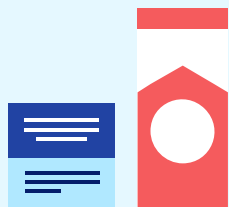




# Heart Failure Management: From Prescription to PO

Hanna Haddad, PharmD  
PGY2 Cardiology Pharmacy Resident  
UVA Health



01

## HF GDMT

Review the pharmacology of GDMT in HF

02

## Adherence

Review strategies to improve medication adherence



03

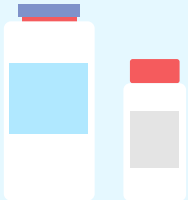
## Cost

Discuss cost associated with GDMT

04

## UVA Cost Savings Programs

Summarize cost savings available to patients at UVA

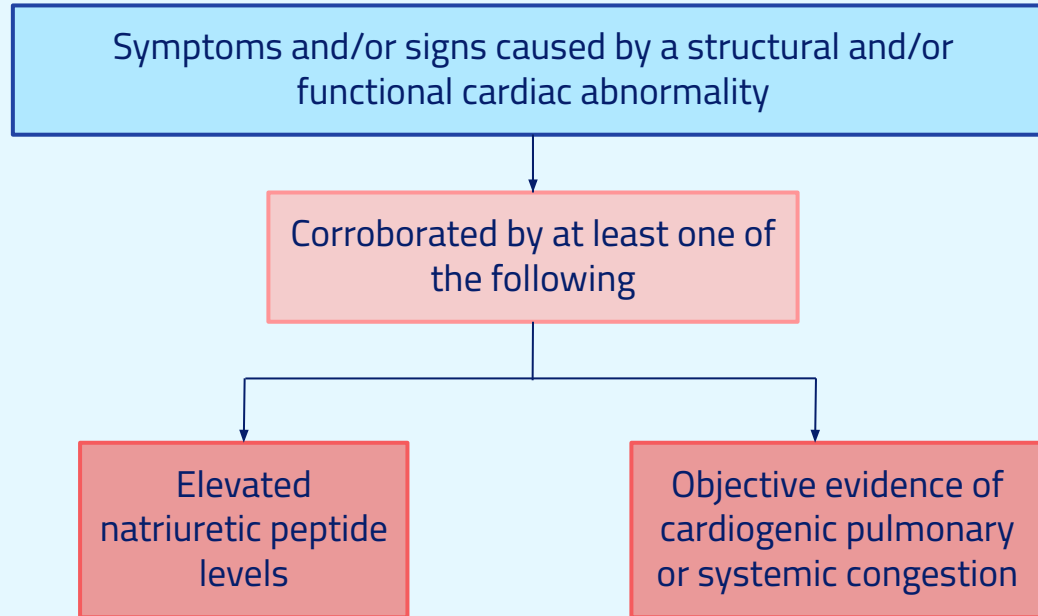




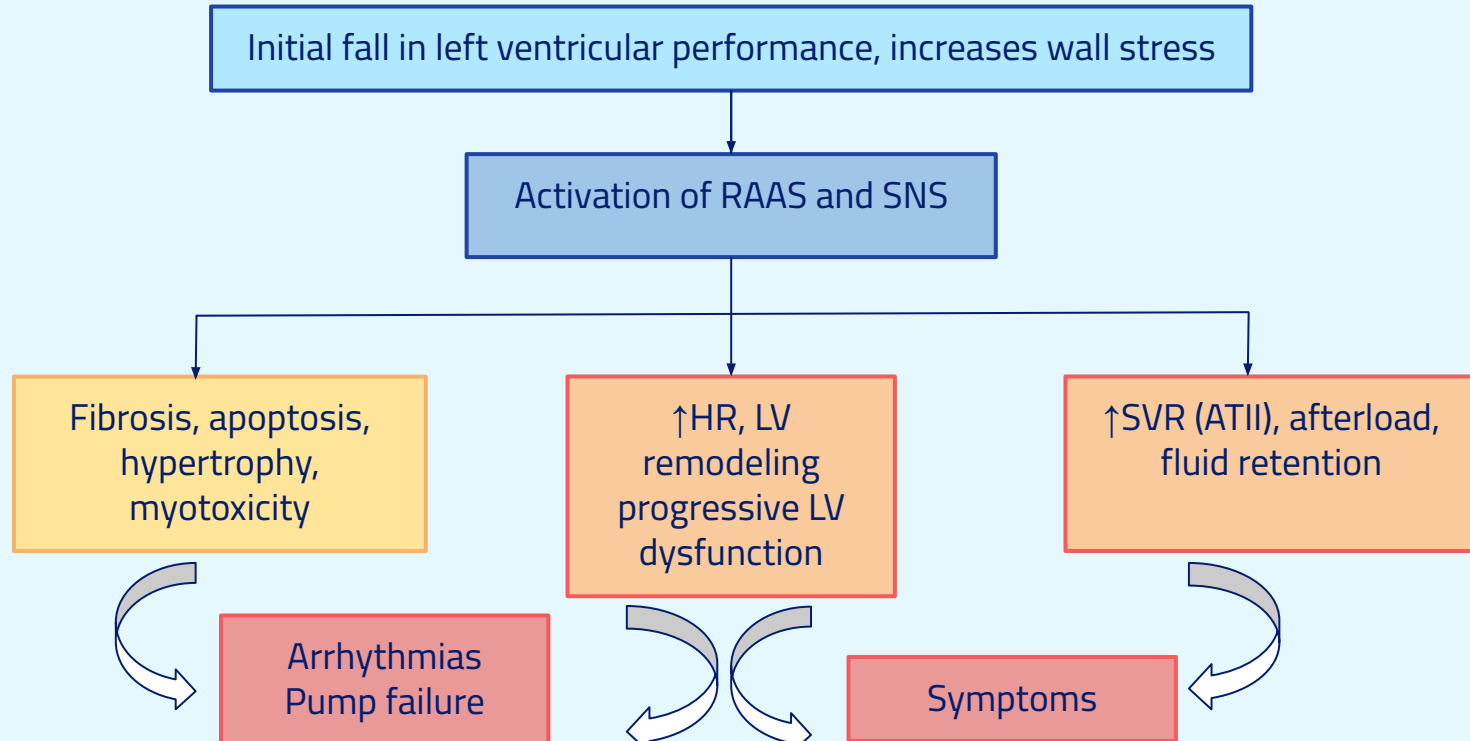
# 01 Heart Failure and GDMT



# Heart Failure

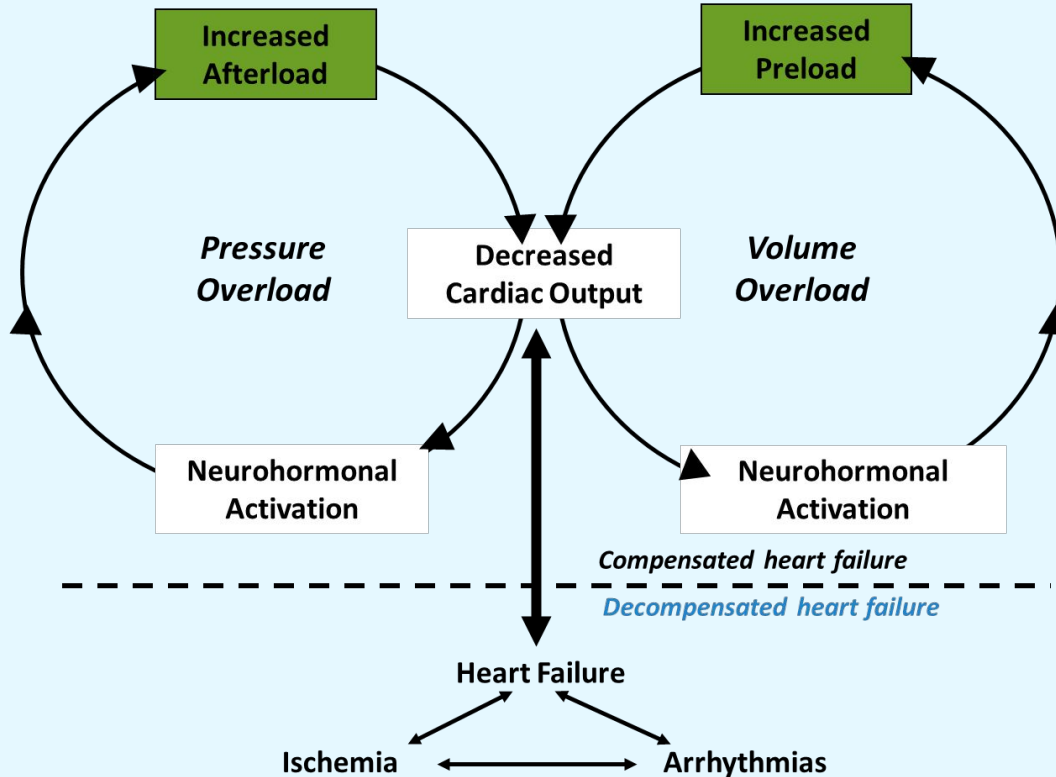


# Compensatory Mechanisms

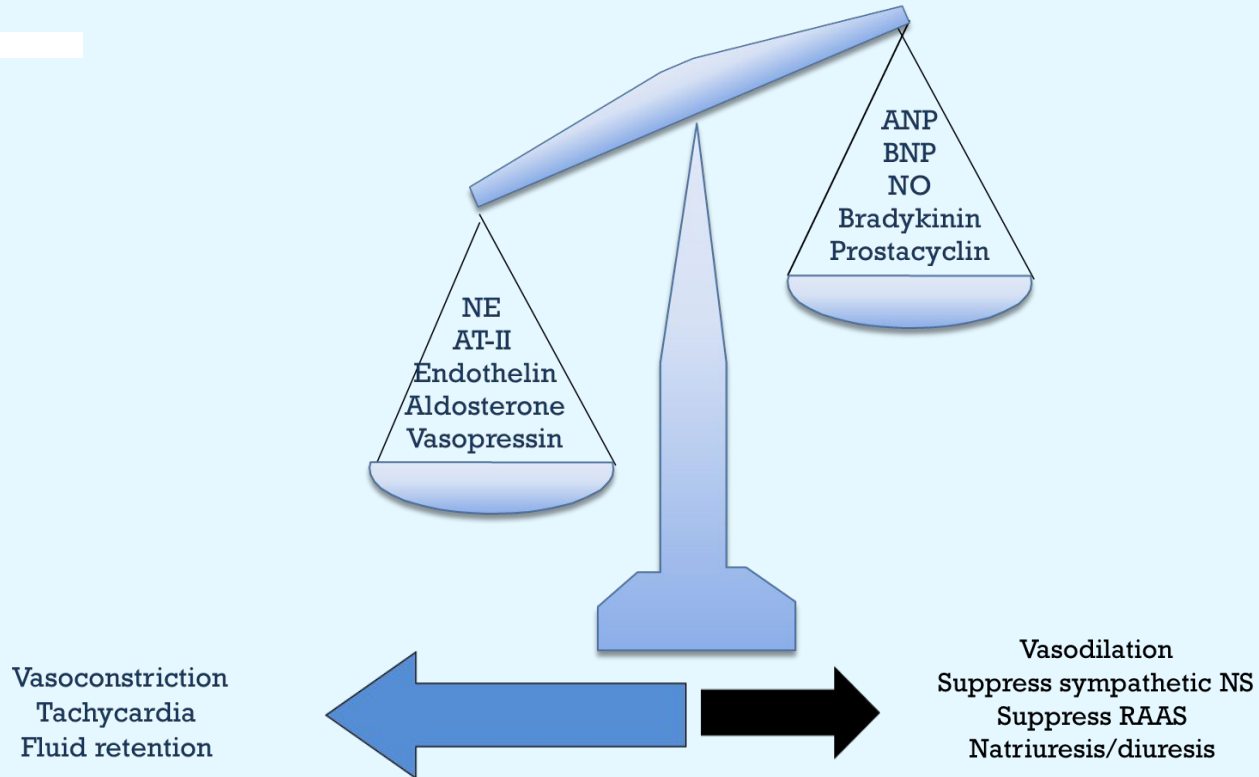


SNS: Sympathetic Nervous System, RAAS: Renin-angiotensin-aldosterone system, LV: left ventricle

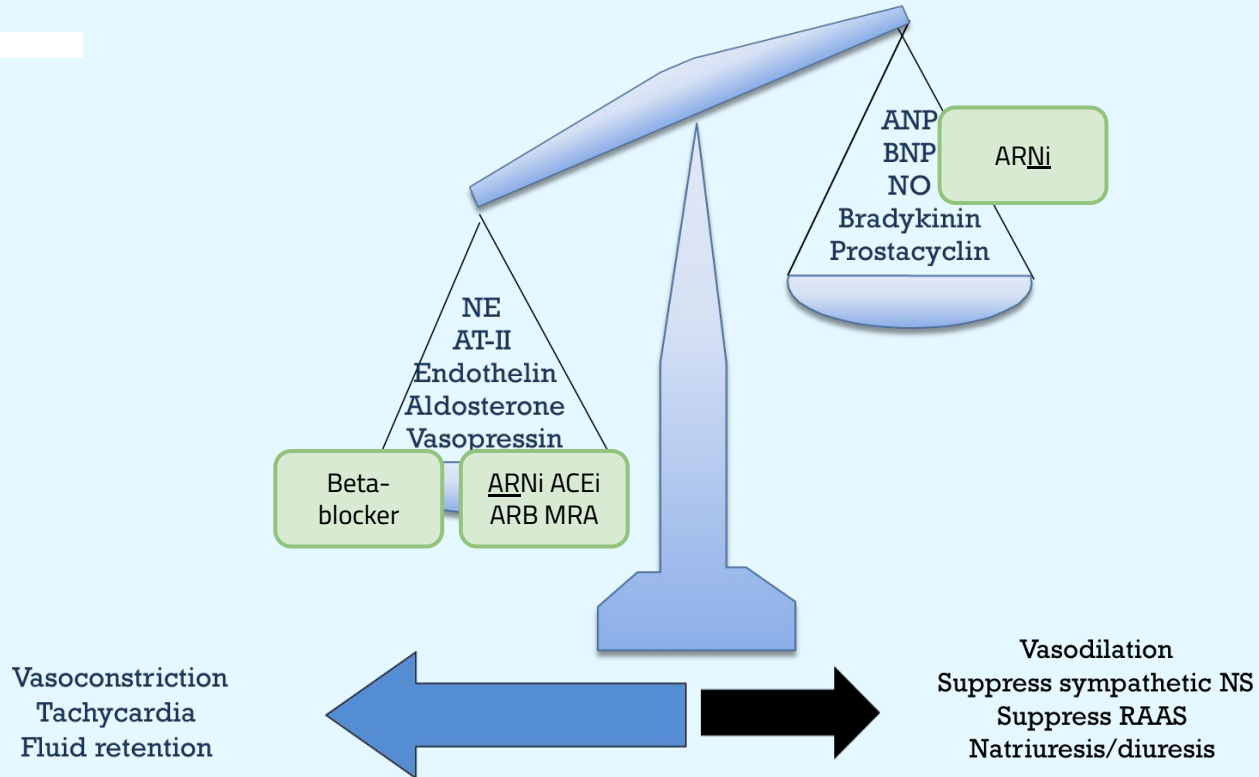
# Progression of HF



# Neurohormonal Imbalance



# Neurohormonal Imbalance





# GDMT



## First-Line Quadruple Therapy

Beta-blocker

RAAS Inhibitors

MRA

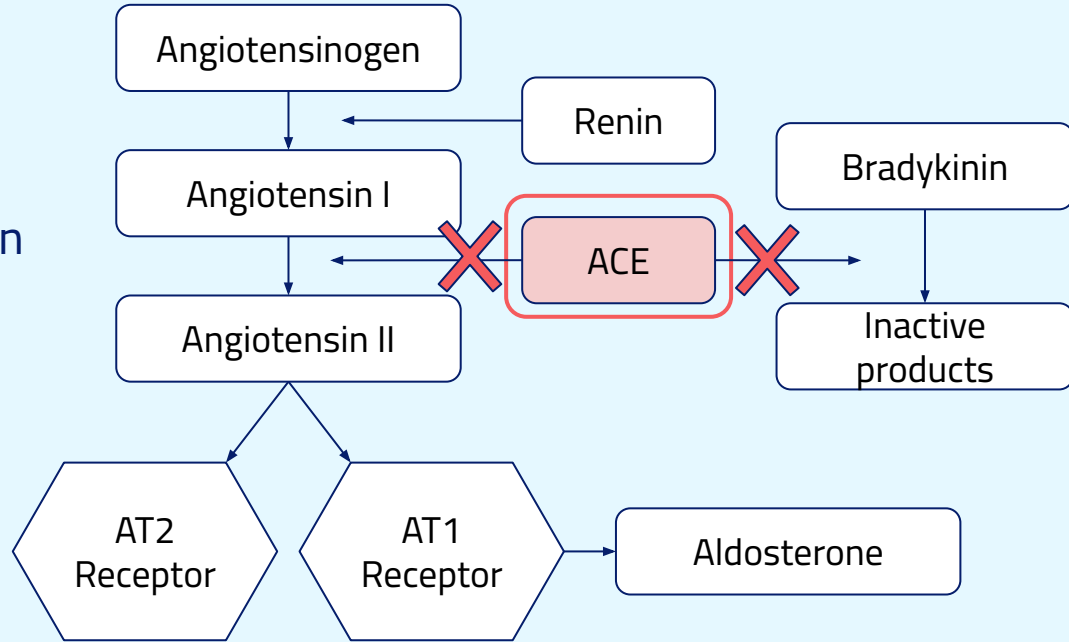
SGLT2i

# ACE Inhibitors



## Mechanism of action:

- Inhibits angiotensin converting enzyme (ACE)
- Prevents conversion of Angiotensin I to Angiotensin II (AT-II, potent vasoconstrictor)
- Results = lower AT-II levels
- Vasodilatory response
- Decrease in aldosterone, vasopressin production



**X** = site of ACEi action

# ACE Inhibitors

## Utility in heart failure:

- Short Term:
  - Decrease afterload
  - Improve symptoms
  - Decrease hospitalizations
- Long Term:
  - Reduce LV remodeling
  - Prevent hospitalizations
  - Significant decrease in mortality

## Disadvantages:

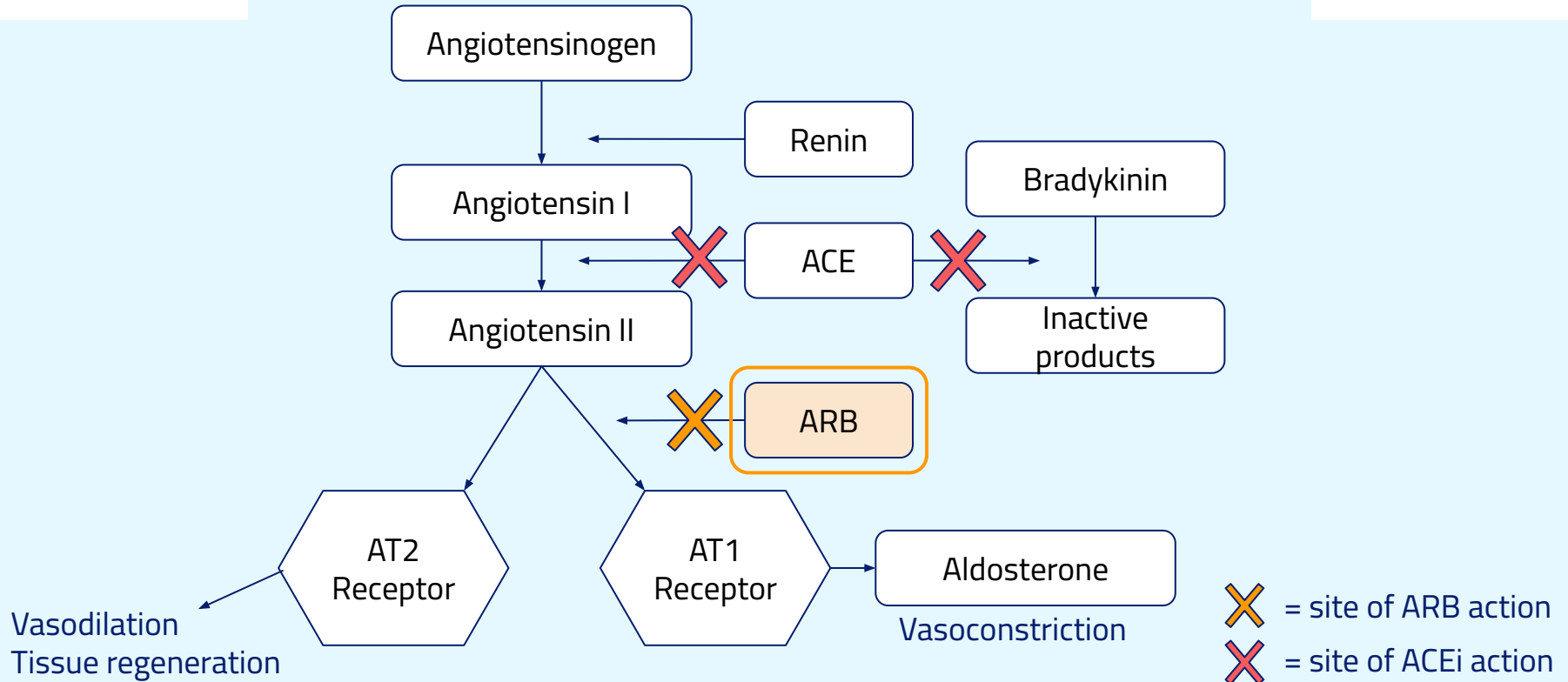
- Only modest effects on improving ejection fraction
- Do not fully suppress aldosterone formation
- Non-ACE methods for generating AT-II

# ACE Inhibitors

## Adverse Effects:

- Hyperkalemia
- Renal dysfunction
  - A-II is a potent efferent arteriole vasoconstrictor
- Cough
- Hypotension
- Dizziness
- Rash
- Angioedema

# Angiotensin Receptor Blockers



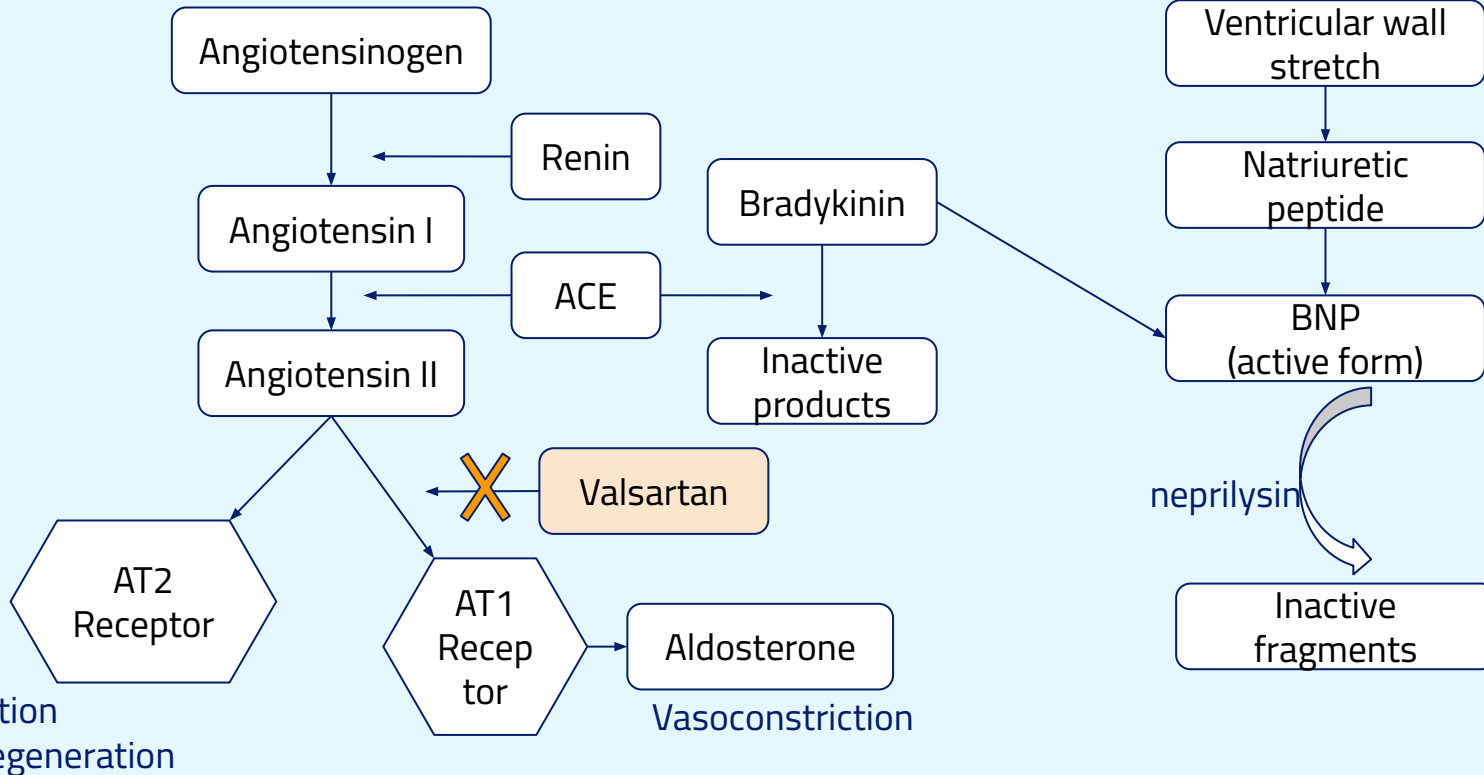
# Angiotensin Receptor Blockers



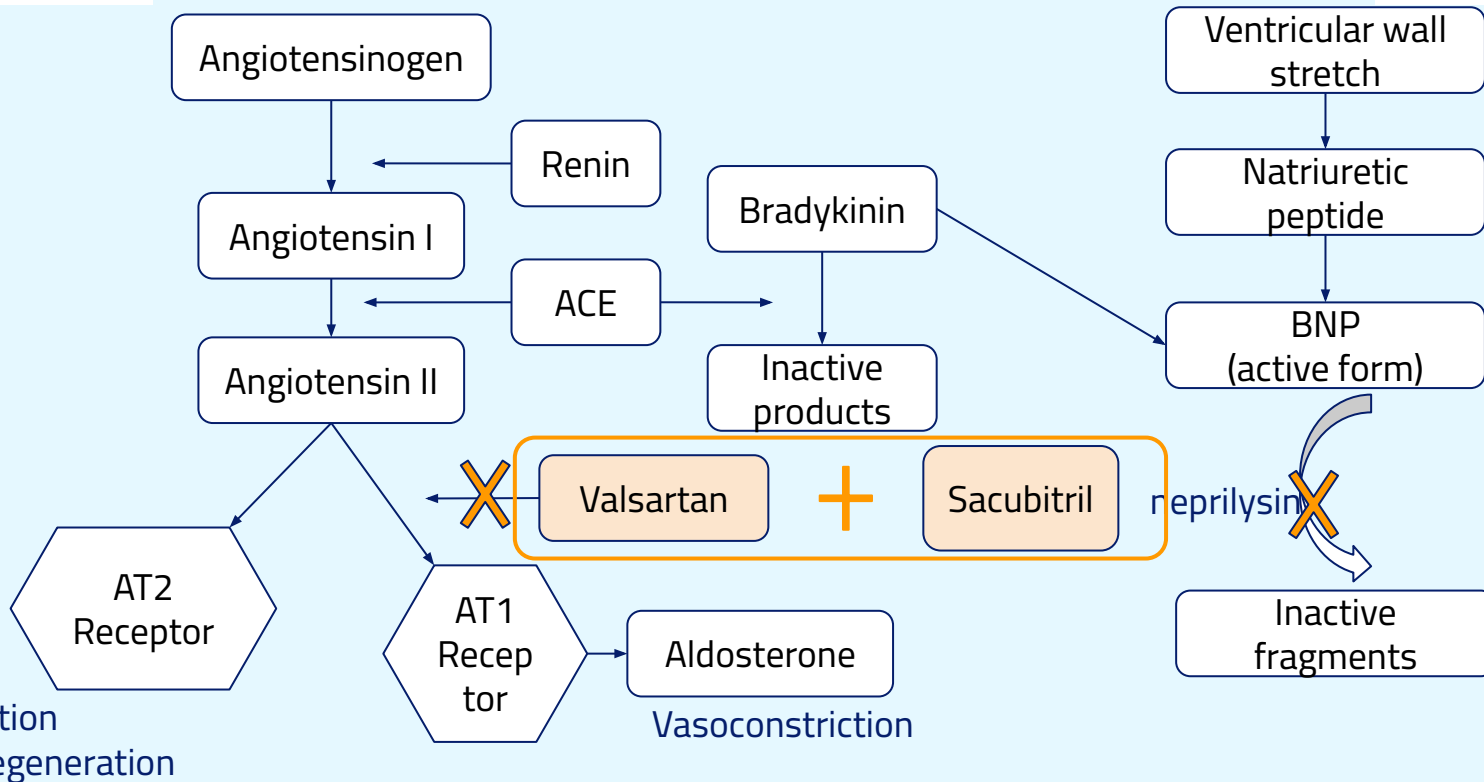
## Special Considerations:

- Use if patient experiencing dry cough with ACEi
- Angioedema with ACEi (consider with caution)

# Angiotensin Receptor-Neprilysin Inhibitor



# Angiotensin Receptor-Neprilysin Inhibitor





# Angiotensin Receptor-Neprilysin Inhibitor



- PARADIGM-HF trial: sacubitril/valsartan demonstrated superiority to enalapril in reducing the risk of cardiovascular death or hospitalizations for HFrEF

COR	LOE	Recommendations
1	A	1. In patients with HFrEF and NYHA class II to III symptoms, the use of ARNi is recommended to reduce morbidity and mortality. <sup>1-5</sup>
1	A	2. In patients with previous or current symptoms of chronic HFrEF, the use of ACEi is beneficial to reduce morbidity and mortality when the use of ARNi is not feasible. <sup>6-13</sup>
1	A	3. In patients with previous or current symptoms of chronic HFrEF who are intolerant to ACEi because of cough or angioedema and when the use of ARNi is not feasible, the use of ARB is recommended to reduce morbidity and mortality. <sup>14-18</sup>

# Beta Blockers



## **Mechanism of action:**

- Antagonize effect of catecholamines (epinephrine and norepinephrine) at beta adrenoceptors

## **Utility in heart failure:**

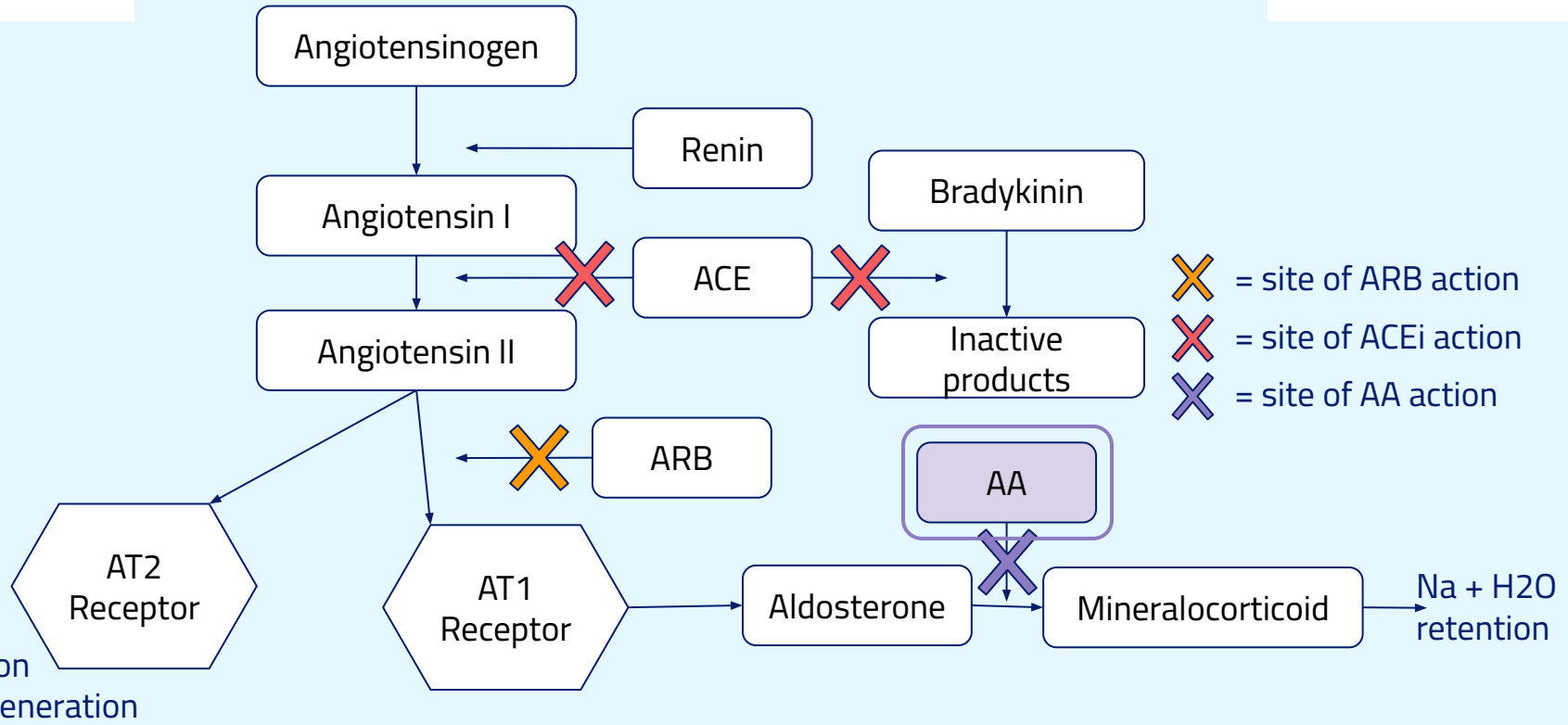
- Inhibit SNS effects on the heart
- Reduces afterload and increases ejection fraction in the long term
- Reduces remodeling/slows progression
- Reduces hospitalization
- Reduces mortality

# Beta Blockers for HF



Agent	Starting dose	Target dose
<b>Carvedilol</b>	3.125 mg twice daily	25-50 mg twice daily
<b>Metoprolol succinate</b>	12.5-25 mg daily	200 mg daily
<b>Bisoprolol</b>	2.5 mg daily	10 mg daily

# Aldosterone Antagonists



# Aldosterone Antagonists



## Utility in Heart Failure:

- Reduced mortality in all symptomatic HF patients (NYHA II-IV)

## Adverse Effects:

- Gynecomastia (spironolactone)
- Hirsutism (spironolactone)
- Hyperkalemia

## Contraindications:

- Potassium > 5.5 mmol/L
- Severe acute or chronic kidney disease/injury

# SGLT2 Inhibitors



## Utility in Heart Failure:

- Reduced hospitalization for HF and cardiovascular mortality irrespective of presence of type 2 diabetes

## Adverse Effects:

- Urinary tract infections
- Diabetic ketoacidosis (hold prior to being NPO)

## Contraindications:

- Severe acute or chronic kidney disease/injury
- Recurrent/chronic urinary tract infections

# GDMT



## First-Line Quadruple Therapy

Beta-blocker

ACEi/ARB/ARNI

MRA

SGLT2i

## Add-On Therapies

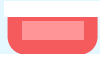
Hydralazine +  
Nitrates

Vericiguat

Ivabradine

GLP-1

# Soluble Guanylate Cyclase Stimulators (Vericiguat)



## **Mechanism of action:**

- Enhance the activity of sGC, an enzyme in the cardiopulmonary system that relaxes smooth muscles via increasing nitric oxide levels

## **Place in therapy:**

- Select high-risk patients with HFrEF and recent worsening of HF on GDMT
- May reduce HF hospitalization and cardiovascular death (Class 2b)

## **Contraindications:**

- Pregnancy (embryo-fetal toxicity)
- Concomitant use with PDE5 inhibitors and nitrates



# Ivabradine



## Mechanism of action:

- Sinoatrial node modulator that selectively inhibits the cardiac pacemaker current ( $I_f$ )

## Place in therapy:

- Symptomatic NYHA II-III, stable chronic HFrEF <35%, receiving GDMT with maximally tolerated beta blocker, in sinus rhythm with heart rates >70 BPM at rest (Class 2a)

## Contraindications:

- Acute decompensated heart failure
- Sick sinus syndrome
- Severe hepatic impairment

# Approach to Initiation



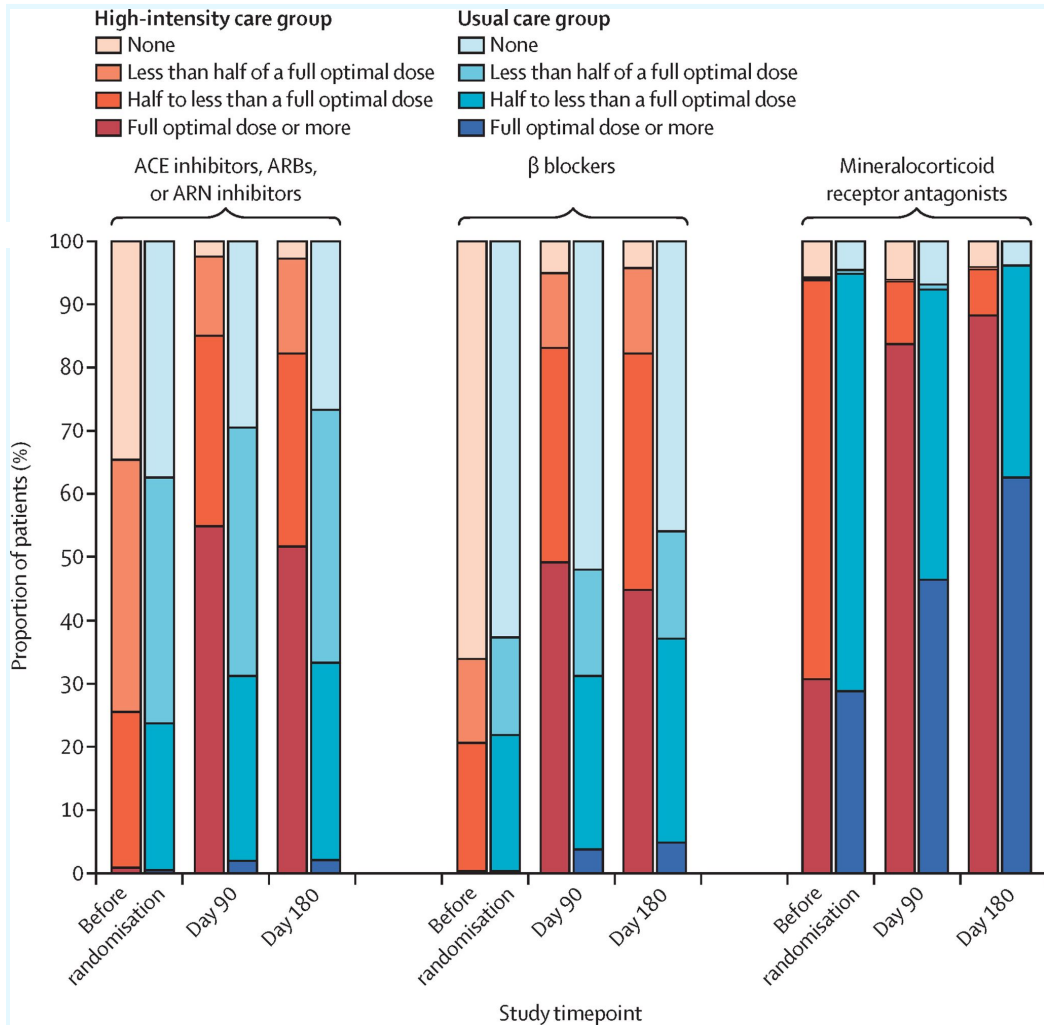
## Safety, tolerability, and efficacy of up-titration of guideline-directed medical therapies for acute heart failure (STRONG-HF): a multinational, open-label, randomised, trial

*Alexandre Mebazaa, Beth Davison, Ovidiu Chioncel, Alain Cohen-Solal, Rafael Diaz, Gerasimos Filippatos, Marco Metra, Piotr Ponikowski, Karen Sliwa, Adriaan A Voors, Christopher Edwards, Maria Novosadova, Koji Takagi, Albertino Damasceno, Hadiza Saidu, Etienne Gayat, Peter S Pang, Jelena Celutkiene, Gad Cotter*

# STRONG-HF



<b>Objective</b>	Compare high-intensity early follow-up from acute HF hospitalization with rapid up-titration of GDMT to target doses within 2-3 weeks of discharge to standard post-discharge care
<b>Design</b>	Multinational, open-label, randomized, parallel-group trial
<b>Intervention</b>	Randomized 1:1 to high-intensity up-titration (n=542) or usual care (n=536)
<b>Outcomes</b>	Primary: All-cause death or heart failure readmission by day 180 Secondary: Change from baseline to day 90 in EQ-5D VAS, all-cause death by day 180, all cause death or HF readmission by day 90
<b>Results</b>	Primary: High-intensity versus usual care group: 15.2% versus 23.3% (p=0.0021) Secondary: Change from baseline to day 90 in EQ-5D VAS high intensity versus usual care: 0.88 versus 0.9 (p < 0.0001)

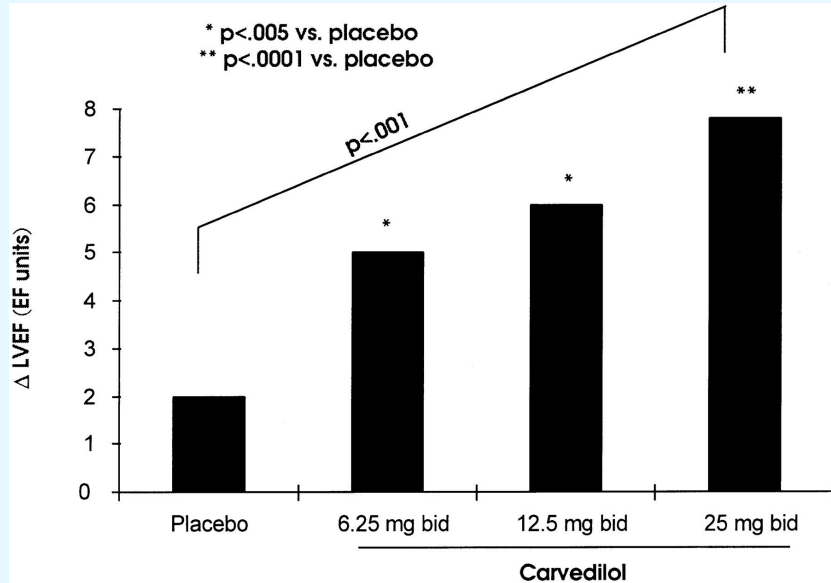


Oral guideline-directed medical therapies for heart failure prescribed, in high-intensity care and usual care groups by visit

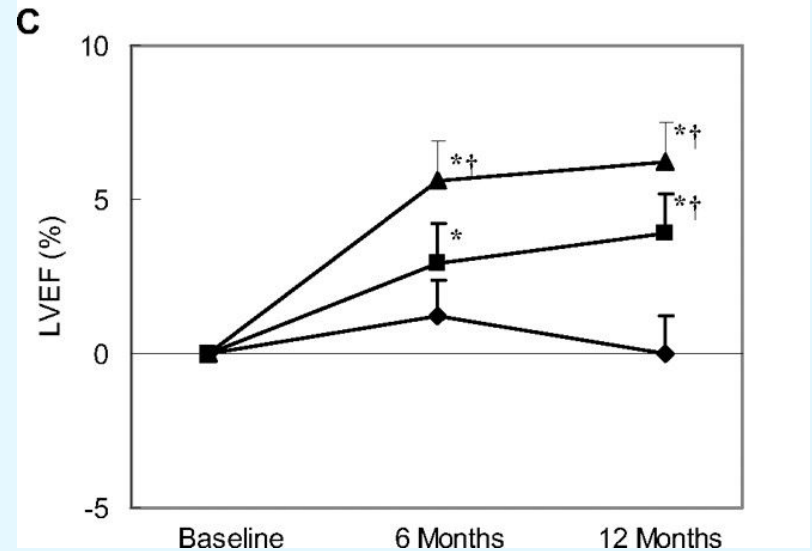
# Dose Matters



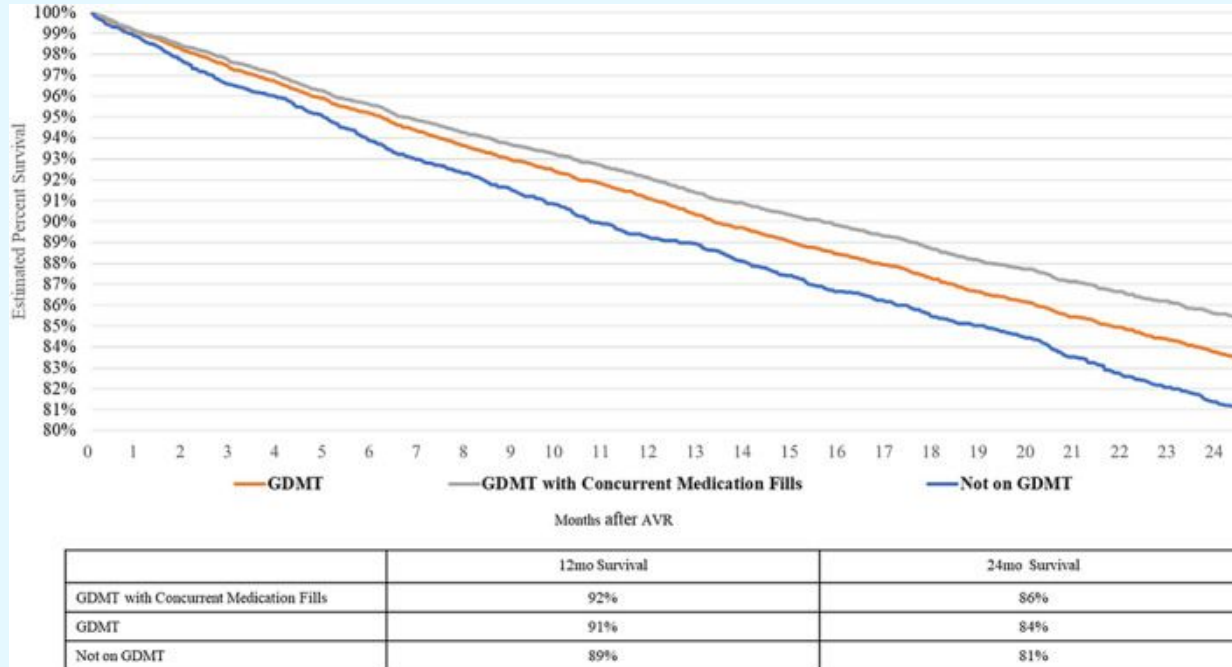
## Carvedilol



## Metoprolol XL



# Adherence Matters



# UVA GDMT Clinic



- Pharmacist led GDMT titration clinic at Fontaine Heart and Vascular Center
- Patient population:
  - Stable, LVEF <40% documented within the last 6 months
- Referrals:
  - Order 'SSAPPT', then select Pharmacy, add HF GDMT into comments

Support Services Scheduling Request ✓ Accept ✗ Cancel

Class: **Internal Referral** Incoming Referral

Referral Type: Consultation **Consultation**

Ref to Department: Heart and Vascular Cente... **Heart and Vascular Center at Fontaine** Maternal Fetal Clinic at the Battle Bldg  
Surgical Care, West Complex Digestive Health, University Hospital  
Kidney Center Clinic, West Complex Psychiatric Medicine Northridge  
Psychiatric Medicine, West Complex Child and Adolescent Psychiatry Clinic Ivy Road

Services requested:  Nutrition/Dietitian  Smoking Cessation  **Clinical Pharmacist**  Counseling **HF GDMT Clinic**  
 Psychiatric assessment  CARES program  Taking Care of Kidneys Class  
 Education class with NP  Psychiatry Social Work

Status: **Normal** Standing **Future**

Expected Date: 11/19/2024 **Today** Tomorrow 1 Week 2 Weeks 1 Month 3 Months 6 Months  Approx.

Expires: 11/19/2025 1 Month 2 Months 3 Months 4 Months 6 Months **1 Year** 18 Months

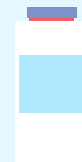
⌵ Additional Order Details

⚠ Next Required ✓ Accept ✗ Cancel



02

# Adherence





# HF Rehospitalizations



- HF is the leading cause of hospitalization in patients >65 years of age with increasing rates of hospitalizations among young adults (ages 18-49 years) since 2013
- Prevalence projected to increase by 46% and direct medical costs reach \$53 billion by 2030
- The majority of heart failure patients (~2/3) are rehospitalized within 1 year of discharge
  - Up to 44% within 6 months

# Causes for Rehospitalization



- Disease progression
- Volumetric indices
- Cardiac biomarkers
- Associated comorbidities
- Failed social-support system
- Inadequate discharge planning or follow-up
- **Nonadherence to lifestyle recommendations**
- **Nonadherence to medications**
- **Suboptimal medication management**

Up to 50% of heart failure readmissions are possibly preventable!

# Risk Factors for Nonadherence in Chronic Diseases



- Health system/health care provider factors
- Sociodemographic factors
- Patient-related psychosocial factors
- Treatment-related factors
- Condition-related factors



# Risk Factors for Nonadherence in Chronic Diseases




- **Health system/health care provider factors**
- **Sociodemographic factors**
- **Patient-related psychosocial factors**
- Treatment-related factors
- Condition-related factors


# Promoting Adherence

- Frequent medication reconciliation
- Encourage utilization of pillbox
- Enrollment in pill pack programs
- Aide in medication procurement
- Identify and remove barriers to obtaining medications







# UVA Resources to Improve Adherence



- Pill boxes available upon request in clinic and inpatient
- Encourage enrollment in UVA Specialty Pharmacy Mail Order
- Participation in UVA interactive home monitoring (IHM)
  - Telemonitoring of vital signs, weight
- Inpatient Meds to Beds program
- Early heart failure clinic follow-up appointments



# UVA Resources to Improve Adherence

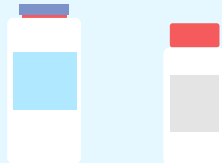


- Pill boxes available upon request in clinic and inpatient
- Encourage enrollment in UVA Specialty Pharmacy Mail Order
- Participation in UVA interactive home monitoring (IHM)
  - Telemonitoring of vital signs, weight
- Inpatient Meds to Beds program
- Early heart failure clinic follow-up appointments
  
- **Cost assistance**

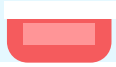


# 03

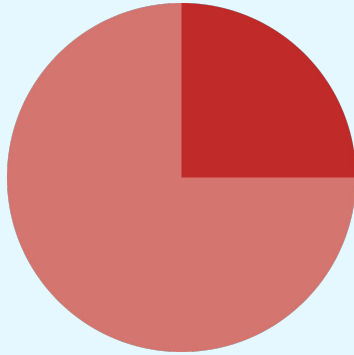
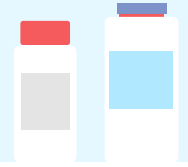
## Cost



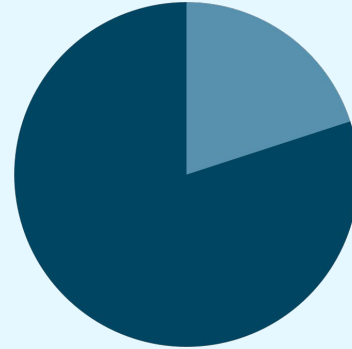




# Nonadherence Due to Cost



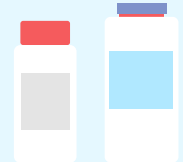
25% of adults report difficulty affording their prescription medications



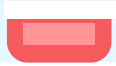
20% of adults report not taking their medications as prescribed due to cost



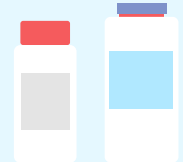
# Cost Burdens



- Patients enrolled in Medicare in 2020 faced an annual mean cost for GDMT including ARNI and SGLT2 inhibitor of \$2,200
  - Substitution for an ACEi/ARB reduced annual median cost to \$1,300
  - Generics only regimen excluding an SGLT2 inhibitor reduced annual median cost to \$160



# Mitigating Cost



**Routine Discussion  
in Clinic**

**Insurance Status**

**Public Policy and  
Reform**

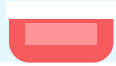
**Generic/therapeutic  
substitution**

**Discount  
cards**

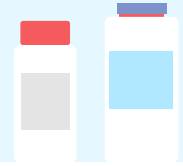
**Cost savings  
programs**

# Where to Begin?





# Mitigating Cost



**JACC STATE-OF-THE-ART REVIEW**

## Contributors and Solutions to High Out-of-Pocket Costs for Heart Failure Medications

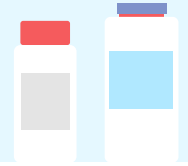
**A State-of-the-Art Review**



Emily F. Lowe, MD,<sup>a</sup> Denae Gerasta, BA,<sup>b</sup> Madeline Balsler, MPH, MSW,<sup>b</sup> Robert L. Page II, PHARM D, MSPH,<sup>c</sup> Elise Tsai, BS,<sup>b</sup> Henry D. Biermann, MD,<sup>d</sup> Andrea Mitchell, MPH,<sup>e</sup> Denise Chan, CPHT,<sup>f</sup> Daniel D. Matlock, MD, MPH,<sup>a,b</sup> Neal W. Dickert, MD, PhD,<sup>e</sup> Caroline E. Sloan, MD, MPH,<sup>g</sup> Larry A. Allen, MD, MHS<sup>a,b</sup>



# Out of Pocket Cost Simplified



Pharmacy Benefit  
Plan



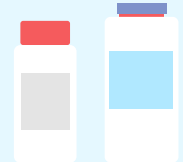
Insurance Status



Out of Pocket Cost



# Out of Pocket Cost Simplified



Pharmacy Benefit  
Plan

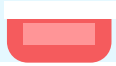


Insurance Status

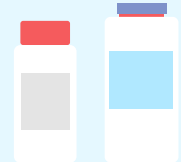


Out of Pocket Cost

- Premium
- Deductible
- Drug formulary and their tiers
- Copay versus coinsurance



# Out of Pocket Cost Simplified



## Pharmacy Benefit Plan

- Premium
- Deductible
- Drug formulary and their tiers
- Copay versus coinsurance

### **Copay**

- Fixed dollar amount
- Commonly used for lower tier drugs

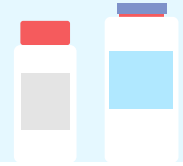
### **Coinsurance**

- Percentage of the total drug cost
- Commonly used for higher tier drugs





# Out of Pocket Cost Simplified



Pharmacy Benefit  
Plan



Insurance Status



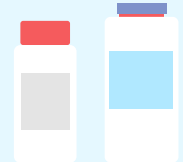
Out of Pocket Cost

- Premium
- Deductible
- Drug formulary and their tiers
- Copay versus coinsurance

- Uninsured
- Commercial/Private
- Medicare Part D
- Medicare Advantage Plan
- Medicaid
- Veterans administration



# Out of Pocket Cost Simplified



Pharmacy Benefit Plan



Insurance Status

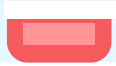


Out of Pocket Cost

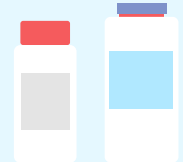
- Premium
- Deductible
- Drug formulary and their tiers
- Copay versus coinsurance

- Uninsured
- Commercial/Private
- Medicare Part D
- Medicare Advantage Plan
- Medicaid
- Veterans administration





# Patient Assistance Programs

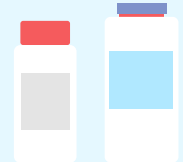


- Patient assistance programs (PAP)
  - Offer free or discounted prices for brand-name drugs
  - Manufacturer, nonprofit, or state government driven programs
- Eligibility criteria
  - Reside in the United States or U.S. territory
  - 2024 annual income <250-400% of the federal poverty limit
  - With or without insurance
- UVA Pharmacy has a designated technician for PAP assistance





# Cost Savings Programs



- Companies collect data from pharmacy benefit managers (PBM) and report the price that will be paid at various pharmacies
- A portion of the cost goes back to the PBM
  - Results in reduced profit margins for pharmacies
- Patient is responsible for presenting coupon to their pharmacy
- Beneficial for uninsured patients or those with high deductibles

GoodRX

BuzzRX

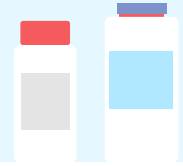
Prime Savings



Single Care

WellRX



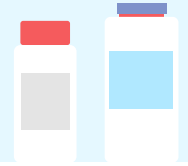
# Manufacturer Discount Cards



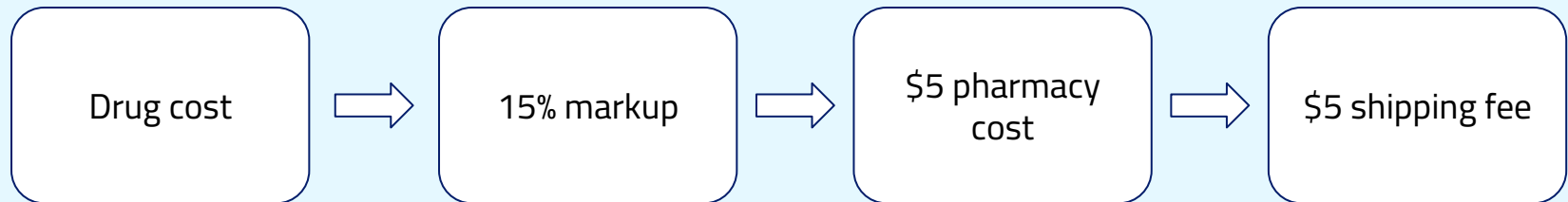
- 
- Available for brand-name drugs without a generic available
  - Can be combined with insurance
    - Amount paid can be applied to deductible and out of pocket maximum
  - Limited by expiration date and maximum savings amounts
  - Cannot be used with Medicare or other government-funded insurance
- 



# Cost Plus

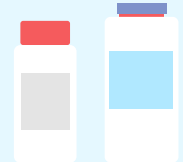


- Mark Cuban started Cost Plus to increase affordability of medications
- Limited medication supply
- Targeted to high dollar medications
- Takes requests for new medications





# Public Policy and Reform



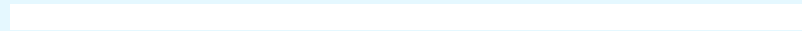
## The Inflation Reduction Act of 2022

- Lowered Medicare Part D prescription drug costs
- Expanded the Medicare Extra Help program
- Eliminate the coverage gap phase (capping costs at \$2,000 for all Part D enrollees)
- Medicare's New Drug Price Negotiation Program
  - Going into effect early 2026, includes Sacubitril/valsartan, empagliflozin, dapagliflozin, apixaban, and rivaroxaban
  - Negotiated prices ~%60 of the list price

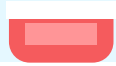


# 04

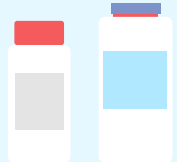
## UVA Cost Savings Programs







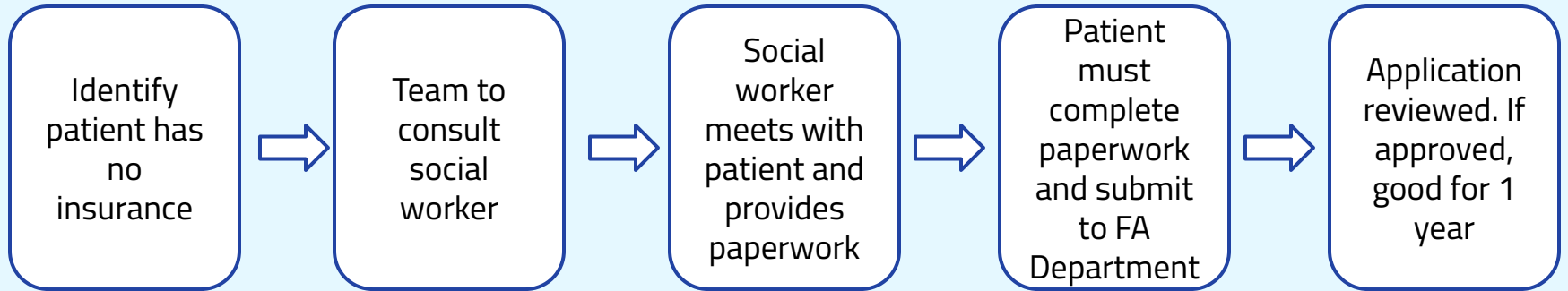
# Financial Assistance Through UVA



- Charity care discounts began in 2019
- UVA FA currently offers discount charges for medical care, physician's visits, and prescription medications
- Eligibility based on household size, income, and assets
- September 2024, extended coverage was rolled out
  - Deeper discounts reaching more patients up to 400% of the Federal Poverty level

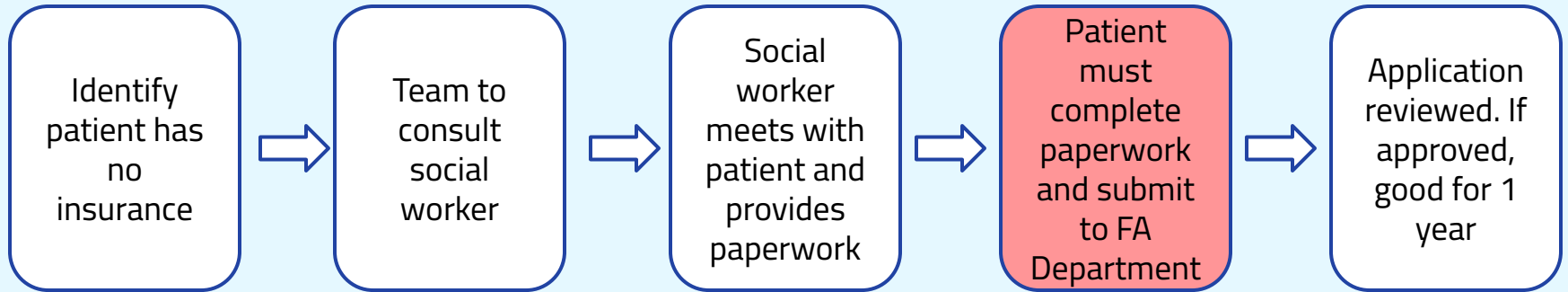


# Application Process





# Application Process





# FA Pharmacy Coverage (updated 9/2024)



FA Group	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
% drug coverage	100%	100%	100%	100%	100%	100%	0%	100%	60%	50%
Patient cost	\$0	\$0	\$0	\$0	\$0	\$0	100%	\$0	40%	50%



# FA Pharmacy Coverage (updated 9/2024)



FA Group	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
% drug coverage	100%	100%	100%	100%	100%	100%	0%	100%	60%	50%
Patient cost	\$0	\$0	\$0	\$0	\$0	\$0	100%	\$0	40%	50%



# FA Pharmacy Coverage (updated 9/2024)



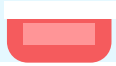
FA Group	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
% drug coverage	100%	100%	100%	100%	100%	100%	0%	100%	60%	50%
Patient cost	\$0	\$0	\$0	\$0	\$0	\$0	100%	\$0	40%	50%



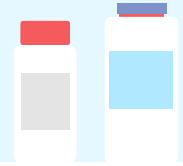
# FA Pharmacy Coverage



- Uninsured patients are eligible for a **40% discount at UVA Pharmacy**
  - If a patient has insurance coverage, they may be eligible for the discount if there is a confirmed product not covered by their insurance

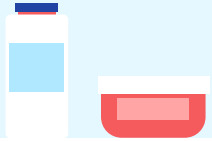


# Summary



- GDMT treats heart failure via several mechanisms including preload/afterload reduction and SNS stimulation reduction
- Literature shows significant improvement in symptoms and outcomes, especially when target doses are achieved
- Promoting adherence is essential to prevention of rehospitalization
- UVA Health offers several resources to aid in financial burden of prescriptions





# Questions?

Hanna Haddad  
PGY2 Cardiology Pharmacy Resident  
ajj2qc@UVAHealth.org

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, and infographics & images by **Freepik**



# Heart Failure Management: From Prescription to PO

Hanna Haddad, PharmD  
PGY2 Cardiology Pharmacy Resident  
UVA Health

