

<table>
<thead>
<tr>
<th>Date Sent</th>
<th>Date Received</th>
<th>Appointment Date</th>
</tr>
</thead>
</table>

**ESSENTIAL INVESTIGATIONS TO BE COMPLETED BEFORE REFERRAL (All answers must be YES)**

1. **ABNORMAL ECG** YES / NO  
(Please enclose ECG)

2. **CHEST X-RAY** YES / NO  
(Please enclose report)

3A. **BLOODS** YES / NO  
3B. **HAEMOGLOBIN** YES / No g/dl

3C. **U & Es** YES / NO  
3D. **CREATININE** YES / No mmol/l

3E. **LIVER FUNCTION TEST** YES / NO  
3F. **THYROID FUNCTION TEST** YES / NO

**NOTE:** If a NORMAL ECG and a NORMAL chest X-ray are found then NO REFERRAL IS REQUIRED

### SYMPTOM REVIEW

- **Breathlessness** YES / NO
- **Orthopnea** YES / NO
- **Reduced Exercise Tolerance** YES / NO
- **Peripheral Oedema** YES / NO
- **PND** YES / NO
- **Fatigue/Lethargy** YES / NO

### MEDICAL HISTORY

- **Previous MI** YES / NO
- **History of Angina** YES / NO
- **Hypertension** YES / NO
- **Valvular Disease** YES / NO
- **Heart Murmur** YES / NO
- **Arrhythmias** YES / NO

### CLINICAL REVIEW

- **Pulse** ________________/min  
- **BP** ________________/mm/Hg  
- **JVP** ________________  
- **Chest** ________________

- **Heart Sounds** ____________________________________________

- **Current medication** ________________________________________

### REFERRAL DESTINATION

<table>
<thead>
<tr>
<th>Hospital (please tick)</th>
<th>Open Access Heart Failure Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tel:</td>
</tr>
</tbody>
</table>

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

11/11/2003