How to Improve Heart Failure Outcomes

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Learning Objectives

- Define the clinical syndrome of heart failure
- Recognise the typical and atypical symptoms of heart failure
- Be able to secure a diagnosis of heart failure
- Summarise the non-pharmacological management of heart failure
- Use an aid-memoire to standardise the pharmacological and device therapy management of heart failure
- Know how to manage common adverse events of therapies
- Use the Tasmanian Health Pathways as a source of knowledge to co-manage your heart failure patients, streamline referrals and optimise outcomes

Heart failure affects a large number of Australians each year, placing a significant burden on the healthcare system[1]

61,000 deaths
were listed as caused by heart failure in Australia in 2016

511,000 Australians
(2.1%) had heart failure in 2016

~67,000 Australians
are newly diagnosed with chronic heart failure every year

158,000 hospitalisations
With primary diagnosis of heart failure in Australia in 2016
1.1 million days of hospital stay

8.9 days
average length of stay[2]

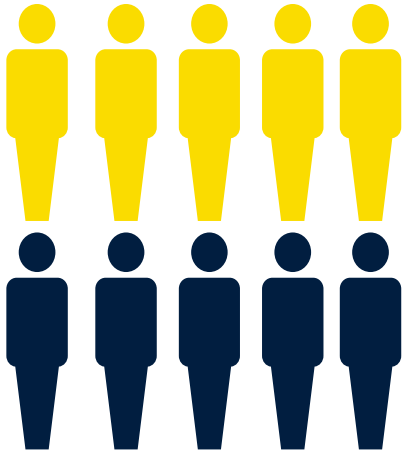
$3.1 billion
per annum in costs to the Australian economy
$2 billion in hospital care

+146,000 cases/10 years
projected growth

1. Chen L, Booley S, Keates AK, Stewart S. Snapshot of heart failure in Australia. May 2017. Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia
2. Australian Institute of Health and Welfare 2011. Cardiovascular disease: Australian facts 2011. Cardiovascular disease series. Cat. no. CVD 53. Canberra: AIHW.

Chronic HF has a significant impact on long-term prognosis[1]

5
years



~50%
mortality after onset of heart failure[2-4]

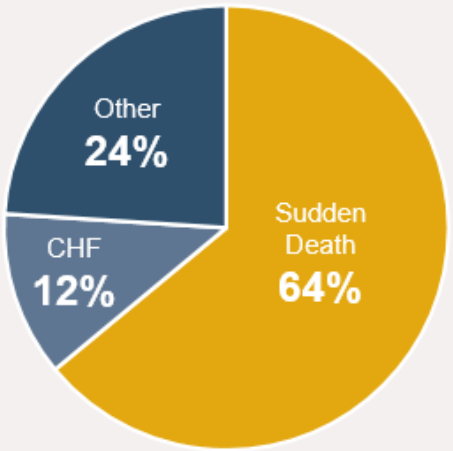
- All patients with heart failure, regardless of their symptoms, have a poor prognosis[1]
- Within 3 years, 34% of NYHA class I and II patients, and 42% of NYHA class III and IV patients die[1]

1. Ahmed A. *Am J Cardiol* 2007;99:549–53.
2. Roger VL *et al*. *JAMA* 2004;292:344–50.
3. Levy D *et al*. *N Engl J Med* 2002;347:1397–402.
4. Go AS *et al*. *Circulation* 2014;129:e28–e292.

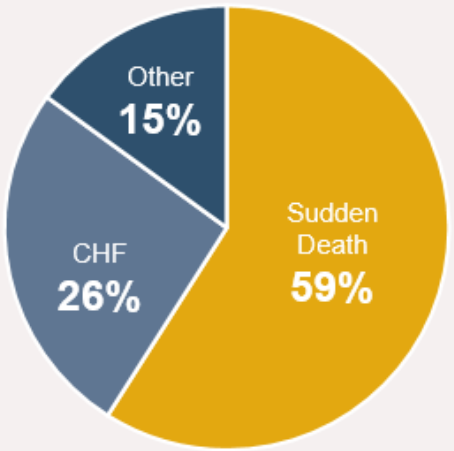
SUDDEN CARDIAC DEATH

is the most common mode of death in NYHA Class II/III patients†[1]

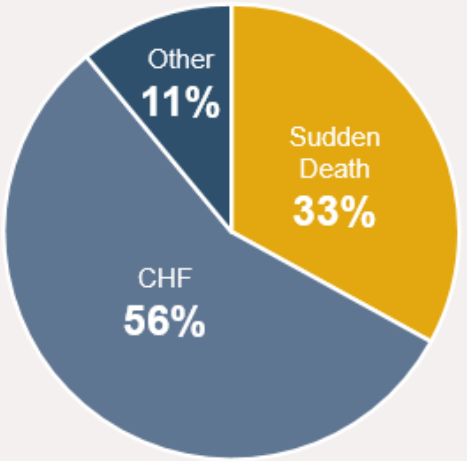
NYHA II
(n=103)



NYHA III
(n=237)



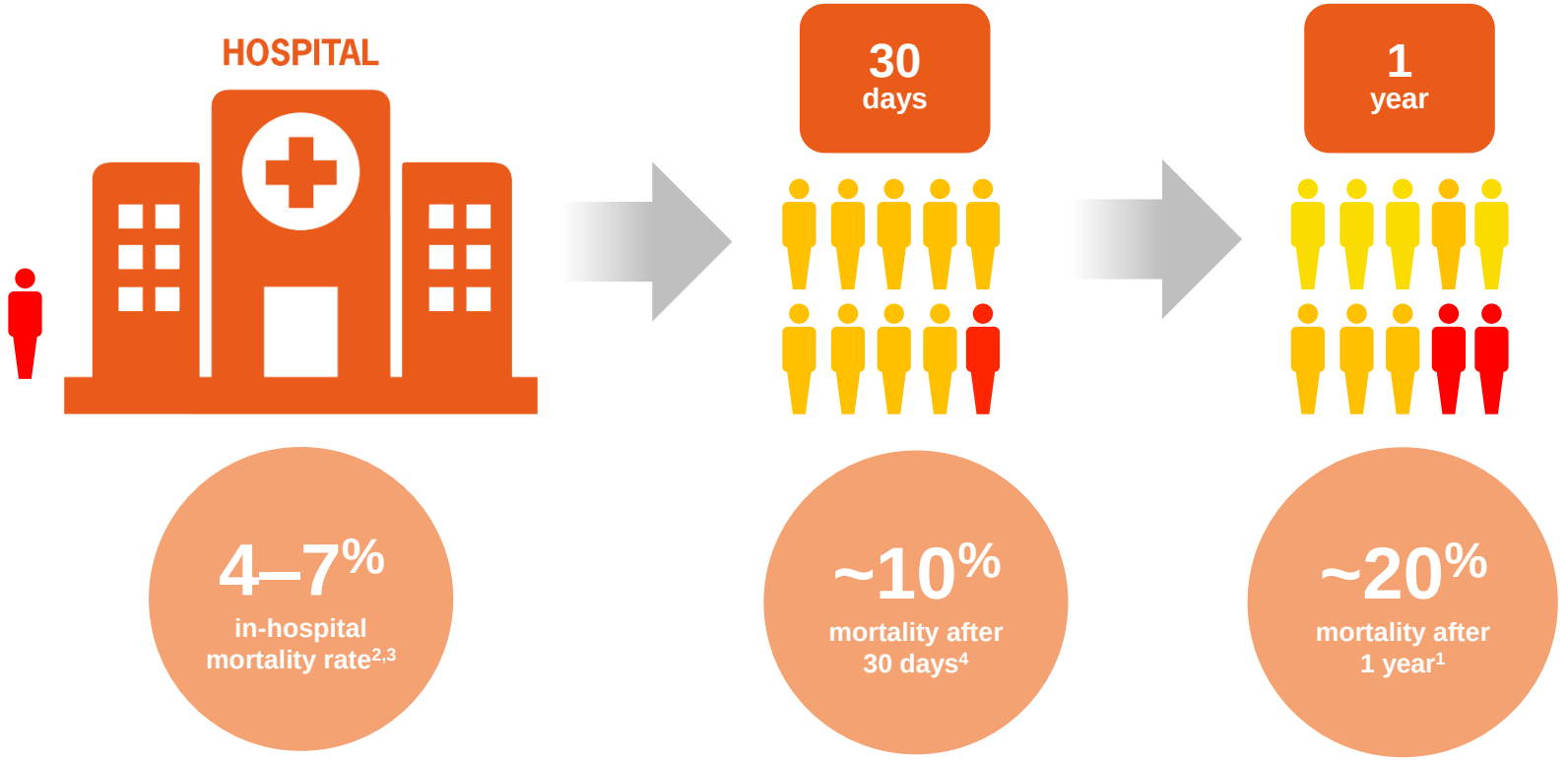
NYHA IV
(n=27)



There is no such thing as a 'stable' HF-rEF patient

1. MERIT-HF study group. Lancet 1999; 353: 2001–2007.

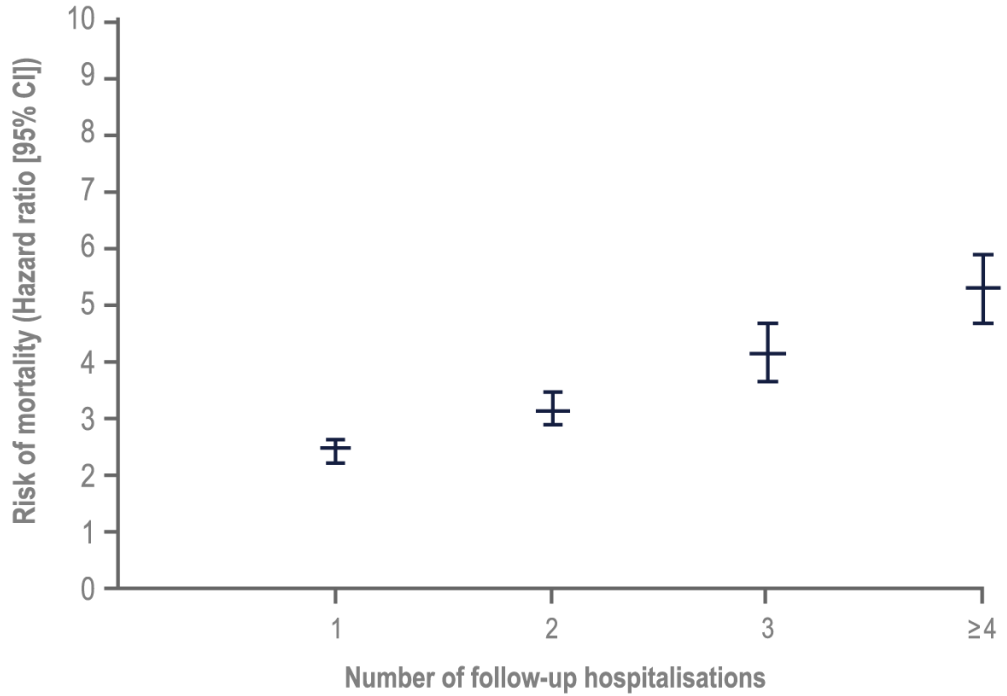
HOSPITALISATION FOR ACUTE HEART FAILURE IS ASSOCIATED WITH SIGNIFICANT MORTALITY[1-4]



1. Maggioni AP *et al. Eur J Heart Fail* 2013;15:808–17.
2. Maggioni AP *et al. Eur J Heart Fail* 2010;12:1076–84.
3. Nieminen MS *et al. Eur Heart J* 2006;27:2725–36.
4. Loehr LR *et al. Am J Cardio*l 2008;101:1016–22.

Each time a patient is hospitalised for HF, their mortality risk increases[1]

Risk of mortality during a median follow-up of 1,024 days, according to the number of re-hospitalisations for heart failure[1]



Adapted from Lee DS et al. (2009).[1] Retrospective clinical audit examining the 'dose-dependent' relationship between heart failure events and death in patients with heart failure (n=9138) in the Enhanced Feedback For Effective Cardiac Treatment Study.

30% readmission rates[2]
within 30 days

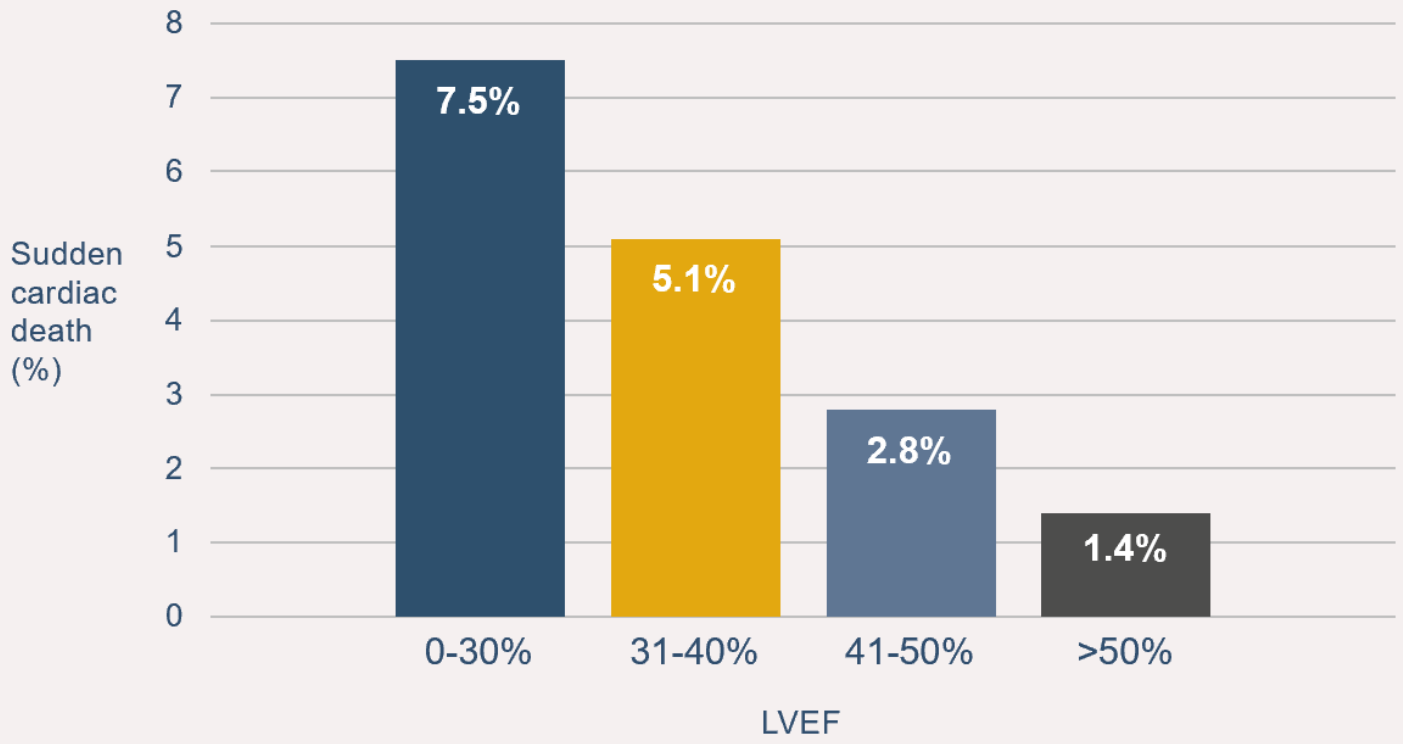
3 more hospital admissions[2]
within 1 year of *de novo* HF admission

~30% of admission preventable[2]
(53,000 admissions)

1. Lee DS *et al*. *Am J Med* 2009;122:162–9 e1.
2. Chen L, Booley S, Keates AK, Stewart S. Snapshot of heart failure in Australia. May 2017. Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia

INCREASED RISK

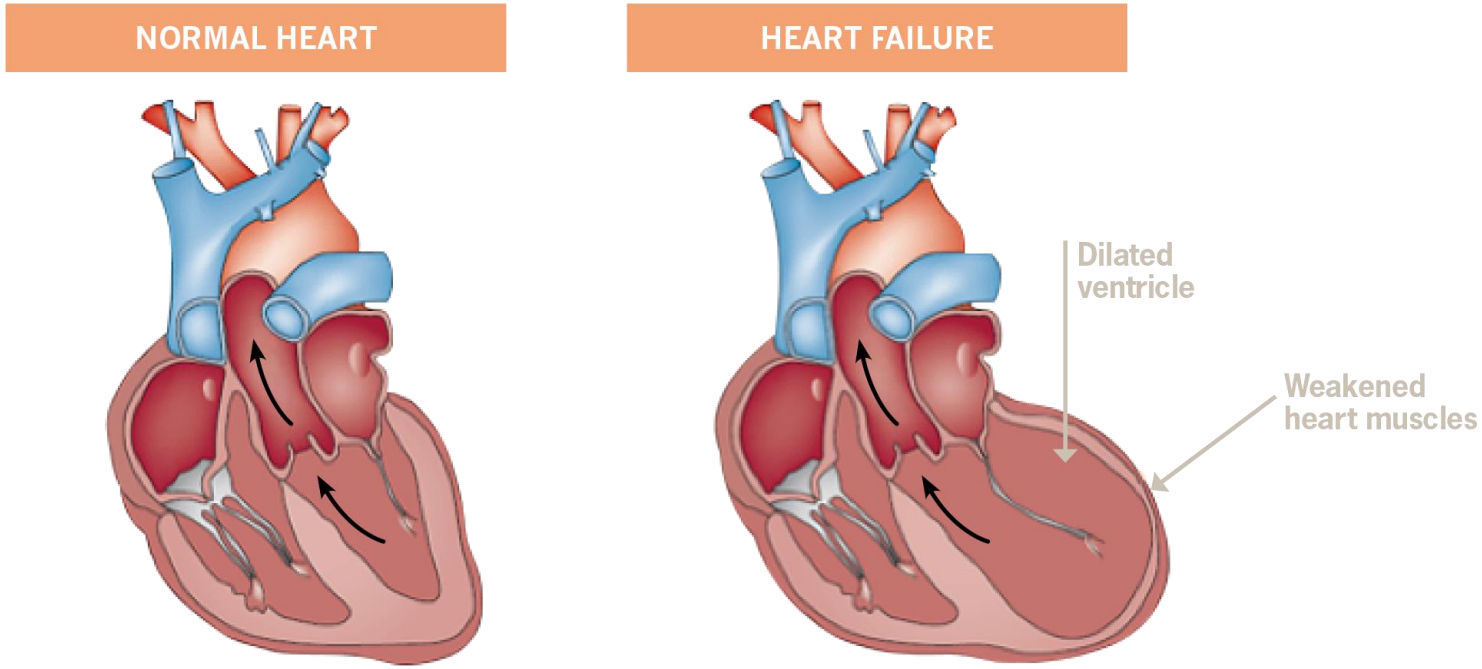
of sudden cardiac death with lower LVEF†[1]



LVEF is also important for risk stratification

Symptoms and Signs of Heart Failure are the Result of Abnormalities of Cardiac Structure/Function

- Abnormality of cardiac structure or function leads to failure of the heart to adequately perfuse organ systems
- Weakening or stiffening of the heart muscle over time leads to pump failure and insufficient delivery of blood around the body



Heart Failure is a Clinical Syndrome

Heart failure is characterised by typical symptoms, which include:

- Breathlessness
- Orthopnoea
- Paroxysmal nocturnal dyspnoea
- Ankle swelling
- Fatigue
- Reduced exercise tolerance

These symptoms may be accompanied by typical signs, such as:

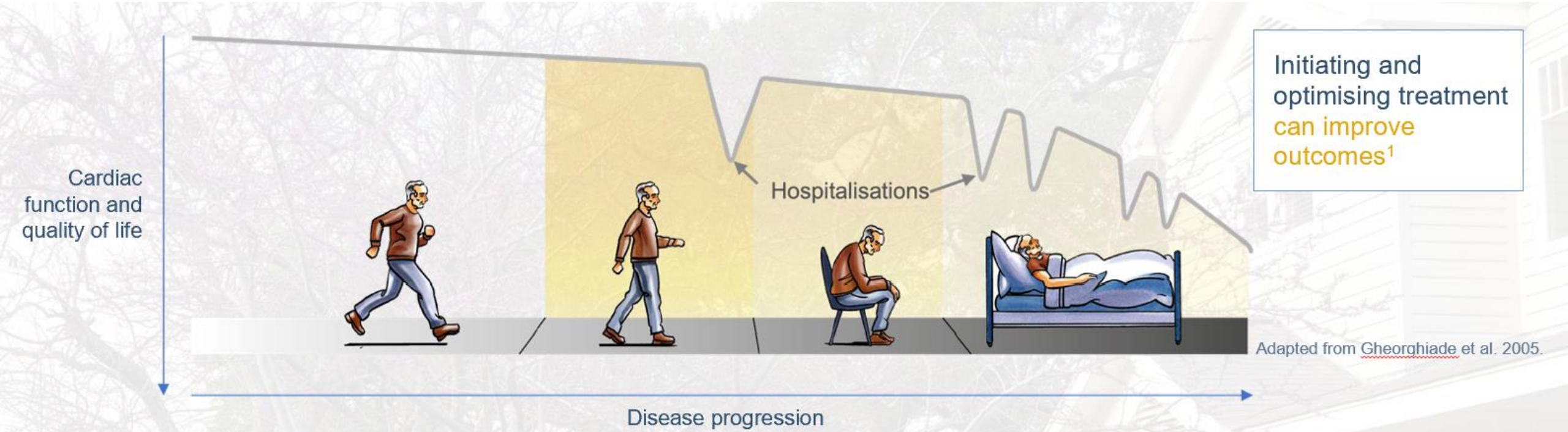
- Elevated jugular venous pressure
- Pulmonary crackles
- Peripheral oedema

Heart Failure Signs & Symptoms

Symptoms	Signs
Typical	**More specific**
Breathlessness Orthopnoea Paroxysmal nocturnal dyspnoea Reduced exercise tolerance Fatigue, tiredness, increased time to recover after exercise Ankle swelling	Elevated jugular venous pressure Hepatojugular reflux Third heart sound (gallop rhythm) Laterally displaced apical impulse
Less typical	**Less specific**
Nocturnal cough Wheezing Bloated feeling Loss of appetite Confusion (especially in the elderly) Depression Palpitations Dizziness Syncope Bendopnoea	Weight gain (>2 kg/week) Weight loss (in advanced heart failure) Tissue wasting (cachexia) Cardiac murmur Peripheral oedema (ankle, sacral, scrotal) Pulmonary crepitations Reduced air entry and dullness to percussion at lung bases (pleural effusion) Tachycardia Irregular pulse Tachypnoea Cheyne Stokes respiration Hepatomegaly Ascites Cold extremities Oliguria Narrow pulse pressure

- Symptoms and signs of heart failure should be assessed at each visit
- Particular attention should be given to evidence of congestion and BP/HR
- Persistence of symptoms despite treatment often indicates the need for additional therapy

Chronic Progressive Disease



Increasing frequency of acute events with disease progression leads to high rates of hospitalisation, increased morbidity and increased risk of mortality.[1-3]

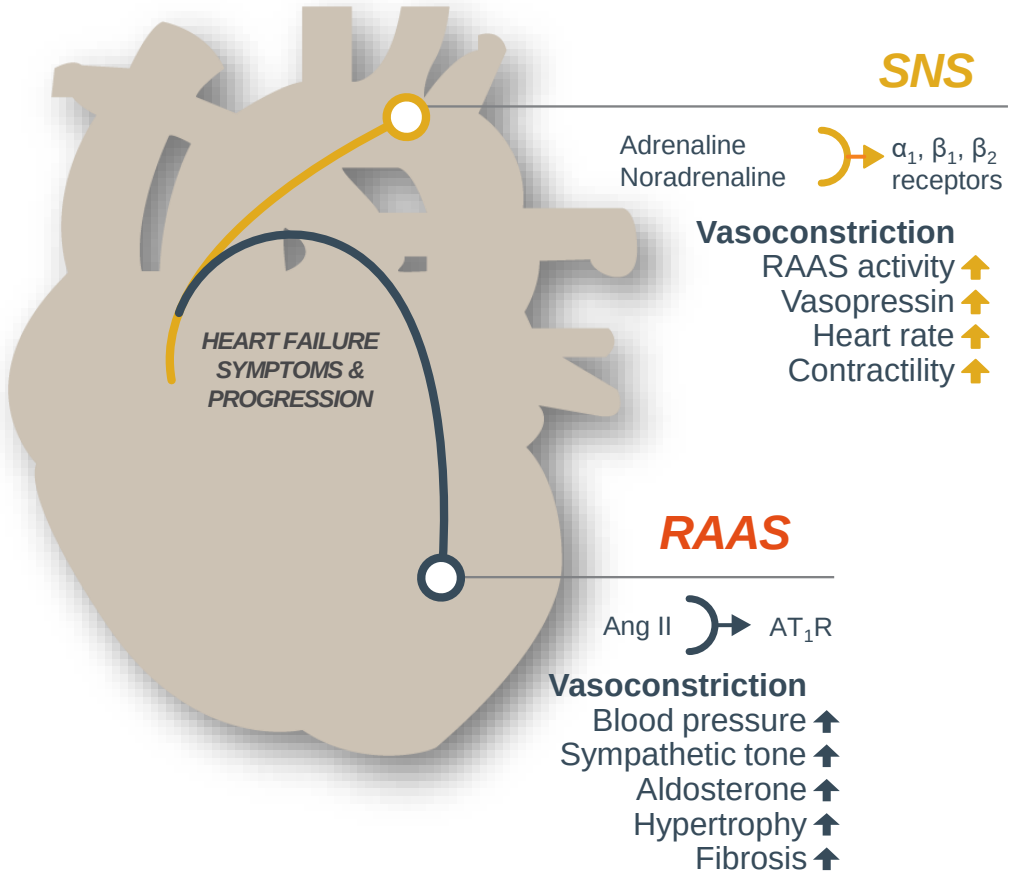
NYHA classification is important for evaluating the symptoms of patients with HF

- HF can be graded according to NYHA functional classification.
- NYHA functional classification is widely used and accepted and is based on exercise capacity and symptoms of the disease.[1]

NYHA Classes			
NYHA class I	**NYHA class II**	**NYHA class III**	**NYHA class IV**
No limitation of physical activity	Slight limitation of physical activity	Marked limitation of physical activity	Unable to carry on any physical activity without discomfort
No overt symptoms	Comfortable at rest, but ordinary physical activity causes symptoms of heart failure	Comfortable at rest, but less than ordinary activity causes symptoms of heart failure	May have symptoms even at rest which increases with any activity

1. McMurray JJ *et al*. *Eur Heart J* 2012;33:1787–847.

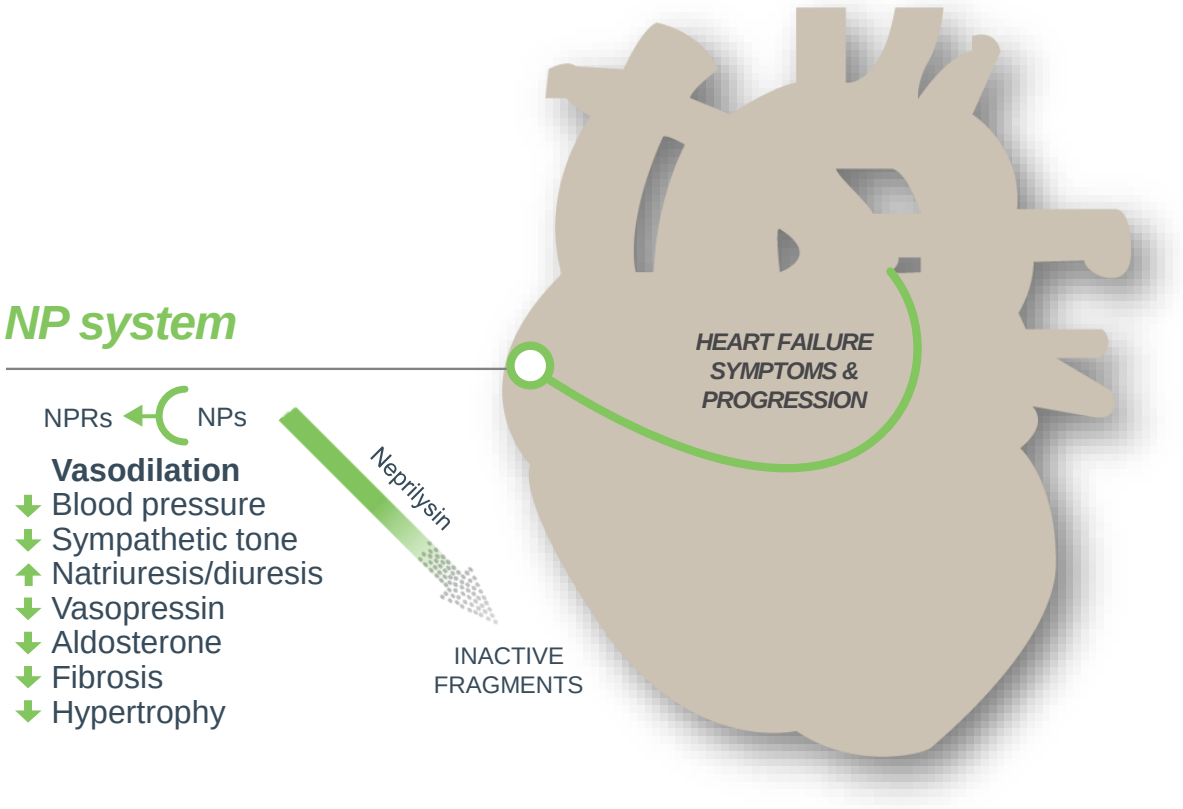
The SNS and RAAS are over-activated in HF and are responsible for many of the pathophysiological responses that contribute to disease progression[1-3]



Ang: angiotensin; AT_1R: angiotensin type 1 receptor; HF: heart failure; RAAS: renin-angiotensin-aldosterone system; SNS: sympathetic nervous system.

1. Kemp CD *et al. Cardiovasc Pathol* 2012;21:365–71. 2. Schrier RW *et al. N Engl J Med* 1999;341:577–85. 3. Langenickel *et al. Drug Discov Today: Ther Strateg* 2012;9:e131–9.

Secretion of natriuretic peptides results in a number of responses that act to reduce the symptoms and progression of HF[1,2]



NP: natriuretic peptide; NPR: natriuretic peptide receptor.

1. Levin ER *et al. N Engl J Med* 1998;339:321–8. 2. Mangiafico S *et al. Eur Heart J* 2013;34:886–93c.

DEFINITION OF HEART FAILURE[1]

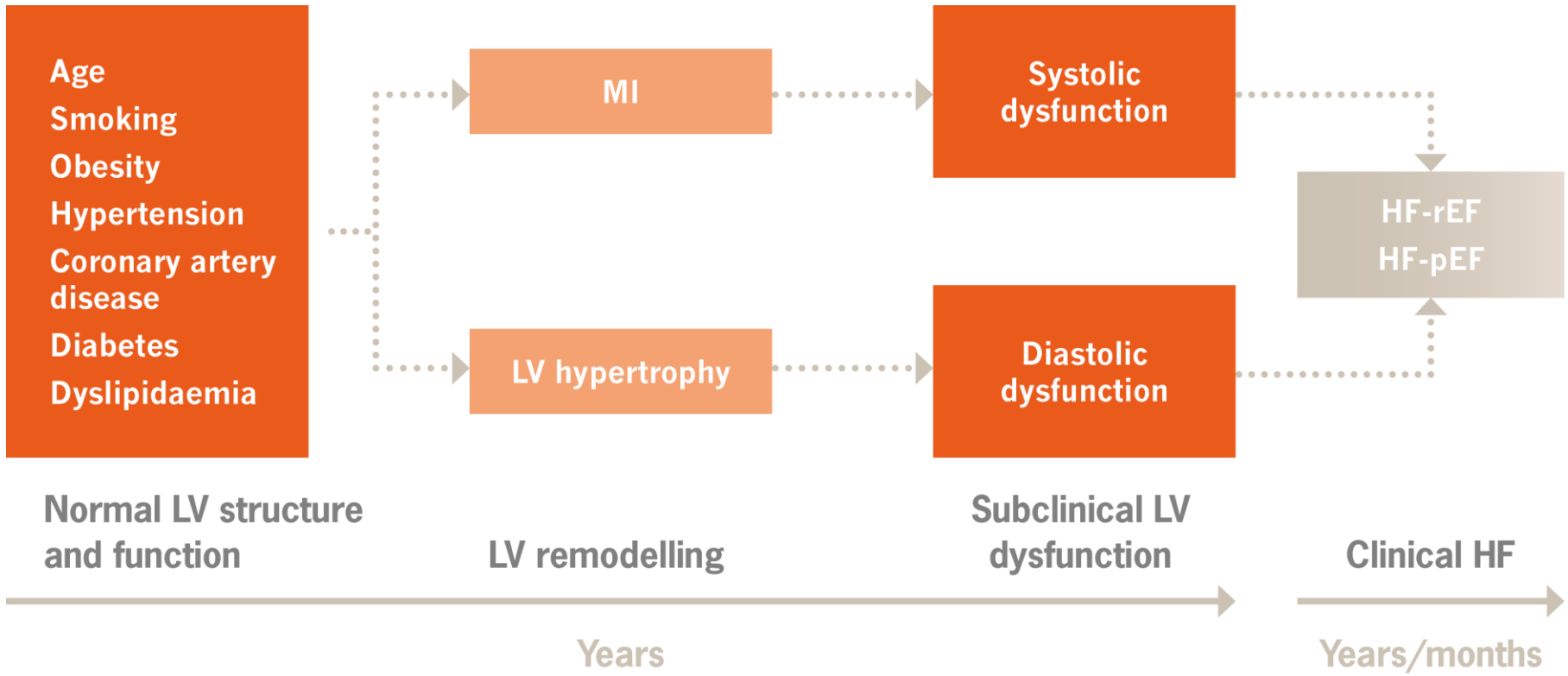
HF-rEF	HF-pEF
• Symptoms ± signs of heart failure **and** • LVEF <50%†	• Symptoms ± signs of heart failure **and** • LVEF ≥50% **and** • Objective evidence of: - Relevant structural heart disease (LV hypertrophy, left atrial enlargement) **and/or** - Diastolic dysfunction, with high filling pressure demonstrated by any of the following: • Invasive means (cardiac catheterisation) • Echocardiography • Biomarker (elevated BNP or NT-proBNP) • Exercise (invasive or echocardiography)

"HF is a complex clinical syndrome with typical symptoms and signs that generally occur on exertion, but can also occur at rest (particularly when recumbent), that is secondary to an abnormality of cardiac structure or function that impairs the ability of the heart to fill with blood at normal pressure or eject blood sufficient to fulfil the needs of the metabolising organs."[1]

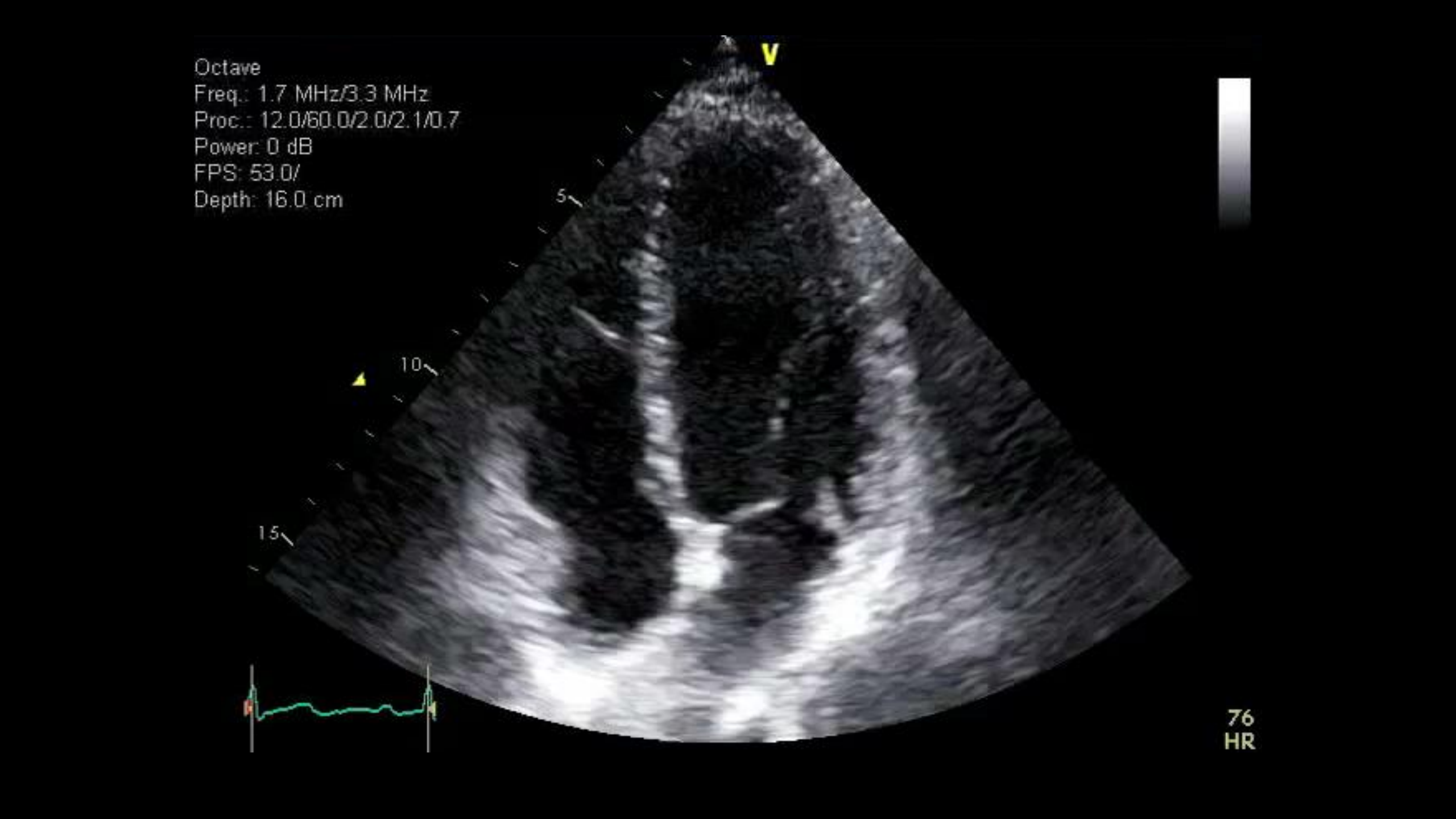
CSANZ Heart Failure Guidelines

Different Co-Morbidities and Pathophysiological Processes Can Lead to Different Types of Heart Failure[1]

A range of risk factors and co-morbidities contribute to the development of heart failure[9]



1. Krum H *et al. Lancet* 2003;362:147–58
2. Ponikowski P *et al. Eur Heart J* 2016; 37:2129-2200


Octave
Freq.: 1.7 MHz/3.3 MHz
Proc.: 12.0/60.0/2.0/2.1/0.7
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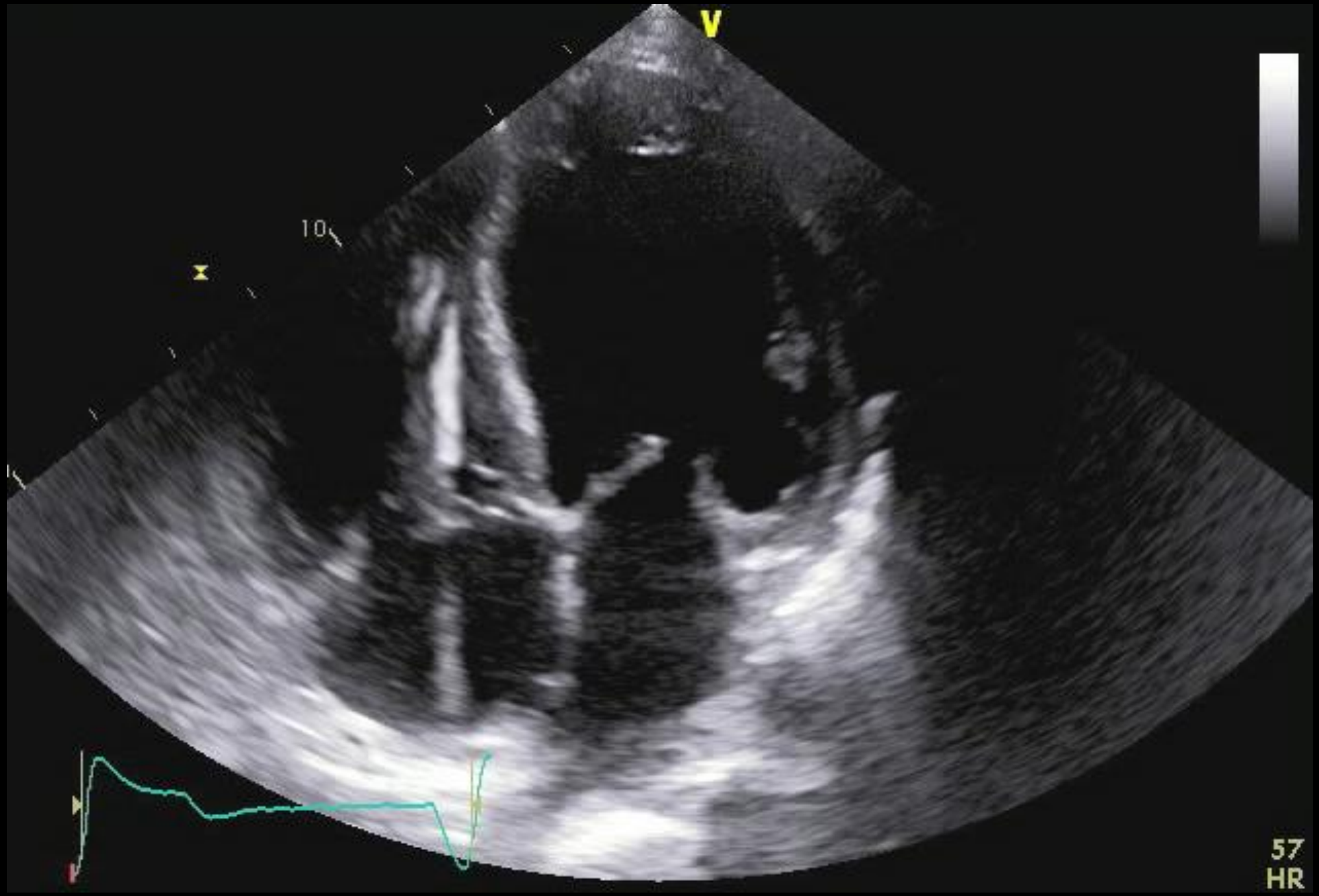
10
15
76
HR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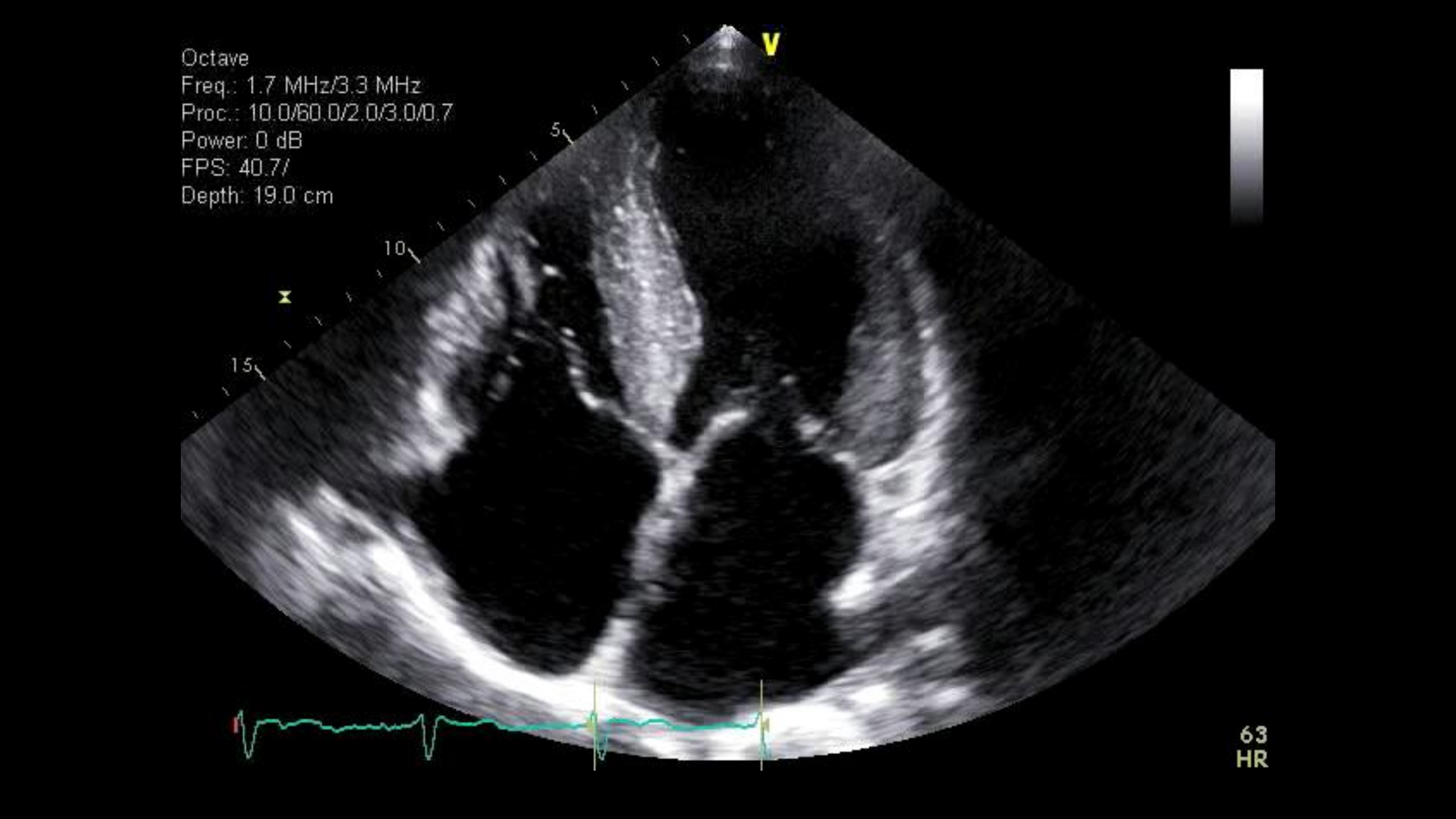
57
HR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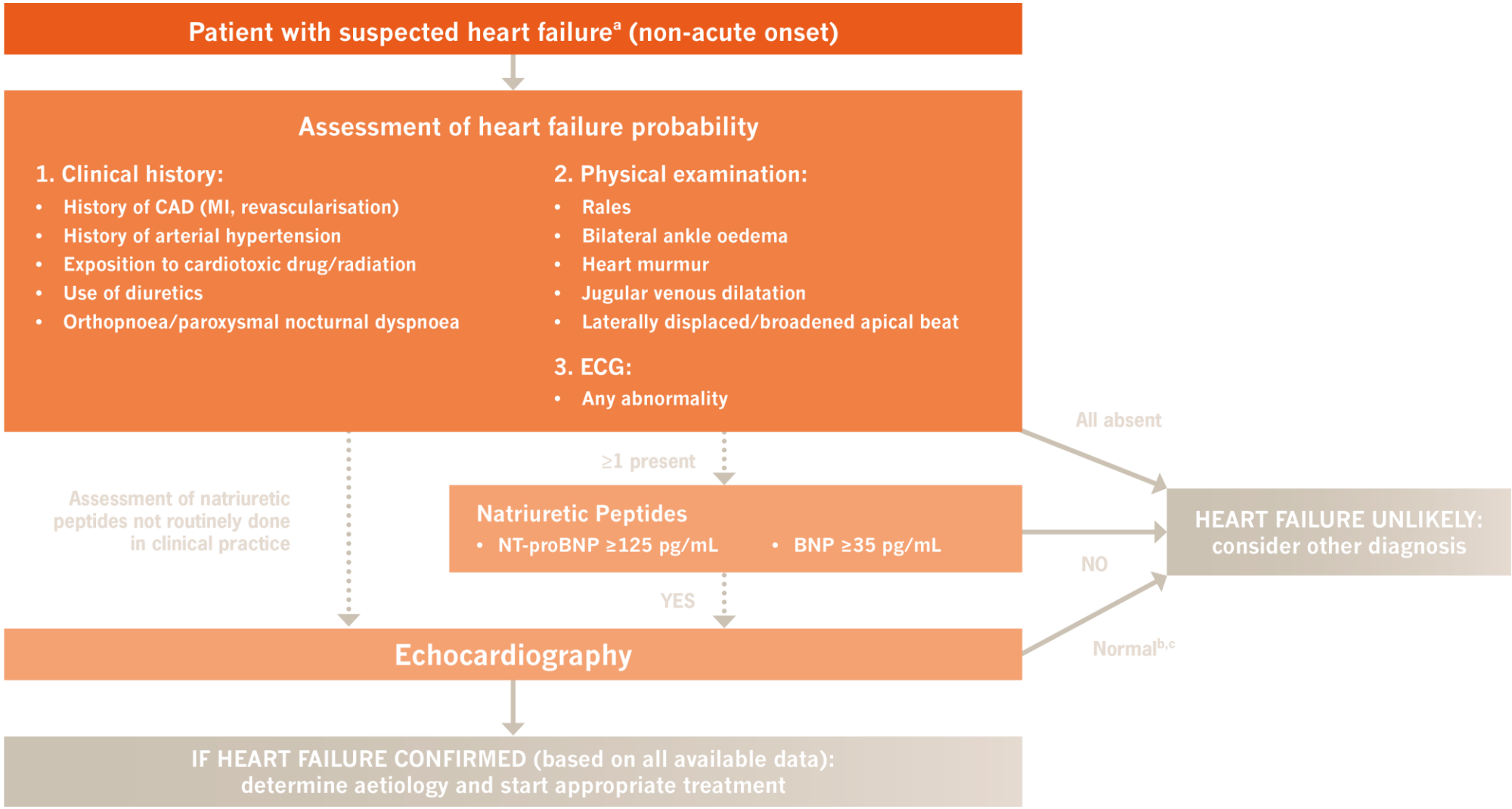
Proc.: 10.0/60.0/2.0/3.0/0.7
Power: 0 dB
FPS: 40.7/
Depth: 19.0 cm
5
10
15
63
HR

A NUMBER OF DIAGNOSTIC ASSESSMENTS CAN BE USED TO SUPPORT THE PRESENCE OF HEART FAILURE

Assessment of symptoms	Compatible symptoms include breathlessness, fatigue, angina, palpitations or syncope
Assessment of signs	Compatible signs should include appearance, pulse, BP, fluid overload, respiratory and heart rate
ECG	ECG changes are common (e.g. presence of new Q waves reflecting a MI; wave abnormalities reflecting ischaemia, or an arrhythmia). If the ECG is completely normal, heart failure, especially with systolic dysfunction, is unlikely (<10%)
Laboratory analyses	Elevated BNP/NT-proBNP, hyponatraemia, renal dysfunction, mild elevations of troponin
Chest X-ray	Permits assessment of pulmonary congestion and may demonstrate important pulmonary or thoracic causes of dyspnoea
Echocardiography	Provides extensive information on cardiac anatomy, wall motion and valvular and ventricular function; used to confirm heart failure diagnosis

Diagnostic Algorithm for Non-Acute Heart Failure



BNP/NT-pro-BNP Cut-Offs for Acute Presenters

BNP

- <100 pg/mL – HF unlikely
- 100–500 pg/mL – HF is possible, but consider other diagnoses
- >500 pg/mL – HF is very likely

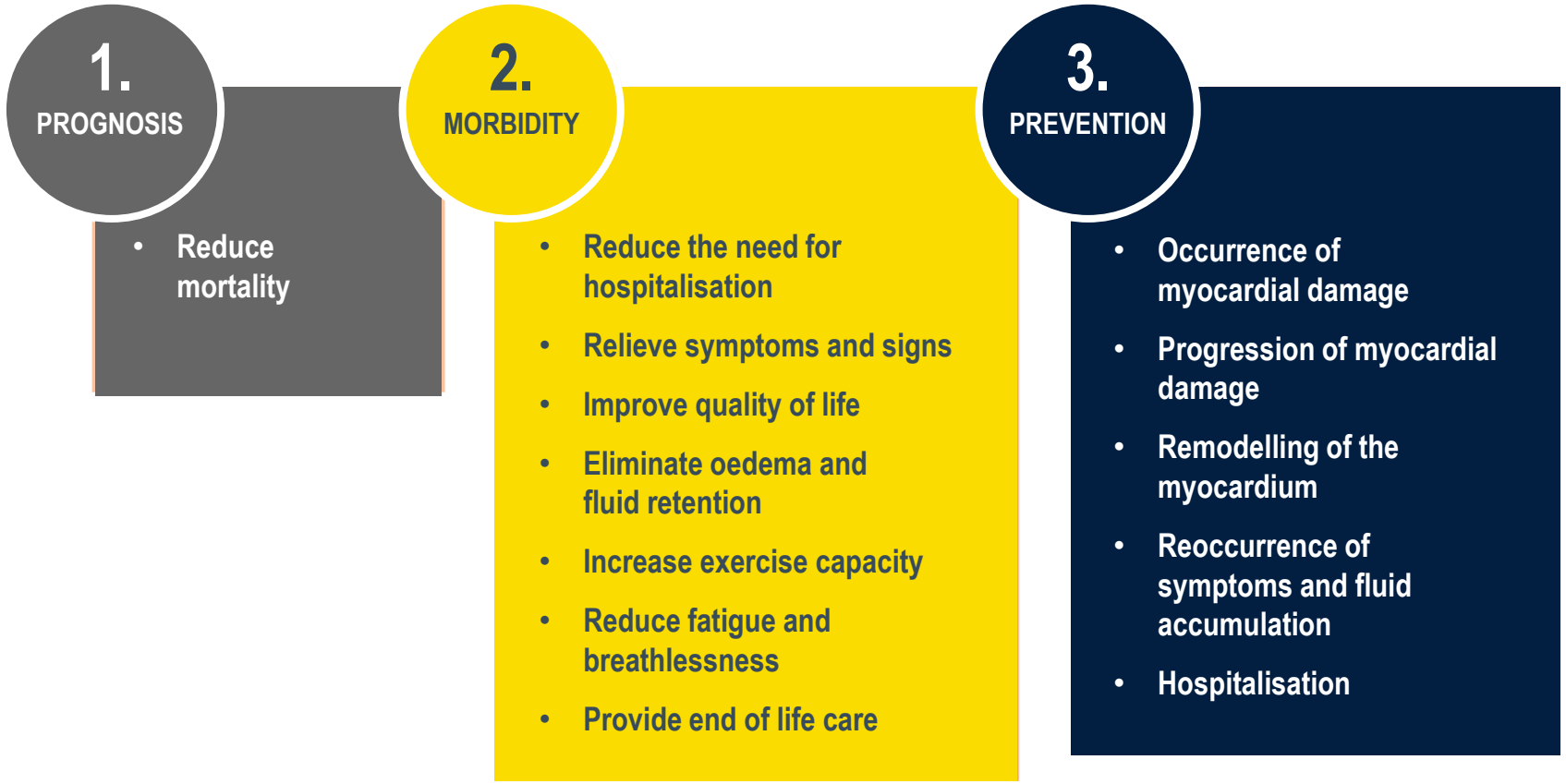
NT-pro-BNP

Age	HF is unlikely	HF is possible, but consider other diagnoses	HF is very likely
<50	<300 pg/mL	300–450 pg/mL	>450 pg/mL
50–75	<300 pg/mL	450–900 pg/mL	>900 pg/mL
>75	<300 pg/mL	900–1,800 pg/mL	>1,800 pg/mL

Moe GW *et al*. Canadian Journal of Cardiology. 2015; 31(1): 3-16

What are the treatment objectives for chronic HF?

Objectives of treatment for chronic HF[1]



Adapted from Dickstein *et al.* (2008).[1]
HF: heart failure.
1. Dickstein K *et al*. *Eur Heart J* 2008;29:2388–442.

Standard of Care from Landmark Clinical Trials

1987

ACE inhibitors[1]
CONSENSUS
enalapril vs placebo
(n=253)

1991/92

ACE inhibitors[2,3]
SOLVD
enalapril vs placebo
(n=6797)

1999

Beta-blockers[4]
CIBIS-II
bisoprolol vs placebo
(n=2647)

Beta-blockers[5]
MERIT-HF
metoprolol vs placebo
(n=3991)

Aldosterone antagonists[6]
RALES
spironolactone vs placebo
(n=1663)

2001

ARBs[7]
Val-HeFT
valsartan vs placebo
(n=5010)

Beta-blockers[8]
CAPRICORN
carvedilol vs placebo
(n=1959)

Beta-blockers[9]
COPERNICUS
carvedilol vs placebo
(n=2289)

2003

ARBs[10]
CHARM-Alternative
candesartan vs placebo
(n=2028)

2004

Nitrates/vasodilators[11]
A-HeFT
isosorbide dinitrate/
hydralazine vs placebo
(n=1050)

SHIFT (2010)
6,558 patients
(I_f inhibitor) *vs. placebo:*
18% ↓ CV death or heart failure hospitalisation

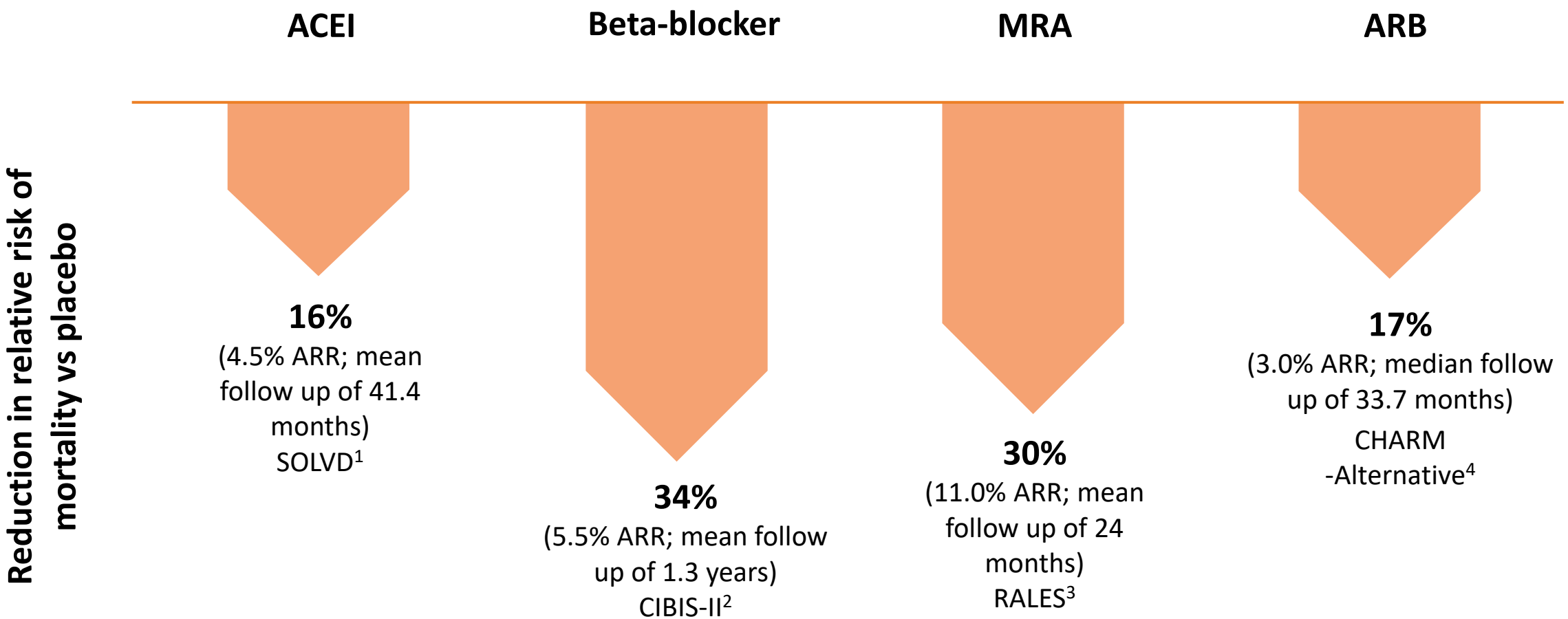
2011

Aldosterone antagonists[12]
EMPHASIS-HF
eplerenone vs placebo
(n=2737)

PARADIGM-HF (2014)
8,442 patients
(ARNI) vs. ACEi:
20% ↓ CV mortality or heart failure hospitalisation

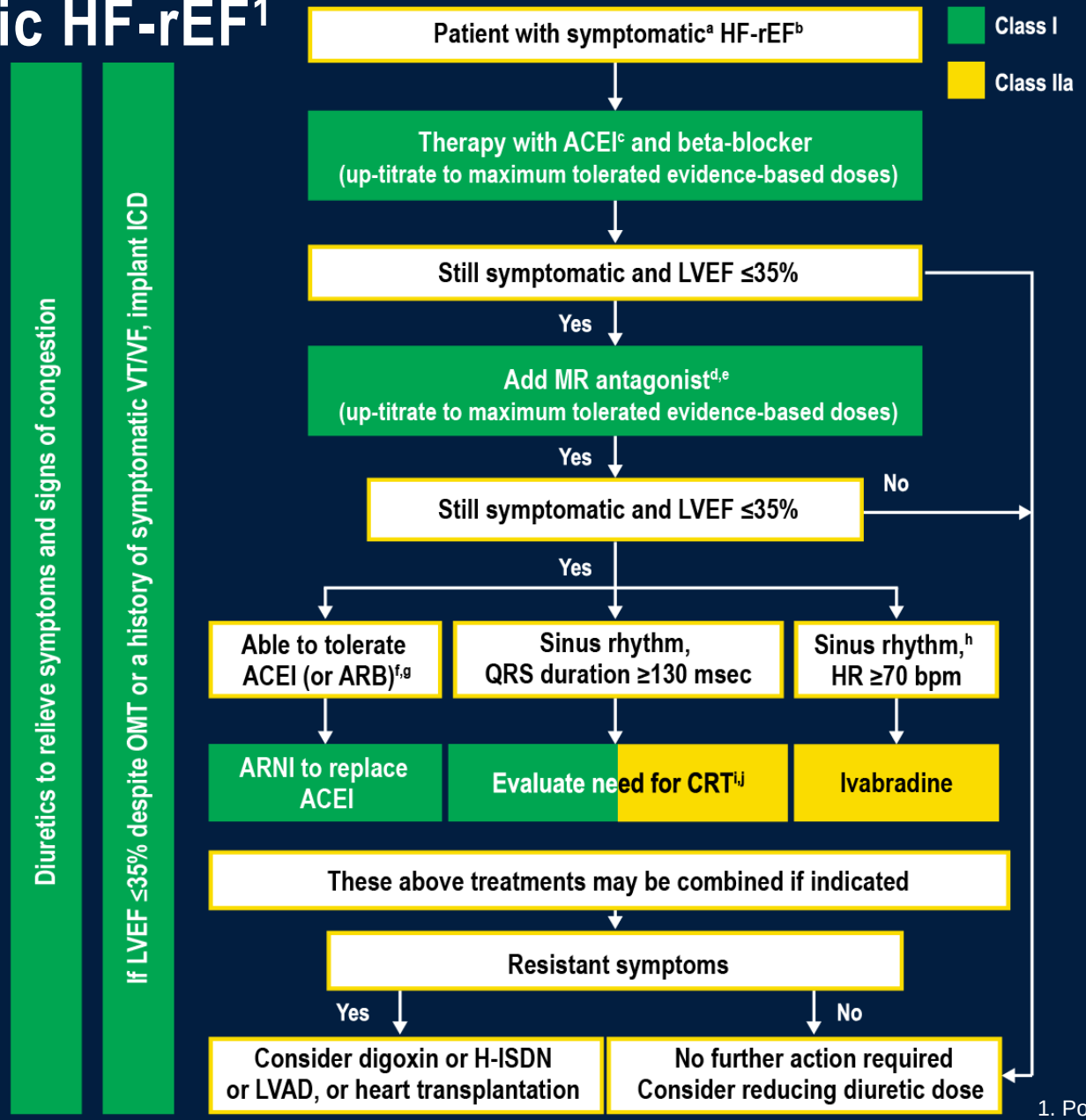
1. The CONSENSUS Trial Study Group. *N Engl J Med* 1987;316(23):1429–35. 2. The SOLVD Investigators. *N Engl J Med* 1991;325(5):293–302. 3. The SOLVD Investigators. *N Engl J Med* 1992;327(10):685–91. 4. The CIBIS-II Investigators. *Lancet* 1999;353(9146):9–13. 5. MERIT-HF Working Group. *Lancet* 1999;353(9169):2001-–7. 6. Pitt B *et al. N Engl J Med.* 1999;341(10):709–17. 7. Cohn J *et al. N Engl J Med* 2001;345(23):1667–75. 8. Dargie HJ. *Lancet* 2001;357(9266):1385–90. 9. Packer M *et al. N Engl J Med* 2001;344(22):1651–8. 10. Granger CB *et al. Lancet.* 2003;362(9386):772–6. 11. Taylor AL *et al. N Engl J Med* 2004;351(20):2049–57. 12. Zannad F *et al. N Engl J Med* 2011;364(1):11–21.

Standard Therapy Improves Survival

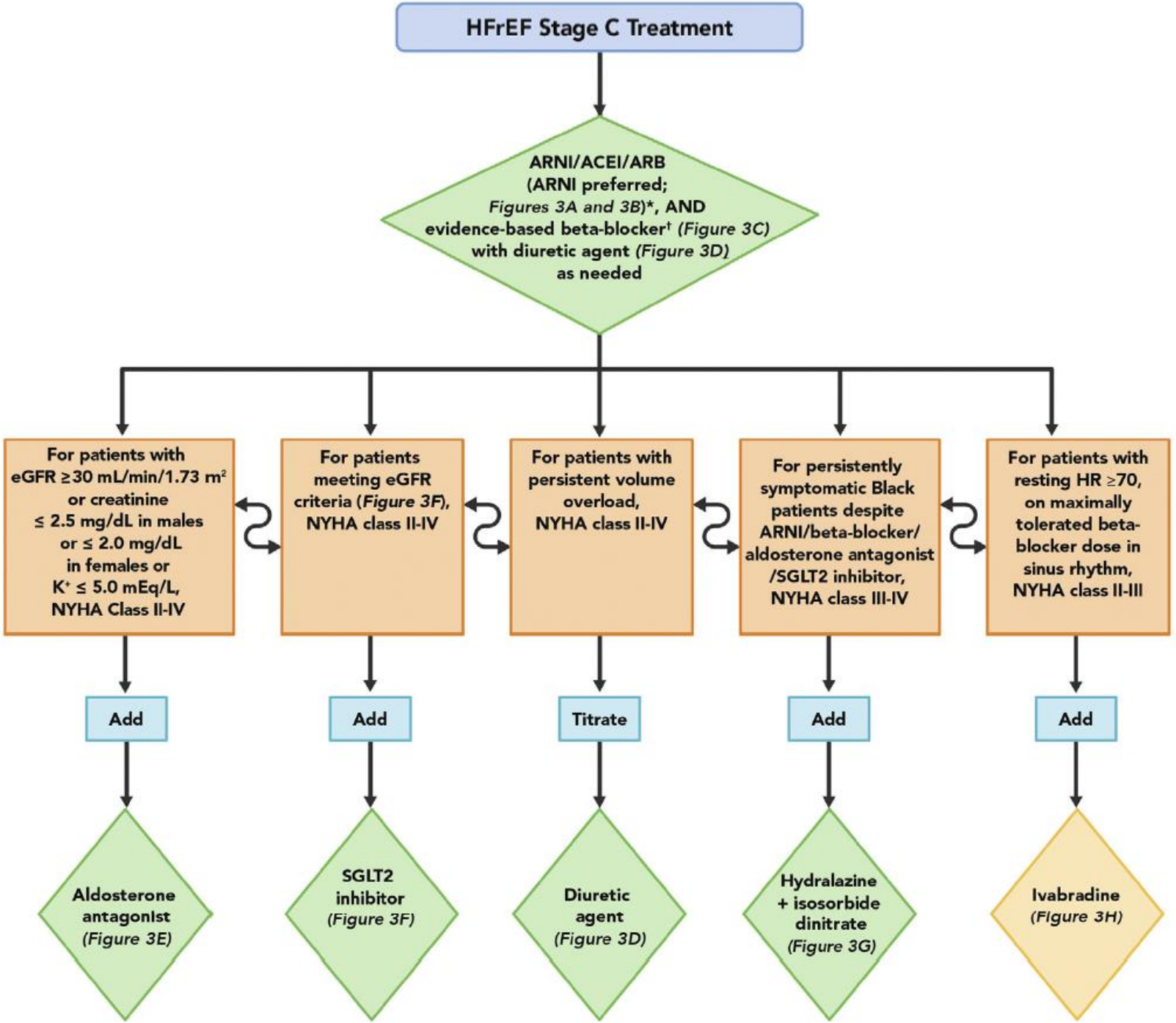


1. The SOLVD Investigators. *N Engl J Med* 1991;325(5):293–302
2. The CIBIS-II Investigators. *Lancet* 1999;353(9146):9–13.
3. Pitt B *et al. N Engl J Med.* 1999;341(10):709–17.
4. Granger CB *et al. Lancet.* 2003;362(9386):772–6.

The Updated 2016 ESC HF Guidelines Therapeutic Algorithm for a Patient with Symptomatic HF-rEF[1]



1. Ponikowski P *et al. Eur Heart J* 2016. doi:10.1093/eurheartj/ehw128.



https://doi.org/10.1016/j.jacc.2020.11.022

A SIGNIFICANT PROPORTION

of Australians with HF are missing out on guideline-recommended treatment

SHAPE study[1]

A retrospective cohort study of HF in the Australian primary care setting using Medical Director data

21,803 people classified as having:

- definite HF (16,930) or
- probable HF (4,873)

Of those classified as having definite or probable heart failure (HF):

<15%

had HF recorded as a diagnosis (although 55% had HF recorded either as a diagnosis or as free text in the notes)

Only 1 in 5

were on a HF specific medication (21.8%)

22%

had symptoms/ signs of HF and were on a diuretic

Fewer than half

(46.8%) had a cardiologist referral within 30 days of a HF diagnosis

I_f - Channel Blocker: Ivabradine

Mode of action

- Slows HR through inhibition of the I_f channel in the sinus node

Key trial data

- SHIFT study[1]

Safety considerations

- Bradycardia
- May increase risk of developing AF
- Associated with phosphenes

1. Swedberg K, et al. *J Am Coll Cardiol.* 2012; 59(22):1938–1945.

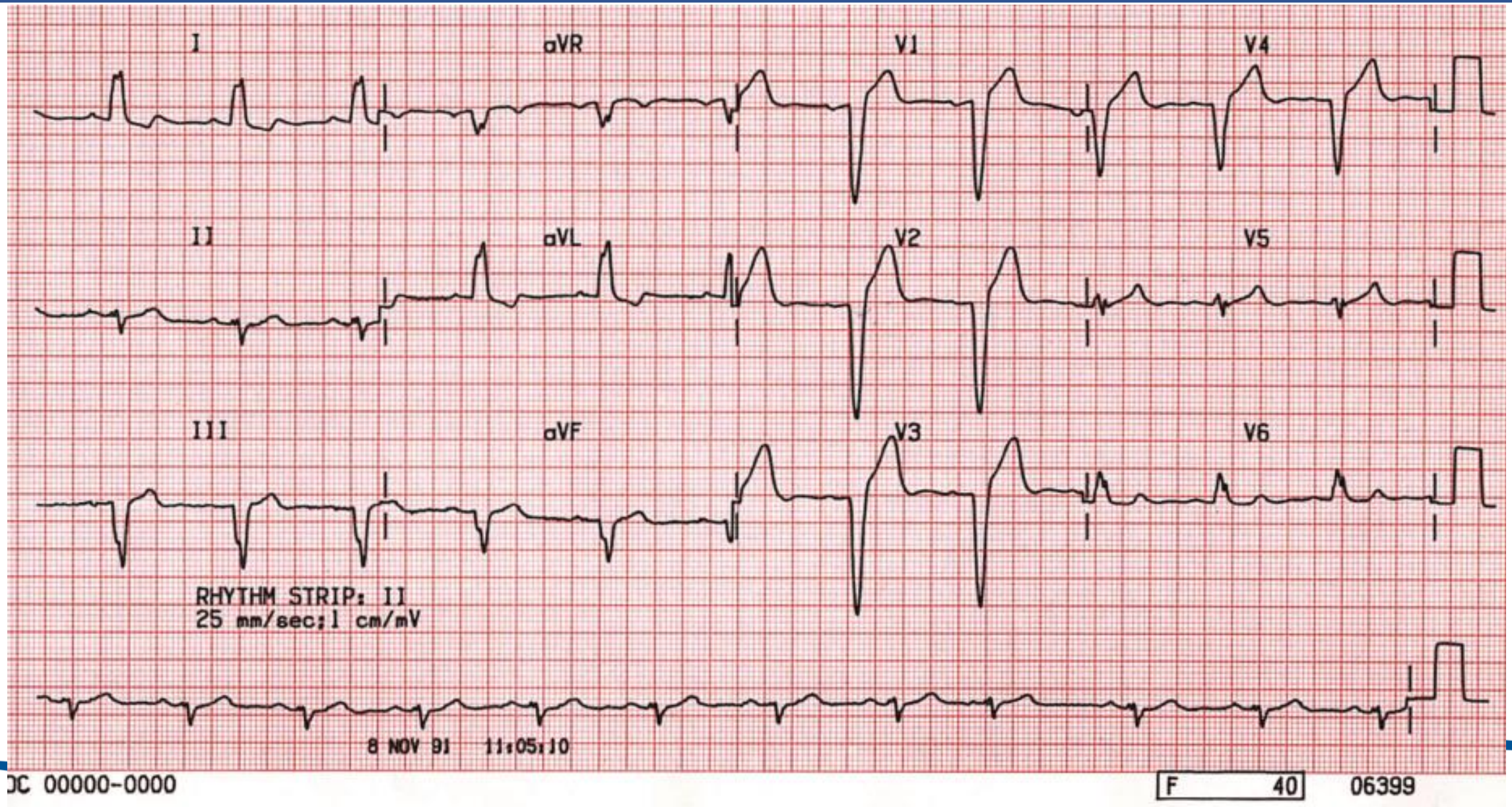
I_f - Channel Blocker: Ivabradine

Drugs in this category	Starting dose (mg)	Target dose (mg)
Ivabradine	5 BID	7.5 BID

Dosage considerations:

- Start with low dose
- In patients >75 years of age, 2.5 mg BID starting dose may be used
- Modify dose based on patient's resting heart rate. Aim for targeted dose, or highest tolerated dose based on resting HR (50 to 60 BPM target)

LBBB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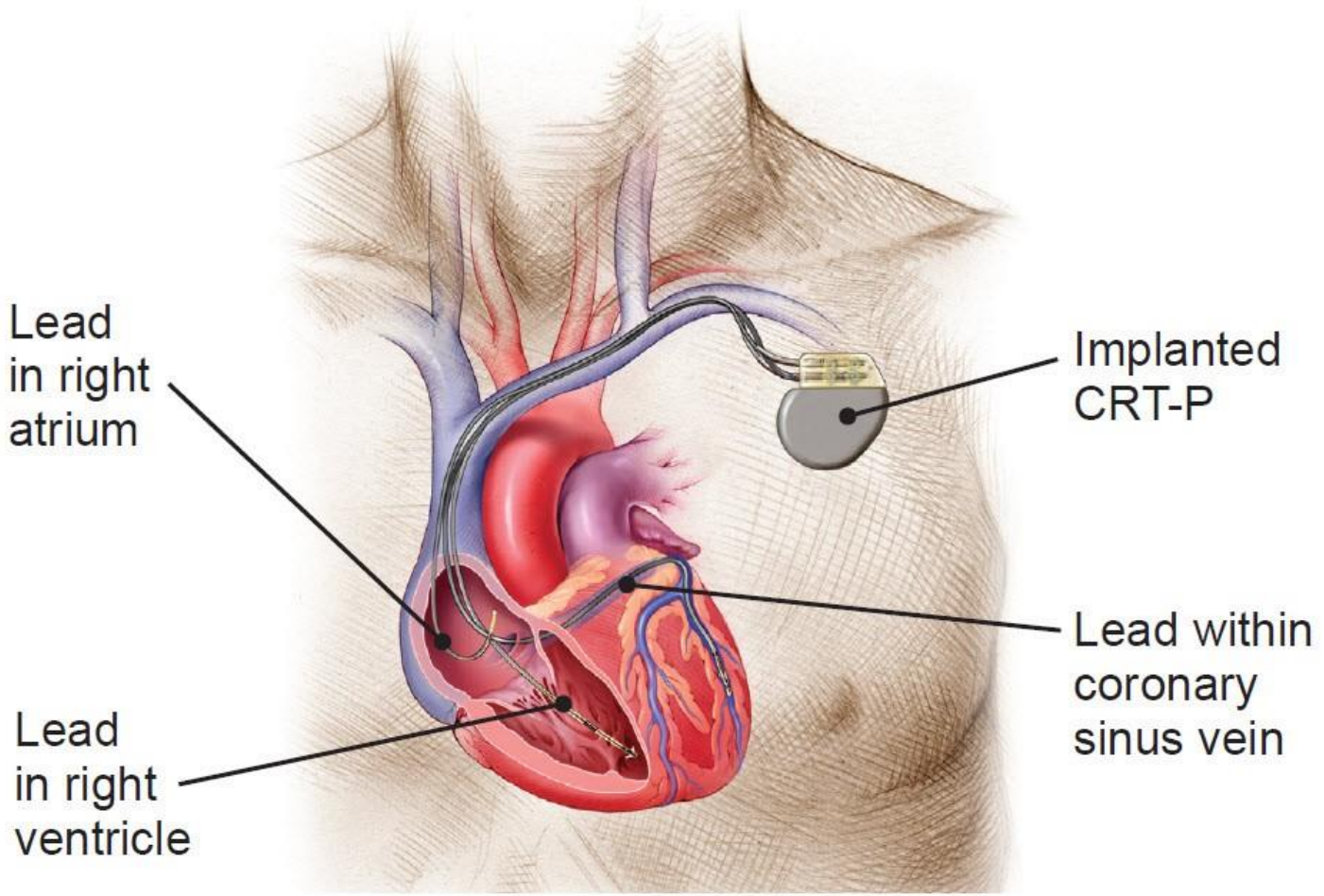
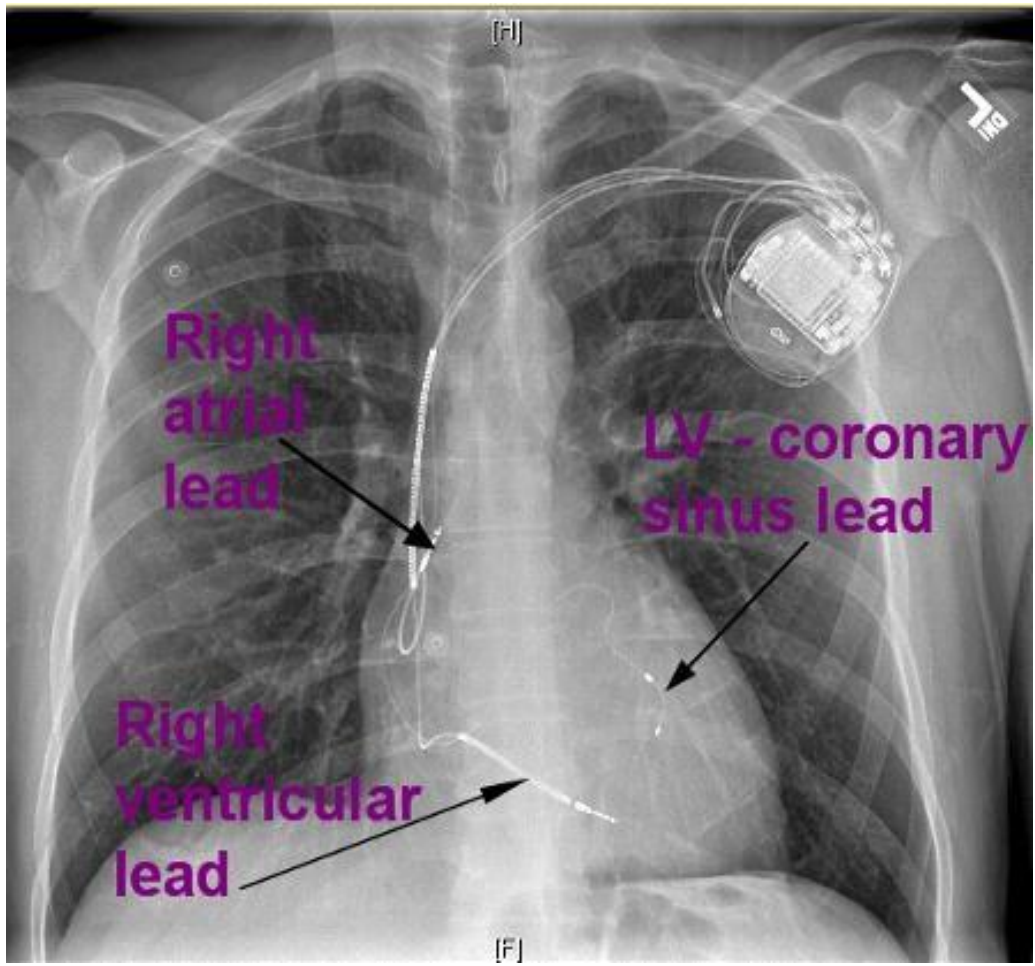
Cardiac Resynchronisation Therapy (CRT)

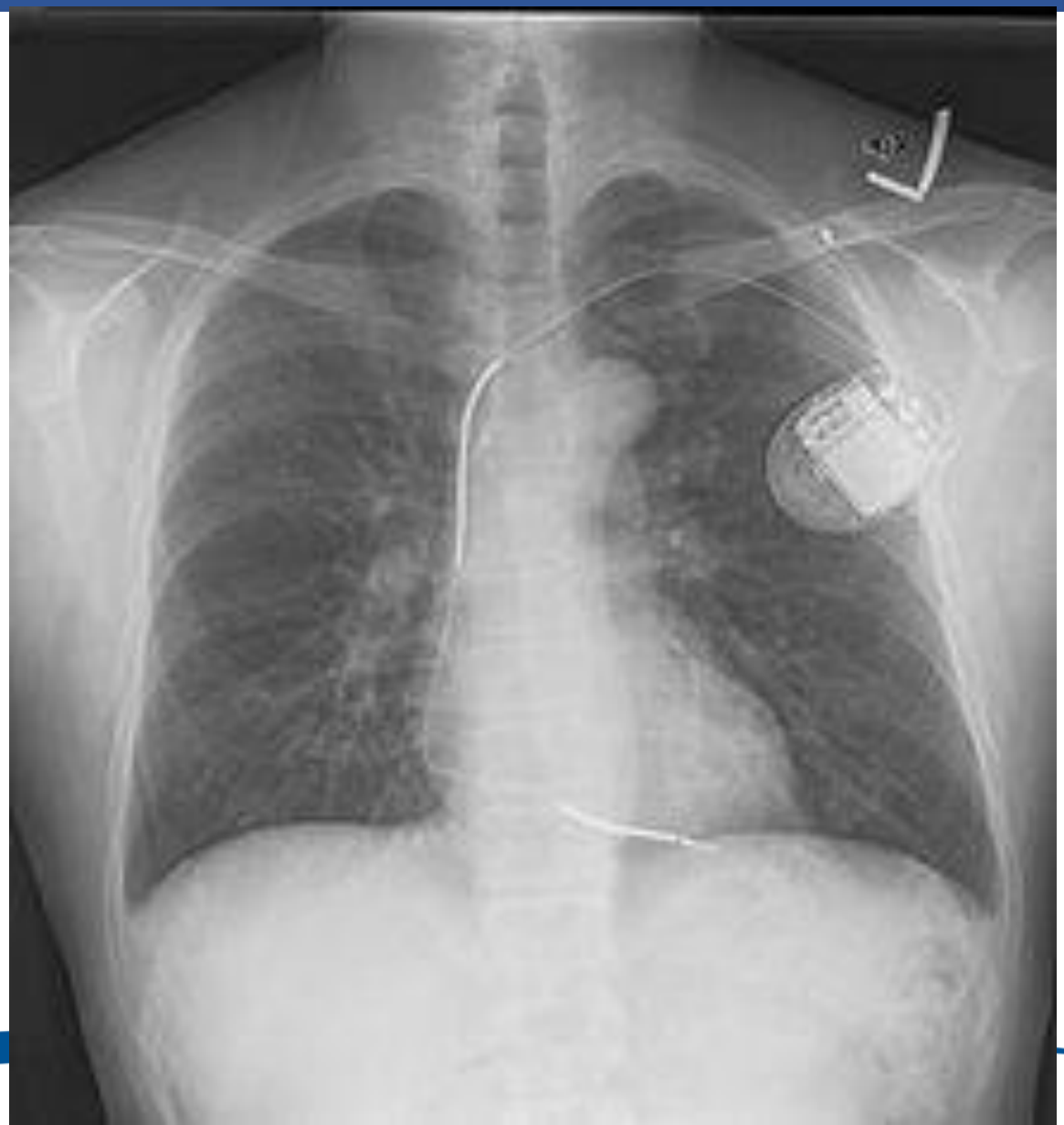




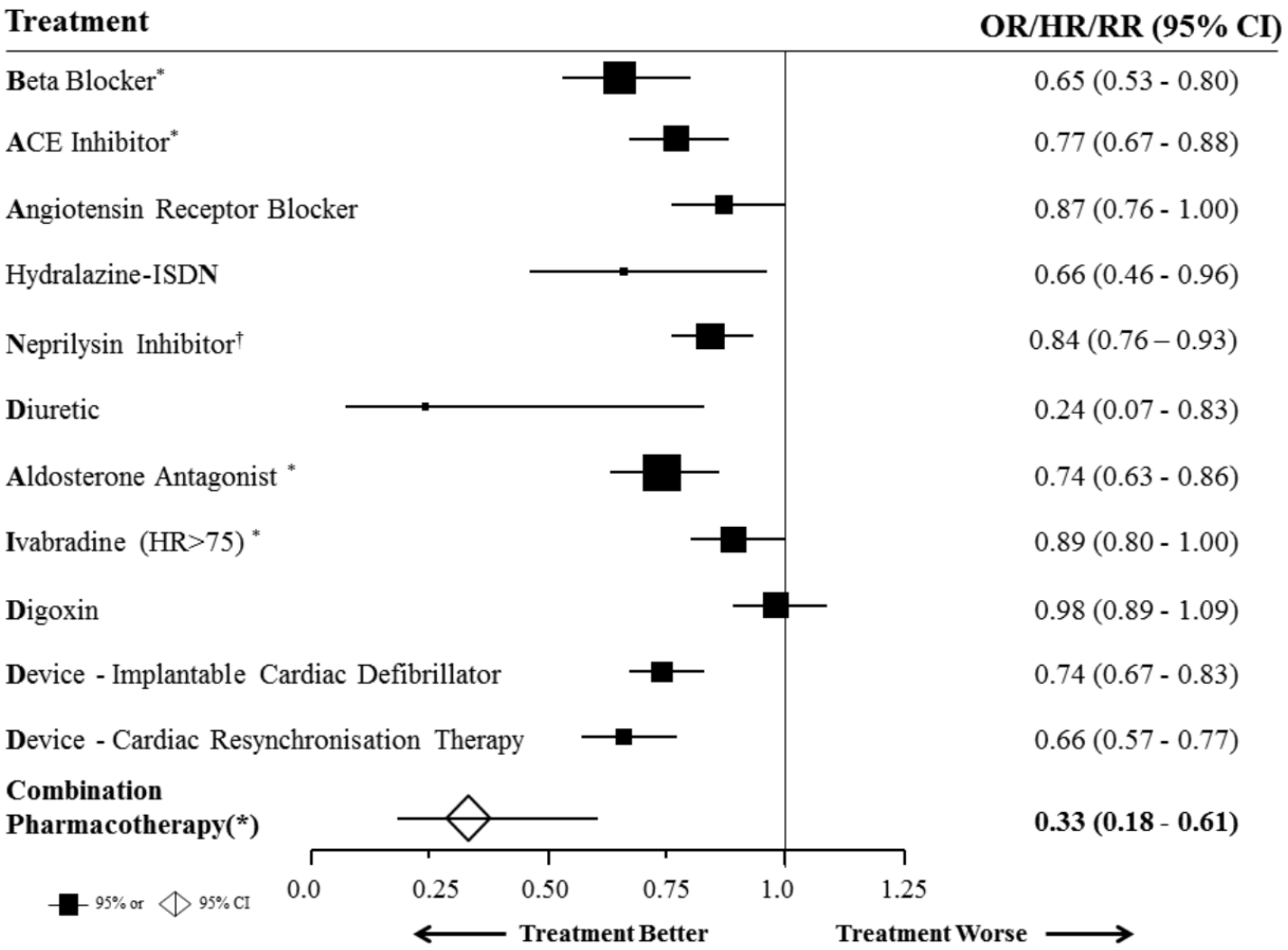
Implantable Defibrillator

- Primary Prevention
- Secondary Prevention

- Antitachycardic Pacing (ATP)
- Defibrillation



BANDAID[2]



Intern Med J. 2016 Jun;46(6):653-62. doi: 10.1111/imj.12839

Australian Guidelines for Heart Failure (2018) Recommend a Number of Non- and Pharmacological Interventions[1]

Non-pharmacological management recommendations

- Multi-disciplinary care team for the patient
- Physical activity program
- Restrict dietary sodium to <2 g/day
- Fluid limitation (1–1.5 L/day) appropriate to symptom severity
- Cease smoking
- Limit alcohol intake to 10–20 g/day – ideally nil
- Daily weighing – advised to seek medical attention if >2 kg gained in a two-day period
- Vaccinations against pneumococcal disease and influenza
- For obese patients – weight loss
- Address sleep apnoea
- Diet with reduced saturated fat intake and high fibre
- Limit caffeine

Pharmacological management recommendations

- ACEI or ARB
- Beta-blocker
- Diuretic
- Mineralocorticoid receptor antagonist
- Direct sinus node inhibition
- Digoxin

1. Atherton JJ et al. Heart Lung Circ 2018; 27: 1123–1208

Keep heart failure in mind

when managing your comorbid patients

Who is the typical Australian HF patient?

- 75% of HF patients are NYHA class II–IV[a1]
- 1 in 4 have been admitted to hospital in past year[a1]
- HF prevalence increases with age (13.9% of those aged ≥75 years)[a1]

Persistent symptoms despite treatment of comorbidities may be a sign that current chronic HF therapy should be re-evaluated[5]

94.5% of HF patients have two or more other chronic conditions[b2]

Prevalence of comorbidity in patients with HF[3]

HYPERTENSION: ~66%

ATRIAL FIBRILLATION (AF): up to 50%[c]
(AF is a common precipitant of HF, and conversely, HF is the strongest predictor for AF)

CORONARY ARTARY DISEASE: up to 50%
(most common cause of incident HF-rEF: 16.5% incidence of HF at 1 year post AMI[d4])

CHRONIC KIDNEY DISEASE (CKD): >60%
(~30% with moderate to severe[e] CKD)

COPD: ~20%

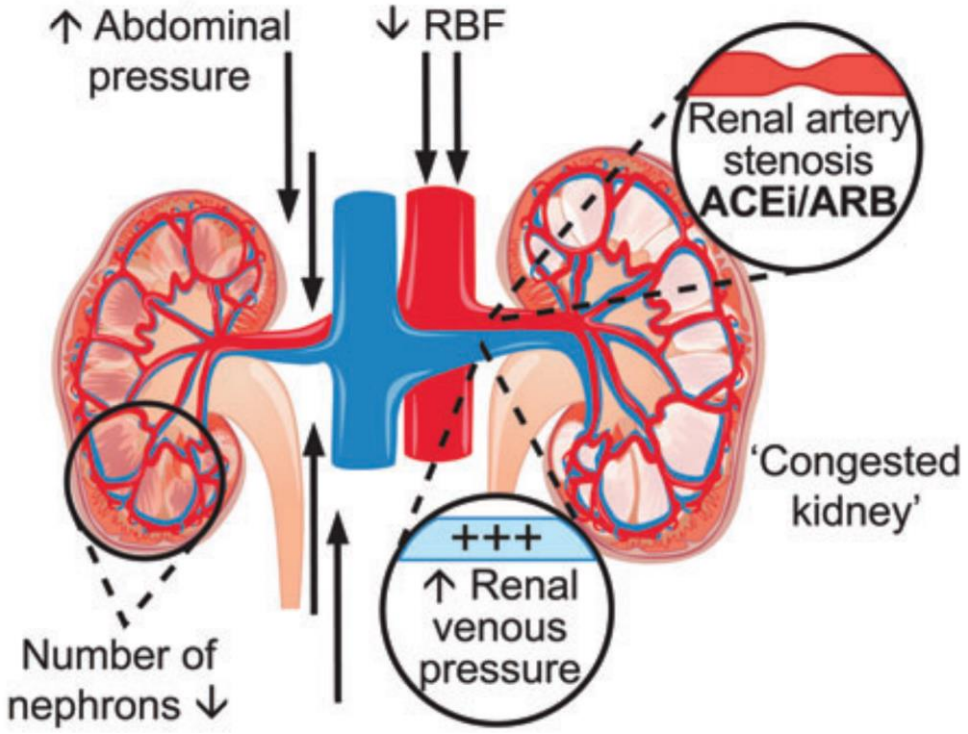
DIABETES: 30–40%

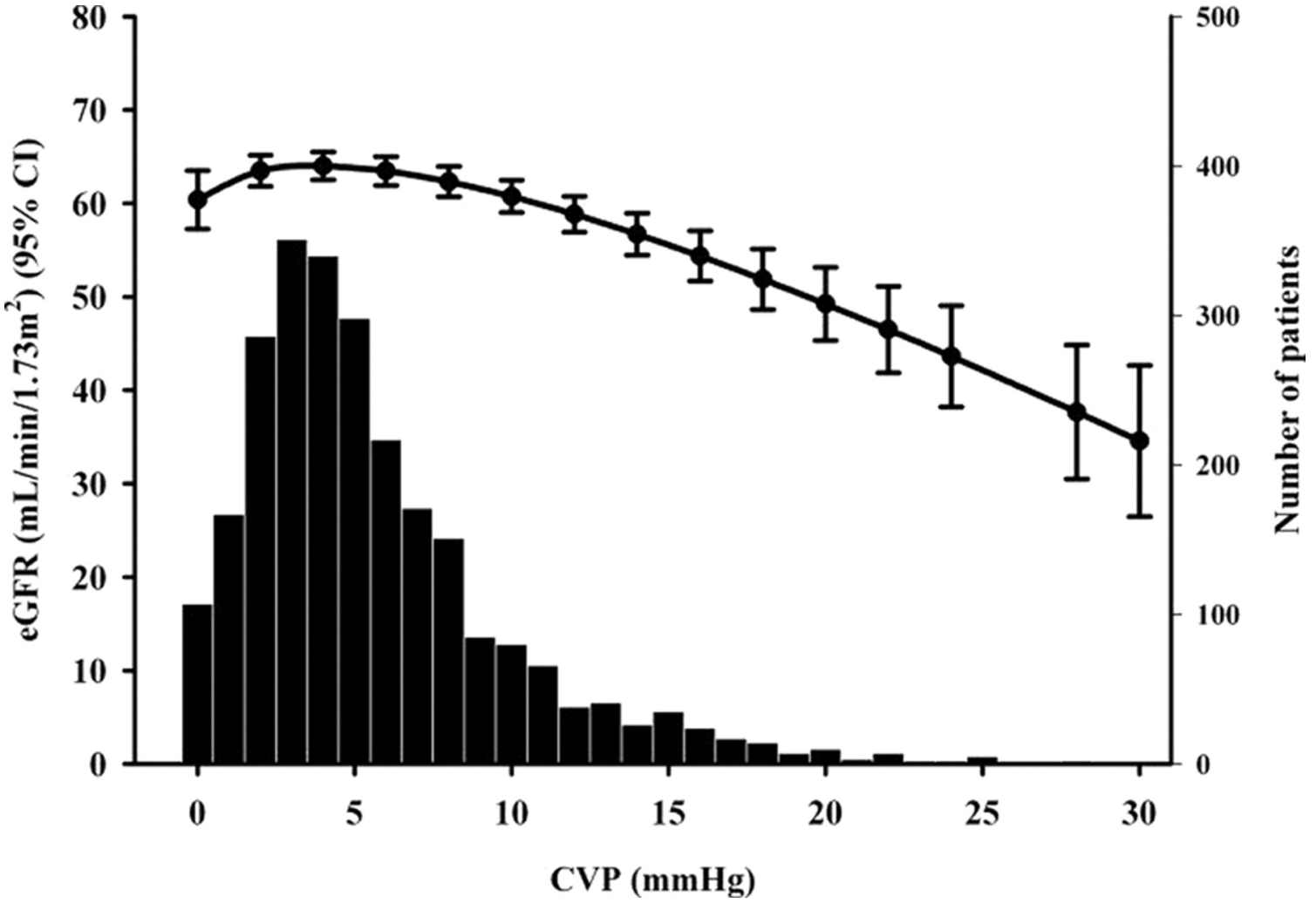
SLEEP-DISORDERED BREATHING: 50–75%

Causes of Acute Heart Failure Decompensations

- Non-adherence to diet or medications
- Arrhythmias
- Ischaemia
- Infection
- Anaemia
- Thyroid disease
- Hypertension
- Renal Failure
- Acute or worsening valvular disease
- Addition of exacerbating medications
    - NSAIDs, prednisolone, non-dihydropyridine calcium channel antagonist

Relationship Between CVP and eGFR





Bock & Gottlieb. Circulation. 2010;121:2592-2600

Iron Deficiency

- **Fe essential**
  - Oxygen uptake, transport and storage
  - Oxidative metabolism in skeletal and cardiac muscle
  - Erythropoiesis
- **Clinical consequences in absence of anaemia**
  - Repletion of Fe in those without anaemia improves cognitive, symptomatic, and exercise performance.

Anaemia

COR	LOE	Recommendations	Comment/ Rationale
IIb	**B-R**	In patients with NYHA class II and III HF and iron deficiency (ferritin <100 ng/mL or 100 to 300 ng/mL if transferrin saturation is <20%), intravenous iron replacement might be reasonable to improve functional status and QoL.	NEW: New evidence consistent with therapeutic benefit.
III: No Benefit	**B-R**	In patients with HF and anemia, erythropoietin-stimulating agents should not be used to improve morbidity and mortality.	NEW: Current recommendation reflects new evidence demonstrating absence of therapeutic benefit.

Yancy, *et. al*. *Circulation*. 2017. DOI:10.1161/CIR.509/-/DC1

Treating Hypertension to Reduce the Incidence of HF

COR	LOE	Recommendations	Comment/ Rationale
I	**B-R**	In patients at increased risk, stage A HF, the optimal blood pressure in those with hypertension should be less than 130/80 mm Hg.	NEW: Recommendation reflects new RCT data.

Yancy, *et. al*. *Circulation*. 2017. DOI:10.1161/CIR.509/-/DC1

Multidisciplinary Strategies Optimise the Management of Patients with Heart Failure and Improve Patient Outcomes

- **Coordination of care** along the continuum of heart failure is crucial to achieving the goal of heart failure management – providing a 'seamless' system of care, **optimising the management** of patients[1]
- Multidisciplinary management programs have been reported to reduce rates of **heart failure hospitalisation, all-cause hospitalisation and mortality** in patients with heart failure when compared with usual care[2-4]

1. McMurray JJ *et al. Eur Heart J* 2012;33:1787–847.
2. Yancy CW *et al. J Am Coll Cardiol* 2013;62:e147–239.
3. Holland R *et al. Heart* 2005;91:899–906.
4. McAlister FA *et al. J Am Coll Cardiol* 2004;44:810–9.

Heart Failure Education

Heart Failure

Important information for patients, families & friends

theAlfred

Weigh yourself everyday

Weigh yourself daily in the morning after going to the toilet and before eating. Record this daily.

If your weight increases or decreases by 2kg in 2 days contact your GP for an appointment.

Minimise your salt intake

Salt causes your body to retain fluid. Aim to avoid adding salt to your meals and whilst cooking. Some take away foods such as pizza and Asian foods can also be high in salt.

Try to choose healthy options. Purchase low salt products aiming for less than 400mg of sodium per 100g serving.

Avoid Alcohol

Alcohol has toxic effects on the heart. Aim to avoid alcohol consumption or at least minimise to 1 drink per day.

Exercise regularly

Try to undertake regular exercise (e.g. walking) each day. Gradually aim for at least 30 minutes of moderate exercise daily. It may suit you better to do this as three 10-minute sessions.

If you experience shortness of breath or chest pain contact your doctor immediately.

Visit your local doctor regularly

Regular visits with your GP to check your blood pressure, heart rate, kidney function and fluid levels are important and help reduce the need to return to hospital.

Immunisations

Have your Flu vaccination every year and your Pneumococcal vaccination every 5 years from your GP.

Part of AlfredHealth

Restrict your fluid intake to 1.5L per day

Limit the amount of fluid you drink each day unless otherwise instructed by your treating doctor (usually 1.5L daily).

Fluids include soup, jelly, tea, coffee, soft drink, water and ice.

Take all your medications as prescribed

Medications prescribed by your doctor are to improve your heart's function and control your symptoms. Some of these medications may initially make you feel fatigued however **do not** stop your medications suddenly.

If you are concerned, see your GP for a review.

Quit Smoking

Smoking increases your risk of heart disease. There are many resources available to help you quit smoking.

Talk to your GP or your treating doctor, or call the Quitline 13 78 48 about strategies to quit including nicotine gums and patches.

Eat a healthy diet

Being overweight means the heart must work harder to pump and can lead to further damage. Being underweight increases your risk of hospitalisation and complications.

People with heart failure should aim to maintain a healthy weight. Consult a dietitian if you need help to achieve this.

Don't be afraid to ask for help

Coping with heart failure can be very challenging. Your GP and specialist are all there to support you when you need assistance.

Don't ignore symptoms. If you are feeling unwell or your mood is low seek medical advice

If you would like to comment on this resource or request a copy in a different format, contact patient.information@alfred.org.au or phone: (03) 9076 3026

Adapted with permission from Barwon Health Heart Failure information for patients

Your department name
The Alfred
55 Commercial Road
Melbourne VIC 3004

Phone: 03 9076 2000
Web: alfredhealth.org.au

AlfredHealth

PATIENTS COME FIRST

Prompt Doc No: AHG0002141 Approval Date: 31/01/2017 Review & Update by: 31/01/2020

Heart Failure Management Plan

Heart Failure
Daily Weight Monitoring

theAlfred

Name ……

Weigh yourself every morning after going to the toilet and before eating breakfast. Record your weight below.

Weight gain often means that fluid is building up in the body (1kg equals 1 litre). **If you gain more than 2kg over 2 days contact your GP for an appointment straight away.**

Monitor your signs and symptoms as well (i.e: increased shortness of breath, increased tiredness, bloating in the stomach and puffy ankles and legs) **If you are experiencing these symptoms contact your GP for an appointment straight away.**

Month	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

Month	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

Chronic heart failure action plan

Note: It is important that you develop an individualised action plan with your healthcare team that takes into account the severity of your heart failure, any other health problems you may also have, and your health care preferences.

Every day:

- Weigh yourself and keep track of your weight.
- Restrict your fluid intake and salt intake as recommended by your doctor.
- Take your medicines as prescribed.
- Be physically active.
- Remember to call for medical assistance when the need arises (see below).

Call your doctor or heart failure nurse as soon as possible if:

- you gain or lose more than 2 kilograms over 2 days
- you have worsening shortness of breath with your normal activities
- your heart is beating very quickly
- you are very dizzy, or you pass out (faint)
- your angina is getting worse
- there is increased swelling in your ankles, legs or abdomen
- you are coughing a lot – especially at night
- you are generally feeling more tired or sad than usual.

When you have angina:

*If calling 000 does not work on your mobile phone, try 112.

- Immediately stop and rest.
- If rest alone does not bring rapid or effective relief, take a dose of your angina medicine
- If the angina is not relieved within 5 minutes, take another dose of your angina medicine
- If the angina is not completely relieved within 10 minutes of onset by rest and medicine OR is severe OR gets worse quickly, **this is an emergency. Get help fast. Call triple zero (000)* and ask for an ambulance.** Don't hang up. Wait for advice from the 000 operator.

Call triple zero (000)* and ask for an ambulance if:

You suddenly have severe shortness of breath, or you are experiencing new 'blackouts'
*If calling 000 does not work on your mobile phone, try 112.

For more information, refer to the source of this action plan—the Heart Foundation booklet 'Living well with chronic heart failure'.

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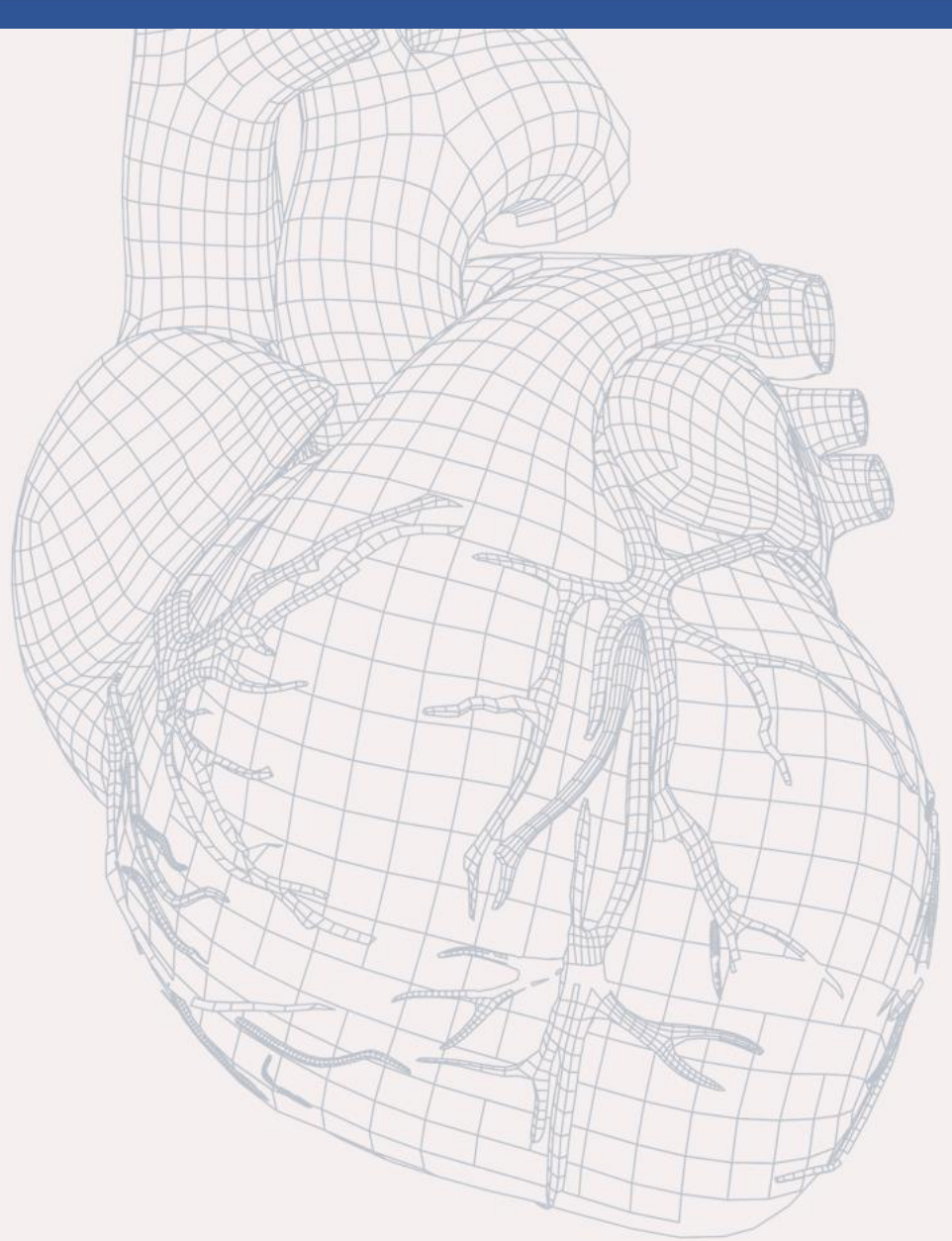
Heart Foundation™

Heart Information

THE CRITICAL ROLE OF THE GP

in identifying patients with heart failure who are symptomatic despite treatment



THE MAJORITY OF PATIENTS

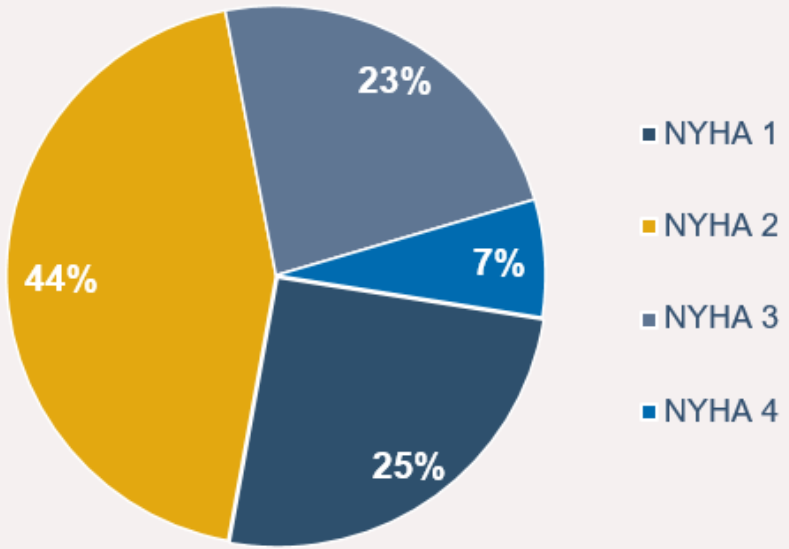
with chronic heart failure seen by GPs are mildly symptomatic[1]

2016 BEACH data:†1

The majority of patients being treated by Australian GPs are mildly symptomatic (NYHA II) and are on an average of 2 to 3 medications for their chronic heart failure.

Chronic heart failure patients

(n=216)



Mild symptoms of heart failure can be subtle and non-specific – they may even go unrecognised by patients[2,3]

†Data from the Bettering the Evaluation and Care of Health (BEACH) program collected over three study periods between 2010 and 2015. Data on 8,989 patients (including 324 with chronic heart failure) from 308 general practitioners were analysed.

References: 1. Taylor JC et al. Aust Fam Physician 2016; 45: 823 827. **2.** Atherton JJ et al. Heart Lung Circ 2018; 27: 1123–1208.
3. Ponikowski P et al. Eur Heart J 2016; 37: 2129–2200.

GPs ARE WELL PLACED TO IDENTIFY

patients with HF-rEF who are symptomatic on their current treatment[1]

The CSANZ encourages a collaborative 'shared care' model between GPs and specialists:

"**GPs have a vital role in the management of patients with heart failure in the community**"[2]

CSANZ Heart Failure Guidelines

A patient with congestive heart failure will see their GP 12 times per year on average[1]

Symptoms of fatigue and/or breathlessness in a patient with HF-rEF should be a red flag

- The signs and symptoms of heart failure can be subtle and non-specific, and may be mistaken for other health conditions or old age – patients themselves may not even recognise them
- Regularly questioning your heart failure patients about their symptoms can help you to identify when their heart failure treatment may need to be reviewed

If you are not asking about their HF symptoms, then who will?

TIPS FOR IDENTIFYING SYMPTOMATIC HF-rEF[1]

Ask your patients about their symptoms:

- Do you need to sleep propped up on pillows to breathe easier?
- Do you struggle to catch your breath walking up stairs?
- Do you have swollen feet or ankles at the end of the day?
- Do you cough, even when you don't have a cold?
- Do you no longer do the things you used to enjoy due to exhaustion?

ASK ABOUT

CHECK FOR

EVALUATE

REVIEW

TIPS FOR IDENTIFYING SYMPTOMATIC HF-rEF[1]

Check for:

- Peripheral oedema – press the skin of the ankles to detect pitting
- Increased use of diuretics to control symptoms

ASK ABOUT

CHECK FOR

EVALUATE

REVIEW

TIPS FOR IDENTIFYING SYMPTOMATIC HF-rEF[1]

Are the symptoms/signs evidence of worsening HF-rEF?

- Consider additional investigations for underlying causes (such as worsening comorbidities)*

If you suspect symptomatic HF-rEF despite treatment:

- Is a repeat ECHO and/or cardiologist referral needed?
- Re-evaluate current HF-rEF treatment – does it need to be adjusted/intensified?

TIPS FOR IDENTIFYING SYMPTOMATIC HF-rEF[1]

Review every 6–12 months once stabilised, or following a change in clinical status:

- Symptom assessment
- Serum biochemistry (electrolytes, urea, creatinine, and glucose)
- Full blood count

ASK ABOUT

CHECK

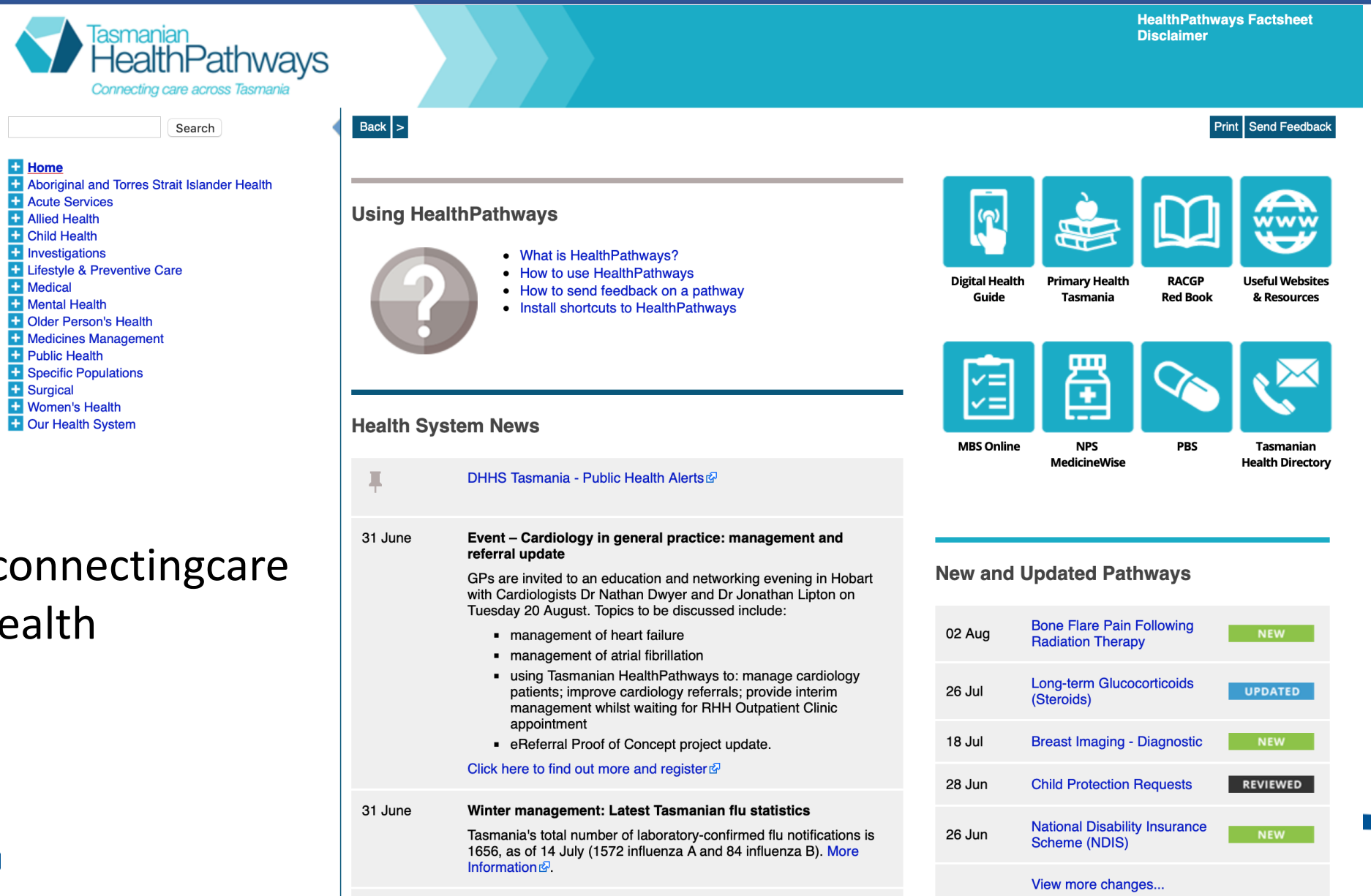
EVALUATE

REVIEW

When to Refer to Heart Failure Physician

- New onset HF (especially in young)
- LVEF ≤ 35%
- Oedema despite escalating doses of diuretics
- Low blood pressure
- High heart rate
- End-organ dysfunction
- NYHA FC III/IV
- Hospitalisation
- Intolerance or down-titration of GDMT

https://tasmania.healthpathways.org.au



Username: connectingcare
Password: health

Red flags

- Acute pulmonary oedema or severe dyspnoea
- Associated chest pain or palpitations
- ECG changes of ischemia, infarction, or arrhythmia
- Symptoms of hypoperfusion

Background

+ About heart failure

Assessment

Heart failure can be difficult to detect in many patients as there can be few abnormal findings. It can be hard to differentiate from other causes of dyspnoea.

1. Assess for + symptoms of heart failure.
2. Consider + risk factors for heart failure.
3. Perform + examination.
4. Arrange + investigations.
5. Determine the + cause as this will influence management.

Management

Use titration plan

Full benefits of drug therapy are only achieved by titration to maximum target dose. Use titration plan and request nurse-led titration if unable to achieve in community.

+ **Prevention**
+ **Initial management**
+ **Ongoing management**
+ **Exacerbation management**
+ **Management following discharge**

Request

- If any + red flags, consider transfer to the Emergency Department for management.
- In all stabilised patients, consider request for cardiac rehabilitation.
- If + complicating factors, consider requesting early cardiology assessment.
- Request cardiology assessment or seek cardiology advice if:
  - the diagnosis or aetiology is in doubt.
  - a younger patient with heart failure or women who are pregnant or planning a pregnancy.
  - underlying coronary disease.
  - significant valvular or structural heart disease.
  - inadequate response to treatment, or difficult to manage.
- If other co-morbidities, consider requesting a general medicine assessment or aged care assessment.
- Consider referral to + Heart Failure Nurse Practitioner Clinic (South only) for education, support, help with self-management, and medication adjustment.

Information

+ For health professionals

+ For patients

+ Sources

Assessment

Heart failure can be difficult to detect in many patients as there can be few abnormal findings. It can be hard to differentiate from other causes of dyspnoea.

1. Assess for + symptoms of heart failure.
2. Consider + risk factors for heart failure.
3. Perform + examination.
4. Arrange − investigations.

Investigations

- Arrange:
  - echocardiography for all patients where heart failure is suspected.
    - Provides information on systolic and diastolic function.
    - May exclude acute or chronic valvular disease and pericardial effusion or tamponade.
  - bloods – FBE, creatinine, electrolytes, LFTs, TFTs, ferritin, fasting glucose and lipids, urinalysis.
  - ECG – looking for ischaemia, previous MI, left ventricular hypertrophy, bundle branch block, arrhythmias.
- Consider:
  - troponins if acute onset and myocardial infarction (MI) is possible.
  - chest X-ray – may be normal, main use is to exclude lung pathology causing dyspnoea or other co-morbidities that may worsen heart failure.
- + Brain natriuretic peptide (BNP) testing is not routinely done in general practice due to cost, but may be carried out in the Emergency Department or specialist setting.

5. Determine the − cause as this will influence management.

Causes of heart failure

Heart failure is caused by abnormal myocardium, abnormal loading, or abnormal rhythm.

Look for:

- Coronary artery disease
- Hypertension
- Valvular disease
- Other cardiac causes e.g., arrhythmias, cardiomyopathies
- Other causes e.g., alcohol, anaemia, thyrotoxicosis
- Medications:
  - Non-steroidal anti-inflammatory drugs (NSAIDs)
  - Prednisolone (long-term)
  - Cyclosporine
  - Clozapine

Management

Use titration plan

Full benefits of drug therapy are only achieved by titration to maximum target dose. Use titration plan and request nurse-led titration if unable to achieve in community.

+ Prevention

− Initial management

1. If any + red flags, consider transfer to the Emergency Department for management.
2. If + complicating factors, consider requesting early cardiology assessment. The decision to refer will depend on clinician's experience and clinical situation.
3. If possible, withdraw any + medications which may be contributing to the heart failure.
4. If evidence of fluid overload, start + diuretic and review regularly. Aim to establish a goal (dry) weight.
5. Once fluid overload is controlled, add + ACE inhibitor. ACE inhibitors improve prognosis in all grades of heart failure.
   - If intolerant to ACE inhibitors, consider + angiotensin 2 receptor antagonists. The side-effect of a cough alone is not necessarily an indication to cease an ACE inhibitor.
   - Monitor by clinical symptoms, weight, blood pressure, heart rate (target is 55 to 60 beats per minute), and renal function.
6. If heart failure with reduced ejection fraction (HFREF), add in a + beta blocker when patient no longer has fluid overload or pulmonary congestion:
   - Gradually titrate up the dose of ACE Inhibitor and beta blocker, as tolerated.
   - It is preferable to use lower doses of combined agents rather than a higher dose of a single agent.
7. In all patients with left ventricle ejection fraction ≤ 40%, add + spironolactone unless contra-indicated or not tolerated.
   - If unsure whether it is appropriate to start this, seek cardiology advice.
   - Spironolactone is not being used as a diuretic in this setting.
8. To aid and troubleshoot drug titration, use the Tasmania Health Service – Heart Failure Medication Titration Plan.
9. If patient remains symptomatic with ejection fraction < 40% despite maximal tolerated standard therapy as above, change ACE (or ARB) therapy to + angiotensin receptor/neprilysin inhibitor (ARNI).
10. If in sinus rhythm and heart rate remains > 77 beats per minute despite maximal betablocker, consider adding Ivabradine. PBS authority is restrictive.
11. For patients in atrial fibrillation (AF) or patients in sinus rhythm with refractory symptoms despite heart failure management as above, consider + digoxin.
12. In diabetic patients with heart disease and inadequate glycaemic control on metformin alone, consider sodium glucose cotransporter 2 inhibitors e.g., empagliflozin.
13. Treatment of + heart failure with preserved ejection fraction (HFPEF) (previously called diastolic heart failure) is:
    - for symptom relief only and does not alter prognosis.
    - usually for older patients with co-morbidities.

+ Ongoing management

+ Exacerbation management

+ Management following discharge

Ongoing management

1. Maintain the patient on the minimum dose of diuretic required. Cease frusemide altogether if possible.
2. Screen for and treat any iron deficiency. Investigate potential causes appropriately.
3. Provide advice about:
    - the nature of the disease, prognosis, and impact on life
    - self management

    Self management

    - A self management diary can assist with:
        - monitoring symptoms.
        - response to medication.
        - patient managed flexible diuretic regimen.
    - Heart Failure Action Plan (template for Medical Director and Best Practice medical software)

    - salt restriction
    - smoking cessation
    - alcohol intake
    - medications
    - fluid restriction
    - exercise and heart failure rehabilitation – recommended in all stable patients.
4. Consider referral to Heart Failure Nurse Practitioner Clinic (South only) for education, support, help with self-management, and medication adjustment.
5. Monitor:
    - for depression and anxiety which are common in heart failure using the PHQ9 assessment tool.
    - CVS risk factors – atrial fibrillation, lipids, diabetes, smoking.
    - symptom control, medications, and compliance.
    - renal function and electrolytes when changing medication, following hospitalisation, or every 3 to 6 months if stable.
6. Consider additional issues in heart failure management.

    Additional issues in heart failure management

    - General Practice Management Plan (GPMP) and Home Medication Review
    - Immunisation
    - Fitness to drive
    - Palliative care discussion and Advance Care Planning.
    - Deactivation of defibrillators
    - Benefits e.g., disability allowance.
    - Home help, community nursing, family and carer support.
    - Consultation with pharmacist for Webster pack to improve compliance.

Prevention

Initial management

Ongoing management

Exacerbation management

1. Determine the most likely cause of the exacerbation and correct this.

Most likely causes of exacerbation

- Myocardial ischaemia
- Medications e.g., poor adherence, alterations to medications
- Infection
- Uncontrolled hypertension
- Cardiac arrhythmia
- Poor adherence to salt and fluid restrictions
- Valvular dysfunction
- Anaemia
- Renal failure leading to fluid overload
- Pulmonary embolus
- Thyroid dysfunction

2. Increase diuretics to get back to target weight. Consider use of a heart failure diary to monitor and self-manage medications.
3. If not responding, seek cardiology advice as a short course of intravenous (IV) frusemide may be indicated.
4. Once stable:
    - Look at maximising the maintenance treatment.
    - For patients whose performance status is poor or deteriorating, or who have multiple co-morbidities, consider a palliative or end-stage heart failure approach, even if the exacerbation has responded to treatment.

Management following discharge

Advanced or End-stage Heart Failure

Assessment

Practice point

Consider a palliative approach in patients with severe heart failure.
Use the "surprise" question, "Would I be surprised if my patient was dead within one year?" as an indicator for a palliative approach.

Identify patients at risk of deteriorating and dying, by using indicators of deteriorating health and advanced disease, and then ask the "surprise" question.

1. Look for:
   - ≥ 2 indicators of deteriorating health.
   - any clinical indicators of advanced disease e.g., breathlessness or chest pain at rest or on minimal exertion, anorexia and cachexia, extreme fatigue.
2. Ask the "surprise" question, "Would I be surprised if my patient was dead within one year?"

Management

1. Continue with usual management of heart failure:
   - Assess and treat any reversible causes of breathlessness.
   - Diuretics are usually continued up until the final stages.
2. Dyspnoea:
   - Opioids
   - Anxiolytics
   - Palliative home oxygen
3. Manage other symptoms:
   - Depression – there is an increased incidence of depression in patients with heart failure.
   - Refractory angina – consider short acting opioids.
   - Chronic renal failure.
   - Nausea.
   - Constipation.
4. If there is an implantable device, this may need to be deactivated. Discuss with the cardiologist as the action required may depend on both the device type and the underlying condition.
5. Reassess community supports.
6. Discuss end of life issues.

Request

- If symptoms are complex or difficult to manage, consider advice or palliative care assessment.
- For advice about palliative oxygen in hypoxaemic patients, discuss with the cardiologist or respiratory physician.
- To discuss deactivating an implantable defibrillator, contact the cardiologist concerned.
- Request home review from ACAT for increased services if appropriate.

TASMANIAN HEALTH SERVICE | Tasmanian Government

HEART FAILURE MEDICATION TITRATION PLAN

STATEWIDE

TRIAL

Facility: _____

PT ID										

SURNAME..... D.O.B .....

OTHER NAMES.....

ADDRESS.....

.....

Attach Patient Sticker Label

☑ appropriate boxes throughout

FT1776660~

In heart failure with reduced ejection fraction (HFrEF) (EF<40%) the following medications can reduce morbidity and mortality when titrated to maximum tolerated dose: i) angiotensin-converting-enzyme inhibitor (ACEI) or angiotensin II receptor blocker (ARB) or angiotensin receptor-neprilysin inhibitor (ARNI); ii) beta-blockers and; iii) mineralocorticoid receptor antagonists (MRA).

Monitoring recommendations:

- Check blood pressure (BP) (including postural drop) and heart rate (HR) each visit and clinically review the patient prior to each dose adjustment
- Ensure that baseline serum potassium (K+) is less than 5mmol/L and eGFR is greater than 30mL/min
- ACEI/ARB/ARNI/MRA check: serum K+, creatinine, eGFR, and urea 1 week after commencing or titrating dose
- MRA only check: serum K+, creatinine, eGFR, and urea monthly for 6 months, then 6 monthly once dose is stable
- Diuretic dose change beyond 3 days requires medical, blood chemistry, and fluid status review

NB: Patients over 75 years old with comorbidities are more likely to experience adverse effects

Observations	EF %	eGFR mL/min	Serum K+ mmol/L	BP mmHg	HR bpm	Weight kg	Target weight kg
Date (if known)							

Medication titration instructions

Order of titration: (1,2 or 3)	Drug class	Medication name	Current dose/frequency	Target dose/frequency	Schedule
	ACEI ARB ARNI				**Caution: >36 hr washout if changing from ACEI to ARNI** Increase dose by every week(s)
	Beta-blocker[1]	☐ Bisoprolol ☐ Carvedilol ☐ Metoprolol XL ☐ Nebivolol			Increase dose by every week(s)
	MRA	☐ Sprionolactone ☐ Eplerenone			**Caution: Risk of hyperkalaemia** Increase dose by every week(s)
	Diuretic			Variable dose with no target[2]	If fluid overloaded change dose to: If dehydrated change dose to:

Additional instructions:

1. Consider ivabradine if HR remains greater than 77 despite maximum tolerated beta blocker dose (only use in sinus rhythm)
2. Increase dose where weight gain is more than 2 kg over 2 days. Reduce dose where weight loss is more than 2 kg over 2 days and / or there are signs of dehydration (dizziness, postural hypotension, dry mucosa)

HF medications to be titrated by *(print name)*: _____

Medical Consultant's name *(print)*: _____

Prescriber's name *(print)*: _____

Prescriber's signature: _____

Date: DD / MM / YYYY

(Insert Service Name)

Phone: Fax:

Queensland Government

© The State of Queensland (Queensland Health) 2012 Contact CIM@health.qld.gov.au Queensland Health has granted permission for the Tasmanian Health Service to adapt SW066 Heart Failure Medication Titration Plan v5.00 – 08/2017. No changes have been made to clinical content as per copyright rules. Refer next page for problem solving guidelines provided by the Queensland Government.
The relevant THS State-wide Protocol and Procedure is located on the THS intranet site via hyperlink: Strategic Document Management System

HEART FAILURE MEDICATION TITRATION

Heart Failure Medication Titration Problem Solving Guide

NSAIDS or COX-2 inhibitors are contraindicated in patients with heart failure. Avoid negatively inotropic calcium channel blockers (verapamil, diltiazem) in patients with heart failure with reduced ejection fraction (HFrEF).

Hypotension

- **Asymptomatic hypotension** does not usually require any change in therapy (systolic BP 90-100 mmHg)
- **Symptomatic hypotension** (dizziness, light-headedness and/or confusion):
  - I. Stop or reduce calcium – channel blockers and/or other vasodilators unless essential e.g. for angina
  - II. Consider reducing diuretic dose if there are no signs or symptoms of congestion
  - III. Temporarily reduce ACEI / ARB / ARNI or beta-blocker dose if above measures do not work
  - IV. Review patient as clinically appropriate within one week and seek specialist advice if the above measures do not work

Severe symptomatic hypotension or shock requires immediate referral to an emergency department.

Worsening renal function

- ACEI / ARB are generally well tolerated even in patients with renal impairment (eGFR less than 30mL/min). Use ARNI with caution in patients with eGFR less then 30mL/min.
- Heart failure patients are more vulnerable to acute renal failure following a destabilising event such as a dehydrating illness or over-diuresis or addition of nephrotoxic medications.
  NB: Advise patients experiencing such an event to seek urgent medical attention and to stop the ACEI / ARB / ARNI until clinically reviewed and blood chemistry is checked.
- Some rise in urea, creatinine and serum K+ is expected after commencing an ACEI / ARB / ARNI. Blood chemistry must be checked one week after commencing or titrating dose and monitored closely there after to ensure kidney function is not worsening.
- An eGFR decrease of up to 30% is acceptable provided it stabilises within 2 weeks. Check serum K+, creatinine and urea within 48 hours if required.
- If the 3GFR declines more than 30%, the patient should be reviewed urgently for clinical assessment of volume status and review of nephrotoxic medications. Seek specialist advice regarding the safety of continuing therapy.

Caution: eGFR may over estimate renal function in low body weight individuals and does not reflect accurate renal function in individuals with fluctuating creatinine levels.

Hyperkalaemia

Careful serum K+ monitoring is required with ACEI / ARB / ARNI and MRA. Urgently check serum K+, creatinine and urea if patient is dehydrated or septic. If serum K+ rises to:

- I. 5.0-5.5 mmol/L, review and reduce K+ supplements or retaining agents (e.g. amiloride, spironolactone, eplerenone)
- II. 5.-5.9 mmol/L, cease all K+ supplements or retaining agents
- III. 6 mmol/L or greater, immediately seek specialist advice

Bradycardia

- Where heart rate is less than 50 beats per minute, and the patient is on a beta-blocker, review the need for other drugs that slow heart rate (e.g. digoxin, amiodarone) in consultation with specialist; and arrange ECG to exclude heart block
- Consider reduction of beta-blocker where there is marked fatigue or symptomatic bradycardia

Congestion or peripheral oedema

Suggested actions when congestion or peripheral oedema is worsening:

- Increase the diuretic dose and then consider having the dose of beta-blocker
- Liaise with the heart failure service and review the patient daily or weekly (as appropriate)
- Seek specialist advice if symptoms do not improve; and, if there is severe deterioration, refer patient to an emergency department immediately

Angioedema and cough

I. Angioedema, although rare, can occur at any time when using ACEI / ARB / ARNI. Actions include:

- Stop ACEI / ARB / ARNI immediately
- Seek specialist advice where angioedema occurs with an ACEI before trialling ARB due to possible cross-sensitivity
- Avoid ARNI where angioedema is due to ACEI / ARB

II. Cough is common in patient with heart failure. Actions include:

- Exclude pulmonary oedema as a cause if cough is new or worsening
- Consider if cough is caused by ACEI or other drugs and only discontinue drug if cough is not tolerable
- Consider substituting ACEI with an ARB if the cough is troublesome or interferes with sleep

This form is not intended to replace clinical judgement. Endorsed by the Queensland Heart Failure Services Steering Committee August 2017.
To down load form: http://www.health.qld.gov.au/heart_failure
Endorsed by the Heart Failure Service – Royal Hobart Hospital THS (5 April 2017) Phone: 03 6166 7398

Guidelines for HFpEF (LVEF ≥ 50%): Focus on Management of Symptoms and Co-Morbidities

ACCF/AHA recommendations for the treatment of HF-pEF	Class of recommendation	Level of evidence
Systolic and diastolic blood pressure should be controlled according to published clinical practice guidelines	**I**	**B**
Diuretics should be used for relief of symptoms due to volume overload (irrespective of LVEF)	**I**	**C**
Coronary revascularisation for patients with CAD in whom angina or demonstrable myocardial ischemia is present despite GDMT	**IIa**	**C**
Management of AF according to published clinical practice guidelines for HF-pEF to improve symptomatic HF	**IIa**	**C**
Use of beta-blockers, ACEIs and ARBs for hypertension in HF-pEF	**IIa**	**C**
ARBs might be considered to decrease hospitalisations in HF-pEF	**IIb**	**B**
Nutritional supplementation is not recommended in HF-pEF	**III: no benefit**	**C**

Yancy CW *et al. J Am Coll Cardiol* 2016. doi:10.1016/j.jacc.2016.05.011

Principles of Management in HFpEF

- A: Avoid tachycardia
  - Digoxin or beta blockers with atrial fibrillation (restore and maintain SR)
- B: Blood pressure control
  - ACEi, ARBs and MRA may be of greatest benefit
- C: Comorbid condition treatment
  - Manage obesity, sleep apnoea, pulmonary disease, anaemia, ischaemia
- D: Diuretics to relieve congestion
  - Judicious use of loop diuretic with careful monitoring of renal function
- E: Exercise training encouraged
  - Improves exercise capacity, physical function and QoL[1]

1. Circ Heart Fail 2014; 8: 33-40

GPs are crucial in the heart failure journey

- GPs see patients more frequently than their physicians
- There is no such thing as a ‘stable’ heart failure patient – even mildly symptomatic patients with HF are at risk for sudden death
- Regularly ask patients with heart failure about their symptoms and check for ‘red flags’:
  - Persistent symptoms of heart failure despite treatment
  - Peripheral (pitting) oedema
  - Increased use of diuretics to control symptoms
- Titrating medical therapy to maximum tolerated doses can help patients to stay out of hospital and live longer

Final Key Points

- Heart failure is a common clinical syndrome with high morbidity and mortality
- Echocardiography is an important clinical tool to distinguish between HFrEF and HFpEF as management strategies differ
- The management of heart failure is complex and requires a multidisciplinary approach
- The use of Tasmanian Health Pathways can assist in optimising your patients health

QUESTIONS AND DISCUSSION