Complete Summary

GUIDELINE TITLE

Guidelines for the prevention, detection and management of chronic heart failure in Australia, 2006.

BIBLIOGRAPHIC SOURCE(S)

National Heart Foundation of Australia, Cardiac Society of Australia and New Zealand, Chronic Heart Failure Guidelines Expert Writing Panel. Guidelines for the prevention, detection and management of chronic heart failure in Australia, 2006. Sydney (Australia): National Heart Foundation of Australia; 2006 Nov. 79 p. [335 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: National Heart Foundation of Australia, Cardiac Society of Australia and New Zealand. Guidelines on contemporary management of the patient with chronic heart failure in Australia. Sydney (Australia): National Heart Foundation of Australia; 2002.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- October 18, 2007, PDE5 inhibitors, Viagra (sildenafil citrate), Levitra (vardenafil HCL), Cialis (tadalafil): The PRECAUTION and updated Adverse Reactions Sections of the approved product labeling for Viagra, Levitra, and Cialis were revised in response to reports of sudden decreases or loss of hearing.
- August 16, 2007, Coumadin (Warfarin): Updates to the labeling for Coumadin to include pharmacogenomics information to explain that people's genetic makeup may influence how they respond to the drug.
- October 6, 2006, Coumadin (warfarin sodium): Revisions to the labeling for Coumadin to include a new patient Medication Guide as well as a reorganization and highlighting of the current safety information to better inform providers and patients.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Chronic heart failure

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Treatment

CLINICAL SPECIALTY

Cardiology
Family Practice
Internal Medicine
Nursing

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To obtain better health outcomes by improving the management of chronic heart failure (CHF)
- To reduce unwarranted variation from best practice treatment of CHF throughout Australia

TARGET POPULATION

Patients with, or at risk of developing, chronic heart failure (CHF)

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Evaluation of signs and symptoms
2. Electrocardiography, chest x-ray, echocardiography
3. Full blood count, plasma urea, creatine, and electrolytes
4. Measurement of plasma levels of B-type natriuretic peptide

Management

1. Non-pharmacological
    - Patient support, including discussion of lifestyle, personal issues, medical issues, and support
    - Physical activity and dietary restrictions
    - Referral for sleep apnoea
    - Risk factor modification
2. Pharmacological
    - Angiotensin-converting enzyme inhibitors (ACEIs)
    - Beta-blockers
    - Statins
    - Diuretics
    - Aldosterone receptor antagonists
    - Angiotensin II receptor antagonists
    - Eplerenone
    - Hydralazine isosorbide dinitrate combination
    - Digoxin
3. Devices, including biventricular pacing and implantable cardioverter defibrillators
4. Surgical approaches that may include myocardial revascularisation, insertion of devices, and cardiac transplantation
5. Post-discharge multidisciplinary management programs and palliative care strategies
6. Treatment of associated disorders

MAJOR OUTCOMES CONSIDERED

- Morbidity and mortality
- Quality of life
- Hospitalization durations and rates
- Functional status

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

I: Evidence obtained from a systematic review of all relevant randomized controlled trials (RCTs)

II: Evidence obtained from at least one properly designed randomised controlled trial

III-1: Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)

III-2: Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group

III-3: Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group

IV: Evidence obtained from case series, either post-test or pre-test and post-test

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendations

1. Rich body of high-quality randomized controlled trial (RCT) data
2. Limited body of RCT data or high-quality non-RCT data
3. Limited evidence
4. No evidence available – panel consensus judgment

COST ANALYSIS

Economic Burden

Chronic cardiovascular disease contributes to more than $5 billion per annum in healthcare costs in Australia. Although chronic heart failure (CHF) is a major component of such expenditure, there are limited data relating to its exact share of this burden. In 1993–94, the Australian Institute of Health and Welfare estimated CHF accounted for the following costs:

- $411 million of healthcare costs (representing 0.4% of total healthcare costs)
- $140 million per annum in hospitalisation costs
- $135 million per annum for nursing home costs

Based on data from at least six other developed countries, this was a likely under-estimate. For example, CHF is reported to directly consume approximately 1.5–2% of total healthcare costs, hospital admissions being the greatest single component (around 70%). A more recent analysis suggests that CHF contributes to more than $1 billion in healthcare expenditure per annum in Australia.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Throughout the original guideline document, boxed "practice points" highlight key issues, while summaries of graded recommendations are provided for most sections.

The grades of recommendations (A-D) are defined at the end of the "Major Recommendations" field.

Diagnosis

Symptoms of Chronic Heart Failure (CHF)

Practice Point

Clinical diagnosis of CHF is often unreliable, especially in obese patients, those with pulmonary disease and the elderly. Therefore, it is important to perform investigations to confirm the diagnosis.

Diagnostic Investigations

Practice Point

The classic symptom of CHF is exertional dyspnoea or fatigue. Orthopnoea, paroxysmal nocturnal dyspnoea (PND) and ankle oedema may appear at a later stage.

Physical signs are often normal in the early stages. Examination should include assessment of vital signs, cardiac auscultation (murmurs, S3 gallop) and checking for signs of fluid retention (e.g., raised jugular venous pressure, peripheral oedema, basal inspiratory crepitations).

All patients with suspected CHF should undergo an electrocardiogram (ECG), chest x-ray, and echocardiogram, even if the physical signs are normal.

Full blood count, plasma urea, creatinine, and electrolytes should be measured during the initial workup, and if there are any changes in the patient's clinical status. Urea, creatinine, and electrolytes should also be checked regularly in stable patients, and when changes are made to medical therapy.

The role of plasma B-type natriuretic peptide (BNP) measurements is evolving, but it has been shown to improve diagnostic accuracy in patients presenting with unexplained dyspnoea. In patients with new symptoms, where the diagnosis is not clear following the initial clinical assessment and an echocardiogram cannot be organised in a timely fashion, then measurement of BNP or N-terminal proBNP may be helpful. In this setting, a normal level makes the diagnosis of heart failure unlikely (especially if the patient is not taking cardioactive medication). If the level is raised, further investigation—including echocardiography — is warranted.

Underlying aggravating or precipitating factors (e.g., arrhythmias, ischaemia, non-adherence to diet or medications, infections, anaemia, thyroid disease, addition of exacerbating medications) should be considered and managed appropriately.

Recommendations for Diagnostic Investigation of CHF

- All patients with suspected CHF should undergo an echocardiogram to improve diagnostic accuracy and determine the mechanism of heart failure. (Grade of recommendation = D)
- Coronary angiography should be considered in patients with a history of exertional angina or suspected ischaemic left ventricular (LV) dysfunction. (Grade of recommendation = D)
- Plasma BNP measurement may be helpful in patients presenting with recent-onset dyspnoea; it has been shown to improve diagnostic accuracy with a high negative predictive value. (Berger et al., 2002) (Grade of recommendation = B)
- Haemodynamic measurements may be particularly helpful in patients with refractory CHF, recurrent heart failure with preserved systolic function (HFPSF) (diastolic CHF), or in whom the diagnosis of CHF is in doubt (Stevenson et al., 1990) (Grade of recommendation = D)
- Endomyocardial biopsy may be indicated in patients with cardiomyopathy with recent onset of symptoms, where coronary heart disease (CHD) has been excluded by angiography, or where an inflammatory or infiltrative process is suspected (McCarthy et al., 2000) (Grade of recommendation = D)
- Nuclear cardiology, stress echocardiography and positron emission tomography (PET) can be used to assess reversibility of ischaemia and viability of myocardium in patients with CHF who have myocardial dysfunction and CHD. Protocols have been developed using magnetic resonance imaging (MRI) to assess ischaemia and myocardial viability, and to diagnose infiltrative disorders. However, MRI is not widely available. (Grade of recommendation = D)
- Thyroid function tests should be considered, especially in older patients without pre-existing CHD who develop atrial fibrillation, or in whom no other cause of CHF is evident. (Grade of recommendation = D)

Supporting Patients

Recommendations for Discussion with Patients with CHF

- **Lifestyle**: Adopt a healthier lifestyle to address risk factors/conditions contributing to the development and progression of CHF (see Section 6, Non-pharmacological management, in the original guideline document).
- **Personal issues**: Understand the effect of CHF on personal energy levels, mood, depression, sleep disturbance and sexual function, and develop strategies to cope with changes and emotions related to family, work and social roles.
- **Medical issues**: Consider practical issues related to pregnancy, contraception, genetic predisposition and practical items, such as an alert bracelet and a diary for daily weights/medications.
- **Support**: Access to support services, such as Heart Support Australia, Cardiomyopathy Association of Australia, home help and financial assistance.

Practice Point

Information for people with CHF can be obtained through the Heart Foundation's telephone information service, Heartline 1300 36 27 87 (local call cost) and the Heart Foundation website: www.heartfoundation.com.au.

Patients should also consult their local phone directories for contact details for Heart Support Australia and the Cardiomyopathy Association of Australia in each state.

Non-pharmacological Management

Physical Activity and Rehabilitation

Practice Point

Non-pharmacological management may be as important as prescribing appropriate medications. Patients with CHF may develop physical deconditioning. Therefore, regular physical activity is recommended using a rehabilitation program tailored to suit the individual. Other measures are listed in the recommendations below.

Sleep Apnoea

Practice Point

If sleep apnoea is suspected, referral to a sleep physician is indicated.

Recommendations for Non-pharmacological Management of CHF*

- Regular physical activity is recommended (Mancini et al., 1992). All patients should be referred to a specially designed physical activity program, if available (Chati et al., 1996; Meyer et al., 1997; Sinoway, 1998) (Grade of recommendation = B)
- Patient support by a doctor and pre-discharge review and/or home visit by a nurse is recommended to prevent clinical deterioration (Rich et al., 1995; Stewart et al., 1999) (Grade of recommendation = A)
- Patients frequently have coexisting sleep apnoea and, if suspected, patients should be referred to a sleep clinician as they may benefit from nasal continuous positive airway pressure (CPAP) (Naughton, 1998) (Grade of recommendation = D)
- Patients who have an acute exacerbation, or are clinically unstable, should undergo a period of bed rest until their condition improves (McDonald, Burch, & Walsh, 1972) (Grade of recommendation = D)
- Dietary sodium should be limited to below 2 g/day (Stewart et al., 1999) (Grade of recommendation = C)
- Fluid intake should generally be limited to 1.5 L/day with mild to moderate symptoms, and 1 L/day in severe cases, especially if there is coexistent hyponatraemia (Fonarow et al., 1997) (Grade of recommendation = C)
- Alcohol intake should preferably be nil, but should not exceed 10 to 20 g a day (one to two standard drinks) (Fonarow et al., 1997) (Grade of recommendation = D)
- Smoking should be strongly discouraged. (Grade of recommendation = D)
- Patients should be advised to weigh themselves daily and to consult their doctor if weight increases by more than 2 kg in a two-day period, or if they experience dyspnoea, oedema, or abdominal bloating. (Grade of recommendation = D)

- Patients should be vaccinated against influenza and pneumococcal disease. (Grade of recommendation = B)
- High-altitude destinations should be avoided. Travel to very humid or hot climates should be undertaken with caution, and fluid status should be carefully monitored. (Grade of recommendation = C)
- Sildenafil and other phosphodiesterase V inhibitors are generally safe in patients with heart failure. However, these medications are contraindicated in patients receiving nitrate therapy, or those who have hypotension, arrhythmias, or angina pectoris (Zusman et al., 1999) (Grade of recommendation = C)
- Obese patients should be advised to lose weight. (Grade of recommendation = D)
- A diet with reduced saturated fat intake and a high fibre intake is encouraged in patients with CHF. (Grade of recommendation = D)
- No more than two cups of caffeinated beverages per day recommended. (Grade of recommendation = D)
- Pregnancy should be avoided in patients with CHF. (Grade of recommendation = D)

* These grades of recommendation apply only to patients with CHF

Pharmacological Therapy

Recommendations for Preventing CHF and Treating Asymptomatic LV Dysfunction

- All patients with asymptomatic systolic LV dysfunction should be treated with an angiotensin-converting enzyme inhibitor (ACEI) indefinitely, unless intolerant (Pfeffer et al., 1992; "Effect of enalapril," 1992) (Grade of recommendation = A)
- Anti-hypertensive therapy should be used to prevent subsequent CHF in patients with elevated blood pressure (Kostis et al., 1997; Dahlof et al., 1991; "Medical Research Council trial of treatment," 1992; Hansson et al., 1999; Hansson et al., 2000; Brown et al., 2000) (Grade of recommendation = A)
- Preventive treatment with an ACEI may be considered in individual patients at high risk of ventricular dysfunction (Yusuf et al., 2000) (Grade of recommendation = B)
- Beta-blockers should be commenced early after a myocardial infarction (MI), whether or not the patient has systolic ventricular dysfunction (Dahlof et al., 1991; "Medical Research Council trial of treatment," 1992) (Grade of recommendation = B)
- Statin therapy should be used as part of a risk management strategy to prevent ischaemic events and subsequent CHF in patients who fulfill criteria for lipid-lowering (Kjekshus et al., 1997) (Grade of recommendation = B)

Treatment of Symptomatic Systolic Heart Failure

Practice Point

All patients with systolic LV dysfunction, whether symptomatic or asymptomatic, should be commenced on ACE inhibitors with every effort made to up-titrate to

the dose shown to be of benefit in major trials. Other recommended medications are listed in the recommendations below.

Practice Point

Drugs to avoid in CHF:

- Anti-arrhythmic agents (apart from beta-blockers and amiodarone)
- Non-dihydropyridine calcium-channel blockers (verapamil, diltiazem)
- Tricyclic antidepressants
- Non-steroidal anti-inflammatory drugs and COX-2 inhibitors
- Clozapine
- Metformin and thiazolidinediones (pioglitazone, rosiglitazone)
- Corticosteroids (glucocorticoids and mineralocorticoids)
- Tumour necrosis factor antagonist biologicals

Recommendations for Pharmacological Treatment of Symptomatic CHF

First-line Agents

- ACEIs, unless not tolerated or contraindicated, are recommended for all patients with systolic heart failure (left ventricular ejection fraction [LVEF] <40%), whether symptoms are mild, moderate, or severe (The SOLVD Investigators, 1991; The CONSENSUS Trial Study Group, 1987) (Grade of recommendation = A)
- Every effort should be made to increase doses of ACEIs to those shown to be of benefit in major trials ("Clinical outcome," 1998; Packer et al., 1999). If this is not possible, a lower dose of ACEI is preferable to none at all. (Grade of recommendation = B)
- **Diuretics** should be used, if necessary, to achieve euvolaemia in fluid-overloaded patients. In patients with systolic LV dysfunction, diuretics should never be used as monotherapy, but should always be combined with an ACEI to maintain euvolaemia. (Grade of recommendation = D)
- **Beta-blockers** are recommended, unless not tolerated or contraindicated, for all patients with systolic CHF who remain mildly to moderately symptomatic despite appropriate doses of an ACEI (Packer et al., "The effect of carvedilol," 1996; "Effect of metoprolol CR/XL," 1999; "The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II)," 1999; Packer et al., 2001) (Grade of recommendation = A)
- Beta-blockers are also indicated for patients with symptoms of advanced CHF (Packer et al., 2001) (Grade of recommendation = B)
- **Aldosterone receptor blockade with spironolactone** is recommended for patients who remain severely symptomatic, despite appropriate doses of ACEIs and diuretics (Pitt et al., 1999) (Grade of recommendation = B)
- **Eplerenone** is recommended in the early post-MI period for patients with LV systolic dysfunction and symptoms of heart failure. (Grade of recommendation = B)
- **Angiotensin II receptor antagonists** may be used as an alternative in patients who do not tolerate ACEIs due to kinin-mediated adverse effects (e.g., cough) (Pitt et al., 1997). They should also be considered for reducing morbidity and mortality in patients with systolic CHF who remain symptomatic despite receiving ACEIs. (Grade of recommendation = A)

Second-line Agents

- **Digoxin** may be considered for symptom relief and to reduce hospitalisation in patients with advanced CHF (Digitalis Investigation Group, 1997). It remains a valuable therapy in CHF patients with atrial fibrillation. (Grade of recommendation = B)
- **Hydralazine-isosorbide dinitrate combination** should be reserved for patients who are truly intolerant of ACEIs and angiotensin II receptor antagonists, or for whom these agents are contraindicated and no other therapeutic option exists (Cohn et al., 1986) (Grade of recommendation = B)

Other Agents

- **Amlodipine** and **felodipine** can be used to treat comorbidities such as hypertension and CHD in patients with systolic CHF. They have been shown to neither increase nor decrease mortality (Packer et al., "Effect of amlodipine," 1996; Cohn et al., 1997; Packer, 2000) (Grade of recommendation = B)

Devices

Pacing

Practice Point

Bradycardia is common in elderly patients with advanced heart disease treated with beta-blocker therapy.

Implantable Cardioverter Defibrillators

Practice Point

Prophylactic implantable cardioverter defibrillator (ICD) implantation may be considered in patients with an LVEF $\leq$35%; however, this is currently constrained by funding and other logistical issues. Until these issues are resolved, this therapy may not be universally available.

Decisions about pacing, cardiac resynchronisation therapy, defibrillators, and choice of device are complex and generally require specialist review.

Recommendations for Device-Based Treatment of Symptomatic CHF

- Biventricular pacing (cardiac resynchronisation therapy, with or without ICD) should be considered in patients with CHF who fulfill each of the following criteria (Cazeau et al., 2001) (Grade of recommendation = A):
    - New York Heart Association [NYHA] symptoms Class III–IV on treatment
    - Dilated heart failure with left ventricular ejection fraction $\leq$35%
    - QRS duration $\geq$120 ms
    - Sinus rhythm
- ICD implantation should be considered in patients with CHF who fulfill any of the following criteria (Bristow et al., 2004) (Grade of recommendation = A):

- Survived cardiac arrest resulting from ventricular fibrillation or ventricular tachycardia not due to a transient or reversible cause
- Spontaneous sustained ventricular tachycardia in association with structural CHD
- LVEF $\leq$30% measured at least 1 month after acute MI, or 3 months after coronary artery revascularisation surgery
- Symptomatic CHF (i.e., NYHA functional class II–III) and left ventricular ejection fraction $\leq$35%

Surgery

Indications for Cardiac Transplantation

Definite	• Persistent NYHA Class IV symptoms • VO_2 max <10 mL/kg/min • Severe ischaemia not amenable to revascularisation • Recurrent uncontrollable ventricular arrhythmias
Probable	• NYHA Class III • VO_2 max <14 mL/kg/min + major limitation • Recurrent unstable angina with poor LV function
Inadequate	• LVEF <20% without significant symptoms • Past history of NYHA Class III or IV symptoms • VO_2 max >14 mL/kg/min without other indication

Acute Exacerbations of CHF

Practice Point

Acute pulmonary oedema (APO) is a life-threatening disorder. However, appropriate therapy will often result in a marked improvement in the patient's clinical status within a few hours.

Emergency Management of Suspected Cardiogenic APO

A (airway)	• Exclude obstruction
B (breathing)	• Hypoxaemia (→ oxygenation) • Respiratory fatigue (→ mechanical ventilation)
C (circulation)	• Heart rate/rhythm (→ anti-arrthymics/cardioversion) • Hypotension (→ inotropes/intra-aortic balloon pump)
D (differential diagnosis)	• Cardiogenic APO • Non-cardiogenic pulmonary oedema • Acute exacerbation of airways disease • Acute massive pulmonary embolism • Pneumothorax

	• Foreign body aspiration • Hyperventilation syndrome
E (aetiology) (cardiogenic APO)	• Precipitants • Ischaemia, tachyarrhythmia, fluid overload, medication • Underlying pathology • Systolic LV dysfunction—coronary heart disease, dilated cardiomyopathy, mitral regurgitation • Diastolic LV dysfunction—hypertensive heart disease, hypertrophic cardiomyopathy, aortic stenosis • Normal LV function—mitral stenosis

See Figure 10.1 in the original guideline document for emergency therapy of acute heart failure.

Heart Failure with Preserved Systolic Function (HFPSF)

Epidemiology/Clinical Characteristics

Practice Point

Although the epidemiology of HFPSF or diastolic heart failure has been incompletely described, the main risk factors are advanced age, hypertension, diabetes, LV hypertrophy, and CHD. Diagnosis, investigation, and treatment are summarised in the Table below.

Diagnosis, Investigation, and Treatment of HFPSF

Diagnosis • Clinical history of CHF • Exclude myocardial ischaemia, valvular disease • Objective evidence of CHF (x-ray consistent with CHF) • Ejection fraction $\geq$45% (echocardiography, gated blood pool scanning, left ventriculography) • Echocardiographic or cardiac catheterization evidence of diastolic dysfunction, where possible • Use of plasma BNP measurement for diagnosis of diastolic heart failure is not proven.
Investigations Echocardiography • Pseudonormal or restrictive filling pattern demonstrated by mitral inflow (age appropriate) • Left atrial enlargement • Reduced septal annular velocity (Ea) on tissue Doppler imaging

- Ratio of E wave to Ea >15

Cardiac catheterisation

- Elevated LV end diastolic pressure
- Prolonged Tau

Treatment (empirical at this stage)

- Aggressive risk factor reduction
- Hypertension—blood pressure (BP) reduction; consider ACEIs or angiotensin II receptor antagonists to reduce LV hypertrophy
- Diabetes mellitus—strict glycaemic and BP control; consider ACEIs or angiotensin II receptor antagonists early, using lower BP recommendations for treating hypertension in diabetic patients

Treatment of Associated Disorders

See Chapter 12 in the original guideline document for a discussion of treatment of associated disorders, including cardiac arrhythmia, valvular heart disease, CHD, arthritis, chronic renal failure, anaemia, cancer, diabetes, thromboembolism, and gout.

Post-discharge Management Programs

Practice Point

Multidisciplinary programs of care targeting high-risk CHF patients following acute hospitalisation prolong survival, improve quality of life, and are cost effective in reducing recurrent hospital stays.

Palliative Support

Practice Point

An individualised program of palliative care should be considered for patients facing the strong possibility of death within 12 months and who have advanced symptoms (i.e., NYHA Class IV) and poor quality of life, resistant to optimal pharmacological and non-pharmacological therapies.

Practice Point

Palliative care should only be considered when progressive symptoms prove to be refractory to optimal treatment.

Treating doctors should discuss with their patients the level of intervention appropriate and/or desirable during this phase of their illness, so that unwanted, traumatic interventions are prevented in the last few days of life. Both the patient

and their family and carers may need significant emotional support during this process.

Definitions:

Grades of Recommendations

A. Rich body of high-quality randomized controlled trial (RCT) data
B. Limited body of RCT data or high-quality non-RCT data
C. Limited Evidence
D. No evidence available – panel consensus judgment

CLINICAL ALGORITHM(S)

Clinical algorithms are provided in the original guideline document for the following:

- Diagnostic algorithm for chronic heart failure (CHF)
- Advanced diagnostic/treatment algorithm for CHF
- Pharmacological treatment of asymptomatic left ventricular (LV) dysfunction (left ventricular ejection fraction [LVEF] <40%) (New York Heart Association [NYHA] Class I)
- Pharmacologic treatment of systolic heart failure (LVEF <40%) (NYHA Class II-III)
- Pharmacologic treatment of refractory systolic heart failure (LVEF <40%) (NYHA Class IV)
- Pharmacologic treatment of heart failure after recent or remote myocardial infarction (MI)
- Management of clinical deterioration in CHF
- Management of heart failure with preserved systolic function (HFPSF) (diastolic heart failure)

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for selected recommendations (see "Major Recommendations" field).

Recommendations based on consensus expert opinion are also included where evidence-based recommendations are not available.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Accurate diagnosis and appropriate management of chronic heart failure

POTENTIAL HARMS

- Beta-blockers should not be initiated during a phase of acute decompensation, but only after the patient's condition has stabilised. Adverse effects of beta-blockade in this setting include symptomatic hypotension, worsening of symptoms due to withdrawal of sympathetic drive, and bradycardia.
- The risk of hyperkalaemia — which is potentially lethal, particularly in the presence of angiotensin-converting enzyme inhibitors (ACEI) and/or renal impairment — requires vigilance when using spironolactone. The latter is also an androgen receptor antagonist and may cause feminisation side effects, such as gynaecomastia.
- Sustained inotropic stimulation can potentially increase myocardial oxygen demand in patients with myocardial ischaemia and possibly promote arrhythmia. For this reason, inotropic therapy should be reserved for patients not responding to other treatments for short-term support, until they can recover from acute haemodynamic compromise.
- Milrinone is less frequently used in chronic heart failure (CHF) because of concerns about arrhythmogenesis.
- Implantable cardioverter device (ICD) implantation may worsen quality of life, and the mortality benefit from ICD implantation needs to be balanced against the effects of living with a device that delivers painful shocks which are not controllable by the patient.
- In one study of left ventricular assist devices (LVADs) there was a greater than two-fold increased risk of serious adverse events, including infection, bleeding, thromboembolism and device malfunction.
- In using diuretics to relieve fluid overload in decompensation, great care must be taken to avoid overzealous diuresis leading to hypovolaemia and its consequences (acute renal failure, postural dizziness), as well as hypokalaemia.
- There is some evidence that morphine may be detrimental in acute myocardial infarction (MI) and acute cardiogenic pulmonary oedema (APO), and its place in management of APO is now controversial.
- Beta-blockers should not be commenced or increased during the acute decompensation episode, as the acute negative inotropic effect of these agents at a time of fluid overload may worsen clinical status.
- Sotalol is associated with a 1& to 3% incidence of ventricular proarrhythmia, and efficacy at one year is only 40 to 50%.
- While efforts should be made to achieve good glycaemic control, metformin should be avoided — particularly in patients with severe or decompensated chronic heart failure — because of an increased risk of lactic acidosis. Thiazolidinediones ('glitazones') may lead to fluid retention and should not be used in patients with New York Heart Association (NYHA) Class III or IV symptoms. In patients with Class I and II symptoms, 'glitazone' therapy should be initiated with caution and promptly withdrawn if heart failure worsens.
- Patients with diabetes, in whom hyporeninaemic hypoaldosteronism is common, may be at risk of developing hyperkalaemia when an angiotensin II receptor antagonist is added to angiotensin-converting enzyme inhibitor therapy, and vigilant monitoring of serum potassium is recommended.

CONTRAINDICATIONS

CONTRAINDICATIONS

- Sildenafil is contraindicated in patients receiving nitrate therapy, or those who have hypotension, arrhythmias or angina pectoris.
- Many of the medications used in treatment are contraindicated in pregnancy.
- Non-dihydropyridine calcium-channel blockers that are direct negative inotropes, such as verapamil and diltiazem, are contraindicated in patients with systolic heart failure.
- Therapy with class I anti-arrhythmic agents (e.g., flecainide) is generally contraindicated in the presence of systolic heart failure.
- Arterial vasodilators, including angiotensin-converting enzyme inhibitors (ACEIs), are usually contraindicated in patients with severe aortic stenosis because of the risk of coronary hypoperfusion.
- Pre-existent impairment of left ventricular (LV) systolic function represents a relative contraindication to aggressive chemotherapy with such agents.
- Treatment of gout in the patient with chronic heart failure (CHF) is made somewhat more complex by the contraindication to the use of non-steroidal anti-inflammatory drugs and cyclo-oxygenase-2 enzyme (COX-2) inhibitors. Similarly, corticosteroids are also best avoided in the management of this complication in the CHF patient.

Relative Contraindications to Cardiac Transplantation:

- Age >65
- Active infection
- Untreated malignancy, or treated malignancy in remission and <5 years follow-up
- Fixed high pulmonary pressures (pulmonary vascular resistance >4 Wood units, or mean transpulmonary gradient >12 mmHg or pulmonary artery systolic pressure >60 mmHg)
- Current substance abuse (including tobacco and alcohol)
- Coexisting systemic illness likely to limit survival
- Severe and irreversible major organ dysfunction
- Adverse psychosocial factors limiting compliance with medical therapy
- Recent pulmonary embolism (<6 weeks)
- Diabetes mellitus with severe or progressive end-organ damage
- Morbid obesity
- Unhealed peptic ulceration

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The guidelines are not prescriptive, as patient circumstances and clinical judgement will determine the most appropriate course of treatment for each individual with chronic heart failure (CHF). Clinical trials provide group data and clinical practice requires individual judgement.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm
Patient Resources
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

National Heart Foundation of Australia, Cardiac Society of Australia and New Zealand, Chronic Heart Failure Guidelines Expert Writing Panel. Guidelines for the prevention, detection and management of chronic heart failure in Australia, 2006. Sydney (Australia): National Heart Foundation of Australia; 2006 Nov. 79 p. [335 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 (revised 2006 Nov)

GUIDELINE DEVELOPER(S)

Cardiac Society of Australia and New Zealand - Disease Specific Society
National Heart Foundation of Australia - Disease Specific Society

SOURCE(S) OF FUNDING

National Heart Foundation of Australia
Cardiac Society of Australia and New Zealand

GUIDELINE COMMITTEE

Writing Panel

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Prof Henry Krum (*Co-chair*); A/Prof Michael Jelinek (*Co-chair*); Prof Simon Stewart; Prof Andrew Sindone; A/Prof John Atherton; Dr Anna Hawkes (*Executive Officer*)

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Many members of the Writing Panel have received paid honoraria for work performed on behalf of manufacturers of therapies described in these guidelines. However, no members of the Writing Panel stand to gain financially from their involvement in these guidelines and no conflicts of interest exist for Writing Panel members, the National Heart Foundation of Australia or the Cardiac Society of Australia and New Zealand.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: National Heart Foundation of Australia, Cardiac Society of Australia and New Zealand. Guidelines on contemporary management of the patient with chronic heart failure in Australia. Sydney (Australia): National Heart Foundation of Australia; 2002.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.

Print copies: Available from the National Heart Foundation of Australia's national telephone information service at 1300 36 27 87 or E-mail: heartline@heartfoundation.com.au.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Guidelines for the prevention, detection and management of people with chronic heart failure in Australia 2006. Position statement. MJA 2006; 185(10)549-56. Electronic copies: Available from the MJA Web site.

- Diagnosis and management of chronic heart failure 2006. Quick reference guide for health professionals. 2006. 9 p. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.

Print copies: Available from the National Heart Foundation of Australia's national telephone information service at 1300 36 27 87 or E-mail: heartline@heartfoundation.com.au.

PATIENT RESOURCES

The following are available:

- Information Sheet including Action Plan - Summary version of booklet "Living well with chronic heart failure." 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.
- Symptoms of chronic heart failure. 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.
- Lifestyle issues. 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.
- Monitoring and controlling fluid balance. 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.
- Medicines. 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.
- Commonly asked questions. 2008. Available in Portable Document Format (PDF) from the National Heart Foundation of Australia.

Print copies of the entire booklet available via e-mail at: heartline@heartfoundation.org.au.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI on April 12, 2007. The information was verified by the guideline developer on June 27, 2007. This summary was updated by ECRI Institute on September 7, 2007 following the revised U.S. Food and Drug Administration (FDA) advisory on Coumadin (warfarin). This summary was updated by ECRI Institute on November 6, 2007, following the updated U.S. Food and Drug Administration advisory on Viagra, Cialis, Levitra, and Revatio.

COPYRIGHT STATEMENT

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

Date Modified: 11/3/2008


DEPARTMENT OF HEALTH & HUMAN SERVICES • USA