LIVING WELL WITH HEART FAILURE

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NHS
Guy's and St Thomas' NHS Foundation Trust
Integrated Care
Ageing and Health
Cardiology Older Persons Service (COPS)

Overview

- Diagnostic challenges of HF in older adults
- Pragmatic approach to managing older patients with HF
- Novel treatments in HF – ARNIs, SGLT-2 inhibitors
- Quality of life (HRQOL, Living Well, Dying well)
- Future directions: integrated care services, one-stop diagnostic clinics, matching treatment to patient phenotype

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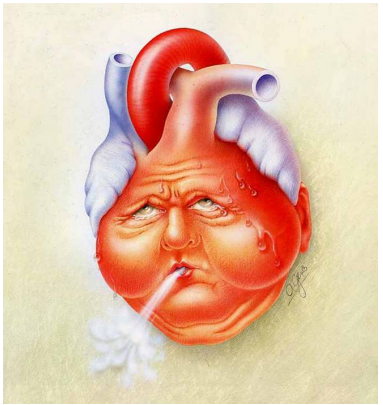
Definitions:

Heart Failure:

*"A **clinical syndrome** characterised by typical symptoms (eg breathlessness, fatigue, ankle swelling) that may be accompanied by signs (eg elevated JVP, pulmonary congestions, rales, peripheral oedema) caused by a **structural and/or functional** cardiac abnormality, resulting in **reduced cardiac output** and/or **elevated intracardiac pressures**"* (ESC, 2016)



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ESC HF Guidelines 2016: Definition of heart failure with preserved (HFpEF), midrange (HFmrEF) and reduced ejection fraction (HFrEF)

Table 3.1 Definition of heart failure with preserved (HFpEF), mid-range (HFmrEF) and reduced ejection fraction (HFrEF)

Type of HF		HFrEF	HFmrEF	HFpEF
CRITERIA	1	Symptoms ± Signs[a]	Symptoms ± Signs[a]	Symptoms ± Signs[a]
	2	LVEF <40%	LVEF 40–49%	LVEF ≥50%
	3	–	1. Elevated levels of natriuretic peptides[b]; 2. At least one additional criterion: a. relevant structural heart disease (LVH and/or LAE), b. diastolic dysfunction (for details see Section 4.3.2).	1. Elevated levels of natriuretic peptides[b]; 2. At least one additional criterion: a. relevant structural heart disease (LVH and/or LAE), b. diastolic dysfunction (for details see Section 4.3.2).

BNP = B-type natriuretic peptide; HF = heart failure; HFmrEF = heart failure with mid-range ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; LAE = left atrial enlargement; LVEF = left ventricular ejection fraction; LVH = left ventricular hypertrophy; NT-proBNP = N-terminal pro-B type natriuretic peptide.

[a]Signs may not be present in the early stages of HF (especially in HFpEF) and in patients treated with diuretics.

[b]BNP>35 pg/ml and/or NT-proBNP>125 pg/mL.

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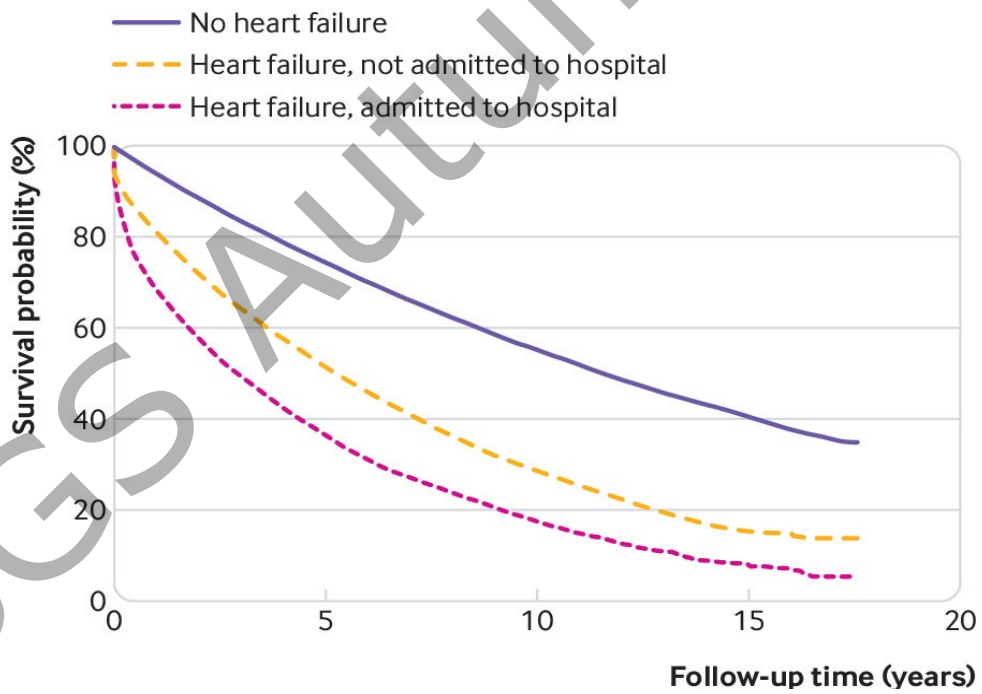
www.escardio.org/guidelines

European Heart Journal, Volume 37, Issue 27, 2016, Pages 2129–2200.

HF Key Facts

- Almost 1million in UK
- Most aged >75 (mean 79yrs)
- Prognosis worse than cancer
- Approximately 50% die within 2yrs of hospitalisation (median 18 months)



Clare J Taylor et al. BMJ 2019;364:bmj.l223

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Typical Case

- 82F presents to GP with mild bilateral ankle swelling, and raised NT-pro BNP 599
- Referred to COE HF (COPS) clinic
- Reports worsening exertional dyspnoea (NYHA 3) for past 12/12
- PMH:
  - HTN on amlodipine
  - T2 DM on gliclazide
  - CKD Stage IIIa (eGFR 45)
  - COPD (FEV1 70%; 20 py)
  - Dyslipidaemia
- ECG: SR 72bpm, LVH

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What is the next step investigation?

1. Echo and spirometry
2. Repeat BNP and echo
3. Exercise stress echo
4. Blood tests, BNP, and echo
5. Echo, right (+/- left) heart catheter

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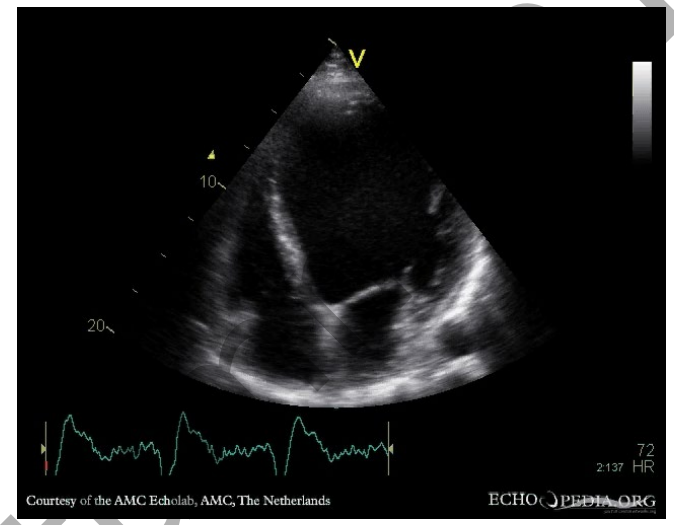
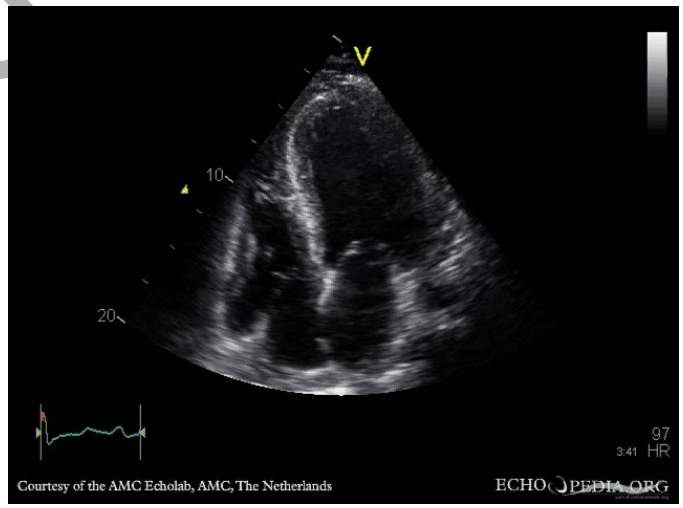
What is the most likely diagnosis in our 82yrs lady?

1. HFrEF



2. HFpEF



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Which objective tests help diagnose HFpEF?

1. LA size and volume
2. E/E`
3. TR velocity
4. Exercise stress echo
5. NT proBNP
6. Symptoms and signs
7. All of the above

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Which finding is not compatible with HFpEF?

1. E/E` 15
2. NT proBNP 202
3. Dilated LA
4. LVEF 44%
5. TR velocity 3.4m/s

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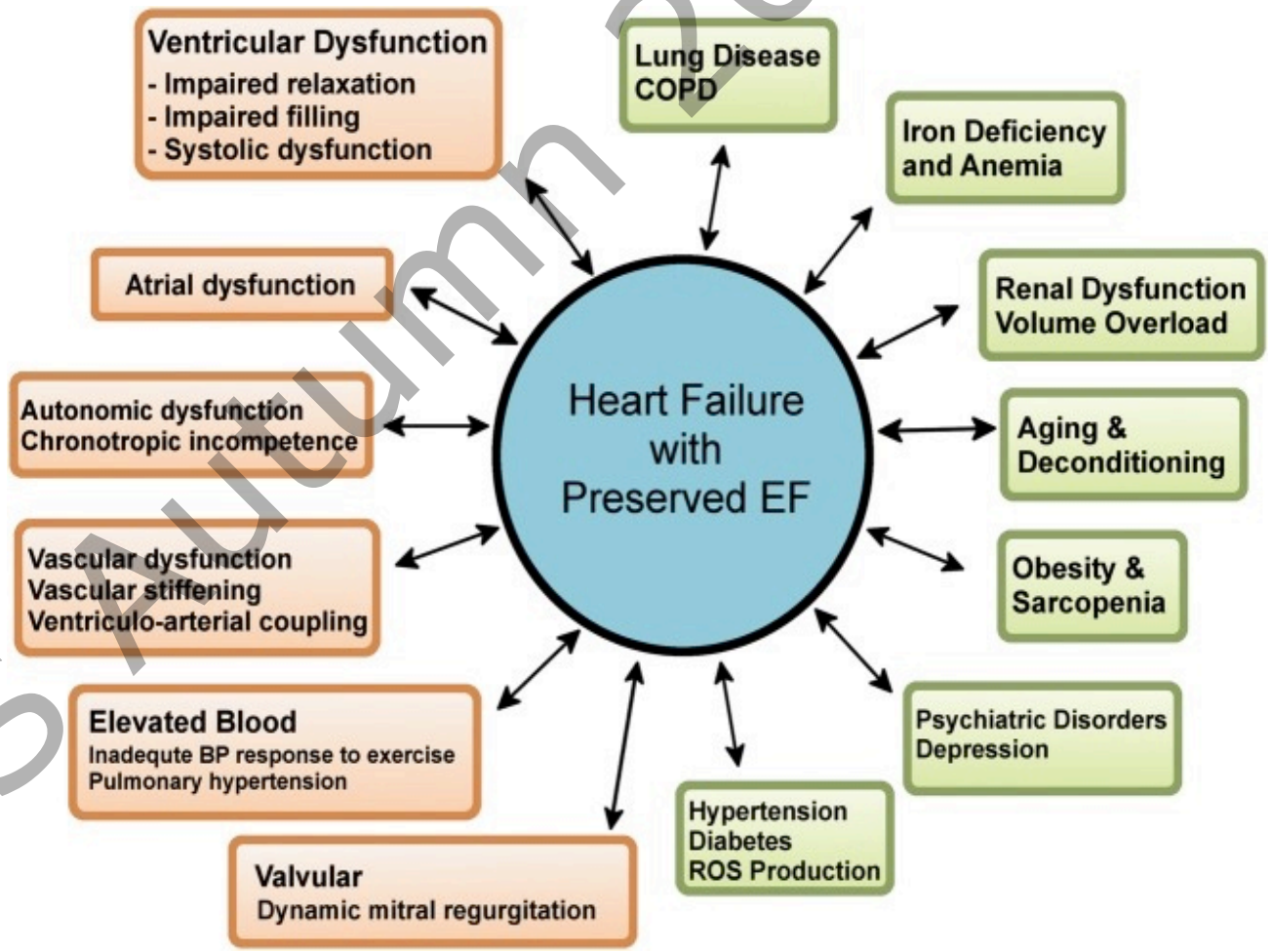
Who are these patients?

Typical demographics and comorbidities associated with HFpEF

Advanced age
Arterial hypertension
Atrial fibrillation
Female gender
Kidney dysfunction
Metabolic syndrome
Obesity
Physical deconditioning
Pulmonary disease (e.g. COPD)
Pulmonary hypertension
Sleep apnoea



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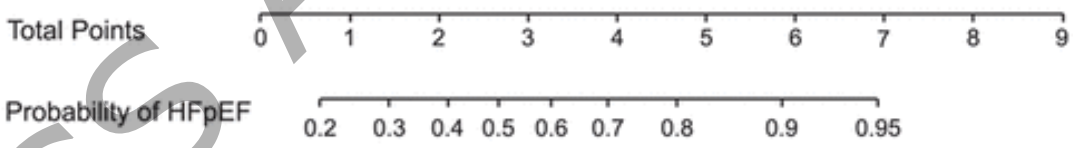
Ponikowski P, et al. Eur Heart J 2016; 37: 2129-200

Senni M, et al. Eur Heart J 2014; 35: 2797-811

H_2FPEF Score

	Clinical Variable	Values	Points
H_2	**H**eavy	Body mass index > 30 kg/m^2	2
	Hypertensive	2 or more antihypertensive medicines	1
F	Atrial **F**ibrillation	Paroxysmal or Persistent	3
P	**P**ulmonary Hypertension	Doppler Echocardiographic estimated Pulmonary Artery Systolic Pressure > 35 mmHg	1
E	**E**lder	Age > 60 years	1
F	**F**illing Pressure	Doppler Echocardiographic E/e' > 9	1
	H_2FPEF score		Sum (0-9)



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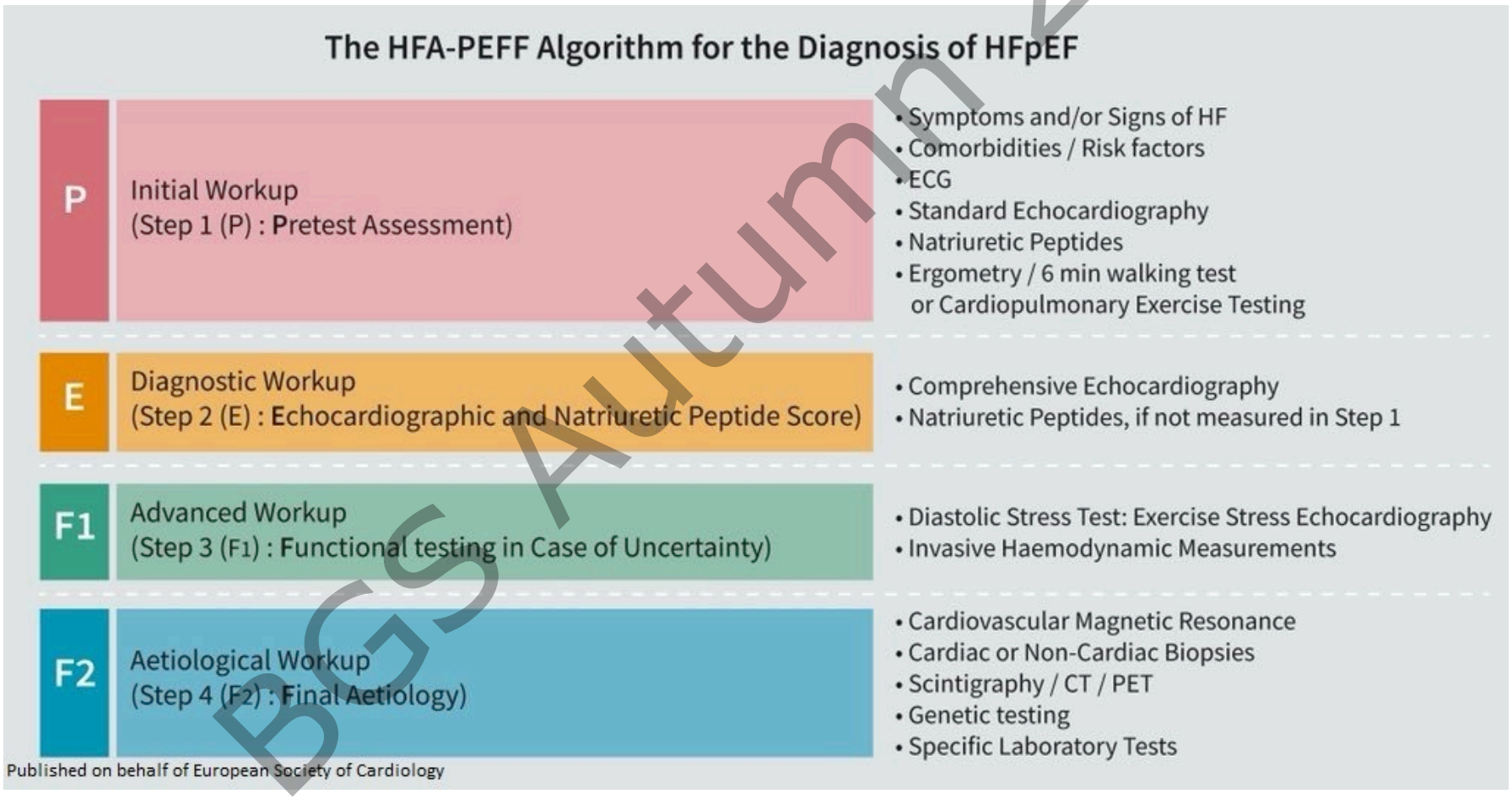
Yogesh N.V. Reddy. Circulation. A Simple, Evidence-Based Approach to Help Guide Diagnosis of Heart Failure With Preserved Ejection Fraction, Volume: 138, Issue: 9, 861-870, DOI: (10.1161/CIRCULATIONAHA.118.034646) © 2018 American Heart Association, Inc.

What is the work up?
- An algorithm for HFpEF diagnosis

ESC/HFA consensus (21 Oct 2019)



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Causes of raised BNP

Cardiac	Non-cardiac
• Heart failure • Acute coronary syndromes • Pulmonary embolism • Myocarditis • Left ventricular hypertrophy • Hypertrophic or restrictive cardiomyopathy • Valvular heart disease • Congenital heart disease • Atrial and ventricular arrhythmia • Heart contusion • Cardioversion, ICD shock • Surgical procedures involving the heart • Pulmonary hypertension	• Advanced age • Ischaemic stroke • Subarachnoid haemorrhage • Renal dysfunction • Liver dysfunction • Paraneoplastic syndromes • Chronic obstructive pulmonary disease • Severe infections • Anaemia • Severe burns • Severe metabolic disturbances

Different causes of elevated BNP/NT-proBNP concentrations due to cardiac and non-cardiac reasons. (Modified from: Ponikowski P, et al. Eur Heart J 2016;37:2129–200)

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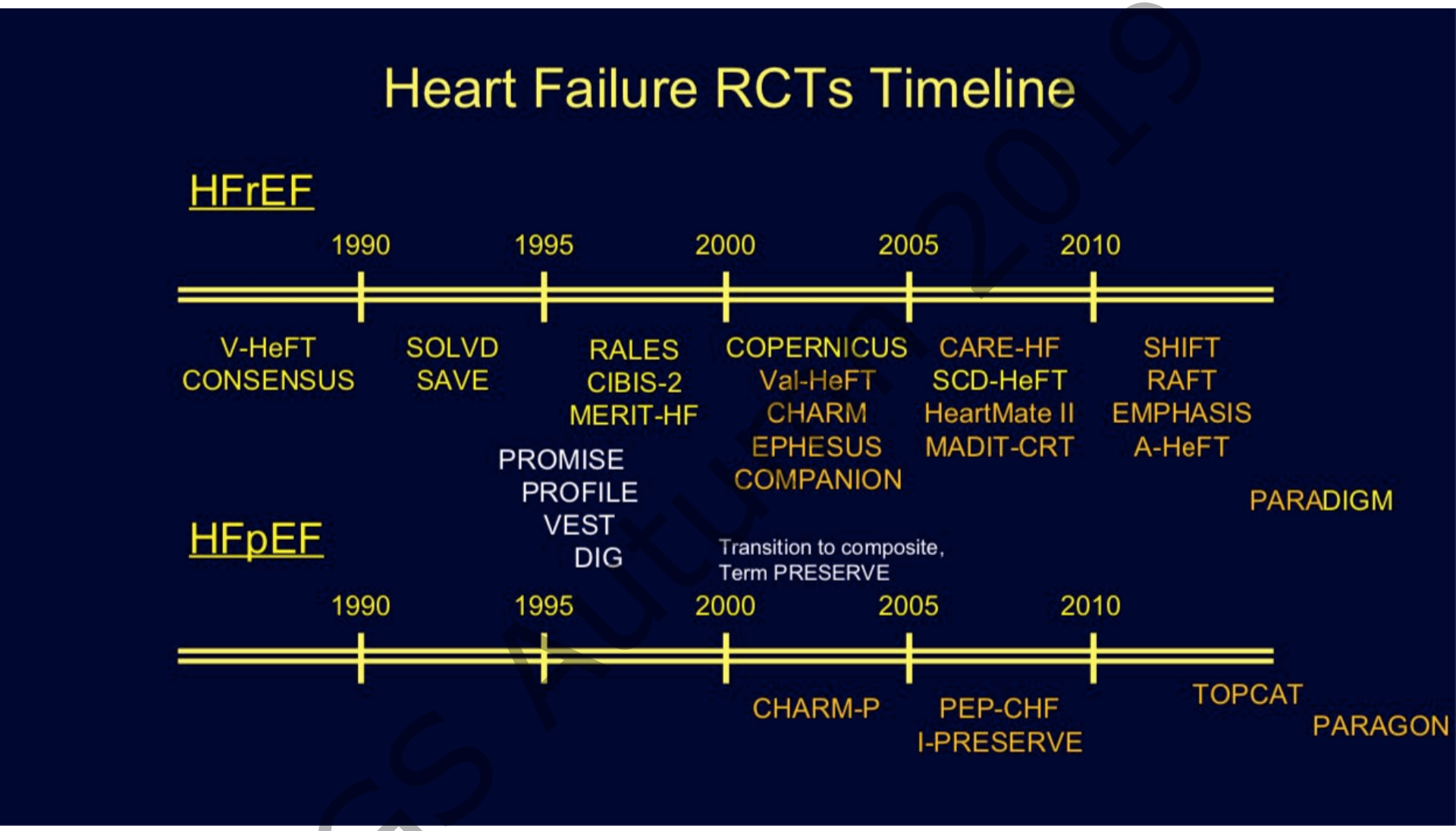

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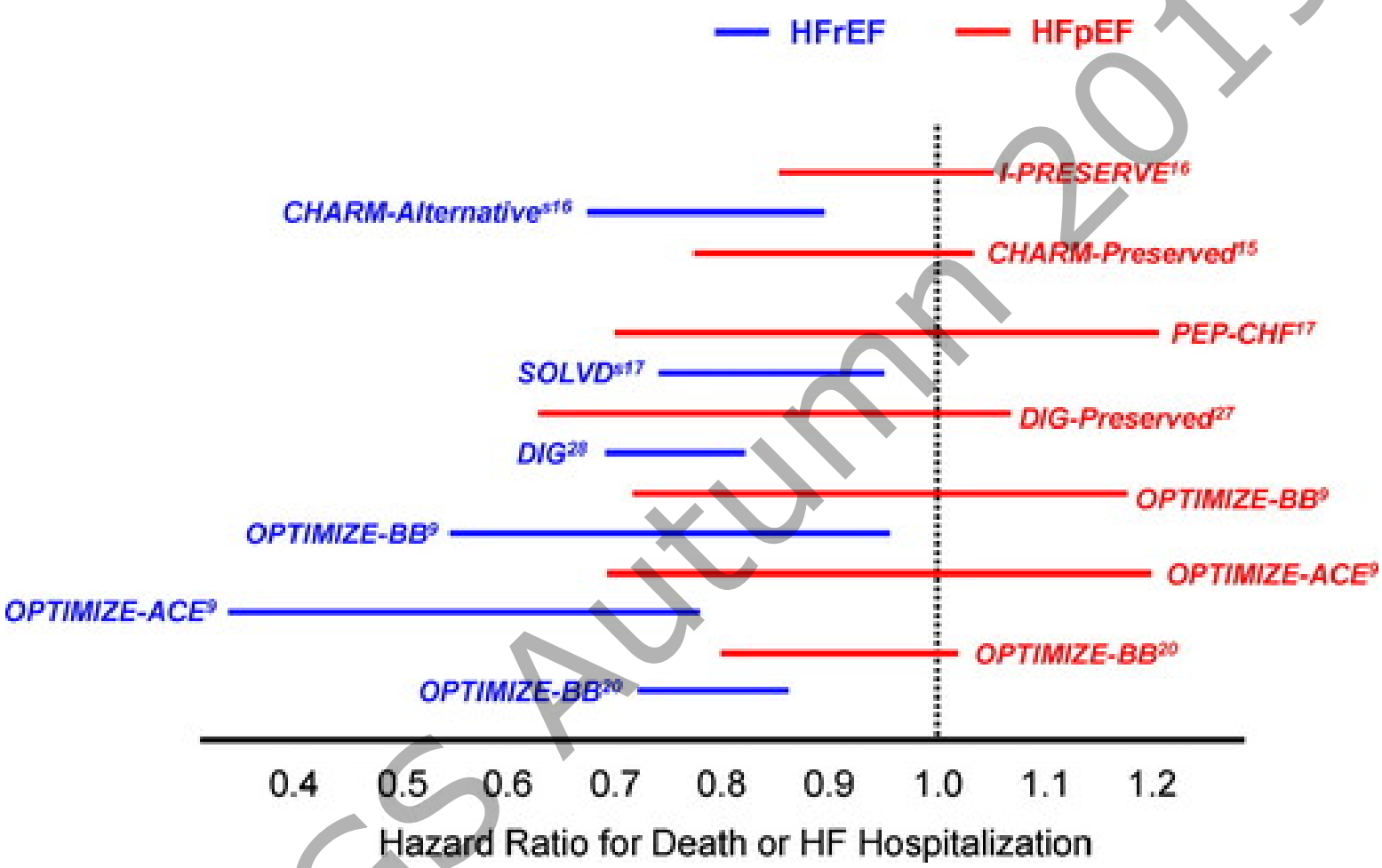
HF Trials since 1980's



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Borlaug B. Circulation 2011.

Treatment- one size does not fit all!

HFrEF

Recommendations	Class [a]	Level [b]	Ref [c]
An ACE-I[d] is recommended, in addition to a beta-blocker, for symptomatic patients with HFrEF to reduce the risk of HF hospitalization and death.	I	A	2, 163 –165
A beta-blocker is recommended, in addition an ACE-I[d], for patients with stable, symptomatic HFrEF to reduce the risk of HF hospitalization and death.	I	A	167– 173
An MRA is recommended for patients with HFrEF, who remain symptomatic despite treatment with an ACE-I[d] and a beta-blocker, to reduce the risk of HF hospitalization and death.	I	A	174, 175

ESC 2016

HFpEF

- Optimise co-morbidities
- Treat symptoms
- Patient specific therapies

- ? MRAs
- ? ARNIs
- ? SGLT2 inhibitors

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Specific recommendations regarding monitoring and follow-up of the older adult with heart failure

Monitor frailty and seek and address reversible causes (cardiovascular and non-cardiovascular) of deterioration in frailty score.
Medication review: optimize doses of heart failure medication slowly and with frequent monitoring of clinical status. Reduce polypharmacy; number, doses and complexity of regime. Consider stopping medication without an immediate effect on symptom relief or quality of life (such as statin). Review the timing and dose of diuretic therapy to reduce risk of incontinence.
Consider need to refer to specialist care of the elderly team and to general practitioner and social worker, etc. for follow-up and support for the patient and his/her family.

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Novel Treatments:

"a new era in heart failure medical treatment"

- ARNIs
- SGLT-2 inhibitors

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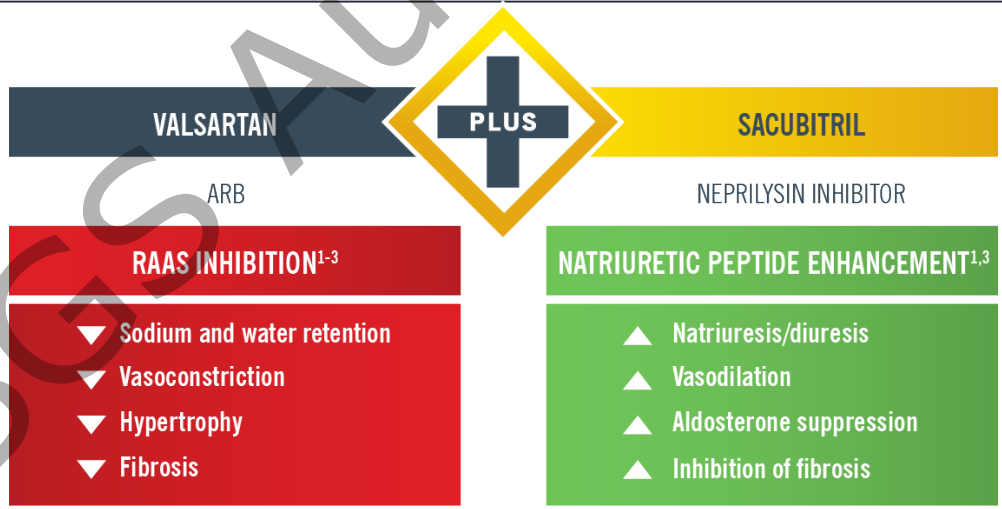
ARNIs in HFrEF

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 SEPTEMBER 11, 2014 VOL. 371 NO. 11

Angiotensin–Neprilysin Inhibition versus Enalapril in Heart Failure

John J.V. McMurray, M.D., Milton Packer, M.D., Akshay S. Desai, M.D., M.P.H., Jianjian Gong, Ph.D., Martin P. Lefkowitz, M.D., Adel R. Rizkala, Pharm.D., Jean L. Rouleau, M.D., Victor C. Shi, M.D., Scott D. Solomon, M.D., Karl Swedberg, M.D., Ph.D., and Michael R. Zile, M.D., for the PARADIGM-HF Investigators and Committees*



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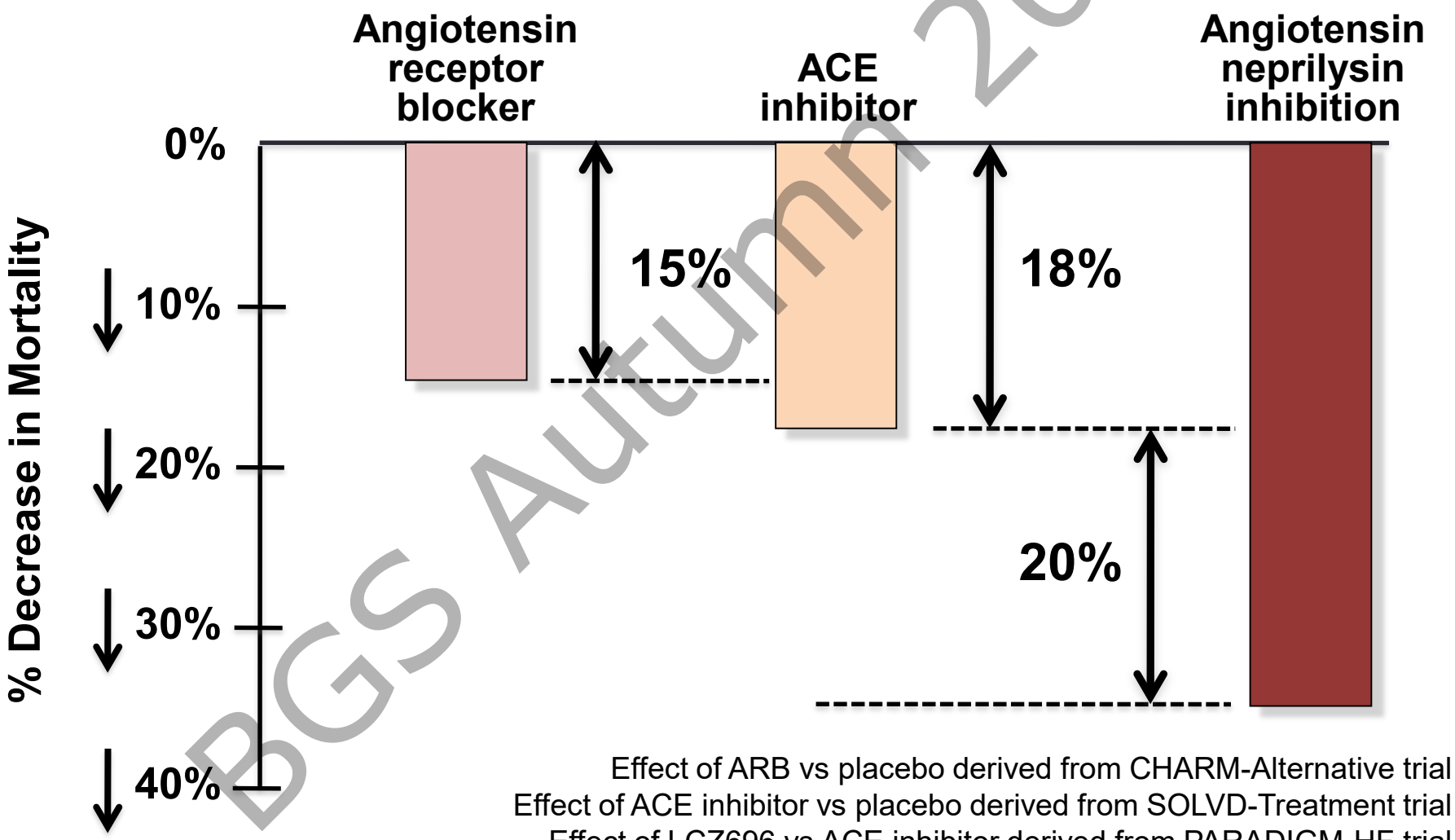
Angiotensin Neprilysin Inhibition Doubles Effect on Cardiovascular Death of Current RAAS Inhibitors



Effect of ARB vs placebo derived from CHARM-Alternative trial
Effect of ACE inhibitor vs placebo derived from SOLVD-Treatment trial
Effect of LCZ696 vs ACE inhibitor derived from PARADIGM-HF trial

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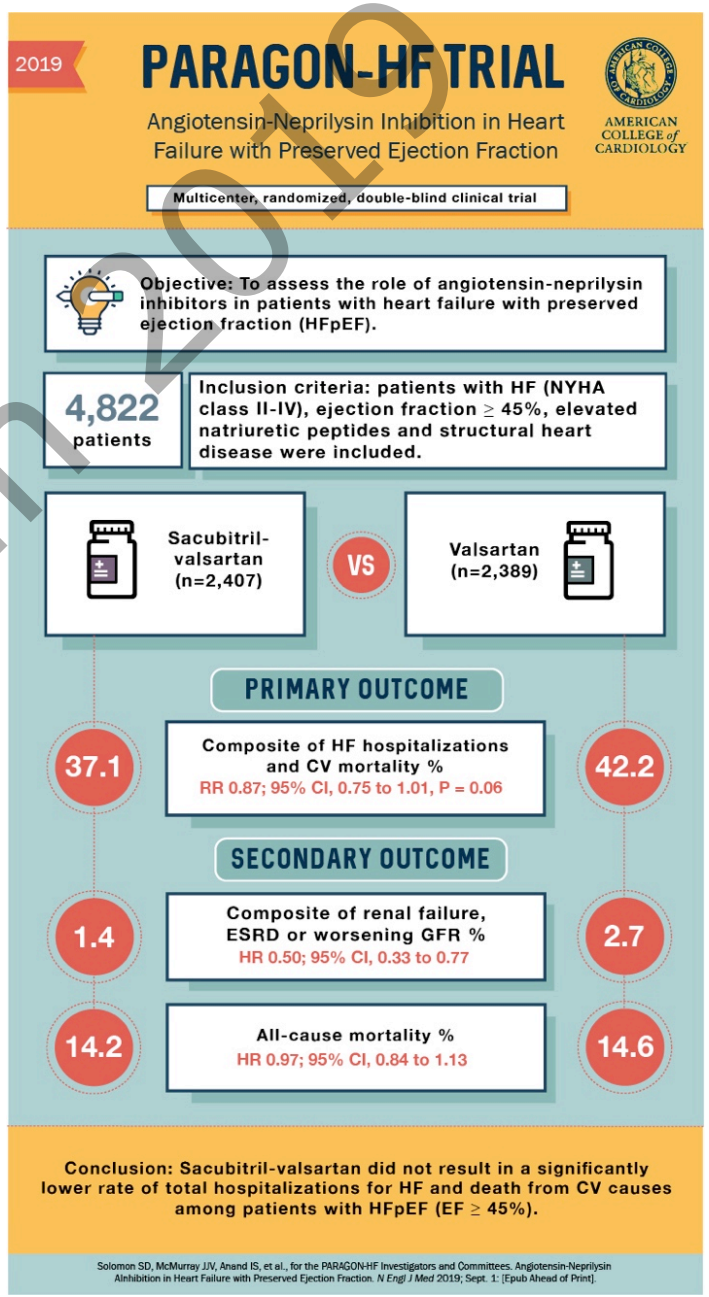
ARNIs in **HFpEF** (PARAGON HF study 2019)

- No significant reduction in incidence of CV death or hospitalisation
  - Trend towards benefit
- Lower EF and women benefitted most
- Better renal outcomes



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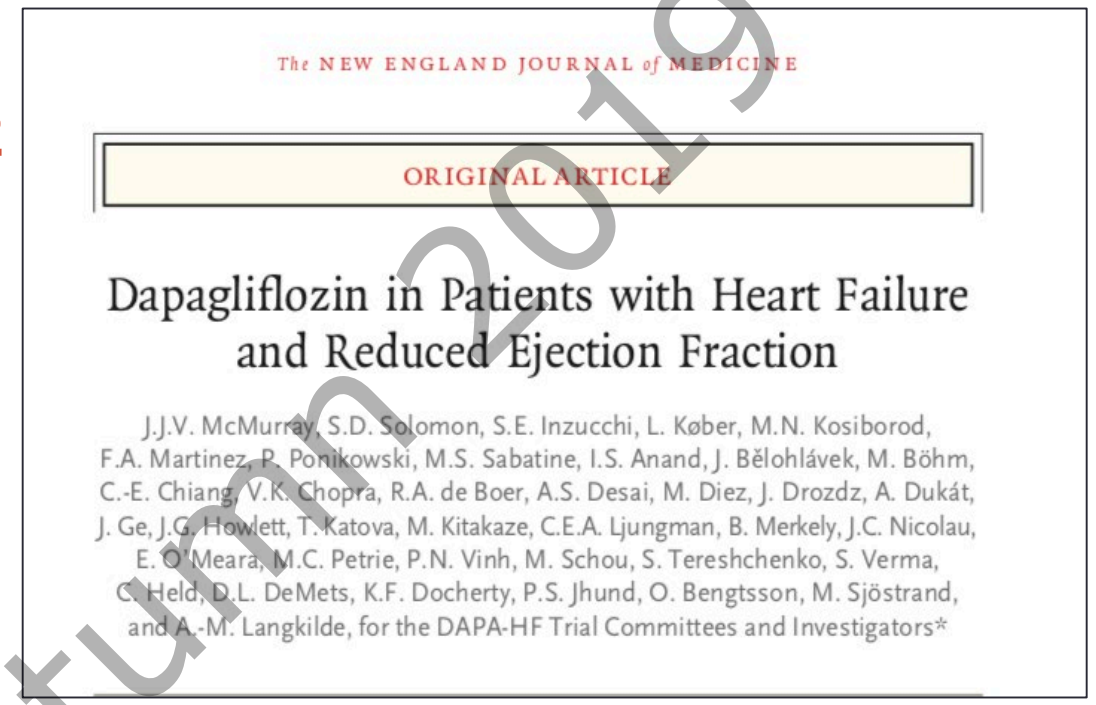
SGLT-2 Inhibitors

- *Dapa-HF* study 2019 (NEJM)
- 4744 patients **HFrEF**
- ↓ risk for all-cause death by 18%
- ↓ relative risk of dying or HF hospitalisation by 26% compared to standard therapies (p= 0.00001, NNT 21)
- Can be used in patients with or without T2 diabetes (T1 DM excluded)
- SEs: UTIs and candida



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Dapagliflozin in Patients with Heart Failure and Reduced Ejection Fraction

J.J.V. McMurray, S.D. Solomon, S.E. Inzucchi, L. Køber, M.N. Kosiborod, F.A. Martinez, P. Ponikowski, M.S. Sabatine, I.S. Anand, J. Bělohlávek, M. Böhm, C.-E. Chiang, V.K. Chopra, R.A. de Boer, A.S. Desai, M. Diez, J. Drozdz, A. Dukát, J. Ge, J.G. Howlett, T. Katova, M. Kitakaze, C.E.A. Ljungman, B. Merkely, J.C. Nicolau, E. O'Meara, M.C. Petrie, P.N. Vinh, M. Schou, S. Tereshchenko, S. Verma, C. Held, D.L. DeMets, K.F. Docherty, P.S. Jhund, O. Bengtsson, M. Sjöstrand, and A.-M. Langkilde, for the DAPA-HF Trial Committees and Investigators*

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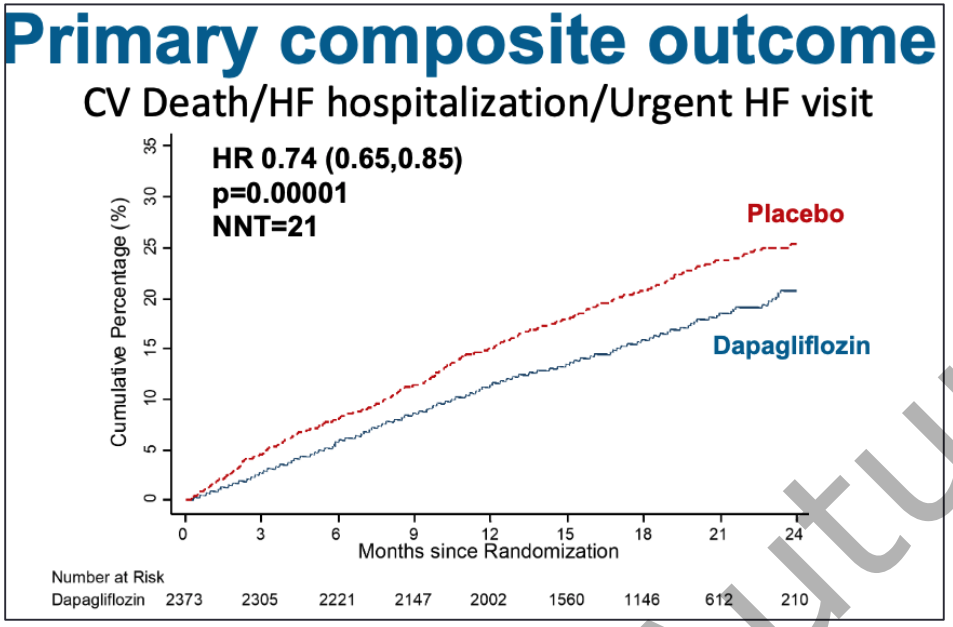
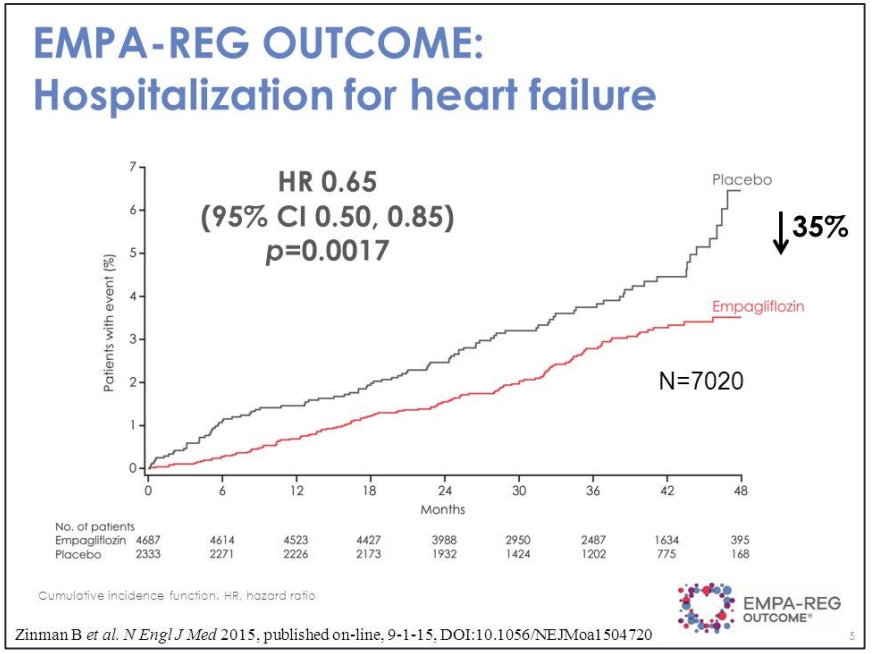
SGLT-2 inhibitors - HFrEF





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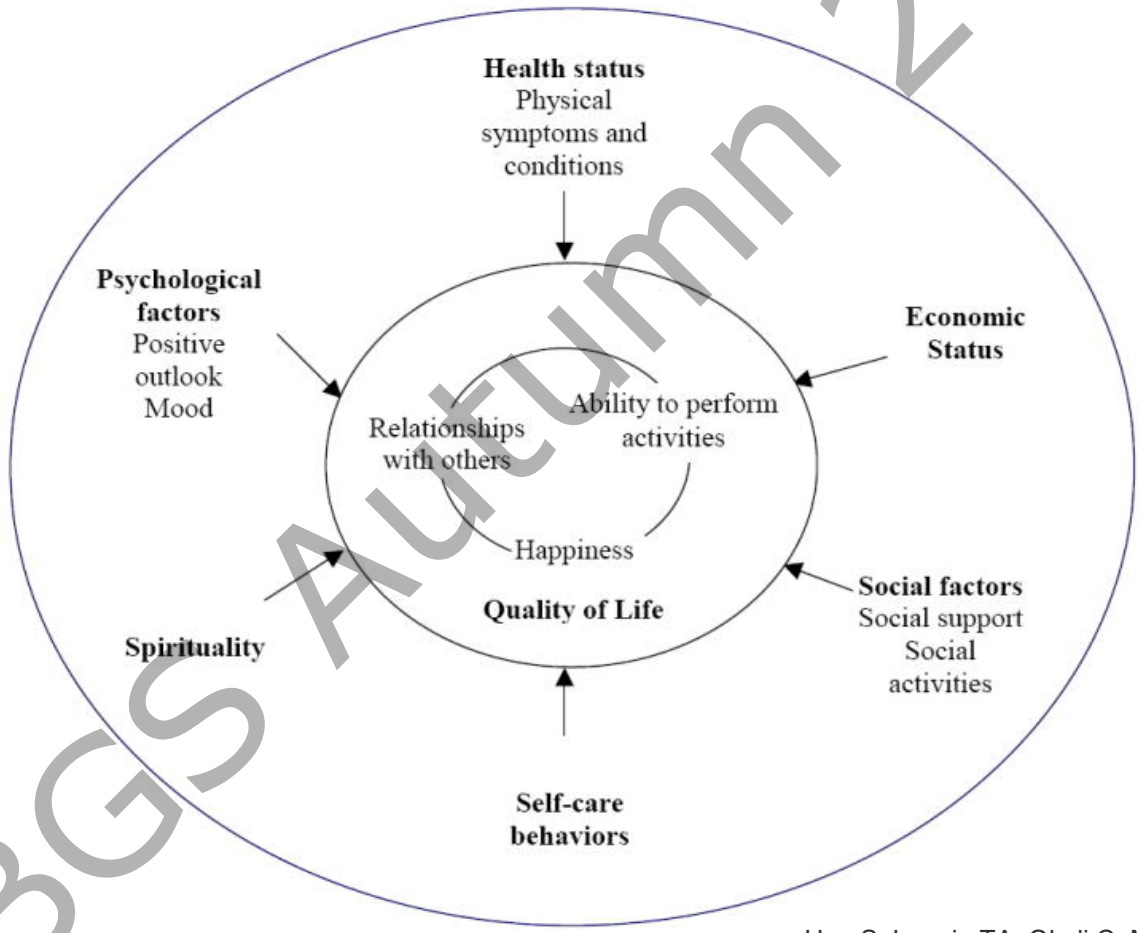
Quality of life in patients with Heart Failure



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Heo S, Lennie TA, Okoli C, Moser DK. Quality of life in patients with heart failure: ask the patients. *Heart Lung*. 2009;38(2):100–108. doi:10.1016/j.hrtlng.2008.04.002

Quality of Life and Wellbeing

- The **Minnesota Living with Heart Failure (MLHFQ)** questionnaire is the most commonly used disease-specific instrument to measure QOL in heart failure with proven validity and reliability (Erceg et al, 2019).
  - takes ~20mins,
  - 21 items which reflect a patients everyday life
  - Total score between 0 and 105
  - higher values indicating poorer HRQOL

- **Maintaining a good quality of life is as important as survival** to most patients living with chronic, progressive illnesses. **Poor QOL is related to high hospitalisation and mortality rates.**

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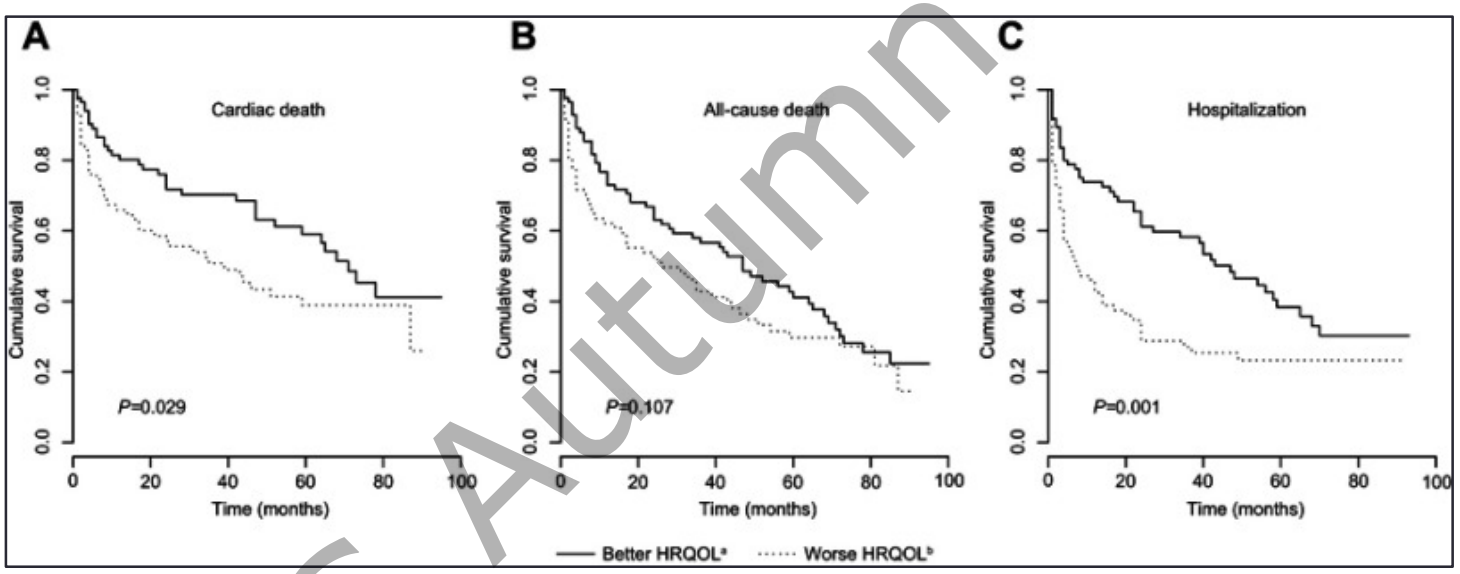
Prognostic value of HRQOL Questionnaires

- Higher MLHFQ score = higher probability of death or hospitalisation



Solid line = MLHFQ score ≤47; Dashes = Worse HRQOL - MLHFQ score >47.

Erceg P, et al. 2019. Clin Interv Aging.

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Treatments proven to Improve QOL

- **ACEi, ARBs, and Ivabradine** (I*f* channel) increased HRQOL in older subjects (LIVE:LIFE trial, 2017)
- **SGLT-2 inhibitors (DAPA-HF 2019)**- improvement in symptom scores favouring dapagliflozin over placebo (KCCQ score 6.1 vs 3.3 points; P < 0.001)
- **Cardiac resynchronization therapy** (CRT) in selected patients produce improvements in HRQOL (Veazie et al., 2012)
- **Multidisciplinary** HF management and monitoring programs also improve HRQOL in HF patients (ESC, 2016)
- **Cardiac rehabilitation** and **exercise** training programs appear to be among the most promising interventions for improving HRQOL in elderly HF patients (Erceg et al., 2019)

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Cardiac rehab and exercise

- Evidence that cardiac rehabilitation: (Cochrane review - Long L et al., 2019)
  - reduces mortality
  - reduces morbidity
  - reduces unplanned hospital admissions
  - improvements in exercise capacity
  - Improves quality of life (improvement in the MLHFQ (P=0.0007), and psychological well-being)

- Exercise **improves diastolic function and QOL in HFpEF**
  - Italian study (Antonicelli et al, 2016) randomised 343 elderly pts (mean age 77yrs) to 'exercise training' or usual care and found:
  - ↑walking distance
  - ↑QOL was improved
  - ↓NT-proBNP

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Its safe!

A French observational study (Pavy et al, 2006) > 25 000 patients undergoing cardiac rehabilitation reported only 1 cardiac event per 50 000 hours of exercise training, equivalent to 1.1 cardiac arrest per million patient-hours

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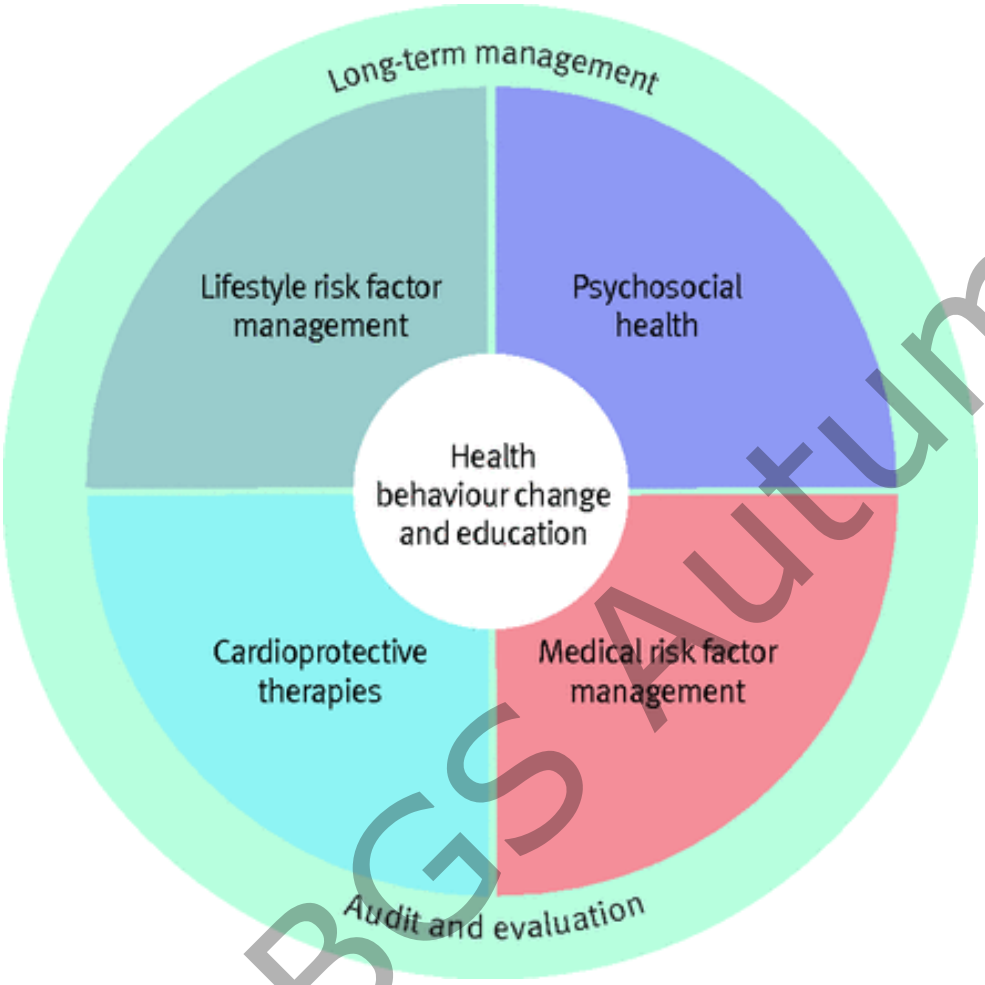
Core components of cardiac rehabilitation



MDT management is crucial:

- Cardiologist, community cardiologist, physician, or general practitioner with a special interest
- Nurse specialist
- Physiotherapist
- Dietitian
- Psychologist
- Exercise specialist
- Occupational therapist

Dalal HM et al. Cardiac rehabilitation BMJ 2015

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Recommendations	Class	Level
Exercise, multidisciplinary management, and monitoring of patients with heart failure		
It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional capacity and symptoms.	I	A
It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization.	I	A
It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality.	I	A

ESC 2016

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Living Well:
Optimisation, prevention and education

- **Optimise** underlying co-morbidities:
  - control HTN:
    - HYVET trial (Beckett et al): tight BP control reduced risk of developing HF by 72% compared with placebo in elderly pts (≥ 80years old) with high BP. (NB potential increased falls risk etc)
  - optimise kidney disease
  - weight loss
- **Prevention** measures e.g. healthy diet, smoking cessation, and exercise.
- Treat iron deficiency
- Vaccinations
- Public **education** about heart failure, adherence, self care

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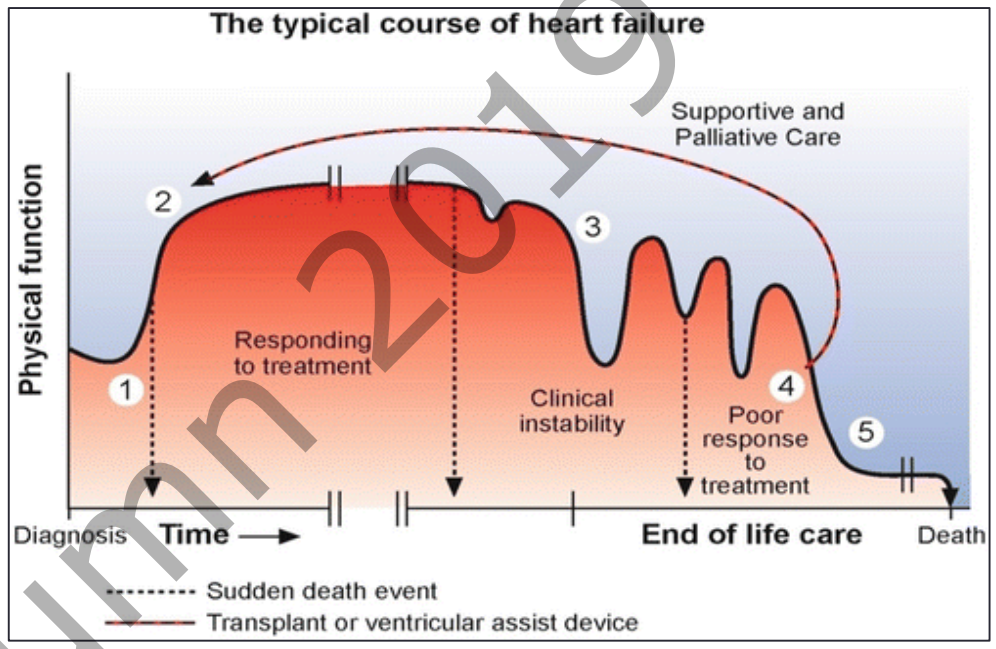
Dying well:



Goodlin S, 2009. JACC

- Focus on improving QOL
- Advanced care planning
- Early discussions with patients and families
- Early referral to community palliative care:
  - The value of palliative care and effective EOL care should be communicated more widely and sooner to patients and their families, to encourage timely decision-making.
- Timely decision making to stop unnecessary investigations & medications

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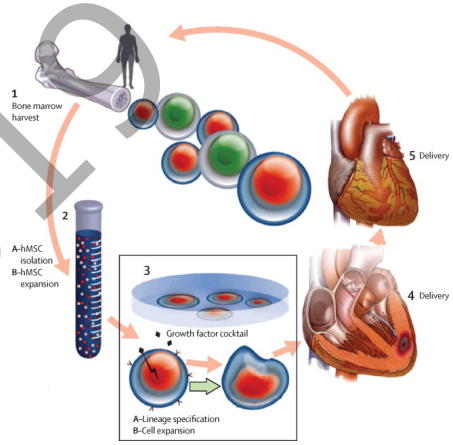
The Future



- **More RCTs needed which include elderly, frail patients**
- Matching treatment strategies to a specific patient's phenotype:
  - e.g. Amyloid, Valve disease, Pulmonary hypertension, HTN
- **New therapies for HFpEF: targeting endothelial dysfunction and the pulmonary vascular bed may provide novel therapeutic agents.** Biological therapies.
- Novel ways of providing cardiac rehabilitation and community care using the internet and mobile phones. Telemedicine to monitor patients.
- One stop clinics for older, frailer patients
- **NHS Long Term Plan: increased testing in primary care eg BNP and echo in the community, rapid community response teams, cardiac rehab, MDT approach**
- **Integrated care - better integration of hospital, community and emergency care**

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Summary

- In our patient cohort: a holistic, patient-centred approach with focus on QOL is paramount
- Understanding HFpEF and its management is particularly relevant
  - New diagnostic algorithm and scores for HFpEF
- International guidelines recommend cardiac rehabilitation and exercise programmes which including health education and psychological wellbeing
- Collaborative, multidisciplinary and integrated approach is essential

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THANK YOU

QUESTIONS?

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British Geriatrics Society
Improving healthcare for older people

BGS

24th Annual
BGS Cardiovascular SIG Meeting

24 January 2020, London

Cardiovascular ambulatory care in the older person - what is possible?

This event is intended for clinicians and healthcare professionals working with older people with cardiovascular disease. The day will include keynote presentations from experts in the field, symposia, and exhibitions from commercial organisations. Topics include:

- Ambulatory care and the older person
- Hospital at home
- Monitoring in ambulatory care
- Heart failure
- Venous thromboembolic diseases
- Chest pain assessment and management

Registration and programme at www.bgs.org.uk/events

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