Common Challenges in Primary Care: Heart Failure & POTS

Wednesday 10 September 2025
The Prince Charles Hospital

phn BRISBANE NORTH
An Australian Government Initiative

Queensland Government
Metro North Health

Welcome!

Metro North Hospital and Health Service and Brisbane North PHN respectfully acknowledge the Traditional Owners of the land on which our services and events are located. We pay our respects to all Elders past, present and future and acknowledge Aboriginal and Torres Strait Islander people across the State.

AGENDA

6:30pm

GPLO UPDATE

Dr Kylie Norris | GP Liaison Officer, Metro North HHS & Brisbane North PHN

6:45pm

POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME

Dr Sarah Stevens | Staff Specialist, Internal Medicine & Aged Care, RBWH

7:30pm

HEART FAILURE

Dr Scott McKenzie | Senior Staff Specialist, Heart Failure & Transplant Unit, TPCH

Slides & resources

Queensland Government

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Home / Refer your patient / GP and primary care education & events / GP and primary care education

GP and primary care education

Presentations and further resources from past education events

- Caboolture Hospital education
- Cardiology
- Championing Generalism Workshop (updated 2025)
- Diabetes
- Gastroenterology and Hepatology
- Gender Services
- Genetics
- Gynaecology (updated 2024)
- Haematology and Oncology
- Heart Failure
- Immunology & ENT (updated 2024)
- Kidney Health
- Maternity (updated 2025)
- Men's Health (updated 2024)
- Mental Health (updated 2024)
- Neurology
- Orthopaedics (updated 2024)
- Paediatric
- Persistent Pain Management
- Respiratory
- Rheumatology
- Sexual Health
- Skin Cancer (updated 2024)
- Spinal health
- Surgery
- Urology

Contact

Email: MNGPLO@health.qld.gov.au

Refer a patient

Access the referral guidelines to refer a patient.

Call the GP hotline for enquiries about referring on **1300 364 938**

General Practice Liaison Officer Program

0499 112 282

MetroNorthGPLO@health.qld.gov.au

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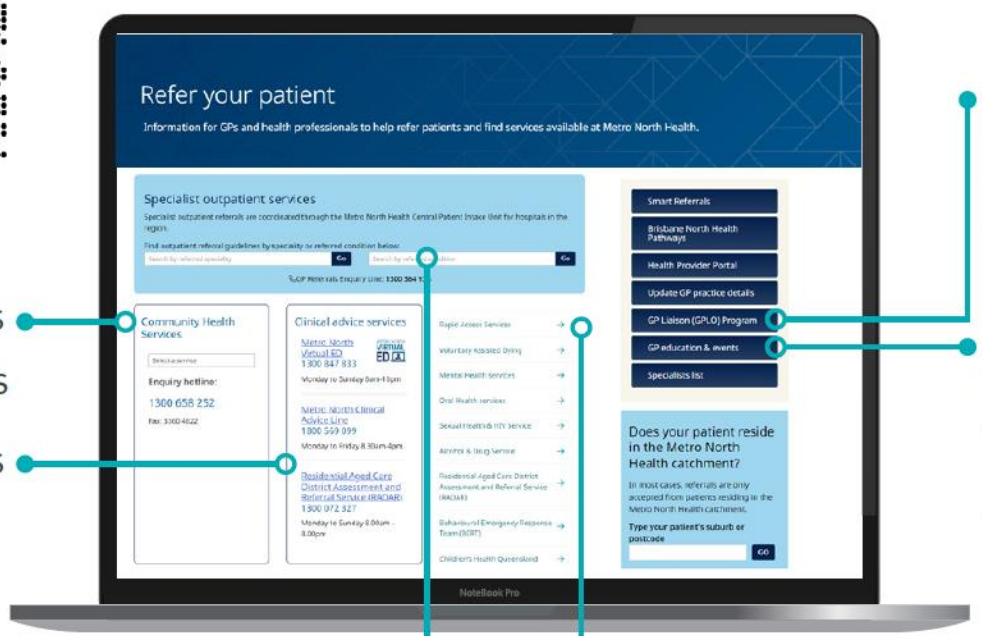
Refer Your Patient

is your one stop shop for Metro North Health service information and updates.

Scan the QRcode to Refer Your Patient.



Community Health Services

Clinical advices services and ED alternatives

Referral Guidelines

Rapid Access Clinics and Services

GP Liaison Officer Program including:

- contact information
- GP resources

GP Education & events including:

- upcoming GP education events
- Presentations, recordings and resources from past education events

Metro North Clinical Advice Line

> ## Connecting GPs directly to Metro North specialties.
>
> **This service is for GPs ONLY and is not a patient advice phone line.**

The Metro North Health Clinical Advice Line connects GPs to specialist advice from hospital and community clinicians. There are two pathways:

1. Phone line
2. Written request for advice.

The range of adult specialities currently available to support patient care in the community includes:
(This list will expand over time so keep coming back for the latest advice services available)

1. Phone advice

Specialty	Catchment*	Exclusion Criteria
General Medicine and Rapid Access Clinic	TPCH	• Excludes Cardiology, Heart Failure or Respiratory Conditions • Excludes Residential Aged Care residents (Call RADAR - 1300 072 327)
Haematology	Metro North	• Excludes Patients under 16 years
Heart Failure Service and Rapid Access Clinic	Redcliffe RBWH TPCH	• Excludes New heart failure patients • Excludes Patients seen by another heart failure service

Clinical Advice Line
1800 569 099
Open Monday to Friday
8.30am – 4.00pm

Note: This is for GPs only and the phone line is not open to patients.

Want to learn more?

For more information, please call the advice line or email MNH_SpecialtyAdviceLine@health.qld.gov.au.

The team can also undertake engagement sessions with interested GPs (Virtual or Face to Face).

Home / Hospitals & services / Virtual Ward / Health professionals

Health professionals

Virtual Ward

Virtual Ward

About the Virtual Ward

Health professionals

Frequently Asked Questions

If you are a Queensland Health employee, please refer to the Metro North Virtual Ward Intranet Page (internal link) (QH network only) available on QHEPS to access the internal referral form.

The Metro North Virtual Ward (VW) is an additional telehealth service that complements the current Virtual Emergency Department, Covid Virtual Ward, and Hospital-in-the-home services available within the Metro North Health region. Given the success of the virtual care model, the Metro North VW can now admit and manage patients with conditions other than COVID.

The VW can assist GPs by providing an inpatient equivalent admission for eligible patients.

On admission patients will be provided with team-based care via regular phone calls and/or video consults. The ward is based at the Royal Brisbane and Women's Hospital, from 0700 to 1930, 7 days a week, with overnight access to medical support. The patients will have access to medical, nursing, pharmacy, and social work support.

What can Virtual Ward provide?

Monitoring determined by patient's primary illness and co-morbidities.

Where required, patients will be provided with the following monitoring equipment free of charge and delivered to their home:

- Oxygen saturation probe
- Blood pressure monitor
- Thermometer
- Scales
- Facilitation of relevant investigations i.e.- Blood tests, medical imaging including MRI, ECG, Echo
- Facilitation of Specialist opinion
- Pharmacy review
- Referral to Allied Health

Which patients are eligible for admission to the VW?

Patients who require a brief period of monitoring and treatment which would otherwise require them to stay in hospital.

Patients at risk of deterioration, which if detected early, can be managed at home with the aim that hospital admission be avoided.

Patients where daily review in between planned GP review would be helpful.

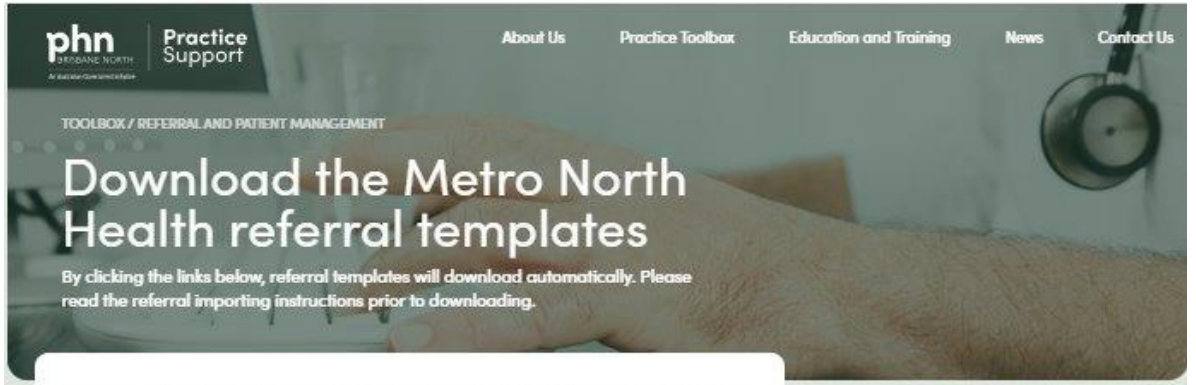
Examples of conditions that may be suitable for admission include:

- COVID
- community acquired pneumonia, infective exacerbations of asthma and other chronic obstructive airway conditions
- infections including cellulitis, osteomyelitis, UTI
- severe hypertension without neurological red flags for short term monitoring, medication adjustment
- hyperglycaemia without ketoacidosis for short term monitoring, medication adjustment.
- electrolyte abnormalities requiring monitoring
- supratherapeutic INR for short term monitoring
- serendipitous lumps to expedite investigation and Specialist review.

How to refer your patients to VW?

Phone **(07) 3074 2109** in hours (0800-1700hrs) or phone RBWH switchboard out of hours on **(07) 3646 8111** and ask to speak to the Virtual Ward Consultant.

If your patient is accepted by the Virtual Ward Consultant please complete an electronic referral using Virtual Ward specific, Best Practice or Medical Director, referral templates which can be accessed from the Brisbane North PHN website.



Important note: The referral templates provided are not to be used by Medical Officers employed within Metro North HHS for referring patients to hospital outpatient services. Medical Officers may refer Category 1 patient by completing the *Inter-Facility Speciality Outpatient Referral Form* (to refer patients to another Metro North facility for a new condition) or *Internal Referral Form* (within the same facility). Medical Officers are to redirect patients to their General Practitioner for consideration of referral for non-urgent health conditions.

PDF
Metro North Health referral importing instructions

Medical Director templates (RTF version 6.4)

Community and oral health
General paediatrics
Maternity shared care
Palliative care
Caboolture Hospital
Redcliffe Hospital
The Prince Charles Hospital
Royal Brisbane and Women's Hospital
Virtual Ward

Best Practice templates (RTF version 6.4)

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Home / Refer your patient / Complex Chronic Disease / Cardiac Rehabilitation

Cardiac Rehabilitation

The cardiac rehabilitation service provides an integrated education and exercise program for clients following a recent (within 6 months) cardiac event including NSTEMI or STEMI, PCI, Coronary Artery Bypass Grafting, Cardiac Valve Surgery or clients who have medically stable Heart Failure.

The program

This program is conducted over 6 weeks and includes the following:

- Exercise program – once or twice weekly in a gym setting or via telehealth in the client's own home
  Clients will be assessed for suitability for home based virtual care delivery and only offered this option if clinically appropriate
- Education program –varying topics related to health, diet and fitness
- Access to multidisciplinary allied health team for identified needs/goals (as per Complex Needs Service)

The service is available at various locations throughout the Metro North Health catchment.

Patient eligibility

- patients with acute myocardial infarction (NSTEMI, STEMI & SCAD, including patients with and without post-MI revascularisation eg. Those medically managed with confirmed CAD)
- PCI,
- Coronary Artery Bypass Grafting,
- Cardiac Valve Surgery,
- medically managed coronary artery disease eg. Stable angina,
- heart transplant
- clients who have medically stable Heart Failure & cardiomyopathy conditions

Send referral

Hotline: 1300 364 938

Electronic:
GP Smart Referrals (preferred)
eReferral system templates
Medical Objects ID: MQ40290004P
HealthLink EDI: qldmnhhs

Mail:
Metro North Central Patient Intake
Aspley Community Centre
776 Zillmere Road
ASPLEY QLD 4034

Health pathways

Access to Health Pathways is free for clinicians in Metro North Brisbane.

For login details email:
healthpathways@brisbanenorthphn.org.au

Login to Brisbane North Health Pathways:
brisbanenorth.healthpathwayscomm

Queensland Government | Smart Referrals

Patient name: James METRONORTH DoB: 1 Jan 1980

Request information

Request date	5 Sep 2025
* Request type	New referral | Update | Continuation | Request for advice
* Reason for referral	○ New condition requiring specialist consultation ○ Deterioration in condition, recently discharged from outpatients < 12 months ○ Other
* Priority	Urgent | Routine
* Provider	QHSR | Private

Consents

* Date patient consented to request	05 Sep 2025
* Patient is willing to have surgery if required?	Yes | No | Not applicable
* Condition and Specialty	Rehabilitation — HealthPathways
Suitable for Telehealth?	Yes | No
* Are you the patient's usual GP?	Yes | No

Request recipient

* Service/Location	Please select		
Specialist name			
Organisation details	Healthy Ageing Assessment Rehabilitation Team (HAART)	KALLANGUR SATELLITE HEALTH CENTRE	31.7 km
	Cardiac Rehabilitation – Allied Health – Physiotherapy – Complex Chronic Disease Team	NORTH LAKES HEALTH PRECINCT	34.3 km
	Pulmonary Rehabilitation – Allied Health – Physiotherapy – Complex Chronic Disease Team	NORTH LAKES HEALTH PRECINCT	34.3 km
	Community Based Rehabilitation Team - Specialist Rehabilitation	NORTH LAKES HEALTH PRECINCT	34.3 km
	Rehabilitation	REDCLIFFE HOSPITAL	37.4 km

Condition specific clinical information

Investigations and imaging

Standard clinical information

Patient information

Insurance information

Referring GP's information

Supporting documentation

HOPE

Heart Outreach Program for Health Equity

A specialist cardiology service model for Aboriginal and Torres Strait Islander people closer to home

The HOPE Program will deliver culturally appropriate patient-centered care to Aboriginal and Torres Strait Islander people, in partnership between Metro North Health and the Institute for Urban Indigenous Health (IUIH).

Metro North Health specialist cardiology team will deliver clinics at Moreton Aboriginal and Torres Strait Islander Community Health Service (MATSICHS) centers in Margate and Caboolture. Cardiac investigations including ECHO will be offered on site via telecardiac services.

The HOPE Program is available for adults who identify as Aboriginal and Torres Strait Islander people requiring a specialist cardiology service.

Exclusions: Patients with -

- Acute chest pain
- Implanted device for assessment
- Suspected endocarditis
- Acute dysrhythmia

Referrals are requested to be sent via the usual Metro North Health referral channel (Central Patient Intake Unit) and clearly marked for HOPE Program.

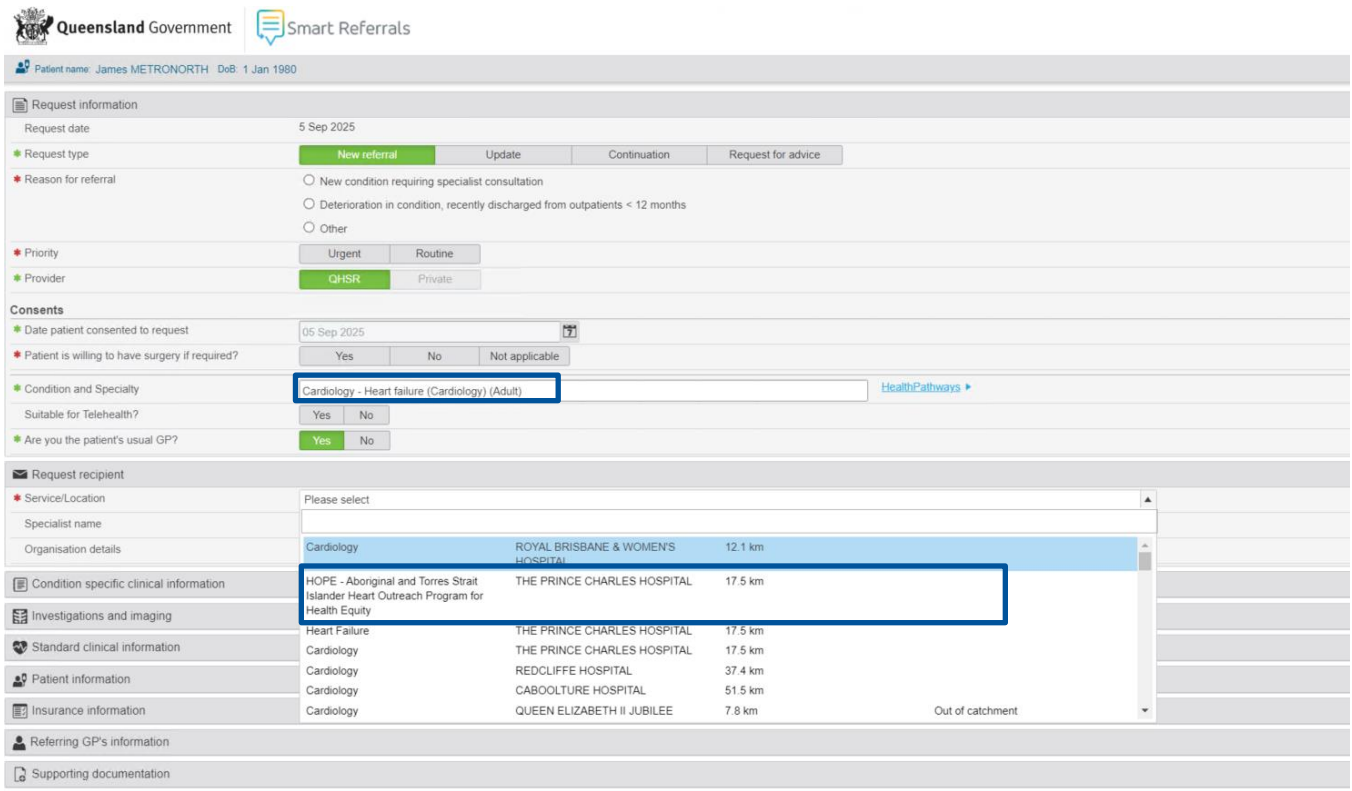
For further information please contact the HOPE team on 3139 4000 (extension 84015) or via email on **HOPEmnhhs@health.qld.gov.au**

IUIH Institute for urban indigenous health

Moreton ATSICHS

Metro North Health

Queensland Government



Supporting people 65 years and over live their best lives!

The **Healthy Ageing Assessment and Rehabilitation Team (HAART)** provides comprehensive assessment, care planning, reconditioning and rehabilitation after a recent health event, functional health decline, injury or chronic condition.

Kallangur Satellite Hospital
9 Stoker Way,
Kallangur

Call 3285 0000

Metro North Health | Queensland Government

Queensland Government | Smart Referrals

Patient name: James METRONORTH DoB: 1 Jan 1980

Request information

Request date	5 Sep 2025
* Request type	New referral | Update | Continuation | Request for advice
* Reason for referral	○ New condition requiring specialist consultation ○ Deterioration in condition, recently discharged from outpatients < 12 months ○ Other
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Consents

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* Patient is willing to have surgery if required?	Yes | No | Not applicable
* Condition and Specialty	Rehabilitation — HealthPathways
Suitable for Telehealth?	Yes | No
* Are you the patient's usual GP?	Yes | No

Request recipient

* Service/Location	Please select		
Specialist name			
Organisation details	Rehabilitation	THE PRINCE CHARLES HOSPITAL	17.5 km
	Healthy Ageing Assessment Rehabilitation Team (HAART)	KALLANGUR SATELLITE HEALTH CENTRE	31.7 km
	Cardiac Rehabilitation – Allied Health – Physiotherapy – Complex Chronic Disease Team	NORTH LAKES HEALTH PRECINCT	34.3 km
	Healthy Ageing Assessment Rehabilitation Team (HAART)	BRIBIE ISLAND SATELLITE HEALTH CENTRE	54.9 km
	Community Based Rehabilitation Team - Specialist Rehabilitation	NORTH LAKES HEALTH PRECINCT	34.3 km

Condition specific clinical information
Investigations and imaging
Standard clinical information
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Supporting documentation

Queensland Government

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Community and Oral Health
Metro North Health

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Home / Healthcare Services / Rapid Access to Community Care (RACC)

Rapid Access to Community Care (RACC)

Rapid Access to Community Care (RACC) is a multidisciplinary service (Clinical Nurse and Occupational Therapists) that provides assessment and care for people following a fall at home, or with an exacerbation of a chronic condition, illness or injury, or an inability to physically and/or cognitively manage in their own residence that does not require acute medical attention. The service is an alternative to hospital presentation for people requiring community-based support and can assist to optimise care options and services, particularly for older people without the need for any hospital interaction.

RACC accept direct clinician to clinician referrals via phone primarily from GPs and Queensland Ambulance Service for adult patients requiring rapid community assessment and linkage to established community support. Electronic referrals are also accepted.

Our services

RACC undertakes a clinical phone assessment with the client within 1 business day to initiate the assessment and intervention pathway and communicates the outcome to the client's GP.

RACC provides a single, rapid, comprehensive, in-home assessment and immediate intervention including on-referral to the most appropriate community-based care services within 3 business days of receipt of the referral.

Referral pathways include community support services including Metro North Community Health services, PHN Team Care Coordination, Non-Government Organisations and My Aged Care.

The assessment and referral outcomes are communicated to the GP.

Service Scope

Referrals accepted from GPs, Queensland Ambulance Service including Falls Co- Responders, OPEN, PHN Team care co-ordination and Virtual ED referral.

Community dwelling adult patients at risk of avoidable hospital presentation requiring rapid comprehensive assessment to optimise community support services.

Reside in Metro North

Outside Service Scope

- Patients who reside in Residential Aged Care Facilities
- Patients whose primary issue is acute mental health concerns.
- Patients whose primary issue is alcohol or drug related.
- Current inpatient admission
- Linked with other Community and Oral Health home visiting services.
- Under 18 years of age

Contact us

Phone: 1300 220 922 (clinicians only)
Open: Referrals accepted Monday-Friday 0900-1700

Need help outside hours?

For non-urgent medical issues call MN Virtual ED 1300 847 833

or 13 HEALTH (13 43 25 84)

Refer a patient

To refer a patient:
Phone referral 1300 220 922 Monday to Friday 0900-1700

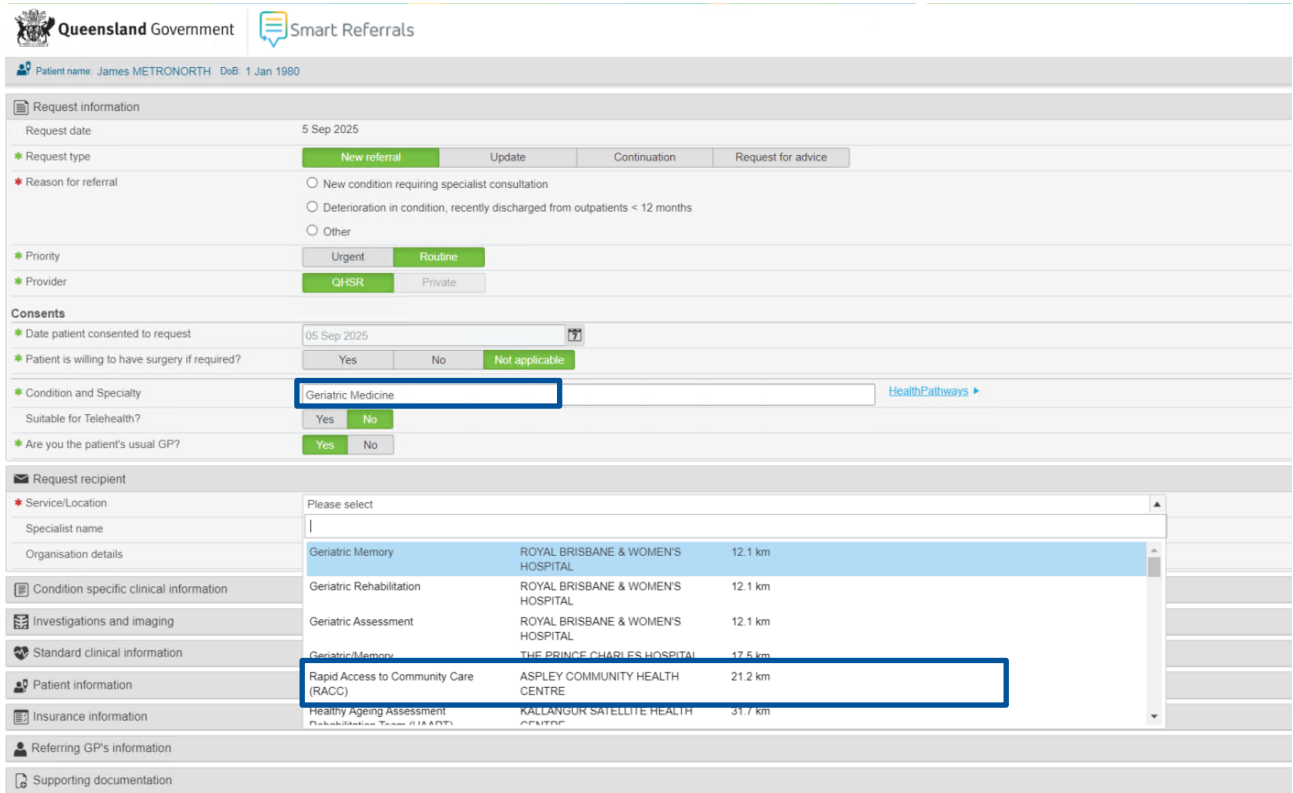
GP: phone or submit electronic referral via GP Smart Referrals

VED: phone or submit electronic referral via Refer

QAS: phone referral if need to book home visit appointment whilst on scene and then submit eARF as per QAS process.

Referral enquiries:

Phone referral line 1300 220 992 to discuss referral and scope of service.



Healthcare coordination
for people with long term medical conditions.

TEAM® CARE COORDINATION

Team Care Coordination is a free service delivered by clinical nurses who work with patients to:

- provide disease, health and community service information
- coordinate health, community and social support services, including My Aged Care and NDIS navigation support
- support the communication between patients, service providers and health professionals.

How GPs refer

- gain patient's verbal consent
- send completed referral and health summary to Team Care Coordination by either:
  - eReferral: via Medical Objects to teamcare (MM4030000FT)
  - Fax: secure fax to 07 3630 7808

Eligibility

Patients are eligible if they:

- have at least one or more chronic complex medical condition
- live in the Metro North catchment
- are not living in a residential aged care facility
- are not receiving other comprehensive support packages or end of life palliative care services.

eReferral templates can be imported from www.brisbanenorthphn.org.au

phn BRISBANE NORTH
An Australian Government Initiative

For more information phone **1800 250 502**
www.brisbanenorthphn.org.au

Team Care Coordination is managed by Brisbane North PHN and is supported financially by Metro North Hospital and Health Service

TEAM® CARE COORDINATION

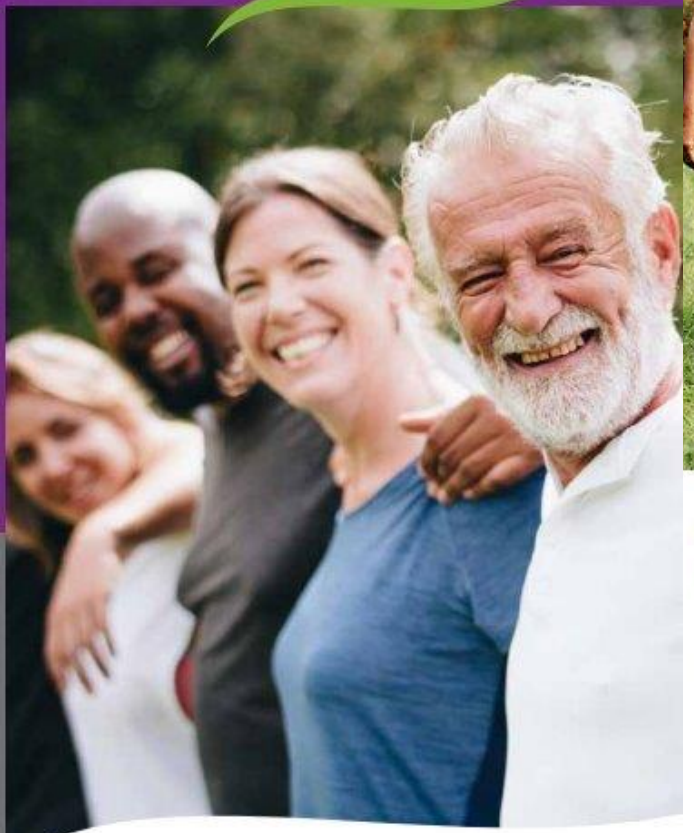
The Team Care Coordination program is a free service for people over the age of 18 with complex and chronic health conditions. It supports people to remain living at home by improving their self-management and quality of life.

The service is delivered by clinical nurses and allied health that can offer health education and coordination of health and community services. Our team will:

- conduct a face-to-face in-home visit, telehealth, or phone consultation to understand your needs and goals
- offer ongoing support and contact for up to three months, with the possibility of extension if needed
- focus on improving quality of life and self-management.

SOCIAL HEALTH CONNECT
AT FOOTPRINTS COMMUNITY

Helping you to manage your social health and improve connection!



footprints community
BETTER TOGETHER

WHAT IS SOCIAL HEALTH CONNECT?

Social Health Connect supports people aged 18+ in the Kilcoy and Caboolture regions who are experiencing social isolation and loneliness.

The program will help you address barriers that may impact on your ability to improve your social health, community participation and connection.

Barriers include:

- Finances
- Housing
- Transport
- Physical health barriers
- Mental health barriers
- Limited social supports and networks
- Language barriers.

Interpreter

You can ask for an interpreter.
It is FREE.

SOCIAL HEALTH CONNECT TEAM

The Footprints Social Health Connect team is:

- Highly skilled
- Professional
- Warm.

The Footprints Social Health Connect team:

- Supports people in the local Kilcoy and Caboolture regions with practical guidance for an engaging and meaningful life
- Supports people to develop person centred goals plans
- Supports people to build independence and resilience to improve and manage their health and wellbeing
- Links people to local groups, activities or social opportunities that align with their individual interests
- Links people to services that can support them to address barriers to social participation e.g. financial supports, carer supports, My Aged Care and transport supports
- Provides an easily accessible referral pathway and strongly encourage referrals from General Practitioners and Health Professionals.

Supported by
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Postural Orthostatic Tachycardia Syndrome

Dr Sarah Stevens
Staff Specialist
Internal Medicine & Aged Care, RBWH

phn BRISBANE NORTH
An Australian Government Initiative
Queensland Government
Metro North Health

DYSAUTONOMIA POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME (POTS)

DR SARAH STEVENS BPTY, MBBS, FRACP
GENERAL PHYSICIAN

Acknowledgement of Country

We would like to acknowledge the traditional custodians of this land and pay our respects to the Elders both past, present and future for they hold the memories, the traditions, the culture and hope of their people

Introduction

- No conflicts to disclose

Why am I speaking to you tonight?

- I am a General Physician with an interest in POTS
- I will share what I've learned from
  - Literature Review
  - Discussions with Australian experts
  - Discussions with GP's
  - My own experiences
- I am NOT an expert, but I'll do my best!

“We can do it, we can do it”

“We made it!”

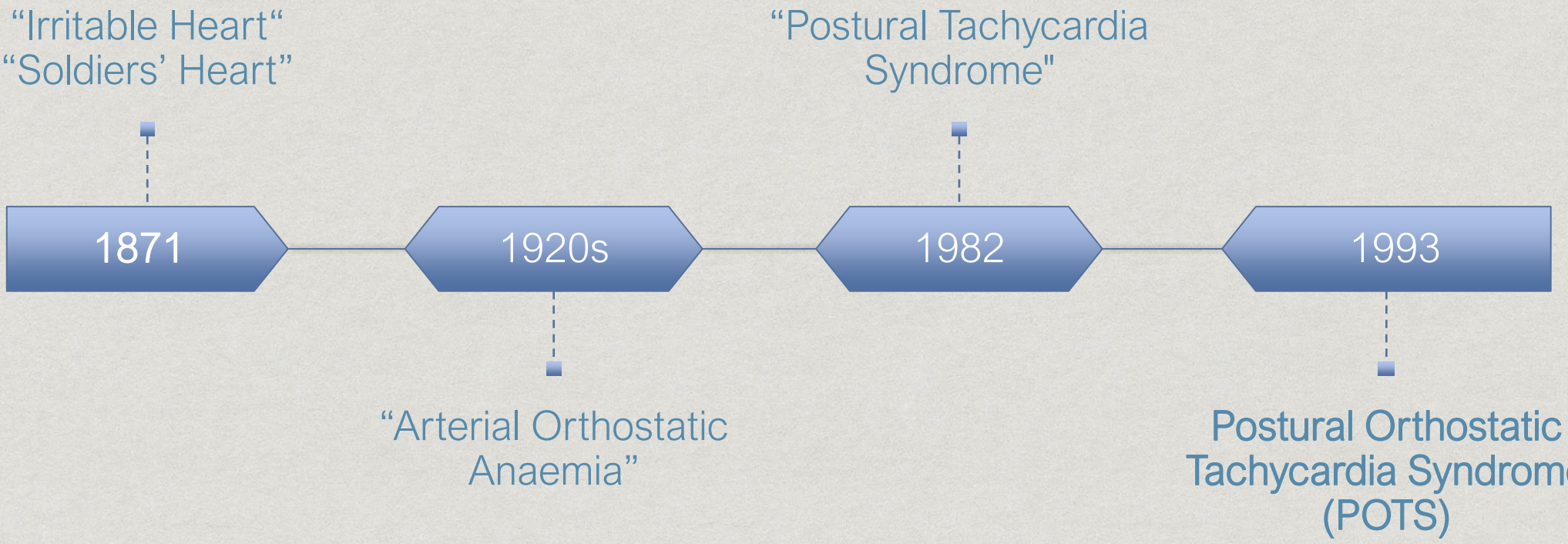
“Noooooo…. More steep hills to climb”

“We did it!”

Outline

- POTS History & Literature
- Case study
- POTS pathophysiology/phenotypes
- POTS Work-up & management
- Questions

The History of POTS



POTS literature

https://potsfoundation.org.au/the-knowledge-hub/

Invited Review Article

Pathophysiology and management of postural orthostatic tachycardia syndrome (POTS): A literature review 2025

Mohamad Ghazal, MD [a], Abdul Rahman Akkawi, MD [b], Andrew Fancher, MD [b], Emmanuel Oundo, MD [b], Hammad Tanzeem, MD [c], Laiba Sajjad, MD [b], Alexandros Briasoulis, MD, PhD [d,e,*]

[a] Department of Internal Medicine, Albany Medical College, Albany, NY, USA
[b] Department of Internal Medicine, Kansas University School of Medicine-Wichita, Wichita, KS, USA
[c] Department of Internal Medicine, University of Cincinnati, Cincinnati, OH, USA
[d] Departm
[e] Departm

Canadian Cardiovascular Society Position Statement on Postural Orthostatic Tachycardia Syndrome (POTS) and Related Disorders of Chronic Orthostatic Intolerance 2020

Satish R Raj [1], Juan C Guzman [2], Paula Harvey [3], Lawrence Richer [4], Ronald Schondorf [5], Colette Seifer [6], Nicolas Thibodeau-Jarry [7], Robert S Sheldon [8]

Affiliations + expand

PMID: 32145864 DOI: 10.1016/j.cjca.2019.12.024

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Contents lists available at ScienceDirect

Autonomic Neuroscience: Basic and Clinical

journal homepage: www.elsevier.com/locate/autneu

Review article

The use and effectiveness of exercise for managing postural orthostatic tachycardia syndrome in young adults with joint hypermobility and related conditions: A scoping review 2024

Karen C. Peebles *, Charl Jacobs, Logan Makaroff, Verity Pacey

Department of Health Sciences, Faculty of Medicine, Health and Human Sciences, Macquarie University, Sydney, Australia

Efficacy of Therapies for Postural Tachycardia Syndrome: A Systematic Review and Meta-analysis 2018

Rachel Wells, MBBS; Adrian D. Elliott, PhD; Rajiv Mahajan, MD, PhD; Amanda Page, PhD; Valeria Iodice, MD, PhD; Prashanthan Sanders, MBBS, PhD; and Dennis H. Lau, MBBS, PhD

Case Study: 23yo Female

Presented with postural symptoms after a flu-like illness.

GP referred for ?POTS

Case Study: History

- PMHx: Hypermobility, Migraines (monthly)
- Medications: Sumatriptan PRN
- Allergies: nil
- SHx: Lives with a flat-mate in West End
  - Works in retail, studying nursing
  - Nil smoking/drugs, Occasional ETOH
- FHx: nil sudden cardiac death or other

Case Study: History (cont)

- HPC:
  - Flu-like illness about 4 months ago, lasted > week
  - Since then, every time she stands up she feels dizzy with a racing heart mild headache and faint atypical chest pain
  - Symptoms settle if she's supine
  - Some days are worse than others
  - Nil symptoms while supine, nil orthopnea, dyspnoea or ankle swelling
  - 2 months ago she nearly "passed out" prompting GP review

Case Study: History (cont)

- Diet/Exercise:
  - No regular exercise, been lying down more anymore since symptom onset
  - Eats 2-3 meals a day, often skips breakfast
  - Drinks 2-3 coffees a day plus diet coke
  - Drinks 1.5-2L water a day
  - Weight stable, nil eating disorder history
- Mood:
  - She's been "quite stressed with uni and work for the last 6 months"
  - Increased sick leave
  - DASS-21 score: 11 "Mild depression, Moderate anxiety"

Case Study: Malmo POTS survey

Please circle the number on the scale that corresponds to your average symptoms for the past week. You should only answer once per question. If you haven't experienced symptoms, circle zero (0).

Australian POTS Foundation

No symptoms **Pronounced symptoms**

1. Dizziness in upright position or while standing up

0 1 2 3 4 5 6 7 8 **9** 10

2. Dizziness, feeling that you are going to faint

0 1 2 3 4 5 6 7 8 9 **10**

3. Palpitations, high pulse, or feeling heart beating irregularly

0 1 2 3 4 5 6 7 **8** 9 10

4. Difficult breathing (dyspnoea) both at effort and rest

0 1 2 3 4 5 6 7 8 9 10

5. Chest pain

0 1 2 3 4 **5** 6 7 8 9 10

6. Headache

0 1 2 3 4 5 6 **7** 8 9 10

7. Concentration difficulties and/or problems with thinking

0 1 2 3 4 5 6 7 **8** 9 10

8. Muscle pain

0 1 2 3 **4** 5 6 7 8 9 10

9. Nausea

0 1 2 **3** 4 5 6 7 8 9 10

10. Gastrointestinal problems (stomach-ache, diarrhoea, constipation)

0 1 2 3 4 **5** 6 7 8 9 10

11. Abnormal tiredness that persists after rest

0 1 2 3 4 5 6 7 8 **9** 10

12. Insomnia

0 1 **2** 3 4 5 6 7 8 9 10

MALMO POTS SCORE: 70 [Score ≥42 = 97% sensitivity/ 98% specificity for POTS]

Skåne University Hospital and Lund University, Malmö, Sweden
Authors: Jasmina Medic Spahic, Viktor Hamrefors, Richard Sutton, and Artur Fedorowski English version. Date: 20210904

Case Study:

- The following blood tests were performed by her GP prior to specialist review and within **normal** range:
  - FBC
  - eLFTs
  - TFTs
  - Early morning cortisol
  - bHCG
  - Iron studies
- 12 lead ECG: Normal
- 24 hour Holter: Normal sinus rhythm, nil arrhythmias or pauses >2sec. Patient reported symptoms correspond to episodes of sinus tachycardia up to 138bpm
- Transthoracic Echocardiogram: normal
- Note: prior Brain MRI 2022: NAD (performed during migraine investigations)

Case Study: Examination

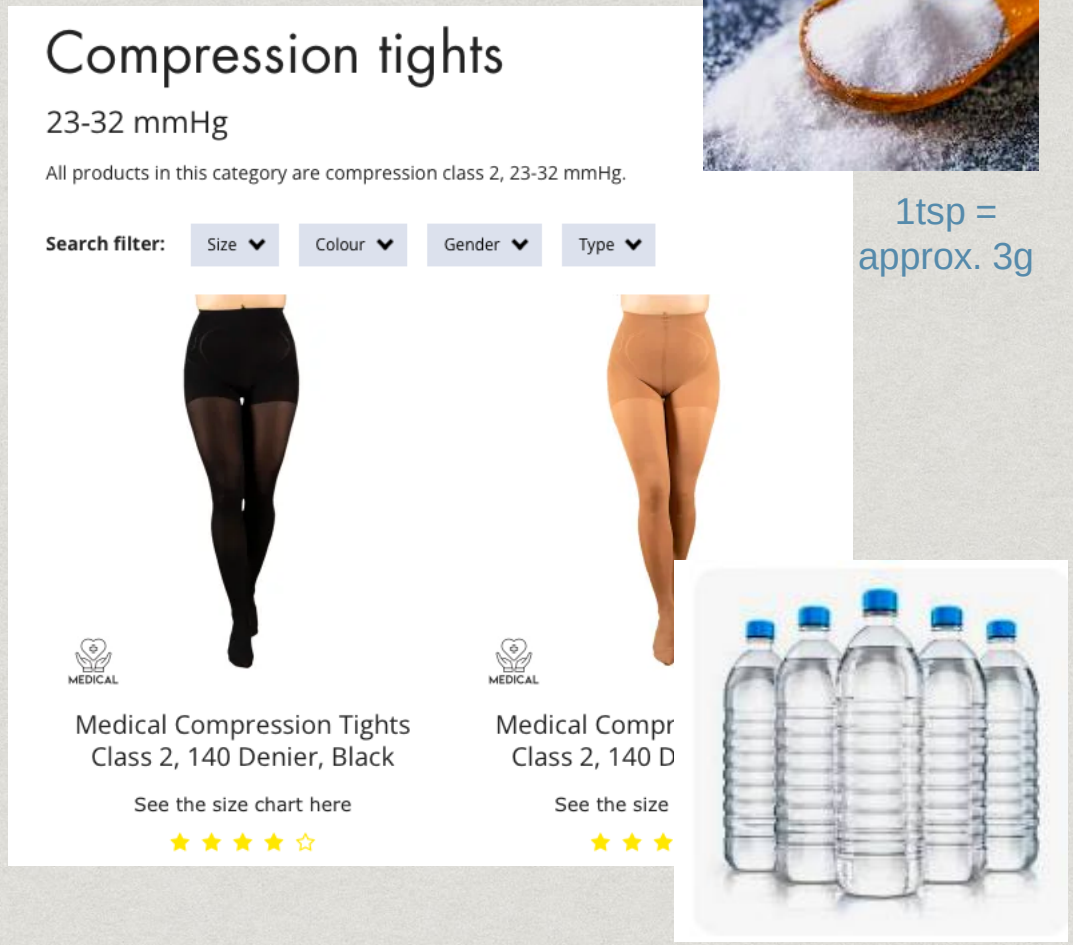
- Height: 172cm, Weight: 60kg, BMI: 20.3
- Cardiorespiratory exam: nil murmurs, nil pedal oedema
- Active standing test:

	HR	BP
Supine for 5 mins	80	118/78
3min standing	118	108/74
5min standing	120	112/78
10min standing	116	115/73

Max HR - Resting HR = 40 bpm

Case Study: Management

- **A diagnosis of POTS was made**
- Validation and education
- Lifestyle advice:
  - > 3L fluids a day (avoid caffeine & alcohol)
  - Liberal salt diet (10g day)
  - Compression garments



1tsp = approx. 3g

Case Study: Management

- She had “already tried the lifestyle changes”
- **Propranolol 10mg BD** was commenced (morning and early afternoon)
- Self titrate propranolol dose to by 10mg every 3 days to 40mg
- Home recording of postural HR each morning
- Medical certificate


Grand Island Doctors Hospital
2989 Carolina Avenue, Grand Junction, Colorado
970-244-5713

Medical Certificate
for Sick Leave

Case Study: 1 week later (phone)

- Her symptoms and her home readings had improved with propranolol 20mg BD
- Nil side effects
- A chronic condition management plan

Case Study: 1 month Follow up

- Symptoms had significantly improved
- Propranolol 20mg BD “optimal”
- Had seen exercise physiologist twice
  - symptomatic but rests and hydrolyte helped
- Mood improved, was able to work
- Nil migraines since initial review
- Exam: Postural tachycardia 28bpm (previously 40bpm)

Case Study: 3 month Follow up

- Significant symptom burden following a respiratory virus
- Nearly passed out several times
- Studying for uni (nursing) exams
- Finding it hard to keep fluids up, drinking coffee while studying
- No home readings as ‘too symptomatic’
- Tried propranolol 30mg BD, which helped “a bit”
- Exam: postural tachycardia of 38bpm with a mild postural SBP drop of 15mmHg

Case Study: 3 month Follow up (cont)

- Time off work to focus on study
- Propranolol was changed to ivabradine 2.5mg BD
- She also agreed to try abdominal binders

** pause case study**

Case Study: 2 weeks later

- Symptoms much improved with ivabradine at 5mg BD
- Felt abdominal binders made her nausea worse
- Exam: Postural tachycadia10bpm without hypotension
- But was worried about "flaring up" on exam day
- Decision was made to try PRN midodrine 2.5mg

Case Study: 1 week later (phone)

- She found midodrine helped her symptoms a lot but it's "expensive"
- She hasn't had to use it daily but saves it for bad days or before exercise
- Mood much better after completing her exams
- She's re-linked in with her exercise physiologist

POTS: Where are we today?

Symptom burden, quality of life, and diagnostic journey of people with postural orthostatic tachycardia syndrome, Australia, 2021–24: a descriptive patient registry data study *Med J Aust 2025*

15% adolescents
33% long-COVID

Marie-Claire Seeley[1,2], Gemma Wilson[1,2], Eric Ong[1], Amy Langdon[1], Jonathan Chieng[1], Danielle Bailey[1], Kristina Comacchio[1], Amanda Page[2,3], Dennis H Lau[1,4], Celine Gallagher[1,2]

	n=500
Mean Age, yrs	31 ± 12
Sex (women)	434 (86.8%)
Mean age at onset, yrs - Adults - Adolescents	 22 (15-33) 14 (12-16)
No. of physicians seen prior to diagnosis	5.2 ± 4.6
ED presentations with symptoms prior to diagnosis	284 (54.5%)

Onset Trigger	n=500
- Infection	197 (39.4%)
- Trauma/concussion	34 (6.8%)
- Vaccination	29 (5.8%)
- Surgery	17 (3.4%)
- Other*	44 (8.8%)
- No identifiable trigger	179 (35.8%)

* pregnancy, menopause, stress event, allergic reaction, eating disorder

POTS Diagnosis & Management Challenges

Physician Factors

- Failure to recognise autonomic symptoms
- Nuances with diagnostic criteria

Healthcare system Factors

- Cost of medications (non-PBS)
- No ICD code for POTS till 1 Jul 2025 [ICD-10 G90.a]
- Lack of specialised public clinics

Patient Factors

- Complex co-morbidities, varying symptomatology
- High proportion with neurodivergence disorders
- Cognitive dysfunction

POTS Phenotypes

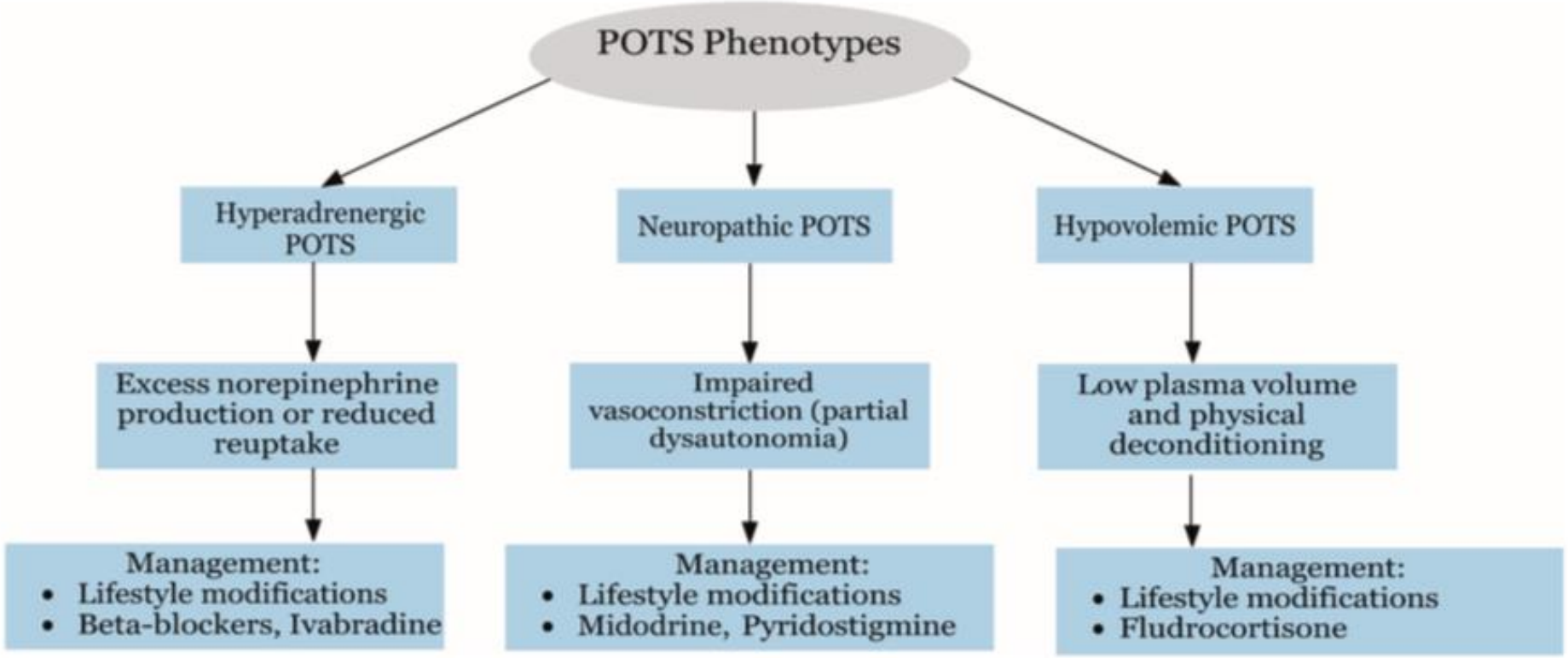


Fig. 1. Phenotype-Based Classification and Management of Postural Orthostatic Tachycardia Syndrome (POTS).

POTS Phenotypes: Hypovolaemic

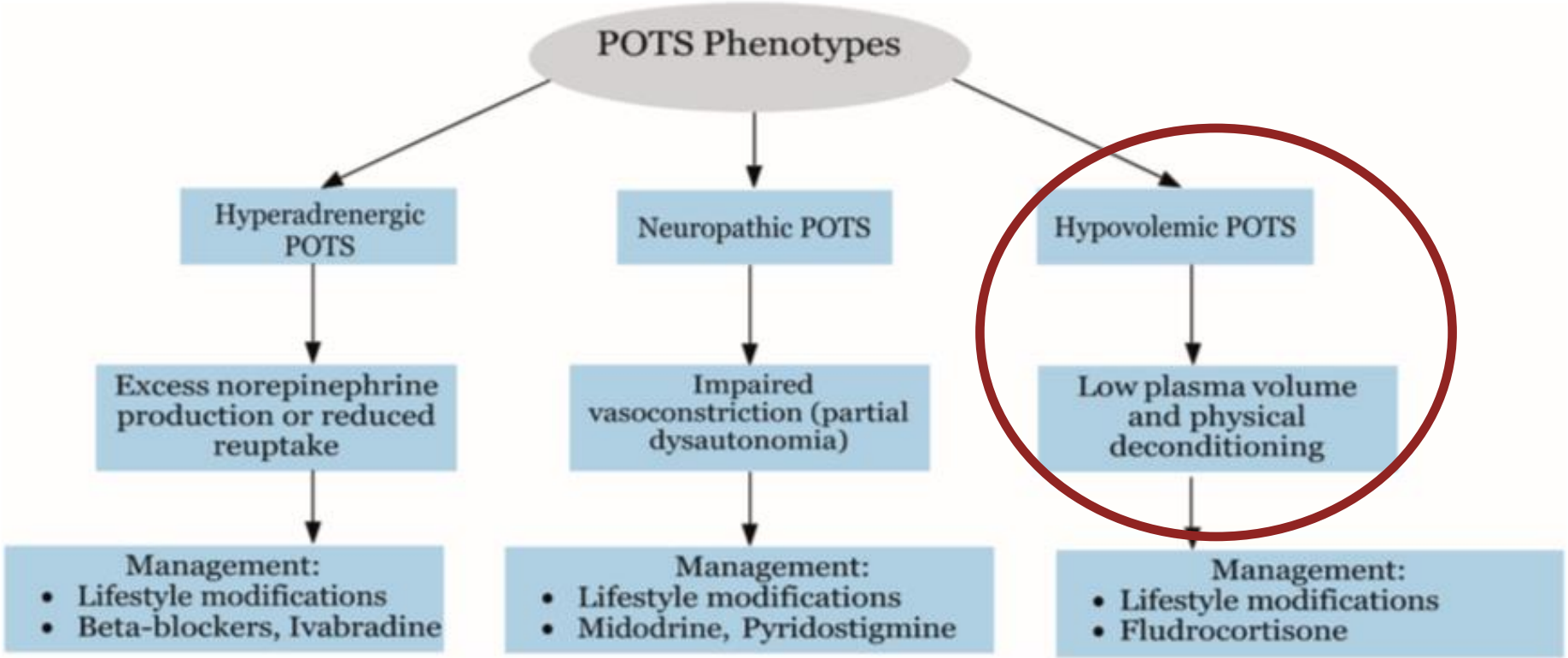


Fig. 1. Phenotype-Based Classification and Management of Postural Orthostatic Tachycardia Syndrome (POTS).

POTS Phenotypes: Hyperadrenergic

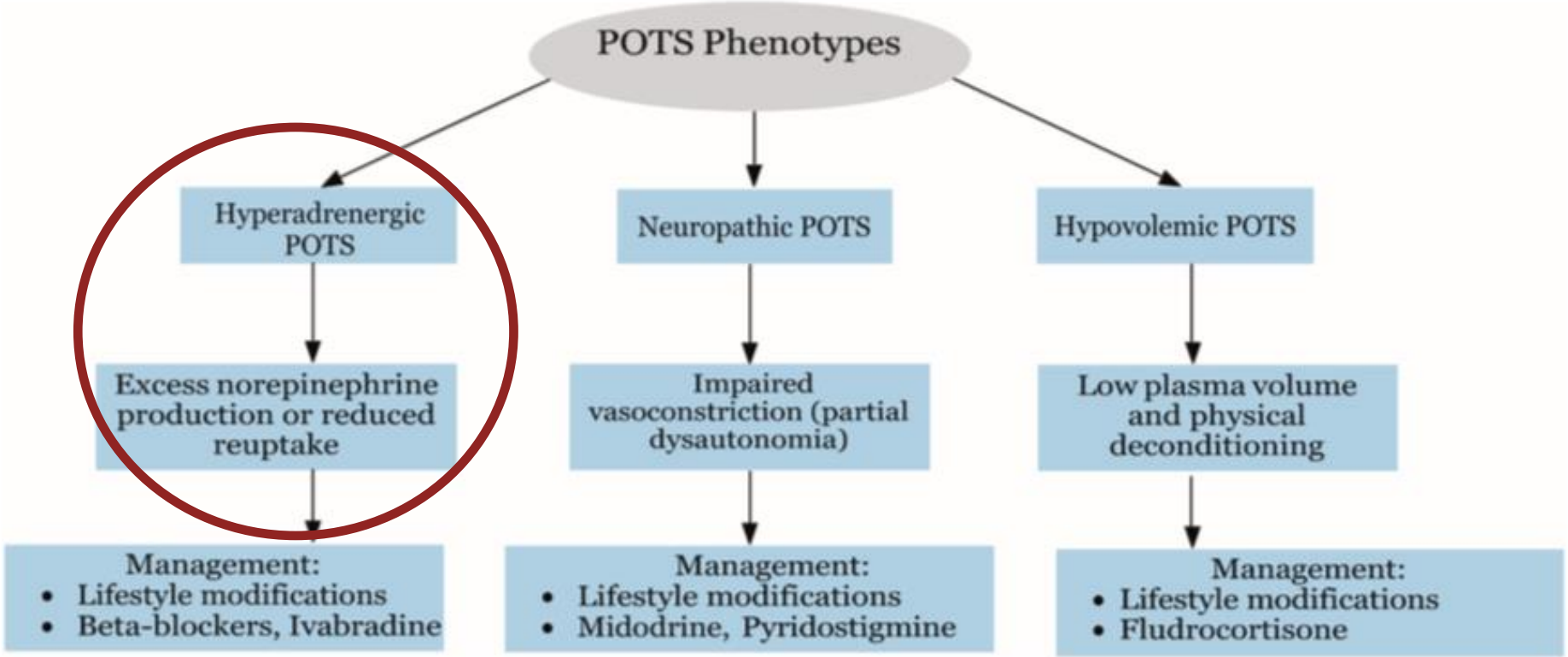


Fig. 1. Phenotype-Based Classification and Management of Postural Orthostatic Tachycardia Syndrome (POTS).

POTS Phenotypes: Neuropathic

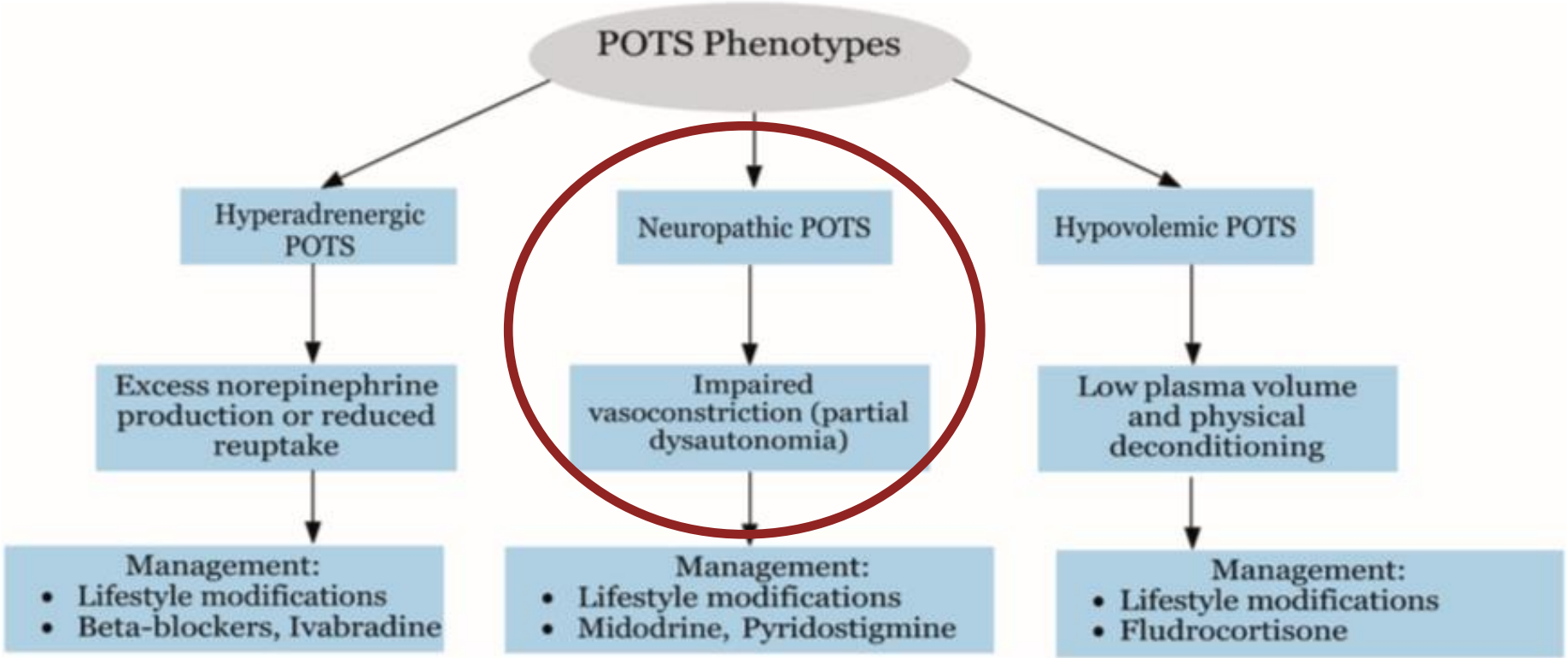


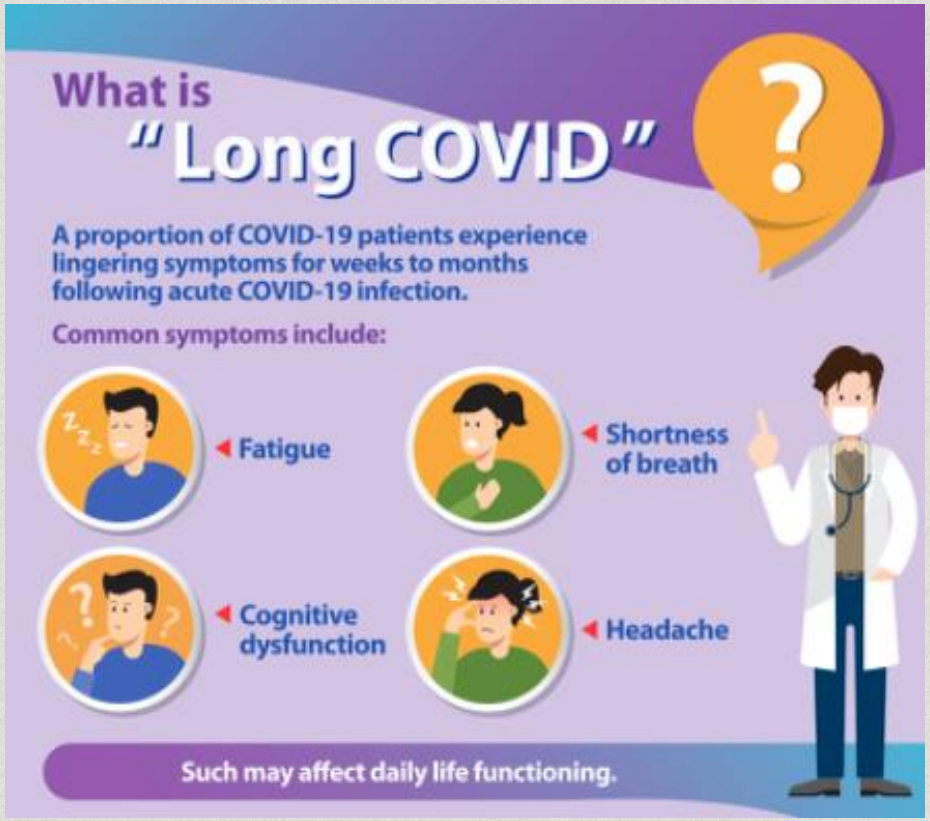
Fig. 1. Phenotype-Based Classification and Management of Postural Orthostatic Tachycardia Syndrome (POTS).

Pathophysiology: Other

- Deconditioning
- RAAS
- Autoimmune
- Genetic predisposition

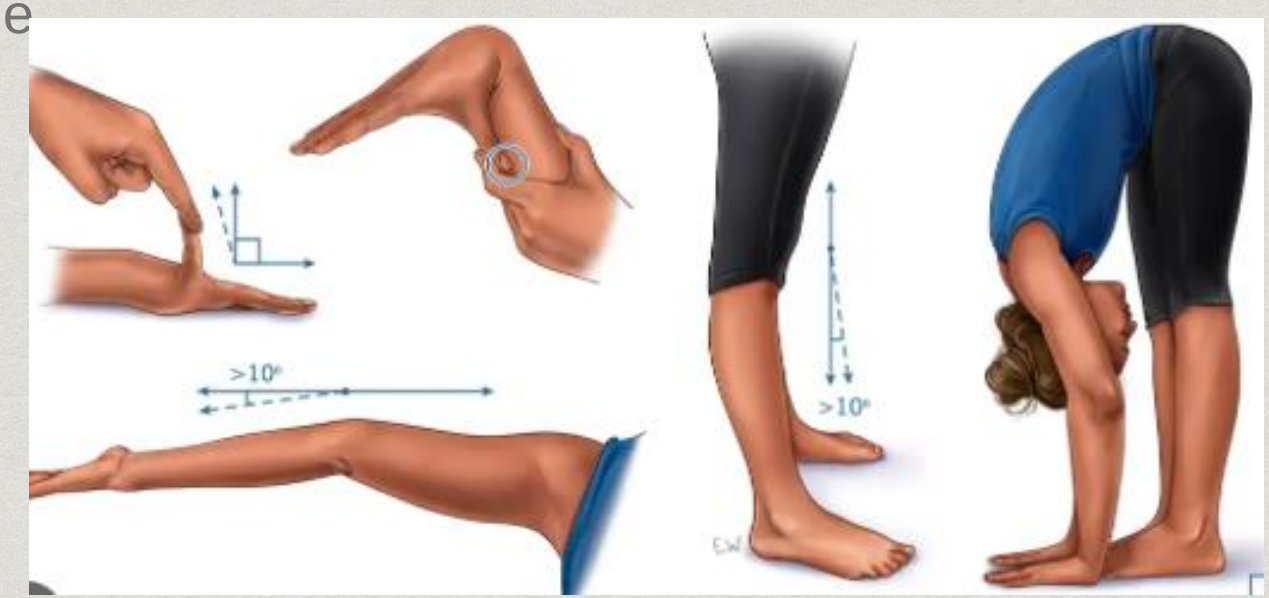
Triggers/Aggravating factors

- Long Covid/viruses
- Pregnancy
- Vaccinations
- Surgery
- Pre-menstral
- Hot environments



Associated conditions

- Hypermobility spectrum disorder
- Hypermobile Ehlers-Danlos Syndrome
- Endometriosis
- Fibromyalgia
- Irritable bowel syndrome
- Migraine
- Chronic Fatigue Syndrome
- Mast Cell Activation Syndrome
- Mental health disorders (Anxiety, depression, ADHD, ASD)



DIAGNOSTIC CRITERIA

- Sustained HR rise of 30 bpm or more on **Active Standing Test** (40bpm in 12-19year olds) or absolute HR>120
- Symptoms of unexplained orthostatic intolerance for >3 months
- Absence of orthostatic hypotension within 3 minutes

Differential diagnoses

- Cardiac disorders e.g. structural disorders such as mitral valve prolapse
- Arrhythmias
- Inappropriate Sinus Tachycardia
- Endocrine disorders e.g. Thyroid dysfunction, Addisons disease, phaeochromocytoma
- Vasovagal syncope
- Anaemia
- Eating disorders (although nausea is a symptom of POTS)
- Parkinson's Plus Syndromes (in older adults)

POTS Work Up

History

Examination

Investigations

POTS History of Presenting complaint

Common orthostatic intolerance symptoms

- Lightheadedness
- Palpitation ("heart racing")
- Tremulousness
- Atypical chest discomfort

Other commonly reported symptoms not necessarily associated with particular postures

- Sleep disturbances
- Headaches
- Chronic fatigue
- Chronic pain
- Exercise intolerance and deconditioning
- Perceived Cognitive impairment ("brain fog")
- Peripheral acrocyanosis ("POTS feet")
- Frequent nausea
- Mild diarrhea/constipation/bloating/unspecific abdominal pain ("irritable bowel syndrome")

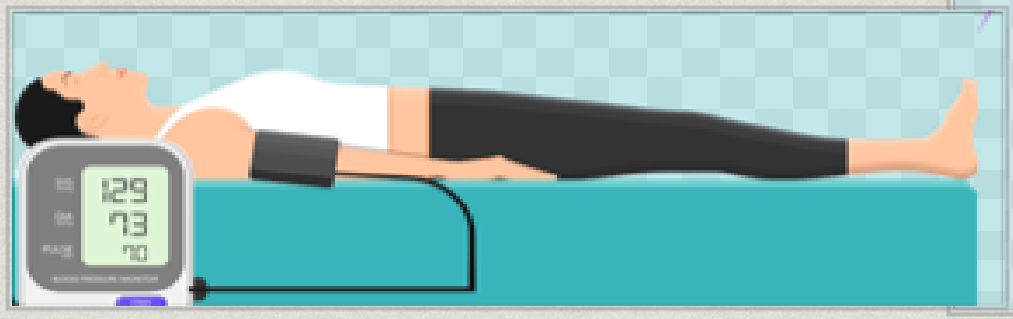
POTS Further History

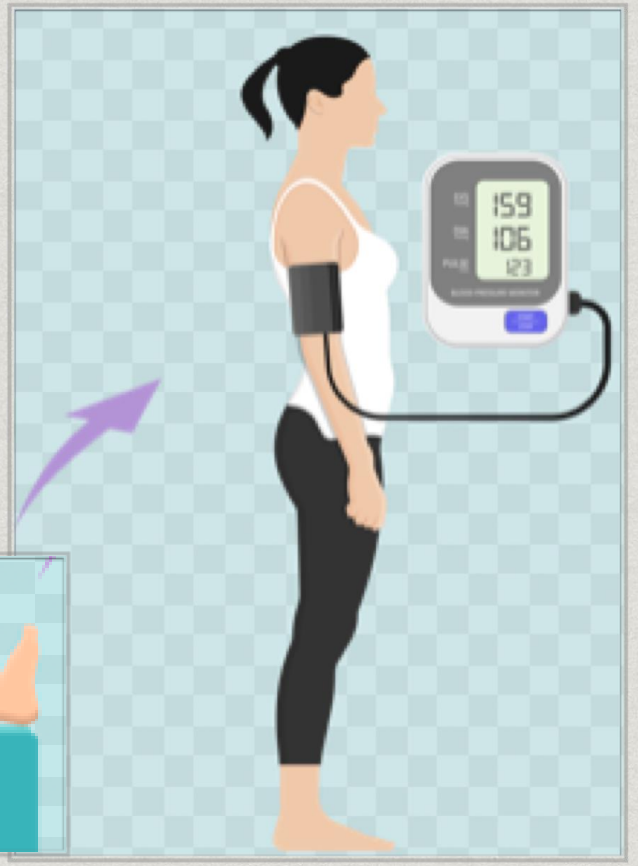
- Medications including OTC
- Diet, exercise and weight history
- Sexual history and contraception
- Screen for coexisting conditions such as migraines, hypermobility
- Mood (consider depression scores)
- Family History
  - Sudden cardiac death
  - Structural heart disease
  - Arrhythmias
  - Endocrine disorders

POTS Work Up: Examination

- Height, Weight & BMI
- Cardiorespiratory exam
- **Active standing test**
- GUT and Neurological examination as indicated by history

Active standing test:
HR and BP
Supine after 5 mins,
Then standing at 3, 5 & 10mins





Name: _____

DOB: _____

Date of Assessment: _____

10 Minute Standing Test	BP	HR
Lying (5-10 minutes full rest)		
Standing 1 minute		
Standing 2 minutes		
Standing 3 minutes		
Standing 4 minutes		
Standing 5 minutes		
Standing 6 minutes		
Standing 7 minutes		
Standing 8 minutes		
Standing 9 minutes		
Standing 10 minutes		
Delta Heart Rate (Max HR – Lying HR after 5 minutes)		

Is the delta Heart Rate >30 bpm or absolute HR >120 bpm *	Yes/No
Is there an absence of blood pressure drop >20/10 mmHg in first 3 minutes?	Yes/No
Have confounding conditions been treated (anaemia, dehydration, thyroid, malnutrition)?	Yes/No
Have the symptoms persisted for longer than 3 months?	Yes/No

If you answered yes to ALL of these questions, this patient most likely has POTS. Proceed to the following questions.

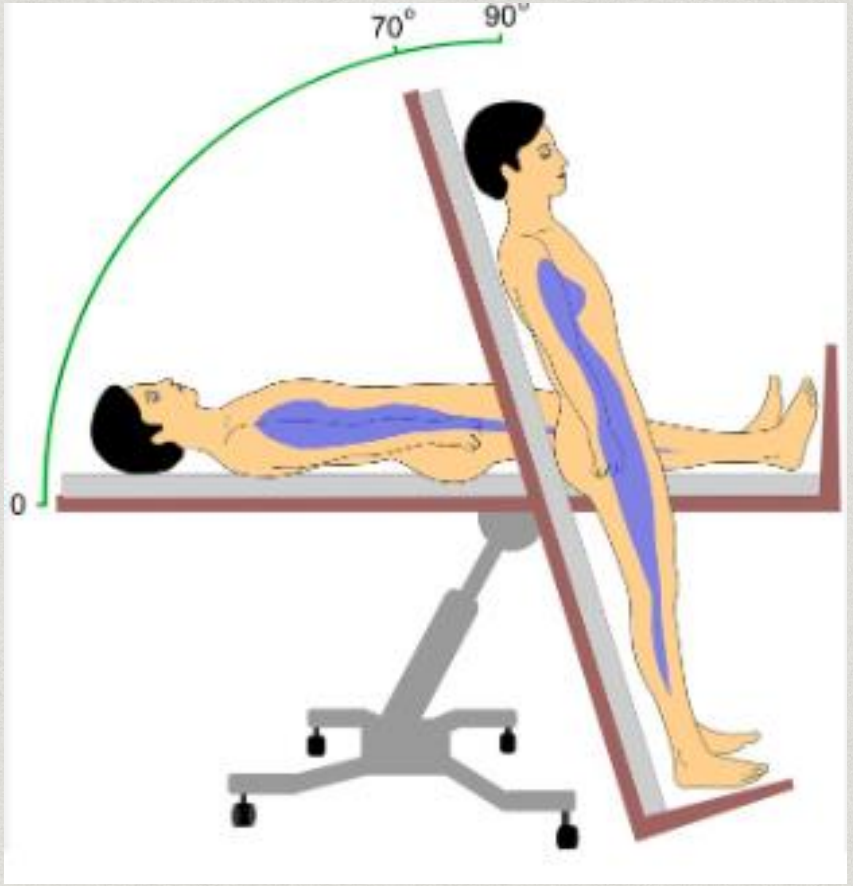
Does this patient have conditions contraindicated to salt and water loading?	Yes/No
Does this patient have frequent episodes of syncope?	Yes/No
Does this patient have significant functional decline such as work/education absenteeism?	Yes/No

If you answered yes to any of these questions, advise on lifestyle changes that are appropriate and refer for opinion from a POTS aware specialist. Consider implementation of a *Team Care Arrangement* and refer to a multidisciplinary POTS aware team for management. **

** While POTS is diagnosed when the delta HR is >30 bpm, the condition fluctuates and is diurnal in nature Consider repeat assessments or HR tracking through an app. if there is a high clinical suspicion of POTS.*

POTS Work Up: Investigations

"To tilt or not to tilt?"



POTS Work Up: Investigations

- Blood tests
  - FBC
  - Electrolytes, urea and LFT's
  - TFTs
  - Early morning cortisol
  - bHCG
  - Iron studies
- Other investigations:
  - 12 lead ECG
  - 24 hour Holter Monitor
  - Transthoracic Echocardiogram
  - Ambulatory BP monitoring*
- To consider:
  - MRI brain with contrast if significant postural headache
  - Plasma metanephrines, especially if patient is hypertensive

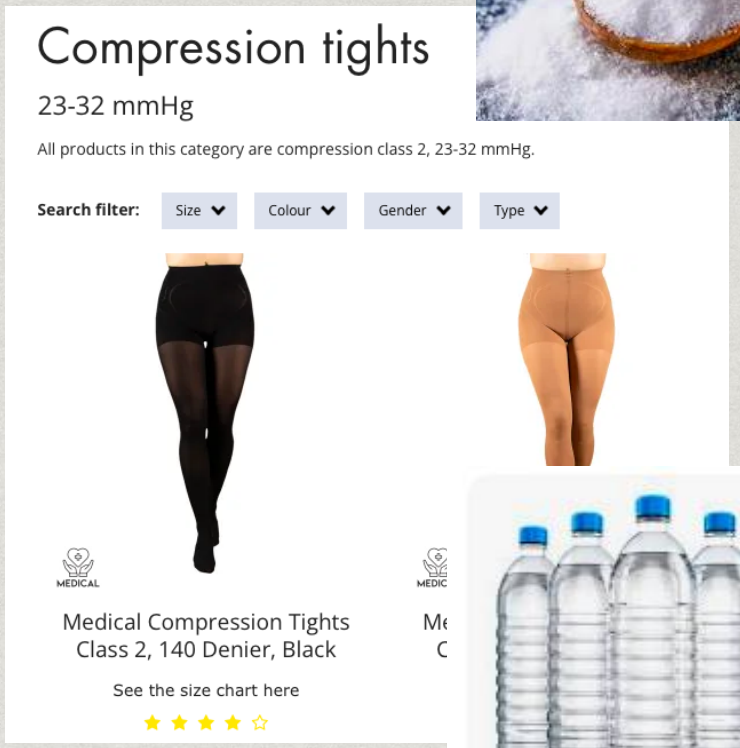
POTS Management

NON-PHARMACOLOGICAL & PHARMACOLOGICAL

POTS Management

NON-PHARMACOLOGICAL

- Volume expansion:
  - >3L fluid a day (not caffeine or alcohol)
  - Liberal salt diet (10g day)
- Medication cessation
  - SNRI, diuretics, caffeine, alcohol, antihypertensives
- Compression garments
  - https://compressionsockshop.com.au/



POTS Management

NON-PHARMACOLOGICAL

- Graded Exercise Program
  - Exercise physiologist
  - Start supine or swimming
- Self Education and Validation
  - POTS Foundation
  - https://potsfoundation.org.au/

POTS Management

PHARMACOLOGICAL

- No universally agreed upon 'first line' medication for POTS
- No TGA approved medications for POTS, all are "off label"
- General principals:
  - Start low and titrate to lowest effective dose
  - If no symptomatic benefit: discontinue
  - Often require more than one agent
  - Aim to manage symptoms so patients can 'do more' and address de-conditioning

"Medications manage symptoms"

POTS Management

PHARMACOLOGICAL

- **Beta Blockers**
- MOA: reduce heart rate through B1 receptors and inhibits renin
- Best studied class of drug for POTS
- Propranolol crosses BBB and has secondary favorable effects on migraine prevention
- Start low dose 10mg daily or twice daily,
- Other beta blockers can be used at low doses (Bisoprolol, metoprolol, atenolol)
- Can use in pregnancy (or swap to labetalol)

POTS Management

PHARMACOLOGICAL

- **Ivabradine**
- MOA: blocks I(f) channels, reducing HR without impacting BP
- More expensive than beta blockers ~$50 for 56 (~1 month)
- Not studied in pregnancy
- Limited quality data but anecdotally quite effective
- Start 2.5mg once or twice a day
- Can have visual disturbance but usually well tolerated

POTS Management

PHARMACOLOGICAL

- **Fludrocortisone**
- MOA: synthetic mineralocorticoid increases salt and water retention (at expense of potassium)
- Conflicting low quality data
- Start 50mcg daily and up titrate every 5-7 days. If not helping by about 150mcg suggest switching agents or adding another agent
- HTN and fluid retention common reasons for discontinuation. Hyperkalaemia is not usually an issue at doses <150mcg a day

POTS Management

PHARMACOLOGICAL

- **Midodrine (vasodrine)**
- MOA: selective alpha adrenergic agonist. Onset 15-20mins duration ~3.5hrs
- Limited data on adults, Anecdotally effective choice
- Very expensive ~$110 for 90 tablets (3-4 weeks worth)
- Well tolerated. SE: HTN & ‘Hairs stand on end’
- Start 2.5mg TDS or QID, increase doses every 3 days until desired effect up to 10mg doses. Discontinue if side effects or nil response
- Can be used PRN eg. before vacuuming or before exercise

POTS Management

PHARMACOLOGICAL

- **Pyridostigmine (Mestinon)**
- MOA: Inhibits acetylcholinesterase thus increasing parasympathetic tone. Onset ~20mins, duration ~4 hours
- Limited data some success anecdotally
- SE: diarrhoea, excess saliva (should only last 4 hours)
- Starting dose: 10mg at 7am, 11am, 3pm increase by 10mg every few days up to 30mg then can increase by 30mg up to ~90mg TDS
- Can be used PRN

POTS Medication Comparison

Medication	Mechanism of Action	Notes / Side Effects	Dosing for POTS	Max dose for effectiveness in POTS
Beta Blockers (e.g. metoprolol, propranolol, bisoprolol)	β1-blockade → ↓ HR, ↓ renin	Best evidence for low-dose propranolol; fatigue common	Propranolol: 10mg BD Uptitrate by 10mg every 3 days Bisoprolol: 2.5mg OD or BD Uptitrtte by 2.5mg every 3 days	Propranolol: 40mg daily or 20mg BD Bisoprolol: 10mg daily
Ivabradine	↓ HR without effect on BP	More expensive than beta-blockers. Can cause visual changes.	2.5mg OD or BD Uptitrtte by 2.5mg every 3 days	10mg BD
Fludrocortisone	↑ Na+/H2O retention → ↑ volume	Can cause HTN, hypokalemia Fluid retention	50mcg daily Uptitrate by 50mcg weekly	150mcg daily
Midodrine	α-agonist → ↑ venous return	Expensive. Onset 20mins, duration 3.5hours	2.5mg TDS/QID Uptitrtte by 2.5mg every 3 days	10mg QID
Pyridostigmine	↑ ACh → ↑ parasympathetic tone	Diarrhea abdominal pain common Onset 20mins, duration 4 hours	10mg TDS (7am, 11am, 3pm) Uptitrtte by 10mg every few days until 30mg then uptitrtte by 30mg every 3 days	90mg TDS

POTS Management: novel options

- Rescue therapy: IV normal saline 0.9%
- **Continuous OCP**
- Droxidopa: converts to noradrenaline (one retrospective small study suggests improved QOL)
- Clonidine and methyldopa: central sympatholytics (two small studies, limited results)
- IVIG: mixed results (case series only showed improvement in refractory cases, conflicting evidence and expert opinions)
- Very low dose naltrexone (<0.1mg). Limited data, conflicting expert opinions
- Cutaneous vagal nerve stimulation
- Hyperbaric oxygen

Take home messages

- General Practitioners should feel empowered to diagnose & manage POTS
- Tilt table testing is NOT a standard diagnostic too
- Delays in diagnosis and management may lead worse outcomes
- Graded Exercise Programs by an experienced Exercise Physiologist or Physiotherapist are helpful
- There is evidence to support medication use to control symptoms
- Specialist referrals should be sought if the diagnosis is unclear or initial management ineffective

Thank you!

Questions?

sarah.stevens1@uq.net.au

Postural Orthostatic Tachycardia Syndrome (POTS)

Background

About postural orthostatic tachycardia syndrome (POTS)

Assessment

1. Take a history. Ask about:
   - common presenting symptoms:
     - Orthostatic
     - Gastrointestinal
     - Thermoregulatory/secretory
     - Urinary
     - Neurological
     - Vasomotor
   - Symptoms suggesting an alternative cardiac cause e.g., chest pain
   - Impact on daily tasks (including home, school/work, lifestyle)
   - Possible triggering event
   - Duration and pattern of symptoms
   - Associated conditions
   - Family history of POTS, or family members with POTS-like symptoms or associated conditions.
2. Ask the patient to complete the Malmo POTS Survey (MAPS) (a score of ≥ 42 is suggestive of POTS).
3. Examine the patient:
   - Cardiac examination including auscultation for heart murmurs
   - Active standing test
4. Consider differential diagnoses. Be aware that these conditions may co-exist with POTS.
5. Arrange investigations (note that Tilt Table Testing should not be used routinely). Consider:
   - home monitoring – if patient does not meet criteria for POTS in the consulting room, ask the patient to record their lying and standing blood pressure and heart rate in the morning, as the autonomic dysfunction is often worse in the morning.
   - 24-hour ambulatory blood pressure monitor if blood pressure is labile or clinic readings are inconsistent.
   - cardiac investigations including ECG, Holter monitor and Echocardiogram.
   - bloods – FBC, electrolytes, urea, and creatinine, thyroid function test, iron studies
   - further investigations depending on presenting symptoms and examination findings.
6. Suspect a diagnosis of POTS if no known secondary cause of symptoms and:
   - a positive active standing test in younger patients, or
   - Malmo POTS Survey (MAPS) score of ≥ 42 – suggestive of POTS, even in the absence of a positive stand test.

Management

1. Provide education:
   - Explain that there is no cure for POTS but there are treatments that can relieve the symptoms.
   - First-line treatment is lifestyle modifications.
   - Give written information

Heart Failure

Dr Scott McKenzie
Senior Staff Specialist
Heart Failure & Transplant Unit, TPCH

phn BRISBANE NORTH
An Australian Government Initiative
Queensland Government
Metro North Health

Heart Failure:
Titration & Optimisation

Metro North GPLO Education

10/09/2025

Dr Scott McKenzie

My Disclosures

- Speakers' Honoraria: Amgen, Astra Zeneca, Bayer, BMS, Boehringer Ingelheim, Boston Scientific, CSL, Lilly, Medtronic, MSD, Novartis, Novo Nordisk, Pfizer, Viatris, Vifor
- Unrestricted Educational Grants: Boehringer Ingelheim
- Investigator: Amgen, Astra-Zeneca, Bayer, Bristol Myers Squibb, Boston Scientific, Corvia, Cytokinetics, Genzyme, Medtronic, MSD, Novartis, Novo Nordisk, Pfizer
- Travel Support: Bayer, Boehringer Ingelheim, MSD, Pfizer, Servier, St Jude Medical,
- Advisory Board: Abbott, Astra Zeneca, Lilly / Boehringer Ingelheim, Medtronic, Novartis, Novo Nordisk

Subtyping Heart Failure:

Table 3 Heart failure diagnostic criteria.

Heart failure diagnostic criteria	
HFrEF	**HFpEF**
• Symptoms ± signs of heart failure **and** • LVEF <50%[a]	• 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)

Atherton J *et al. (Heart Failure Guidelines 2018) Heart Lung Circ* 2018;27:1123–8.

Mr ARB Presents to you 5 days after discharge:

- Background History:
  - Ischaemic Heart Disease
    - MI 1982
    - Chronic occluded LAD
  - Type II Diabetes Mellitus
  - Dyslipidaemia
  - Asthma

- Background Medications:
  - Aspirin 100 mg daily
  - Ramipril 5 mg nocte
  - Metformin XR 1000 mg daily
  - Magnesium 500 mg bd
  - Atenolol 25 mg daily
  - Ezetimibe 10 mg daily
  - Rosuvastatin 20 mg daily
  - Esomeprazole 20 mg daily

Queensland Health

Discharge Summary

Address : [redacted]

Date of Birth : 25-Jul-1954 (70 years)
Sex : Male
Phone 1 : (0409) [redacted]
Phone 2 : (0409) [redacted]

Facility
Prince Charles (The) Hospital
Rode Road, CHERMSIDE 4032
Phone : (07) 3139 4000
Fax : (07) 3139 4908

Summary Author
[redacted]

Episode Details
Consultant : DR [redacted]
Registrar :
Facility Unit :
Admission Source : Transferred from another hospital
Admission Date : 10-Apr-2025 18:30

Discharge Details
Reason :
Status : Home/usual residence
Phone :
Address :
Discharge Date : 16-Apr-2025 15:35

Reason for Admission/Presenting Problems
Admitted for decompensated heart failure during recent admission at RBWH following R) MCA stroke

Principal Diagnosis

Diagnosis	Comments
Decompensated Heart Failure	

Secondary Diagnosis

Date	Problem	Comments
	Rhinovirus	

Previous Medical History

Date	Problem	Comments
	HFrEF - secondary to Ischaemic cardiomyopathy	

Principal Diagnosis

Diagnosis	Comments
Decompensated Heart Failure	

Secondary Diagnosis

Date	Problem	Comments
	Rhinovirus	

Previous Medical History

Date	Problem	Comments
	HFrEF - secondary to Ischaemic cardiomyopathy - single vessel coronary artery disease (angiogram 2012) - TTE Oct '21: LVEF 16%, normal RV size/fx, 2/4 MR, RVSP 33 mmHg	
	T2DM - HbA1c 6.2% (7/2/22)	
	Hypertension	
	Asthma	

Alerts
Nil Entered

Follow Up Arrangements
Nil Entered

Recommendations to GP
No specific follow-up with GP is necessary

Recommendations to Patient
Nil Entered

Care Plan Summary
SPEECH PATHOLOGY

Mr [redacted] was seen by the speech pathology team during his admission at TPCH following his R) MCA stroke. He was initially assessed at RBWH following the stroke protocol.

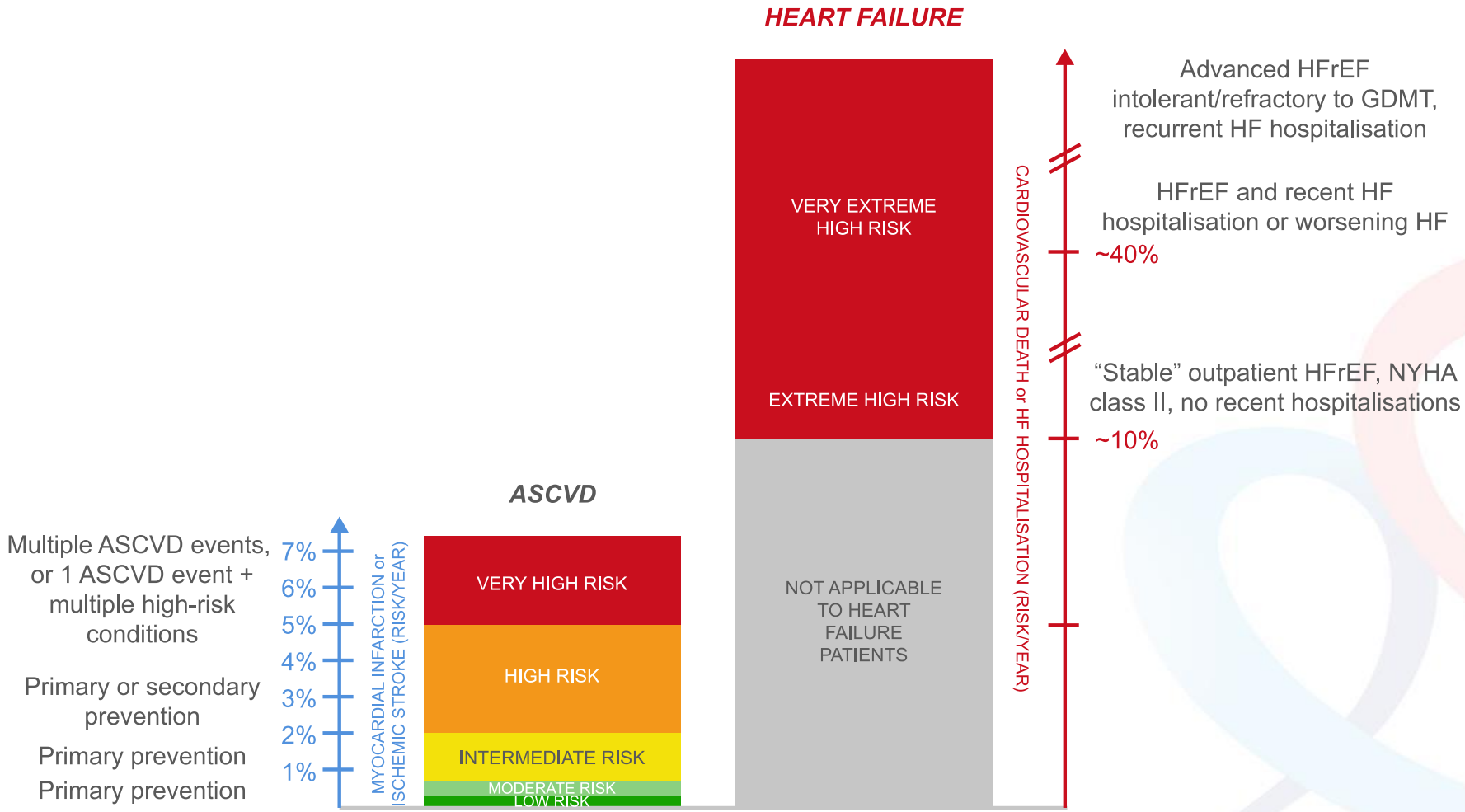
Mr ARB:
Discharge Medications:

- Aspirin 100 mg daily
- Ramipril 10 mg daily
- Metformin XR 1000 mg daily
- Magnesium 500 mg bd
- Bisoprolol 2.5 mg daily
- Ezetimibe 10 mg daily
- Rosuvastatin 20 mg daily
- Furosemide 80 mg mane & midday

How does his risk of death or rehospitalisation now compare to his risk of rehospitalisation / death after his MI?

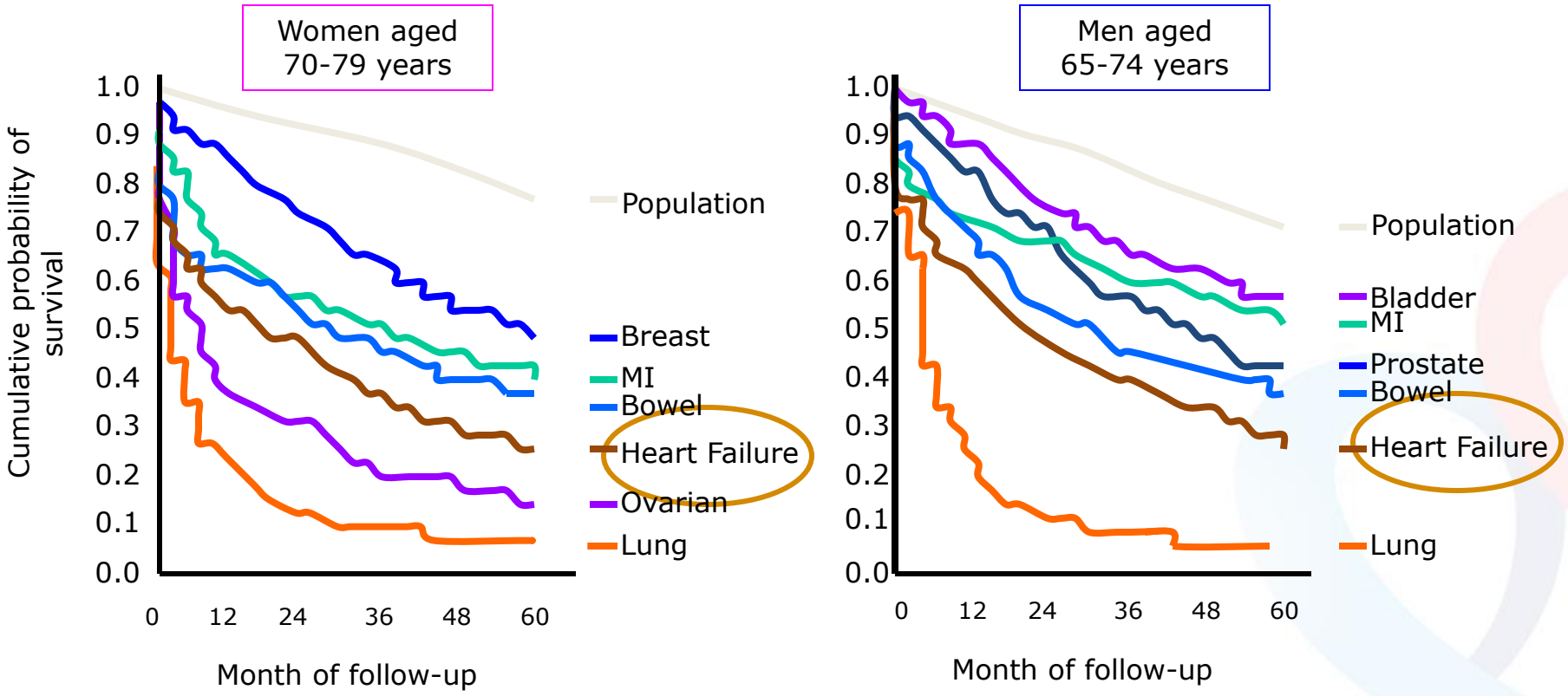
a) Much higher
b) Slightly higher
c) About the same
d) Slightly lower
e) Much lower

Mortality / Hospitalisation Risk & Heart Failure:



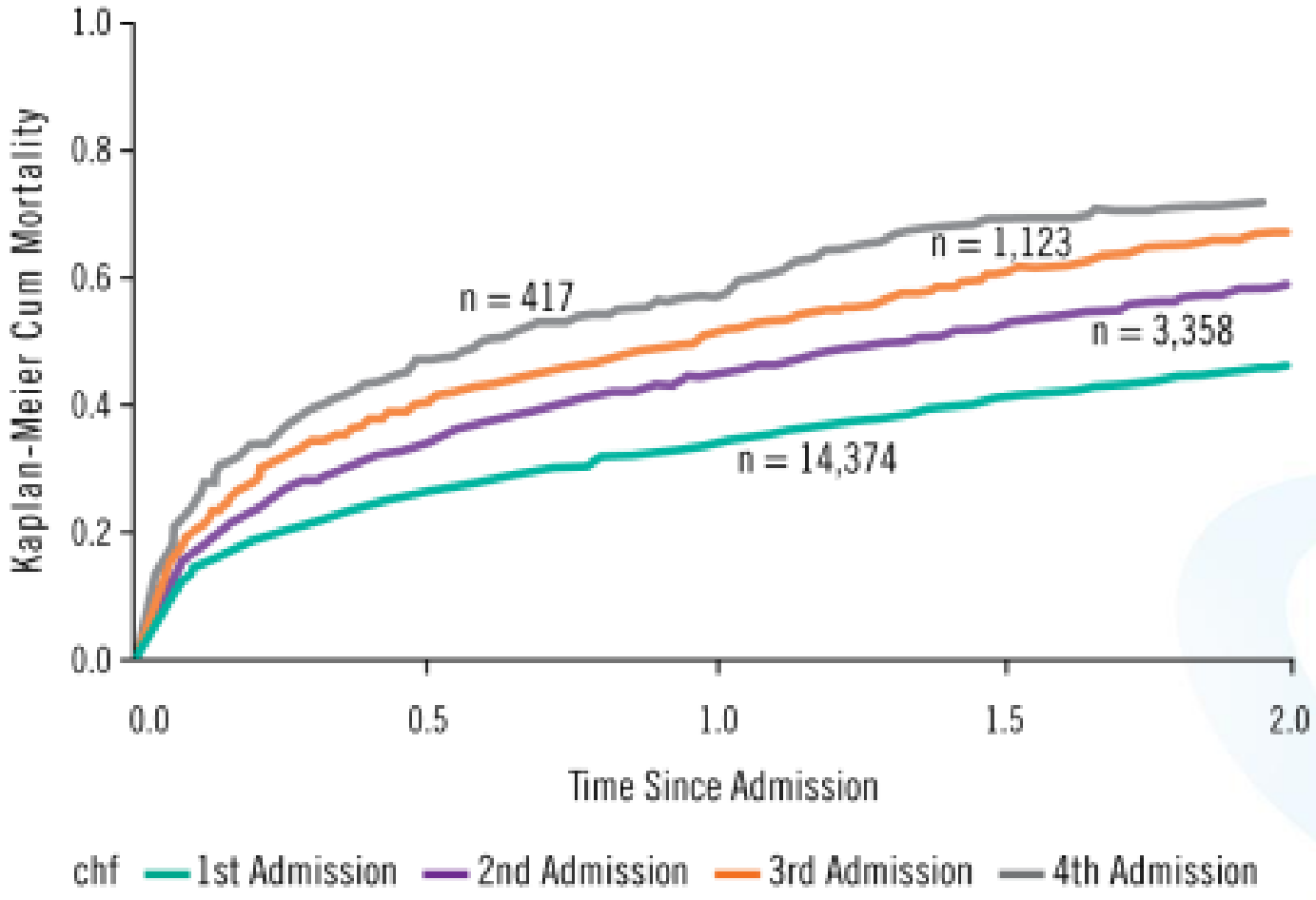
Greene et al. JAMA 2021, 326: 2261-2

Well doc, at least it's not cancer:



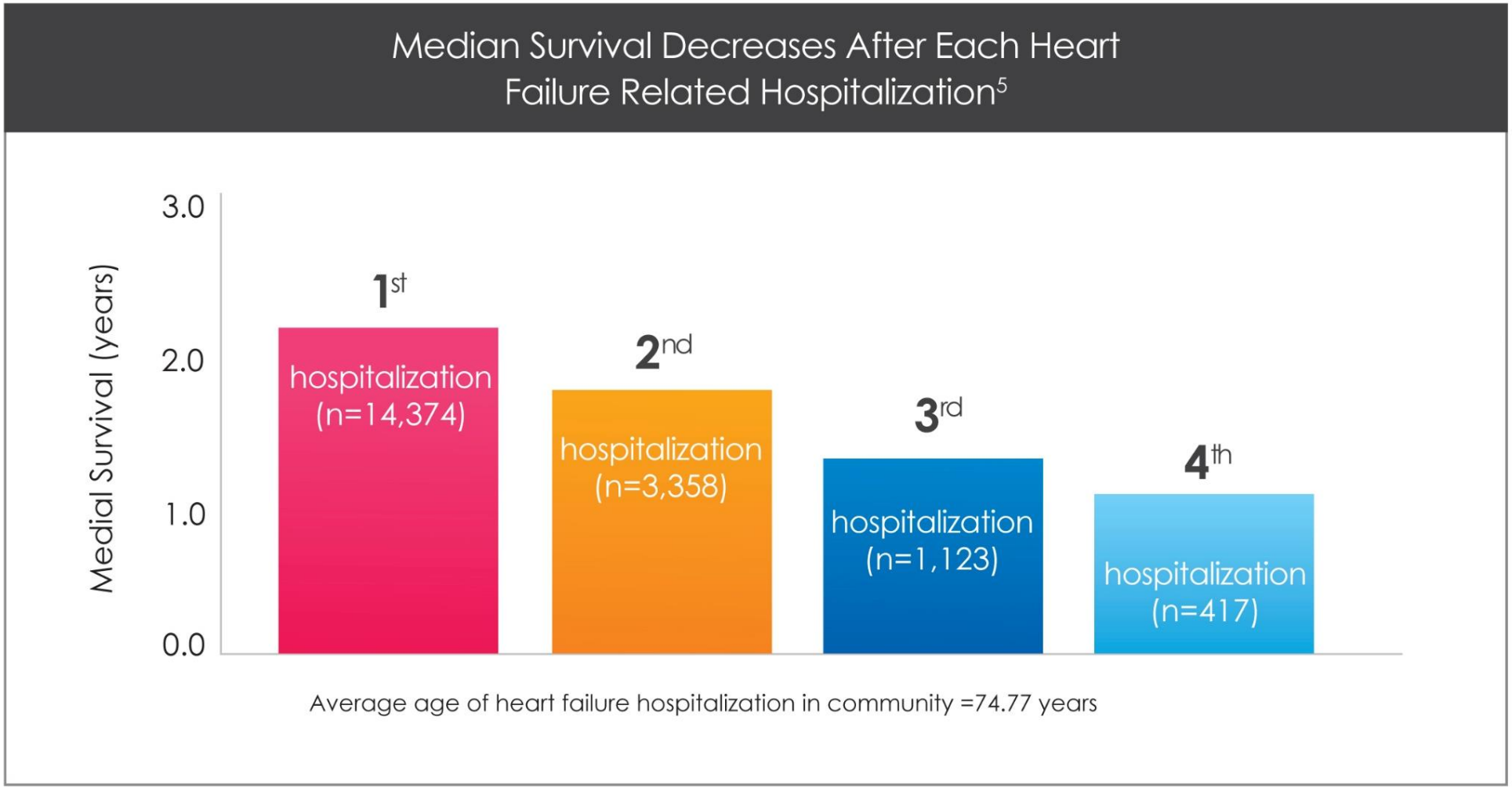
Adapted from Stewart S et al. *Eur J of Heart Failure* 2001, 3(3):pp.315-322

More Hospital Stays = Worse Prognosis



Setoguchi et al. Am Heart J 2007

Hospitalization

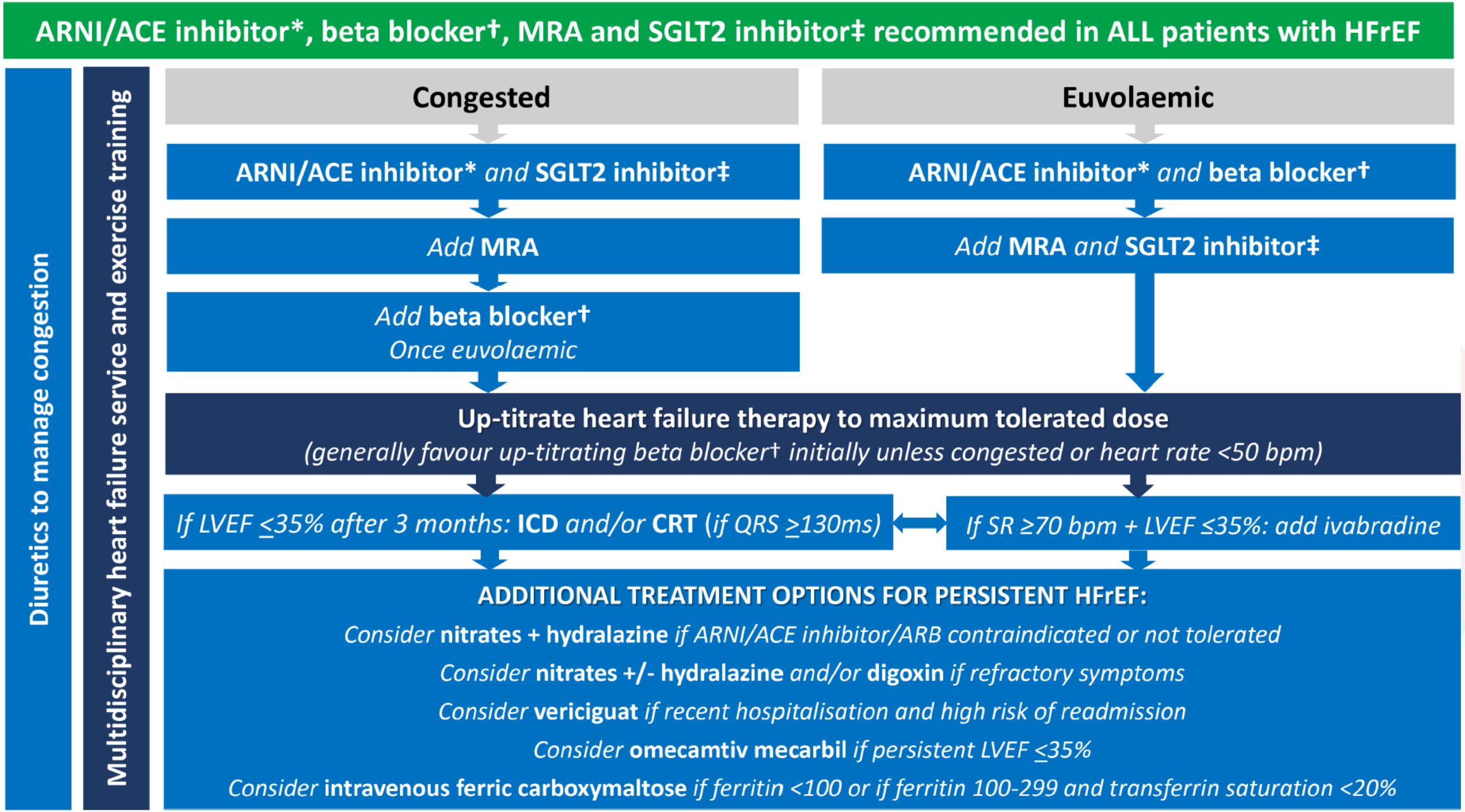


Miller L, Guglin M.; J Am Coll Cardiol. 2013;61:1209-21.

Back to Mr ARB (5 days after discharge):

- Updated History:
  - Ischaemic HFREF
    - MI 1982
    - Chronic occluded LAD
    - EF: 23%
  - Type II Diabetes Mellitus
  - Dyslipidaemia
  - Asthma

- Updated Medications:
  - Aspirin 100 mg daily
  - Ramipril 10 mg daily
  - Metformin XR 1000 mg daily
  - Magnesium 500 mg bd
  - Bisoprolol 2.5 mg daily
  - Ezetimibe 10 mg daily
  - Rosuvastatin 20 mg daily
  - Furosemide 80 mg mane & midday

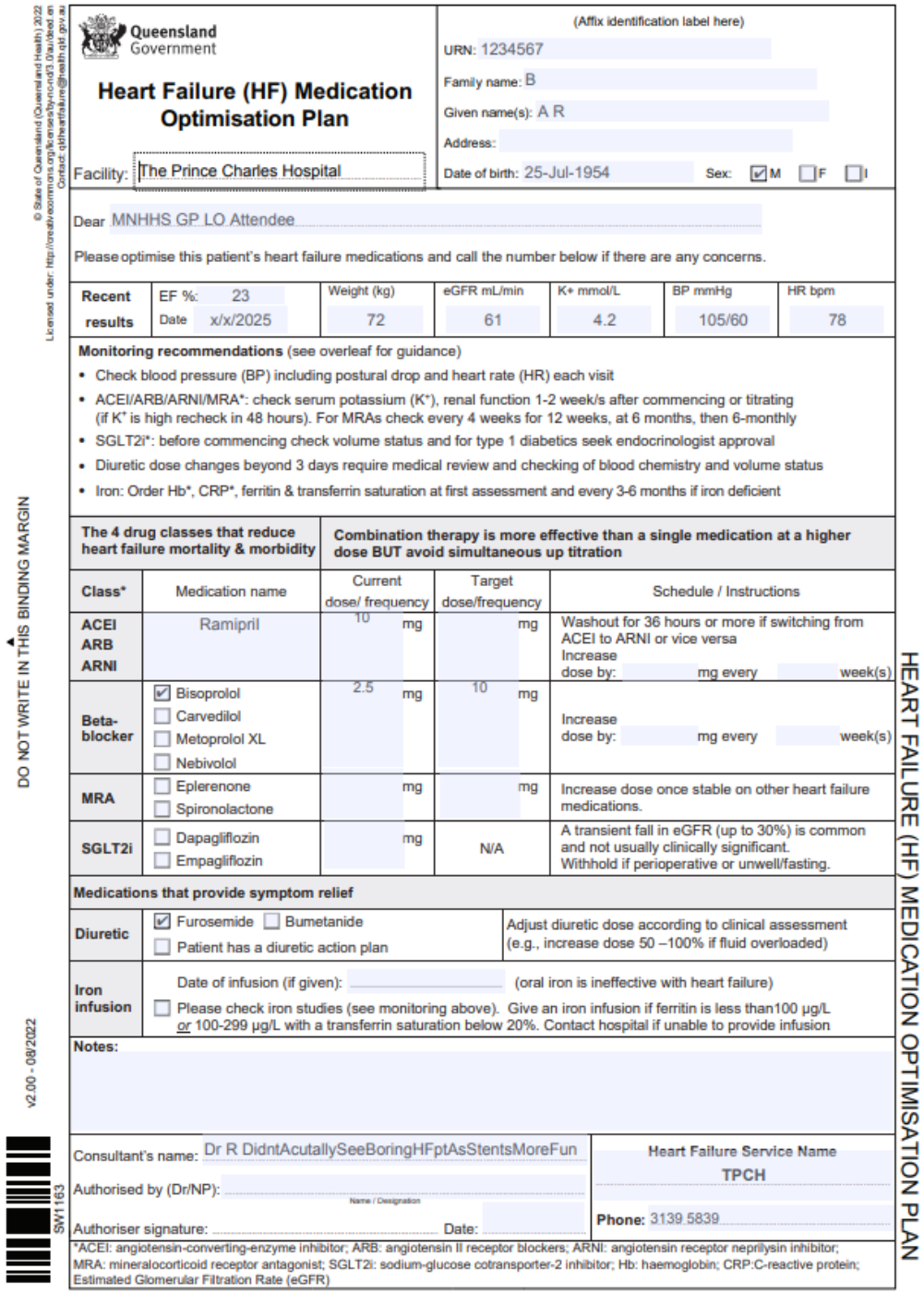


Consensus Statement on Pharmacological Management of Heart Failure 2022 MJA 2(4) • 15 August 2022

So, what do you do next with Mr ARB?

- First ask if he has one of these:

(They have to be handed to patient)



Queensland Government

Heart Failure (HF) Medication Optimisation Plan

Facility: The Prince Charles Hospital

(Affix identification label here)

URN: 1234567
Family name: B
Given name(s): A R
Address:
Date of birth: 25-Jul-1954 Sex: ☑ M ☐ F ☐ I

Dear MNHHS GP LO Attendee

Please optimise this patient's heart failure medications and call the number below if there are any concerns.

Recent results	EF %: 23 Date x/x/2025	Weight (kg)	eGFR mL/min	K+ mmol/L	BP mmHg	HR bpm
		72	61	4.2	105/60	78

Monitoring recommendations (see overleaf for guidance)

- Check blood pressure (BP) including postural drop and heart rate (HR) each visit
- ACEI/ARB/ARNI/MRA*: check serum potassium (K^+), renal function 1-2 week/s after commencing or titrating (if K^+ is high recheck in 48 hours). For MRAs check every 4 weeks for 12 weeks, at 6 months, then 6-monthly
- SGLT2i*: before commencing check volume status and for type 1 diabetics seek endocrinologist approval
- Diuretic dose changes beyond 3 days require medical review and checking of blood chemistry and volume status
- Iron: Order Hb*, CRP*, ferritin & transferrin saturation at first assessment and every 3-6 months if iron deficient

The 4 drug classes that reduce heart failure mortality & morbidity		Combination therapy is more effective than a single medication at a higher dose BUT avoid simultaneous up titration		
Class*	Medication name	Current dose/ frequency	Target dose/frequency	Schedule / Instructions
ACEI ARB ARNI	Ramipril	10 mg	mg	Washout for 36 hours or more if switching from ACEI to ARNI or vice versa Increase dose by: mg every week(s)
Beta-blocker	☑ Bisoprolol ☐ Carvedilol ☐ Metoprolol XL ☐ Nebivolol	2.5 mg	10 mg	Increase dose by: mg every week(s)
MRA	☐ Eplerenone ☐ Spironolactone	mg	mg	Increase dose once stable on other heart failure medications.
SGLT2i	☐ Dapagliflozin ☐ Empagliflozin	mg	N/A	A transient fall in eGFR (up to 30%) is common and not usually clinically significant. Withhold if perioperative or unwell/fasting.

Medications that provide symptom relief

Diuretic	☑ Furosemide ☐ Bumetanide ☐ Patient has a diuretic action plan	Adjust diuretic dose according to clinical assessment (e.g., increase dose 50 –100% if fluid overloaded)
Iron infusion	Date of infusion (if given): (oral iron is ineffective with heart failure) ☐ Please check iron studies (see monitoring above). Give an iron infusion if ferritin is less than100 µg/L or 100-299 µg/L with a transferrin saturation below 20%. Contact hospital if unable to provide infusion	

Notes:

Consultant's name: Dr R DidntAcutallySeeBoringHFptAsStentsMoreFun

Authorised by (Dr/NP): Name / Designation

Authoriser signature: Date:

Heart Failure Service Name: TPCH

Phone: 3139 5839

*ACEI: angiotensin-converting-enzyme inhibitor; ARB: angiotensin II receptor blockers; ARNI: angiotensin receptor neprilysin inhibitor; MRA: mineralocorticoid receptor antagonist; SGLT2i: sodium-glucose cotransporter-2 inhibitor; Hb: haemoglobin; CRP:C-reactive protein; Estimated Glomerular Filtration Rate (eGFR)

DO NOT WRITE IN THIS BINDING MARGIN

HEART FAILURE (HF) MEDICATION OPTIMISATION PLAN

v2.00 - 08/2022

SW1163

Heart Failure Medication Optimisation Plan

- If the patient didn't get one but you want to see the advice:

- https://www.health.qld.gov.au/__data/assets/pdf_file/0018/428121/Medn_Titration.pdf

- Or use Google

- Or:

Back to important things on Mr ARB's:

Address:

Facility: The Prince Charles Hospital

Date of birth: 25-Jul-1954 Sex: ☑ M ☐ F ☐ I

Dear MNHHS GP LO Attendee

Please optimise this patient's heart failure medications and call the number below if there are any concerns.

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- Diuretic dose changes beyond 3 days require medical review and checking of blood chemistry and volume status
- Iron: Order Hb*, CRP*, ferritin & transferrin saturation at first assessment and every 3-6 months if iron deficient

You talk to Mr ARB:

- His breathlessness is the same as when he left hospital and much better than when he arrived

- He’s had no dizziness

You talk to Mr ARB:

- His breathlessness is the same as when he left
- He’s had no dizziness
- Does that mean he’s asymptomatic?

Is this asymptomatic?
(extract from real letter from hospital RMO)

Thank you for seeing Mrs M [redacted] S [redacted] who has been suffering ankle swelling and occasionally feelings short of breath on exertion.

I have commenced her on oral frusemide, and she is currently asymptomatic with an exercise tolerance of 100 m.

I request that you assess her for possible heart failure and enclose her latest echo result.

Yours sincerely

You talk to Mr ARB:

- His breathlessness is the same as when he left
- He's had no dizziness
- He can walk around the supermarket slowly leaning on a trolley and might stop to catch his breath once (NYHA Class IIIa)

You check Mr ARB's observations:

- HR: 78
- BP: 101/62 mmHg

- On your scales he weighs 73 kg

Please optimise this patient's heart failure medications and call the number below if there are any concerns.

Recent results	EF %: 23 Date x/x/2025	Weight (kg) 72	eGFR mL/min 61	K+ mmol/L 4.2	BP mmHg 105/60	HR bpm 78

Monitoring recommendations (see overleaf for guidance)

- Check blood pressure (BP) including postural drop and heart rate (HR) each visit
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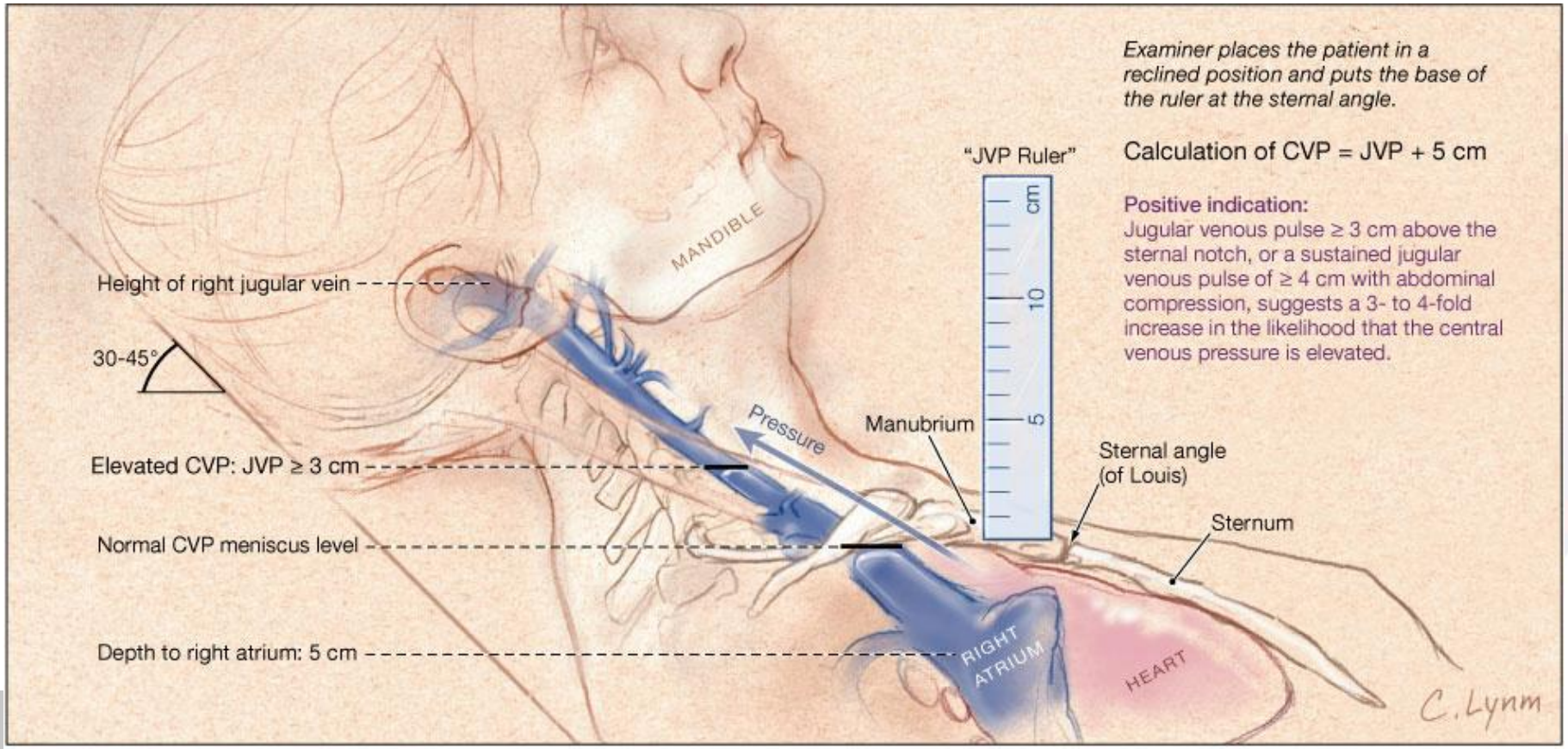
- Diuretic dose changes beyond 3 days require medical review and checking of blood chemistry and volume status
- Iron: Order Hb*, CRP*, ferritin & transferrin saturation at first assessment and every 3-6 months if iron deficient

Don’t forget to assess his JVP (at least on the first visit after hospital)

- Consider: is JVP too high to see top?
  - Sit them up to 90º
- Is JVP too low to see?
  - Lie them flatter



Source: Simel DL, Rennie D: *The Rational Clinical Examination: Evidence-Based Clinical Diagnosis:* http://www.jamaevidence.com

You check Mr ARB's observations:

- HR: 78
- BP: 101/62 mmHg

- On your scales he weighs 73 kg
- His JVP is just above his clavicle when lying at 45 degrees

Please optimise this patient's heart failure medications and call the number below if there are any concerns.

Recent results	EF %: 23 Date x/x/2025	Weight (kg) 72	eGFR mL/min 61	K+ mmol/L 4.2	BP mmHg 105/60	HR bpm 78

Monitoring recommendations (see overleaf for guidance)

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- Iron: Order Hb*, CRP*, ferritin & transferrin saturation at first assessment and every 3-6 months if iron deficient

So, what do you do with him?

a) That EF is very low and his symptoms haven't changed so I'll issue repeat scripts and let the hospital up titrate
b) His BP and heart rate are okay so I should try increasing something (it could be months before hospital review)
c) His BP is too low so I'll make no changes but bring him back in a week
d) I probably should do something so I'll call the heart failure support pharmacist for advice

Keep this in the back of your mind too: STRONG-HF Study

- Titration at high intensity up titration vs usual care
- High Intensity = Aim to achieve 100% of target doses of all medications by 2
- Plus 4 visits over the next 2 months

A Mebazaa et al: Lancet 2022; 400: 1938–52

STRONG-HF Study:
These were carefully selected patients:

Primary cause of heart failure			
Ischaemic	260/541 (48%)	254/534 (48%)	514/1075 (48%)
Non-ischaemic	281/541 (52%)	280/534 (52%)	561/1075 (52%)
LVEF category at baseline			
≤40%	365 (67%)	366 (68%)	731 (68%)
>40%	177 (33%)	170 (32%)	347 (32%)
<50%	452/540 (84%)	460/535 (86%)	912/1075 (85%)
≥50%	88/540 (16%)	75/535 (14%)	163/1075 (15%)
LVEF at baseline, %‡	36·7 (12·57)	35·9 (12·47)	36·3 (12·52)
Hospitalised for heart failure in the past year	140 (26%)	133 (25%)	273 (25%)
Number of heart failure	0·3 (0·68)	0·4 (1·42)	0·3 (1·11)

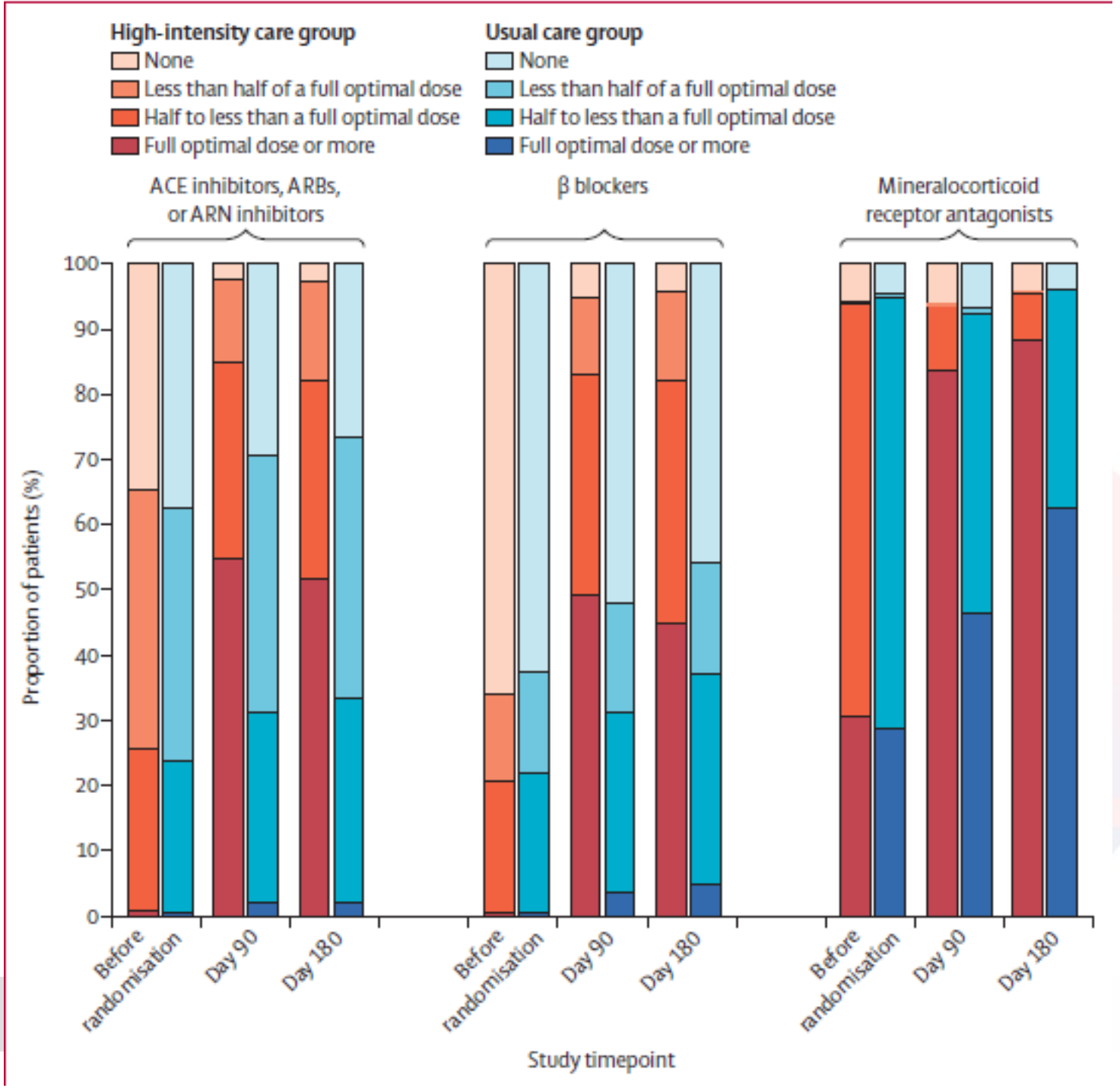
A Mebazaa et al: Lancet 2022; 400: 1938–52

STRONG-HF Study:
These were carefully selected patients:

Oral heart failure medications taken before randomisation			
ACE inhibitors	208/540 (38%)	211/534 (39%)	419/1074 (39%)
ARBs	104/540 (19%)	76/534 (14%)	180/1074 (17%)
ARN inhibitors	42/540 (8%)	48/534 (9%)	90/1074 (8%)
β blockers	184/540 (34%)	200/534 (37%)	384/1074 (36%)
Mineralocorticoid receptor antagonists	509/540 (94%)	510/534 (96%)	1019/1074 (95%)
Loop diuretic	520/540 (96%)	509/534 (95%)	1029/1074 (96%)

A Mebazaa et al: Lancet 2022; 400: 1938–52

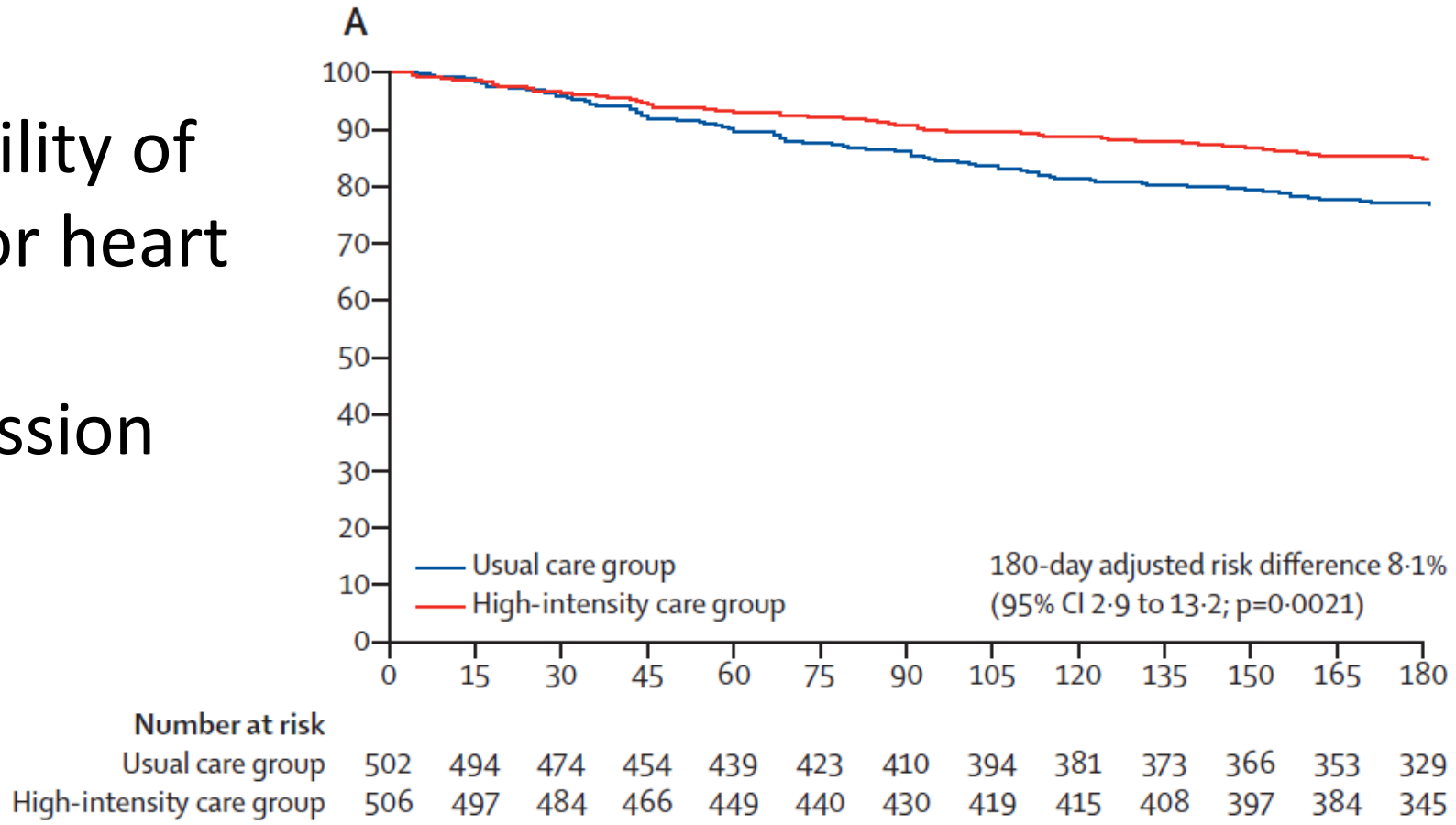
STRONG-HF Study: And they didn't always achieve the goal:



A Mebazaa et al: Lancet 2022; 400: 1938–52

STRONG-HF Study:
It suggests benefits from optimising quickly

Probability of death or heart failure readmission



A Mebazaa et al: Lancet 2022; 400: 1938–52

So, what do you do with him?

a) That EF is very low and his symptoms haven't changed so I'll issue repeat scripts and let the hospital up titrate
b) His BP and heart rate are okay so I should try increasing something (it could be months before hospital review)
c) His BP is too low, so I'll make no changes but bring him back in a week
d) I probably should do something, so I'll call the heart failure support pharmacist for advice

Mr ARB:
What I would do:

- HF only Medications:
  - Ramipril 10 mg daily
  - Bisoprolol 2.5 mg daily
  - Furosemide 80 mg mane & midday

- New HF only Medications:
  - Ramipril 10 mg daily
  - Bisoprolol 2.5 mg daily
  - Furosemide 80 mg mane only
  - Empagliflozin / Dapagliflozin 10 mg

- See him in a week or two to reassess volume status

Mr ARB comes back in 2 weeks

- He complains of being dizzy for the last few days
- He's walking around his block (really slowly)

- His BP 85/54 mmHg, HR 84

Mr ARB, dizzy. What do you do?

a) Cut that Ramipril back to 5 mg
b) Cut that Bisoprolol back to 1.25 mg
c) Withhold Bisoprolol & Ramipril and review next week
d) Assess his fluid status

Mr ARB, dizzy. What do you do?

a) Cut that Ramipril back to 5 mg
b) Cut that Bisoprolol back to 1.25 mg
c) Withhold Bisoprolol & Ramipril and review next week
d) Assess his fluid status

Mr ARB, dizzy & hypotensive

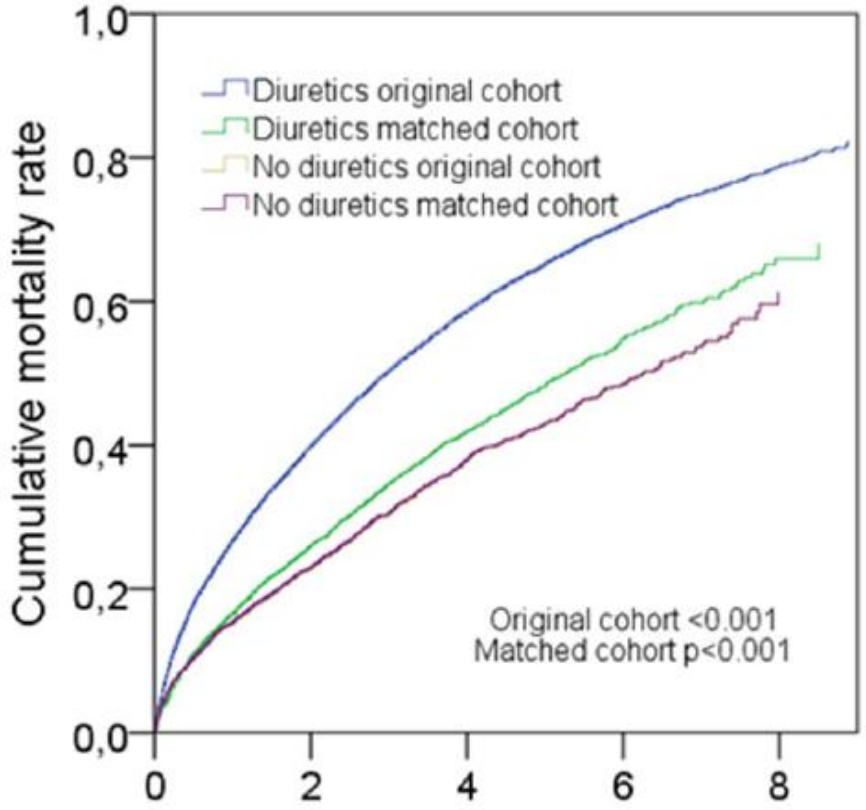
- His weight is 69 kg
- You can’t see his JVP until you lie him nearly flat

- He’s dehydrated

- You stop his Furosemide (enough?)

& ask him to come back in a week

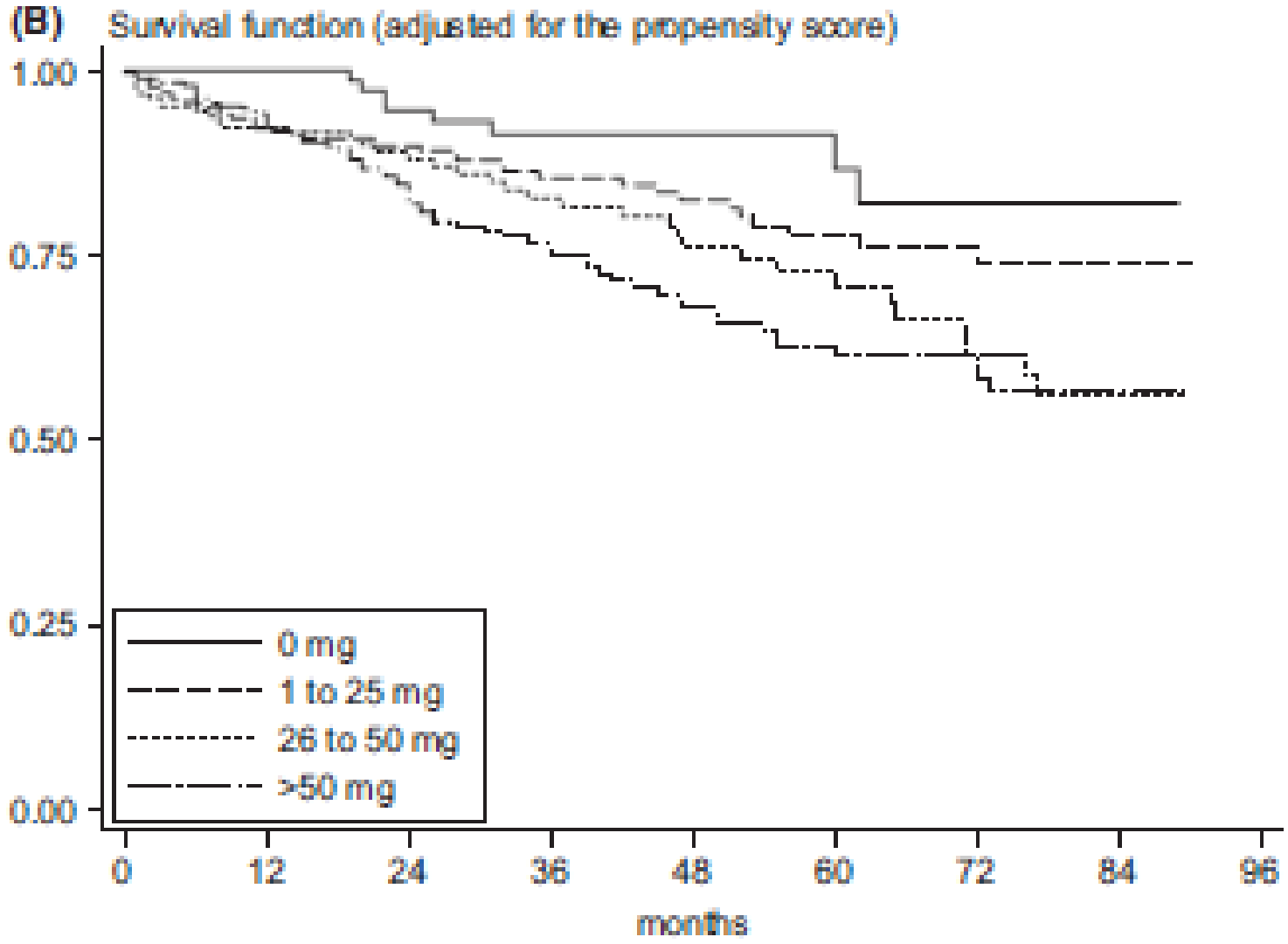
The need for loop diuretics is a bad sign



Numbers at risk					
Diuretics original cohort	22,881	11,720	5,209	1,497	232
No diuretics original cohort	3,337	2,206	1,066	289	
Diuretics matched cohort	3,282	2,059	970	297	
No diuretics matched cohort	3,282	2,185	1,064	289	

P. Parén et al. / International Journal of Cardiology 257 (2018) 118–124

Higher doses of diuretics are a worse sign

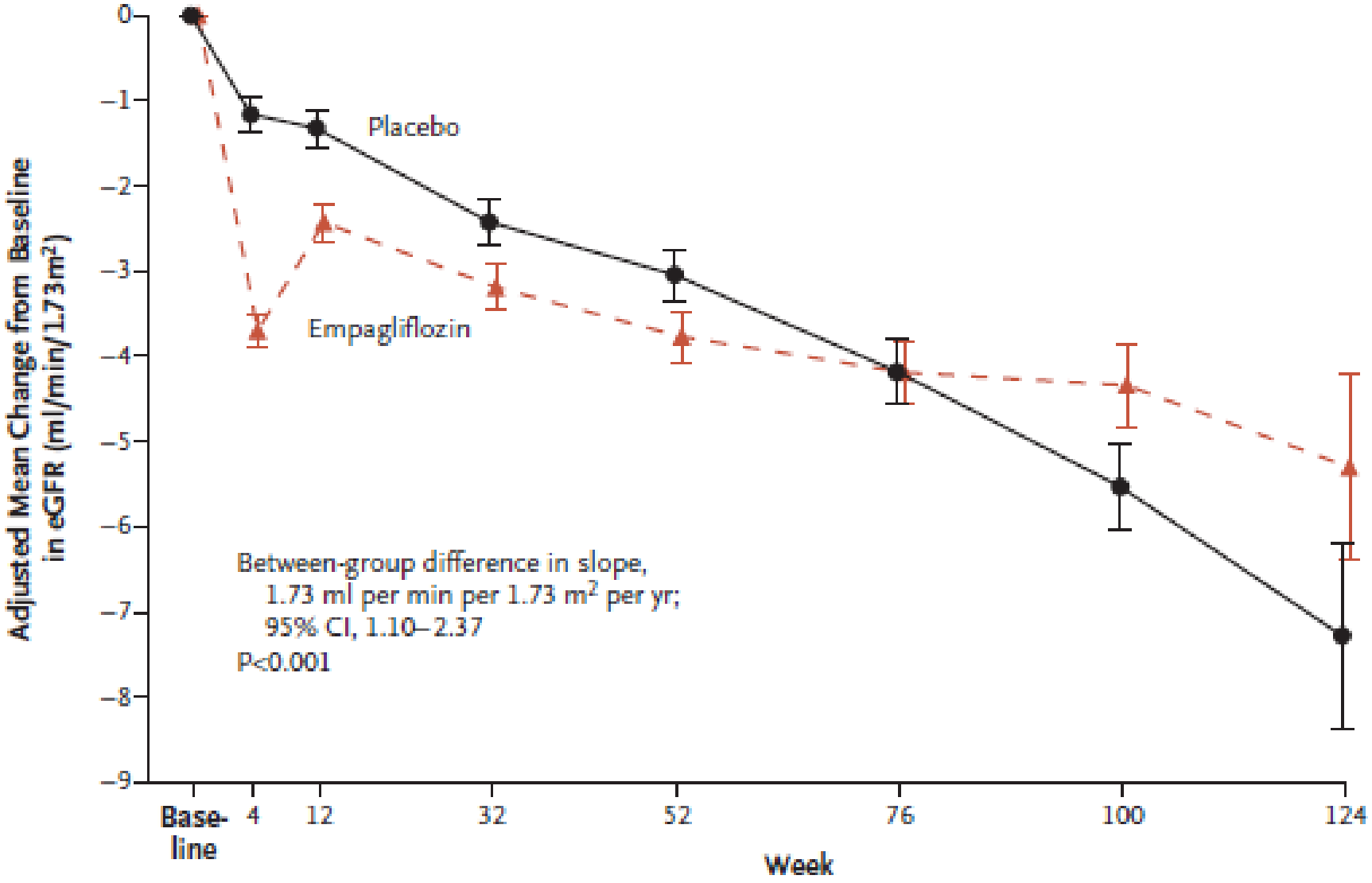


Dini FL et al Int J Clin Pract 2013;67:656–664

Mr ARB is dehydrated.

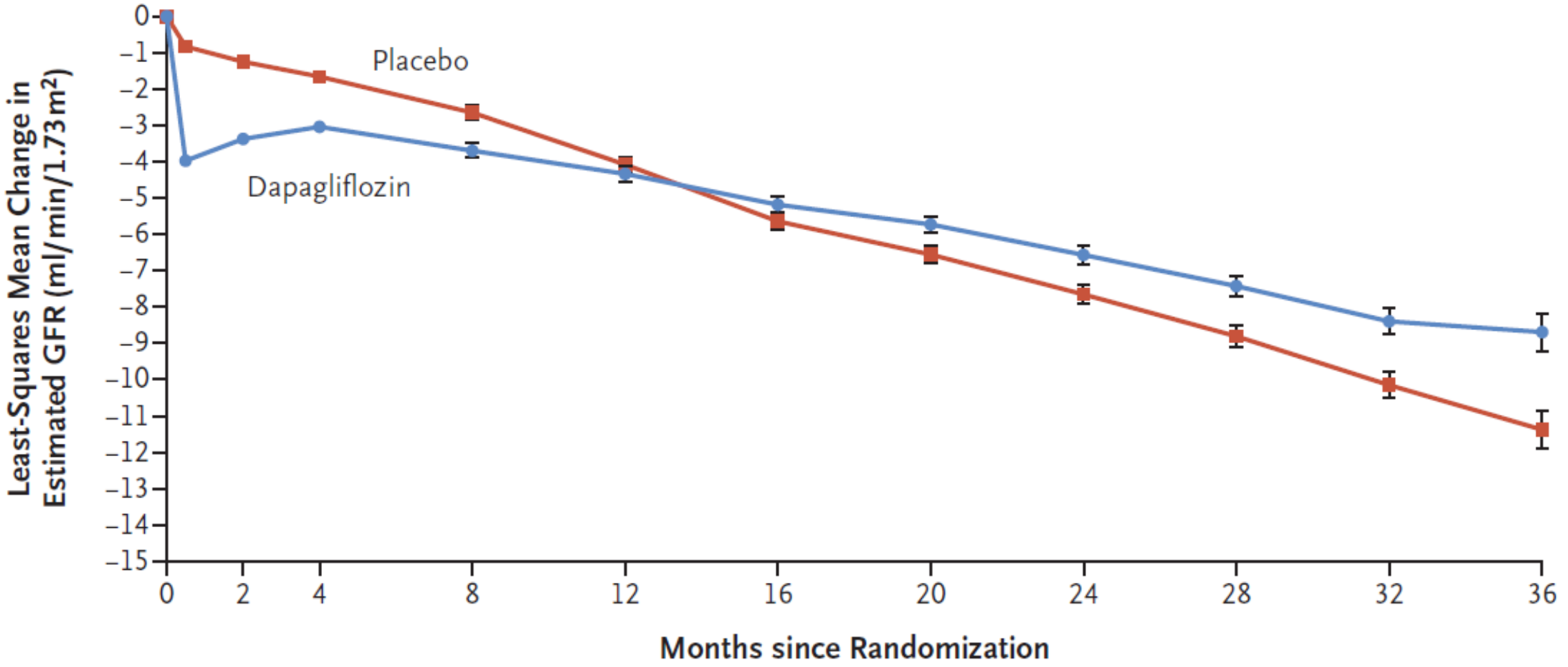
- Should you check his renal function?

Don’t check renal function now:



M Packer et al: EMPEROR-Reduced N Engl J Med 2020;383:1413-24

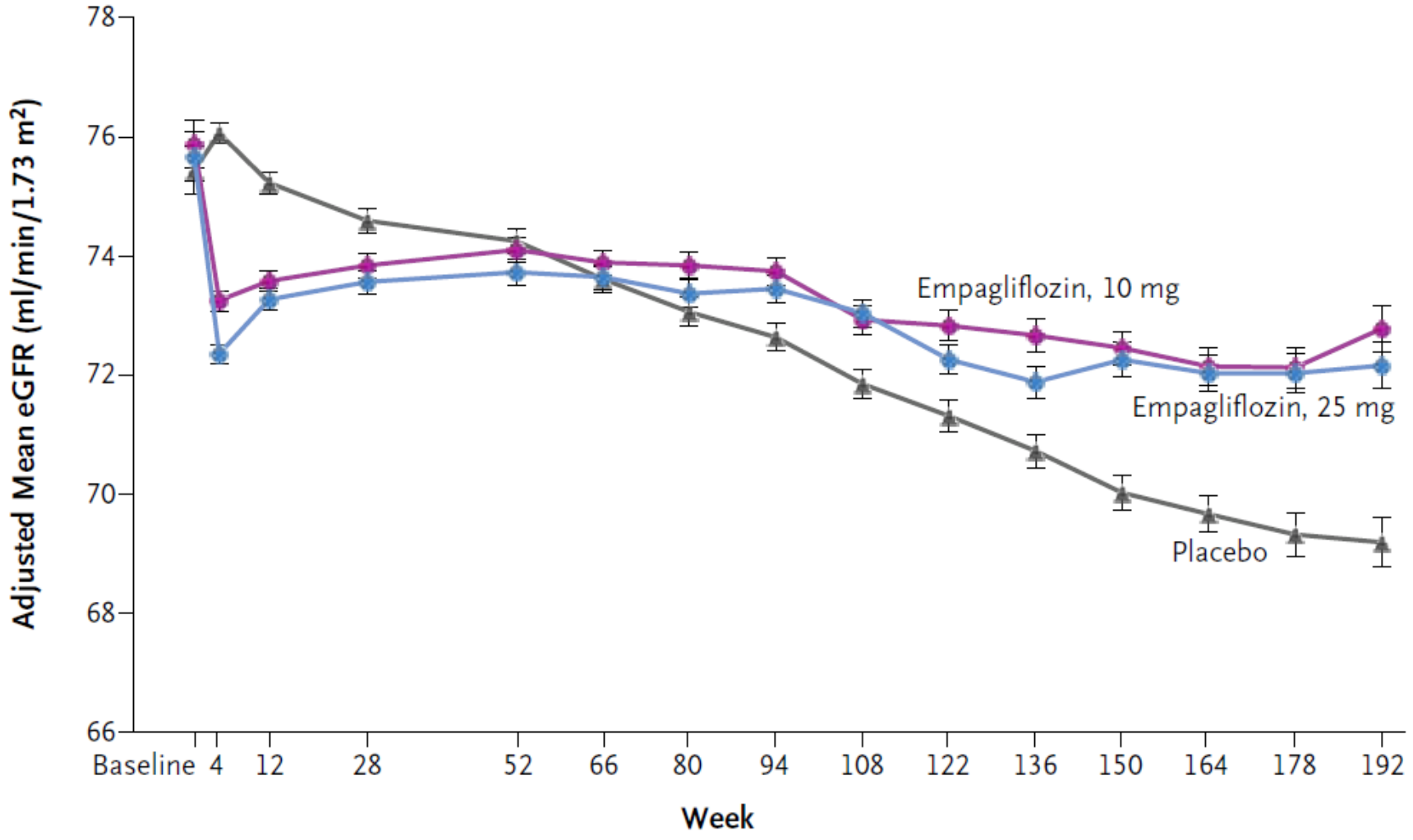
Similar pattern of GFR change on Dapagliflozin



Hiddo J.L. Heerspink et al (DAPA-CKD): DOI: 10.1056/NEJMoa2024816

But it only improves more with time:

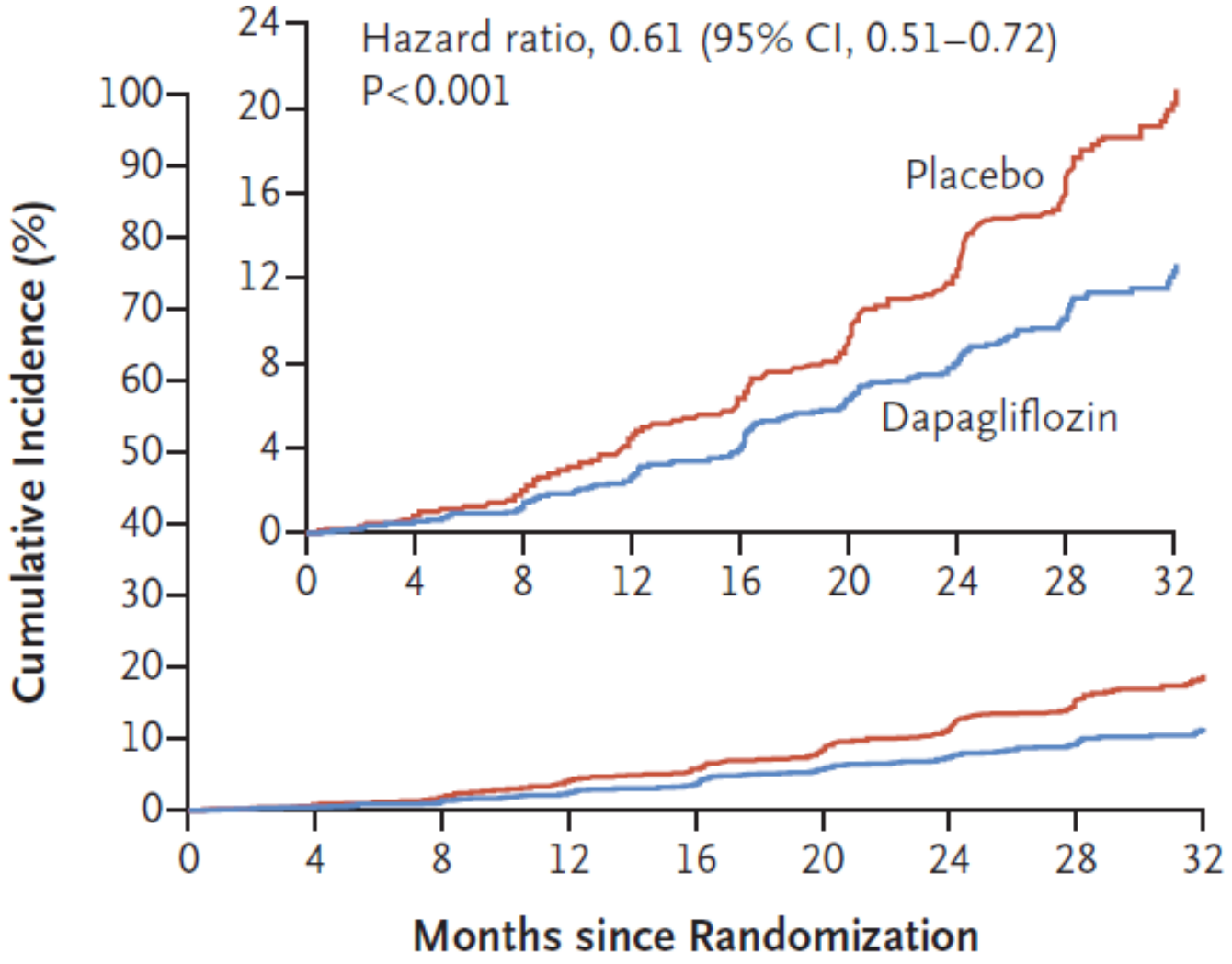
Change in eGFR:



C Wanner et al (EMPA-REG OUTCOME); DOI: 10.1056/NEJMoa1515920

And it improves more with time even in CKD

DAPA-CKD Primary outcome: 50% drop in GFR / ESRF / Death



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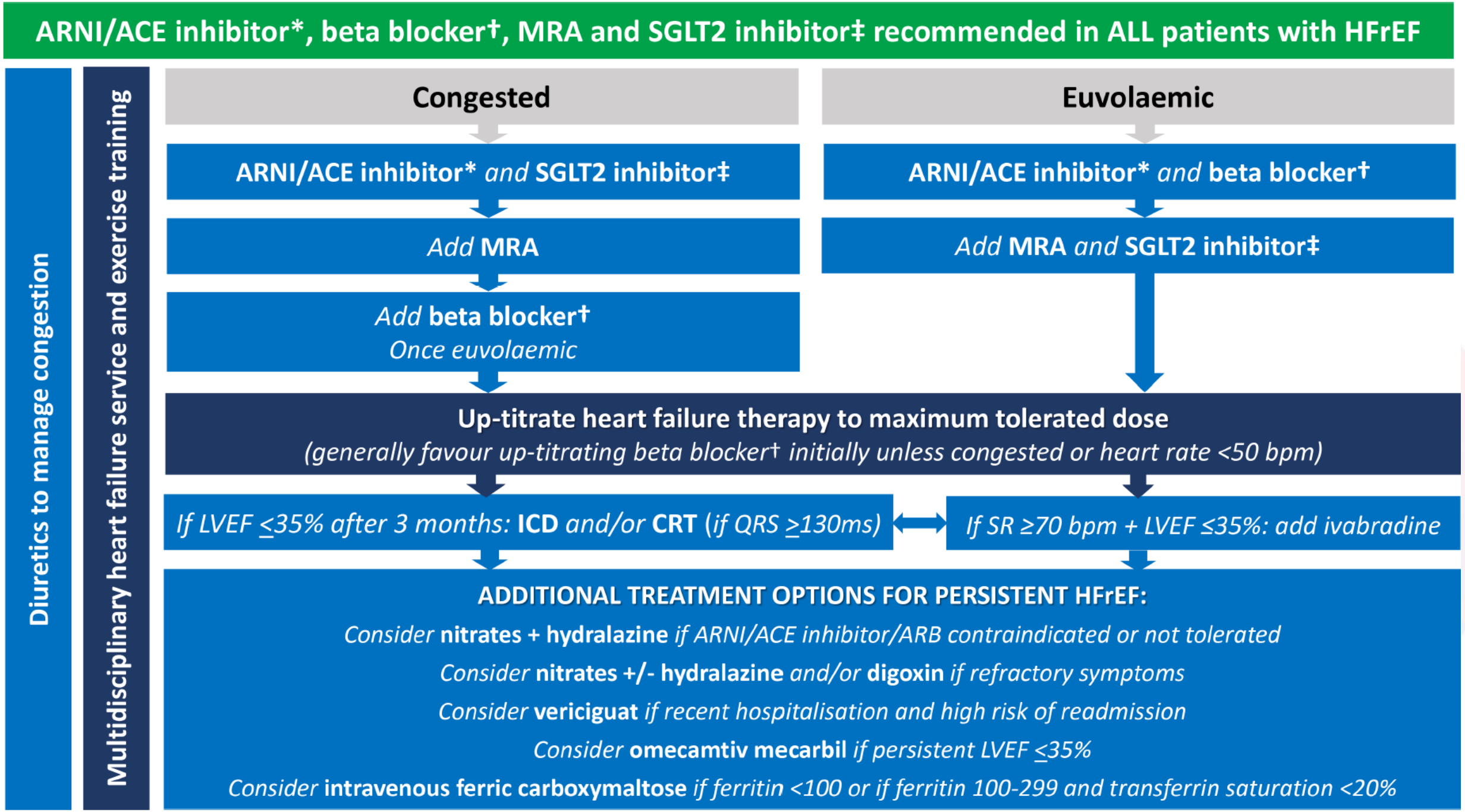

Consensus Statement on Pharmacological Management of Heart Failure 2022 MJA 2(4) • 15 August 2022

Mr ARB returns 1 week later

- On Assessment:
  - Slightly more breathless, has to stop once walking around his block some days
  - BP 106/74 mmHg, HR 92
  - Weight 75 kg (up 6kg)
  - JVP 2 cm above clavicle
- Updated HF Medications:
  - Ramipril 10 mg daily
  - Bisoprolol 2.5 mg daily
  - Empagliflozin 10 mg morning
  - No Furosemide for a week

What do you do with Mr ARB now his weight is up?

a) Resume Furosemide
b) Add an MRA (Spironolactone or Eplerenone*)
c) Add an MRA and Furosemide
d) Change Ramipril to Sacubitril-Valsartan 49/51 mg bd after 36 hour washout
e) Get him booked into a RAHFTS Clinic

RAHFTS Clinic?

- Rapid Access Heart Failure Therapy Service
- Goal: Avoid Emergency Visits for Heart Failure
- NP run clinic: Patients will be seen within one business day
- Phone Metro North Clinical Advice Line
  - 1800 569 099

What do we do with Mr ARB now?

- Why not change Ramipril to Sacubitril-Valsartan 49/51 mg bd:
  - Need for washout period of 36 hours whilst unstable
  - Diuretic enhancing properties of Sacubitril-Valsartan
  - Guideline recommended treatment

Check his electrolytes the day before he sees you:

Monitoring recommendations (see overleaf for guidance)

- Check blood pressure (BP) including postural drop and heart rate (HR) each visit
- ACEI/ARB/ARNI/MRA*: check serum potassium (K^+), renal function 1-2 week/s after commencing or titrating (if K^+ is high recheck in 48 hours). For MRAs check every 4 weeks for 12 weeks, at 6 months, then 6-monthly
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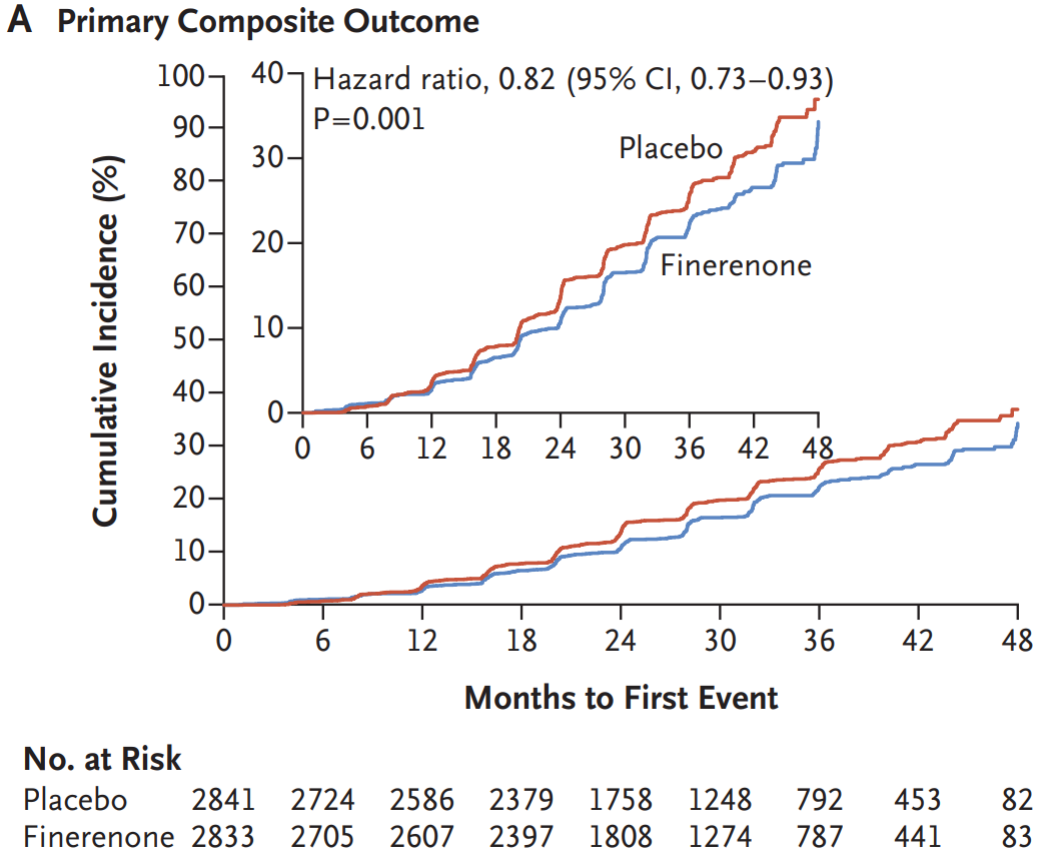
- Diuretic dose changes beyond 3 days require medical review and checking of blood chemistry and volume status
- Iron: Order Hb*, CRP*, ferritin & transferrin saturation at first assessment and every 3-6 months if iron deficient

MRAs are probably nephroprotective (at least Finerenone is)



G. L Bakris et al; New Engl J Med 2020;383:2219-2229

Mr ARB

- Cooler weather develops
- Mr ARB attends the HF NP clinic post-discharge (6 weeks)
  - He is changed from Ramipril to Sacubitril-Valsartan 49/51 mg twice daily after 36 hour washout period
- You receive the 2 week follow up blood tests

Mr ARB's Biochemistry:

CUMULATIVE SERUM BIOCHEMISTRY

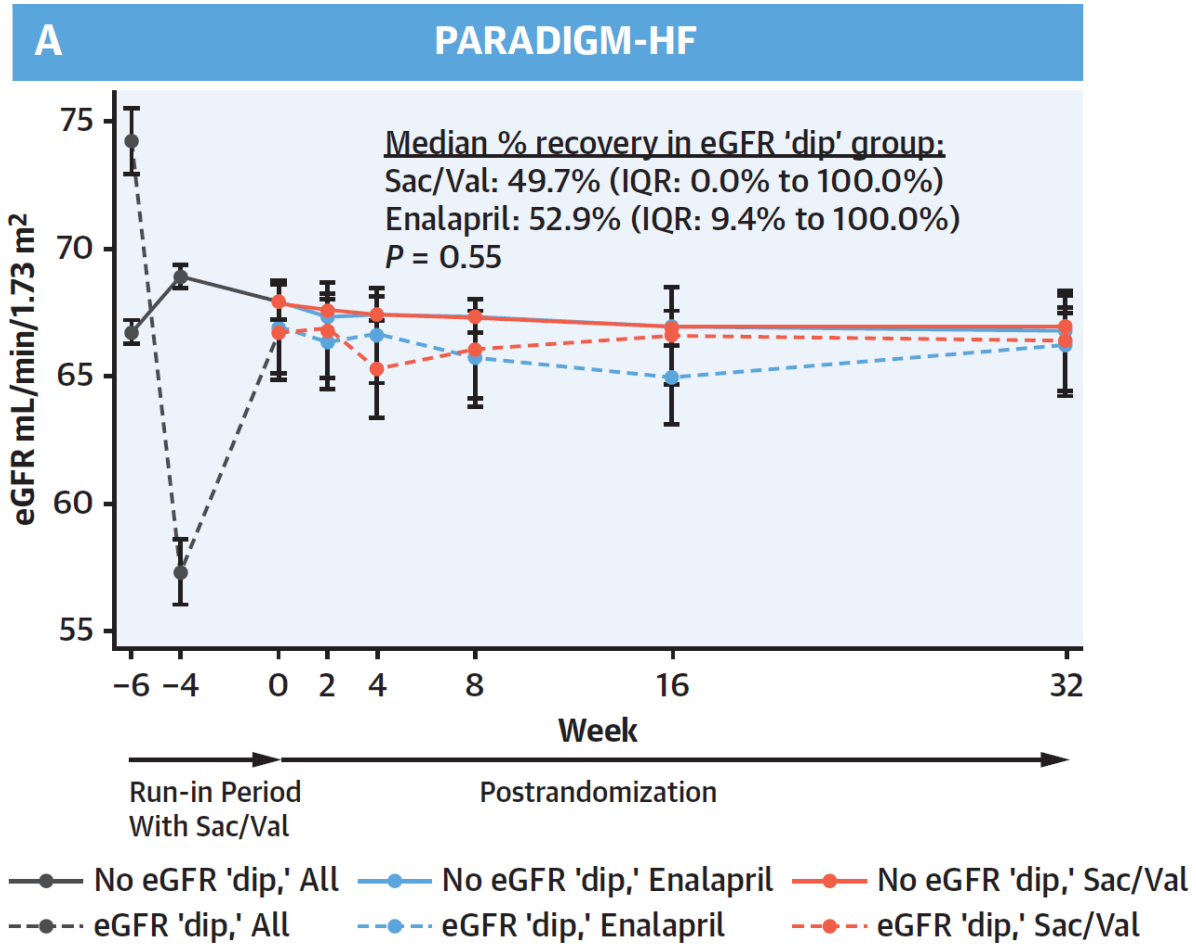
Date	17/10/24	09/01/25	17/04/25	17/06/25	08/07/25	
Time	08:00	11:30	12:25	08:56	08:02	
Lab No	76988625	77336312	78207676	92120996	92336795	
	FASTING	FASTING	RANDOM	RANDOM	FASTING	FASTING
Sodium	140	140	140	133	132	mmol/L (137-147)
Potass.	4.6	5.0	4.5	4.7	4.4	mmol/L (3.5-5.0)
Chloride	104	107	102	99	97	mmol/L (96-109)
Bicarb	28	27	28	22	23	mmol/L (25-33)
An.Gap	13	11	15	17	16	mmol/L (4-17)
Gluc	7.5	5.6	7.3	11.0	10.3	mmol/L (3.0-6.0)
Urea	9.7	12.0	12.6	15.9	17.0	mmol/L (3.0-8.5)
Creat	80	106	96	100	144	umol/L (60-140)
eGFR	86	61	69	65	42	mL/min (over 59)
Urate	0.30	0.35	0.41	0.53	0.54	mmol/L (0.12-0.45)

Mr ARB's 44% rise in Creatinine
What do you do?

a) Tell him to withhold the Sacubitril-Valsartan & reassess in a week
b) Tell him to drink more fluids & reassess in a week
c) Assess his fluid status
d) Tell him to withhold Spironolactone & reassess in a week

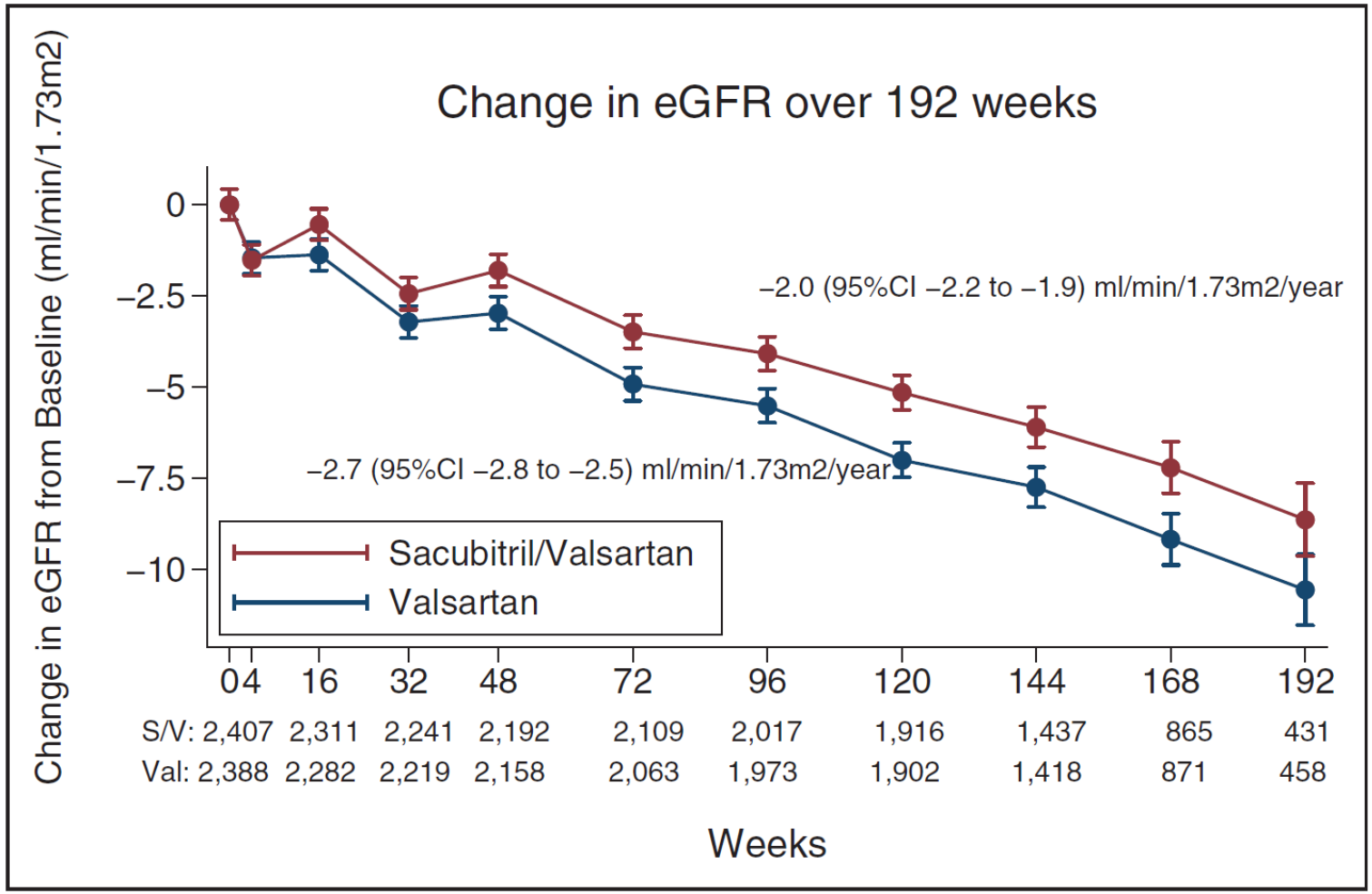
Ordinarily an eGFR change with Sacubitril-Valsartan shouldn't cause too much concern

FIGURE 2 Average eGFR Over Time According to eGFR Decline and Treatment



S. Chatur et al J Am Coll Cardiol 2023;81:1443–1455

Sacubitril-Valsartan is probably slightly reno-protective: PARAGON



F R. McCausland et al: Circulation. 2020;142:1236–1245

Mr ARB's 44% rise in Creatinine
What do you do?

a) Tell him to withhold the Sacubitril-Valsartan & reassess in a week
b) Tell him to drink more fluids & reassess in a week
c) Assess his fluid status
d) Tell him to withhold Spironolactone & reassess in a week

Mr ARB's Fluid Assessment

- His weight is up 5 kg to 76 kg on his home scales
- He's breathless and can't do the shopping

- You bring him into clinic
- His BP is 90/44 mmHg sitting & standing, & heart rate 96
- His JVP is 4 cm above clavicle
- He has no crackles in his lung fields
- He does have some ankle oedema

Mr ARB's is fluid overloaded – What do you do?

a) Resume Furosemide 40 mg daily
b) Resume Furosemide 40 mg daily & get him into RAHFTS
c) Resume Furosemide 40 mg daily & see him later in week
d) Resume Furosemide 40 mg daily & increase bisoprolol to 5mg because of that tachycardia

Mr ARB's is fluid overloaded – What do you do?

a) Resume Furosemide 40 mg daily
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c) Resume Furosemide 40 mg daily & see him later in week
d) Resume Furosemide 40 mg daily & increase bisoprolol to 5mg because of that tachycardia

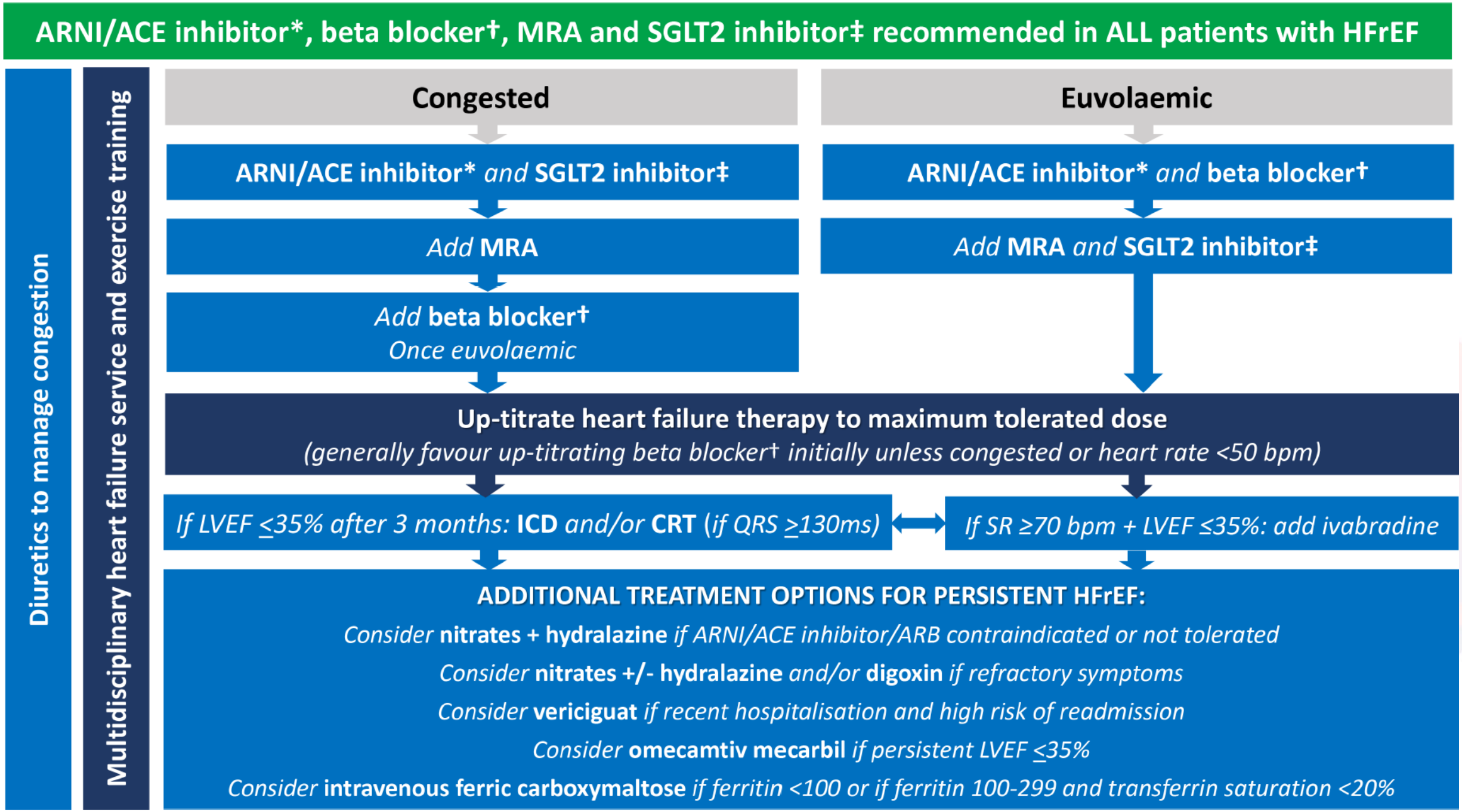
Mr ARB diureses the 5 kg:

Date	17/04/25	17/06/25	08/07/25	30/07/25	15/08/25		
Time	12:25	08:56	08:02	08:06	07:43		
Lab No	78207676	92120996	92336795	77468861	29138203		
	RANDOM	RANDOM	FASTING	RANDOM	RANDOM		RANDOM
Sodium	140	133	132	132	135	mmol/L	(137-147)
Potass.	4.5	4.7	4.4	4.6	4.1	mmol/L	(3.5-5.0)
Chloride	102	99	97	100	99	mmol/L	(96-109)
Bicarb	28	22	23	22	26	mmol/L	(25-33)
An.Gap	15	17	16	15	14	mmol/L	(4-17)
Gluc	7.3	11.0	10.3	15.3	13.7	mmol/L	(3.0-7.7)
Urea	12.6	15.9	17.0	13.8	15.0	mmol/L	(3.0-8.5)
Creat	96	100	144	122	108	umol/L	(60-140)

Mr ARB: Are we there yet?

- Current Medications:
  - Aspirin 100 mg daily
  - Sacubitril-Valsartan 49/51 mg twice daily
  - Metformin XR 1000 mg daily
  - Magnesium 500 mg bd
  - Bisoprolol 2.5 mg daily
  - Ezetimibe & Rosuvastatin 10 & 20 mg daily
  - Empagliflozin 10 mg morning
  - Spironolactone 25 mg morning
  - Furosemide 40 mg morning when needed

- Observations:
  - BP 90/54 mmHg
  - HR: 78
  - Euvolaemic

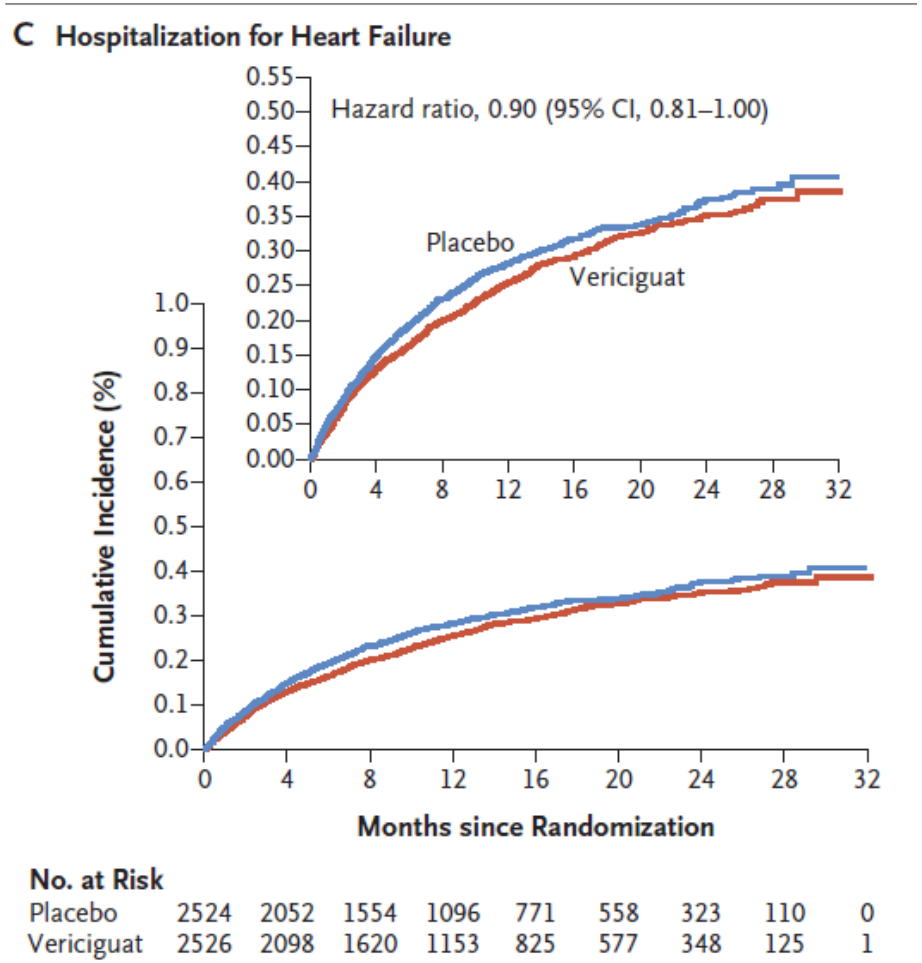


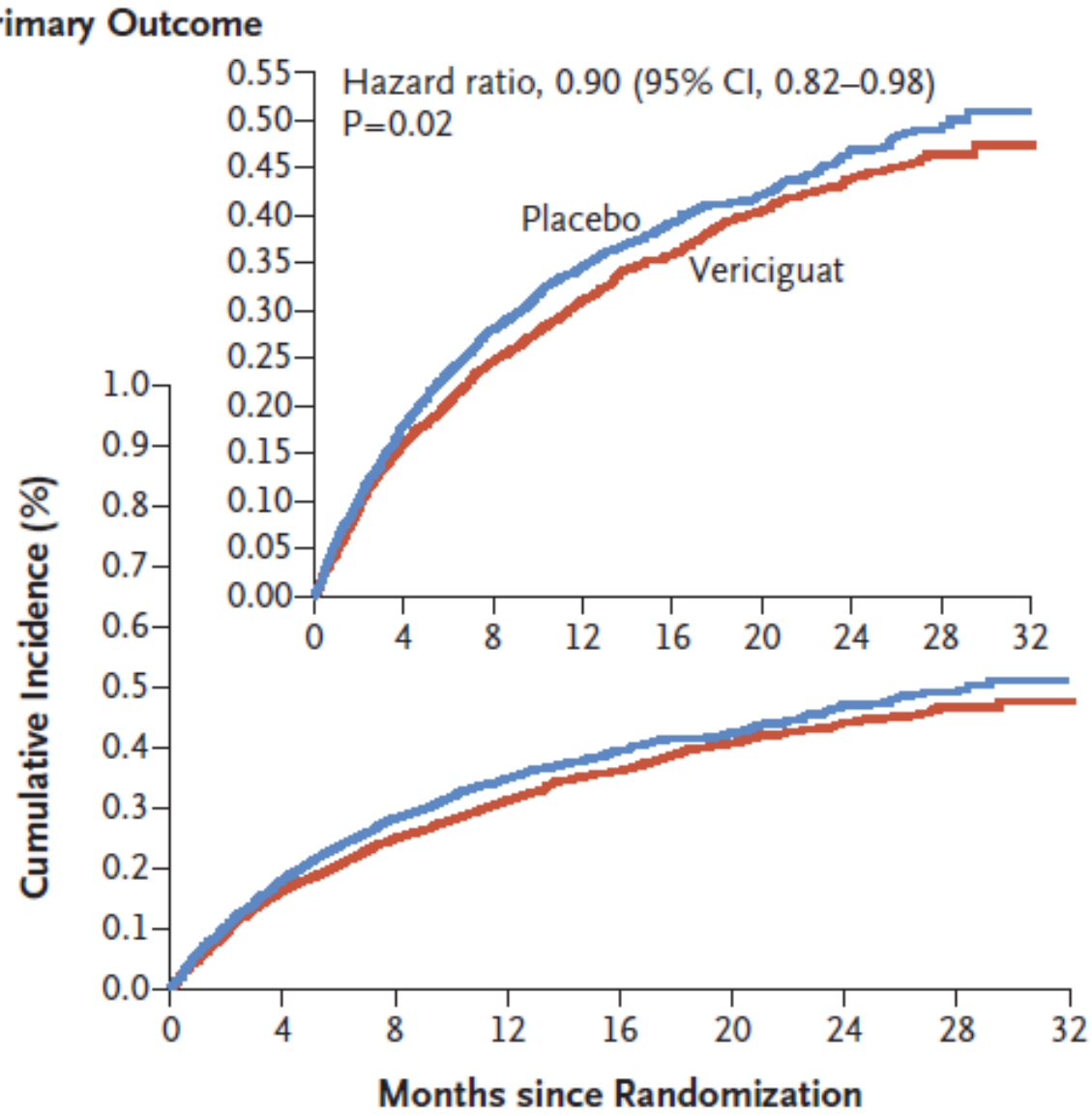
Consensus Statement on Pharmacological Management of Heart Failure 2022 MJA 2(4) • 15 August 2022

Do you change anything for Mr ARB & if so what?

a) No, his BP is pretty low
b) Yes he's not at target dose of bisoprolol – I'll increase
c) Yes he's not at target dose of sacubitril-valsartan - I'll increase
d) Yes he's missing vericiguat I'll ring his cardiologist to start

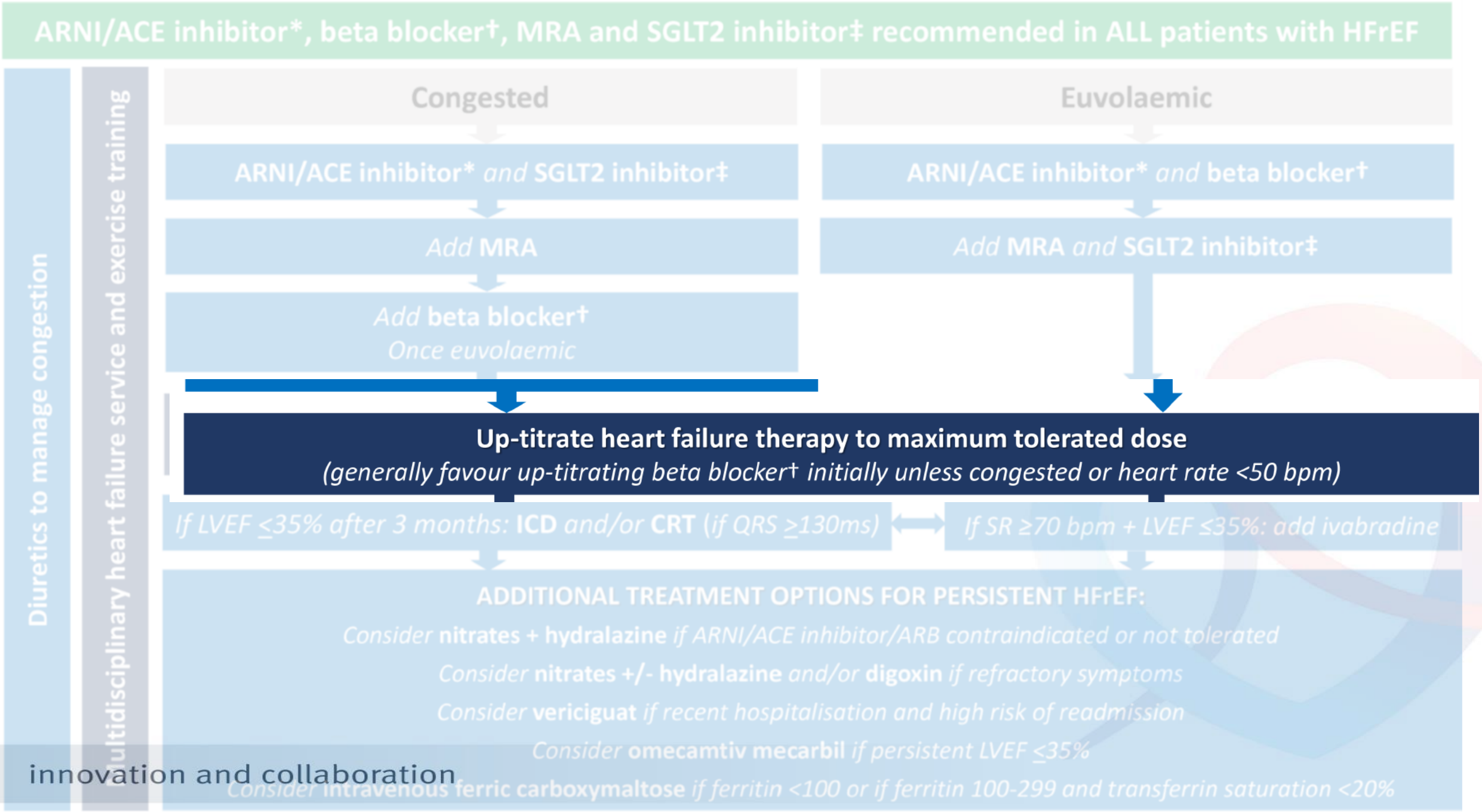
Vericiguat: VICTORIA





P W Armstrong: N Engl J Med 2020;382:1883-93

Consensus Statement on Pharmacological Management of Heart Failure 2022 MJA 2(4) • 15 August 2022



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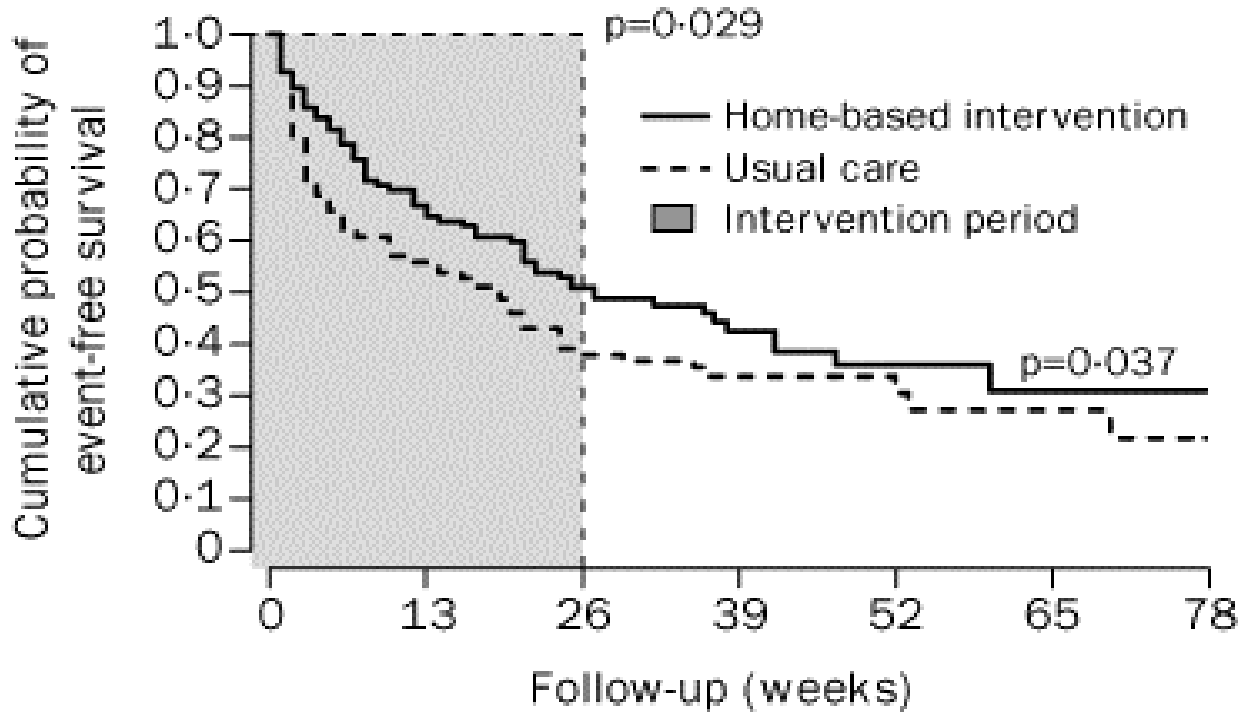
Multidisciplinary Intervention in HF



Numbers at risk

Intervention	100	66	51	23	13	6	4
Usual care	100	57	38	17	9	5	2

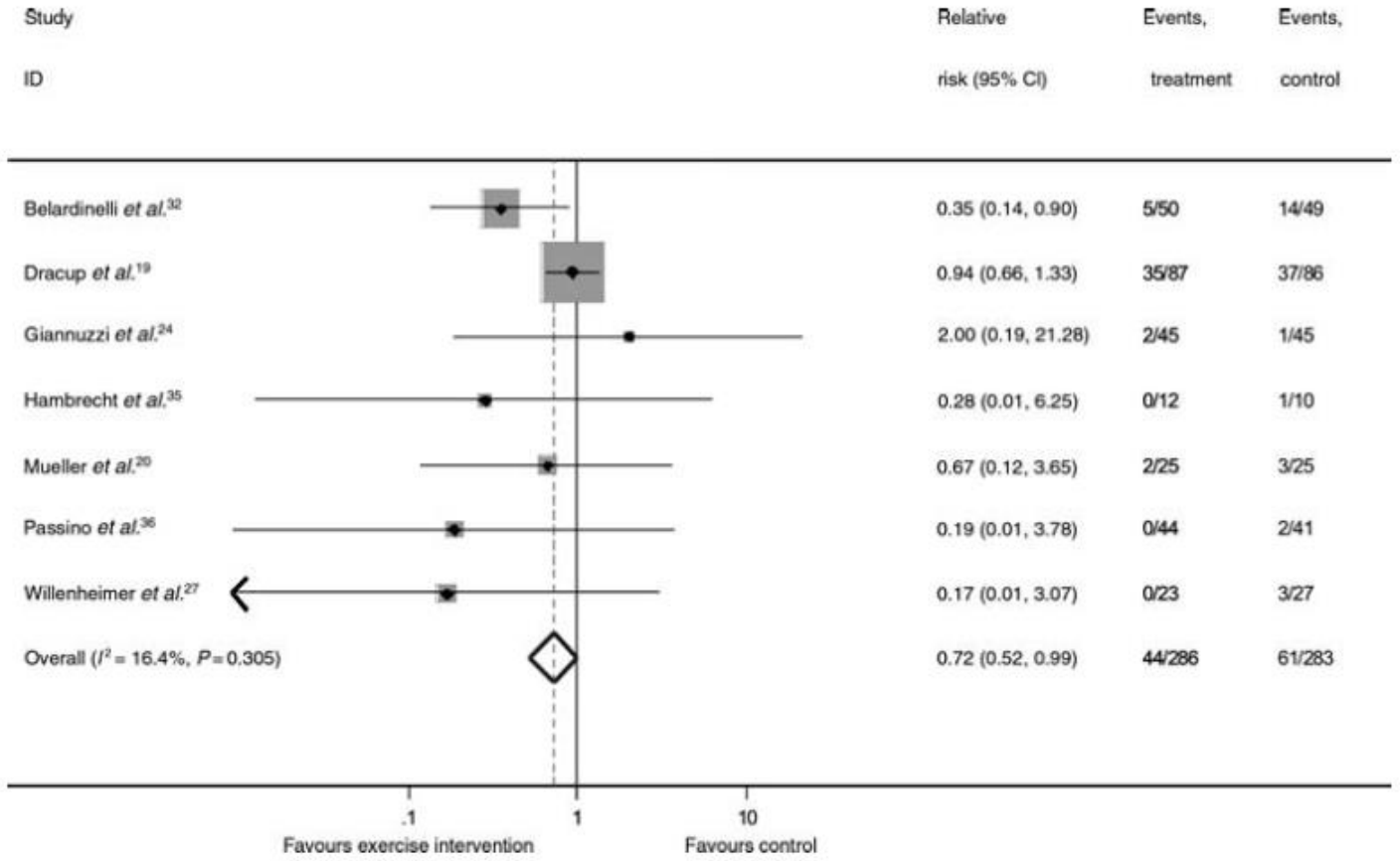
- 200 CHF patients (76 yrs)
- Cardiac nurse home visit 7-14d post-discharge (physical exam, disease understanding, diet and med r/v, physical activity, social support).
- Counselling, adherence, strategies, exercise program, carer monitoring.
- Flexible diuretic regime
- Point of contact

- Reduced death/re-hosp 40%
- Reduced re-hosp 54%
- Reduced costs

Stewart, Marley, Horowitz: Lancet 1999; 354: 1077 – 83

Exercise is good for you (Breathlessness is not harmful)

It reduces hospitalization:



And improves Quality of Life

Where to next for Mr ARB?

- Up titrate to maximal doses as allowed by symptoms and as quickly as possible

- Favour up titration of beta-blockers if heart rates over 70
- Favour up titration of Sacubitril-Valsartan if BP over 100 mmHg

Thank you

Brisbane North

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    - Cardiac Catheterisation Complications
    - Cardiovascular Disease Risk Assessment
    - Chest Pain
    - Heart Failure
      - Advanced or End-stage Heart Failure
    - Heart Murmurs in Adults
    - Infective Endocarditis Prophylaxis
    - Hyperlipidaemia
    - Hypertension
    - Long QT Syndrome
    - Palpitations
    - Postoperative Care of Cardiothoracic Patients
    - Rheumatic Heart Disease (RHD)
    - Syncope or Transient Loss of Consciousness
    - Cardiology Requests

/ Medical / Cardiology / Heart Failure

Heart Failure

Red flags

- Persistent heart failure (HF) symptoms at rest or with minimal exertion (New York Heart Association (NYHA) class III/IV)
- Symptomatic hypotension with systolic blood pressure < 100 mm Hg
- Oxygen saturation < 90%
- Persistent sinus tachycardia after 3 minutes rest (e.g., resting heart rate > 110 beats per minute)

Background

About heart failure (HF)

Assessment

1. Take a history and check for:
   - symptoms of HF.
   - risk factors for HF.
2. Consider possible causes and exacerbating factors, as these will significantly influence management.
3. Examine the patient:
   - Check vital signs, including blood pressure, resting heart rate, and oxygen saturation. Symptomatic hypotension or persistent tachycardia will require emergency management.
   - Check height and weight, and calculate BMI.
   - Look for signs of HF.
4. Grade severity using New York Heart Association (NYHA) HF classification to help predict survival and guide management.
5. Arrange investigations:
   - 12-lead ECG
   - Blood for natriuretic peptides (BNP or NT-proBNP)
   - Other laboratory tests – FBC, E/LFTs, TSH, lipid profile, ferritin, HbA1c if diabetes, and urinalysis
   - Echocardiography
   - Radiography if indicated – if suspected COPD or asthma, consider spirometry testing instead.

Management

1. Phone 000 to arrange ambulance transfer for emergency assessment if:
   - any red flags.

Queensland Government | Smart Referrals

Patient name: James METRONORTH DoB: 1 Jan 1980

Request information

Request date	5 Sep 2025
* Request type	New referral | Update | Continuation | Request for advice
* Reason for referral	○ New condition requiring specialist consultation ○ Deterioration in condition, recently discharged from outpatients < 12 months ○ Other
* Priority	Urgent | Routine
* Provider	QHSR | Private

Consents

* Date patient consented to request	05 Sep 2025
* Patient is willing to have surgery if required?	Yes | No | Not applicable
* Condition and Specialty	Cardiology - Heart failure (Cardiology) (Adult)
Suitable for Telehealth?	Yes | No
* Are you the patient's usual GP?	Yes | No

HealthPathways

HealthPathways | Metro North

Heart Failure

HealthPathways home page

Request recipient

* Service/Location: Please select

Specialist name

Organisation details

Cardiology	ROYAL BRISBANE & WOMEN'S HOSPITAL	12.1 km	
HOPE - Aboriginal and Torres Strait Islander Heart Outreach Program for Health Equity	THE PRINCE CHARLES HOSPITAL	17.5 km	
Heart Failure	THE PRINCE CHARLES HOSPITAL	17.5 km	
Cardiology	THE PRINCE CHARLES HOSPITAL	17.5 km	
Cardiology	REDCLIFFE HOSPITAL	37.4 km	
Cardiology	CABOOLTURE HOSPITAL	51.5 km	
Cardiology	QUEEN ELIZABETH II JUBILEE	7.8 km	Out of catchment

Condition specific clinical information

Investigations and imaging

Standard clinical information

Patient information

Insurance information

Referring GP's information

Supporting documentation

Optional activity

Quality improvement activity

1.0 MO | Self log

Use the online form to capture quality improvements you have implemented or plan to implement as an outcome of this educational activity.

1. Use the QR to open the online form
2. Complete the online form
3. Once completed, you will receive an email with your answers
4. Self log the activity with your answers as supporting evidence.