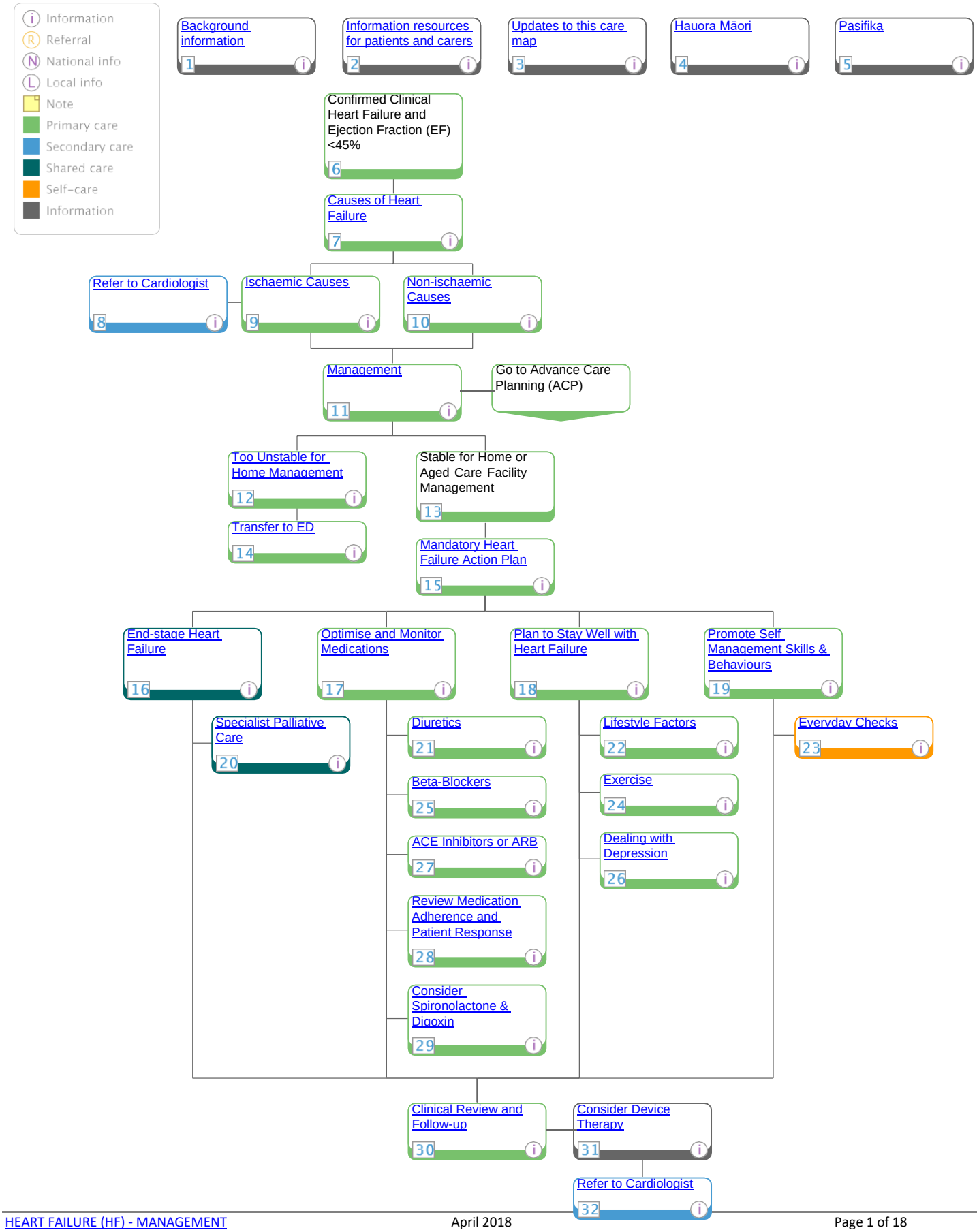
Heart Failure (HF) - Management

Medicine > Cardiology > Heart Failure



1. Background Information

Scope:

- the management of chronic heart failure (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
- 'right-sided' HF
- management of specific causes of HF

Definition:

- 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:

- New York Heart Association (NYHA) class I:
  - includes asymptomatic left ventricular systolic dysfunction (LVSD)
  - ordinary physical activity does not cause fatigue, breathlessness, or palpitations
- NYHA class II:
  - symptomatically 'mild' HF
  - slight limitation of physical activity
  - ordinary physical activity may result in fatigue, palpitations, 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:

- 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
  - hypertension
  - cardiomyopathies
  - endocrine conditions, e.g. diabetes mellitus (DM), hypothyroidism, hyperthyroidism, Cushing's syndrome, adrenal insufficiency, excessive growth hormone, phaeochromocytoma
  - infiltrative conditions, e.g. 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, e.g. 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, e.g. anthracyclines and trastuzumab, can result in cardiomyopathy
- toxins, e.g. alcohol, mercury, cobalt, arsenic, cocaine

Incidence and prevalence:

- in developed countries the prevalence of heart failure among adults is approximately 1-2%, although the prevalence may be more than 10% among older adults (>70 years)
- a typical primary care clinician, caring for 2000 patients, is therefore likely to have approximately 40 patients with heart failure, and more if their population is older
- the prevalence of HF is expected to rise in New Zealand through a combination of:
  - improved survival of people with ischaemic heart disease
  - more effective treatments for HF
  - the effects of an ageing population
- the mortality rate from heart failure for Māori aged over 65 years in New Zealand is significantly higher than for non-Māori for both males and females (RR 2.80 for males; RR 1.70 for females)
- mortality rates for Maori are even more pronounced in younger age groups (45-65 years), and heart failure occurs approximately 10-15 years earlier in Māori compared to non-Māori

Risk factors:

- age
- cardiac diseases
- CAD
- myocardial infarction (MI)
- smoking
- hypertension
- family history of HF
- hypercholesterolaemia
- male gender – although risk of HF is higher in men, there are more women than men with HF due to population demographics
- ethnic background:
  - 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
- five year survival rate is estimated at 58%
- prognosis for people with HF and preserved ejection fraction 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
- HF has a major impact on quality of life (QoL) and is associated with mood disorders

2. Information resources for patients and carers

Resources:

- Heart Failure Action Plan
- Heart Failure Resource Book
  - hard copies of this patient resource can be obtained from The National Heart Foundation of New Zealand
  - phone 09-526-8557

Te Ara Whānau Ora Brochure:

- Te Ara Whānau Ora Brochure

Consider appropriateness of Advance Care Planning (Advance Care Planning (ACP) pathway)

3. Updates to this care map

Pathway review/update: February 2016.

This care map has been updated in line with consideration to evidenced based guidelines.
For further information on contributors and references please see the care map's Provenance.

4. Hauora Māori

Māori are a diverse people and whilst there is no single Māori identity, it is vital practitioners offer culturally appropriate care when working with Māori whānau. It is important for practitioners to have a baseline understanding of the issues surrounding Māori health.

This knowledge can be actualised by (not in any order of priority):

- acknowledging Te Whare Tapa Wha (Māori model of health) when working with Māori whānau
- asking Māori clients if they would like their whānau or significant others to be involved in assessment and treatment
- asking Māori clients about any particular cultural beliefs they or their whānau have that might impact on assessment and treatment of the particular health issue (Cultural issues)
- consider the importance of whānaungatanga (making meaningful connections) with their Māori client / whānau
- knowledge of Whānau Ora, Te Ara Whānau Ora and referring to Whānau Ora Navigators where appropriate
- having a historical overview of legislation that has impacted on Māori well-being

For further information:

- Hauora Māori
- Central PHO Maori Health website

5. Pasifika

Pacific Cultural Guidelines (Central PHO) 6MB file

Our Pasifika community:

- is a diverse and dynamic population:
  - more than 22 nations represented in New Zealand
  - each with their own unique culture, language, history, and health status

- share many similarities which we have shared with you here in order to help you work with Pasifika patients more effectively

The main Pacific nations in New Zealand are:

- Samoa, Cook Islands, Fiji, Tonga, Niue, Tokelau and Tuvalu

Acknowledging *The FonoFale Model (pasifika model of health)* when working with Pasifika peoples and families.

Acknowledging general pacific guidelines when working with Pasifika peoples and families:

- Cultural protocols and greetings
- Building relationships with your pasifika patients
- Involving family support, involving religion, during assessments and in the hospital
- Home visits
- Contact information

Pasifika Health Service - Better Health for Pasifika Communities:

- the Pasifika Health Service is a service provided free of charge for:
  - all Pasifika people living in Manawatu, Horowhenua, Tararua and Otaki who have long term conditions
  - all Pasifika mothers and children aged 0-5 years
- an appointment can be made by the patient, doctor or nurse
- the Pasifika Health Service contact details are:
  - Palmerston North Office - 06 354 9107
  - Horowhenua Office - 06 367 6433
- Better Health for Pasifika Communities brochure

Additional resources:

- Ala Mo'ui - Pathways to Pacific Health and Wellbeing 2010-2014
- Primary care for pacific people: a pacific health systems approach
- Tupu Ola Moui: The Pacific Health Chart Book 2004
- Pacific Health resources
- List of local Maori/Pacific Health Providers
- Central PHO Pacific Health website

7. Causes of Heart Failure

Ischaemic versus non-ischaemic causes need to be considered.

Potential causes include:

- 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
  - hypertension
  - cardiomyopathies
  - endocrine conditions e.g:
    - diabetes mellitus (DM)
    - hypothyroidism
    - hyperthyroidism
    - Cushing's syndrome
    - adrenal insufficiency
    - excessive growth hormone

- phaeochromocytoma
- infiltrative conditions e.g:
  - sarcoidosis
  - amyloidosis
  - haemochromatosis
  - connective tissue disease
  - HIV infection
  - end-stage renal disease
- conditions that reduce cardiac output, such as:
  - increased vascular resistance with hypertension
  - abnormal heart rhythm, e.g. atrial fibrillation
  - aortic stenosis
  - pericardial disease
  - obstructive sleep apnoea
- conditions that result in a high cardiac output, such as:
  - anaemia
  - thyrotoxicosis
  - septicaemia
  - Paget's disease
- medications, such as:
  - beta-blockers, calcium-channel blockers, and some antiarrhythmics
  - cytotoxic agents, e.g. anthracyclines and trastuzumab, can result in cardiomyopathy
- toxins e.g:
  - alcohol
  - mercury
  - cobalt
  - arsenic

8. Refer to Cardiologist

A referral letter outlining relevant information (patient identification, history and assessment findings and current treatment) should be sent to:

Cardiologist, Cardiology Service, MidCentral Health
Private Bag 11036
Palmerston North

9. Ischaemic Causes

Coronary artery disease or a previous heart attack accounts for about 70% of all heart failure cases.

Referral to a cardiologist is recommended to assess and treat patients appropriately.

10. Non-ischaemic Causes

Non-ischaemic causes of heart failure include:

- idiopathic causes
- myocarditis

- infiltrative myocardial disease
- hypertension
- peripartum cardiomyopathy
- connective tissue disease
- substance abuse

11. Management

There are a range of nursing services available to support the management of heart failure patients including nurses within Central PHO with a focus on long term conditions, Practice Nurses who are focused on long term conditions, and for the more complicated patients with persistent symptoms Nurse Practitioners and Clinical Nurse Specialist services through MidCentral Health:

- Cardiology referral for Clinical Nurse Specialist/Nurse Practitioner, Heart Failure Clinic

12. Too Unstable for Home Management

Indications for immediate referral to Emergency Department include:

- 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
  - worsening orthopnoea
  - increased respiratory rate
  - oxygen saturation of less than 90%
  - agitation
- associated chest pain or palpitations:
  - tachycardia or tachyarrhythmia, e.g. fast atrial fibrillation (AF)
- general signs of hypoperfusion:
  - cool, clammy skin
  - cyanosis or pallor
- syncope, dizziness, or altered level of consciousness
- associated haemoptysis or frothy pink sputum
- haemodynamic instability

14. Transfer to ED

Ring Palmerston North Hospital (06-358-8001) and ask operator to page the **on-call Medical Registrar.**

NB: The Emergency Department requires formal documentation (clinical assessment, investigations and working diagnosis/problem list and any intervention to date).

15. Mandatory Heart Failure Action Plan

A heart failure action plan that is personalised can assist patients with self management.

Patients should be advised on "Everyday Checks" and the necessary steps to staying well and keeping out of hospital.

Action plans should include how to recognise a deterioration and the actions that should be taken.

16. End-stage Heart Failure

All patients with end-stage heart failure resistant to optimal heart failure therapy should be offered a palliative approach.

17. Optimise and Monitor Medications

The treatment of heart failure routinely involves the use of a diuretic, beta blocker and an angiotensin converting enzyme (ACE) inhibitor

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

- a clinical assessment of functional capacity, fluid status, cardiac rhythm and cognitive and nutritional status
- a review of medication, including need for changes and possible side effects
- serum electrolytes and creatinine

Consider Medicine Use Review (MUR) or Community Pharmacy LTC Service:

The Community Pharmacy Long Term Conditions (LTC) Service provides physical and systematic adherence support for people with long term conditions. It requires an eligibility assessment prior to a person registering at a specific pharmacy for the service. It is an ongoing service provided as part of the Services Agreement between community pharmacies and DHBs.

The Medicines Use Review (MUR) Service enhances medicines knowledge and understanding for people with poor adherence to long term medicines. It aims to optimise self-management of medicines. It is a short term (up to a year) service involving an initial consultation and at least one follow-up:

- pharmacies offering MUR
- MUR Referral Form

18. Plan to Stay Well with Heart Failure

Advise patients that it is never too late to make lifestyle changes in order to help them stay well with heart failure and improve their general health.

Health professionals can assist patients to make a plan for change and support patients to set realistic goals. It is important that patients choose something they really want to do.

The Staying Well with Heart Failure Booklet (developed by the Heart Foundation of New Zealand - see below) can be used by patients to make a plan for change and helps with setting and maintaining goals:

- Staying well with heart failure:
  - hard copies of this patient resource can be obtained from The National Heart Foundation of New Zealand:
  - phone 09-526-8557

19. Promote Self Management Skills & Behaviours

Self-management advice:

- patients should be encouraged to self-manage their condition where appropriate e.g. daily weighing and possibly self-adjustment of diuretic dose
- ensure that the patient or their carer knows:
  - how to adjust the dose in response to symptoms
  - when to seek help if their symptoms deteriorate or fail to respond to dose adjustment
- inform patient that they can adjust the times that they take the diuretic to suit social needs e.g. if they are going out, they can delay a dose until they return

NB: If requiring a dose increase of diuretic for greater than 3 days - condition needs to be reviewed by General Practitioner

or Nurse Practitioner.

20. Specialist Palliative Care

Arohanui Hospice

This is the specialist palliative care service serving the Manawatu, Horowhenua, Tararua and Rangitikei regions to provide support and advice to other health care teams for the care of palliative or imminently dying patients within these regions. Arohanui Hospice works closely with other specialist and community services to deliver the best possible care for people with a life limiting illness.

Any person residing in the MidCentral Health region or Rangitikei region, who has an advanced disease either of malignant or non malignant origin and those with a poor prognosis and for whom intensive treatment is unlikely to produce a good outcome will be considered for referral. Of particular concern are those people who may be experiencing symptoms that are not proving easy to alleviate.

Guidelines for referral include (at least two of the following):

- uncontrolled complex symptoms
- psychosocial issues
- patient is considered to have less than 12 months to live
- end of life support

Current services provided:

- specialist community nurses in the community
- inpatient care
- 24 hour advice
- day stay programme
- outpatient clinics
- psychosocial/pastoral and bereavement support
- palliative care professional education

How to refer:

Patients are usually referred to Arohanui by their GP, hospital doctor, Nurse Practitioner or medical specialist. Referral forms are available on website under 'Our Services/Referrals' and on Compass Health website under referrals.

Palliative Care Partnership (PCP):

The PCP provides a service that maximises the skills and expertise of both generalist and palliative specialist services by:

- enhancing access to palliative care
- increasing knowledge and support to general practice teams through regular education sessions
- reducing cost as a barrier to access to community palliative care

There are a series of requirements for general practitioners to complete to be a member of this partnership. The business rules for general practitioners and practice nurses to be accredited providers are available from Central PHO as are the remuneration criteria. Please contact Compass Health for further information.

Hospital palliative care service:

A specialist palliative care service operates within Palmerston North Hospital Monday to Friday 0830 - 1700hrs. The team is advisory to the primary admitting team and receives referrals for the above reasons as well as for advice only. They play a key role in linking to community services including Arohanui Hospice and Aged Residential Care.

21. Diuretics

In the majority of patients with symptomatic heart failure, the first line medicine used is a diuretic.

A loop diuretic such as furosemide is recommended as these are usually more effective than thiazide diuretics.

A reasonable starting dose of oral furosemide for a patient in the community setting is 20-40 mg, once daily. Subsequent doses are then determined by the response to treatment - an improvement in symptoms and a weight loss of approximately 1 kg/day.

Bumetanide is an alternative for patients who do not respond to adequate doses of furosemide. The recommended starting dose for oedema is 0.5 - 1 mg, once daily. In severe cases, the dose may be increased up to 10 mg per day.

22. Lifestyle Factors

Stop Smoking:

All smokers should be encouraged to stop smoking and offered assistance in smoking cessation. 'ABC' is a memory aid for health care workers to understand the key steps to helping people who smoke:

- **A.** ask all people about their smoking status and document this
- **B.** provide Brief advice to stop smoking to all people who smoke, regardless of their desire or motivation to quit
- **C.** make an offer of, and refer to or provide, evidence based cessation treatment

For further support, advice and information patients can:

- ring Quitline 0800 778 778 or go to www.quit.org.nz
- ring Aukati KaiPaipa 0800 742 666 for a free face-to-face kaupapa Māori service

See Stop Smoking Support Pathway.

Dietary restrictions and healthy weight:

- advise restriction of salt intake (less than 6g per day):
  - inform about the salt content of common foods
  - advise people not to replace salt with salt substitutes that are high in potassium
- in overweight patients, referral to a weight loss group or dietitian may be appropriate
- advise people to avoid excessive fluid intake:
  - restrict to less than approximately 2.0L a day in patients with mild/moderate symptoms
  - restrict to 1.5-2.0L per day in those with severe symptoms

Limit or avoid alcohol:

Discuss alcohol consumption with the patient and tailor advice appropriately to the clinical circumstances:

- advise against both regular excessive intake (more than 1 or 2 units every couple of days) and binge drinking
- alcohol is contraindicated in those with alcohol related cardiomyopathy

Immunisations:

Consider immunisation in all patients to minimise the risk of exacerbating chronic HF with respiratory infection:

- advise an annual influenza vaccination
- offer a single pneumococcal vaccination

23. Everyday Checks

Everyday checks are important for patients to recognise any fluid build up. Patients who perform these checks are more likely to act early to reduce fluid build up according to their individualised heart failure action plan.

Patients should be advised to weigh themselves on the same scales everyday:

- patient tips for accurate weight measurement:
  - advise patient to weigh themselves every morning after going to the toilet and before eating/drinking

- use digital scales on a firm surface
- record weight in a record sheet or in a diary or notebook and compare weight to the patients target weigh

Patients should check for swelling every morning:

- patient tips for checking for swelling:
  - check one le.g. by pressing firmly into the skin of your ankle, shin and knee with your finger. If your finger makes a dent in your skin, you have swelling. Make a note of any swelling on your record sheet

Patients need to be aware of changes in their breathing everyday:

- suggest to patients to make a note of changes in their breathing on their record sheet
- advise patient to follow their action plan if they are more short of breath than usual, for example:
  - have a constant cough or wheeze
  - notice a change in sputum colour
  - have difficulty carrying on a conversation
  - need to use more pillows at night

24. Exercise

Promote regular aerobic activity:

- reduces thromboembolic risk and other consequences of prolonged inactivity
- community based exercise training programmes:
  - benefits patients with left ventricular ejection fraction (LVEF) less than or equal to 40%, and younger than age 75 years
  - improve exercise capacity
  - improve exercise performance
  - improve quality of life in patients
  - seem to be safe for clinically stable patients
- there are no clear recommendations on the most effective training type, intensity, duration, or setting

Consider referral to UCOL Ukinetics.

25. Beta Blockers

Beta-blockers approved for use in New Zealand for heart failure include metoprolol, carvedilol and bisoprolol.

There is no clear evidence that any one of medications is superior to another, but specific patient factors may guide the choice. For example:

- bisoprolol and metoprolol CR are once daily dosing, which may be more convenient for some patients
- bisoprolol may be preferable in patients with atrial fibrillation as it reduces heart rate more than other beta-blockers, but it also increases susceptibility to bradycardia
- bisoprolol may be preferable in people with COPD compared to carvedilol as it is more cardio-selective

When initiating a beta-blocker the recommendation is to start at a low dose, increase slowly and aim for the highest tolerated dose ("go slow, aim high"). Recommended dosing for beta-blocker:

- Metoprolol 23.75 mg daily titrated to 195 mg daily
- Carvedilol 3.125 mg twice daily titrated to 25 mg twice daily or 50 mg twice daily if >85kg
- Bisoprolol 1.25 mg daily titrated to 10 mg daily

In general the beta-blocker can be increased fortnightly. If a beta-blocker is initiated before an ACE inhibitor, e.g. in a patient with arrhythmia or angina but without acute fluid overload, the dose should be increased to mid-range and then an ACE inhibitor started.

26. Dealing with Depression

The diagnosis of depression should be considered in all patients with heart failure (HF):

- where depression is likely to have been precipitated by HF symptoms, reassess the patient's psychosocial status once the physical condition has stabilised
- where it is apparent that depression is co-existing with HF, treat the patient for depression
- carefully consider the potential risks and benefits of medication treatment
  - tricyclic antidepressants (TCA) may reduce contractility and cause proarrhythmias, and should not be used in patients with HF

Psychological factors exert an influence on patients with heart failure in several ways:

- limitations and concerns related to living with heart failure can influence mood, degree of disability, quality of life, and mortality
- depression and anxiety influence health service use
- the presence of depression influences mortality and morbidity

Patients' beliefs about heart failure should be assessed. Interventions based on psychological principles designed to alter beliefs about heart failure, such as a referral to the **Massey University Psychological Service**, should be considered:

Massey University Psychological Service:

- offers short to medium term (usually 6-8 sessions) psychology services for people who live in the MidCentral region who are dealing with or adjusting to a long-term medical condition
- referral criteria includes:
  - symptoms of psychological distress such as anxiety, depression, difficulty in coping with the impact on their roles and relationships
  - high frequency patients/clients
  - patients with adherence issues

Referrals may also be made for immediate family members/key support people who have been adversely affected by the chronic condition:

- Massey Psychology Service Brochure
- Massey Psychology Service Referral Form
- Massey Self Distress Rating Form

27. ACE Inhibitors or ARB

The following selection of ACE inhibitors are recommended:

- Lisinopril 2.5 mg daily titrated to 20-40 mg daily
- Cilazapril 0.5 mg daily titrated to 1-2.5 mg daily
- Quinapril 2.5 mg daily titrated to 20-40 mg daily
- Enalapril 2.5 mg daily titrated to 10-20 mg twice daily

Commencing treatment:

- initiate therapy at a low dose
- monitor and titrate the dose upwards at no more than two-weekly intervals until a target dose for management, ie shown to be beneficial in clinical trials, or highest tolerated dose is achieved
- treatment frequently causes an adverse effect on renal function and electrolyte balance:
  - check baseline electrolytes and creatinine prior to initiation and monitor with each dose increase
- discontinue medications, if possible, that may have a further detrimental effect upon renal function, ie non-steroidal anti-inflammatory drugs (NSAIDs) and potassium supplements]

- monitor renal function and serum electrolytes:
  - before starting an ACE inhibitor or an angiotensin receptor blocker (ARB)
  - after starting treatment
  - after each dose increase
- consider cardiology referral prior to initiation if:
  - baseline creatinine is greater than 200micromol/L
  - potassium is greater than 5.9mmol/L
  - sodium is 130mmol/L or less
  - the patient is taking high dose diuretics (more than 80mg furosemide daily)
  - systolic blood pressure (BP) is less than 100mmHg
  - the patient is frail and elderly
- during monitoring, acceptable alterations in baseline biochemistry include:
  - an increase in creatinine by no greater than 50% above baseline or to less than 250micromol/L
  - an increase in serum potassium to no greater than 5.5mmol/L
  - if levels are elevated above this, discontinue the drug and obtain specialist advice
- hypotension may occur with concomitant therapy – if it is clinically symptomatic:
  - discontinue calcium-channel blockers and nitrates if at all possible
  - consider reducing the diuretic dose if there are no signs of congestion
- dry cough is another common adverse effect – if it presents:
  - it may be a symptom of pulmonary oedema
  - if the cough is persistent and troubling the patient, an angiotensin II receptor blocker (ARB) may be substituted for ACE inhibitor

Prescribing ACE inhibitors with loop diuretics – do not start a diuretic and an ACE inhibitor at the same time because of the risk of hypotension.

Angiotensin II receptor blockers (ARBs), e.g. Losartan are used in patients where ACE inhibitors are contraindicated or not tolerated, ie because of cough:

- in patients who are taking aldosterone antagonists, closely monitor potassium and creatinine levels, and calculated glomerular filtration rate (eGFR)

Prescribing ARBs:

- start with a low dose and titrate upwards
- double the dose in short intervals (usually 2-week intervals are suitable)
- after each upward titration, monitor the person's renal function and blood pressure
- do not increase the dose further if there is worsening renal function or hyperkalaemia
- aim for the target dose, or failing that the highest tolerated dose
- maintain the ARB at the target or highest-tolerated dose indefinitely unless complications occur

28. Review Medication Adherence and Patient Response

All people with heart failure (HF) require regular follow-up, monitoring, and review of medications to:

- assess any need for changes
- detect possible adverse effects

The frequency of monitoring depends on:

- clinical status and stability of the patient
- intensity of treatment
- any co-morbidities

The monitoring interval:

- should be short (days to 2 weeks) if the clinical condition or medication has changed
- is required at least 6-monthly for stable patients
- monitor patient response and re-check renal function 1 week after commencing treatment and following each dose increase

Assess and monitor:

- symptoms and signs of HF:
  - functional capacity, limitation of activity by fatigue and dyspnoea according to New York Heart Association (NYHA) classification
  - pulmonary and systemic congestion (auscultate for crepitations, assess jugular venous pressure [JVP], peripheral oedema, body weight change, hepatomegaly)
- haemodynamic status:
  - lying and standing blood pressure (BP)
  - heart rate and rhythm:
    - ask about syncopal and presyncopal symptoms
    - examine pulse
    - perform a 12-lead ECG if indicated
  - creatinine and electrolytes, glomerular filtration rate (eGFR) – frequency dependent on individual case, current medication, recent dose increase, instability

During monitoring, acceptable alterations in baseline biochemistry are as follows:

- increase in creatinine up to 50% from baseline or up to 250micromol/L
- potassium to no greater than 5.9mmol/L
- NB: if levels are elevated above this:
  - halve the dose of ACE inhibitor or ARB and re-check in 5-7 days
  - obtain specialist advice and consider stopping or discontinuing the dose of the following drugs:
    - nephrotoxic drugs, e.g. non-steroidal anti-inflammatory drugs (NSAIDs)
    - vasodilators, e.g. calcium channel blockers, nitrates
    - potassium supplements or potassium-sparing diuretics
    - diuretics – consider dose reduction if the person is hypovolaemic
- if creatine values increase to greater than 100% of baseline, or potassium values increase to greater than 5.9mmol/L, stop the ACE inhibitor or ARB immediately and seek specialist advice
- an increase in serum creatine of 30% or more with a large decrease in blood pressure (BP) soon after starting treatment may suggest renovascular disease that should be investigated
- furosemide dose may be increased to twice daily administration, however, the administered dose should not normally exceed 80mg without specialist advice

29. Consider Spironolactone & Digoxin

Spironolactone may be considered in patients with moderate to severe heart failure due to left ventricular systolic dysfunction unless contraindicated by the presence of renal impairment or a high potassium concentration:

- the recommended dose of spironolactone is 25 mg once daily. Lower doses (spironolactone 12.5 mg once daily) may be considered if adverse effects occur at the higher dose

Digoxin **(targeting a therapeutic digoxin level of <1 nmol/L)** should be considered for all patients with heart failure who are in atrial fibrillation and for patients with heart failure with LV systolic dysfunction (LVEF <45%) who remain symptomatic despite treatment with an ACE inhibitor, diuretics, spironolactone and beta-blockers with the aim of improving symptoms and preventing further clinical deterioration:

- slow oral digitalisation can be acheived by starting a maintenance dose of 0.125 mg daily. A repeat digoxin level is recommended at 2 weeks. Recommended sampling time is 6-24 hours post dose
- ***NB:*** Digoxin toxicity is more likely at digoxin levels >2.5nmol/L and there is a small increase in mortality with digoxin

concentrations >1.5 nmol/L

30. Clinical Review and Follow-up

Monitor the patient at short intervals (days to 2 weeks) if the clinical condition or drug treatment has changed. Otherwise monitor at least 6-monthly.

Clinical review should include the following:

- clinical assessment of:
  - functional capacity
  - fluid status
  - cardiac rhythm (minimum of examining the pulse)
  - cognitive status
  - nutritional status
- a review of drug treatment, including need for changes and possible side effects
- a minimum of serum electrolytes, creatinine and eGFR

During patient review, continue to follow the pathway starting from the "Causes of Heart Failure" box.

31. Consider Device Therapy

Device therapy for heart failure includes implantation of a cardiovertor defibrillator or cardiac resynchronisation therapy (CRT), using devices that provide biventricular pacing or may combine the ability for both pacing and defibrillation.

Device therapy may be considered for some patients with heart failure:

- those who remain symptomatic despite optimal use of heart failure medications
- those with an ejection fraction that remains low (<35%)
- those with a QRS duration >149 milliseconds

Patients with co-morbidities that are likely to reduce their life expectancy (within one year) are generally considered not suitable for device therapy. On pragmatic grounds it is recommended that patients for device therapy should be $\leq$ 75 years.

32. Refer to Cardiologist

A referral letter outlining relevant information (patient identification, history and assessment findings and current treatment) should be sent to:

Cardiologist, Cardiology Service, MidCentral Health
Private Bag 11036
Palmerston North

Heart Failure

Provenance Certificate

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Overview

This document describes the provenance of MidCentral District Health Board's **Heart Failure** pathway. This pathway is regularly updated to include new, quality-assessed evidence, and practice-based knowledge from expert clinicians. Please see the Editorial Methodology section of this document for further information.

This localised pathway was last updated in January 2015.

For information on changes in the last update, see the information point entitled 'Updates to this care map' on each page of the pathway.

One feature of the "Better, Sooner, More Convenient" (BSMC) Business Case, accepted by the Ministry of Health in 2010, was the development of 33 collaborative clinical pathways (CCP).

The purpose of implementing the CCP Programme in our DHB is to:

- Help meet the Better Sooner More Convenient Business Case aspirational targets, particularly the following:
    - Reduce presentations to the Emergency Department (ED) by 30%
    - Reduce avoidable hospital admissions to Medical Wards and Assessment Treatment and Rehabilitation for over-65-year-olds by 20%
    - Reduce poly-pharmacy in the over-65-year-olds by 10%
- Implement a tool to assist in planning and development of health services across the district, using evidence-based clinical pathways.
- Provide front line clinicians and other key stakeholders with a rapidly accessible check of best practice;
- Enhance partnership processes between primary and secondary health care services across the DHB.

To cite this pathway, use the following format:

Map of Medicine. Medicine. MidCentral District View. Palmerston North: Map of Medicine; 2014 (Issue 1).

Editorial methodology

This care map was based on high-quality information and known Best Practice guidelines from New Zealand and around the world including Map of medicine editorial methodology. It has been checked by individuals with front-line clinical experience (see Contributors section of this document).

Map of Medicine pathways are constantly updated in response to new evidence. Continuous evidence searching means that pathways can be updated rapidly in response to any change in the information landscape. Indexed and grey literature is monitored for new evidence, and feedback is collected from users year-round. The information is triaged so that important changes to the information landscape are incorporated into the pathways through the quarterly publication cycle.

References

This care map has been developed according to the Map of Medicine editorial methodology. The content of this care map is based on high-quality guidelines and practice-based knowledge provided by contributors with front-line clinical experience. This localised version of the evidence-based, practice-informed care map has been peer-reviewed by stakeholder groups and the CCP Programme Clinical Lead.

1.	National Institute for Health and Clinical Excellence (NICE). Chronic heart failure - management of chronic heart failure in adults in primary and secondary care. Clinical guideline 108. London: NICE; 2010.
2.	Clinical Knowledge Summaries (CKS). Chronic heart failure. Version 1.0. Newcastle upon Tyne: CKS; 2009.
3.	Scottish Intercollegiate Guidelines Network (SIGN). Management of chronic heart failure. A national clinical guideline. SIGN Publication no 95. Edinburgh: SIGN; 2007.
4.	Map of Medicine (MoM) Clinical Editorial team and Fellows. London: MoM; 2011.
5.	bpac NZ. (2013). Identifying patients with heart failure in primary care. Best Practice Journal, 50, 5-11.
6.	bpac NZ. (2013). Managing patient s with heart failure in primary care. Best Practice Journal, 50, 15-20.
7.	bpac NZ. (2006). ACE inhibitors. Author.
8.	New Zealand Heart Foundation of New Zealand (2009). New Zealand Guideline for the management of chronic heart failure, 2009 update. Author.
9.	European Society of Cardiology (ESC). ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (2012). European Heart Journal. Author.
10.	De Backer, D., Biston, P., Devriendt, J., Madl, C., Chochrad, D., Aldecoa, C., & Vincent, J. (2010). Comparison of dopamine and norepinephrine in the treatment of shock. The New England Journal Of Medicine, 362(9), 779-789.

Contributors

MidCentral DHB's Collaborative Clinical Pathway editors and facilitators worked with clinical stakeholders such as front-line clinicians and pharmacists to gather practice-based knowledge for its care maps.

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Disclaimers

Clinical Board Central PHO, MidCentral DHB

It is not the function of the Clinical Board Central PHO, MidCentral DHB 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.