



# Heart Failure GDMT Optimization

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Advanced Heart Failure & Heart Transplant



# Financial/ Commercial Disclosures

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No Commercial or Financial  
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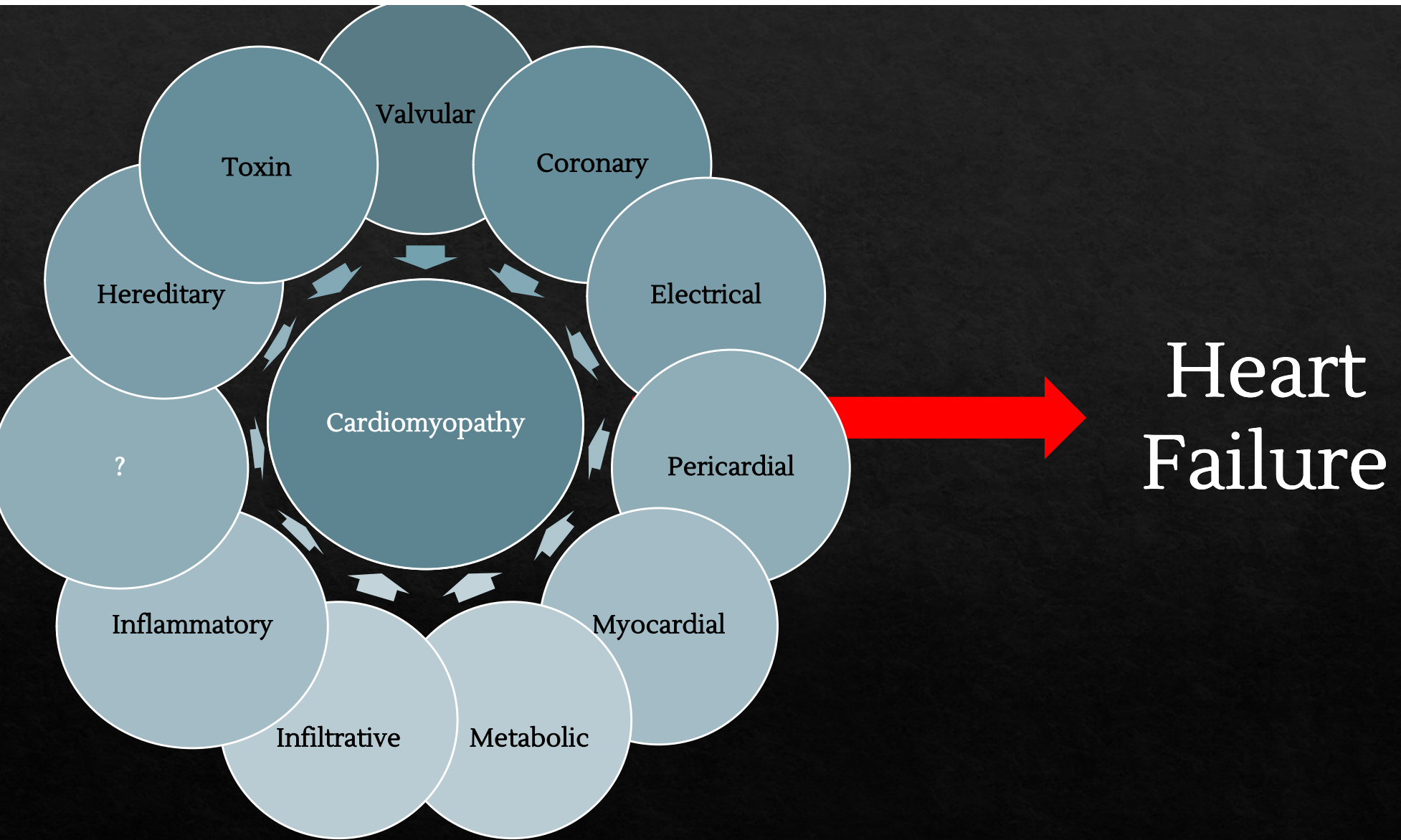
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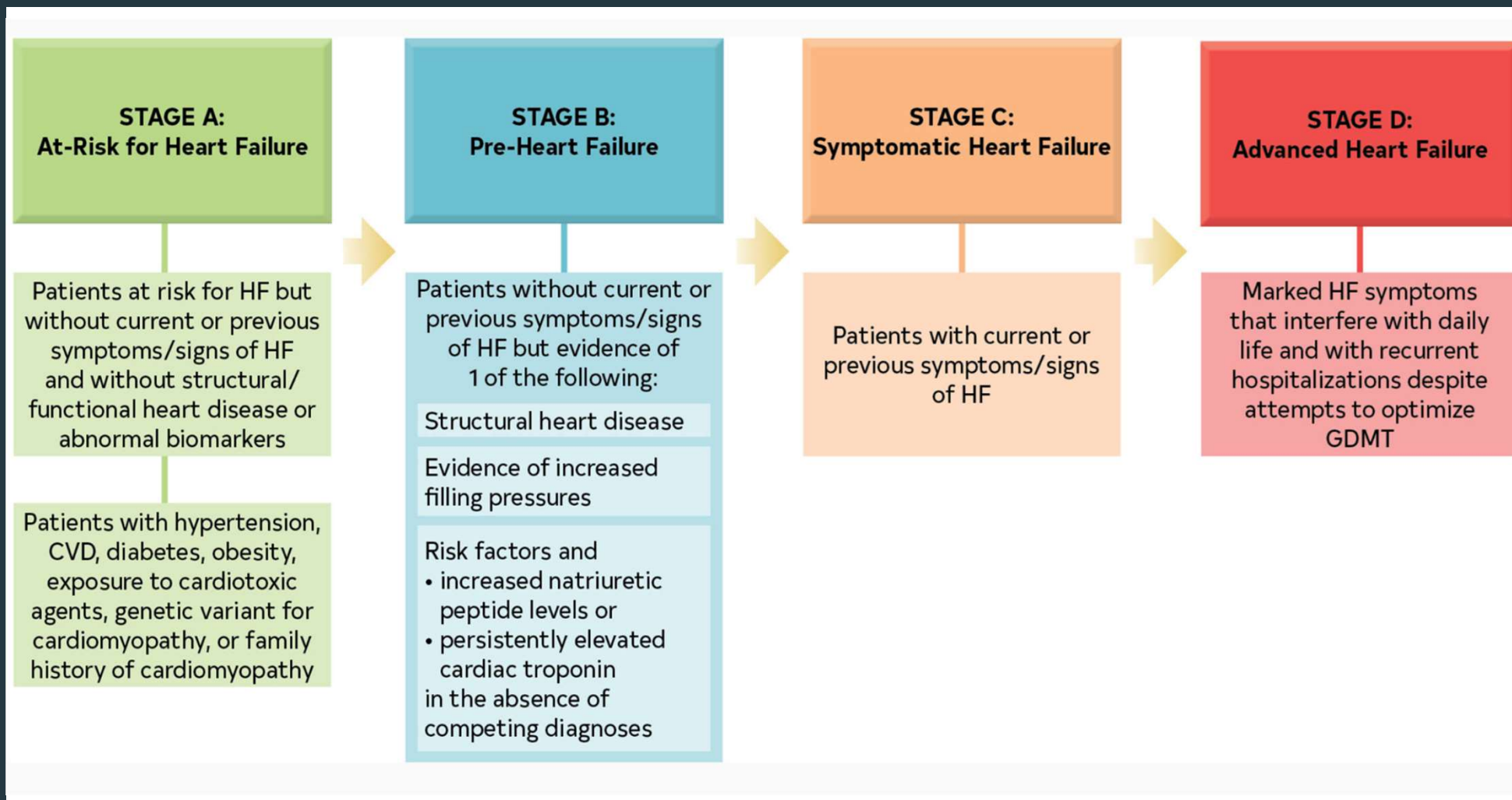
# Learning Objectives

- ◆ Identify the New York Heart Association Classification and Stages of Heart Failure (HF)
- ◆ Recognize how to classify heart failure by left ventricle ejection fraction (LVEF)
- ◆ Formulate and implement strategies to optimize HF therapies based on LVEF
- ◆ Determine criteria for Advanced Heart Failure & Heart Transplant referral

# What is Heart Failure?

Syndrome of symptoms





**2022 ACC/AHA Stages of HF** The ACC/AHA stages of HF are shown. ACC indicates American College of Cardiology; AHA, American Heart Association; CVD, cardiovascular disease; GDMT, guideline-directed medical therapy; and HF, heart failure.

# New York Heart Association Classification

Used to characterize symptoms and functional capacity of patients with symptomatic heart failure HF (stage C) or advanced HF (stage D)

NYHA widely used in clinical practice to determine the eligibility of patients for treatment strategies

4 Classifications

# New York Heart Association Classification

NYHA I	NYHA II	NYHA III	NYHA IV
No limitation of physical activity.  Ordinary physical activity does not cause symptoms of HF	Slight limitation of physical activity.  Comfortable at rest but ordinary physical activity results in symptoms of HF	Marked limitation in physical activity.  Comfortable at rest but less than ordinary activity causes symptoms of HF	Unable to carry out any physical activity without symptoms of HF or symptoms of HF at rest



# Classification of Heart Failure by Left Ventricle Ejection Fraction

HFrEF

- Heart Failure with reduced Ejection Fraction
- EF  $\leq$ 40%

HFmrEF

- Heart Failure with mildly reduced Ejection Fraction
- EF 41-49%

HFpEF

- Heart Failure with preserved Ejection Fraction
- EF  $\geq$ 50%

HFimpEF

- HF with baseline EF  $\leq$ 40%,  $\geq$ 10% increase from baseline EF & 2<sup>nd</sup> EF > 40%



Why optimize Guideline Directed Medical  
Therapy (GDMT)?

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# Background:

- ◆ >6 million individuals living with heart failure
- ◆ > 1 million new cases per year
- ◆ \$ 30 billion spent on heart failure (2012) & rising. Around \$43.6 billion in 2020
- ◆ > 3 million physician office visits for heart failure (2018)
- ◆ Most frequent cause of hospitalization in the elderly & > 1 million principal discharge (2018)

Why is it  
important to  
Optimize  
Medical  
Therapy (OMT)?

### CHAMP HF Trial:

- Medication utilization
- Achievement of target dose
- Factors associated with lower medication utilization or dose
- Medication utilization & dose at 12 months

# Consequences of failure to achieve OMT

Increased risk of :

- Mortality
- Morbidity
- Hospitalization
- lack of improved health status

Additionally, patient who have not received OMT may not meet criteria for device therapy

# Challenges & Barriers to Achieving OMT

--patient related factors



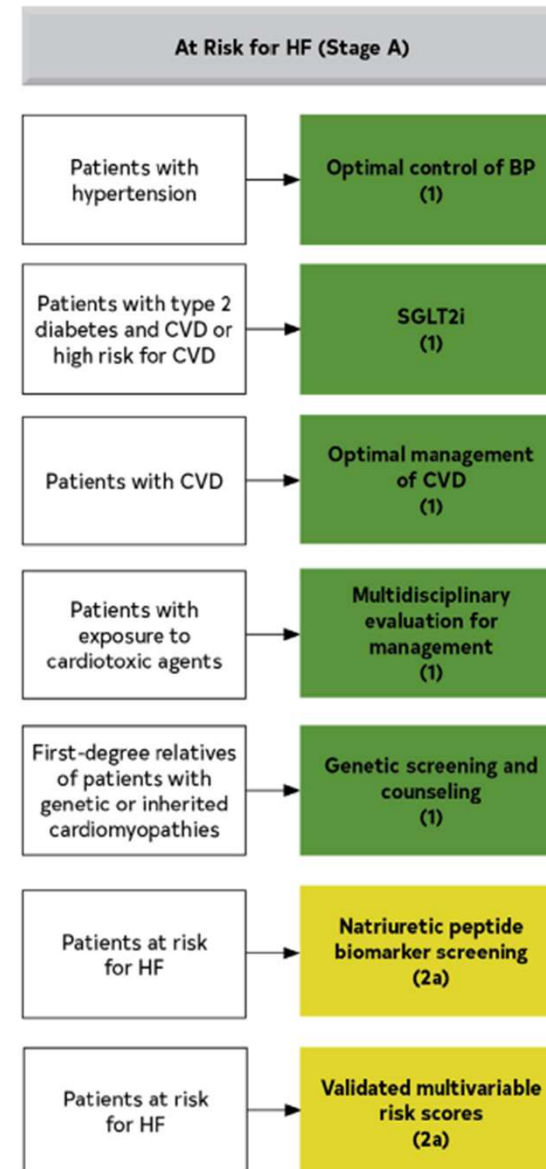
--clinician related factors

--system related factors

--economic factors:

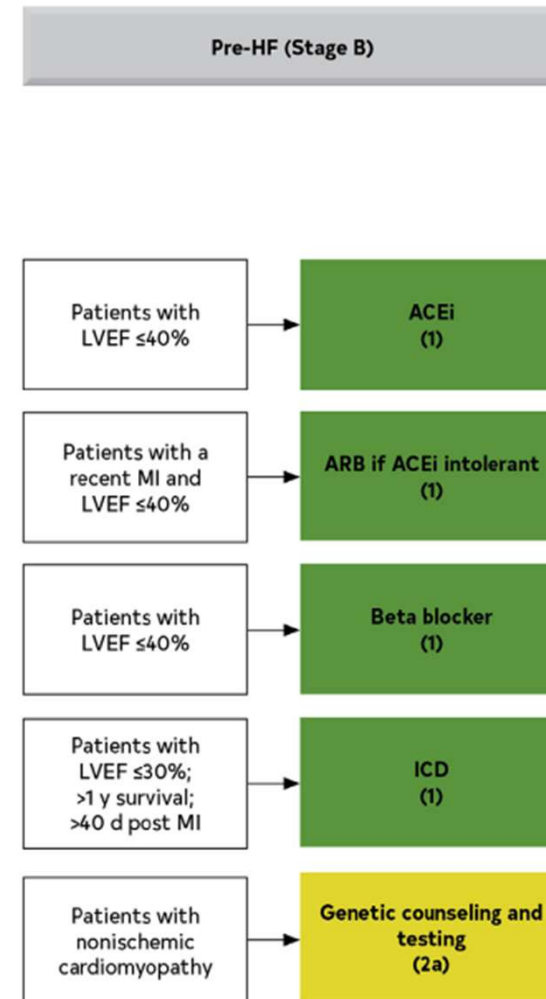
# Heart Failure Management

# Heart Failure Management: Stage A



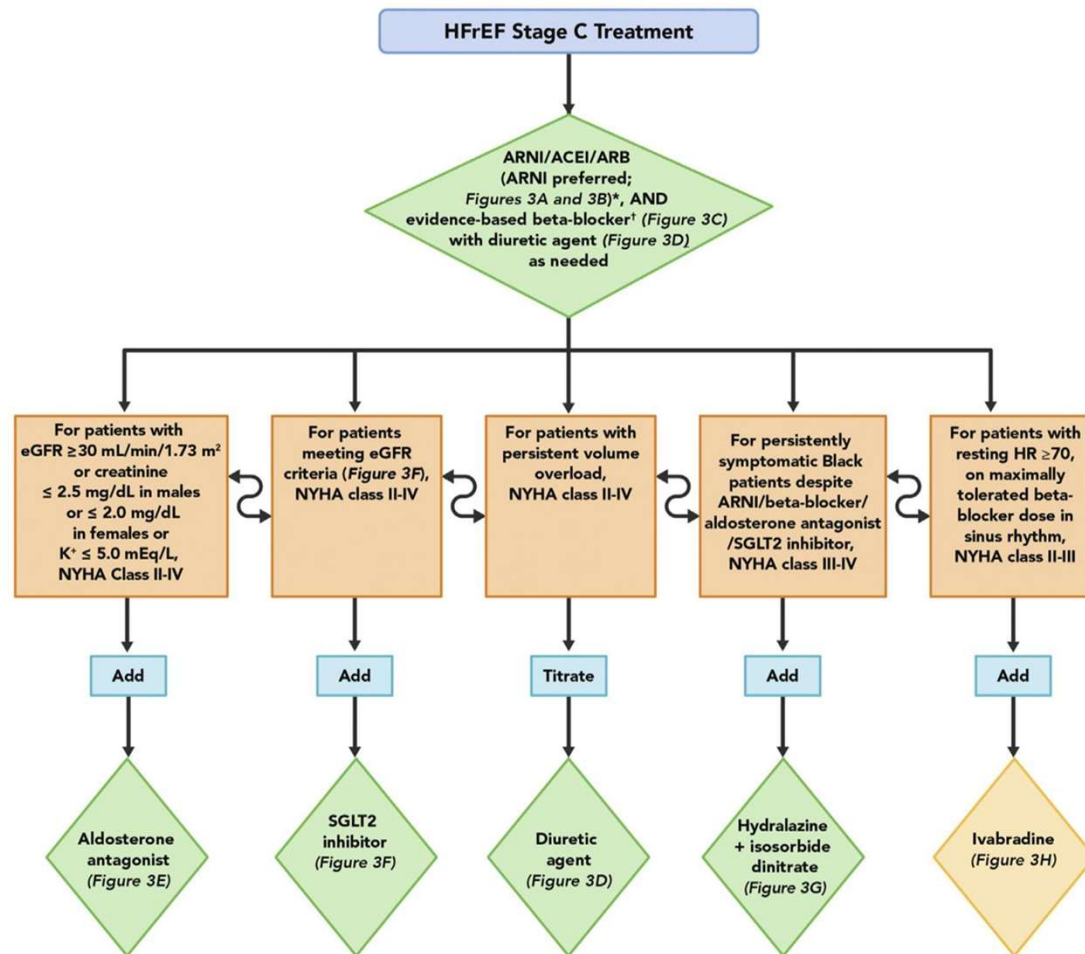


# Heart Failure Management: Stage B



# Optimizing medical therapy in HFrEF

Stage C



# 4 MAIN PILLARS!

ARNI

- Sacubitril - Valsartan

BB

- Metoprolol Succinate
- Carvedilol
- Bisoprolol

MRA

- Eplerenone
- Spironolactone

SGLT2i

- Dapagliflozin (GFR > 30)
- Empagliflozin (GFR >20)

## 2022 ACC Heart Failure RASI Guideline

–In patients with HFrEF and NYHA Class II-III sxms, use of ARNi is recommended to reduce morbidity and mortality

–In patients with chronic symptomatic HFrEF NYHA II-III who tolerate ACEi/ARB, replacement by ARNI is recommend

–Patients with previous or current sxm of chronic HFrEF who are intolerant to ACEi due to cough/angioedema and when ARNI is not feasible, use of ARB is recommended.

## Entresto (Sacubitril/valsartan)

- ◆ Starting dose: 24/26 mg BID
- ◆ Goal dose: 97/103 mg BID
- ◆ Titrate every 2 weeks to goal dose or max tolerated
- ◆ Consider dose adjusting Diuretic
- ◆ Obtain labs in about 1 week to assess renal function and potassium level
- ◆ Avoid splitting tablet in 1/2
- ◆ Harm: ARNI should not be given concomitantly with ACEi or within 36 hr of last dose of ACEi, hx of Angioedema

Goal BP: 90-100s systolic or as tolerated.

# Caution with Starting Entresto

- Renal Impairment:
  - GFR 30-59: no starting dose adjustment required
  - GFR <30: starting dose 24/26 mg BID & titrate up
  - If patient on HD: Kidneys have left the chat- START IT.
- Systolic BP <100
- Hypovolemia
- Renal Artery stenosis
- Hepatic Impairment
  - Child Pugh A: no renal adjustment
  - Child Pugh B: starting dose 24/26 mg BID & Titrate up

## ARB

–Losartan:

Starting dose: 12.5 to 25 mg daily

Max dose: 150 mg daily

–Valsartan

Starting dose: 40 mg BID

Max dose: 320 mg/ day (160 mg  
BID)

## ACEi

–Lisinopril:

Starting Dose: 2.5-5 mg daily

Max dose: 40 mg daily

–Enalapril:

Starting Dose: 2.5 mg BID

Max dose: 40 mg daily

## Hydralazine/ Isosorbide

–Hydralazine: 10 mg TID or 25 mg TID with max dose 75 mg TID

–Isosorbide Dinitrate: 20 mg TID with max dose of 40 mg TID



# Beta Blocker

- Metoprolol Succinate
  - start: 12.5-25 mg daily
  - target dose 200 mg daily

- Carvedilol
  - start: 3.125 mg BID
  - target dose:
    - >85 kg: 50 mg BID
    - < 85 kg: 25 mg BID

- Bisoprolol
  - start: 1.25 mg
  - target dose: 10 mg

Goal Heart Rate: 60s

Titrate to target dose or goal heart rate every 1-2 weeks

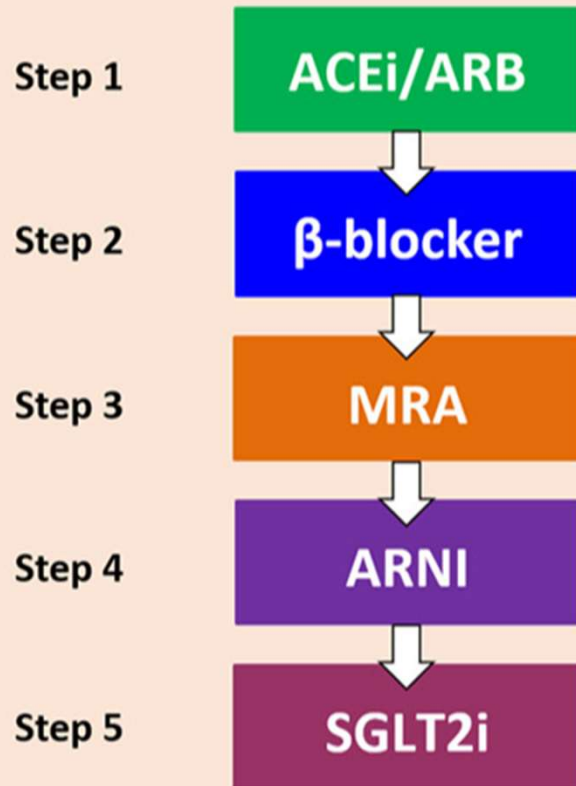
# MRA Therapy

- Spironolactone / Eplerenone
  - starting dose 12.5- 25 mg
  - target dose: 25 mg-50mg
- Titrates every 2 weeks to goal dose or as tolerated
- Labs: obtain in 3 days or 1 week, followed by 2-3 weeks then monthly for 3 months then every 3 months

# SGLT2i

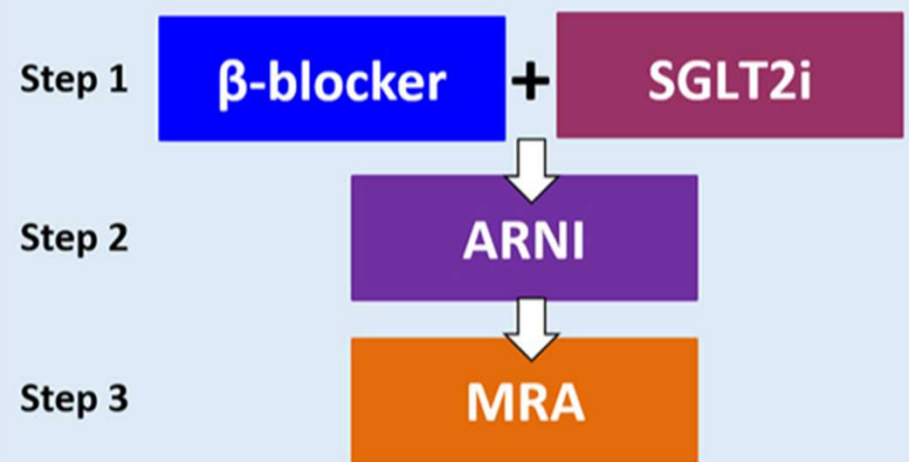
- Indicated in patients with
  - HFrEF, HFmrEF, HFpEF
  - NYHA II-IV
- Empagliflozin (Jardiance)
  - 10 mg daily for HF
  - 25 mg for DMT2
  - GFR  $\geq$  to 20
- Dapagliflozin (Farxiga)
  - 10 mg daily for HF
  - 10 mg daily for DMT2
  - GFR  $\geq$  to 30
- if patient has hx of DMT2 & A1c  
Is  $>9$  : patient at higher risk of EDKA.  
Avoid starting. Defer to Endo/PCP
- Contraindicated in:
  - Hx of UTIs
  - DMT1
  - HD

## Conventional sequencing



*Uptitration to target doses at each step  
Typically requires 6 months or more*

## Proposed new sequencing



*All 3 steps achieved within 4 weeks  
Uptitration to target doses thereafter*

## First-Line Quadruple Therapy (Induction Therapy)

SGLT2i    ARNi/ACEI    BB    MRA

In any order, initiate in 4-6 weeks

Optimize doses of quadruple therapy

## Add-on Therapies (Consolidation Therapy)

Hydralazine  
-Nitrates\*

ICD

CRT-D

Treatment of specific etiologies

Ivabradine

Digoxin

Vericiguat

## Treatment of Comorbidities

SGLT2i in DM

IV Iron in Iron  
Deficiency

Hypertension

Sleep Apnea

Valvular

Atrial Fibrillation

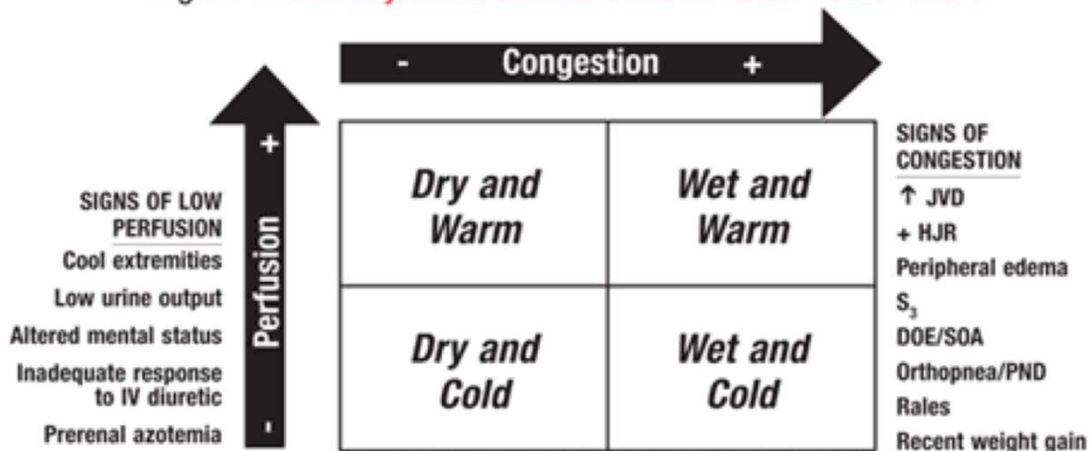
Other comorbidities

Decongestion, Lifestyle Modification

Optimize and Continue  
GDMT

# Clinical States of Heart Failure

Figure 1. Hemodynamic/Clinical State in Acute Heart Failure



↑: increased; +: positive; -: negative; DOE: dyspnea on exertion; HJR: hepatojugular reflux; JVD: jugular venous distention; PND: paroxysmal nocturnal dyspnea; S<sub>3</sub>: ventricular filling murmur; SOA: shortness of air.

Source: References 10, 11.

(<https://www.uspharmacist.com/article/pharmacists-role-in-acute-decompensated-heart-failure-management>)

- Review of patient presentations

# HFpEF

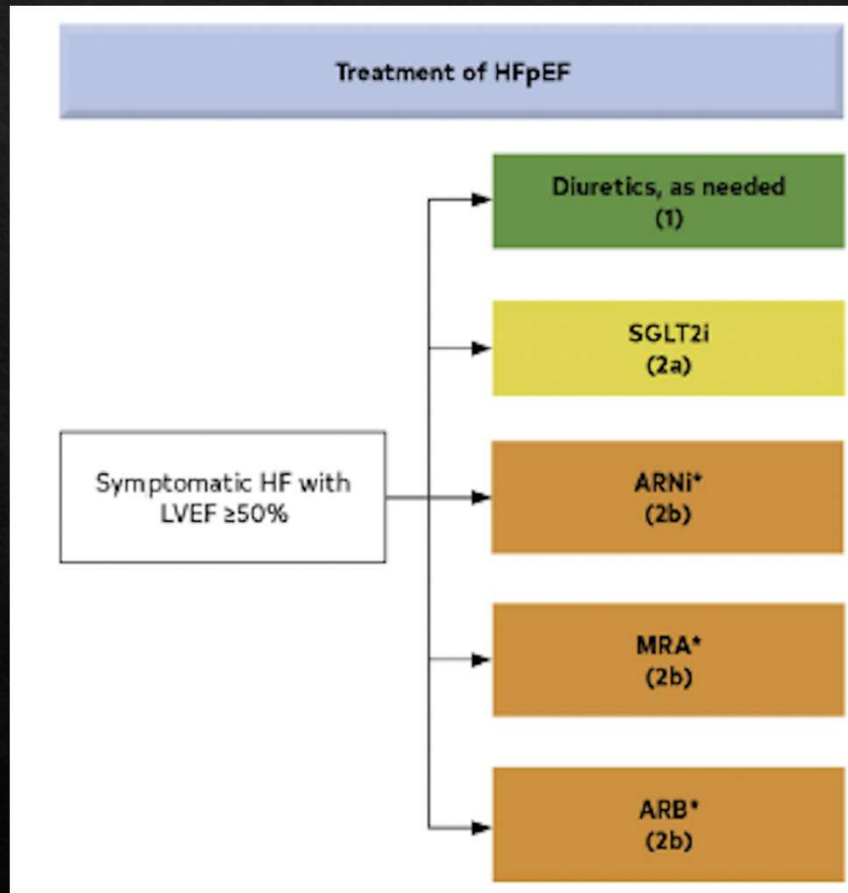
- HFpEF is a complex and multifactorial disorder characterized by exercise intolerance & elevated cardiac filling pressures.
- Etiologies that cause HFpEF: pericardial disease, Valvular disease, CAD, infiltrative disease, hypertension, pulmonary hypertension,
- HFpEF affects primarily elderly patients and particularly prevalent in women and people with HTN
- Compared to older patients, middle-aged patients with HFpEF are more often men
- Other common comorbidities seen in patients with HFpEF: obesity, coronary artery disease, diabetes, sleep-disordered breathing, Afib, renal disease
- HTN is present in most patients with HFpEF. Treatment of hypertension is highly effective at prevention of HFpEF
- Patients typically present with dyspnea on exertion. They often have minimal to no symptoms at rest
- Echocardiogram and Right Heart Catheterization are typically used in the diagnosis of HFpEF

# Optimizing medical therapy in HFpEF





# Heart Failure with preserved ejection fraction



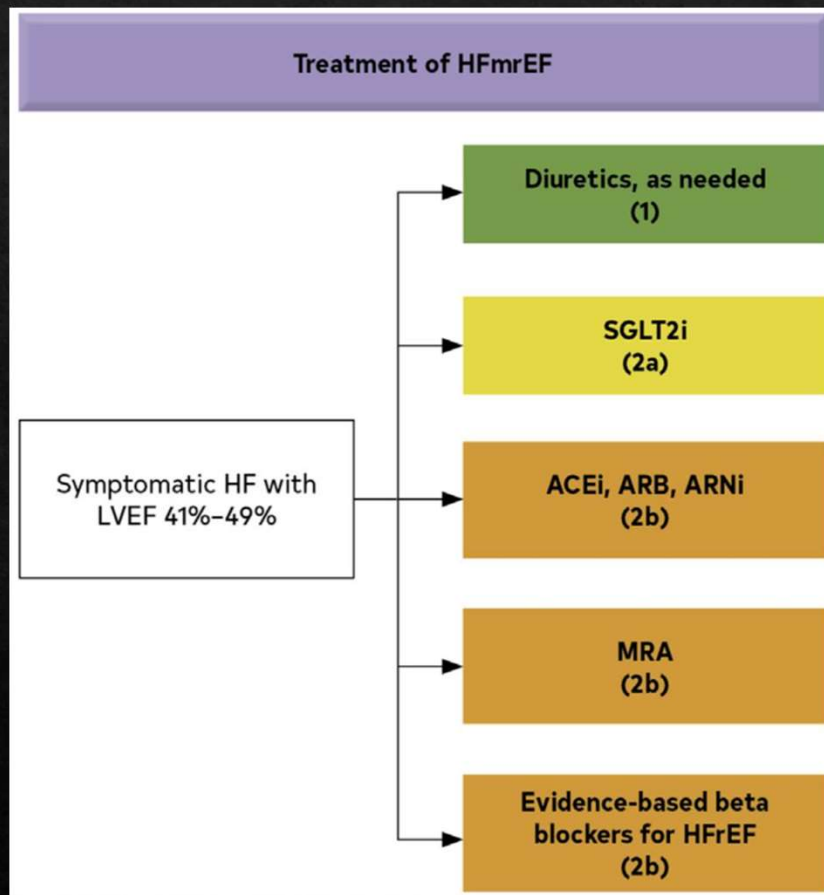
## My Technique

- If patient has more LE edema → Lasix
- If patient has more abdominal symptoms/Chest symptoms → torsemide
- Either Farxiga or Jardiance
- Has Sacubitril which can help with volume
- Spironolactone or Eplerenone
- If patient develops gynecomastia → eplerenone

# Optimizing medical therapy in HFmrEF



# Heart Failure with mildly reduced ejection fraction



## My Technique

- If patient has more LE edema → Lasix
- If patient has more abdominal symptoms/Chest symptoms → Torsemide
- If EF leans close to the 30s → I go Farxiga
- If EF leans closer to the 50s → I go Jardiance
- I Prefer Entresto, has Sacubitril which can help with volume
- Spironolactone or Eplerenone
- if they develop gynecomastia then eplerenone
- Metoprolol succinate, Coreg, bisoprolol

# Landmark Clinical Trials

PARADIGM HF Trial

MERIT HF Trial

COPERNICUS Trial

RALES Trial

Emphasis Trial

EMPEROR Reduced

EMPEROR Preserved

DAPA- HF trial

Deliver HF trial

# When to Refer to Advanced Heart Failure?

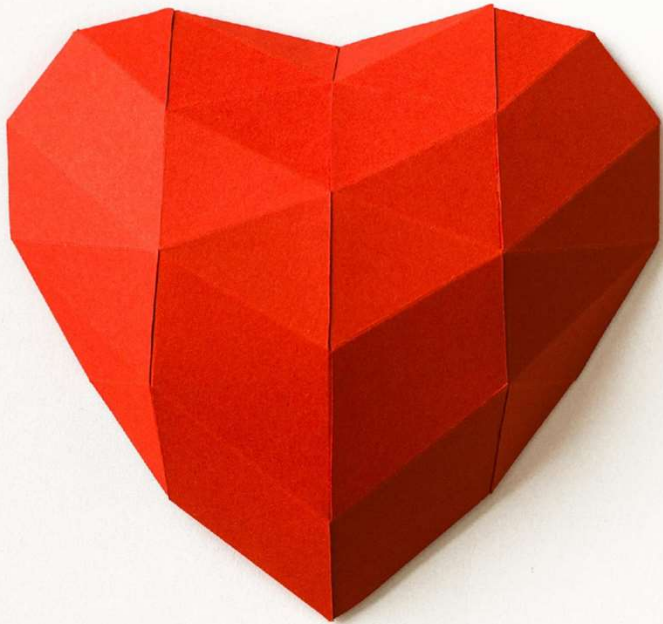




Remember:  
Call 1-800...

I – NEED - HELP

Yancy CW, et al. ACC Consensus. JACC  
2017



I: IV Inotropes

N: NYHA IIIB/IV or elevated natriuretic peptides

E: End-organ dysfunction

E: Ejection Fraction <35%

D: Defibrillator Shock(s)

H: Hospitalizations >1

E: Edema despite ↑ diuretics

L: Low BP, high HR

P: Progressive intolerance or down-titration of GDMT

*“DON’T EXPECT IMPROVEMENT WITHOUT  
INTERVENTION”*

*--KEVIN DAVIS, PA-C*





# Thank you!

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