Heart failure - primary care

Background information

Information resources for patients and carers

Updates to this care map

Heart failure (HF) signs and symptoms

RED FLAG!

Refer immediately to A&E

Go to HF - acute inpatient management

Measure B-type natriuretic peptide (BNP) levels

BNP raised

BNP normal

Refer directly for OP ECHO within 2 weeks

Refer to one-stop clinic (Royal Derby Hospital only)

Confirmed diagnosis

Add patient to primary care HF register

Left ventricular systolic dysfunction (LVSD) or HF with reduced ejection fraction (HFREF)

LVSD with uncontrolled arrhythmia, significant valve disease, angina, or young patient

Suspected HF with normal ejection fraction (HFNEF), or diastolic failure

Consider possible other causes of symptoms in primary care

Manage in primary care

Management difficult - consider referral as appropriate

Go to HF - specialist management

Refer to HF specialist nurse (HFSN)

Refer to secondary care outpatient cardiology consultant with interest in HF

Go to HF - specialist management

Refer to secondary care outpatient cardiology consultant with interest in HF

Go to HF - specialist management

Refer to one-stop clinic (Royal Derby Hospital only)

Updates to this care map

This care map was published by . A printed version of this document is not controlled so may not be up-to-date with the latest clinical information.
1 Background information

Quick info:

Scope:

• assessment and emergency management of acute heart failure (HF) in adults (age 18 years and older)
• diagnosis, assessment, and management of chronic HF in adults (age 18 years and older), including:
  • pharmacological therapies
  • invasive procedures, such as cardiac resynchronisation and implantable cardioverter defibrillator (ICD) insertion
  • monitoring of disease progression
  • consideration of cardiac rehabilitation and end-of-life issues

Out of scope:

• assessment and management of HF in:
  • children and adolescents (under age 18 years)
  • pregnant women
• 'right-sided' HF
• management of specific causes of HF

Definition [1]:

• HF is a complex clinical syndrome of symptoms and signs that suggest impairment of the heart as a pump supporting physiological circulation
• caused by structural or functional abnormalities of the heart

Classification [1]:

• New York Heart Association (NYHA) class I:
  • includes asymptomatic left ventricular systolic dysfunction (LVSD)
  • ordinary physical activity does not cause fatigue, breathlessness, or palpitation
• NYHA class II:
  • symptomatically 'mild' HF
  • slight limitation of physical activity
  • ordinary physical activity may result in fatigue, palpitation, breathlessness, or angina pectoris
• NYHA class III:
  • symptomatically 'moderate' HF
  • patient is comfortable at rest, but ordinary physical activity will lead to symptoms
• NYHA class IV:
  • symptomatically 'severe' HF
  • symptoms of cardiac failure are present even at rest

Potential causes include [1]:

• conditions that damage heart muscle or limit its ability to function normally, such as:
  • coronary artery disease (CAD) – accounts for about 70% of all HF cases [2]
  • hypertension
  • cardiomyopathies
  • endocrine conditions, eg diabetes mellitus (DM), hypothyroidism, hyperthyroidism, Cushing's syndrome, adrenal insufficiency, excessive growth hormone, phaeochromocytoma
  • infiltrative conditions, eg sarcoidosis, amyloidosis, haemochromatosis, connective tissue disease
  • HIV infection
  • end-stage renal failure
• conditions that reduce cardiac output, such as:
  • increased vascular resistance with hypertension
  • abnormal heart rhythm, eg atrial fibrillation (AF)
  • aortic stenosis
• pericardial disease
• obstructive sleep apnoea
• conditions that result in a high cardiac output, such as:
  • anaemia
  • thyrotoxicosis
  • septicaemia
  • liver failure
  • arteriovenous shunts
  • Paget’s disease
  • thiamine (vitamin B1) deficiency
• medications, such as:
  • beta-blockers, calcium-channel blockers, and antiarrhythmics interfere with the heart’s rhythm
  • cytotoxic agents, eg anthracyclines and trastuzumab, can result in cardiomyopathy
  • toxins, eg alcohol, mercury, cobalt, arsenic, cocaine

Incidence and prevalence:
• around 900,000 people in the UK today have HF – with almost as many with damaged hearts but, as yet, no symptoms of HF [1]
• both incidence and prevalence of HF increase steeply with age [1]:
  • average age at first diagnosis is 76 years
• HF affects approximately:
  • 1 in 35 people between age 65-74 years
  • 1 in 15 people between age 75-84 years
  • 1 in 7 people age 85 years and older
• HF currently accounts for [2]:
  • 2% of all hospitalised bed-days
  • 5% of all medical emergency admissions
• the prevalence of HF is expected to rise through a combination of [1]:
  • improved survival of people with ischaemic heart disease
  • more effective treatments for HF
  • the effects of an ageing population

Risk factors:
• age [1]
• cardiac diseases [1]
• CAD [1]
• myocardial infarction (MI) [1]
• smoking [3]
• hypertension [1]
• family history of HF [1]
• hypercholesterolaemia [4]
• male gender – although risk of HF is higher in men, there are more women than men with HF due to population demographics [1]
• ethnic background [1]:
  • people of African or Afro-Caribbean origin are more likely to develop HF due to hypertension rather than CAD
  • people of Asian origin have a greater risk of developing HF due to CAD, often accompanied by obesity and DM

Prognosis:
• 30-40% of patients diagnosed with HF die within a year, after which mortality risk drops to less than 10% per year [1]
• five year survival rate is estimated at 58% [1]
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• prognosis for people with HF and preserved left ventricular ejection fraction (LVEF) is a little better than for people with HF and reduced ejection fraction [2]
• younger patients tend to do better, as do patients with no co-morbidities [1]
• HF has a major impact on quality of life (QoL) and is associated with mood disorders [1]

NB: This information appears on each page of this care map.

References:

2 Information resources for patients and carers

Quick info:
The following resources have been produced by organisations certified by The Information Standard:
• 'Heart failure' (URL) from Blood Pressure Association at http://www.bpassoc.org.uk
• 'Heart failure' (URL) from Bupa at http://www.bupa.co.uk
• 'Heart failure and oedema' (URL) from Datapharm at http://www.medguides.medicines.org.uk
• 'Understanding NICE guidance: Chronic heart failure' (PDF) from the National Institute for Health and Clinical Excellence (NICE) at http://www.nice.org.uk
• 'Heart failure' (URL) from Patient UK at http://www.patient.co.uk

Information for carers and people with disabilities is available at:
• 'Caring for someone' (URL) from Directgov at http://www.direct.gov.uk
• 'Disabled people' (URL) from Directgov at http://www.direct.gov.uk

Patient stories describing their care journeys are available at 'Healthtalkonline' (URL) from DIPEx at http://www.healthtalkonline.org

Explanations of clinical laboratory tests used in diagnosis and treatment are available at 'Understanding Your Tests' (URL) from Lab Tests Online-UK at http://www.labtestsonline.org.uk.

NB: This information appears on each page of this care map.

3 Updates to this care map

Quick info:
Date of publication: 18-Mar-2011

This care map was created in line with the following references:
4 Heart failure (HF) signs and symptoms

Quick info:
Heart failure (HF) can present:
- acutely, as acute HF or decompensated chronic HF with rapid onset of severe symptoms and signs that may include [4]:
  - dyspnoea (shortness of breath) [1]:
    - at rest or upon minimal activity
  - orthopnoea
  - paroxysmal nocturnal dyspnoea (PND)
  - associated symptoms, eg chest pain, palpitations, altered consciousness [4]
- over a longer period of time, as chronic HF with non-specific symptoms such as [1]:
  - dyspnoea of variable severity
  - peripheral oedema
  - fatigue
  - ankle swelling
  - nocturia
  - anorexia
  - abdominal bloating and discomfort
  - constipation
  - cerebral symptoms such as confusion, dizziness and memory impairment
- without symptoms, eg as an incidental finding of impaired left ventricular (LV) function on an echocardiogram [1]

Complications of HF include [2]:
- arrhythmias:
  - occur commonly in people with HF at any stage
  - the prevalence of atrial fibrillation (AF) increases with the severity of HF, increasing from about a 10% incidence in people with mild/moderate HF to 50% in people with severe HF
  - it is unclear whether AF is an independent predictor of mortality in people with HF
- cachexia:
  - a serious complication of chronic HF
  - usually occurs together with severe dyspnoea and weakness
  - life expectancy for HF with cachexia is worse than that for most cancers
- depression - up to a third of people with HF develop severe and prolonged depression
- sexual dysfunction:
  - common in people with HF
  - may be related to cardiovascular disease, fatigue, weakness, medications, depression, or anxiety

References:

5 RED FLAG!

Quick info:
Signs and symptoms suggestive of acute heart failure (HF), decompensated chronic HF, or other cardiac event require immediate transfer to hospital for emergency treatment [4].

Indications for immediate referral include [4]:

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• acute pulmonary oedema – suggested by crepitations throughout the lung
• severe dyspnoea (shortness of breath) or respiratory distress, indicated by:
  • sudden onset of dyspnoea
  • dyspnoea present at rest
  • orthopnoea
  • increased respiratory rate
  • oxygen saturation of less than 90%
  • agitation
• associated chest pain or palpitations:
  • tachycardia or tachyarrhythmia, eg fast atrial fibrillation (AF)
  • ECG changes suggestive of:
    • ischaemia or infarct
    • arrhythmia, particularly if there is haemodynamic instability
• general signs of hypoperfusion:
  • cool, clammy skin
  • cyanosis or pallor
• syncope, dizziness, or altered level of consciousness
• associated haemoptysis or frothy pink sputum
• generalised oedema

Reference:

7 Measure B-type natriuretic peptide (BNP) levels

Quick info:
Natriuretic peptides [2]:
• B-type natriuretic peptide (BNP) is a cardiac neurohormone that:
  • increases renal excretion of sodium and water
  • relaxes vascular smooth muscle, leading to vasodilation
• N-terminal pro-B-type natriuretic peptide (NT-proBNP):
  • the inactive prohormone of BNP
  • secreted from the ventricles in response to volume expansion and pressure overload

Interpreting BNP and NT-proBNP levels:
• HF is unlikely if levels of BNP or NT-proBNP are low or normal in an untreated person [2]
• increased levels of BNP or NT-proBNP are not used exclusively to diagnose HF because levels are also known to [2]:
  • increase with age
  • differ between men and women
  • be affected by co-morbidities, eg renal failure, and pharmacological treatments
• the following are known to reduce BNP levels [1]:
  • obesity
  • treatment with:
    • diuretics
    • angiotensin-converting enzyme (ACE) inhibitors
    • beta blockers
    • angiotensin II receptor antagonists (ARBs)
    • aldosterone antagonists
• the following are known to increase BNP levels [1]:
- left ventricular hypertrophy (LVH)
- ischaemia
- tachycardia
- right ventricular (RV) overload
- hypoxaemia, including pulmonary embolism (PE)
- renal dysfunction – indicated by a eGFR of less than 60mL/minute
- sepsis
- chronic obstructive pulmonary disease (COPD)
- diabetes mellitus (DM)
- age of more than 70 years
- cirrhosis of the liver
- BNP levels are therefore generally only used to exclude HF [2]
- level of serum natriuretic peptide does not differentiate between HF due to left ventricular systolic dysfunction (LVSD) and HF with preserved left ventricular ejection fraction (LVEF) [1]

References:

8  BNP raised

Quick info:
Raised natriuretic peptide levels are defined as either of the following [1]:
- serum B-type natriuretic peptide (BNP) level of 100-400pg/mL (29-116pmol/L)
- N-terminal pro-B-type natriuretic peptide (NT-proBNP) level of 400-2000pg/mL (47-236pmol/L)

High levels are defined as either of the following [1]:
- BNP level above 400pg/mL (116pmol/L)
- level above 2000pg/mL (236pmol/L)

Be aware that very high BNP levels carry a poor prognosis [1].

Reference:

9  BNP normal

Quick info:
Patients with normal natriuretic peptide levels are unlikely to have heart failure (HF) – differential diagnoses should be considered in these patients [1].
Normal levels are defined as either of the following [1]:
- serum B-type natriuretic peptide (BNP) level of less than 100pg/mL (29pmol/L)
- N-terminal pro-B-type natriuretic peptide (NT-proBNP) level of less than 400pg/mL (47pmol/L)

Reference:

10  Refer directly for OP ECHO within 2 weeks

Quick info:
Perform transthoracic Doppler 2D echocardiography to [1]:
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Derbyshire local pathways > Cardiology > Heart failure

• exclude important valve disease
• assess the systolic and diastolic function of the left ventricle
• detect intracardiac shunts

Consider alternative methods of imaging the heart when a poor image is produced by transthoracic Doppler 2D echocardiography, including [1]:
• transoesophageal Doppler 2D echocardiography
• radionuclide angiography
• cardiac magnetic resonance imaging

For all patients [1]:
• assess severity of symptoms and classify HF according to New York Heart Association (NYHA) classifications – see 'Background information' node
• check patient’s functional capacity, fluid status, cardiac rhythm (minimum of examining the pulse), cognitive status and nutritional status
• review current medication – consider the need for changes and possible side effects
• measure serum urea, electrolytes, creatinine, and eGFR levels

Reference:

11 Refer to one-stop clinic (Royal Derby Hospital only)

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Perform transthoracic Doppler 2D echocardiography to [1]:
• exclude important valve disease
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• check patient’s functional capacity, fluid status, cardiac rhythm (minimum of examining the pulse), cognitive status and nutritional status
• review current medication – consider the need for changes and possible side effects
• measure serum urea, electrolytes, creatinine, and eGFR levels

Reference:

14 Left ventricular systolic dysfunction (LVSD) or HF with reduced ejection fraction (HFREF)

Quick info:
Left ventricular systolic dysfunction (LVSD) [2]:
• just over half of all heart failure (HF) patients are found to have LVSD, eg reduced left ventricular ejection fraction (LVEF), on echocardiography
• there is no agreement on what level should be used to separate normal from abnormal LVEF – the usual cut-off is about 40-50%

Reference:
most people with reduced LVEF also have diastolic dysfunction

Management of LVSD [4]:

• aims of treatment are to:
  • maintain quality of life (QoL)
  • reduce morbidity and functional limitations to prevent disease progression
  • reduce mortality
• the three principle treatment approaches involve:
  • lifestyle modifications
  • targeted pharmacological therapy
  • treatment of co-morbidities
• non-pharmacological intervention may need to be considered depending on response to treatment and co-morbidities

References:

16 Suspected HF with normal ejection fraction (HFNEF), or diastolic failure

Quick info:
Heart failure with preserved ejection fraction (HFPEF):
• between 35-50% of people with heart failure (HF) have a normal left ventricular ejection fraction (LVEF) on echocardiography [3]
• in most cases, HFPEF is probably caused by diastolic dysfunction, due to decreased left ventricular (LV) filling, with abnormal LV relaxation or distensibility during diastole [2]
• preserved LVEF is no indication of improved mortality – hospitalisation rates are approximately equivalent to those with HF due to LVSD [4]
• elderly females with hypertension, ischaemic heart disease (IHD) or diabetes typify this diagnostic classification [4]

Consider the underlying cause of HFPEF, which has a wide range of differentials [4]:
• demonstrated LV hypertrophy:
  • hypertensive cardiomyopathy – the most common cause
  • aortic stenosis or coarctation
  • infiltrative or restrictive cardiomyopathy
• no LV hypertrophy:
  • ischaemic HF
  • mitral stenosis
  • aortic or mitral regurgitation
• right ventricular dysfunction, eg pulmonary hypertension (cor pulmonale) or right sided myocardial infarction (MI)
• LV dilatation
• high output HF, eg anaemia, hyperthyroidism
• pericardial constriction or tamponade
• infiltrative or restrictive cardiomyopathy

Management of HFPEF:
• should be targeted towards control of contributing co-morbidity [4]:
  • maintain blood pressure (BP) in patients with hypertension below the lower limit target of 130/80mmHg
  • IHD frequently co-exists – it is an adverse predictor of mortality and patients should be investigated and treated in accordance with current guidance
  • rhythm or rate control therapy as appropriate in patients with atrial fibrillation (AF) – see ‘Atrial fibrillation’ care map
  • consider the use of diuretics, eg loop diuretic or thiazide, in patients with pulmonary or systemic congestion as with HF due to LV dysfunction – although excessive diuresis may have an adverse effect in terms of cardiac output and renal function [4]
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• the most reliable evidence for the management of patients with preserved LV systolic function is for the use of angiotensin II receptor blockers [1]:
  • the CHARM Preserved study found that candesartan had favourable, but not significant, effects on cardiovascular mortality and HF hospitalisation rates [3]
  • should not be initiated if valve disease is suspected [4]
• beta blockers and rate limiting calcium antagonists are also often used although the evidence base is not robust enough to recommend these treatments [3]
• consider the addition of beta blockers in patients [4]:
  • with a history of hypertension or MI
  • who require a rate control treatment strategy for AF

References:

17 Consider possible other causes of symptoms in primary care

Quick info:
Consider the following conditions associated with shortness of breath [1]:
• respiratory conditions, such as:
  • chronic obstructive pulmonary disease (COPD)
  • asthma
  • pneumonia
  • pulmonary embolism (PE)
  • sleep apnoea [4]
• cancer
• obesity – see 'Obesity in adults' care map
• volume overload from:
  • renal failure
  • nephrotic syndrome
• angina – see 'Stable angina' care map
• severe anaemia
• psychogenic causes, eg anxiety
• being unfit
Consider the following conditions associated with peripheral oedema [1]:
• dependent oedema that is not pathological, eg from prolonged inactivity
• nephrotic syndrome
• medications, eg dihydropyridine calcium-channel blockers, non-steroidal anti-inflammatory drugs (NSAIDs)
• hypoalbuminaemia, eg from renal or hepatic disease
• venous insufficiency

References:

18 Manage in primary care
Quick info:
See local info tab.
Overview

This document describes the provenance of Derbyshire Health Community’s Heart failure care map.

This care map has been localised by Derbyshire Health Community, under the lead of Anne Hayes, NHS Derbyshire County Public Health Specialist. The care map has been reviewed by Derbyshire stakeholders and has been approved by the Health Community-wide Clinical Effectiveness and Guideline Group (CEGG).

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Editorial methodology

The Map of Medicine Editorial Team have undertaken the localisation editing of the care map. The text is based on the Map of Medicine international care map, which was created in line with the Map of Medicine editorial methodology.