

Heart Failure with Reduced Ejection Fraction

The Australian Clinical Playbook for Diagnosis,
GDMT Sequencing, and Escalation

LVEF \leq 40%

2026 Update

Australian Context

480,000+

Australians living with heart failure
(projected >600,000 by 2030)

65,000

Preventable hospitalisations
annually (avg stay 6-7 days)

17,000+

30-day hospital
readmission rate

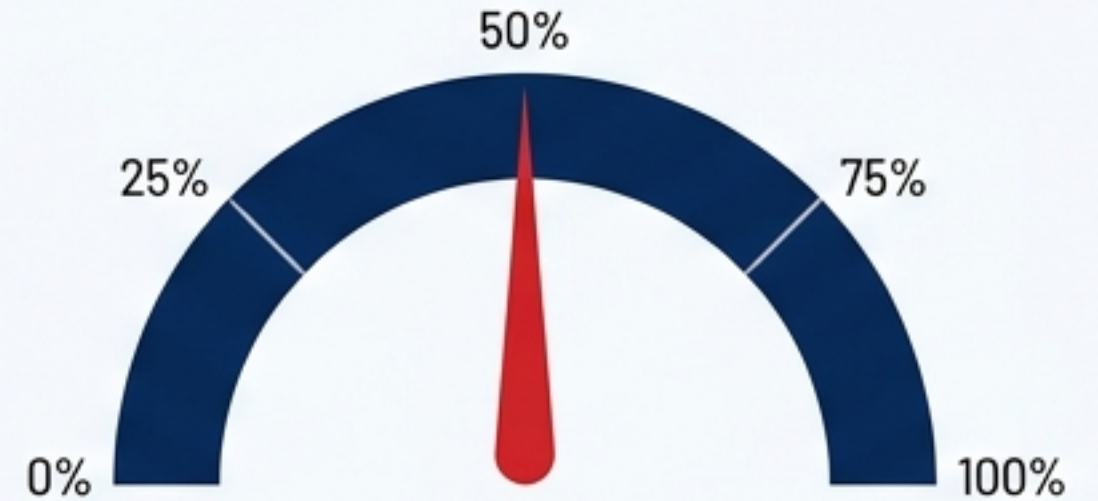
25%

30-day hospital
readmission rate

10,000

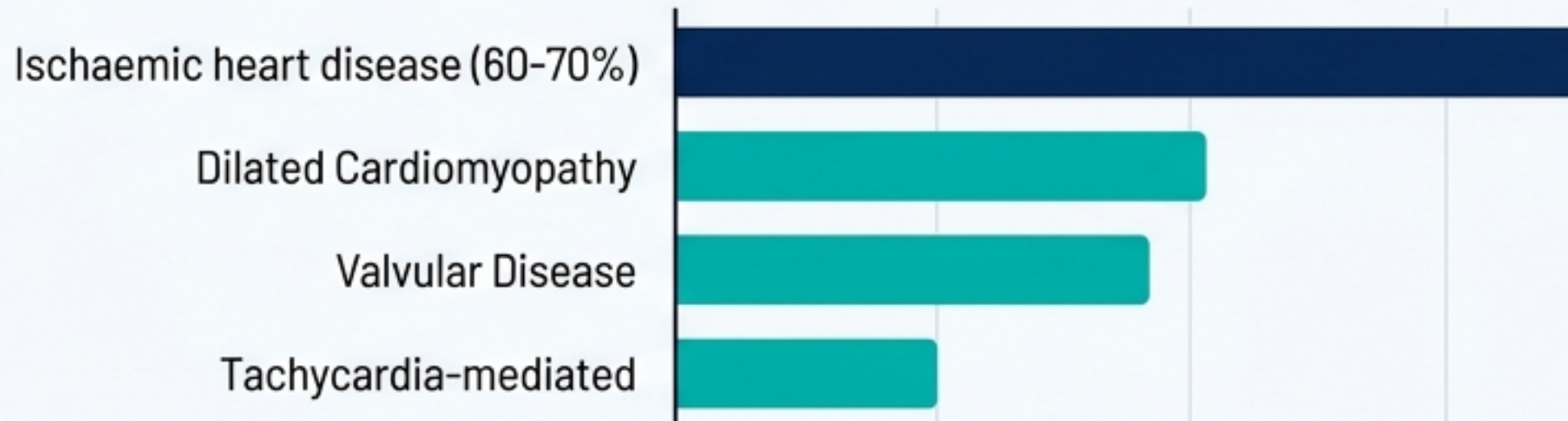
Deaths per year reported by
AIHW where HF is the underlying
or associated cause

MORTALITY GAUGE



Five-year mortality rate.
Comparable to many common cancers.

AETIOLOGY BREAKDOWN IN AUSTRALIA

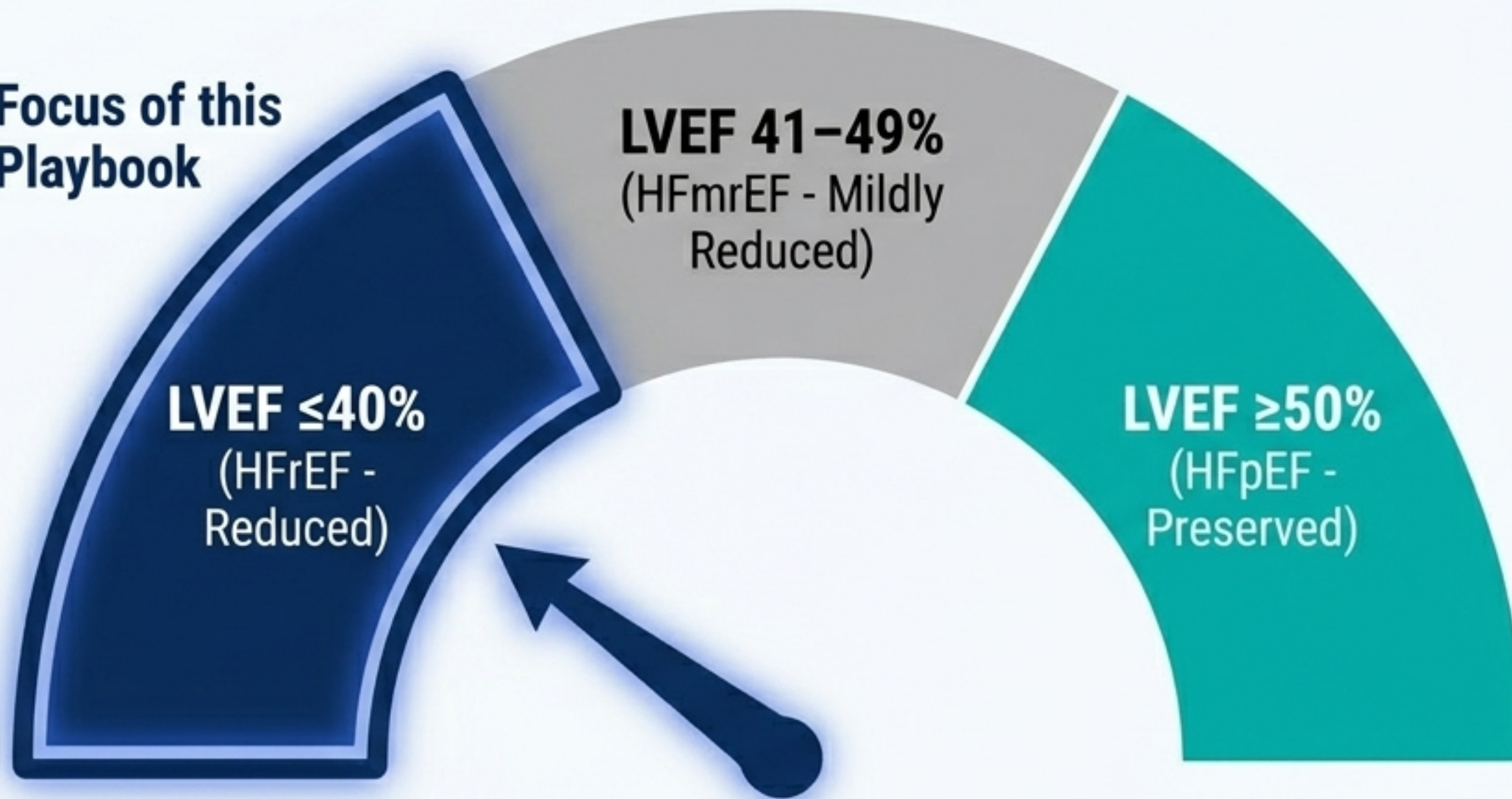


COMORBIDITY ALERT

Iron deficiency is present in up to 50%
of cases and independently worsens
clinical outcomes.

LVEF SPECTRUM DIAL

Focus of this
Playbook



TTE DIAGNOSTIC REQUIREMENTS

- ✓ Requires modified Simpson's biplane method
- ✓ Assess LV dimensions (LVEDD, LVESD)
- ✓ Diastolic function grading (E/e' ratio)
- ✓ Right ventricular function (TAPSE)
- ✓ Valvular status assessment



CLINICAL NOTE: LVEF improvement to >40% (HFimpEF) does not remove the diagnosis. GDMT must continue indefinitely to prevent reverse remodelling.

THE BIOMARKER DIAGNOSTIC MATRIX

BIOMARKER	EXCLUSION THRESHOLD	DIAGNOSTIC THRESHOLD	CLINICAL NOTES
BNP	<100 pg/mL	≥100 pg/mL	Less affected by age and renal function.
NT-proBNP	<300 pg/mL	≥300 pg/mL	Renal impairment raises levels independently.
NT-proBNP (Age-adjusted)	<125 pg/mL (<75 years)	<450 pg/mL (≥75 years)	ESC 2021 age-adjusted cut-offs significantly improve specificity in the elderly.



CRITICAL ARNI INTERACTION: BNP is completely unreliable in patients taking Sacubitril-Valsartan (Entresto). Neprilysin inhibition artificially raises BNP levels. **Exclusively use NT-proBNP** for monitoring these patients.

AETIOLOGY & INVESTIGATION SCREENING CHECKLIST

ISCHAEMIC AETIOLOGY

Coronary angiography or CTCA

[MBS Available]

TISSUE CHARACTERISATION

Cardiac MRI (Detects myocarditis, sarcoidosis, fibrosis)

[MBS item 63448]

IRON DEFICIENCY

Iron studies.
Target: Ferritin <100 µg/L or 100–299 µg/L with TSAT <20%

[MBS item 66591]

FAMILIAL DILATED CARDIOMYOPATHY

Genetic testing referral.
Indicated for young onset or ≥2 affected family members.

INFILTRATIVE / AMYLOIDOSIS

99mTc-DPD / PYP scintigraphy

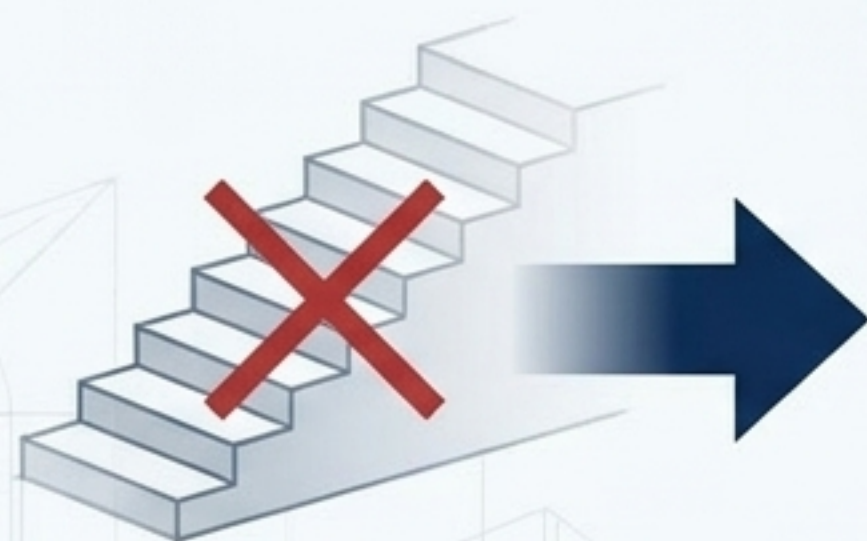
[MBS item 61323]

COMORBIDITY SCREENING

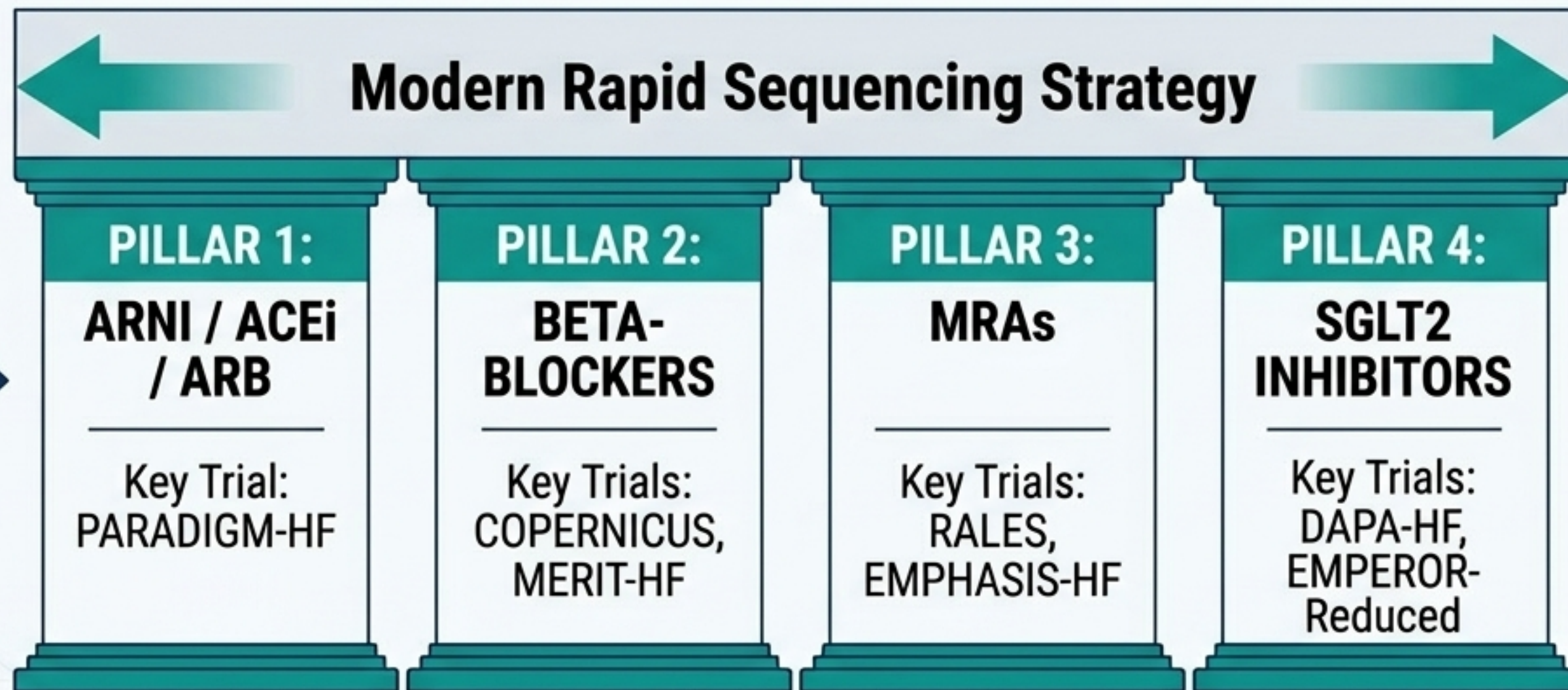
Polysomnography for sleep apnoea; TFTs for thyroid dysfunction.

THE 4-PILLAR DASHBOARD: GUIDELINE-DIRECTED MEDICAL THERAPY

Paradigm Shift



Outdated
Stepwise Approach



INITIATION PROTOCOL: Initiate 1–2 agents from different pillars at each clinic visit (every 1–2 weeks). Target maximum tolerated doses across all 4 pillars within 8–12 weeks. Any dose is better than no dose.

PILLAR 1: SACUBITRIL-VALSARTAN (ENTRESTO®)

CLASS:

Combined neprilysin inhibitor / ARB

STARTING DOSE:

24/26 mg PO BD (50 mg tablet).
Adjust to 49/51 mg BD if transitioning
from high-dose ACEi/ARB.

TARGET DOSE:

97/103 mg PO BD (200 mg tablet).
Titrate every 2–4 weeks.

RENAL RULE:

No adjustment for eGFR ≥ 20 .

PBS STATUS:

Restricted Benefit
(NYHA II–IV, LVEF $\leq 40\%$).

THE 36-HOUR WASHOUT GRAPHIC



ABSOLUTE CONTRAINDICATION: HIGH RISK OF FATAL ANGIOEDEMA IF WASHOUT PERIOD IS IGNORED. DO NOT ADMINISTER ARNI WITHIN 36 HOURS OF AN ACE INHIBITOR.

PILLAR 2: BETA-BLOCKER SELECTION MATRIX

✓ EVIDENCE-BASED FOR HF_rEF

BETA-BLOCKER	DOSING STRATEGY (Start -> Target)	PHARMACOLOGY	PBS STATUS
Carvedilol (Dilatrend®)	Start: 3.125 mg BD -> Target: 25 mg BD (50 mg if ≥85kg)	Non-selective beta/alpha-1	PBS General
Metoprolol Succinate (Betaloc CR®)	Start: 23.75 mg daily -> Target: 190 mg daily	Selective beta-1	PBS General
Bisoprolol	Start: 1.25 mg daily -> Target: 10 mg daily	Selective beta-1	Not PBS-listed for HF (private script)

✗ CONTRAINDICATED FOR HF_rEF MORTALITY BENEFIT

Atenolol and Metoprolol Tartrate are NOT indicated for heart failure.

INITIATION RULE: Initiate at low dose only when patient is euvolaemic and haemodynamically stable.

PILLAR 3: MRAs

Spironolactone

12.5–25 mg daily → Target 25–50 mg daily.

PBS General. Note: 10% risk of gynaecomastia.

Eplerenone

25 mg every other day → Target 50 mg daily.

PBS Authority.

RENAL RULE: Avoid if eGFR <30.
Initiate only if K⁺ <5.0 mmol/L.

PILLAR 4: SGLT2 Inhibitors

Dapagliflozin / Empagliflozin

Fixed dose 10 mg PO once daily.

No titration required. PBS Authority.

RENAL RULE: Initiate if eGFR ≥20.

! AMBER WARNING: Expect a transient, reversible dip in eGFR upon initiation. Benefit persists independent of diabetes status.

SYMPTOM MANAGEMENT & ADJUNCTIVE THERAPIES

For patients who remain symptomatic despite optimization of the 4 Pillars.

VOLUME MANAGEMENT

FUROSEMIDE: Oral start 20-40 mg daily. IV is twice as potent (oral bioavailability ~50%).

DIURETIC RESISTANCE

Add Metolazone (2.5–5 mg) for sequential nephron blockade. Monitor electrolytes closely.

HEART RATE ADJUNCT

Ivabradine (Coralan®)

CRITERIA: Indicated if sinus rhythm, HR ≥ 70 bpm, despite maximal beta-blocker.

DOSE: 5 mg BD \rightarrow 7.5 mg BD.

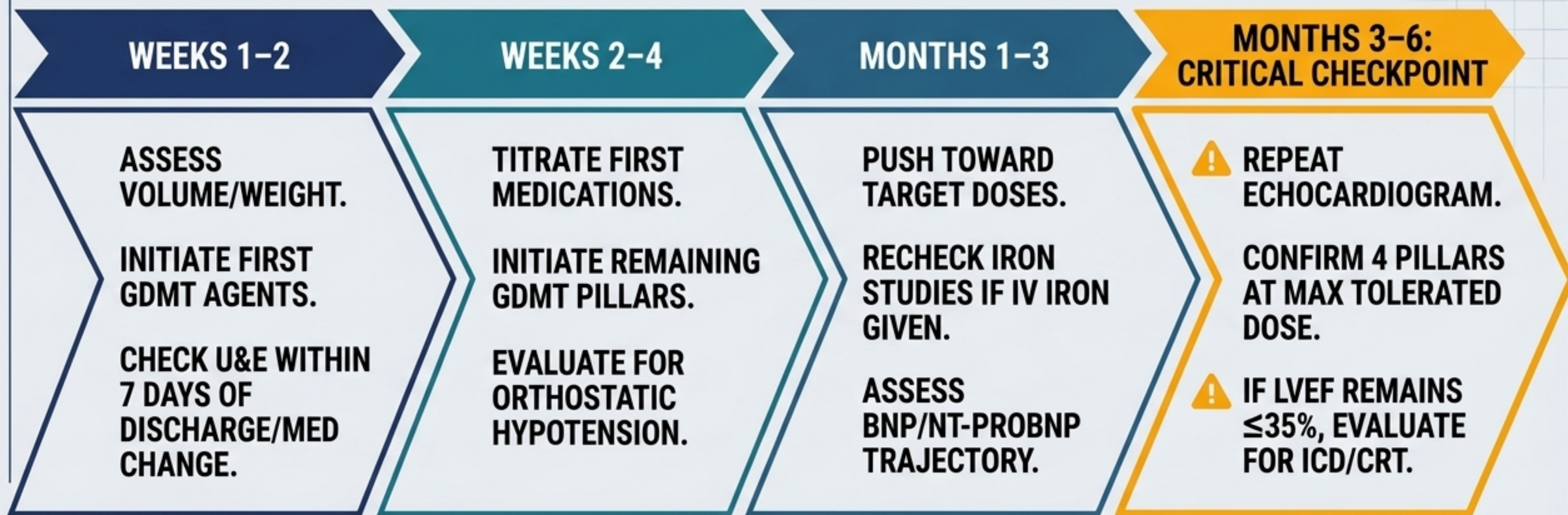
INTRAVENOUS IRON

Ferric Carboxymaltose (Ferinject®)

CRITERIA: Reduces HF hospitalisations. Indicated if if Ferritin < 100 $\mu\text{g/L}$, **OR** Ferritin 100–299 $\mu\text{g/L}$ with TSAT $< 20\%$.

DOSE: 500-1000 mg IV, recheck 4-6 weeks.

THE FIRST 6 MONTHS: CLINICAL PATHWAY TIMELINE



REMOTE MONITORING INTEGRATION: Incorporate structured telephone support, telehealth, and daily patient self-weight monitoring. Alert trigger: $>1.5\text{kg}$ gain in 24h.

MEDICATION TITRATION PROTOCOL MATRIX

DRUG CLASS	TITRATION INTERVAL	KEY MONITORING	STRICT STOP CRITERIA
ARNI / ACEi / ARB	Every 2-4 weeks	BP, K+, Cr within 1-2 weeks	⚠ STOP IF SBP <90, K+ >5.5, or Cr rises >30% from baseline.
Beta-blockers	Every 2-4 weeks	HR (target 55-70)	⚠ STOP IF HR <50, SBP <90, or worsening HF (reduce diuretic before stopping BB).
MRAs	Single dose step	K+ and Cr at days 3, 7, 30	⚠ STOP IF K+ >5.5 or eGFR <30.
SGLT2 inhibitors	No titration (Fixed 10mg)	Check eGFR at 2-4 weeks	⚠ STOP IF sustained eGFR decline >30% or symptomatic hypotension.



NOTE: Transient dips in eGFR are expected with SGLT2i. Do not abandon GDMT prematurely.

DEVICE THERAPY DECISION MATRIX

PRIMARY PREVENTION ICD CRITERIA

- ✓ LVEF $\leq 35\%$
- ✓ ≥ 3 MONTHS OPTIMIZED GDMT
- ✓ NYHA II-III
- ✓ LIFE EXPECTANCY >1 YEAR



DO NOT IMPLANT EARLY. WAIT 40 DAYS POST-MI OR 3 MONTHS POST-NEW NON-ISCHAEMIC DIAGNOSIS (LVEF MAY RECOVER).

CRT DECISION TABLE (QRS MATRIX)

CLASS	CRITERIA
CLASS I (STRONGEST)	QRS ≥ 150 MS, LBBB MORPHOLOGY, LVEF $\leq 35\%$, SINUS RHYTHM
NOT INDICATED (CLASS III)	QRS < 130 MS

WEARABLE CARADIOVERTER-DEFIBRILLATOR (WCD)



INDICATED DURING THE 40-DAY POST-MI WINDOW OR BRIDGING TO TRANSPLANT/LVAD. REQUIRES ≥ 20 HOURS/DAY ADHERENCE.

THE ESCALATION STAIRCASE (INTERMACS PROFILES)

! **REFER EARLY:** ≥ 2 HF hospitalizations in 12 months is a trigger for Advanced HF evaluation.

PROFILE 7 & 6: STABLE / EXERTION LIMITED
Ambulatory but limited. Optimize GDMT/Devices.
[HF CLINIC]

PROFILE 4 & 5: RESTING SYMPTOMS
Frequent flyers with recurrent hospitalizations.
[ADVANCED HF CLINIC (TRANSPLANT/LVAD WORKUP)]

PROFILE 3: STABLE BUT INOTROPE-DEPENDENT
Recurrent instability if weaned.
[ADVANCED HF UNIT]

PROFILE 2: PROGRESSIVE DECLINE
Sliding on inotropes despite therapy.
[ICD / HDU]

PROFILE 1: CRITICAL CARDIOGENIC SHOCK
Crash and burn, escalating inotropes, ECMO.
[ICU - EMERGENT MCS]

END-STAGE PATHWAYS: ADVANCED THERAPIES

LEFT VENTRICULAR ASSIST DEVICE (LVAD)

BRIDGE OR DESTINATION THERAPY.

PRIMARILY HEARTMATE 3™
CENTRIFUGAL-FLOW PUMP.



IMPLANT VOLUME:

~150 IMPLANTED
ANNUALLY IN AUSTRALIA.

SURVIVAL: ~80%
2-YEAR SURVIVAL.



COMPLICATIONS:
GI BLEEDING,
DRIVELINE INFECTION.

HEART TRANSPLANTATION

THE GOLD STANDARD.

VOLUME: 100-120

PERFORMED ANNUALLY ACROSS
7 AUSTRALIAN CENTRES.

**POST-TRANSPLANT
SURVIVAL:**
MEDIAN >13 YEARS.



CONTRAINDICATIONS:
ACTIVE MALIGNANCY,
SEVERE IRREVERSIBLE
PULMONARY HYPERTENSION,
ACTIVE SUBSTANCE ABUSE.

INTEGRATED PALLIATIVE CARE

INTEGRATE EARLY.

**NOT JUST FOR THE
TERMINAL PHASE.**



FOCUS:

REFRACTORY DYSPNOEA
(OPIOIDS) AND FLUID
OVERLOAD (INTERMITTENT
SUBCUTANEOUS
FUROSEMIDE).



TRIGGER:

NYHA III-IV DESPITE
GDMT/DEVICES.

ABORIGINAL & TORRES STRAIT ISLANDER CONSIDERATIONS

THE EPIDEMIOLOGICAL BURDEN

HOSPITALISATION RATES ARE **1.5-2.5X** HIGHER THAN NON-INDIGENOUS AUSTRALIANS.

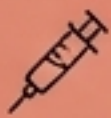
ONSET OCCURS **10-15** YEARS EARLIER.

3-5X HIGHER PREMATURE MORTALITY.

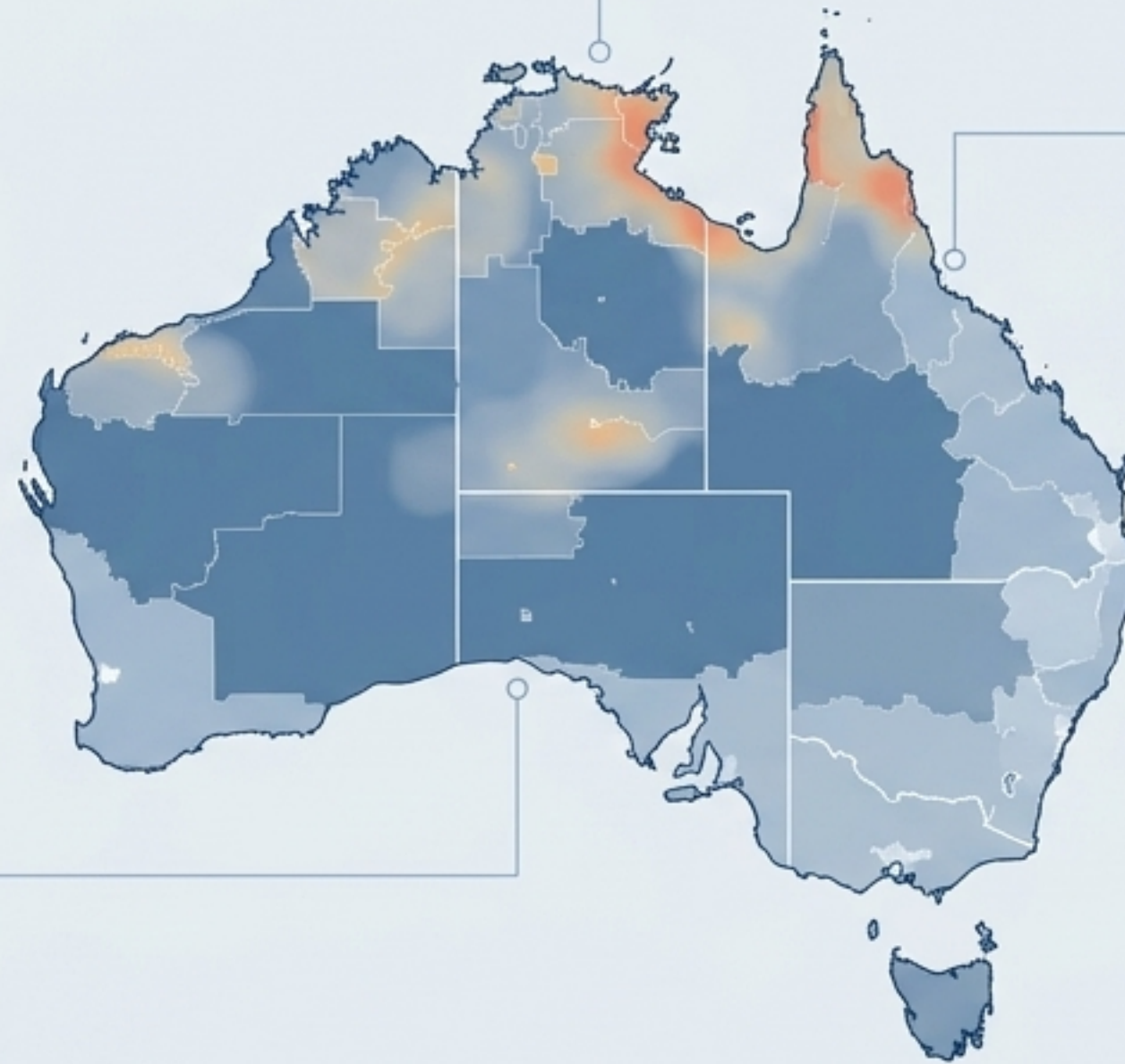
RHEUMATIC HEART DISEASE (RHD)



HIGHLIGHTS RHD-RELATED HF IN NT/FAR NORTH QUEENSLAND.



INTERVENTION REQUIRES 4-WEEKLY BENZATHINE PENICILLIN G SECONDARY PROPHYLAXIS.

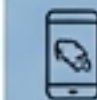


ACCHO MODELS OF CARE

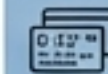
ABORIGINAL COMMUNITY CONTROLLED HEALTH ORGANISATIONS ARE VITAL.



CULTURALLY SAFE ENVIRONMENTS.



TELEHEALTH/REMOTE ECHO (FOCUS PROTOCOLS).



NAVIGATING PBS CO-PAYMENT BARRIERS (CLOSE THE GAP PROGRAM).

SPECIAL POPULATIONS DASHBOARD (PART 1)

PREGNANCY & PERIPARTUM

All 4 GDMT pillars are **teratogenic** (Category D).



Use **Bromocriptine (2.5mg BD)** for peripartum cardiomyopathy.

Enalapril/Losartan compatible with breastfeeding.

RENAL IMPAIRMENT

Cardiorenal syndrome is common.

Mild Cr rise (up to 30%) with GDMT is acceptable.



Avoid MRAs if eGFR <30.

SGLT2i safe down to eGFR 20.

HEPATIC IMPAIRMENT

LFT derangement from passive congestion is expected.



Carvedilol bioavailability increases in cirrhosis—start extremely low.

THE ELDERLY (≥75 YEARS)

High prevalence (>10%).

Lower starting doses required.

Screen for frailty.

CRT-P may be preferred over CRT-D to minimize inappropriate shocks.

SPECIAL POPULATIONS DASHBOARD (PART 2)

PAEDIATRICS

MOST COMMON CAUSES

- Congenital
- Myocarditis
- RHD

GDMT PATHWAYS:

➤ Carvedilol (0.05 mg/kg) and Enalapril are used.

⚠ **SGLT2i** not approved for <18.

MANAGEMENT: Managed by paediatric cardiologists.

IMMUNOCOMPROMISED

TRANSPLANT

Manage immunosuppressive cardiomyopathy.

CHEMOTHERAPY

➤ Anthracyclines and Trastuzumab (often reversible).

➤ Checkpoint inhibitor myocarditis requires **high-dose steroids**.

CHAGAS DISEASE & HIV

HIV CARDIOMYOPATHY

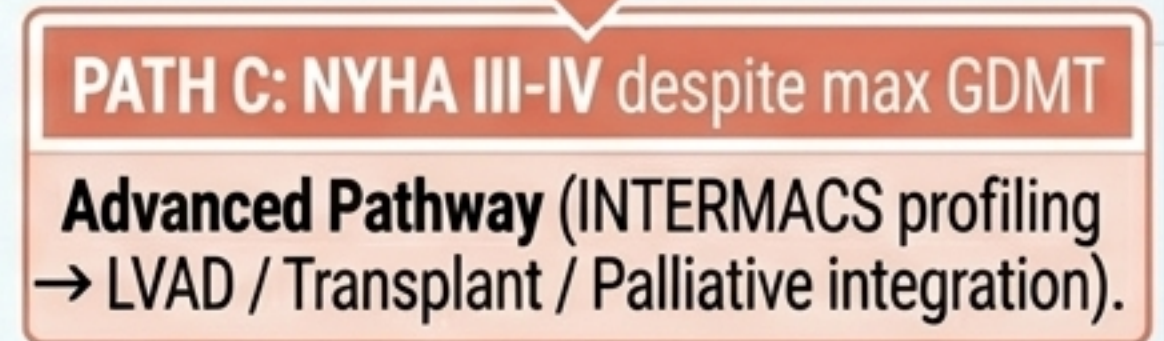
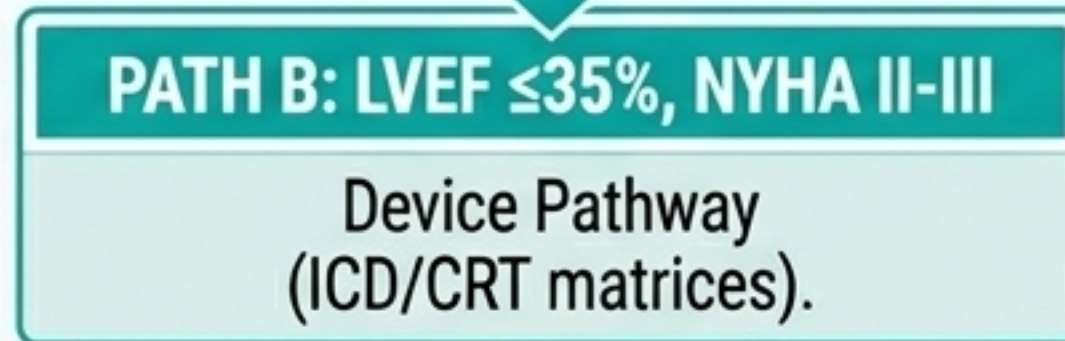
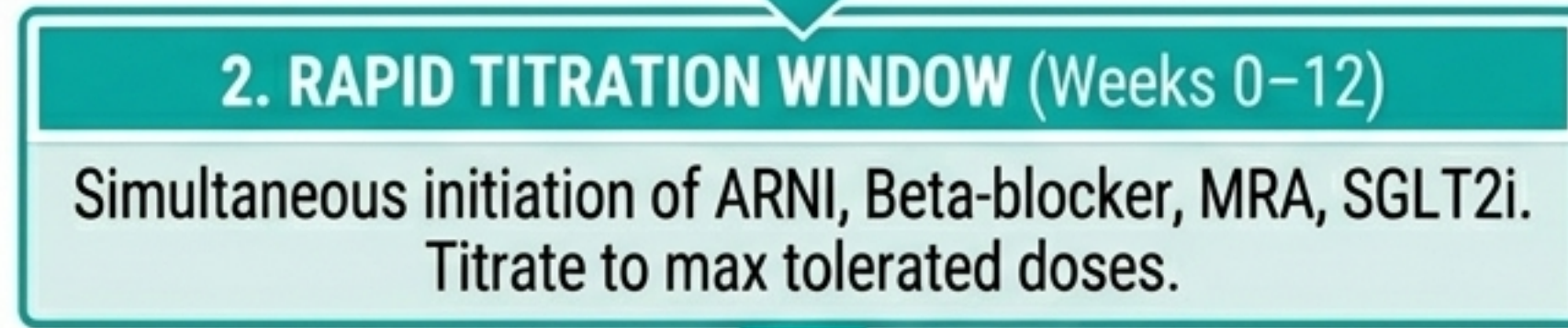
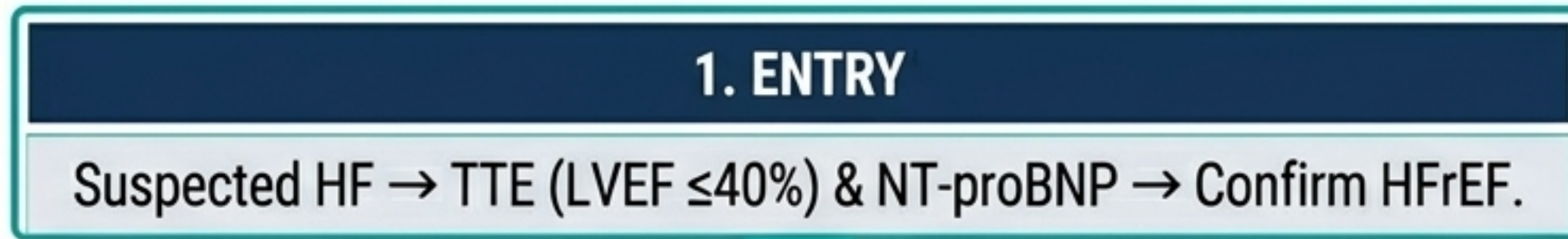
Manage with standard GDMT.

⚠ Beware protease inhibitor interactions.

CHAGAS DISEASE
(Central/South American endemic)

➤ Treated with **Benznidazole** 60-day course.

THE HF_rEF MASTER PATHWAY



OPTIMIZE RAPIDLY. REASSESS CONSTANTLY. ESCALATE APPROPRIATELY.