



FALL EDUCATION FEST

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Guideline Directed Medical Therapy for Heart Failure: Integration and Application in the Hospice and Palliative Care Population

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Conflicts of Interest

No Financial disclosures exist

Behavioral Outcome

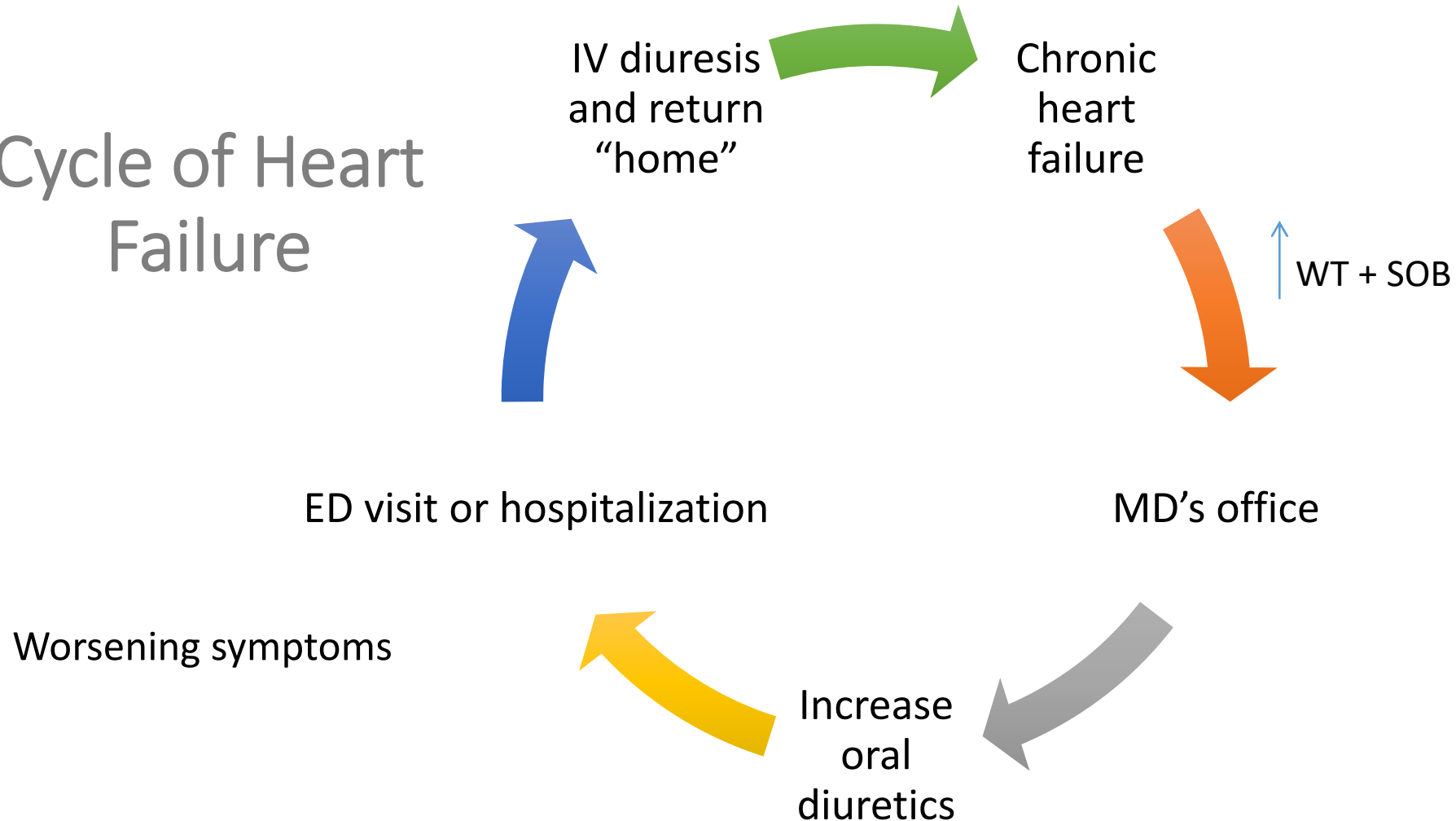
- Identify pathophysiology of structural changes related to heart failure
- Identify guideline directed medical therapy (GDMT) for the treatment of Heart Failure
- Describe indications of advanced heart failure
- Describe medication modification in advanced heart failure in accordance with GDMT

What is Heart Failure?

“A complex clinical syndrome that results from any structural or functional impairment of any ventricular filling or ejection of blood”
(Yancy et al., 2013).



Cycle of Heart Failure



Exacerbations and Readmissions cycle

ACC/AHA HF Staging and Treatment Recommendations

Stage A At high risk, no structural disease	Stage B Structural heart disease, asymptomatic	Stage C Structural heart disease with prior/current symptoms of HF	Stage D Refractory HF requiring specialized interventions
Therapy <ul style="list-style-type: none">• Treat Hypertension• Treat lipid disorders• Encourage regular exercise• Discourage alcohol intake• ACE inhibition	Therapy <ul style="list-style-type: none">• All measures under stage A• ACE inhibitors in appropriate patients• Beta-blockers in appropriate patients Class 1	Therapy <ul style="list-style-type: none">• All measures under stage A Drugs: <ul style="list-style-type: none">• Diuretics• ACE inhibitors• Beta-blockers• Digitalis• Dietary salt restriction Class 2,3,4	Therapy <ul style="list-style-type: none">• All measures under stages A,B, and C• Mechanical assist devices• Heart transplantation• Continuous (not intermittent) IV inotropic infusions for palliation• Hospice care Class 4

HF with Reduced EF or HFrEF

- Also referred to as Systolic HF
- Clinical HF with LVEF of less than or equal to 40%
- Often due to CAD and/or prior MI
 - Other causes include
 - Toxic Cardiomyopathy: ETOH, Chemo, Cocaine
 - Viral/myocarditis leading to dilated cardiomyopathy
 - Stress cardiomyopathy (physical or emotional stressor)
 - Tachycardia-induced cardiomyopathy
- ❖ Medical therapies have been proven effective in HFrEF vs HFpEF

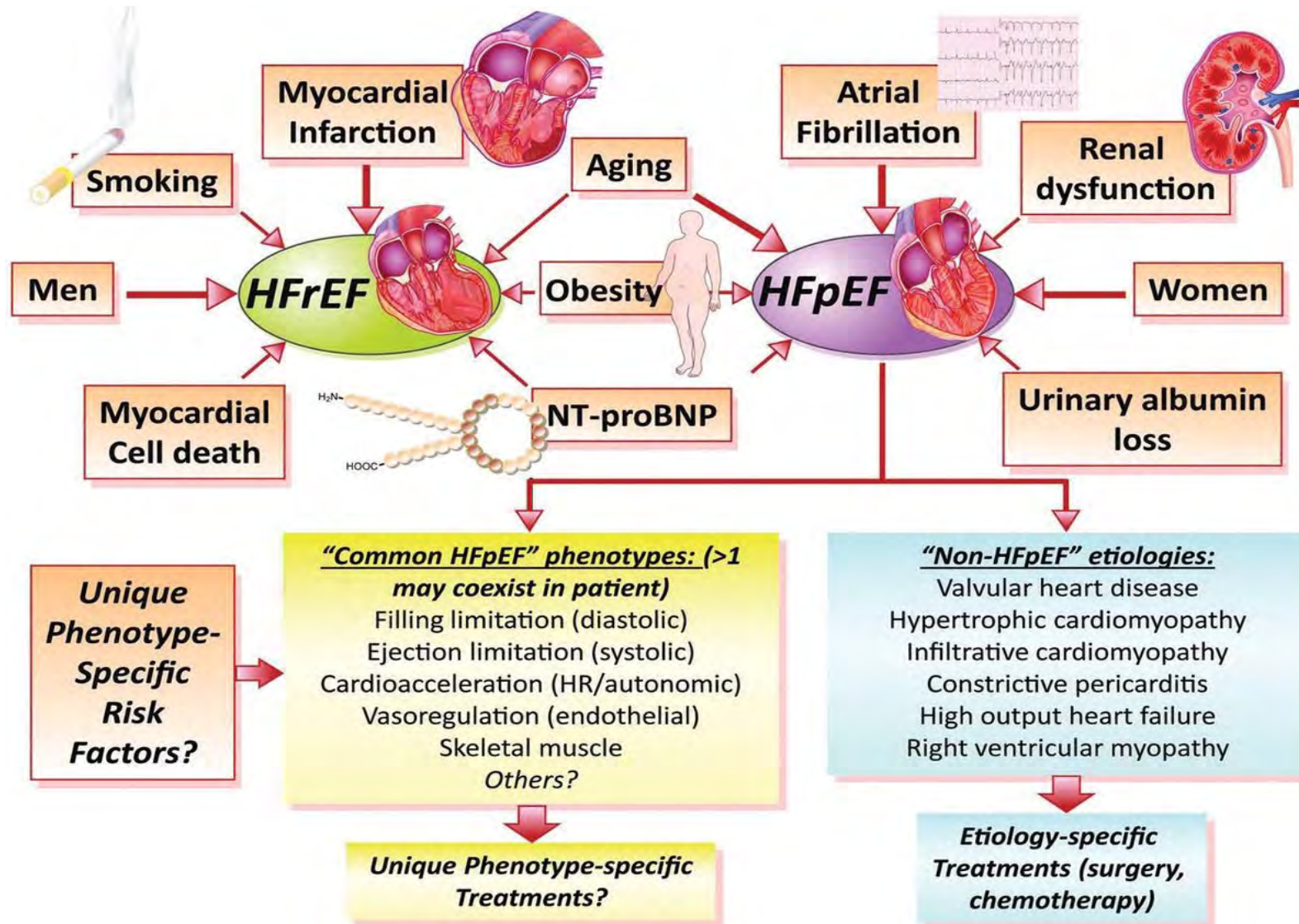
Heart Failure with preserved EF or HFpEF

- Also referred to as Diastolic Heart Failure
- Presents with clinical heart failure with EF of 50% or >
 - Frequently associated with HTN
 - Higher among >65 y and Female
 - High prevalence of obesity, DM, and Atrial fibrillation
 - Increased urinary albumin excretion (UAE)

Differentiating Heart Failure

	HFrEF	HFpEF	Borderline HFpEF	Improved HFpEF
Definition	LV systolic dysfunction	LV systolic function preserved, a filling problem	Characteristics, treatment patterns, & outcomes appear similar to those of patients with HFpEF	Patients who previously had EF <40%
LVEF	≤40%	≥50%	41-49%	>40%
Therapies	BB + ACEi/ARB + aldosterone antagonist if EF is less than 35%	BP, HR control, treat symptoms with diuresis	BP, HR control, treat symptoms with diuresis	Typically remain on BB and ACEi/ARB

Profiles and Phenotypes in HF



Clinical Assessment for Heart Failure

- Biometrics
- Heart Sounds-assessment/devices
- Edema-location/quality
- Dietary and I/O
- Output-quantity/quality
- Respiratory assessment-support, sleep hygiene/secondary dx
- Medication review-GDMT
- Cognitive/Mood/Behavior-psychosocial support
- Preventable/reversible factors-atrial fib, dig toxicity, lyte imbalance, infection, anemia, medication change...

Identifying Advanced HF: Clinical Findings

Repeated (≥ 2) hospitalizations or ED visits for HF in the past year
Progressive deterioration in renal function (e.g., rise in BUN and creatinine)
Weight loss without other cause (e.g., cardiac cachexia)
Intolerance to ACE inhibitors due to hypotension and/or worsening renal function
Intolerance to beta blockers due to worsening HF or hypotension
Frequent systolic blood pressure < 90 mm Hg
Persistent dyspnea with dressing or bathing requiring rest
Inability to walk 1 block on the level ground due to dyspnea or fatigue
Recent need to escalate diuretics to maintain volume status, often reaching daily furosemide equivalent dose > 160 mg/d and/or use of supplemental metolazone therapy
Progressive decline in serum sodium, usually to < 133 mEq/L
Frequent ICD shocks



HFrEF

Cardiovascular (80%-85%)

Worsening HF

- Cardiogenic Shock
- Low Output State

Sudden Cardiac Death

- Ventricular Tachyarrhythmia +++
- Bradyarrhythmia +

Other Cardiovascular or Noncardiovascular (15%-20%)

HFpEF

Cardiovascular

Worsening HF

- Restrictive Cardiomyopathy
- Right Heart Failure

Sudden Death

- Nonarrhythmic Sudden Death
- Tachyarrhythmia
- Bradyarrhythmia

Myocardial Infarction

Vascular

- Aortic Aneurysm
- Pulmonary Embolism

Cerebrovascular

- Intracranial Hemorrhage
- Ischemic Stroke

Noncardiovascular

Renal

- End-stage Renal Disease
- Renal Venous Congestion

Respiratory

- Respiratory Failure
- Pulmonary Hypertension
- Chronic Obstructive Pulmonary Disease

Infection/Sepsis

Malignancy

Multisystem Disease

- Multisystem Organ Failure

Causes of
death among
HF patients

Tele-medicine Clinical Process

- Symptom report and biometrics
 - Daily Weights
 - Respiratory status
 - Activity tolerance
- Algorithms of care
 - Critical thinking guide
 - Chest pain, dyspnea, fluid overload
 - Differentiation of etiology



Care Provider's Role



- Obtain accurate daily weights on your patients
 - Standing weights when possible
 - Document type of weight measurement (i.e. bed, standing scale, digital scale).
 - Symptom recognition/education
 - Document and communicate changes in medical record
 - Goals of care discussions



Medication management and Hospice and Palliative Care Eligibility

Dr. Wendy Schmitz, M.D.

VP of Medical Care, Ohio's Hospice of Dayton



Guideline Directed Medical Therapy (GDMT)

- ☐ What are the AHA/ACC recommendations for HF-Guideline directed medical therapy?
- ☐ How do these recommendations change for end-stage disease?
- ☐ How, when and under what circumstances do we modify GDMT?

Case Study Review

62y.o male with ES CHF and COPD admitted to hospice services
EF 20% NYHA stage 4, orthopnea, 3+ LE edema, O2 dependent,
needing assistance with ADL's, in NSR, SBP 120, HR 100, Cr 2.2 K
4.5.

What medications should this patient be taking for his ES CHF?

- 1) Lisinopril, Metoprolol Tartrate, Furosemide
- 2) Lisinopril, Metoprolol Succ., Bumex, Spironolactone
- 3) Lisinopril, Carvedilol, Valsartan, Spironolactone
- 4) Sacubitril/Valsartan (Entresto), Furosemide,
Spironolactone

ACE/ARB/ARNI

- EF < 40% should be on ACE/ARB/ARNI
- ARB if not tolerating ACE due to cough
- Not ACE and ARB together
- ARNI if able to tolerate ACE or ARB
- ARNI- Angiotensin II Receptor Blocker Neprilysin Inhibitor Valsartan/Sacubitril- Entresto®
 - In place of ACE/ARB for anyone tolerating ACE or ARB
 - Adverse reactions: Angioedema, hypotension, hyperkalemia
 - Cost approx. \$10/tab (twice a day dosing)

Beta-Blockers

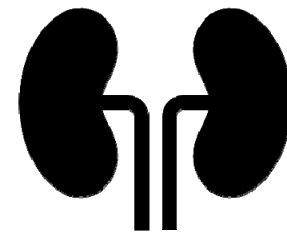
- Start on patients that are stable
- Carvedilol (Coreg), Metoprolol Succinate (Toprol, Toprol xl) Bisoprolol (not Lopressor)
- OK to use with COPD but use caution with asthma
- Avoid abrupt withdrawal
- Complications
 - Bradycardia, Hypotension, Fluid retention, Fatigue

Hydralazine and Nitrate

- If not able to tolerate ACE or ARB
- Use in African American patients, even if they tolerate ACE/ARB
- Enhanced b/p control
- Isosorbide dinitrate/hydralazine (BiDil)
 - Combination tab of Hydralazine and Isosorbide dinitrate, 1-2 tabs three times daily
 - \$4.50 per tab

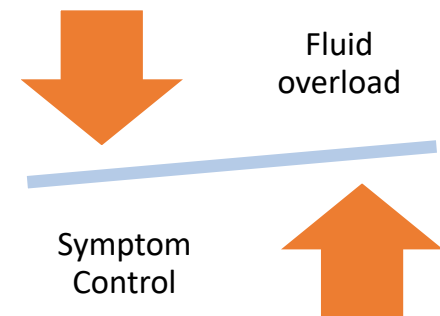
Mineralocorticoid Receptor Antagonists (MRA)

- Spironolactone, Eplerenone
- Start 12.5-25 mg every day or every other day
- Consider KCL
- Monitor labs for Cr and K
- Contraindications:
 - Potassium >5
 - Cr > 2.5 (males), Cr > 2.0 (females) CrCl < 30
 - Caution with elderly
 - NIOSH



Diuretics

- Loop diuretics- Furosemide, Bumetanide, Torsemide
- For s/s of fluid overload: edema, shortness of breath, or BP control
 - Not routinely given just for HF diagnosis
 - If blood pressure is low and patient not volume overloaded adjust/reduce dose accordingly
- Metolazone
 - Exacerbation
 - Weight based dosing/14-hr $\frac{1}{2}$ life
 - 2-3 lbs per day or 5# in a week
 - Specific dry weight and dose to take if weight greater than...
 - 2.5 mg-5 mg starting dose



GDMT for HFrEF

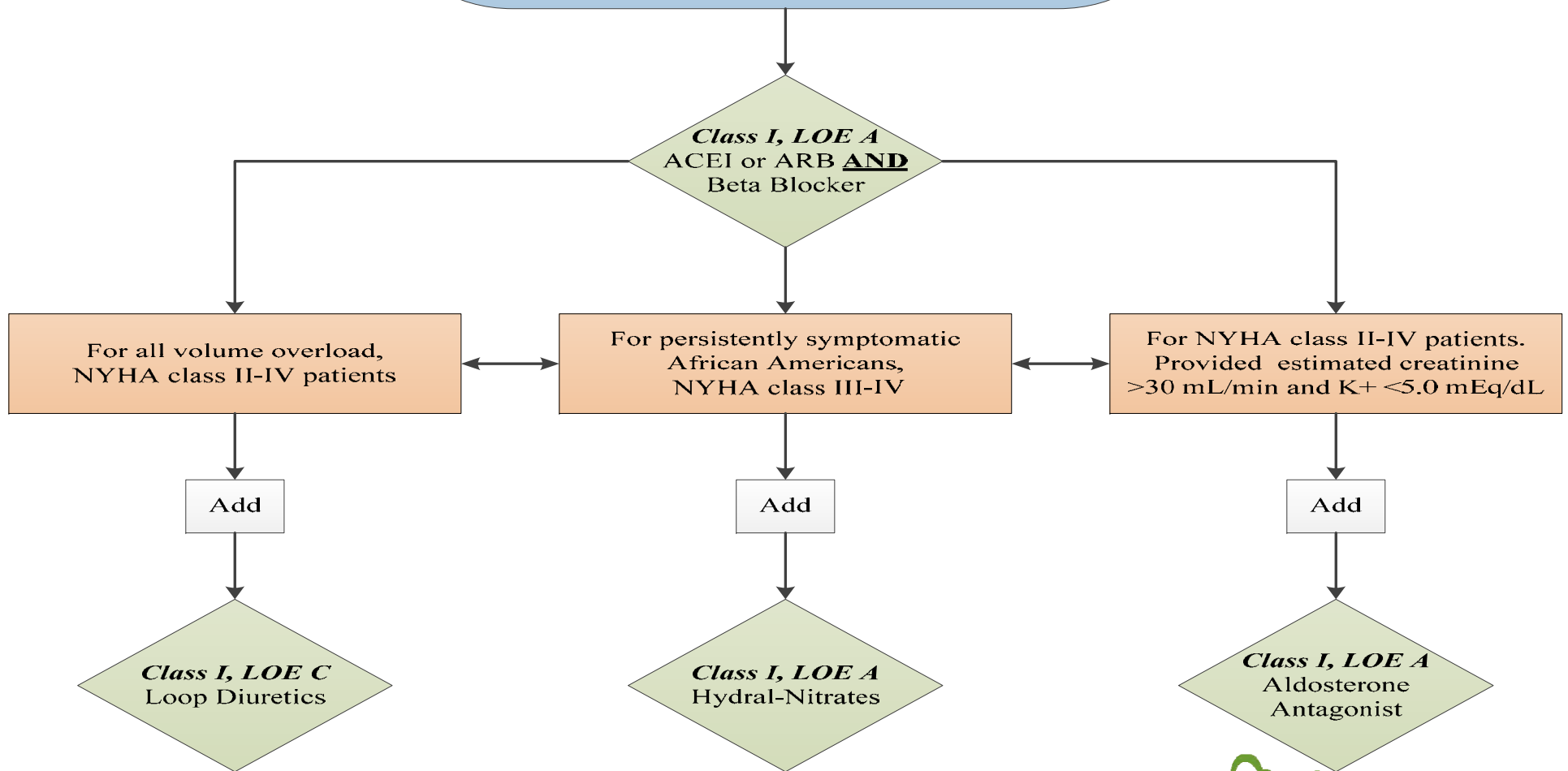
- Digoxin- Can be beneficial for HF
 - Monitor labs in renal insuff./failure, possible dose adjustment
- Anticoagulation- Patients with chronic HF and permanent/persistent/paroxysmal AF and risk factors for stroke should be on anticoagulation tx unless contraindicated.
 - Risk/benefit discussion
- Inotropes- Long-term use of inotropes not recommended except in palliative care setting at fixed rate.
 - Risk of arrhythmias and sudden death
 - Code status discussion

AHA/ACC Classification of Recommendations and Level of Evidence

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	SIZE OF TREATMENT EFFECT				
	CLASS I <i>Benefit >>> Risk</i> Procedure/Treatment SHOULD be performed/ administered	CLASS IIa <i>Benefit >> Risk</i> Additional studies with focused objectives needed IT IS REASONABLE to per- form procedure/administer treatment	CLASS IIb <i>Benefit ≥ Risk</i> Additional studies with broad objectives needed; additional registry data would be helpful Procedure/Treatment MAY BE CONSIDERED	CLASS III <i>No Benefit</i> or CLASS III <i>Harm</i>	
				Procedure/ Test	Treatment
				COR III: No benefit	No Proven Benefit
				COR III: Harm	Excess Cost w/o Benefit or Harmful to Patients
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	■ Recommendation that procedure or treatment is useful/effective ■ Sufficient evidence from multiple randomized trials or meta-analyses	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Sufficient evidence from multiple randomized trials or meta-analyses	
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is useful/effective ■ Evidence from single randomized trial or nonrandomized studies	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Evidence from single randomized trial or nonrandomized studies	
LEVEL C Very limited populations evaluated* Only consensus opinion or experts, case studies, or standard of care	■ Recommendation that procedure or treatment is useful/effective ■ Only expert opinion, case studies, or standard of care	■ Recommendation in favor of treatment or procedure being useful/effective ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation's usefulness/efficacy less well established ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Only expert opinion, case studies, or standard of care	
Suggested phrases for writing recommendations	should is recommended is indicated is useful/effective/beneficial	is reasonable can be useful/effective/beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown/unclear/uncertain or not well established	COR III: No Benefit	COR III: Harm
				is not recommended is not indicated should not be performed/ administered/ other	potentially harmful causes harm associated with excess morbidity/mortality
Comparative effectiveness phrases ¹	treatment/strategy A is recommended/indicated in preference to treatment B treatment A should be chosen over treatment B	treatment/strategy A is probably recommended/indicated in preference to treatment B it is reasonable to choose treatment A over treatment B		is not useful/ beneficial/ effective	should not be performed/ administered/ other

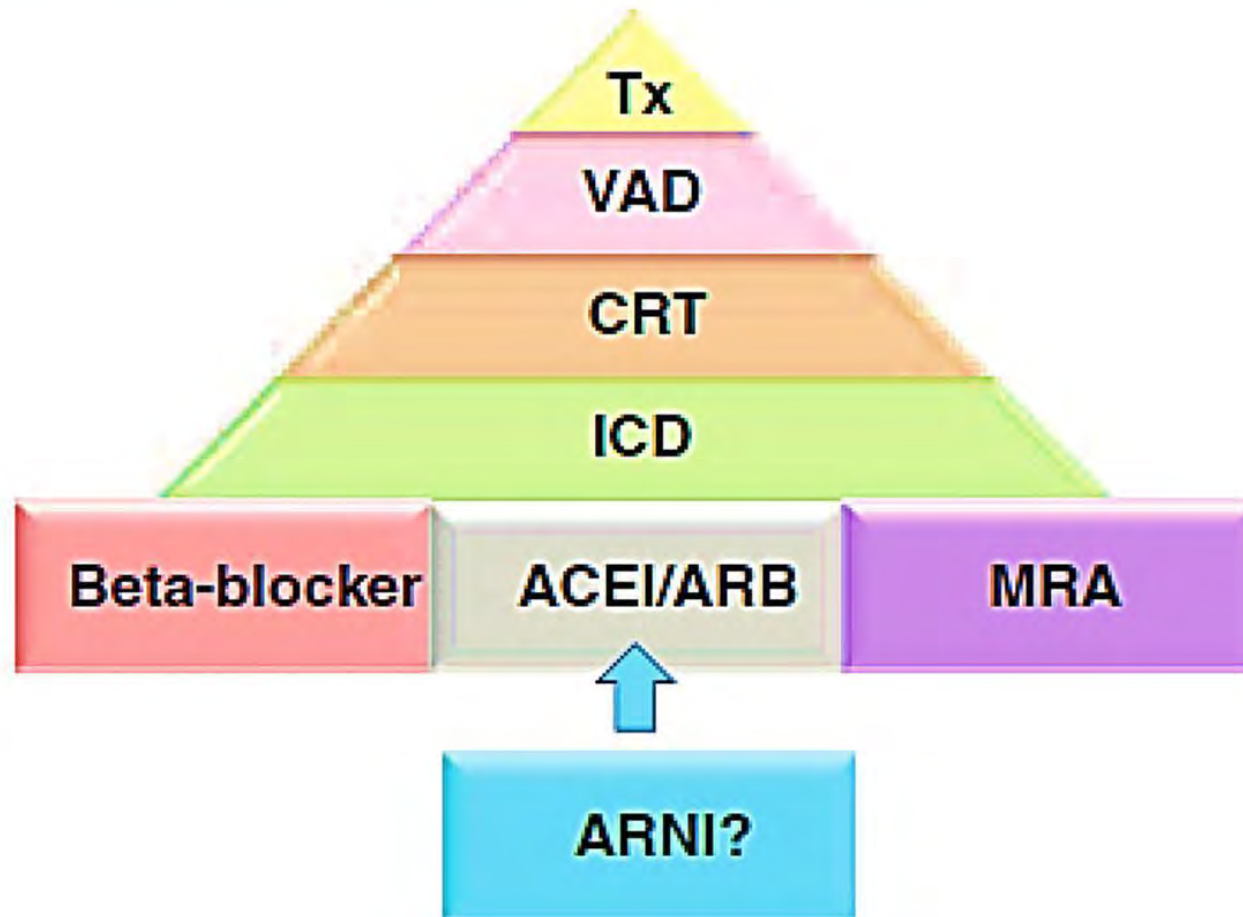
A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Although randomized trials are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

**HFrEF Stage C
NYHA Class I – IV
Treatment:**



ACC/AHA Pharmacological Treatment for
HF Stage C/NYHA Class I-IV

HFrEF Treatment



Case Study Review

62 y.o. male with ES CHF and COPD admitted to hospice services EF 20%, NYHA stage 4, orthopnea, 3+ LE edema, O2 dependent, needing assistance with ADL's, in NSR, SBP 120, HR 100, Cr 2.2, K 4.5.

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GDMT for Stage C HFpEF

Emphasis of treatment based on risk factor control

- Practice guidelines recommend SBP and DBP control
 - <120-125/80
- Diuretic use for treatment if fluid overload and symptom control
- Revascularization, device therapy, or valvular surgery are reasonable in symptomatic patients despite GDMT (appropriate pre-hospice candidates)

GDMT for Stage C HFpEF

- Atrial Fibrillation management; rhythm and rate control improve symptom management
- Ca Channel Blockers and Beta-blocker often used for BP and rate control
- Use of ARBs may be considered to reduce hospitalization in HFpEF
- Routine use of dietary supplements is not recommended in HFpEF and may be harmful

What to Stop? When to Stop? How to Stop?



NOT AN EASY
QUESTION



NOT AN EASY
ANSWER



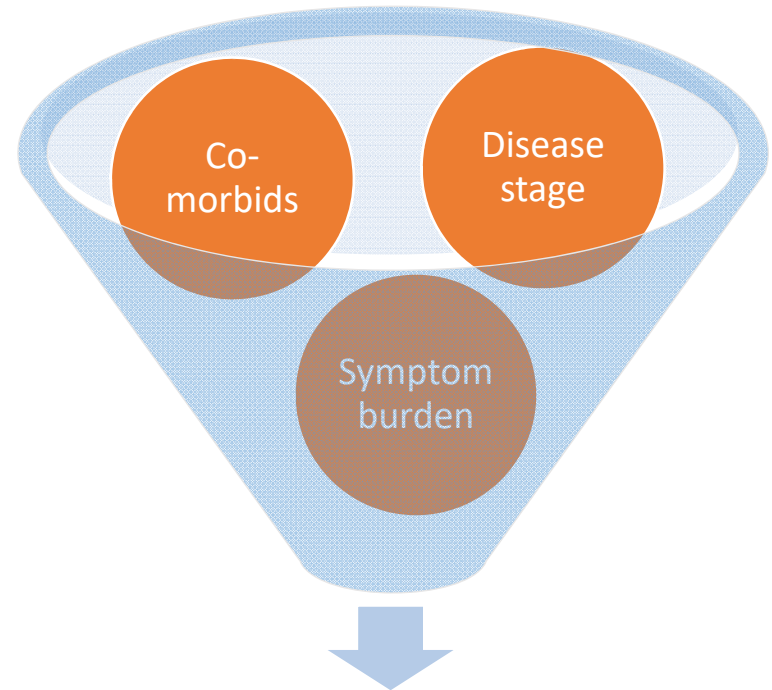
PATIENT
GOALS



RISK VS
BENEFIT

Eligibility for hospice

- Class 3-4 NYHA
- Unable to tolerate optimal treatment
- Dyspnea at rest or with conversation
- CHF refractory to treatment
- O2 dependence
- EF <20% (not required for HFpEF)
- Cardiac cachexia
- Ascites, pleural effusion
- Arrhythmias, d/c of ICD
- Frequent pulmonary edema or chest pain
- Fatigue and sleeping more
- Worsening renal failure



Hospice eligible

Case Study Review

Current hospice patient is an 84y/o female with ES CHF EF 20%. She lives at home with family and holds furniture when she ambulates in the house due to dizziness and instability, She is having more difficulty caring for herself and needing assistance with ADLs. Appetite is poor and she eats 2 small meals a day. No change in weight. She is currently taking Lisinopril, Amlodipine, Coumadin, Spironolactone, metoprolol succ., and furosemide. SBP 100 and HR 62

Which medication regimen is recommended?

- 1) Stop all but comfort medications since she is a hospice patient
- 2) Stop her Furosemide, Coumadin and Amlodipine but keep her Lisinopril, Carvedilol and Spironolactone. Adjust downward as needed
- 3) Continue all her medications
- 4) Stop her Lisinopril and Spironolactone due to poor PO intake and risk for side effects of ARI and dehydration

Dose Reduction Before Drug Elimination

Prognosis days, weeks, months

Dose reduction before drug elimination

- Hypotension or orthostatic
- Dizziness or falls
- Bradycardia (symptomatic)
- Worsening renal function +/- Hyperkalemia
- Pill burden
- Inability/no longer monitoring
- Primary prevention
- Cost



Cautious Use Medications

- Adding Steroids
 - Increase Digoxin level and impact fluid retention
- Adding NSAIDS interferes with ACE inhibitors (not recommended for Cardiovascular patients)
 - K levels
 - BP control
 - CHF exacerbation
- Dehydration or worsened renal function
 - Affects Gabapentin, Digoxin and narcotic effect





Follow-up and Pt/Family Education

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Cardiac and Pulmonary Focused Care Clinical Liaison



Follow up

*Phone call 3 day *Follow up 7-14 days

- Each visit recommendations:
 - Initiate and optimize GDMT
 - Examine precipitating factors of HF
 - Check volume status with lying and upright orthostatic blood pressures
 - Optimized Comorbid conditions
 - Reinforce
 - Education
 - Self care
 - Emergency plan
 - Need to adhere
 - PC/Hospice referral
 - Cardiac rehab referral



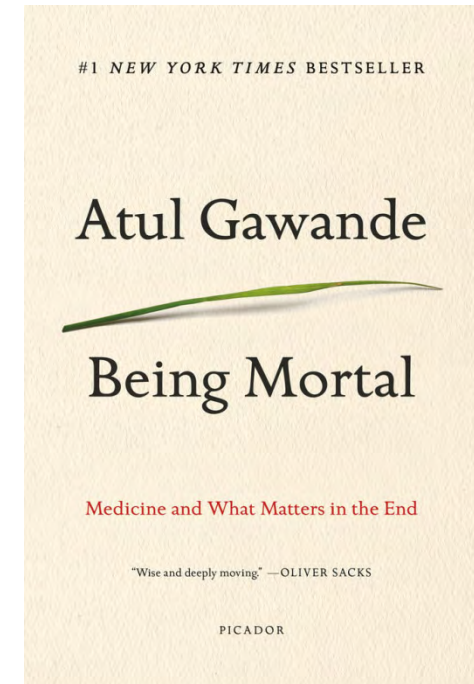
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Coordinating Care for Chronic HF

- Attention to transitions of care among providers to achieve GDMT and prevent hospitalization
- Implement plan of care including GDMT and management of co-morbidities, physician follow up, and self-care strategies
- Initiate palliative and hospice care in patient with symptomatic advanced HF to enhance quality of life

How do I start?

Goals of Care Discussions



“Arriving at an acceptance of one’s mortality and a clear understanding of the limits and the possibilities of medicine is a process, not an epiphany.”

Atul Gawande (2014)

Five Important Questions



Tim Llewellyn

- What is your understanding of your illness?
- What are your biggest fears and concerns?
- What goals are most important to you?
- What are you willing/not willing to accept ?
- How do you want to spend your time if your health worsens?

What does a good day look like for you?

Gawande, A. (2014) *Being Mortal: Medicine and What Matters in the End*

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Patient/Family Teaching: Lifestyle Management

- Medication teaching/management
- Symptom recognition
- Weight monitoring/tele-medicine
- Diet /Fluid Intake
- Follow up care
- Home Care/Hospice Care
- Alcohol and smoking cessation
- Physical activity
- Influenza, Pneumonia/Pneumococcal vaccine

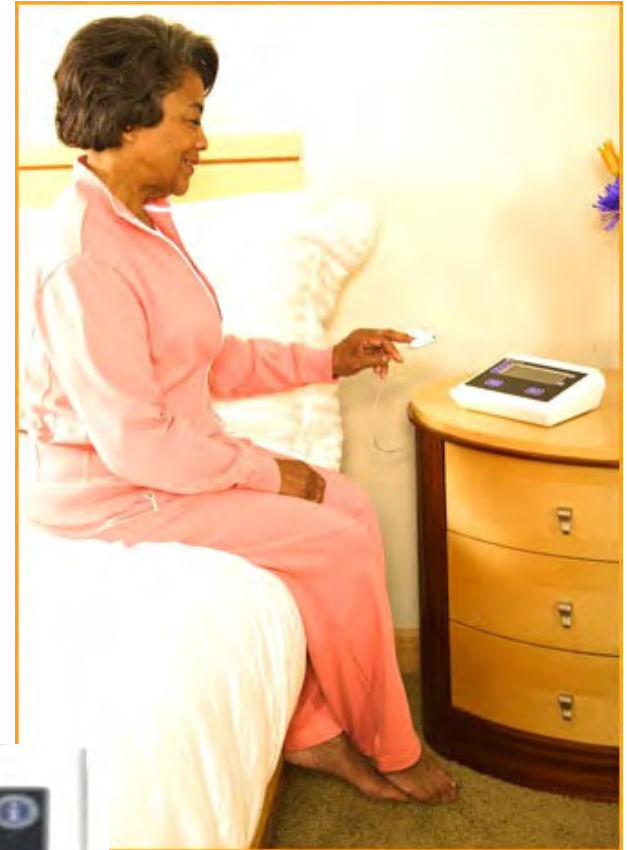


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(Veroff et al., 2012)

Engaging Patient and Caregivers in Tele-medicine

- Change old habits and patterns
 - Provide an alternative
- Identify and enlist patient advocates
- Create an action plan
 - Self-care strategies
 - Symptom recognition
 - Medication education



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Questions?



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