East Lancashire Heart Failure Guidelines for Primary Care

Primary Care Management Guidelines For Patients With Chronic Heart Failure Due To Left Ventricular Systolic Dysfunction

Developed by members of the East Lancashire Local Implementation Team for CHD (Heart failure Sub Group)

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Foreword

The East Lancashire Heart Failure Guidelines for Primary Care have been designed to act as a framework for those caring for patients with heart failure. This would include GPs and other health care professionals for primary care.

Exactly the same guidelines would also be used in secondary care for all but consultant cardiologists.

The document is not meant to be exhaustive and should be read in conjunction with other documentation, for instance NICE guidelines and the BNF.

Dr Alan Myers
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Model of Service for Heart Failure Patients in East Lancashire

Purpose
The purpose of this model is to provide a framework for development of a consistent, structured approach to heart failure services provided to the people of East Lancashire with heart failure. Building on the existing service the plans concentrates on identification and implementation of developments required to meet national guidelines and local need. Following agreement by the East Lancashire CHD Local Implementation Team the aim is to inform the commissioning process of the 3 PCTs in East Lancashire resulting in implementation of the preferred model of service for heart failure patients in East Lancashire.

Introduction
Heart Failure is notoriously difficult to diagnose without clear diagnostic management some patients may be treated unnecessarily whilst others may go untreated. Heart Failure is frequently misdiagnosed. The cause of heart failure should always be established, and the objective evidence of left ventricular dysfunction obtained.

The East Lancashire CHD Local Implementation Team has a number of modernisation groups undertaking work to improve services to people of East Lancashire in respect of CHD. One of the modernisation groups concentrates on improving services for people with heart failure. This multi disciplinary, multi agency group has produced this model.

The model has been developed taking into account national and local priorities including: -

- Chapter 6, standard 11of The National Service Framework for CHD
- National Institute for Clinical Excellence (NICE) clinical guidelines on management of chronic heart failure in adults in primary and secondary care
- The NHS guide “Developing Services for heart failure”
- The outcomes of the workshop held in 2003 “The Future Delivery of Services for People with Heart Failure in East Lancashire”
- The outcomes of the workshop held in October 2003 to identify gaps in the local services when compared with the NICE Guidelines No5) issued July 2003
- The objectives of the EL Heart Failure Modernisation Group agreed by the EL CHD LIT.
- nGMS contract
- CHAI report for East Lancashire.

Implementation Process

- Plan agreed as the preferred way forward by the heart failure modernisation group
- Obtain the support of the EL CHD LIT
- Business Case/ Development Leads to develop detailed costed plans, guidelines and protocols inline with the developments related to specific areas of the plan.

- Detailed plans prioritised and agreed by the heart failure modernisation group
- Implementation phased in accordance with the PCTs' Local Delivery Plans

Exclusions
Where there is reference to overarching areas of work such as health promotion, workforce planning, education and training and information it is acknowledge that the development work is undertaken by other modernisation groups with input as required from members of the modernisation group for heart failure. Where these are referred to in this plan it is as a part of these existing work streams.

Structure
This content of this model is based around the following main headings to correspond with the NICE Guidelines

- Confirmation of diagnosis of heart failure
- Treatment
- Monitoring
- On going support for patients and carers

The pathway will apply to new patients with suspected heart failure and existing patients as they may present at varying stages on the pathway.

Confirmation of Diagnosis of Heart Failure

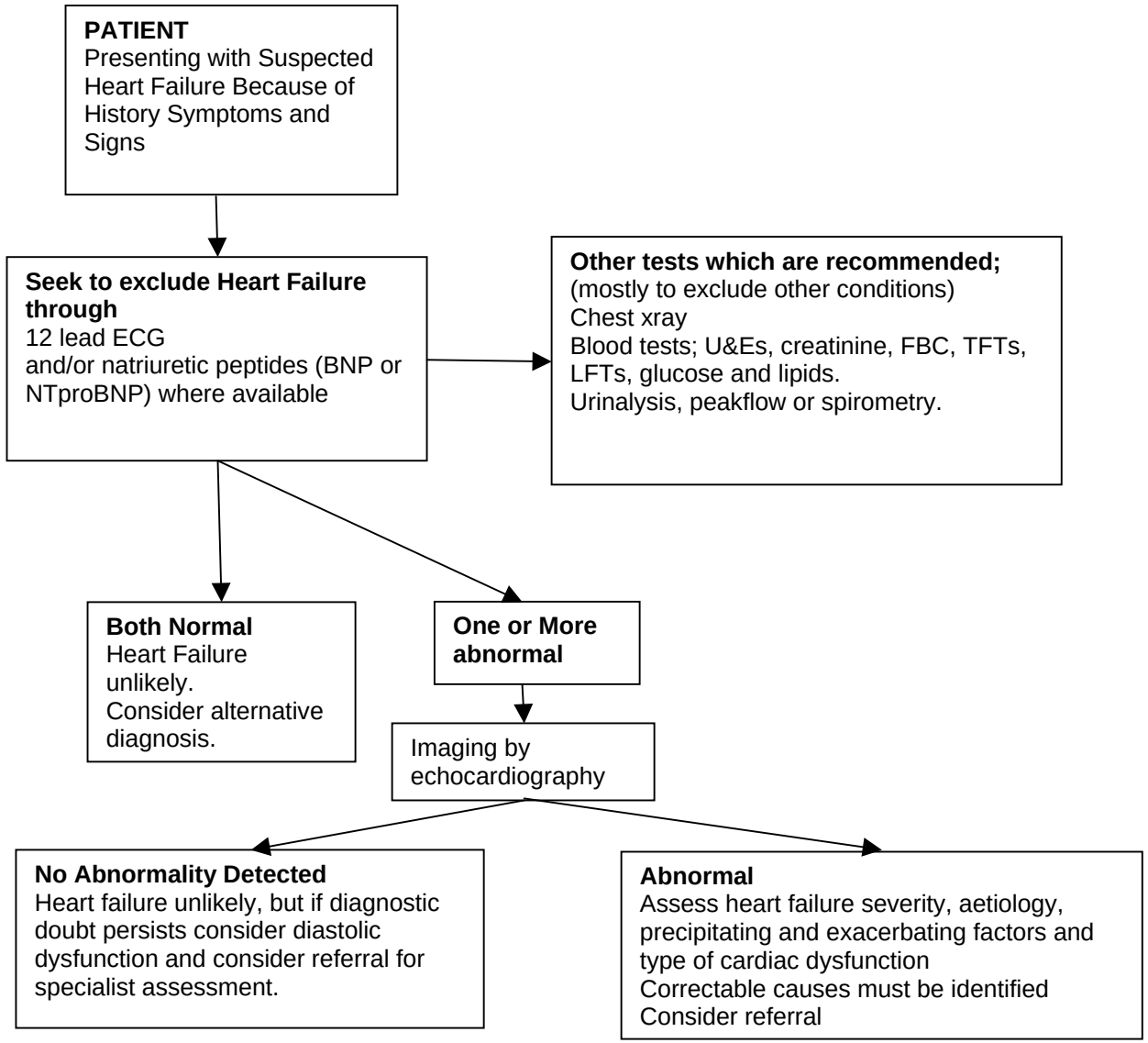
PATIENT

Confirmation of diagnosis of heart failure

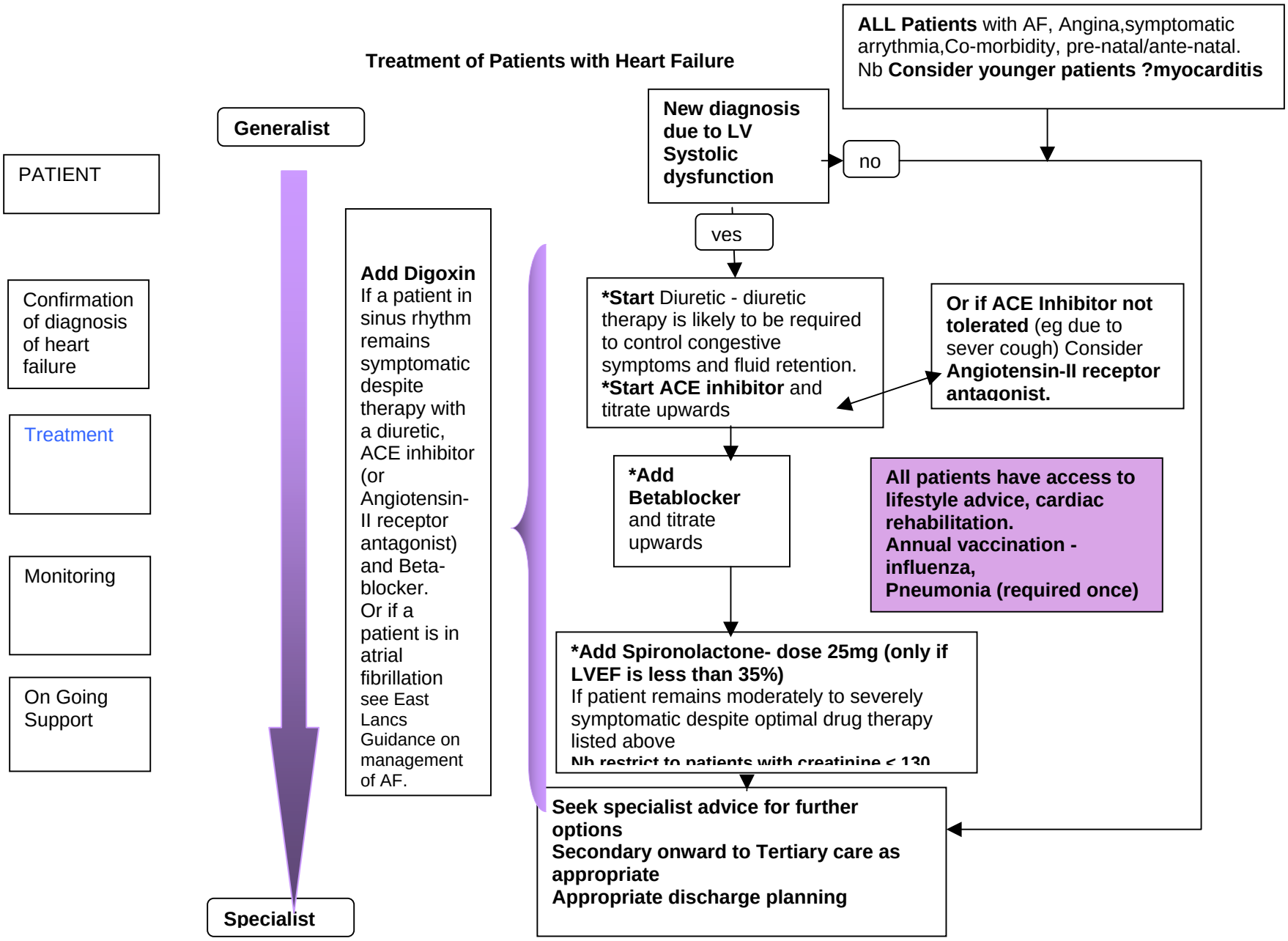
Treatment

Monitoring

On Going Support

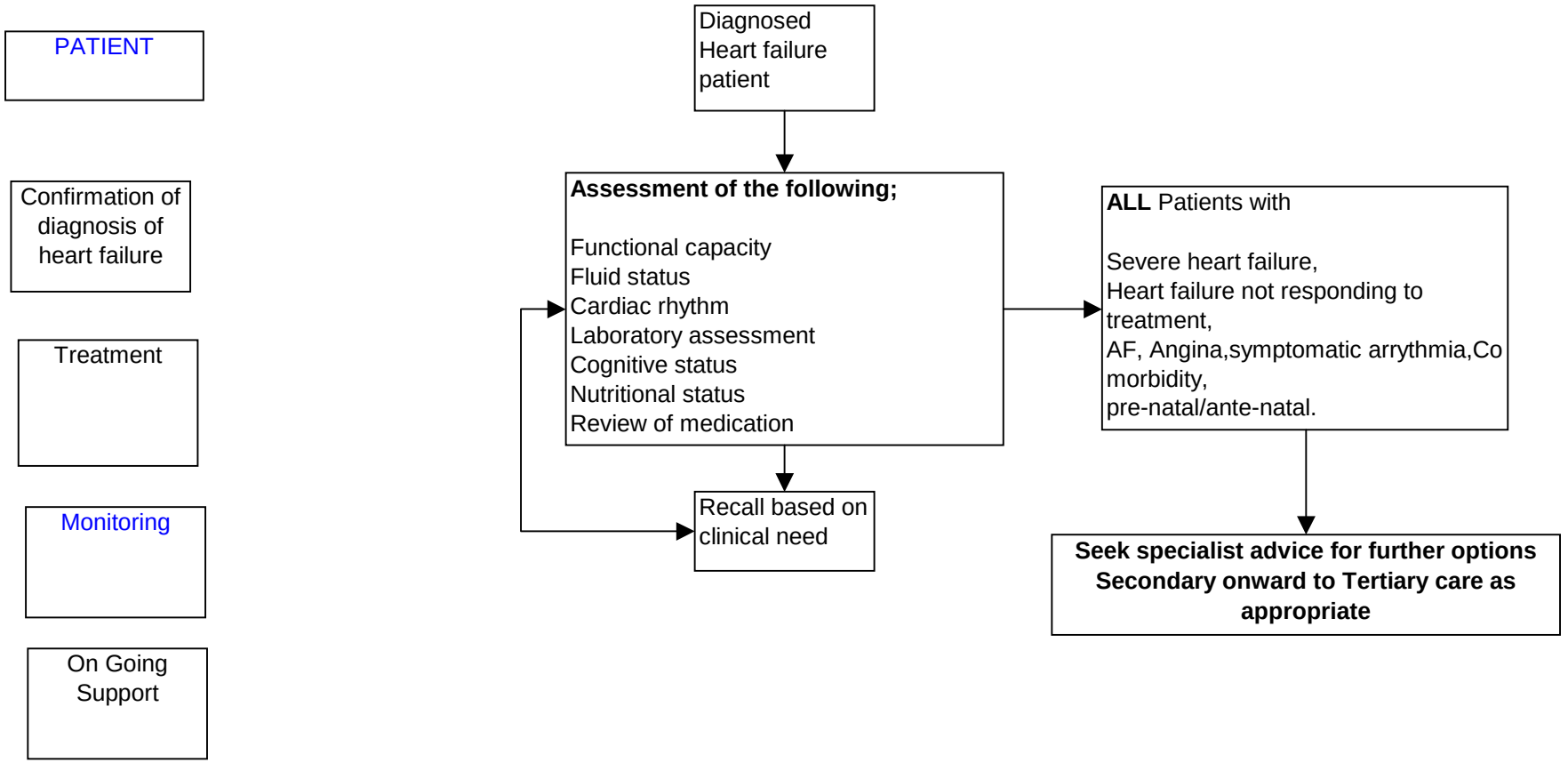


Treatment of Patients with Heart Failure



*All medication prescribed requires regular assessment/follow-up from doctor and should be carried out with caution and understanding of the processes involved. (guidelines to be issued)

Monitoring of patients with Heart Failure



On Going Support for Patients and Carers

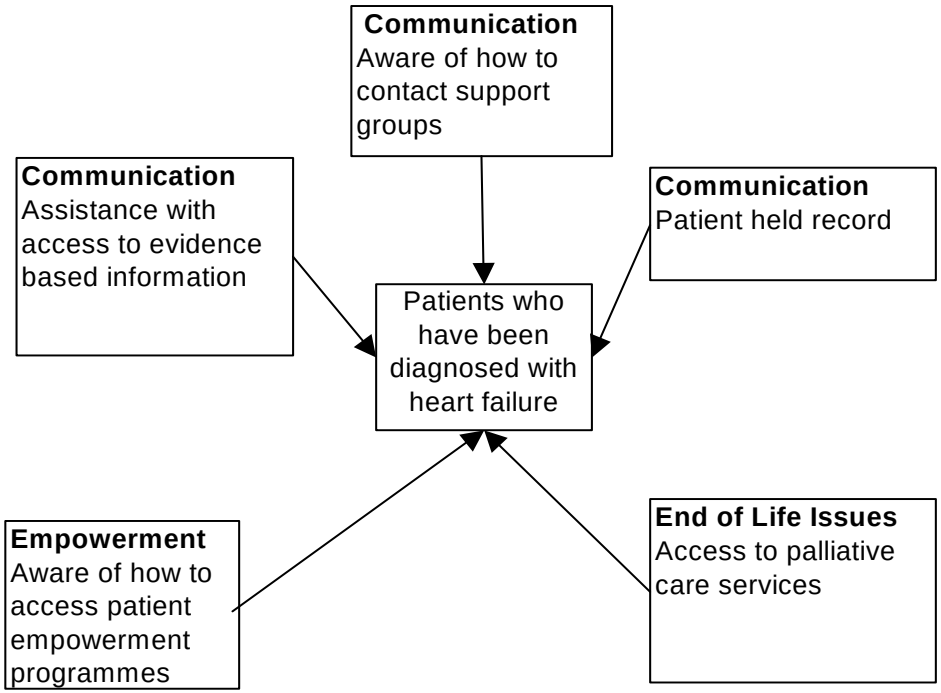
PATIENT

Confirmation of diagnosis of heart failure

Treatment

Monitoring

On Going Support



Abbreviations

ACE	Angiotensin Converting Enzyme Inhibitors
AF	Atrial Fibrillation
BNP	Brain Natriuretic Peptide
CHD	Coronary Heart Disease
CHD LIT	Coronary Heart Disease Local Implementation Team
CXR	Chest X-Ray
DoH	Department of Health
DVT	Deep Vein Thrombosis
ECG	Echocardiogram
EL	East Lancashire
FBC	Full Blood Count
GP	General Practitioner
GTN	Glyceryl Trinitrate
HF	Heart Failure
JVP	Jugular Venous Pressure
LFT	Liver Function Test
LV	Left Ventricular
LVEF	Left Ventricular Ejection Fraction
LVSD	Left Ventricular Systolic Dysfunction
nGMS	New General Medical Services
NHS	National Health Service
NICE	National Institute of Clinical Excellence
NSAIDs	Non Steroidal Anti Inflammatory Drugs
NSF	National Service Framework
NYHA	New York Heart Association
QUEST	Quit Using Expert Specialist Team
TFT	Thyroid Function Test
U&E	Urea & Electrolytes

Aims of the Heart Failure Guidelines for Primary Care

The aim of this document is to provide working guidelines to provide a consistent approach to the management of patients with chronic heart failure in primary care in East Lancashire. It is produced as a guideline to practitioners within Primary Care.

Introduction

Heart Failure is notoriously difficult to diagnose without clear diagnostic management, some patients may be treated unnecessarily whilst others may go untreated. Heart failure is frequently misdiagnosed. The cause of heart failure should always be established, and the objective evidence of left ventricular dysfunction obtained.

The East Lancashire Coronary Heart Disease Local Implementation Team has a number of modernisation groups undertaking work to improve services to people of East Lancashire in respect of CHD. One of the modernisation groups concentrates on improving services for people with heart failure. This multi disciplinary, multi agency group has produced these guidelines.

These guidelines have been developed taking into account national and local priorities and evidence based practice.

- Chapter 6, Standard 11 of The National Service Framework for CHD
- National Institute for Clinical Excellence (NICE 2003) Clinical Guidelines On Management Of Chronic Heart Failure In Adults In Primary And Secondary Care
- The NHS Guide “Developing Services for Heart Failure”
- The outcomes of the workshop held in 2003 “The Future Delivery of Services for People with Heart Failure in East Lancashire”
- The outcomes of the workshop held in October 2003 to identify gaps in the local services when compared with the NICE Guidelines No 5 issued July 2003
- The objectives of the EL Heart Failure Modernisation Group agreed by the E.L. CHD LIT.
- nGMS contract
- CHAI report for East Lancashire

Note - It is recognised that these guidelines will require annual review.

Definition Of Heart Failure

Heart failure is a complex syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the heart to function as a pump to support a physiological circulation. The syndrome of heart failure is characterised by symptoms such as breathlessness and fatigue, and signs such as fluid retention. (NICE 2003)

Burden Of Heart Failure

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.

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 approximately 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.

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).

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).

Approximately 1% of NHS expenditure is currently spent on heart failure, with most of these costs relating to hospital admissions.

Heart failure accounts for around 5% of all medical admissions and 25 – 30% of heart failure patients are readmitted every year. The cost of heart failure is increasing with an estimated UK expenditure of £905 million in 2000 (Mcmurray and Stewart 2003).

Identification Of Patients At Risk Of Heart Failure

National Service Framework for CHD 2000 states that primary care teams should provide a systemic approach to identifying people at high risk of heart failure.

Advice should be offered and treatment given to reduce the risk of patients developing heart failure.

Patients should be reviewed as per the secondary prevention chapter 2 of the NSF for CHD, as these patients are at risk of developing heart failure in the future.

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.

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 or Angiotensin II receptor blockers.
- Thiazide or loop diuretics with K-sparing diuretics.

Both combinations 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 (appendix a)

The list of patients generated is 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.

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.

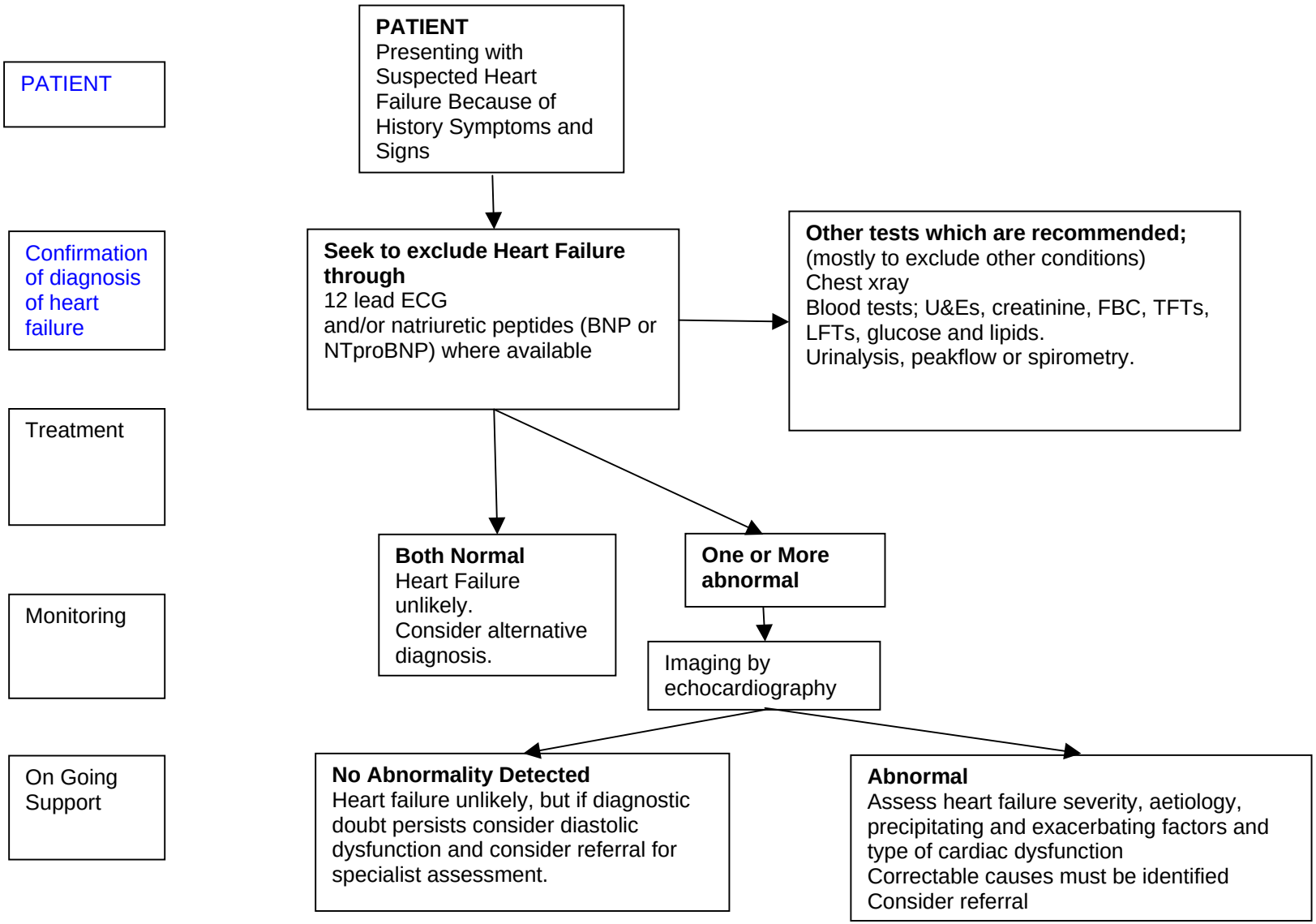
New diagnoses of suspected heart failure may be identified from:

- Consultations with the GP or nurse.
- New patient medicals at which past medical history is disclosed without confirming evidence.

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.

Confirmation of Diagnosis of Heart Failure



Confirmation Of Diagnosis In Primary Care

Patient Presenting With Suspected Heart Failure

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 nonspecialist settings.

It is important to exclude other conditions that may masquerade as heart failure.

Other conditions presenting with similar symptoms:

• Obesity.
• Chest disease – including lung, diaphragm or chest wall.
• Venous insufficiency in lower limbs.
• Drug-induced ankle swelling (e.g. dihydropyridine calcium channel blockers).
• Drug-induced fluid retention (e.g. NSAIDs).
• Hypoalbuminaemia.
• Intrinsic renal or hepatic disease.
• Pulmonary embolic disease.
• Depression and/or anxiety disorders.
• Severe anaemia or thyroid disease.
• Bilateral renal artery stenosis.

NB Elderly patients are particularly likely to have a number of concomitant medical problems.

Healthcare professionals should seek to exclude a diagnosis of heart failure through the following investigations. (NICE 2003)

History

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.
- Concordance with therapy and adverse treatment effects.
- Symptoms due to physical and psychological co-morbidities.
- Relevant socio-economic factors.

Physical examination

Physical examination aims to document:

- Weight including waist circumference.
- Pulse and blood pressure.
- Signs of heart failure.
- Signs of valvular heart disease.

Other non-specific symptoms of heart failure include nocturia, anorexia, abdominal bloating and discomfort, constipation, and cerebral symptoms such as confusion, dizziness and memory impairment.

New York Heart Association Classification

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.

Class Symptoms

I No limitations. Ordinary physical activity does not cause fatigue, breathlessness or palpitation.
(Asymptomatic left ventricular dysfunction is included in this category.)

II Slight limitation of physical activity. Such patients are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, breathlessness or angina pectoris (symptomatically 'mild' heart failure).

III Marked limitation of physical activity. Although patients are comfortable at rest, less than ordinary physical activity will lead to symptoms (symptomatically 'moderate' heart failure).

IV Inability to carry on any physical activity without discomfort. Symptoms of congestive cardiac failure are present even at rest. With any physical activity increased discomfort is experienced (symptomatically 'severe' heart failure).

One of the primary symptoms of heart failure is breathlessness. The degree of exertion required to elicit symptoms such as breathlessness may be used to grade the severity of symptoms into one of four functional classes.

The functional class tends to deteriorate unevenly over time and the severity of symptoms does not necessarily equate with the severity of the underlying heart problem – mild symptoms may be found in patients with severe damage to the heart, and vice versa. Changes in medication and diet can have very favourable or adverse effects on functional capacity in the absence of any measurable change in heart function, however the severity of symptoms may fluctuate even in the absence of changes in medication.

12 Lead ECG And Natriuretic Peptides (BNP Or NT Pro BNP) If Available.

12 lead ECG

- Abnormal ECG - 1 in 3 chance of LVSD
- Normal ECG - negative predictive value of LVSD (98%)
- The nature of ECG abnormality can increase probability of LVSD - anterior Q waves and LBBB with known IHD

Common abnormalities to be found are:

- Q waves
- T wave changes
- ST wave changes
- LBBB
- AF and other rhythm disorders

Natriuretic Peptides (BNP Or NT Pro BNP)

BNP testing is a screening test for the identification of patients who do **not** have heart failure. Heart failure is most unlikely in a patient with a normal ECG or normal plasma concentration of BNP or NT-pro BNP, given the high sensitivity of these tests. Normal results may, therefore, be useful in guiding the doctor to consider other diagnoses and investigations. Any abnormality of the initial 12-lead ECG, or plasma BNP does not confirm a diagnosis of heart failure and further investigation is required. (NICE 2003)

BNP may be normal in patients with heart failure who have been treated with diuretics plus or minus ACE inhibitors.

If either the ECG or the BNP results are abnormal imaging by echocardiography is required. If both the ECG and BNP results are normal heart failure is unlikely.

To evaluate possible aggravating factors and/or alternative diagnosis the following tests are recommended: (nice 2003)

Chest X-ray

Chest x-ray may reveal pulmonary oedema, pleural effusion, cardiomegaly, Kerley B lines and upper lobe vein distension can help confirm the presence of heart failure, however, chest x-ray may be entirely normal.

Blood tests

- U&Es
- FBC
- TFTs
- LFTs
- Fasting lipids
- Fasting glucose

Urinalysis

Peak flow or spirometry

Echocardiography

- Transthoracic Doppler 2D Echocardiographic Examination should be performed to exclude important valve disease, assess the systolic (and diastolic) function of the (left) ventricle, and detect intracardiac shunts.

Seeking Specialist Advice

The basis for historical diagnoses of heart failure should be reviewed, and only patients whose diagnosis is confirmed should be managed in accordance with this guideline.

If the diagnosis of heart failure is still suspected, but confirmation of the underlying cardiac abnormality has not occurred, then the patient should have appropriate further investigation.

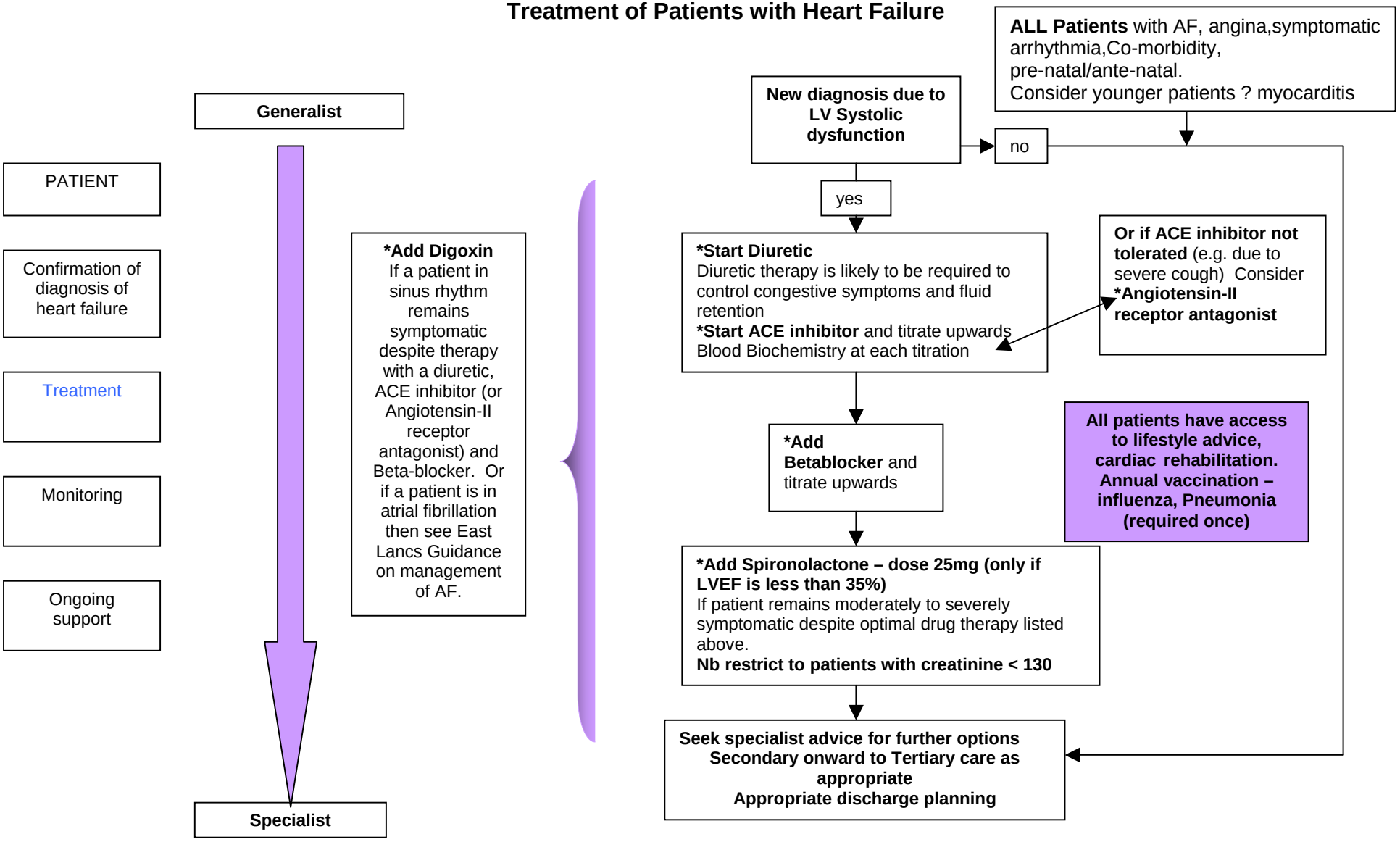
Patients with heart failure require specialist advice in the following situations:

- Heart failure due to valve disease, diastolic dysfunction or any other cause except LV systolic dysfunction
- One or more of the co-morbidities outlined appendix b
- Angina, atrial fibrillation or other symptomatic arrhythmia
- Women who are planning a pregnancy or who are pregnant.

The following situations also require specialist advice:

- Severe heart failure.
- Heart failure that does not respond to treatment.
- Heart failure that can no longer be managed effectively in the home setting.

Treatment of Patients with Heart Failure



*All medication prescribed required regular assessment/follow-up from a doctor and should be carried out with caution and understanding of the processes involved. (Guidelines to be issued)

Treatment Of Patients With Heart Failure

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 smoking cessation service (QUEST)
- 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.

Pharmacological Treatment Of Symptomatic Heart Failure Due To Left Ventricular Systolic Dysfunction

Drug therapy is required for the vast majority of patients with heart failure. It is the responsibility of the individual prescriber to check the dosage of medication. This document should be read as a guide to treatment rather than being considered a protocol that must be followed prescriptively in all patients. Treatment should be tailored to the individual patient, with referral for more specialist advice being considered where appropriate.

The triple combination of ACE inhibitor, beta-blocker and angiotensin II receptor antagonist should be avoided, pending the results of further trials.

Note that at the time of issue of this guideline, the following drugs in this guideline are unlicensed in the UK for the treatment of heart failure or its common signs or symptoms.

• the positive inotropic agent dobutamine
• calcium channel blockers.

Recommendations on specific drugs

Recommendations for pharmacological therapy for patients with heart failure due to left ventricular systolic dysfunction are summarised in the algorithm on page 14

Angiotensin converting enzyme (ACE) inhibitors

All patients with heart failure due to left ventricular systolic dysfunction should be considered for treatment with an ACE inhibitor (appendix d)

- ACE inhibitor therapy should be instituted in patients with heart failure due to left ventricular systolic dysfunction before beta-blockade is introduced.

- ACE inhibitor therapy should be initiated at the appropriate dose and titrated upwards at short intervals (for example, every 2 weeks) until the optimal tolerated or target dose is achieved.

- ACE inhibitors are recommended to be taken at bedtime, particularly the first dose, due to possible hypotension. There is a slight extra risk of postural hypotension in patients who are on diuretics also.

- Blood biochemistry (urea, creatinine and electrolytes) should be measured after initiation and at each dose increment. (see algorithm)

NB. If a patient appears intolerant of an ACE inhibitor due to cough ARBs may be tried as an alternative, however if the cough has not resolved within a month of treatment it is unlikely to be due to ACE and such patients should be restarted on ACE Inhibitors.

Angiotensin II Receptor Blockers (ARBs)

If ACE Inhibitor is not tolerated due to cough, the following drugs are now licensed;

Candersartan is now licensed for CHF.
Valsartan is licensed for LVF post MI.

An isosorbide/hydralazine combination may be used in patients with heart failure who are intolerant of ACE inhibitors or angiotensin II receptor antagonists.

Diuretics

Diuretics (NICE 2003) should be routinely used for the relief of congestive symptoms and fluid retention in patients with heart failure, and titrated (up and down) according to need following the initiation of subsequent heart failure therapies. (appendix c)

Beta-blockers

Beta-blockers licensed for use in heart failure should be initiated in patients with heart failure due to left ventricular systolic dysfunction after diuretic and ACE inhibitor therapy (regardless of whether or not symptoms persist. appendix e)

Beta-blockade therapy for heart failure should be introduced in a ‘start low, go slow’ manner, with assessment of heart rate, blood pressure and clinical status after each titration.

Patients who develop heart failure due to left ventricular systolic dysfunction and who are already on treatment with a beta-blocker for a concomitant condition (for example, angina, hypertension) should continue with a beta-blocker – ensuring it is licensed for heart failure treatment.

Aldosterone antagonists (spironolactone)

Patients with heart failure due to left ventricular systolic dysfunction who remain moderately to severely symptomatic despite optimal therapy (as outlined in the algorithm) should be prescribed spironolactone at a dose of 25 mg once per day (appendix f) – specialist advice may be considered.

Patients with heart failure taking spironolactone should have blood potassium and creatinine levels monitored for signs of hyperkalaemia and/or deteriorating renal function. If hyperkalaemia is a problem then the dose of spironolactone should be halved and biochemistry rechecked.

Digoxin

Digoxin is recommended for:

- Worsening or severe heart failure due to left ventricular systolic dysfunction despite ACE inhibitor, beta-blocker and diuretic therapy
- Patients with atrial fibrillation and any degree of heart failure.

Amiodarone

The decision to prescribe amiodarone should be made in consultation with a specialist.

The need to continue the prescription should be reviewed regularly.

Patients taking amiodarone should have a routine 6-monthly clinical review, including liver and thyroid function test, including a review of side effects and an annual chest XRAY.

Anticoagulants

Anticoagulation is indicated for patients with the combination of heart failure and atrial fibrillation.

In patients with heart failure in sinus rhythm, anticoagulation should be considered for those with a history of thromboembolism, left ventricular aneurysm or intracardiac thrombus.

Aspirin

Aspirin (75–150 mg once daily) should be prescribed for patients with the combination of heart failure and atherosclerotic arterial disease (including coronary heart disease).

Statins (hydroxymethylglutaryl-coenzyme A reductase inhibitors)

Patients with the combination of heart failure and known atherosclerotic vascular disease should receive statins only in accordance with current indications. Specific trials in this area are ongoing.

Inotropic agents (specialist use only)

Intravenous inotropic agents (such as dobutamine, milrinone or enoximone) should only be considered for the short-term treatment of acute decompensation of chronic heart failure. This will require specialist advice.

Calcium channel blockers

Amlodipine should be considered for the treatment of co-morbid hypertension and/or angina in patients with heart failure, but verapamil, diltiazem or short-acting dihydropyridine agents should be avoided.

Major co-morbidities that impact on the pharmacological management of heart failure

The presence of certain co-morbidities may affect the drugs that can be used for the treatment of heart failure, or increase the likelihood of side effects. The major co-morbidities that impact on the management of heart failure are summarised in Appendix b.

Concordance to pharmacological therapy

Dosing regimens should be kept as simple as possible, and the healthcare professional should ensure that the patient and carer are fully informed about their medication.

Lifestyle

Self – Management

Patients should be encouraged to self-manage their condition.

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 should be encouraged to:

- Make a daily record of their weight, on rising, after passing urine, prior to dressing and breakfast.
- 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 guidelines.

Dietary changes

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 (approx 4 pints / day)

Salt restriction

Salt restriction in heart failure should be encouraged.

- 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.

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

Weight reduction

Patients who are overweight or obese should be encouraged to have a healthy balanced diet, referral to dietician may be required for weight reducing advice.

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 smoking cessation service (quest).

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 retention due to volume.

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.

- CCF may cause erectile dysfunction.

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.

Immunisation

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

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:

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 patients should:

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

Driving regulations

Heavy Goods Vehicle and Public Service Vehicle licence:

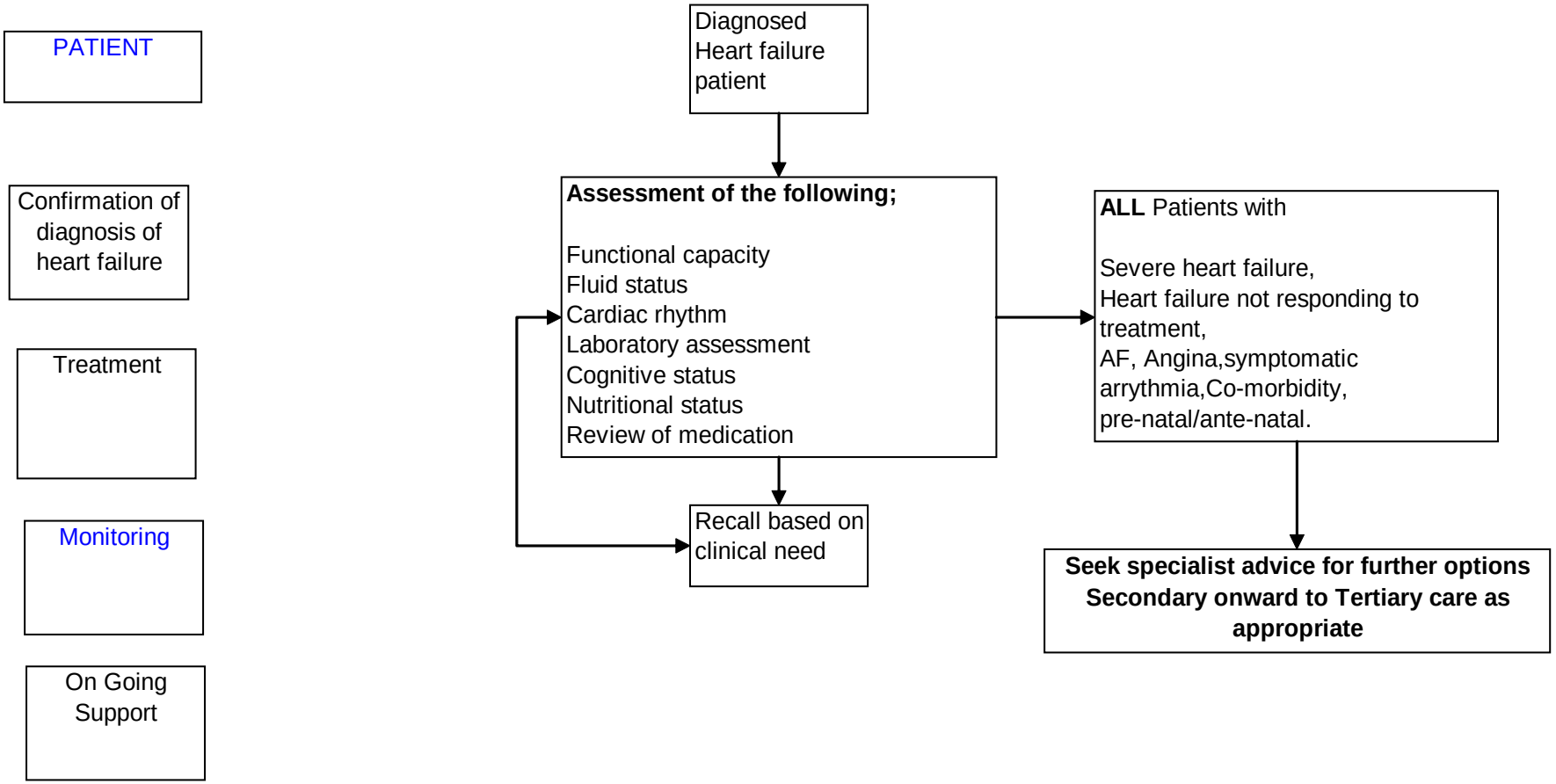
Physicians should be up to date with the latest Driver and Vehicle Licensing Authority guidelines. Check the website for regular updates: www.dvla.gov.uk/

Invasive procedures

Although drug therapy is the mainstay of treatment of heart failure, some patients will also benefit from diagnostic or interventional invasive procedures. These procedures are normally organised by a specialist.

If patients have LBBB **plus** an LV ejection fraction less than 35% they should be referred to a specialist as they may require resynchronisation therapy.

Monitoring of patients with Heart Failure



Monitoring of Patients With Heart Failure

Clinical review

All patients with chronic heart failure require monitoring. This monitoring should include:

- A clinical assessment of functional capacity,
- Fluid status,
- Cardiac rhythm (minimum of examining the pulse),
- Cognitive status and nutritional status
- A review of medication, including need for changes and possible side effects
- serum urea, electrolytes and creatinine *.

* This is a minimum. Patients with co-morbidities or co-prescribed medications will require further monitoring. Monitoring serum potassium is particularly important if a patient is taking digoxin or spironolactone.

More detailed monitoring will be required if the patient has significant co-morbidity or has deteriorated since the previous review.

The frequency of monitoring should depend on the clinical status and stability of the patient. The monitoring interval should be short (days to 2 weeks) if the clinical condition or medication has changed, but is required at least 6 monthly for stable patients with proven heart failure.

Patients who wish to be involved in monitoring of their condition should be provided with sufficient education and support from their healthcare professional to do this, with clear guidelines as to what to do in the event of deterioration.

At clinical review the following assessments should be made:

Assessment of functional capacity

Chiefly from history, but more objectively by use of NYHA Class, specific Quality-of-life questionnaires, 6 minute walk test, or maximal exercise test. NB Not all of these tests are likely to be necessary, or appropriate, at each assessment.

Assessment of fluid status

Chiefly by physical examination – changes in body weight, extent of jugular venous distension, lung crackles and hepatomegaly, extent of peripheral oedema, and lying and standing blood pressure (postural drop in blood pressure may indicate hypovolaemia).

Assessment of cardiac rhythm

Chiefly by clinical examination, but may require 12 lead electrocardiogram (ECG) or 24 hour electrocardiographic monitoring ('Holter') if suspicion of arrhythmia.

Laboratory assessment

Checking of serum biochemistry (urea, electrolytes, creatinine) is essential, but other tests (such as thyroid function, haematology, liver function, level of anticoagulation) may also be required depending on the medication prescribed and co-morbidity.

Recall Based On Clinical Need

Referral for more specialist advice

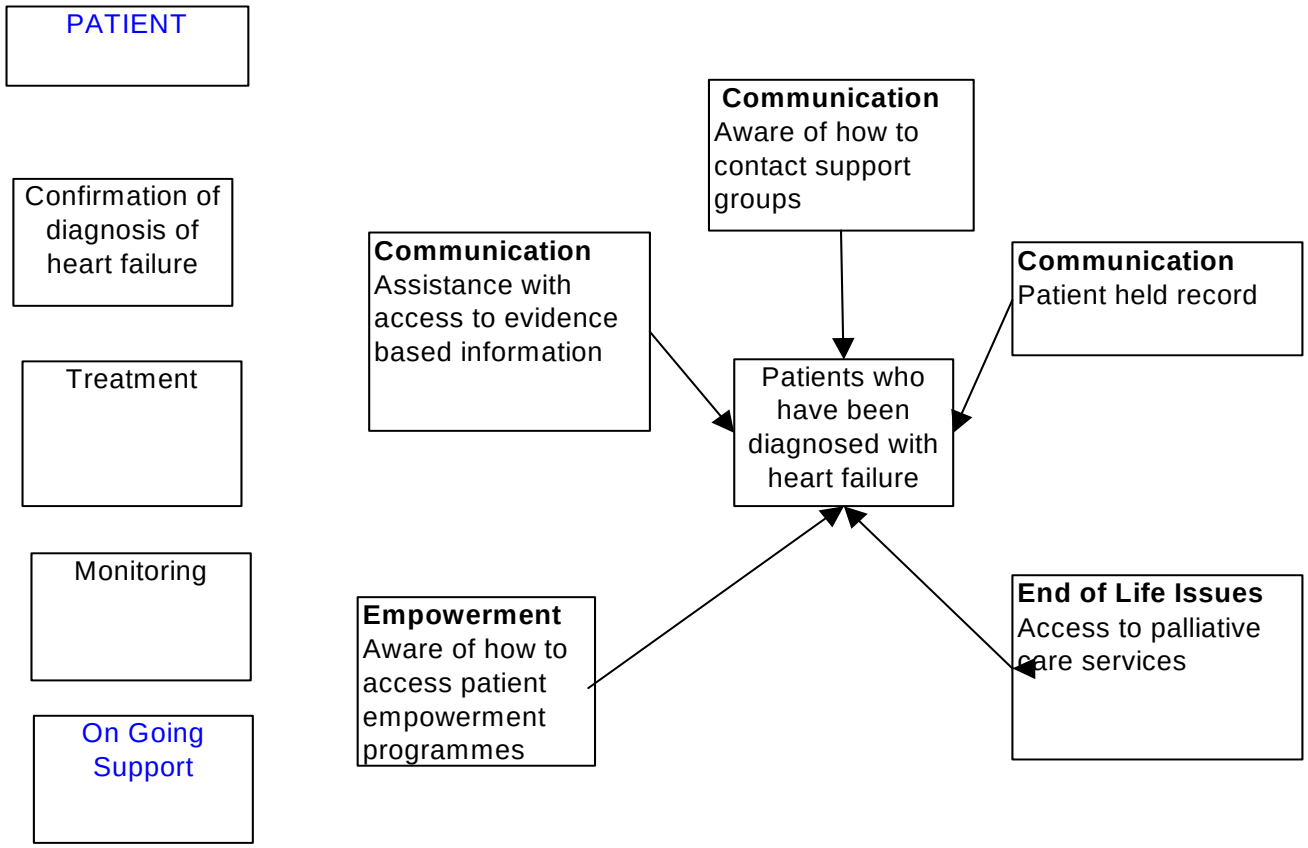
Patients with heart failure require further advice or referral in the following situations:

- Heart failure due to valve disease, diastolic dysfunction or any other cause except left ventricular systolic dysfunction, atrial fibrillation or other symptomatic arrhythmia.
- Women who are planning a pregnancy or who are pregnant.

The following situations also require referral:

- Severe heart failure.
- Heart failure that does not respond to treatment as discussed in this guideline and outlined in the algorithm.
- Heart failure that can no longer be managed effectively in the home setting.

Ongoing Support for Patients and Carers



Ongoing Support

Communication

- Good communication between healthcare professionals and patients and carers is essential for the best management of heart failure.

- The content, style and timing of information provision should be tailored to the needs of the individual patient including information literature. Eg BHF Leaflet, Specialist Heart Failure Nurse Information

- Information on access to patient forums.

- Management of heart failure should be seen as a shared responsibility between patient and healthcare professional.

End of life issues

There is substantial evidence for considerable unmet palliative needs of patients with heart failure and their informal carers. The main areas of need include symptom control, psychological and social support, planning for the future, and end of life care.

Issues of sudden death and living with uncertainty are pertinent to all patients with heart failure. The opportunity to discuss these issues should be available at all stages of care.

The palliative needs of patients and carers should be identified, assessed and managed at the earliest opportunity.

Clinical Audit

Clinical audit – the systematic assessment of the quality of care- is an essential component of modern high quality health care and an important component of clinical governance.

It is recommended that audit is undertaken as per the requirements of nGMS contract, National Service Framework CHD Chapter 6 and national and local requirements.

Appendix a

READ CODES

1. Diagnostic codes

a. The G58 set including;

I. G580 CCF
II. G581 LVF
III. G5810 acute LVF etc

In many software systems a search for G58 will pick up all of the lower level, more-specific daughter codes. The G5yy. set of 'Other ill defined heart disease' which would not be pulled out by a G58 search and include:

I. G5yy9 Left Ventricular systolic dysfunction
II. G5yyA Left Ventricular diastolic dysfunction

These codes are complemented by two recent additions listed b (iv) and (v) below.

2. Investigation Codes

a. Codes for blood test results, ECGs and chest x rays

I. 44AF BNP level
II. 32 ECG codes (too many to list)

b. Echo codes as part of the 5853 set

I. 58530 echo normal
II. 33BB LV ejection fraction
III. 58531 echo abnormal
IV. 58532 echo LV systolic dysfunction
I. 58533 echo LV Diastolic dysfunction

3. Screening codes

a. 1J60 HF suspected
b. 1O1 HF confirmed
c. 1T10 HF excluded

nb a full list of useful codes appendix g

Appendix b

Table 9 Major co-morbidities that impact on the management of heart failure

Co-morbidity	Comments
COPD/asthma/reversible airways disease	Beta-blockers are contraindicated in patients with **reversible** airways disease. The BNF states: 'beta-blockers should be avoided in patients with a history of asthma or chronic obstructive airways disease; if there is no alternative, a cardioselective beta-blocker may be used with extreme caution under specialist supervision'.
Renal dysfunction (eg serum creatinine > 200 µmol/l)	ACE inhibitors and angiotensin-II receptor antagonists may be contraindicated. Patient requires specialist assessment.
Anaemia	Anaemia is common in patients with moderate to severe heart failure and where due to the heart failure (and not other causes) treatment with erythropoeitin and iron therapy may improve symptoms and reduce the risk of hospitalisation for worsening heart failure.[164,165] The results of several large RCTs addressing this issue are awaited.
Thyroid disease	Severe thyroid dysfunction may cause or precipitate heart failure.
Peripheral vascular disease	Not an absolute contraindication to beta-blocker therapy. High index of suspicion for renal artery stenosis required.
Urinary frequency	Requires appropriate specialist referral. Alpha-blockers may cause hypotension or fluid retention, but are not absolutely contraindicated in patients with heart failure. Diuretics likely to be less well tolerated.
Gout	Avoid non-steroidal anti-inflammatory drugs. Gout can be exacerbated by diuretics and may have an atypical presentation in patients with heart failure. Colchicine may be useful for the treatment of an acute attack of gout. Allopurinol may be useful at reducing the risk of further attacks of gout, but should not be started at the time of an acute episode of gout.

Appendix c

Table 4 Diuretics (oral): dosages and side effects

Drug	Initial dose (mg)		Maximum recommended daily dose (mg)	
Loop diuretics				
Bumetanide	0.5–1.0		5–10	
Furosemide	20–40		250–500	
Torasemide	5–10		100–200	
Thiazides*				
Bendroflumethiazide (previously called bendrofluazide)	2.5		5	
Indapamide	2.5		2.5	
Metolazone	2.5		10	
Potassium-sparing diuretic	**+ACEI**	**–ACEI**	**+ACEI**	**–ACEI**
Amiloride	2.5	5	20	40
Triamterene	25	50	100	200

For **spironolactone**, see p 43

*May be effective when added to loop diuretics when fluid retention is resistant, but can promote dramatic diuresis and disturbance in fluid balance and electrolytes. Patients must be closely monitored and specialist advice is required.
ACEI: ACE inhibitor

Potassium sparing diuretics should be avoided if the patient is on an ACE inhibitor or ARB.

ALGORITHM FOR THE USE OF AN ACE INHIBITOR IN HEART FAILURE (NICE RECOMMENDATIONS 2003)

Appendix d

CONFIRMED LEFT VENTRICULAR SYSTOLIC DYSFUNCTION (Ejection fraction ≤40% on ECHO)

Check Urea & Electrolytes

PATIENT ADVICE

- Explain expected benefits
- Treatment is given to improve symptoms, to prevent worsening of heart failure
- Symptoms improve within a few weeks to months
- Advise patients to report principal adverse effects (ie dizziness/symptomatic hypotension, cough)

PROBLEM SOLVING

- Asymptomatic low BP does not usually necessitate any change in therapy
- If symptomatic hypotension consider stopping nitrates, calcium channel blockers (should be discontinued unless absolutely necessary) and other vasodilators
- If no sign/symptoms of congestion but symptomatic BP reduce diuretic
- Cough is common in heart failure; if not related to worsening pulmonary oedema, may be due to ACEI, however this rarely requires treatment discontinuation
- If troublesome cough that interferes with sleep and likely to be caused by ACE consider substituting angiotensin II receptor antagonist (Candesartan) for the ACE

WORSENING RENAL FUNCTION

- If urea and creatinine or K+ rise excessively, consider stopping concomitant NSAIDs, non essential vasodilators (eg calcium antagonists, nitrates) K+ supplements/retaining agents (Triamterene/amiloride) and, if no congestion, reducing the dose of diuretic
- If greater rises in K+ and creatinine persist, halve dose on ACE and blood chemistry to be rechecked, if still persistent seek specialist advice
- If K+ rises to ≥6.0mmol/l or creatinine by >100% or to above 350μmol/l ACE should be stopped and specialist advice sought

STEP ONE
INITIATION OF ACE

- Stop potassium supplements/potassium sparing diuretics (risk of hyperkalaemia) other than spironolactone
- Assess for hypokalaemia
- Seek specialist advice if patient on high dose of loop diuretic (eg furosemide 80mg)
- If possible, stop NSAIDs (risk of renal dysfunction)
- Start with low dose, see table
- U&E levels must be checked 7-10 days after INITIATION/UP TITRATION
- Double dose at not less than 2 weekly intervals
- Aim for target dose, see table
- Failing to achieve target dose, aim for highest tolerated dose.

Discuss with consultant before starting ACE Inhibitor in the following groups:

- Creatinine >200μmol/l
- Sodium <130mmol/l
- Known or suspected renal artery stenosis
- Systolic arterial pressure <100mmHg

STEP 2

- Check creatinine and electrolytes yearly
- Check for adverse effects:
  - Symptomatic hypotension
  - Renal dysfunction-rise in creatinine of 50% above baseline or 200μmol/l, whichever is the smaller, ≤ is acceptable
  - An increase in K+ to 5.9mmol/l is acceptable

LICENSED ACEI	STARTING DOSE (mg)	TARGET DOSE (mg)
Lisinopril	2.5-5.0mg once daily	30-35mg once daily
Ramipril	2.5mg once daily	5mg twice daily or 10mg once daily
Captopril	6.25mg three times daily	50mg-100mg three times daily
Enalapril	2.5mg twice daily	10mg-20mg twice daily
Perindopril	2mg daily	4mg daily

ALGORITHM FOR THE USE OF BETA-BLOCKERS IN HEART FAILURE (BASED ON NICE RECOMMENDATIONS 2003)

Appendix e

CONFIRMED LEFT VENTRICULAR SYSTOLIC DYSFUNCTION (Ejection fraction ≤40% on ECHO)

ADVICE TO PATIENTS

- Explain expected benefits
- Emphasis that treatment given is as much to prevent worsening of heart failure as to improve symptoms; Beta-blockers also increase survival
- If symptomatic improvement occurs, this will be slowly (3-6 months)
- Temporary symptomatic deterioration may occur (20-30% cases during initiation/up titration)
- Advise patient to report deterioration, this can usually be managed by adjustment of medication
- Patient should be advised not to stop medication without consulting their physician
- Patient should be encouraged to weigh themselves daily and consult GP if persistent weight gain

PROBLEM SOLVING

Worsening symptoms/signs (eg dyspnoea, fatigue, oedema, weight gain) **for immediate review:**

- If increasing congestion, double dose of diuretic/halve dose of Beta-blocker if diuretic does not work
- If marked fatigue and/or bradycardia, halve dose of Beta-blocker
- Review 1-2 weeks; if not improved seek specialist advice
- If serious deterioration, before stopping treatment, seek specialist advice

STEP 1
ASSESS WHETHER SUITABLE FOR TREATMENT

Contraindicated in asthma, severe COPD, Heart block, Sick Sinus Syndrome

- Clinically stable Heart Failure (NYHA I-IV)
- No signs of sodium and water retention (oedema, lung crackles, raised JVP or congestion on CXR or hepatic congestion)
- Commence in patient who is already receiving diuretic and ACE Inhibitor
- If on Beta-blocker for concomitant condition to continue on their current Beta-blocker or one alternatively licensed for heart failure
- Heart rate > 60 bpm perform ECG
- Systolic BP > 100mmHg
- No contraindications

STEP 2
SUITABLE FOR BETA-BLOCKER

- Start low and slow (as below)
- Monitor heart rate, BP, clinical status (symptoms, signs, especially signs of congestion, body weight)

STEP 3
TWO WEEKS LATER:

- Check blood electrolytes, urea and creatinine 1-2 weeks after initiation and 1-2 weeks after final dose titration
- Continue to monitor heart rate, BP and clinical status
- Aim for target dose or, failing that, the highest tolerated dose

BISOPROLOL DOSE

1.25mg daily for at least one week
2.5mg daily for at least one week
3.75mg daily for at least one week
5mg daily for at least one week
7.5mg daily for at least one week
10mg thereafter

CARVEDILOL DOSE

3.125mg twice daily for minimum 2 weeks.
6.25mg twice daily minimum 2 weeks.
25mg twice daily maintenance for those weighing <85kg and if severe heart failure.
50mg maintenance dose for those weighing >85kg with mild to moderate heart failure.

Appendix f

ALGORITHM FOR THE USE OF SPIRONOLACTONE IN HEART FAILURE (NICE RECOMMENDATIONS 2003)

CONFIRMED LEFT VENTRICULAR SYSTOLIC DYSFUNCTION
(Ejection fraction ≤35% on ECHO)
(NOTE: LOWER LVEF THAN IN OTHER TREATMENTS)

SPIRONOLACTONE CONTRAINDICATION

- Serum potassium >5.0mmol/l at initiation
- Discuss with cardiologist if mild to moderate renal impairment (creatinine >130μmil/l)

DISCONTINUE SPIRONOLACTONE OR TEMPORARILY STOP

- Potassium rises to ≥6.0mmol/l or creatinine to >200μmol/litre
- Patient develops diarrhoea &/or vomiting (or other cause of sodium and water loss)

REDUCE SPIRONOLACTONE OR CONSIDER ALTERNATE DAY THERAPY OR REDUCING OTHER POTASSIUM SPARING DIURETIC IF:

- Potassium raises to 5.5 - 5.9mmol/l or creatinine rises to 200μmol/l reduce to 25mg on alternate days and monitor blood chemistry closely
- If BP falls excessively and in a sustained way
- Patient exhibits sustained weight loss once optimal weight achieved
- Patient develops painful gynaecomastia

STEP 1
ASSESS WHETHER SUITABLE FOR SPIRONOLACTONE

- Current symptomatic heart failure (NYHA III-IV)
- Already on ACE Inhibitor ,Beta Blockers, diuretics &/or Digoxin

No evidence of hypovolaemia
Check creatinine and electrolytes and review use of potassium sparing diuretics

- Consider stopping potassium supplements and potassium sparing diuretics prior to initiation
- Continue ACE Inhibitor, loop diuretics, Digoxin and Beta-blockers if also prescribed

STEP 2
PATIENT SUITABLE FOR SPIRONOLACTONE INITIATION

- Commence at 25mg daily (or lower dose if concerned)
- Increase to 50mg daily if persistent symptoms and no problems, eg hyperkalaemia

STEP 3
MONITORING

- Repeat blood chemistry after 1 week
- Then after at 4, 8, 12 weeks
- Then repeat at 6, 9, 12 months
- Thereafter at 6 monthly intervals

ADVICE TO PATIENTS

- Explain expected benefits
- Treatment is given to improve symptoms, prevent worsening Heart Failure and increase survival
- Symptom improvement occurs within a few weeks to few months of starting treatment
- Avoid NSAIDs not prescribed by a physician (self-purchase 'over the counter' treatment, eg ibuprofen)
- Temporarily stop Spironolactone if diarrhoea and/or vomiting and contact physician

Appendix g

East Lancashire CHD & OAD Templates

PRIMIS TEAM

Description	Read Code
Heart Failure	G58
Congestive Heart Failure	G580
Acute CHF	G5800
Chronic CHF	G5801
Decompensated Cardiac Failure	G5802
Compensated Cardiac Failure	G5803
Left Ventricular Failure	G581
Acute LVF	G5810
Acute Heart Failure	G582
Heart Failure NOS	G58z
Left Ventricular systolic dysfunction	G5yy9
Left Ventricular diastolic dysfunction	G5yyA

CHD Medication Review - BWDPTCV1

Description	Read Code
All have the option to add free text i.e. why	
Aspirin OTC	8B3T
Aspirin C/I	8I24
Aspirin refused	8I38
Aspirin advice	67I8
Statins C/I	8I27
Statin Declined	8I3C
Statin Not indicated	8I63
Beta Blocker C/I	8I26
Beta Blocker Refused	8I36
Beta Blocker Not indicated	8I62
Ace Inhibitor C/I	8I28
Ace Inhibitor declined	8I3D
Ace Inhibitor not indicated	8I64

FH: Cardiovascular Disease - 12C

Description	Read Code
FH codes allow details of 2 family members	
Ethnic Group	9S
FH: IHD <60	12C2
FH: IHD >60	12C3
No FH: IHD	1226
FH: CVA/stroke	12C4

CHD Test - BWDPTCH2

Description	**Read Code**
ECG (only 24 hr, exercise, 12 lead, normal, abnormal, Amb norm & abnorm)	32
Ultrasound Heart Scan	5853
Hb estimation	423
HbA1c level (DCCT aligned)	42W4
Serum Free T3 Level	442U
Serum Free T4 level	442V
Serum TSH level	442W
Serum Total Bilirubin Level	44EC
Total Alkaline Phosphatase	44F3
ALT/SGPT – Serum Level	44G3
Serum gamma-glutamy transferase level	44G9
Serum Potassium	44I4
Serum Sodium	44I5
Serum Creatinine	44J3
Serum Urea	44J9
Serum Cholesterol	44P
Serum HDL Cholesterol level	44P5
Serum LDL Cholesterol level	44P6
Serum Triglycerides	44Q
Plasma Glucose Level	44g
Plasma Fasting Glucose Level	44g1
Plasma Random Glucose	44g0

CLASP score - 388C

Description	Read Code
CLASP angina score	388F
CLASP SOB score	388H
CLASP ankle score	388G

CHD Monitoring - 662N

Description	**Read Code**
Medication Satisfactory	8B3E1
Alcohol Intake	136
Health Education - Alcohol	6792
(what)	
Smoking Status	(See sheet)
Chews Tobacco	137W
Not interested in stopping smoking	137d
Other smoking information	(See sheet)
Referral to Stop smoking clinic	8HTK
Health Education – Smoking	6791
(what)	
Exercise Grading	138
Exercise on Prescription	8BAH
Cardiac Rehabilitation	8F9
Health Education - Exercise	6798
(what)	
Patient initiated diet	13A
Health Education - Diet	6799
(what)	
Height	229
Weight	22A
BMI	22K
Ideal Weight	66CB
O/E – Pulse Rate	242
O/E - Pulse Rhythm (options Regular, irregular, Reg irreg)	243
BP - Systolic	2469
- Diastolic	246A
Urine test for glucose	466
Urine test for protein	467

Patient Referred to GP	**8H62**
Blood Sample Taken	41D0
Treatment Plan Given (Action Plan)	8BC1
What	Free text
CHD Monitoring	662N
CHD annual review	6A2
Flu vaccination	65E
Place of procedure & Batch no	
No consent for Flu vac	68NE
Pneumo Vac Given	65720
Place of procedure & Batch no	
No consent for pneumoccal vac	68NX

Smoking Status Options

Passive Smoker	137I
Current Non-Smoker	137L
Current Non-smoker	137L
Never Smoked	1371
Ex-Smoker	137S
Ex-Smoker	137S
Ex-Trivial (<1/day)	1377
Ex-Light (1-9/day)	1378
Ex-moderate (10-19/day)	1379
Ex-heavy (20-39/day)	137A
Ex-Very heavy (40+/day)	137B
Ex-smoker - amount unknown	137F
Stopped smoking	137K
Ex Pipe Smoker	137N
Ex cigar smoker	137O
Ex-roll ups	EGTON1027
Ex-cigarette smoker	EGTON322
Current Smoker	137R
Current Smoker	137R
Pipe Smoker	137H
Cigar Smoker	137J
Rolls own cigarettes	137M
Cigarette Smoker	137P
Current smoker	Egton1025
Smoker (Read Codes)	EMISSMRE1

Other Smoking Information Options

Other Smoking Information	EMISOTS1
Keeps trying to stop smoking	137C
Admitted tobacco consumption untrue	137D
Tobacco consumption unknown	137E
Trying to give up smoking	137G
Smoking started	137Q
Date ceased Smoking	137T
NOS	137z
Smoking Age	EGTONSM2

References and Acknowledgments

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