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HFSM

GET WITH THE GUIDELINES

MANAGEMENT OF THE HEART FAILURE PATIENT

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Outline



- Heart failure basics
- Discuss evidence-based medical management of heart failure
- Discuss, in particular, evidence-based beta-blocker therapy for left ventricular systolic dysfunction
- Review ACCF/AHA guidelines on care transition

HEART FAILURE BASICS

What is heart failure (HF)?

- HF is a complex clinical *syndrome* (collection of symptoms) that results from any structural or functional impairment of ventricular filling or ejection of blood
 - When the heart is not able to maintain adequate cardiac output to perfuse organ systems adequately and meet the metabolic needs of the body
 - Symptoms caused by systemic and/or pulmonary congestion due to low output
 - Symptoms include: dyspnea, fatigue, poor exercise tolerance, orthopnea, PND, abdominal fullness, cough, frothy sputum, nocturia
 - Physical exam findings: peripheral edema, ascites, lung rales/crackles, elevated JVP, S3 gallop, tachypnea, hepatomegaly, abdominal distention, etc..
 - Lab work and imaging: elevated BNP, NT pro-BNP, congestion on CXR

What is cardiomyopathy?

- **Cardiomyopathy = “disease of heart muscle”**
 - “A heterogeneous group of diseases of the myocardium associated with mechanical and/or electrical dysfunction that usually (but not invariably) exhibit inappropriate ventricular hypertrophy or dilatation and are due to a variety of causes that frequently are genetic. Cardiomyopathies either are confined to the heart or are a part of generalized systemic disorders, often leading to cardiovascular death or progressive heart failure-related disability.”
- **Ischemic cardiomyopathy**
 - Most common cause of heart failure
 - Heart muscle damage from prior infarct (scar) or ischemia
- **Non-ischemic cardiomyopathy**
 - Hypertensive, due to valve disease, lung disease (right sided), arrhythmia (tachycardia-induced), toxic (ETOH, cocaine), viral, HIV, sarcoid, due to congenital anomaly, idiopathic dilated, myocarditis, chemotherapy-induced, restrictive, hypertrophic, stress-induced (i.e. Takotsubo), pregnancy/post-partum

Types of heart failure

- **Systolic heart failure**
 - Signs of clinical heart failure + left ventricular ejection fraction (LVEF) less than 40%
- **Diastolic heart failure**
 - Signs of clinical heart failure + LVEF is greater than 40%
- **Right heart failure**
 - Isolated right-sided dysfunction, left heart systolic function normal

...Different types of heart failure are treated differently!

	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

MEDICAL MANAGEMENT OF HEART FAILURE

2013 ACCF/AHA Guideline for the Management of Heart Failure

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PRACTICE GUIDELINE

2013 ACCF/AHA Guideline for the Management of Heart Failure

A Report of the American College of Cardiology Foundation/
American Heart Association Task Force on Practice Guidelines

*Developed in Collaboration With the American College of Chest Physicians, Heart Rhythm Society
and International Society for Heart and Lung Transplantation*

Endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation

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Classification of Recommendation and Level of Evidence

		SIZE OF TREATMENT EFFECT				
		CLASS I <i>Benefit >>> Risk</i> Procedure/Treatment SHOULD be performed/administered	CLASS IIa <i>Benefit >> Risk</i> <i>Additional studies with focused objectives needed</i> IT IS REASONABLE to perform procedure/administer treatment	CLASS IIb <i>Benefit ≥ Risk</i> <i>Additional studies with broad objectives needed; additional registry data would be helpful</i> Procedure/Treatment MAY BE CONSIDERED	CLASS III <i>No Benefit or CLASS III Harm</i>	
				Procedure/ Test	Treatment	
				COR III: No benefit	No Proven Benefit	
				COR III: Harm	Excess Cost w/o Benefit or Harmful	
				Not Helpful	Harmful to Patients	
ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Sufficient evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Some conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Some conflicting evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Greater conflicting evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> 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 of experts, case studies, or standard of care	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Only expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Only diverging expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Only diverging expert opinion, case studies, or standard of care 	<ul style="list-style-type: none"> 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 is not recommended is not indicated should not be performed/administered/other is not useful/beneficial/effective	COR III: Harm potentially harmful causes harm associated with excess morbidity/mortality should not be performed/administered/other
Comparative effectiveness phrases*		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			

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.

*Data available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as sex, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use.

†For comparative effectiveness recommendations (Class I and IIa; Level of Evidence A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

MANAGEMENT OF SYSTOLIC HEART FAILURE

Systolic heart failure

- Also referred to as “HF with reduced ejection fraction” (HFrEF)
- Clinical diagnosis of heart failure + LVEF less than or equal to 40%
- Commonly due to coronary artery disease, often with history of prior MI
- Other common causes
 - Toxic cardiomyopathy 2/2 ETOH use, cocaine, chemo
 - Viral/myocarditis -> dilated cardiomyopathy
 - Stress cardiomyopathy (physical or emotional stressor)
 - Tachycardia-induced cardiomyopathy
- ❖ Only in HFrEF patients have medical therapies been proven to be efficacious

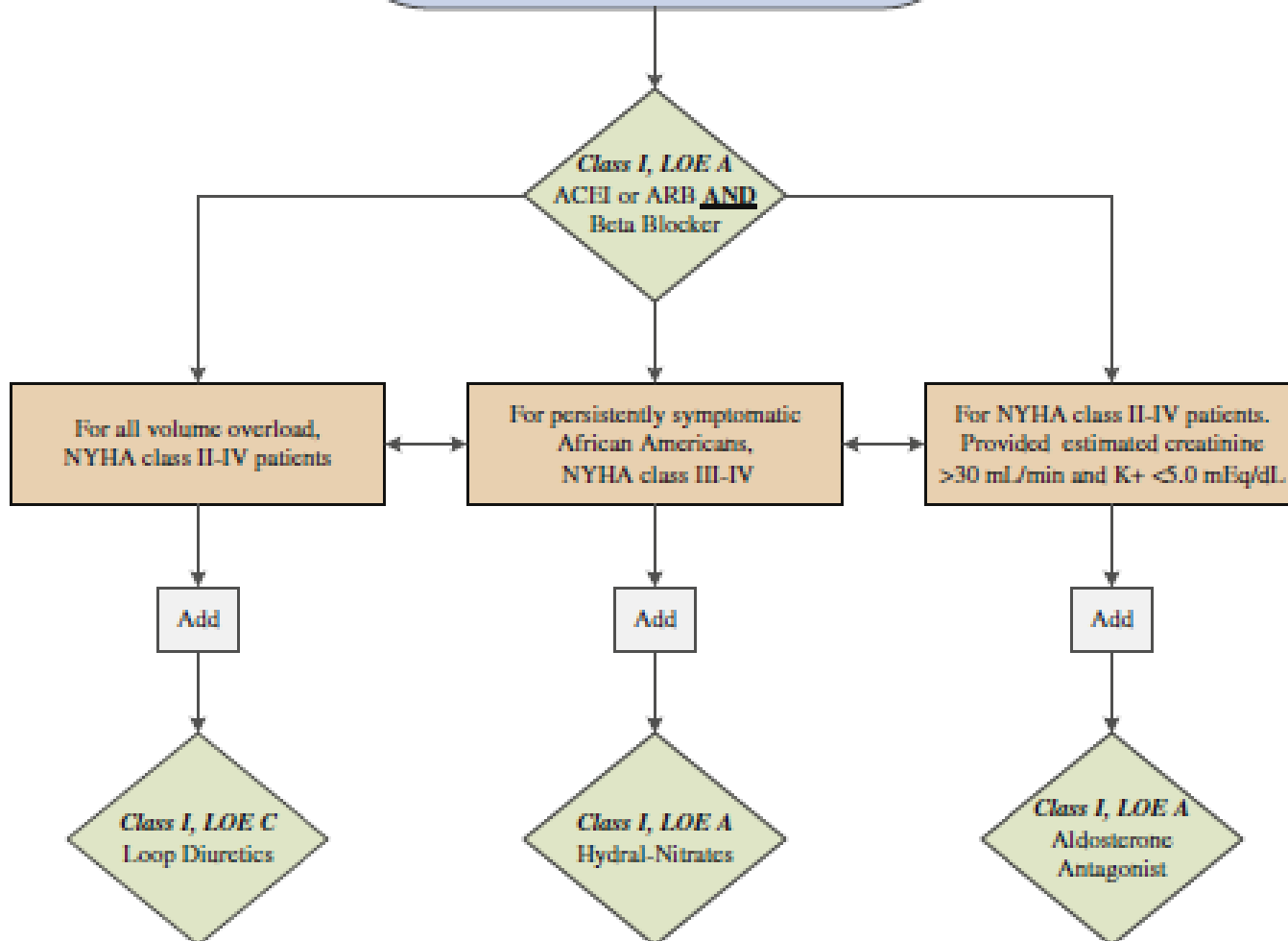
Treatment of systolic heart failure

- Evidence-based beta-blocker
 - Class I: Use of 1 of the 3 beta blockers proven to reduce mortality (e.g., bisoprolol, carvedilol, and sustained-release metoprolol succinate) is recommended for all patients with current or prior symptoms of HFrEF, unless contraindicated, to **reduce morbidity and mortality** (Level of Evidence: A)
- ACE inhibitor or angiotensin receptor blocker
 - Class I: ACE inhibitors are recommended in patients with HFrEF and current or prior symptoms, unless contraindicated, to reduce morbidity and mortality (Level of Evidence: A)
 - Class I: ARBs are recommended in patients with HFrEF with current or prior symptoms who are ACE inhibitor intolerant, unless contraindicated, to reduce morbidity and mortality (Level of Evidence: A)

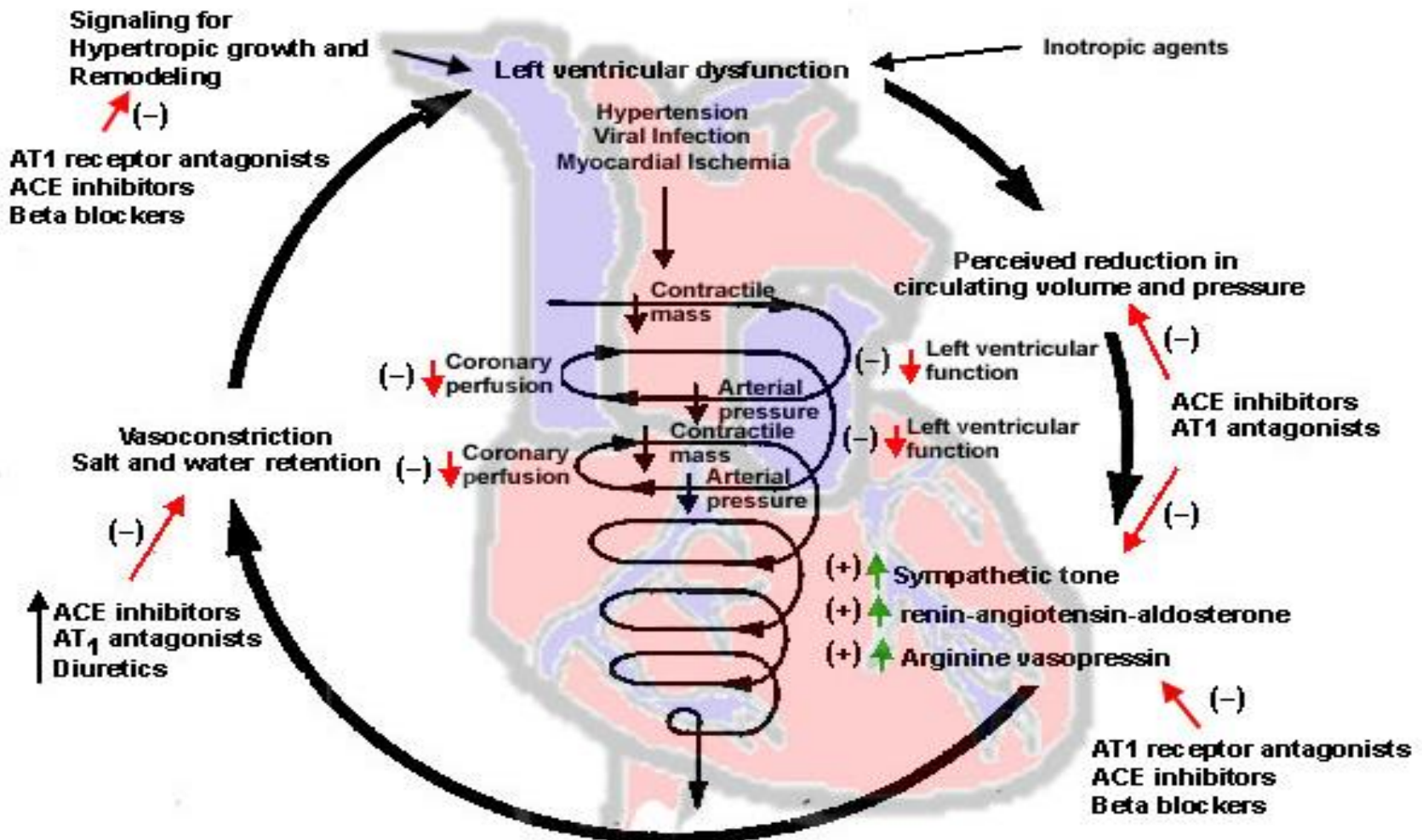
Treatment of systolic heart failure

- Aldosterone antagonist for LVEF $\leq 35\%$
 - Class I: Aldosterone receptor antagonists (or mineralocorticoid receptor antagonists) are recommended in patients with NYHA class II–IV HF and who have LVEF of 35% or less, unless contraindicated, to reduce morbidity and mortality. Patients with NYHA class II HF should have a history of prior cardiovascular hospitalization or elevated plasma natriuretic peptide levels to be considered for aldosterone receptor antagonists.
 - Creatinine should be 2.5 mg/dL or less in men or 2.0 mg/dL or less in women (or estimated GFR >30), and potassium should be less than 5.0 mEq/L. Careful monitoring of potassium, renal function, and diuretic dosing should be performed at initiation and closely followed thereafter to minimize risk of hyperkalemia and renal insufficiency (Level of Evidence: A)
 - Class I: Aldosterone receptor antagonists are recommended to reduce morbidity and mortality following an acute MI in patients who have LVEF of 40% or less who develop symptoms of HF or who have a history of diabetes mellitus, unless contraindicated (Level of Evidence: B)

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



Why these medications?



BETA-BLOCKERS IN SYSTOLIC HEART FAILURE

Evidence-based beta-blockers

	Initial daily dose	Max dose	Mean dose achieved in clinical trial
Bisoprolol	1.25 mg daily	10 mg daily	8.6 mg/day
Carvedilol (Coreg)	3.125 mg BID	50 mg BID	37 mg/day
Carvedilol CR	10 mg daily	80 mg daily	n/a
Metoprolol succinate (Toprol XL)	12.5 mg-25 mg daily	200 mg daily	159 mg/day

What's missing.....?

Metoprolol *tartrate* (Lopressor)!

Which is the BID version of metoprolol

Why Toprol XL but not Lopressor?

- MERIT-HF trial (1999)
 - Purpose was “to determine if metoprolol succinate decreases mortality in patients with symptomatic HF with reduced ejection fraction”
 - Study demonstrated a 34% reduction in all cause mortality with treatment with metoprolol succinate (versus placebo) and led to its approval by the FDA – metoprolol tartrate was NOT approval
 - Mortality benefit consistent with that seen with carvedilol in CAPRICORN and bisoprolol in CIBIS-II



Why Toprol XL but not Lopressor?

- COMET trial (2003)
 - Purpose was “to compare the effects of carvedilol and metoprolol tartrate on morbidity and mortality in patients with mild to severe chronic heart failure and reduced LV ejection fraction”
 - The only major direct comparison study of beta-blockers and demonstrated a 17% reduced in relative risk of death with treatment with carvedilol over metoprolol tartrate (short acting metoprolol) in patients with NYHA class II-IV and LVEF $\leq 35\%$
 - Comment: metoprolol succinate (long acting, i.e. Toprol XL) was not commercially available when this trial started

Additional comments about beta-blockers...

- Metoprolol tartrate is dosed BID but duration is variable and dose related
 - 50% reduction in maximum heart rate after single doses of 20, 50, and 100 mg occurred at 3.3, 5, and 6.4 hours, respectively

But....

- No head-to-head comparison has been done between carvedilol and metoprolol succinate but...
- MADIT-CRT (2009)
 - Study on benefit from cardiac resynchronization therapy
 - Recent retrospective analysis demonstrated a 30% reduction in hospitalized for heart failure or death in patients treated with carvedilol over metoprolol

MANAGEMENT OF DIASTOLIC HEART FAILURE

Diastolic heart failure

- Also referred to as “HF with preserved ejection fraction” (HFpEF)
- Clinical diagnosis of heart failure + LVEF greater than or equal to 50%
- Commonly due to hypertension
- Patients often are older and female
- **High** prevalence of obesity, diabetes, atrial fibrillation

Treatment of diastolic heart failure

- We don't know!
- Blood pressure control
 - Class I: Systolic and diastolic blood pressure should be controlled in patients with HFpEF in accordance with published clinical practice guidelines to prevent morbidity (Level of Evidence: B)
- Treat the symptoms with diuresis
 - Class I: Diuretics should be used for relief of symptoms due to volume overload in patients with HFpEF. (Level of Evidence: C)

CARE TRANSITION FOR THE HEART FAILURE PATIENT

Care transition for the HF patient

- “For patients with HF, the transition from inpatient to outpatient care can be an especially vulnerable period because of the progressive nature of the disease state, complex medical regimens, the large number of comorbid conditions, and the multiple clinicians who may be involved” (ACCF/AHA, 2013)
- “Early post-discharge follow-up may help minimize gaps in understanding of changes to the care plan or knowledge of test results and has been associated with a lower risk of subsequent re-hospitalization” (ACCF/AHA, 2013)

Cost of heart failure admissions

- HF is the primary diagnosis in >1 million hospitalizations annually
- Patients hospitalized for HF are at high risk for all-cause re-hospitalization, with a 1-month readmission rate of 25%
- In 2013, physician office visits for HF cost \$1.8 billion
- The total cost of HF care in the United States exceeds \$30 billion annually, with over half of these costs spent on hospitalizations
- The mean cost of HF-related hospitalizations was \$23,077 per patient and was higher when HF was a secondary rather than the primary diagnosis

ACCF/AHA Recommendation

- Class I Recommendations

- 1. The use of performance improvement systems and/or evidence-based systems of care is recommended in the hospital and *early post-discharge outpatient setting* to **identify appropriate HF patients for GDMT**, provide clinicians with useful **reminders to advance GDMT**, and **assess the clinical response** (Level of Evidence: B)
- 2. Throughout the hospitalization as appropriate, before hospital discharge, at the *first post-discharge visit*, and in *subsequent follow-up visits*, the following should be addressed (Level of Evidence: B)
 - initiation of GDMT if not previously established and not contraindicated
 - precipitant causes of HF, barriers to optimal care transitions, and limitations in post-discharge support
 - assessment of volume status and supine/upright hypotension with adjustment of HF therapy as appropriate
 - titration and optimization of chronic oral HF therapy
 - assessment of renal function and electrolytes where appropriate
 - assessment and management of comorbid conditions
 - reinforcement of HF education, self-care, emergency plans, and need for adherence
 - consideration for palliative care or hospice care in selected patients

ACCF/AHA Recommendation

- Class IIa

- 1. Scheduling an early follow-up visit (within 7 to 14 days) and early telephone follow-up (within 3 days) of hospital discharge are reasonable (Level of Evidence: B)
- 2. Use of clinical risk-prediction tools and/or biomarkers to identify patients at higher risk for post-discharge clinical events are reasonable (Level of Evidence: B)

Goals of follow-up appointment

- Medication reconciliation
- Initiation of guideline derived medical therapy if indicated
- Follow-up lab work if needed
- Physical exam/volume assessment
- Review hospital stay with patient and provider
- Re-educate, re-educate, re-educate
- Prevent re-admission!



Our hospital's example

- Our Heart Failure Team makes an appointment with primary care provider within 7 days of hospital discharge
 - Important to acknowledge day and time preferences of the patient/family
- If no PCP, we make appointment with a family medicine resident to establish care
- When cardiology is consulted, attempt is made to follow-up with cardiology within 7 days of hospital discharge
- Appointment date and time is communicated to patient personally and added to discharge instructions
- At this time, we do not have an outpatient heart failure clinic which is a major limitation for us

THANK YOU!

Questions?

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