An Update on Heart Failure

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ESC Heart Failure guidelines (August 2021)

New terminology

New treatment in HFrEF and HFpEF

Heart failure definitions

HFrEF
Reduced
Ejection Fraction
≤ 40%

***Significant** systolic impairment*

HFpEF
Preserved
Ejection Fraction
≥ 50%

Symptoms with structural/functional cardiac abnormalities and/or raised BNP

HFmrEF
Mildly Reduced
Ejection Fraction
41-49%

(previously 'mid-range' EF)
Similar to HFrEF, eg. high ischaemic aetiology, medication response

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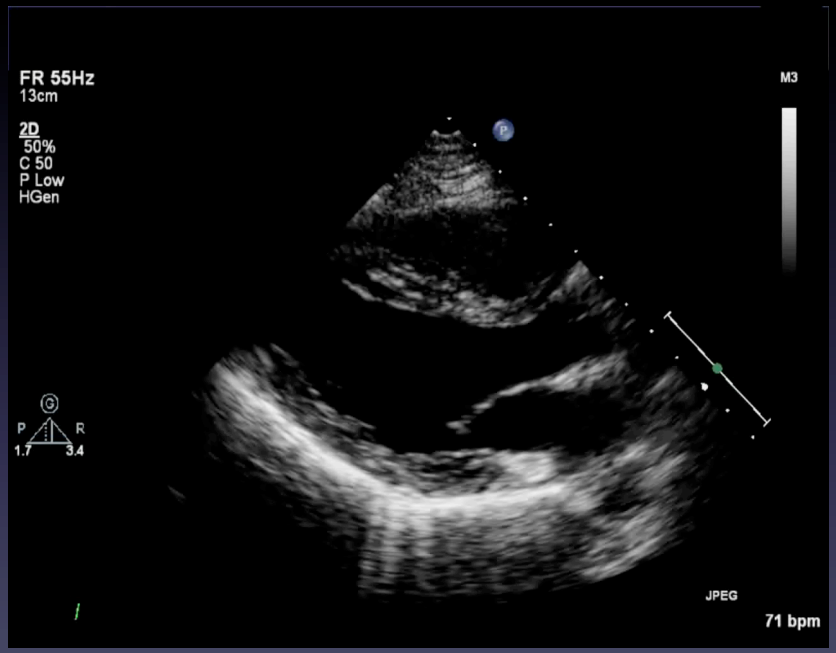
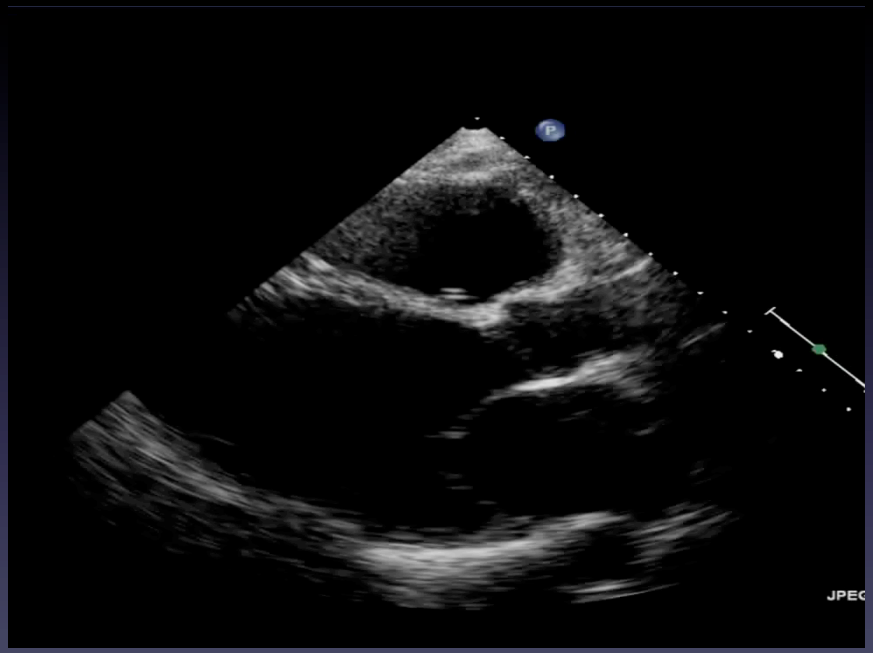
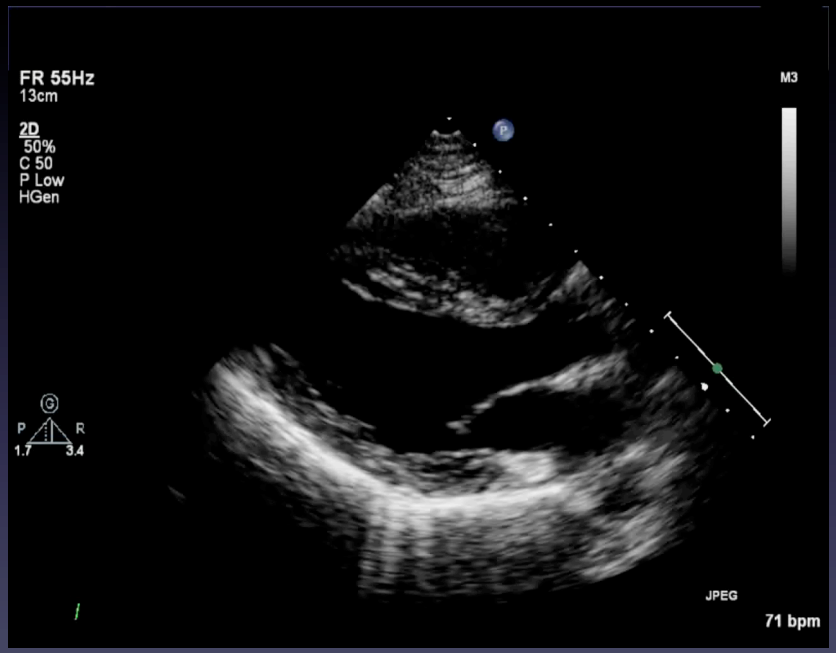
Normal heart



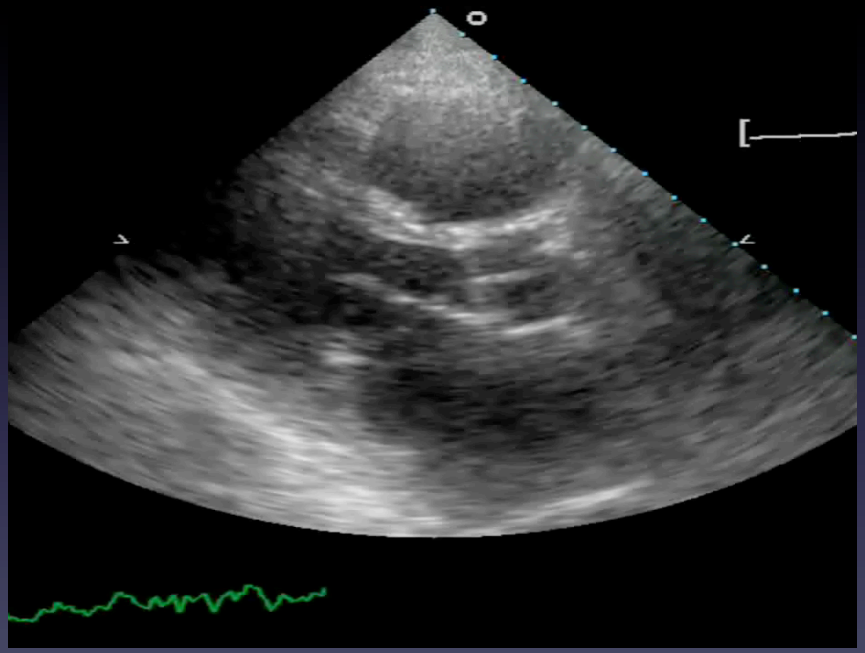
Systolic heart failure (HFrEF)



Normal heart



Diastolic heart failure (HFpEF)



Prognosis in HF

- Mortality still very high
  - 1-year 20% and 5-year 53%
  - Women better survival
  - HFmrEF better survival than HFrEF
  - HFpEF similar survival to HFrEF
- QOL poor
- Average 1 hospitalisation per year
- Higher rate of admissions if diabetes, AF, raised BMI, low eGFR
- Hospitalisation for HF predicted to increase due to aging population

Gerber et al. JAMA Int Med 2015

Causes of heart failure

- Coronary artery disease
- Valve disease
- Cardiomyopathies
- Infective
- Infiltrative
- Storage disorders
- Endomyocardial disease
- Pericardial disease
- Hypertension
- Arrhythmias
- Congenital heart disease
- Drug-induced
  - Chemo/immunotherapy
- Metabolic
- Neuromuscular

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Diagnostic tests in suspected heart failure

- BNP/NT-pro BNP
- 12-lead ECG
- Transthoracic echocardiography
- Chest X-ray
- Routine bloods
  - FBC, UEC, TFT, fasting BSL, HbA1c, lipids, iron studies
- Coronary angiography or CTCA, CMR
- Cardiopulmonary exercise testing, right heart catheterisation

Causes of raised BNP or NT-pro BNP

Cardiac	Heart failure ACS Pulmonary embolism Myocarditis Left ventricular hypertrophy Hypertrophic or restrictive cardiomyopathy Valvular heart disease Congenital heart disease Atrial and ventricular tachyarrhythmias Heart contusion Cardioversion, ICD shock Surgical procedures involving the heart Pulmonary hypertension
Non-cardiac	Advanced age Ischaemic stroke Subarachnoid haemorrhage Renal dysfunction Liver dysfunction (mainly liver cirrhosis with ascites) Paraneoplastic syndrome COPD Severe infections (including pneumonia and sepsis) Severe burns Anaemia Severe metabolic and hormone abnormalities (e.g. thyrotoxicosis, diabetic ketosis)

BNP < 35 pg/ml
or
NT-pro BNP < 125 pg/ml
has good negative predictive value

BNP/NT-pro BNP can be very low in obese patients

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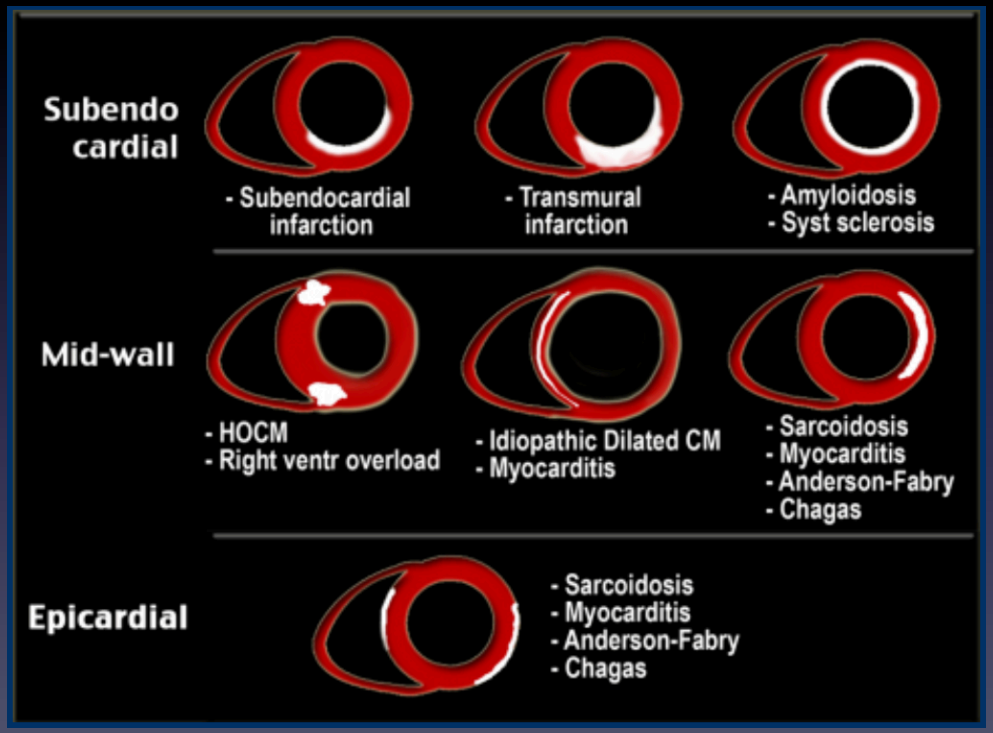
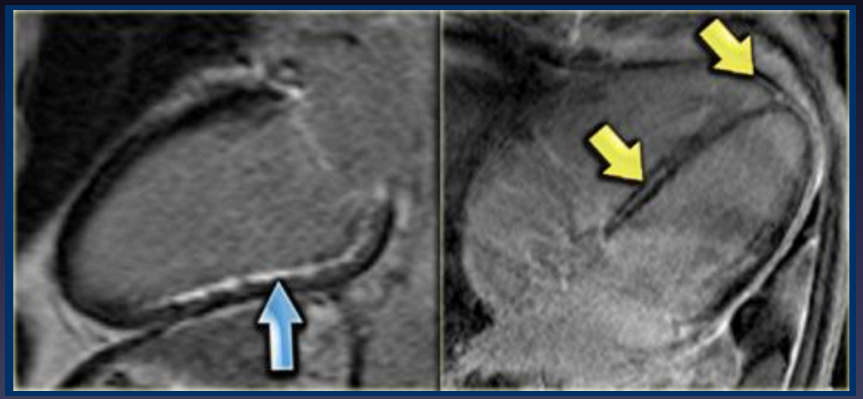
Cardiac MRI
Identifying the aetiology of heart failure





van Es et al. Radiology Assistant

Treatment
- Heart failure with reduced EF -

Aims

1. Reduction in mortality
2. Reduction in hospitalisation
3. Improvement in functional capacity, quality of life

HFrEF Pharmacotherapy

Cornerstone therapy

- Target RAAS and sympathetic nervous system
  - ACE-I / ARB or ARNI
  - Cardioselective beta-blocker
  - Mineralocorticoid receptor antagonist

Uptitrate to maximum tolerated recommended dose

HFrEF new pharmacotherapy

SGLT2 inhibitors

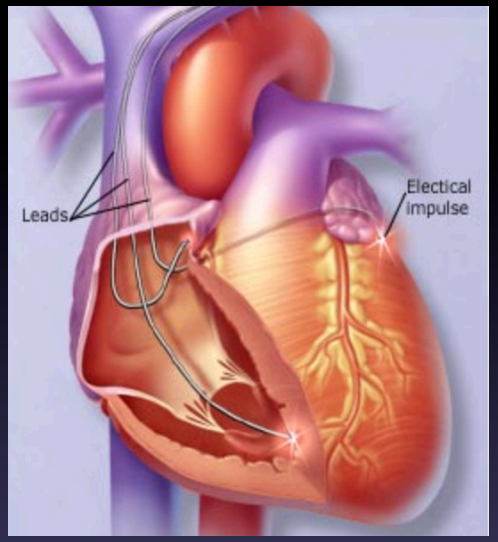
- Dapagliflozin and Empagliflozin
- Added to ACEI / ARNI / BB / MRA
- Australian PBS - patients with diabetes only
- Dapagliflozin – access via PFP

➢ Reduce the risk of CV death and worsening HF

Improving symptoms of HF

- Diuretics
  - Loop diuretics ± thiazides
- Ivabradine
  - Sinus rhythm, HR ≥ 70bpm, LVEF ≤ 35%, hospitalisation within 1 year
- (Digoxin)
  - Digoxin level < 1.2ng/ml

Cardiac resynchronisation therapy



- Symptomatic patients
- QRS ≥ 150 ms
  - QRS ≥ 130 ms
- LVEF ≤ 35% despite optimal medial therapy
- Sinus rhythm or AV nodal ablation in AF

Ventricular arrhythmias in HFrEF

- Amiodarone
  - Reduces ventricular arrhythmias, but no reduction in mortality
- Implantable cardioverter-defibrillators (ICD)
  - Reduces risk of sudden cardiac death
  - Secondary prevention
  - Ischaemic CM > > non-ischaemic CM
  - If LVEF ≤ 35% after 3 months of optimal medical therapy

Treating iron deficiency

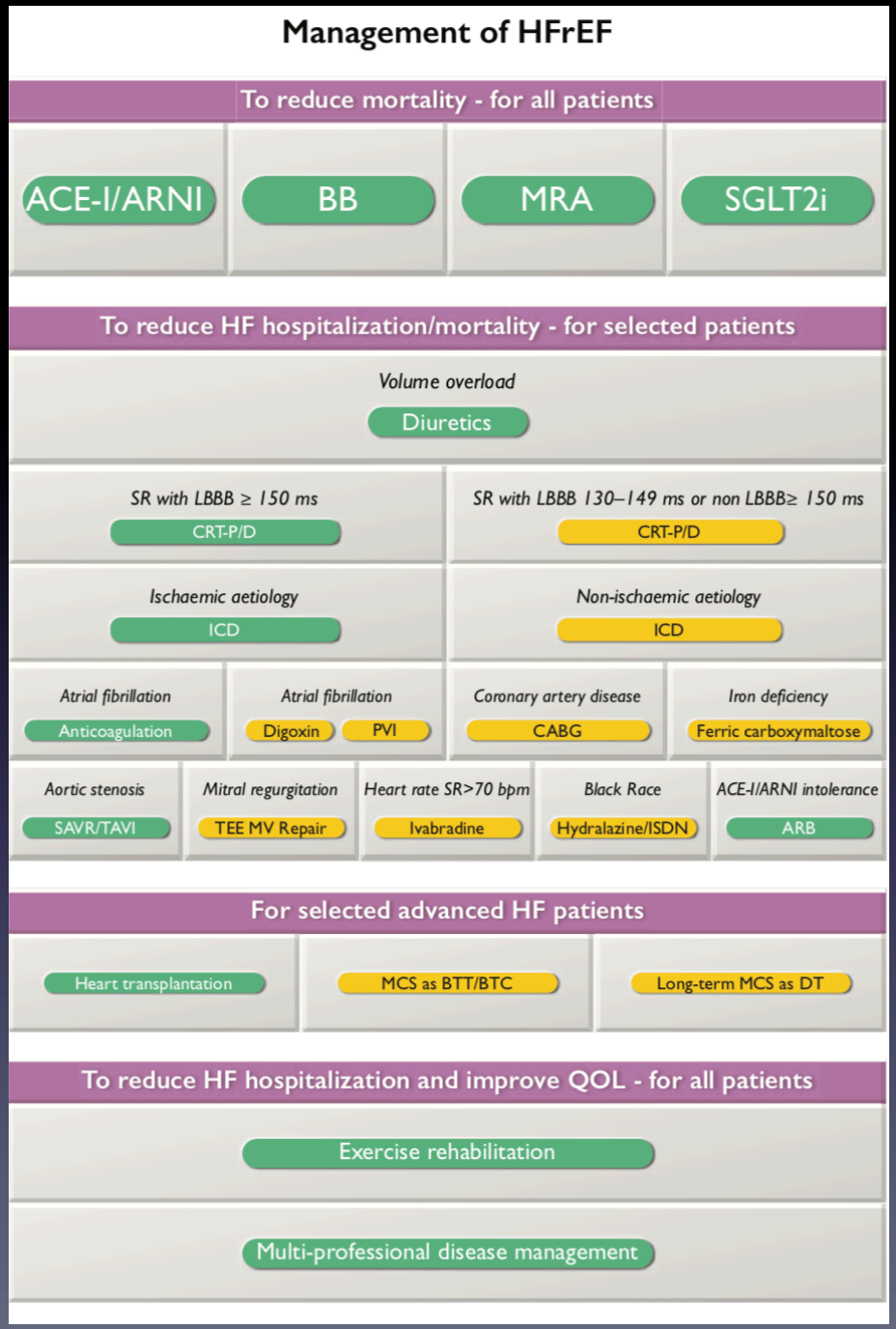
Ferritin < 100ug/l

or 100-299 if Trans sat < 20%

Hb 95-135

Ferric carboxymaltose 1g IV

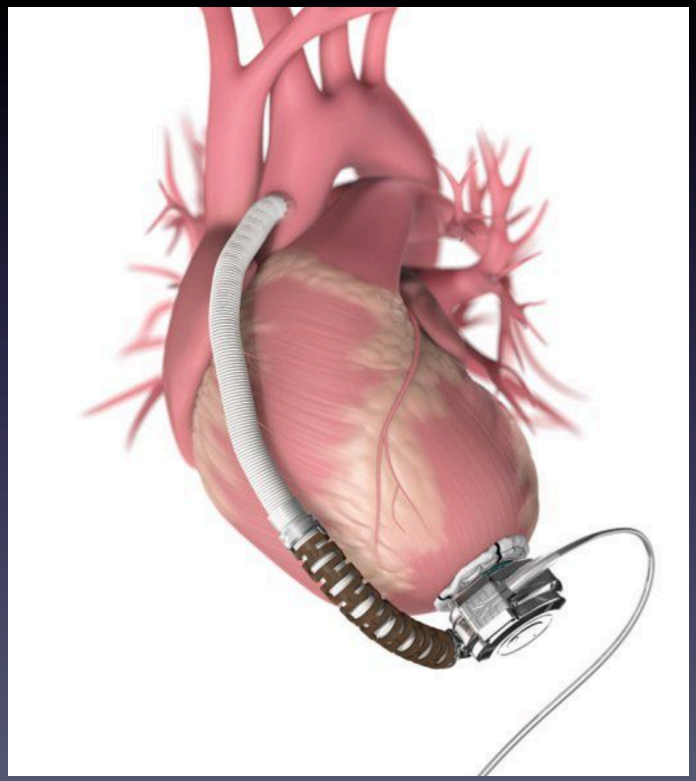
Improves symptoms and reduces HF hospitalisation



ESC HF Guidelines 2021

Ventricular assist devices

- Left, right or biventricular assist devices



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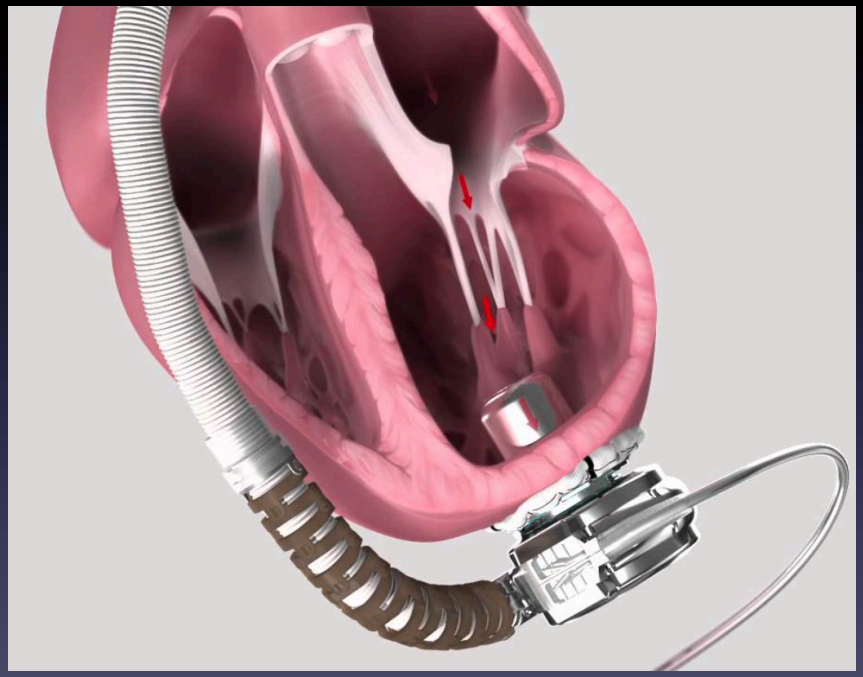

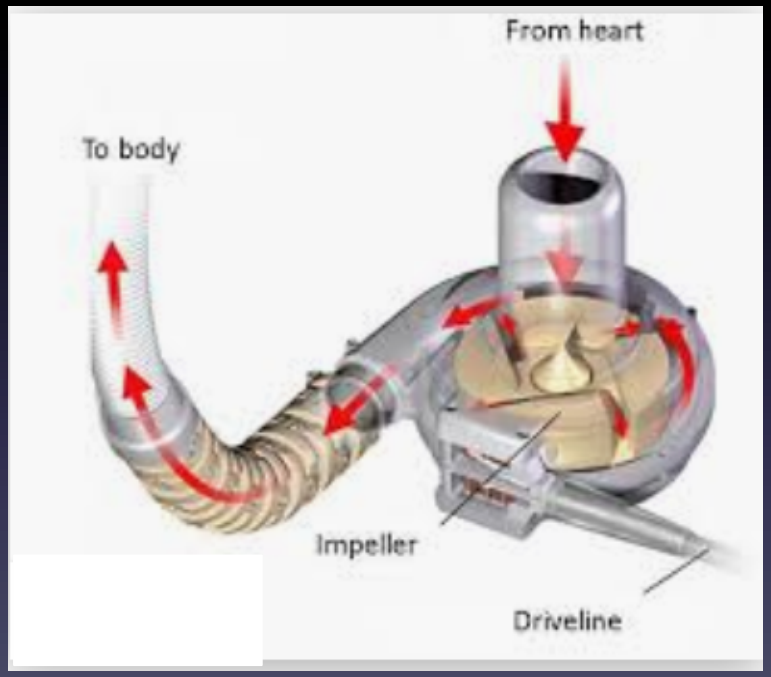

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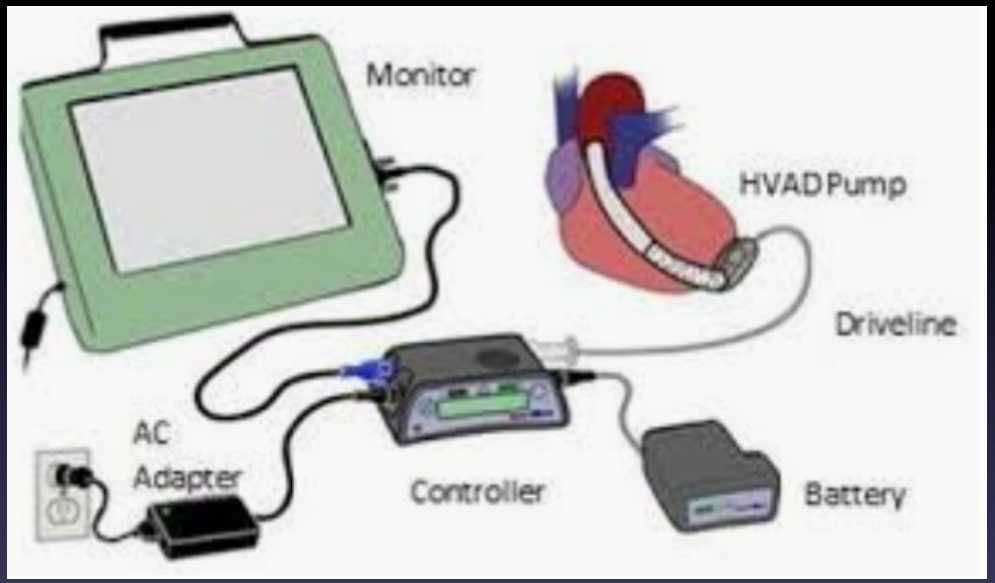
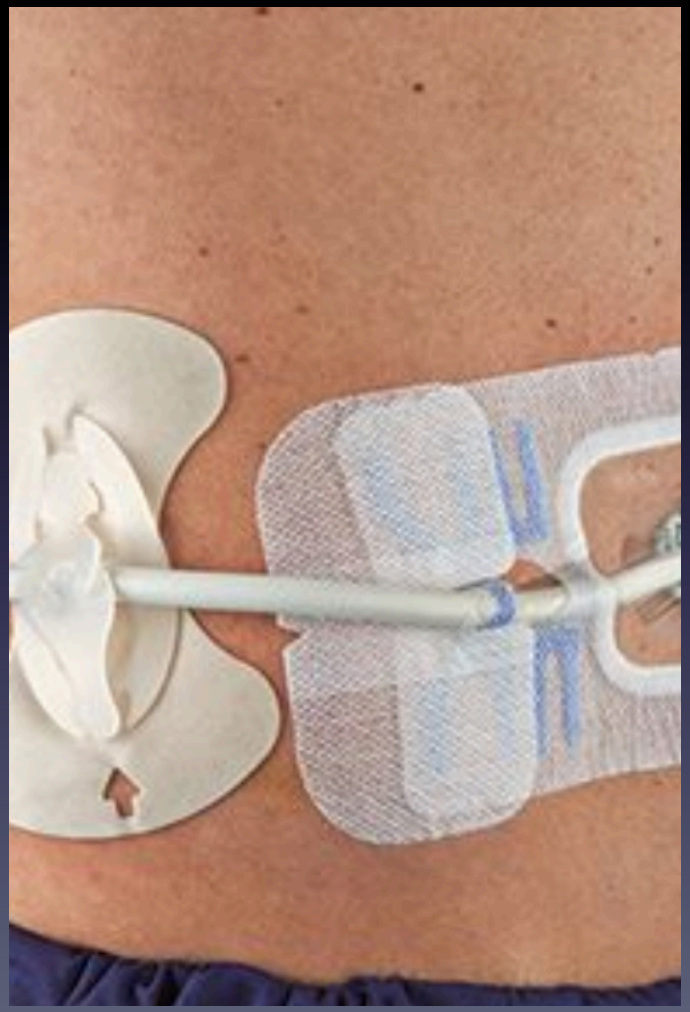




Ventricular assist devices

- Indications:
  - Severe intractable heart failure (L, R or biventricular)
  - As a bridge to transplantation

- Complications: GI bleeding, infections, pump thrombosis, haemolysis

Cardiac transplantation

- Patients with advanced heart failure
  - Frequent hospitalisations
  - Symptoms of low cardiac output and congestive heart failure
    - Despite optimal medical and device therapy

HFmrEF

- LVEF 41-49%
- Features of patients similar to HFrEF
  - Men, younger, IHD, less AF and comorbidities
  - Includes patients who improved from LVEF ≤ 40% or declined from ≥ 50%

HFmrEF

- Diuretics for congestion
- ACE-I, ARB, BB, MRA, ARNI *may* be considered
  - Often patients on these treatments for other indications, therefore should be continued
- Device therapy – insufficient evidence

HFpEF

- LVEF ≥ 50%
- Older patients, female, AF, CKD, non-CV comorbidities more common
- Screen for causes and treat non-CV comorbidities
- Heterogenous condition
- No benefit in ACE-I, ARB, ARNI, BB, MRA
- Diagnostic features:
  - Dilated LA, raised filling pressures (E/e' > 9), raised NT-pro BNP, raised pulmonary pressures

HFpEF

SGLT2-I

- EMPEROR-Preserved trial
  - Reduced cardiovascular death or hospitalisation
  - However LVEF > 40%
  - Empagliflozin 10mg daily
- The only medication shown to improve survival and hospitalisation in HFpEF.

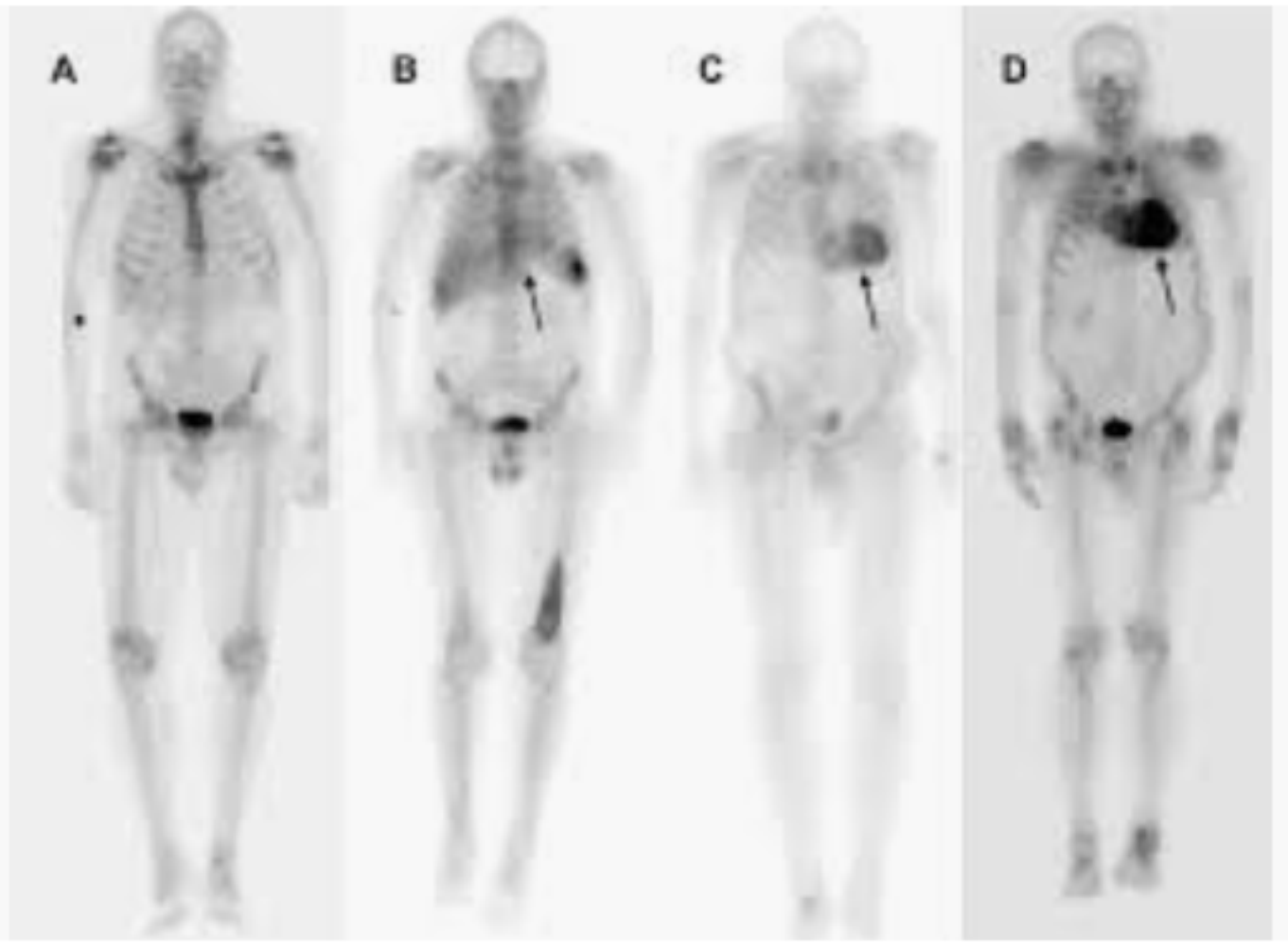
Cardiac amyloidosis

- Can be a cause of HFpEF
- Suspect if LVH
  - Other clues: peripheral neuropathy, bilateral carpal tunnel, other systemic involvement
  - AL: Serum EPG, IEPG, free light chains, urine Bence Jones protein, bone marrow biopsy
  - ATTR: Bone scan
- If AL amyloid – treat the cause (eg. myeloma)
- If ATTR amyloid
  - Clinical trials underway for RNA interference agents – prevents formation of ATTR protein
  - Tafamidis – Stabilises ATTR tetramer (prevent breakdown into monomer)

Circulation. 2016 Jun 14;133(24):2404-12. doi: 10.1161/CIRCULATIONAHA.116.021612. Epub 2016 Apr 22.

Nonbiopsy Diagnosis of Cardiac Transthyretin Amyloidosis.

Gillmore JD[1], Maurer MS[1], Falk RH[1], Merlini G[1], Damy T[1], Dispenzieri A[1], Wechalekar AD[1], Berk JL[1], Quarta CC[1], Grogan M[1], Lachmann HJ[1], Bokhari S[1], Castano A[1], Dorbala S[1], Johnson GB[1], Glaudemans AW[1], Rezk T[1], Fontana M[1], Palladini G[1], Milani P[1], Guidalotti PL[1], Flatman K[1], Lane T[1], Vonberg FW[1], Whelan CJ[1], Moon JC[1], Ruberg FL[1], Miller EJ[1], Hutt DF[1], Hazenberg BP[1], Rapezzi C[1], Hawkins PN[1].



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Thank you