HEART FAILURE GUIDELINE UPDATES: CONSIDERATIONS IN OLDER ADULTS

A presentation for Healthtrust members
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Learning Objectives: Pharmacists and Nurses

1. Recognize Heart Failure (HF) treatment and guideline updates
2. Recall diagnostic criteria and laboratory findings associated with HF
3. Identify current evidence related to treatment considerations in older adults with HF

Learning Objectives: Pharmacy Technicians

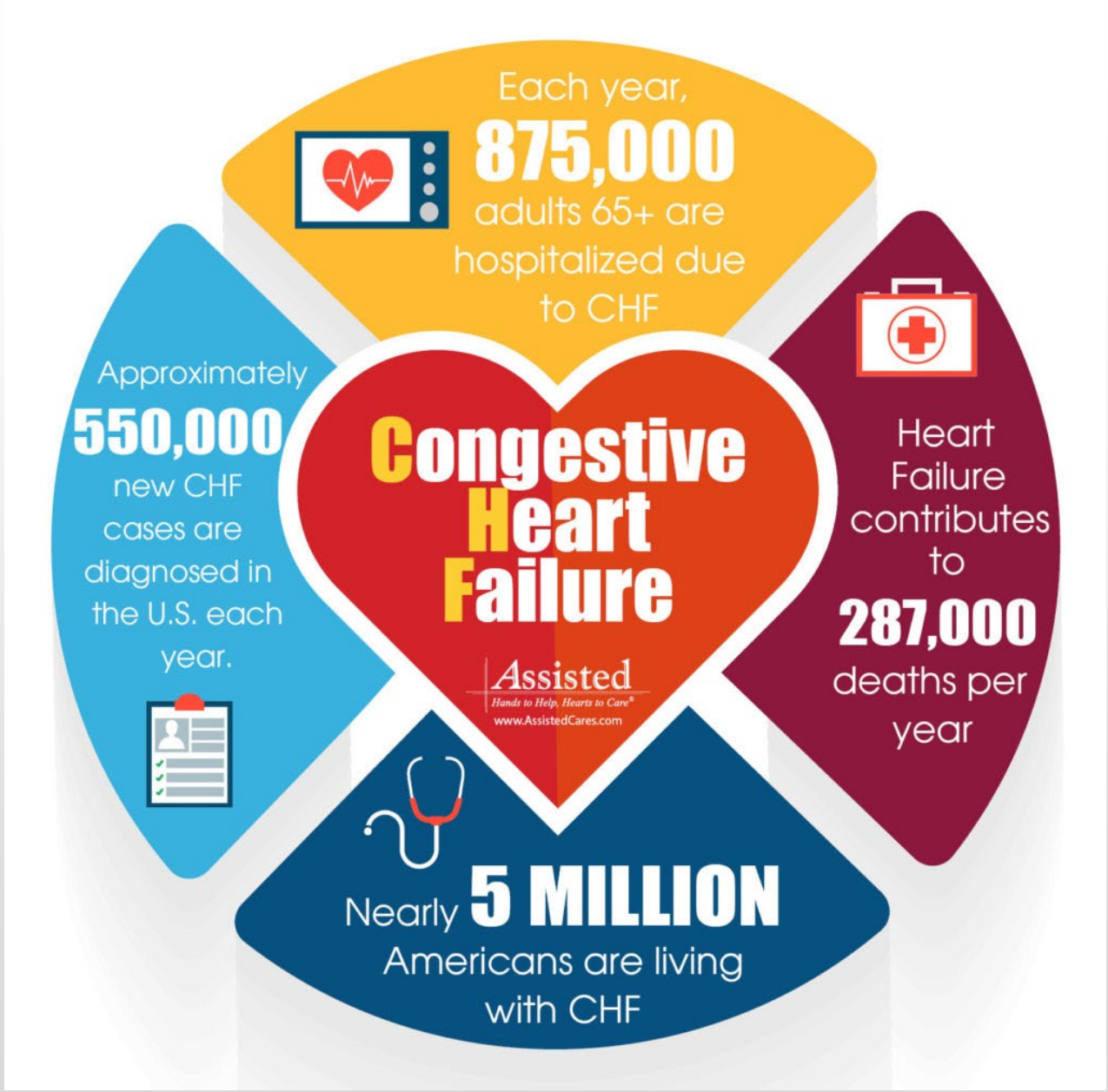
1. Recall the definition of HF
2. Recognize HF treatment considerations in older adults
3. Identify medications used in the treatment of HF

BACKGROUND

CONGESTIVE HEART FAILURE

- Complex clinical syndrome with symptoms and signs that result from structural or functional impairment of ventricular filling or ejection of blood
- Risk factors:
  - Hypertension, obesity, prediabetes, diabetes, acute myocardial infarction
- Other causes:
  - Cardiotoxicity from substance abuse, cardiomyopathy, myocarditis, autoimmune disease

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

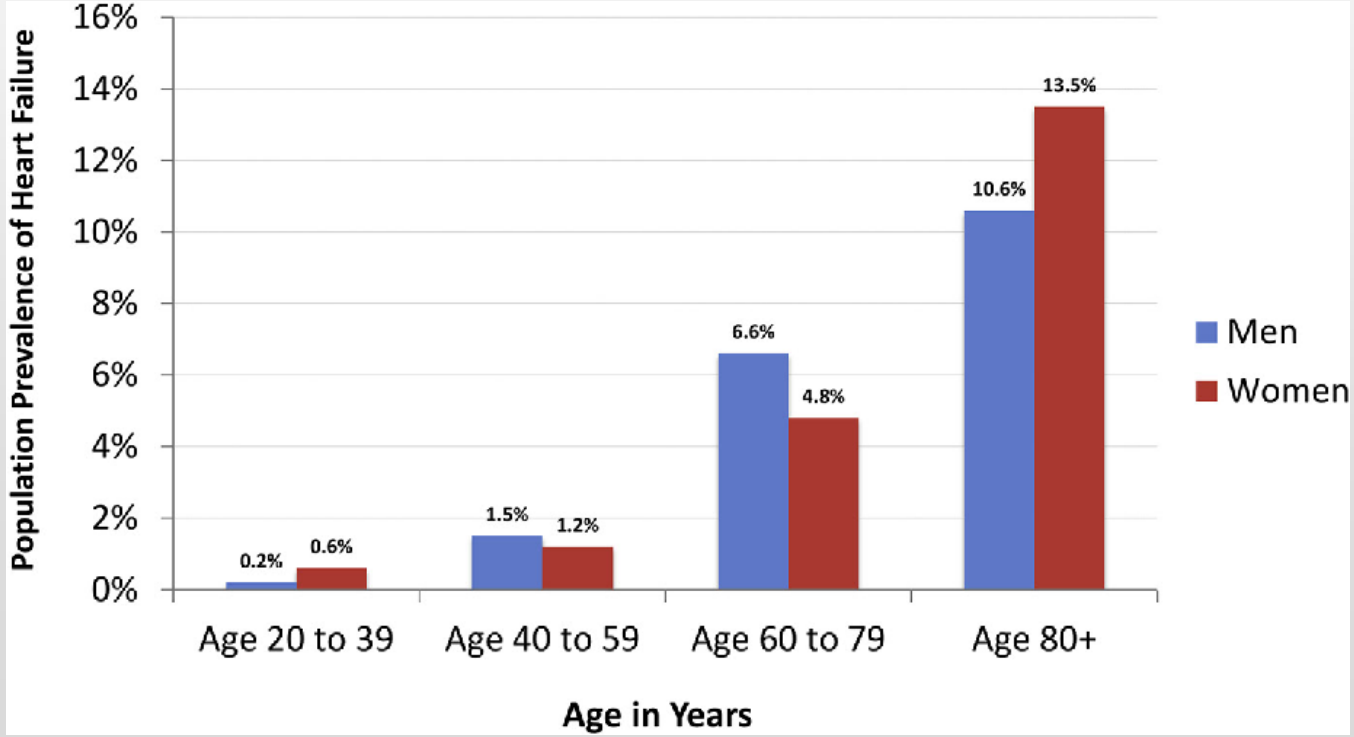


Heart Failure: Epidemiology

Source: J Am Coll Cardiol Heart Fail. 2020 Jul, 8 (7) 523–536.

Heart Failure: Epidemiology in Older Adults

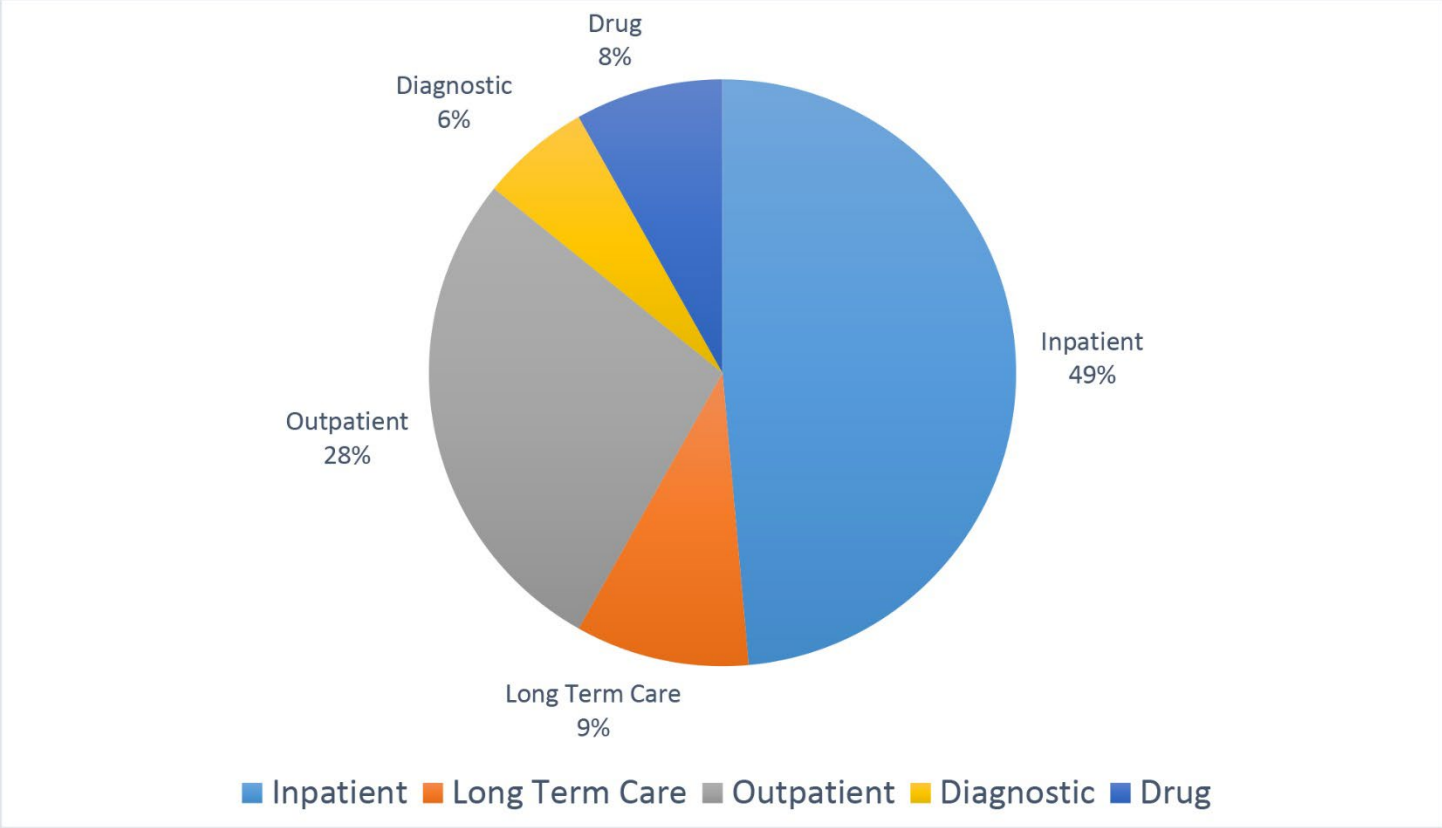
- The prevalence of HF increases significantly with age and is estimated to affect more than 6 million adults in the U.S.
- Second most common inpatient diagnosis billed to Medicare
- Prevalence:



Source: Dharmarajan K, et al. *Heart Fail Clin.* 2017;13(3):417-426.

Heart Failure: Economic considerations

- The annual cost of caring for a patient with heart failure is nearly $30,000
- By 2030 US heart failure costs are expected to reach $160 billion per year

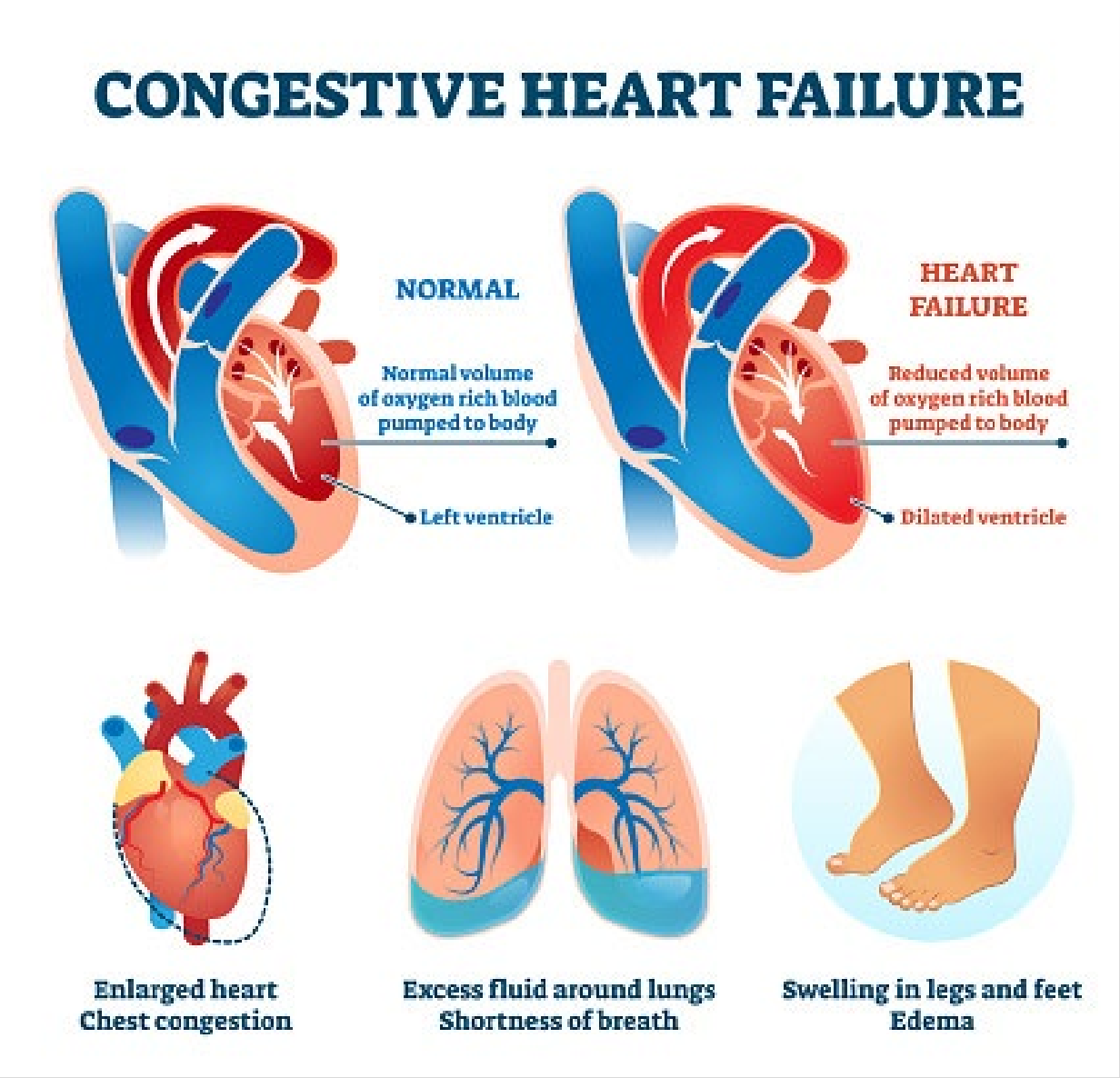


Source: Heidenreich PA, et al. *J Card Fail*. 2022;28(3):453-466.

Heart Failure: Pathophysiology

Renin-angiotensin-aldosterone system (RAAS)	• Increased blood vessel constriction and increased fluid retention
Sympathetic nervous system	• Norepinephrine release → increased HR, contractility and constriction
Vasopressin	• Increases fluid retention and constriction to blood vessels

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.



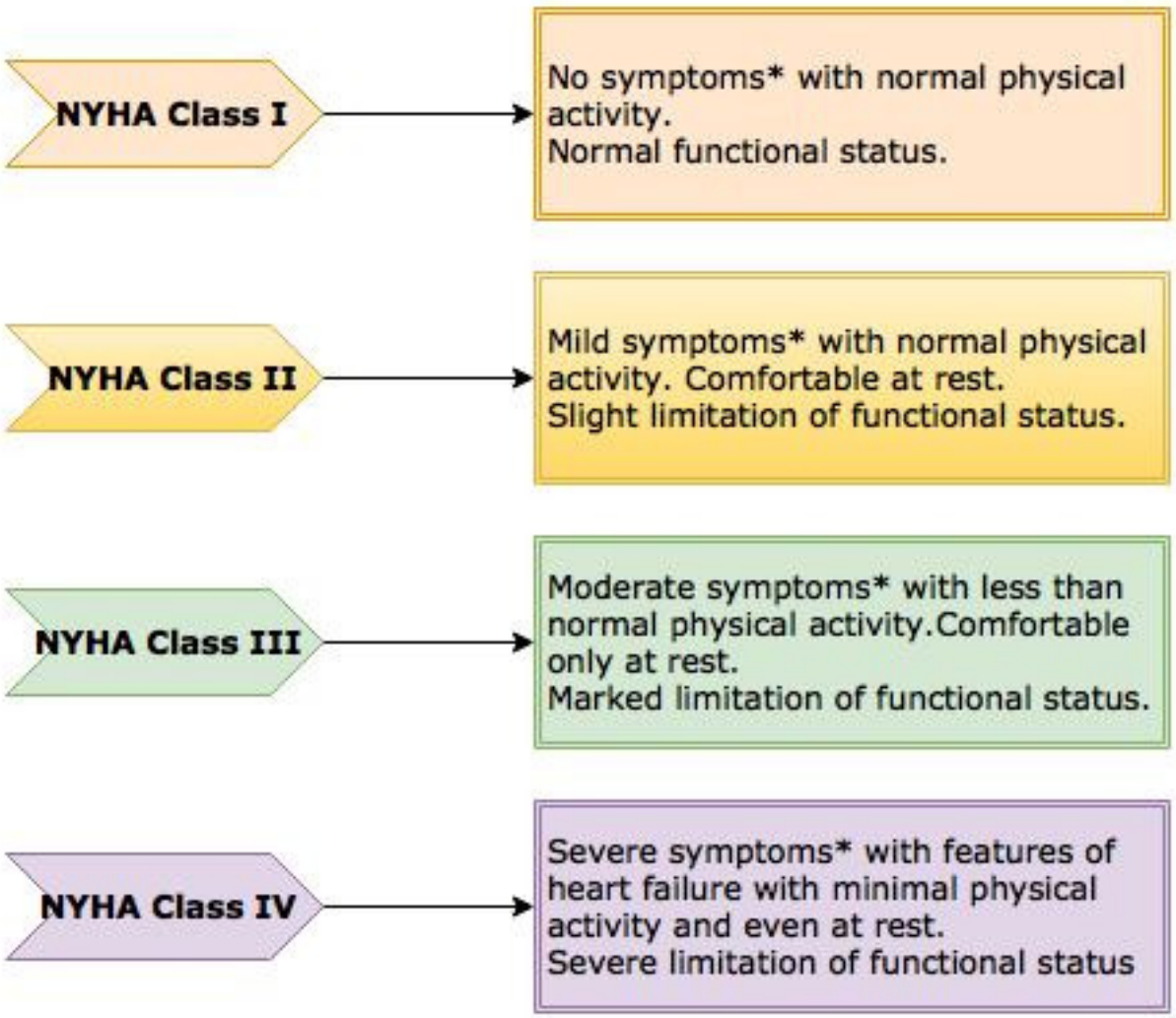
Heart Failure: Pathophysiology

Diagnosis

- **Symptoms on exam**
  - Shortness of breath on rest or exertion
  - Orthopnea
  - Rales on lung exam
  - S3 gallop
  - Hypoperfusion
  - Jugular vein distention (JVD)
  - Pitting edema
- **Laboratory diagnostic criteria**
  - Increased BNP (>100 ng/L)
  - Increased NT-proBNP (>300 ng/L)
  - Exercise stress test if diagnosis remains unclear
  - Left ventricular ejection fraction (LVEF) with transesophageal echocardiogram (TEE)

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

New York Heart Association (NYHA) Classification of severity of Heart Failure

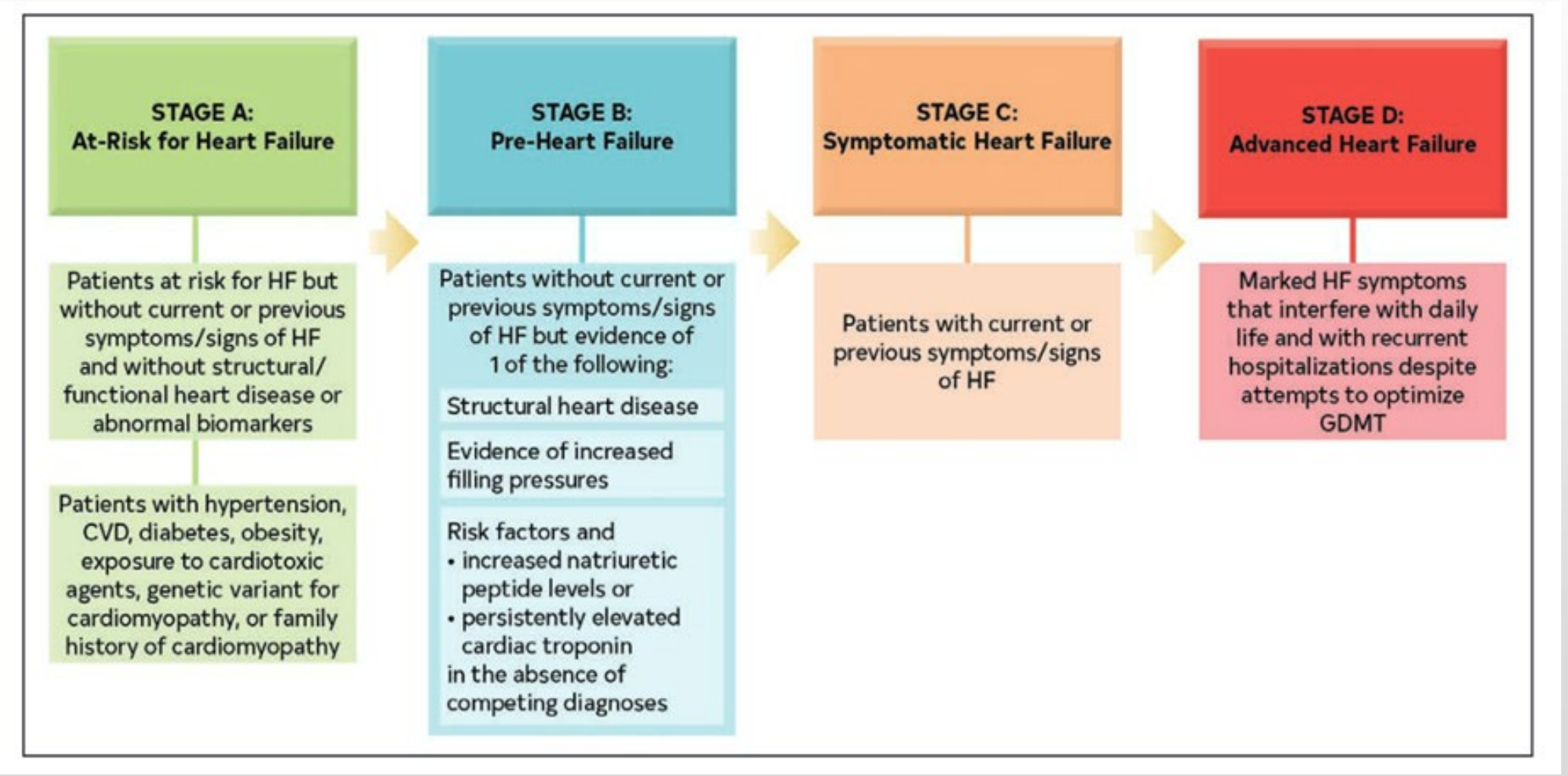


*Symptoms - Fatigue, palpitations, chest pain, dyspnea, syncope

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Heart Failure: Classifications

Classifications



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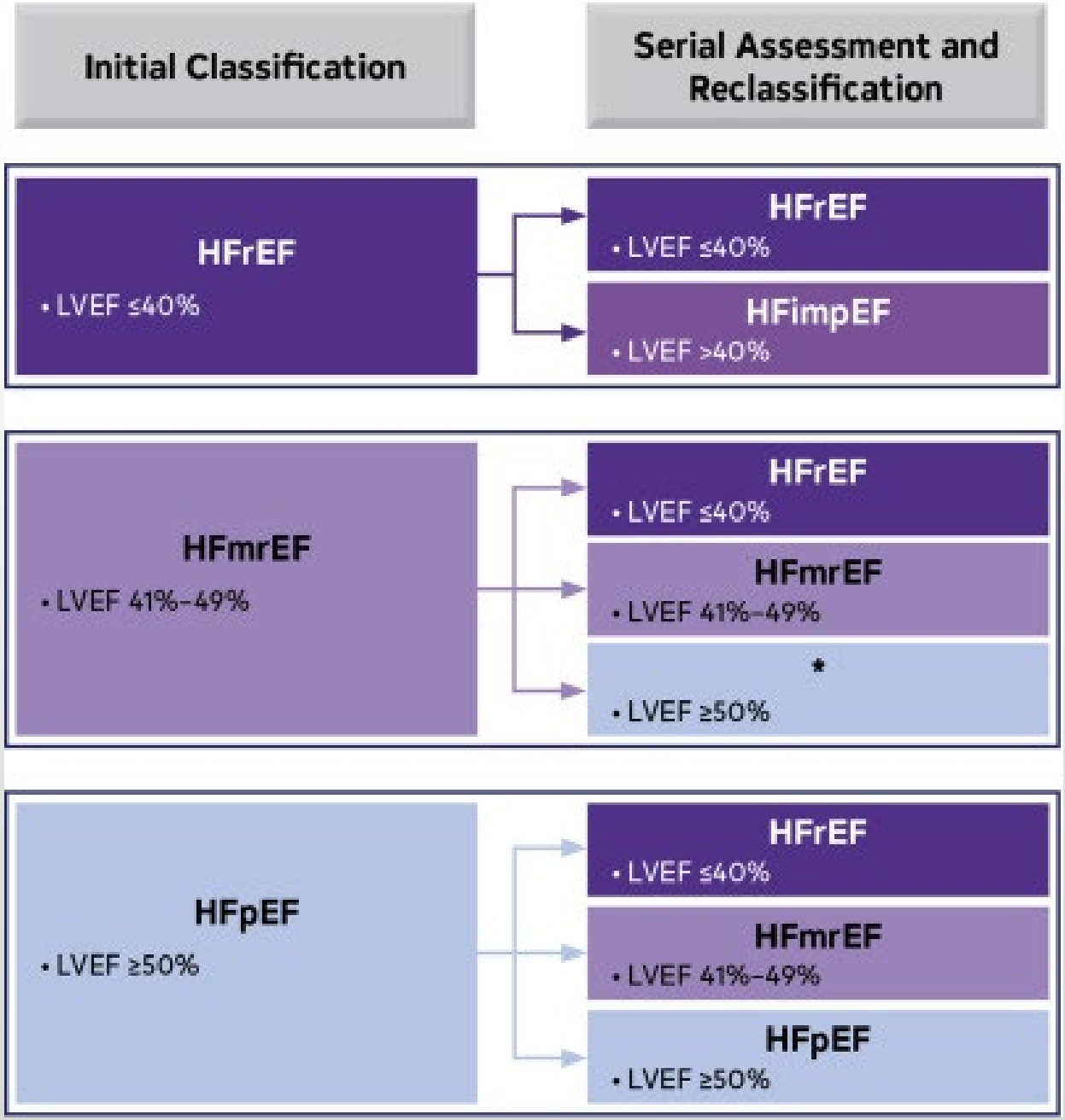

Source: Heidenreich PA, et al. *J Am Cardiol.* 2022. 79 (17) 1757–1780.

Diagnosis: Classification based on EF

Knowledge Check 1– Pharmacist/Nurse

Which of the following HF classifications are newly added to the 2022 ACC/AHA HF Guidelines?

A. HFrEF

B. HFpEF

C. HFmrEF

D. HFimpEF

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CHF: Goals of Therapy

Relieve	Decrease	Reduce
Relieve symptoms and improve quality of life	Decrease hospitalizations	Reduce morbidity and mortality

Knowledge Check 1 – Pharmacy Technician

Heart failure is defined as:

A. A chronic progressive condition in which the muscle pumps too much blood

B. A chronic progressive condition in which the muscle doesn't pump blood as well as it should

C. A condition in which the heart stops working

D. A condition where patients will present with a myocardial infarction

Knowledge Check 1 – Pharmacy Technician

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D. A condition where patients will present with a myocardial infarction

Knowledge Check 2– Pharmacist/Nurse

A 65 year old man presented to the hospital with shortness of breath and fatigue. PMH: HFrEF (EF 35% in 2021), HTN, HLD. The ECHO today shows a LVEF 45%. According to the new ACC/AHA HF Guidelines, which of the following classifications represents the patient's heart failure?

A. Heart Failure with preserved Ejection Fraction (HFpEF)

B. Heart Failure with reduced Ejection Fraction (HFrEF)

C. Heart Failure with mildly reduced Ejection Fraction (HFmrEF)

D. Heart Failure with improved Ejection Fraction (HFimpEF)

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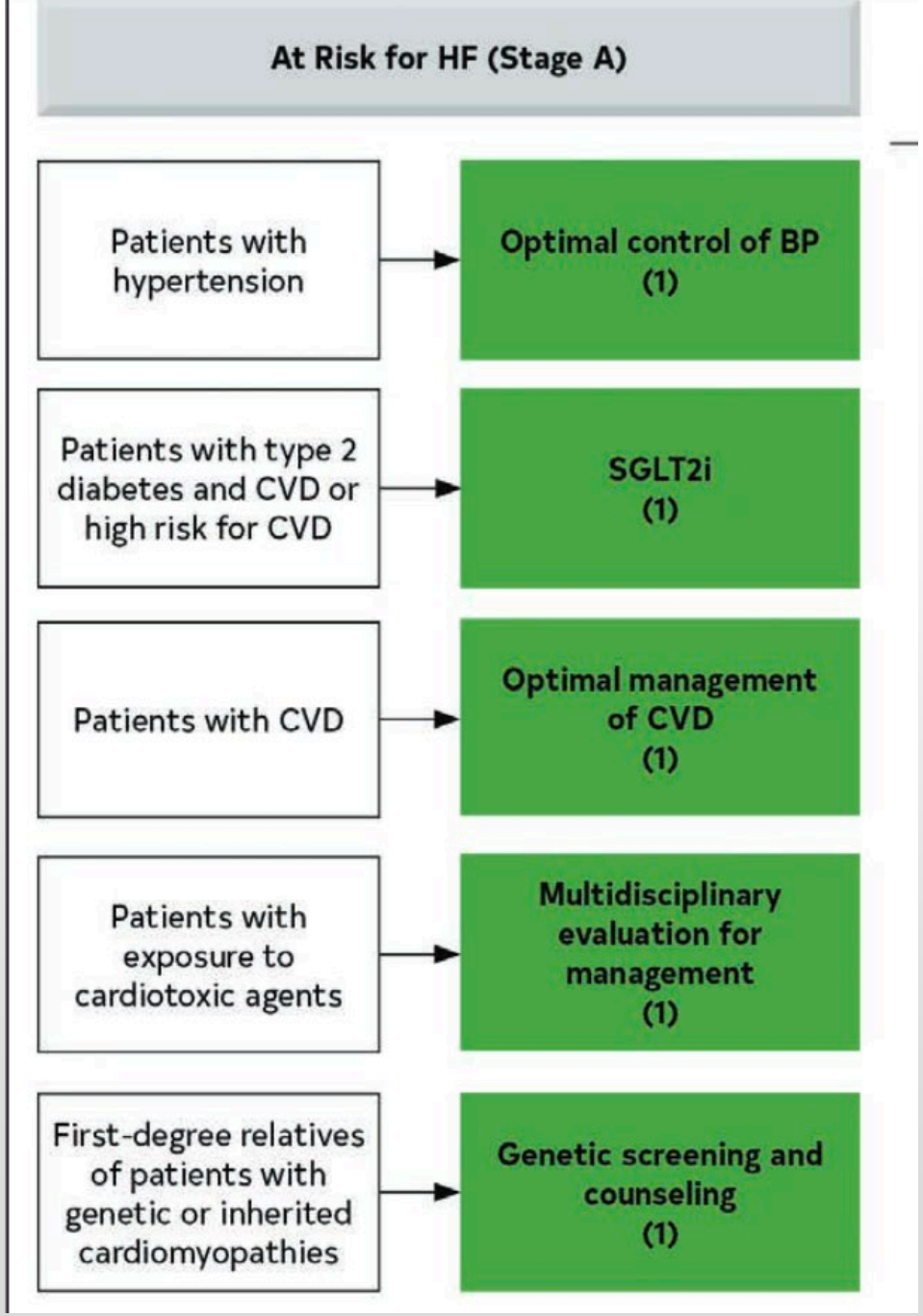
Pharmacologic Treatment



Heart Failure: STAGE A

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE A

- T2D: SGLT2i should be used to prevent hospitalizations for HF (1A)
  - Proposed mechanisms: reductions in plasma volume, cardiac preload, afterload, alterations in cardiac metabolism, etc.
- SGLT2i –MOA: Reduces reabsorption of filtered glucose from the tubular lumen, increases urinary excretion
  - Dosing:
    - Dapagliflozin (Farxiga®)– 10 mg QD (initial and target dose)
    - Empagliflozin (Jardiance®) – 10 mg QD (initial and target dose)
  - CI: eGFR <20 (Empagliflozin), eGFR <25 (Dapagliflozin – may continue therapy), ESRD, Dialysis, Hypersensitivity to medication
  - Warnings: Genital Mycotic Infections, Ketoacidosis, AKI, Urinary Tract Infection, Hepatic dysfunction, Necrotizing Fasciitis, Euglycemic DKA
  - AE: Increased urination, UTI, Increased Thirst, Nasopharyngitis, Weight Loss, Nausea, Renal Insufficiency

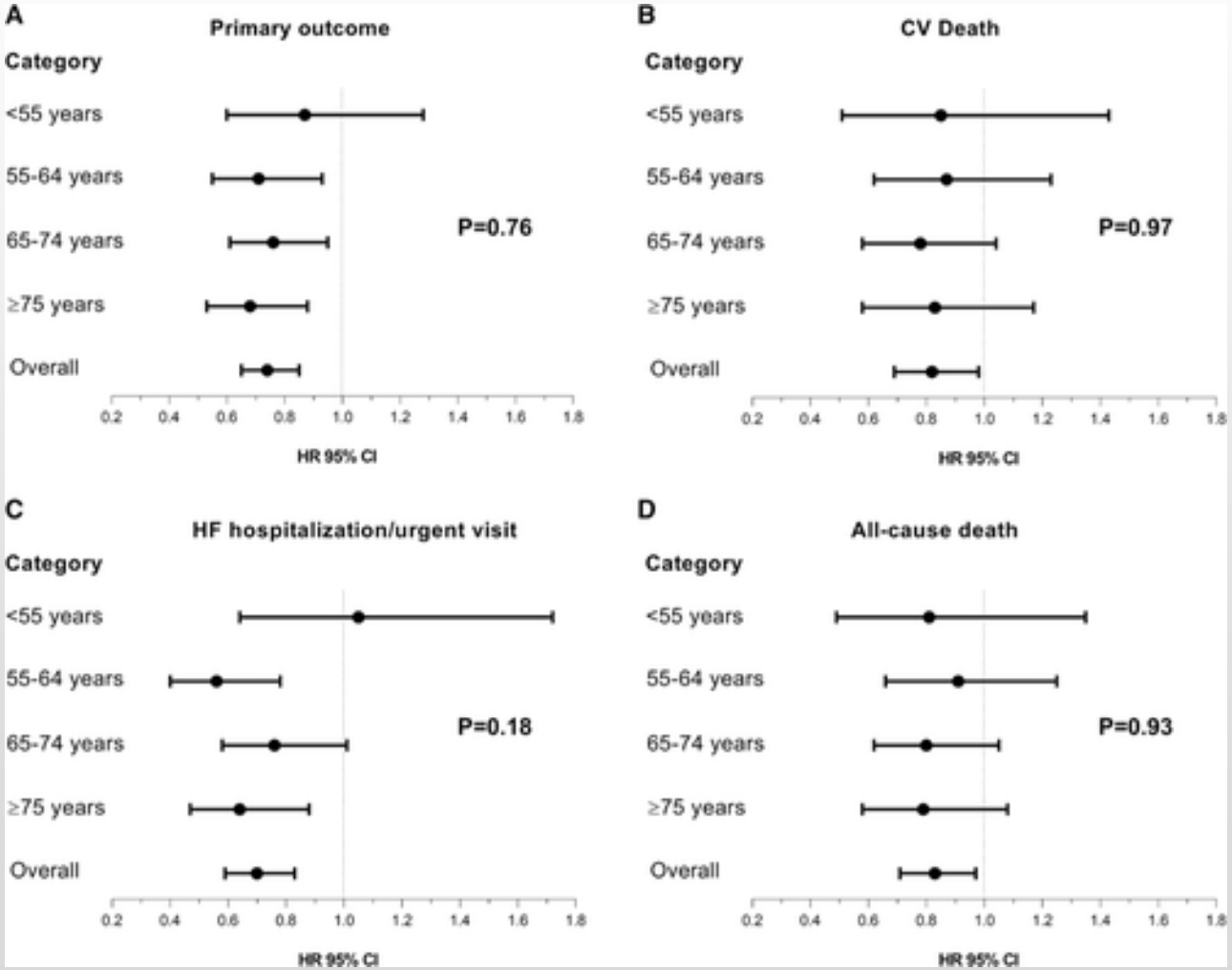
Source: Keller DM, et al.. *J Clin Med*. 2022;11(6):1470.

Dapagliflozin in patients with HF and reduced ejection fraction

DAPA-HF	
Objective	• To evaluate dapagliflozin compared to placebo among patients with heart failure with reduced ejection fraction (HFrEF)
Design	• Phase 3, Randomized, placebo control trial • N=4744; 2373 dapagliflozin 10mg; 2371 placebo in addition to recommended therapy
Primary outcome	• Composite endpoint of Cardiovascular death, hospitalization for HF, urgent HF visit
Results	• Primary outcome: 16.3% of dapagliflozin group vs 21.2% of placebo (p<0.001); NNT=21 Secondary outcomes: - Cardiovascular death: 9.6% with dapagliflozin vs 11.5% with placebo - hospitalization for heart failure: 9.7% with dapagliflozin vs 13.4% with placebo - worsening of renal function: 1.2% with dapagliflozin vs 1.6% with placebo

Source: McMurray JJV, et al. *N Engl J Med.* 2019;381(21):1995-2008.

Dapagliflozin in patients with HF and reduced ejection fraction: Age considerations



- The benefit of dapagliflozin is consistent in older and younger patients, including in individuals ≥75 years of age.
- The risk of adverse events with dapagliflozin was similar across all age groups.
- Advanced age is not a reason to withhold treatment with dapagliflozin in patients with heart failure and reduced ejection fraction.

Source: Martinez FA, et al. *Circulation AHA.* 2020;141(2):100-11.

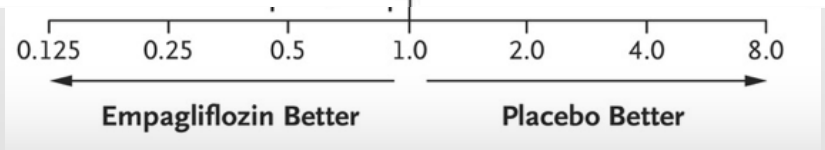
Empagliflozin in HF with reduced ejection fraction

EMPEROR-REDUCED	
Objective	• To assess safety and efficacy of empagliflozin in patients with HFrEF, irrespective of diabetes status
Design	• Phase 3, Randomized, placebo control trial • N=3730; 1863 empagliflozin 10mg; 1867 placebo in addition to recommended therapy
Primary outcome	• Composite outcome of cardiovascular death or HF hospitalization
Secondary outcome	• Total hospitalizations, Composite renal outcome, All-cause mortality, Death/HF hospitalization/emergent or urgent HF visit requiring intravenous treatment or diuretic intensification, intensification of diuretics
Results	Primary outcome: • cardiovascular death or HF hospitalization, for empagliflozin vs. placebo, 19.4% vs. 24.7% ($p < 0.001$) • Cardiovascular death: 10% vs. 10.8% • HF hospitalization: 13.2% vs. 18.3% Secondary outcomes: • Total hospitalizations: 388 vs. 553 ($p < 0.001$) • Composite renal outcome:1.6 vs. 3.1 ($p < 0.01$) • All-cause mortality: 13.4% vs. 14.2% • Death/HF hospitalization/emergent or urgent HF visit : 32.7% vs. 43% ($p < 0.0001$) • Intensification of diuretics: 15.9% vs. 22.2% ($p < 0.0001$)

Source: Packer M, et al. *J am Coll Cardiol.* 2021;77(11):1381-1392.

Empagliflozin in HF with reduced ejection fraction: Age considerations

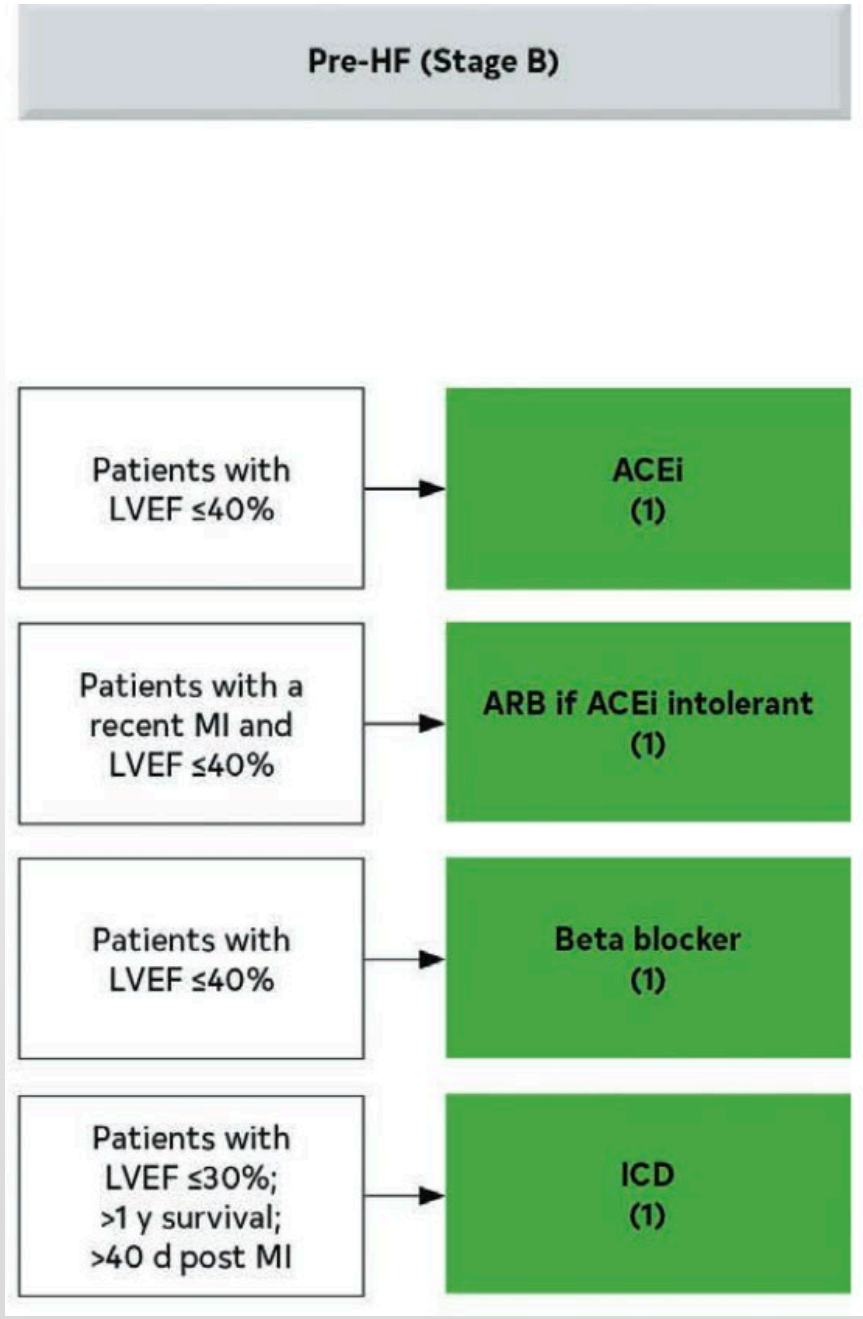
Subgroup	Empagliflozin	Placebo	Hazard Ratio (95% CI)
	no. of patients with events/total no.		
Overall	361/1863	462/1867	0.75 (0.65–0.86)
Baseline diabetes status			
Diabetes	200/927	265/929	0.72 (0.60–0.87)
No diabetes	161/936	197/938	0.78 (0.64–0.97)
Age			
<65 yr	128/675	193/740	0.71 (0.57–0.89)
≥65 yr	233/1188	269/1127	0.78 (0.66–0.93)



Benefits with Empagliflozin were seen regardless of age

Source: Packer M, et al. *J am Coll Cardiol.* 2021;77(11):1381-1392.

HEART FAILURE: STAGE B



Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE B

- **Level 1A Recommendations**
  - Use ACEi in all patients with reduced EF to prevent symptoms of HF and reduce mortality
  - Use statins to prevent HF symptoms and reduce CV events
  - Blood Pressure control is key to prevent symptoms of HF in patients
- **Level 1B Recommendations**
  - Patients with recent MI and HFrEF who are intolerant to ACEi → use ARB
  - Use of BB in patients with recent MI/ACS to reduce mortality
- **Level 1C recommendations**
  - Use of BB in all pts with reduced EF regardless of MI/ACS history
- **Class 3 HARM**
  - Non DHP CCB with (-) inotropic effect may be harmful in asymptomatic patients with low LVEF
  - Avoid TZDs as they increase risk of HF and hospitalizations

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

ACEi/ARBs

- Recommended in all heart failure patients:
  - Decrease mortality; increase left ventricle ejection fraction; decreased cardiac remodeling; decreased RAAS activation

Agent	Dosing
Lisinopril	2.5mg – 5mg daily (titrate up to 20-40mg daily
Enalapril	2.5mg BID (titrate up to 10-20mg BID)
Quinapril	5mg BID (titrate up to 20mg BID)
Ramipril	1.25-2.5mg daily (titrate up to 10mg daily)
Candesartan	4-8mg daily (titrate up to 32mg daily)
Losartan	25mg daily (titrate up to 50-100mg daily)
Valsartan	40mg BID (titrate up to 160mg BID)

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Beta Blockers

- Decrease symptoms, reduce morbidity, mortality and hospitalizations
- Clinical benefit is not a class effect with beta blockers
  - metoprolol succinate, bisoprolol, and carvedilol have benefit in heart failure patients
- MOA: Antagonize effect of catecholamines, especially norepinephrine

Agent	Dosing
Metoprolol succinate	12.5mg – 25mg daily (titrate up to 200mg daily)
Bisoprolol	1.25mg daily (titrate up to 10mg daily)
Carvedilol	3.125mg BID (titrate up to 20-25mg BID)

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C

- **ARNI (Sacubitril/valsartan or Entresto)**
  - Patients with HFrEF and NYHA class II-III reduce morbidity and mortality (1A); shown to prevent hospitalizations and cardiovascular death in NYHA class II-IV
  - ACEi/ARB are recommended when ARNi is not feasible for HFrEF patients (1A)
  - Recommended as the new treatment in hospitalized patients with acute HF before discharge given improvement in health status, reduced NTproBNP, and improved LV remodeling
  - MOA: Neprilysin inhibitor blocks the enzyme neprilysn
  - Dosing: Starting dose 24/26 mg BID, Target dose is 97/103 mg BID
  - CI/Warnings:
    - history of angioedema
    - use within 36 hours of last dose of ACEi

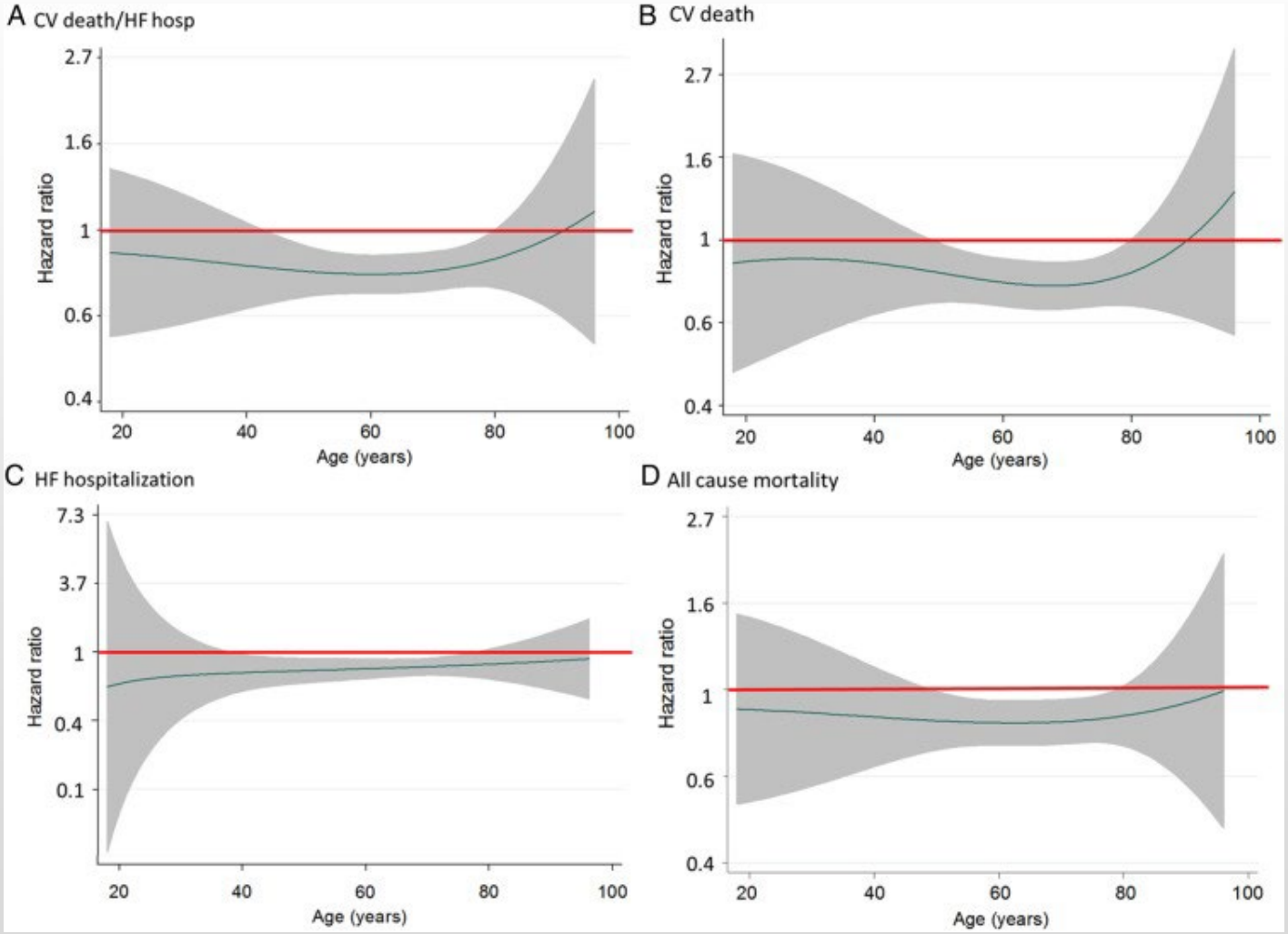
Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Angiotensin-neprilysin inhibition vs enalapril in HF

PARADIGM-HF	
Objective	• To evaluate treatment of sacubitril/valsartan to enalapril among participants with HFrEF
Design	• Randomized, placebo control trial • N=8442; 4187 Sacubitril/valsartan 200mg; 4212 enalapril 10mg BID in addition to standard therapy
Primary outcome	• Composite endpoint of Cardiovascular death or hospitalization for heart failure
Secondary outcome	• All cause mortality, patients with new renal dysfunction, patients with new onset afib
Results	• Trial was stopped early due to benefit • Primary outcome: 21.8% in sacubitril/valsartan group vs 26.5% with enalapril($p<0.001$) • Secondary outcomes: - all cause mortality: 17% in sacubitril/valsartan group vs 19.8% with enalapril - cardiovascular death: 13.3% in sacubitril/valsartan group vs 16.5% with enalapril($p<0.001$) - Hospitalization for heart failure: 12.8% in sacubitril/valsartan vs. 15.6% with enalapril ($p < 0.001$) - Change in (eGFR): -1.61 ml/min/1.73 m^2/year with sacubitril/valsartan vs. -2.04 ml/min/1.73 m^2/year with enalapril ($p < 0.001$) - New AF: 3.1% with sacubitril/valsartan vs. 3.1% with enalapril

Source: McMurray JJV, et al. *The New Eng J Med.* 2014;371(11):993-1004.

Angiotensin-neprilysin inhibition vs enalapril in HF: Age considerations



- Benefits seen regardless of age
- The pre-specified safety outcomes of hypotension, renal impairment and hyperkalemia increased in both treatment groups with age

Source: Jhund PS, et al. *Eur Heart J.* 2015;36(38):2576-2584.

STAGE C

- **Diuretics**
  - Used for symptomatic relief of congestion or fluid retention; Utilize in combination with other GDMT
  - MOA:
    - Block sodium and chloride reabsorption in the thick ascending limb of the loop of Henle
    - Decreases fluid volume
  - Dosing: Lowest effective dose should be used; Can pair with metolazone if loop response is poor/unresponsive

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C

- **Diuretics**

Drug	Initial Daily Dose	Maximum Total Daily Dose	Duration of Action
Loop diuretics			
Bumetanide	0.5–1.0 mg once or twice	10 mg	4–6 h
Furosemide	20–40 mg once or twice	600 mg	6–8 h
Torsemide	10–20 mg once	200 mg	12–16 h
Thiazide diuretics			
Chlorthiazide	250–500 mg once or twice	1000 mg	6–12 h
Chlorthalidone	12.5–25 mg once	100 mg	24–72 h
Hydrochlorothiazide	25 mg once or twice	200 mg	6–12 h
Indapamide	2.5 mg once	5 mg	36 h
Metolazone	2.5 mg once	20 mg	12–24 h

- CI/Warnings:
  - Contraindicated in patients with anuria
  - Black box warning for depletion of electrolytes
- ADRs: hypotension, electrolyte loss
- Monitoring: electrolytes, renal function, urine output

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C

- **Aldosterone Antagonists**
  - Recommended in all NYHA class II-IV CHF patients with K<5 or eGFR>30 to reduce morbidity and mortality (high economic value 1A)
  - MOA: Antagonizes aldosterone receptor in the kidneys; decreases blood pressure and fluid retention
    - Spironolactone (nonselective)
      - endocrine side effects such as gynecomastia, breast tenderness, and impotence
    - Eplerenone (selective)
      - no endocrine side effects, increases triglycerides
  - Dosing:
    - Spironolactone: 12.5mg daily (titrate to 25 mg BID)
    - Eplerenone: 25 mg daily (titrate to 50 mg daily)

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C

- **Hydralazine and isosorbide**

  - Combination of agents recommended as it reduces morbidity and mortality for African Americans who failed ACEi/AA/BB
  - Benefit is not well studied in non-African American groups
  - MOA:
    - Hydralazine : direct arterial vasodilator which decreases afterload for the heart and increases tolerability of nitrates
    - Nitrates increase the availability of nitric oxide which causes venous vasodilation and decrease preload

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C – if GDTM is optimized

- Digoxin (level 0.5-0.9 ng/mL)
  - Use can be beneficial to decrease hospitalizations (Class 2a, Level B) Consider in severe patients have not symptomatically responded to GDMT
  - MOA: Inhibits the Na/K-ATPase-positive inotropic effect-increases cardiac output; produces negative chronotropic effect and decreases heart rate
  - Dosing/Monitoring:
    - 0.125 to 0.25 mg QD
    - Narrow spectrum drug-serum level should be kept <1 ng/ml (range 0.5-0.9 ng/ml)
    - Digoxin toxicity >2 ng/mL

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE C – if GDTM is optimized

- **Ivabradine**
  - Potential adjunctive therapy in symptomatic heart failure patients NYHA class II-III with an EF<35% with resting heart rate>70 BPM
  - Reduces the risk for hospitalizations but does not decrease mortality
  - MOA: Inhibitor of the I-Funny current in the sinus node causing a reduction of heart rate
  - Dosing: 5 mg BID, maintenance dose 7.5 mg BID
  - ADRs: bradycardia, hypertension, atrial fibrillation, QTc prolongation (Target resting heart rate between 50 and 60 BPM)
  - Monitoring: ECG, heart rate, blood pressure

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

STAGE D

- In patients with advanced HF – refer to HF specialty care to discuss heart transplant or palliative care
- Heart transplant: done for select patients despite GDMT, device, and surgical management
- Benefit of fluid restriction is uncertain (2b) → limited effect on clinical outcomes and risk of malnutrition
- Inotropic support (2a/b): Addresses bridge therapy with IV inotropes or if ineligible for cardiac transplantation

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Recommendations for HFrEF Management

1

- In patients with HFrEF, titration of GDMT to target dose is recommended to reduce CV mortality and HF hospitalizations

2

- Titrations should be optimized as frequently as every 1-2 weeks depending on patient's tolerability and lab findings

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Knowledge Check 2 – Pharmacy Technician

Which of the following are medications used in HF? SELECT ALL THAT APPLY

A. Empagliflozin

B. Spironolactone

C. Lisinopril

D. Aspirin

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HFmrEF

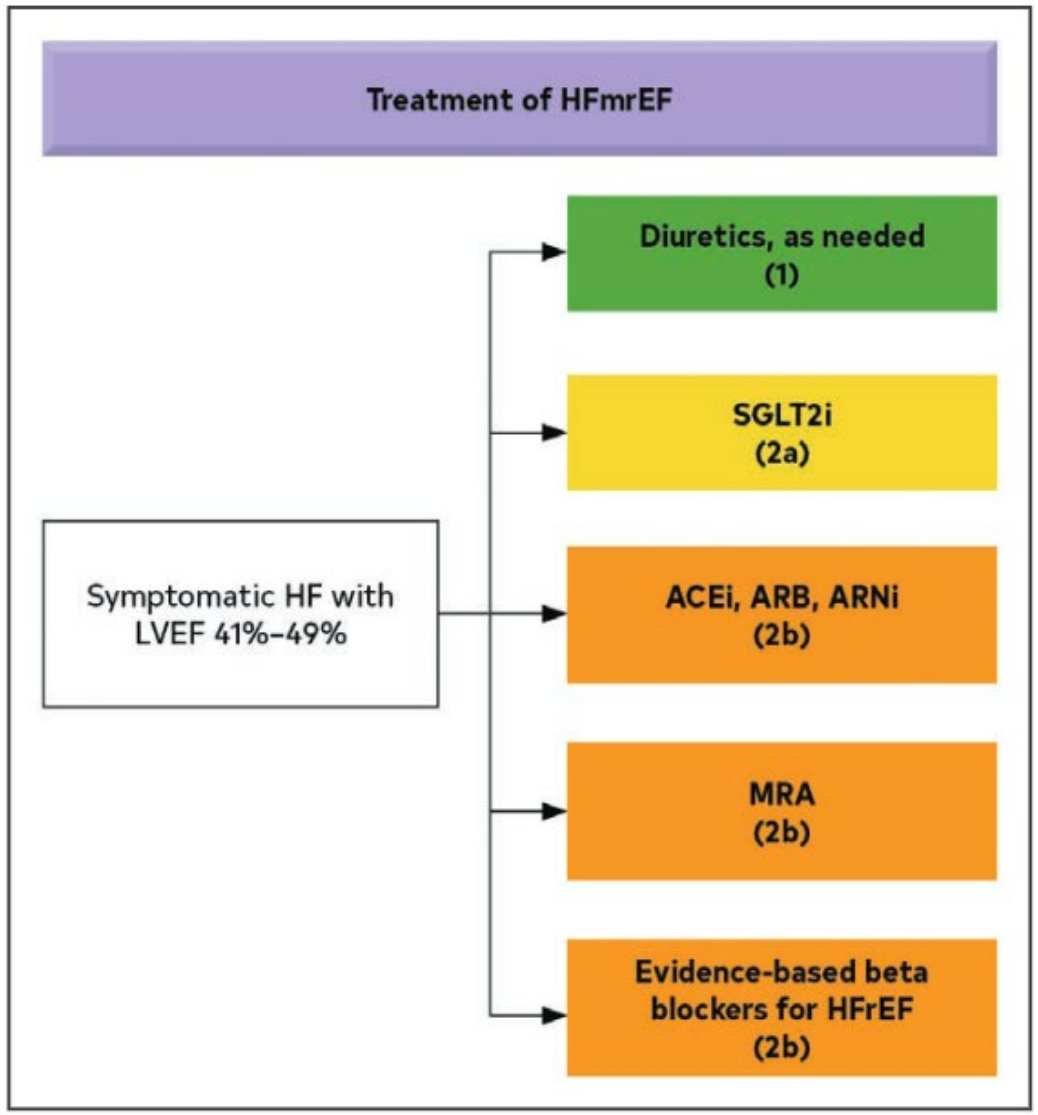
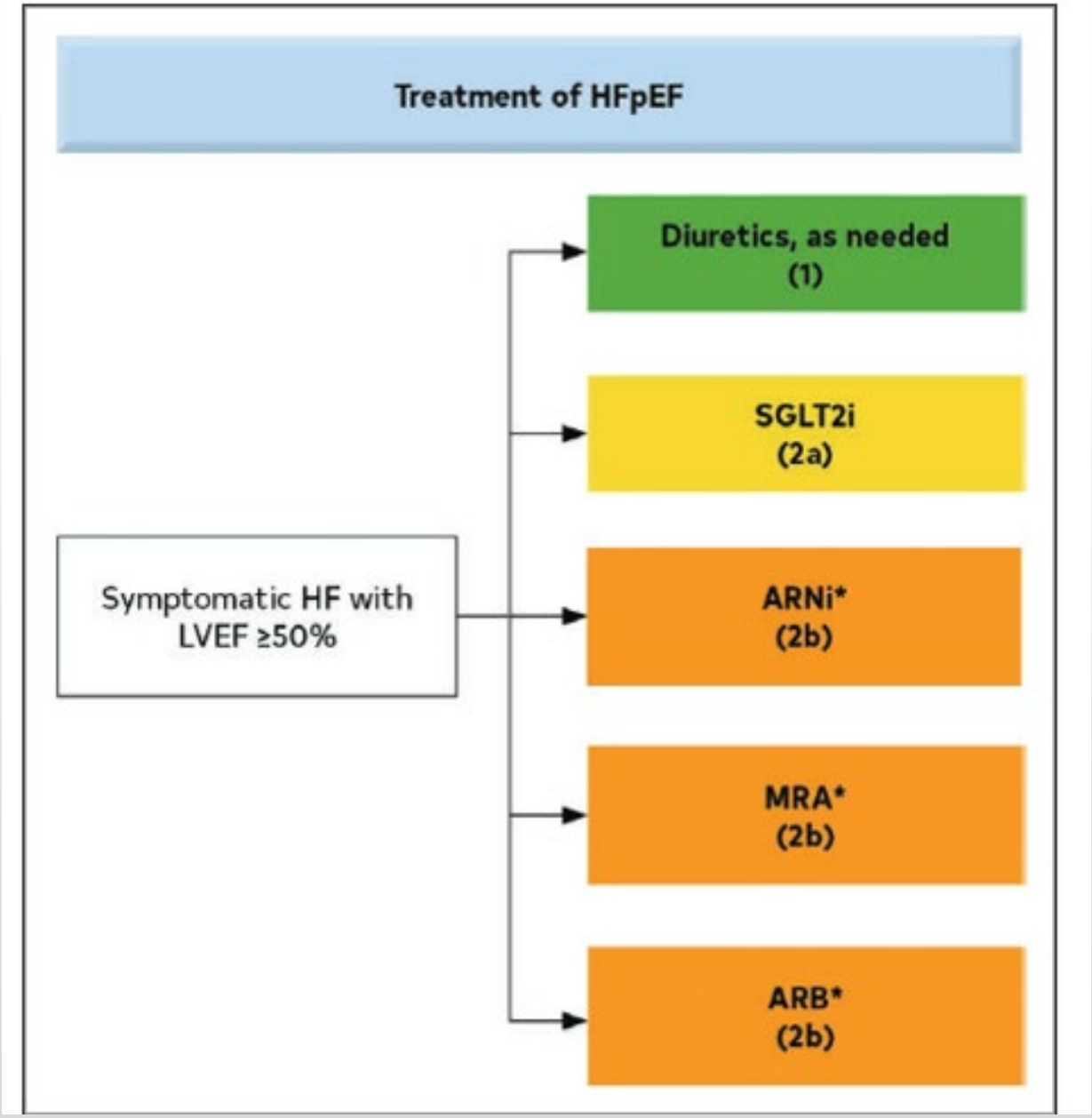


Figure 11. Recommendations for Patients With Mildly Reduced LVEF (41%–49%).

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

HFmrEF

Heart Failure with preserved EF (HFpEF)



Heart Failure with preserved EF (HFpEF)

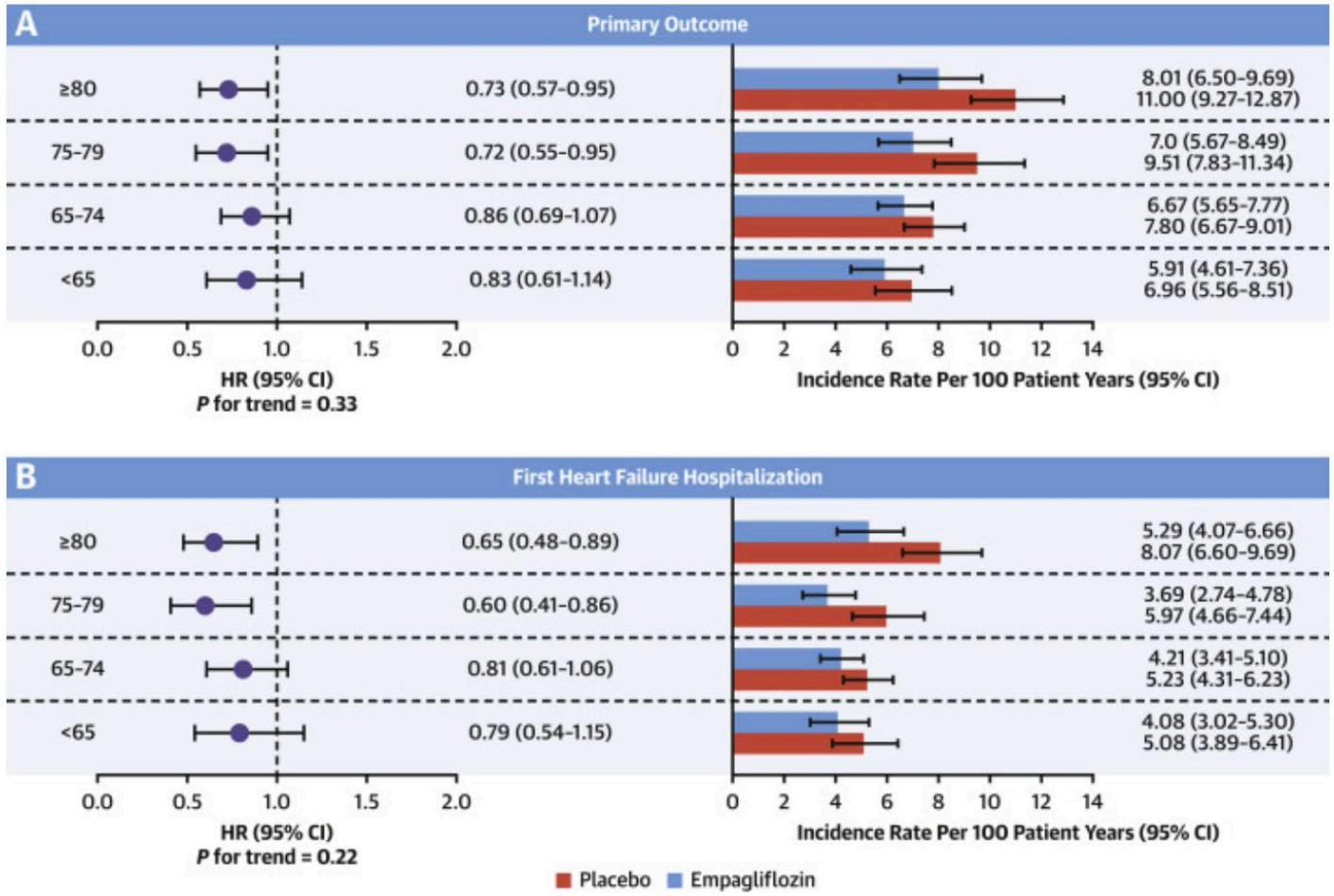
Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

SGLT2 considerations in patients with HFpEF

Evaluation of EMPEROR-PRESERVED	
Objective	• to evaluate the interplay of age and empagliflozin effects in EMPEROR-Preserved
Design	• Multi center, double-blind, parallel group randomized control trial • N=5988; Empagliflozin (2997); placebo(2991) • Patients grouped according to their baseline age (<65 years [n = 1,199], 65-74 years [n = 2,214], 75-79 years [n = 1,276], ≥80 years [n = 1,299]
Primary outcome	• Death from cardiovascular cause or hospitalization for heart failure
Secondary outcome	• Hospitalization for heart failure • Death from cardiovascular cause
Results	• Reduction in death from cardiovascular cause or hospitalization for heart failure • 8.6% vs 11.8% (p<0.001); NNT=30 • Safety: - increased genital infections: 2.2% vs 0.7% - Increased UTIs: 9.9% vs 8.1%

Source: Anker SD, et al. *N Engl J Med.* 2021;385(16):1451-1461.

EMPEROR-Preserved: Age considerations



- Efficacy and tolerability is similar across all age groups
- Hypotension, acute renal failure, UTI, genital infections non-significant between age groups
- No difference in discontinuation between age groups due to adverse events

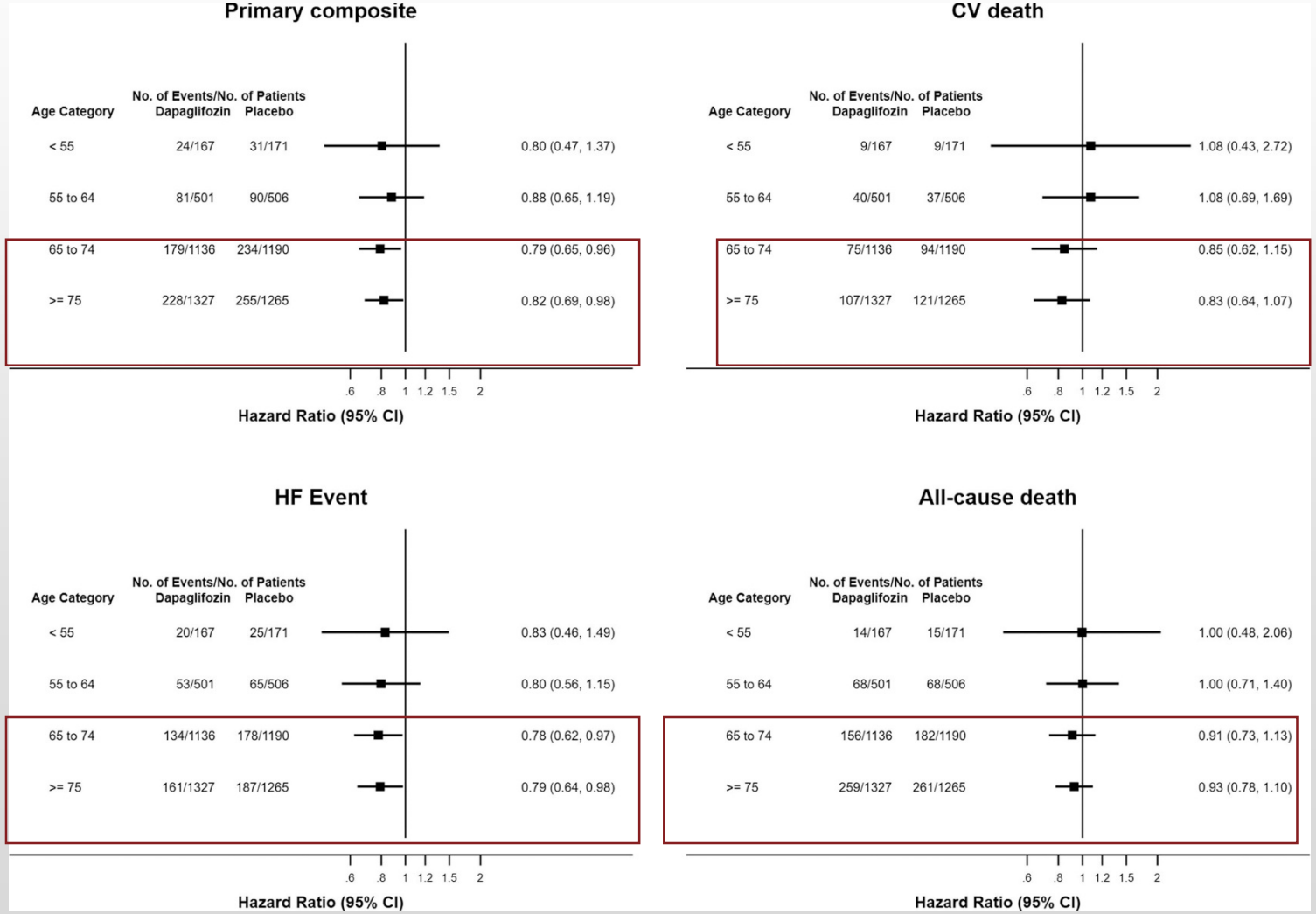
Source: Bohm M, et al. *J Am Coll Cardiol.* 2022;80(1):1-18.

SGLT2 considerations in patients with HFpEF

DELIVER	
Objective	• To evaluate whether dapagliflozin reduces HF hospitalizations, urgent HF visits or CVD mortality
Design	• Multi center, double-blind, parallel group randomized control trial • N=6263; Dapagliflozin (3131); placebo(3132) • patients with NYHA class II-IV and HF with LVEF ≥ 40
Primary outcome	• HF hospitalization, urgent HF visit, or CVD mortality
Secondary outcome	• # of initial and recurrent HF events or CVD mortality All-cause mortality
Results	• Reduction in HF hospitalization, urgent HF visit, or CVD mortality • 16.4% vs 19.5% ($p<0.001$) • Safety: adverse events were similar between groups

Source: Solomon SD, et al. *N Engl J Med.* 2022;387(12):1089-1098.

DELIVER: Age considerations



- Clinical benefits extended across all age groups
- Adverse events occurred more frequently with increasing age
- Discontinuation of treatment was not due to age-related differences

Source: Peikert A,, et al. *Circ Heart Fail.* 2022;15(10):e010080.

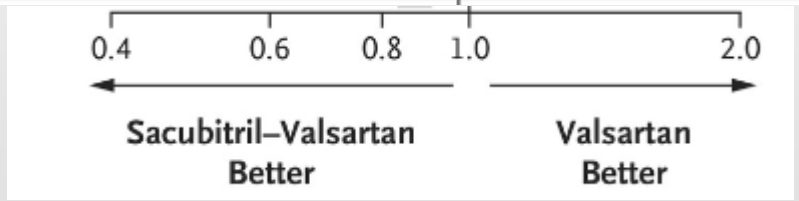
ARNI considerations in patients with HFpEF

PARAGON - HF	
Objective	• To evaluate whether sacubitril-valsartan reduces HF hospitalizations and CV death when compared to valsartan alone
Design	• Multi center, double-blind, active comparator trial • N=4822; Sacubitril-valsartan 97/103mg BID (2419); Valsartan 160mg BID (2403) • Patients with NYHA class II-IV and HF with EF ≥ 45%
Primary outcome	Composite HF hospitalization and CVD mortality
Secondary outcome	• Change in NYHA class at 8 months • Renal composite outcome • All-cause mortality
Results	• No significant difference in primary outcome : HR, 0.87 (95% CI, 0.75-1.01) p=0.06 • Decreased hyperkalemia (13.2% vs 15.3%; p=0.048) • Decreased Sce (10.8% vs 13.7%; p=0.002) • Increased hypotension (15.8% vs 10.8%; p<0.001) • Increased angioedema (0.6% vs 0.2%;p=0.02)

Source: Solomon SD, et al. *N Engl J Med*. 2019;381:1609-1620.

PARAGON-HF Subgroup Analysis : Age considerations

Subgroup	No. of Events/No. of Patients	Rate Ratio (95% CI)
Overall	1903/4796	0.87 (0.75–1.01)
Age		
<65 yr	276/825	0.99 (0.64–1.53)
≥65 yr	1627/3971	0.85 (0.73–0.99)
Age		
<75 yr	938/2597	0.82 (0.66–1.02)
≥75 yr	965/2199	0.92 (0.76–1.11)



- Benefits seen regardless of age
- Lower hyperkalemia and renal dysfunction with ARNI compared to losartan regardless of age
- Older patients have increased risk for hypotension

Source: Solomon SD, et al. *N Engl J Med*. 2019;381:1609-1620.

Knowledge Check 3 – Pharmacy Technician

Which of the following adverse events of sacubitril-valsartan is most concerning in a 80 year old patient?

A. Angioedema

B. Increase in Scr

C. Hypotension

D. Both B and C

Knowledge Check 3 – Pharmacy Technician

Which of the following adverse events of sacubitril-valsartan is most concerning in a 80 year old patient?

A. Angioedema

B. Increase in Scr

C. Hypotension

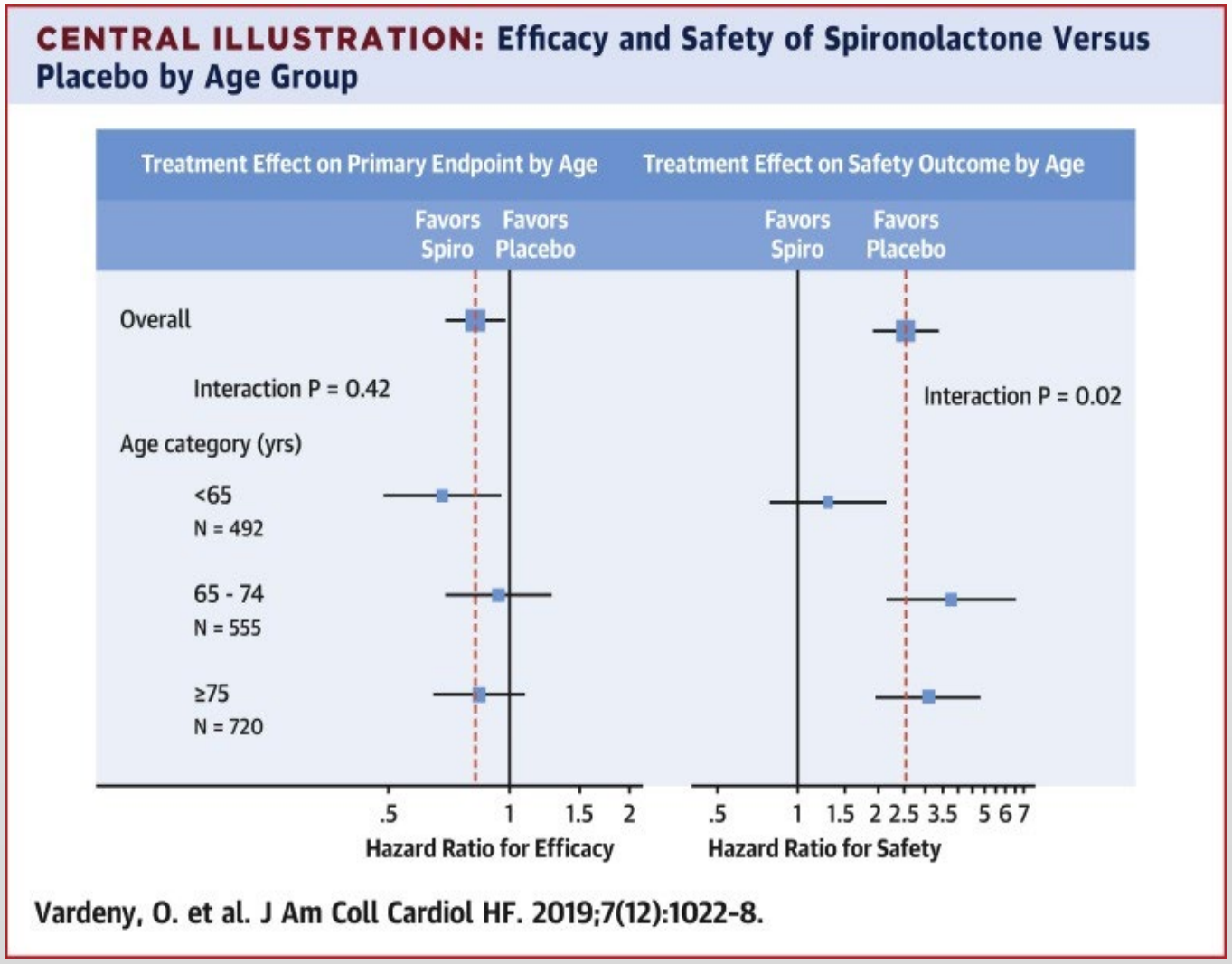
D. Both B and C

Efficacy and Safety of Spironolactone in Heart Failure with Preserved Ejection Fraction

TOPCAT	
Objective	• To evaluate whether spironolactone reduces CV mortality, cardiac arrest or HF hospitalizations when compared to placebo
Design	• Multicenter, randomized, placebo-controlled trial • N=3445; spironolactone (1722), placebo (1723)
Primary outcome	CV mortality, aborted cardiac arrest, or HF hospitalization
Secondary outcome	• CV mortality • Aborted cardiac arrest • HF hospitalization • All cause mortality, any hospitalization, MI, stroke
Results	• No significant difference in primary outcome: HR, 0.89 (95% CI,0.77-1.04) (p=0.14) • Reduction in HF hospitalizations: 12.0% vs. 14.2% (HR 0.83; 95% CI 0.69-0.99; P=0.04; NNT 45) • Increased hyperkalemia (18.7% vs 9.1%; p<0.001) • Increased doubling of Scr (10.2% vs 7%; p<0.001)

Source: Pitt B, et al. *N Engl J Med.* 2014;370(15):1383-1392.

Influence of Age on Efficacy and Safety of Spironolactone in Heart Failure



Source: Vardeny, O. et al. J Am Coll Cardiol HF. 2019;7(12):1022-8.

- Benefits of spironolactone are seen regardless of age
- Patients >65 years old are more likely to experience adverse events such as hyperkalemia and increase in Scr
- Older adults had higher rates of discontinuation due to side effects compared to younger patients

Knowledge check 3 – Pharmacist/Nurse

You decided to start your patient on spironolactone 12.5mg. Which of the following is true regarding use of spironolactone in older adults?

A. Patients >65 years old are less likely to experience adverse events such as hyperkalemia and increase in Scr

B. Spironolactone showed less effectiveness in reducing hospitalizations in patients >65 years old in clinical trials

C. Discontinuation rates were higher with spironolactone in older adults compared to placebo

D. Rate of CV mortality was higher in patients on spironolactone compared to placebo

Knowledge check 3 – Pharmacist/Nurse

You decided to start your patient on spironolactone 12.5mg. Which of the following is true regarding use of spironolactone in older adults?

A. Patients >65 years old are less likely to experience adverse events such as hyperkalemia and increase in Scr

B. Spironolactone showed less effectiveness in reducing hospitalizations in patients >65 years old in clinical trials

C. Discontinuation rates were higher with spironolactone in older adults compared to placebo

D. Rate of CV mortality was higher in patients on spironolactone compared to placebo

Non-pharmacologic management

Sodium restriction

- A registered dietitian- or nurse-coached intervention with 2 to 3 g/d sodium restriction improved NYHA functional class and leg edema in patients with HFrEF
- In a nonrandomized study (>2.5 g/d versus <2.5 g/d), lower dietary sodium was associated with worse all-cause mortality in patients with HFrEF
- In small RCTs, aggressive sodium restriction (0.8 g/d) during hospitalization for acute decompensated HF has not reduced weight, congestion, diuretic use, rehospitalization, or all-cause mortality in patients with HFrEF or in patients with HFpEF
- A recent pilot RCT (N=27) showed that providing patients with 1.5 g/d sodium meals can reduce urinary sodium and improve QOL but not improve clinical outcomes
- Dietary Changes
  - Mediterranean diet, whole grain, plant based, and the DASH diet
  - DASH diet can achieve sodium restriction without compromising nutritional adequacy

AVOID <2g SODIUM INTAKE TO REDUCE CONGESTIVE SYMPTOMS AND IMPROVE QUALITY OF LIFE

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Counseling points

- Monitoring body weight daily
  - Notify MD if weight increases by 2-4 pounds in 1 day or 3-5 pounds in 1 week or when symptoms have worsened
- Fluid restriction to <1.5L/day
- Exercise training recommended to improve functional status, may consider cardiac rehabilitation programs
- Avoid drugs that worsen HF
  - Nutritional supplements, hormone therapies, non-DHP CCB, positive inotropes, NSAIDs, TZDs, specific DPP4i like saxagliptin/alogliptin

Source: Heidenreich PA, et al. *J Am Cardiol. 2022.* 79 (17) 1757–1780.

Key takeaways

The 2022 ACC/AHA HF guidelines have more clear guidance on diagnosis and classification of different types of HF

New data with SGLT2 inhibitors shows clinical benefit in patients with HFmrEF and HFpEF

Although treatments lack survival improvement in patients with EF>40%, the available therapies play a key role in management of symptoms and reducing hospitalizations

Key takeaways: Age considerations

Number of older adults with HF is expected to increase

Older patients are starting to be included in landmark trials

A multifactorial approach is warranted when treating older adults for HF

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Thank you!!

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