Chronic heart failure - advanced therapies
A-Z Frankston-Mornington Peninsula local pathways > Heart failure > Heart failure

Consider the following non-pharmacological interventions where appropriate:

- Cardiac resynchronisation therapy
- Implantable cardioverter defibrillator (ICD)
- Other surgical options
- Consider cardiac transplantation
- Terminal care for refractory or end-stage HF
- Go to end of life - early identification

Key messages

Information resources for patients and carers

Care map information
1 Care map 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

Out of scope:
- assessment and management of HF in:
  - children and adolescents under age 18 years
  - pregnant women
- management of specific causes of HF

Definition [3]:
- 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 (NYHA):
New York Heart Association (NYHA) classes used in pathway (see classification node)

Potential causes include:
- conditions that damage heart muscle or limit its ability to function normally, such as:
  - coronary artery disease (CAD) – accounts for about two-thirds of all systolic HF cases [4]
  - hypertension [4]
  - cardiomyopathies [4]
  - endocrine conditions, eg:
    - diabetes mellitus
    - 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 (severe)
  - severe mitral regurgitation pericardial disease [4]
  - obstructive sleep apnoea (OSA)
- conditions that result in a high cardiac output, such as:
  - anaemia [4,5]
  - thyrotoxicosis [4,5]
  - septicaemia [4,5]
  - liver failure
• arteriovenous shunts [4,5]
• Paget's disease of the bone [4,5]
• thiamine (vitamin B1) deficiency [4,5]
• medications that may exacerbate HF, such as:
  • agents that can adversely affect conduction, eg anti-arrhythmic agents, heart-rate slowing calcium-channel blockers, and beta-blockers
  • some calcium-channel blockers that are negatively inotropic, eg nifedipine, verapamil, diltiazem
• toxins, eg:
  • alcohol
  • mercury
  • cobalt
  • arsenic
  • cocaine

Incidence and prevalence:
• around 300,000 (1.5-2%) Australians are living with HF, with around 30,000 diagnosed each year [1,2]
• both incidence and prevalence of HF increase steeply with age [3]. Prevalence is expected to rise through a combination of:
  • improved survival of people with ischaemic heart disease (IHD)
  • more effective treatments for HF
  • an ageing population
• among Aboriginal and Torres Strait Islander people, chronic heart failure is 1.7 times more common, occurs at a younger age, and rate of preventable CHF related hospitalisations is three times higher than among non-indigenous Australians [2]
• more than 45,000 Australians were hospitalised with HF between 2009-2010, equating to more than 360,000 bed-days [1]
• two thirds of CHF hospitalisations in Australia are considered to be preventable
• between 20-27% people with HF will be readmitted to hospital within one month of being discharged [1,2]
• CHF and complications arising are in the top five ambulatory care sensitive conditions in the Frankston Mornington Peninsula catchment
• HF currently accounts for
  • 2% of all hospitalised bed-days
  • 5% of all medical emergency admissions (check aust data)

Prognosis (Australian Heart Foundation statistics):
• 20-30% of patients diagnosed with mild-moderate HF, and 50% of people diagnosed with severe HF die within one year [1]
• 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
• younger patients tend to do better, as do patients with no co-morbidities [3]
• HF has a major impact on quality of life (QoL) and is associated with mood disorders [3]

References:
1. National Heart Foundation media release 2014 (archived)

2 Information resources for patients and carers
Quick info:
The National Heart Foundation is generally the best source for evidence-based information resources for clinicians and patients.

**Recommended Australian Consumer resources:**
- Living well with Chronic Heart Failure (24 pgs, available in multiple languages) includes "Chronic heart failure action plan" for patients
- Heart online (extensive range of resources incl videos, documents and online calculators)
- Aboriginal health resources for heart disease

**International Resources**
- Heart Failure matters - European website with patient education materials
- American Heart Association - patient education materials

UK Recommended resources for patients and carers, produced by organisations certified by The Information Standard:
  - 'Heart failure' (URL) from Bupa at [http://www.bupa.co.uk](http://www.bupa.co.uk)
  - 'Heart failure' (PDF) from Patient UK at [http://www.patient.co.uk](http://www.patient.co.uk)
  - 'Chronic heart failure; management of chronic heart failure in adults' from National Institute for Health and Care Excellence (NICE) at [http://www.nice.org.uk](http://www.nice.org.uk)

For details on how these international resources are identified, please see Map of Medicine's document on Information Resources for Patients and Carers (URL).

**Clinician Guidelines for heart failure - National Heart Foundation Guidelines and Resources:**
- Guidelines for the prevention, detection and management of heart failure in Australia National Heart foundation 2011
- Quick Reference Guide: Diagnosis and Management of Chronic Heart Failure
- MJA journal article summarising National Heart Foundation guidelines for CHF
- Multidisciplinary Care for people with CHF
- Heart Online website

**Additional clinical guidelines for cardiac rehab:**
- Recommended framework for Cardiac Rehabilitation
- Reducing risk in Heart Disease
- Practitioners guide to Cardiac Rehabilitation - ACHRA (requires membership)

### 3 Key messages

Quick info:

Best management of CHF reduces mortality & morbidity with reduced hospitalisation and better quality of life.
Echocardiography is the best test for diagnosis and assessment of heart failure.
Classification into systolic vs diastolic, and severity of heart failure, guides management and prognosis.
Treatment of comorbidities such as anaemia improves CHF symptoms.
Lifestyle education- exercise; salt reduction, fluid monitoring & weight management improves outcomes- consider HF rehabilitation services and Chronic disease management medicare items.
Avoid/cease drugs that worsen CHF.
Prescribe
  - diuretics for fluid overload
  - ACEI for all SHF-"start low go slow"
  - specific beta blockers titrated to highest doses for moderate/severe CHF
  - then titrate ACEI to effective doses
  - digoxin & nitrates & fish oil may help symptoms
  - spironolactone may be added for severe SHF

Refer to specialists early for severe, complicated or non responsive CHF, or where comorbidities affect management..

The quick reference guide derived from the Heart Foundation guidelines for management of heart failure summarises the key messages for heart failure management; [CHF guide](http://www.nice.org.uk).
The Heart Foundation fact sheet summarises the evidence supporting the need for optimal management of heart failure in Primary Care.
4 Heart failure (HF) - advanced therapies

Quick info:
Patients who remain refractory despite optimal treatment and persist with severe signs and symptoms may be candidates for non-pharmacological intervention:

- firstly, control features of systemic and pulmonary congestion as far as possible
- referral to tertiary care should be considered at an early stage if cardiac surgery, device therapy, or heart transplantation may be appropriate

Non-pharmacological intervention:
- patients may also be candidates for non-pharmacological intervention if:
  - there are specific indications, eg if they have suffered a cardiac arrest from ventricular tachycardia (VT) or ventricular fibrillation (VF)
  - they have wide QRS complexes – consider device therapy
  - they have severe heart failure (HF) and meet the strict indications for transplantation, if no contraindications are present
  - the stage at which non-pharmacological intervention should be considered depends upon the individual patient, co-morbidity, clinical expertise, and local resources:
    - these interventions are not appropriate in all cases
    - some interventions may be considered at an earlier stage in the treatment pathway
    - consider referral at an early stage to tertiary care if cardiac surgery, device therapy, or heart transplantation may be appropriate

6 Cardiac resynchronisation therapy

Quick info:
Cardiac resynchronisation therapy (CRT):

- may confer the following benefits:
  - improve left ventricular (LV) geometry [1]
  - improve papillary muscle synchrony
  - reduce mitral regurgitation [1]
  - reduce mortality in people with heart failure (HF) who are at high risk of ventricular arrhythmias [3]

CRT with pacing (CRT-P) [2]:
- also known as biventricular pacing
- involves implanting a pulse generator into the upper chest with three leads connecting to the right atrium (RA) and both ventricles
- device will resynchronise the contraction of the ventricles and improve pumping efficiency

CRT with a defibrillator device (CRT-D) [2]:
- combines CRT-P and implantable cardioverter defibrillator (ICD) devices
- defibrillates the heart internally in the event of an acute arrhythmic event and improves ventricular efficiency and blood flow

The National Institute for Health and Care Excellence (NICE) recommend the following for patients with HF who have LV dysfunction with a LV ejection fraction (LVEF) of 35% or less [2]:

- CRT-D for patients with:
  - NYHA class I and the following:
    - QRS interval of 150milliseconds or more with or without left bundle branch block (LBBB)
  - NYHA class II or III and either of the following:
    - QRS interval of 120-149milliseconds and LBBB
    - QRS interval of 150milliseconds or more with or without LBBB
- CRT-P for patients with:
  - NYHA class III and either of the following:
    - QRS interval of 120-149milliseconds and LBBB
    - QRS interval of 150milliseconds or more with or without LBBB
Chronic heart failure - advanced therapies
A-Z Frankston-Mornington Peninsula local pathways > Heart failure > Heart failure

- NYHA class IV with:
  - QRS interval of 120 milliseconds or more with or without LBBB

References:

7 implantable cardioverter defibrillator (ICD)

Quick info:
Implantable cardioverter defibrillator (ICD) [1]:
- small battery-powered device that is implanted under the skin just below the clavicle with leads inserting into the heart
- operates by sensing and analysing the heart's electrical activity and delivering electrical pulses or shocks to restore normal rhythm if necessary
- adverse events are mostly related to implantation-related complications, such as:
  - coronary vein dissection
  - coronary vein perforation
  - lead dislodgement
  - infection
  - death
- patients who experience defibrillator shocks may have adverse psychological symptoms, particularly anxiety

ICDs are recommended as a treatment option for the following patients [1]:
- those with a previous serious ventricular arrhythmia who do not have a treatable cause and who have:
  - survived a cardiac arrest due to either ventricular tachycardia (VT) or ventricular fibrillation (VF)
  - spontaneous sustained VT causing syncope or significant haemodynamic compromise
- sustained VT and all of the following:
  - no syncope or cardiac arrest; and
  - an associated left ventricular ejection fraction (LVEF) of 35% or less; and
  - heart failure (HF) no worse than New York Heart Association (NYHA) class III
- those who have a familial cardiac condition with a high risk of sudden death, such as:
  - long QT syndrome
  - hypertrophic cardiomyopathy
  - Brugada syndrome
  - arrhythmogenic right ventricular dysplasia
- those who have undergone surgical repair of congenital heart disease
- those with HF who have LV dysfunction with a LVEF of 35% or less who meet the following criteria:
  - NYHA class I, II, or III with any of the following:
    - QRS interval less than 120 milliseconds and at high risk of sudden cardiac death
    - QRS interval of 120-149 milliseconds without left bundle branch block (LBBB)
  - NYHA class I with:
    - QRS interval of 120-149 milliseconds; and
    - LBBB

References:
8 Other surgical options

Quick info:
Consider alternative surgical options if specifically indicated.

Coronary revascularisation:
- should not be routinely considered in patients with heart failure (HF) due to systolic left ventricular (LV) impairment, unless they have refractory angina [1]
- may relieve myocardial ischaemia, however there is no evidence to suggest an improvement in HF symptoms or outcome
- coronary artery bypass graft (CABG) may be recommended for patients with angina and [2]:
  - significant left main artery stenosis
  - two- or three-vessel coronary artery disease
- percutaneous coronary intervention (PCI) may be considered as an alternative to CABG in patients unsuitable for surgery [2]
- patients with LV systolic dysfunction (LVSD) have increased operative mortality and the risk/benefit balance should be considered

The choice between PCI and CABG should be made by the heart team, including a HF specialist, and be based on [2]:
- extent of coronary artery disease
- expected completeness of revascularisation
- associated valvular disease
- presence of co-morbidities

Other surgical techniques may also have a role [3]:
- mitral valve repair should be considered in patients with a primary indication for CABG and:
  - severe ischaemic mitral regurgitation and ejection fraction greater than 30%
  - moderate ischaemic mitral regurgitation, provided valve repair is feasible, and performed by experienced operators
- LV aneurysmectomy during CABG is indicated in patients with a large LV aneurysm

References:
2. McMurray JJ, Adamopoulos S, Anker SD et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the task force for the diagnosis and treatment of acute and chronic heart failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. Eur Heart J 2012; 33: 1787-847.

9 Consider cardiac transplantation

Quick info:
Cardiac transplantation may offer patients good outcomes:
- increased quality of life (QoL) [2]
- increased survival – 1-year survival of 80%, and 10-year survival of 50%

Consider transplantation for patients with:
- refractory severe chronic heart failure (HF) [1]
- refractory cardiogenic shock (supra-urgent listing) [1]
- refractory ventricular arrhythmias (supra-urgent listing) – very rare

Ensure patients being considered for transplantation are [2]:
- motivated, well informed, and emotionally stable
- capable of complying with the intensive treatment required post-operatively

Contraindications include [2]:
- significant renal failure
- recent thromboembolism
- liver disease
Chronic heart failure - advanced therapies

A-Z Frankston-Mornington Peninsula local pathways > Heart failure > Heart failure

- high, fixed pulmonary vascular resistance
- peptic ulcer disease
- alcohol or substance misuse
- emotional instability or untreated mental illness
- treated cancer during previous 5 years
- systemic disease with multi-organ involvement
- active infection
- other co-morbidity with poor prognosis
- advanced physiological age – risks of transplantation need to be carefully considered

Further considerations regarding cardiac transplantation:
- refer at an early stage if transplantation is a possibility
- currently there is a shortage of organ donors in the UK, limiting availability of the procedure
- patients considering this option should receive counselling about the implications, risks, and complications of the procedure
- optimise treatment for pulmonary and systemic congestion whilst awaiting transplant where possible – this may involve:
  - temporary use of intravenous (IV) inotropes [2,3]
  - use of mechanical circulatory support (MCS) devices to bridge the gap until transplantation [2,4]

References:
2. McMurray JJ, Adamopoulos S, Anker SD et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the task force for the diagnosis and treatment of acute and chronic heart failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. Eur Heart J 2012; 33: 1787-847.

10 Terminal care for refractory or end-stage HF

Quick info:
Provide access to support from a heart failure (HF) specialist and palliative care service for patients with moderate to severe chronic HF and their carer(s) [2].

Prioritise the following objectives for patients considered for palliative care [1]:
- improvement in quality of life (QoL)
- control of symptoms
- early detection and treatment of episodes of deterioration
- pursuing a holistic approach to patient care, encompassing physical, psychological, social, and spiritual well-being
- advanced care planning, including noting preferences for place of death and resuscitation – which may include deactivating an implantable cardioverter defibrillator (ICD)

Liaise with the specialist palliative care service, the HF team, and/or the primary care physician, using a shared-care approach, to address and coordinate the patients’ care [1].

References:
1. McMurray JJ, Adamopoulos S, Anker SD et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the task force for the diagnosis and treatment of acute and chronic heart failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. Eur Heart J 2012; 33: 1787-847.
Overview

This document describes the provenance of the Peninsula Pathways, Heart Failure care map (pathway).

This pathway was last updated in February 2015.

The Peninsula Pathways Program aims to improve the continuity of patient care between primary, community and hospital care settings in the Frankston-Mornington Peninsula region. Work groups comprising of experienced health professionals (GPs, specialists, nurses, allied health professionals) were established to review and localise pathways.

The objective of this pathway is to improve outcomes for patients with heart failure.

To cite this pathway, use the following format:


Editorial methodology

This pathway is currently the first version localised to Frankston Mornington Peninsula.

This pathway has been developed according to the Map of Medicine editorial methodology, using the evidence and expert advice of the international heart failure pathway as a starting point. The content of this care map was further developed with reference to Australian National Heart Foundation guidelines and other current evidence-based guidelines and practice-based knowledge provided by local practitioners with front-line clinical experience (see contributors section of this document).

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Conflicts of interest: None declared

Disclaimer

It is not the function of the Pathways Program, Frankston-Mornington Peninsula Medicare Local to substitute for the role of the clinician, but to support the clinician in enabling access to know-how and knowledge. Users of the Map of Medicine are therefore urged to use their own professional judgement to ensure that the patient receives the best possible care. Whilst reasonable efforts have been made to ensure the accuracy of the information on this online clinical knowledge resource, we cannot guarantee its correctness and completeness. The information on the Map of Medicine is subject to change and we cannot guarantee that it is up-to-date.