



ACUTE HEART FAILURE; DIAGNOSIS AND MANAGEMENT

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DISCLOSURE STATEMENT

- NO DISCLOSURES



ACUTE HEART FAILURE: OBJECTIVES



1. Name the first drug classification of choice with acute decompensated HF?
2. Discuss the rate control medications appropriate for tachycardia induced HF?
3. Review and identify Echo results for valvular culprit for HF?
4. Identify;
 1. Which beta blocker is indicated for which HF?
 2. Why and when to add ACEi / ARB / ARNI?
 3. When to use Digoxin (inotrope)?

2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure



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

Classification of Recommendations and Levels of Evidence



CLASS (STRENGTH) OF RECOMMENDATION	LEVEL (QUALITY) OF EVIDENCE‡
CLASS I (STRONG) Benefit >>> Risk Suggested phrases for writing recommendations: <ul style="list-style-type: none"> Is recommended Is indicated/useful/effective/beneficial Should be performed/administered/other Comparative-Effectiveness Phrases†: <ul style="list-style-type: none"> Treatment/strategy A is recommended/indicated in preference to treatment B Treatment A should be chosen over treatment B 	LEVEL A <ul style="list-style-type: none"> High-quality evidence‡ from more than 1 RCT Meta-analyses of high-quality RCTs One or more RCTs corroborated by high-quality registry studies
CLASS IIa (MODERATE) Benefit >> Risk Suggested phrases for writing recommendations: <ul style="list-style-type: none"> Is reasonable Can be useful/effective/beneficial Comparative-Effectiveness Phrases†: <ul style="list-style-type: none"> Treatment/strategy A is probably recommended/indicated in preference to treatment B It is reasonable to choose treatment A over treatment B 	LEVEL B-R (Randomized) <ul style="list-style-type: none"> Moderate-quality evidence‡ from 1 or more RCTs Meta-analyses of moderate-quality RCTs
CLASS IIb (WEAK) Benefit ≥ Risk Suggested phrases for writing recommendations: <ul style="list-style-type: none"> May/might be reasonable May/might be considered Usefulness/effectiveness is unknown/unclear/uncertain or not well established 	LEVEL B-NR (Nonrandomized) <ul style="list-style-type: none"> Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies Meta-analyses of such studies
CLASS III: No Benefit (MODERATE) Benefit = Risk <i>(Generally, LOE A or B use only)</i> Suggested phrases for writing recommendations: <ul style="list-style-type: none"> Is not recommended Is not indicated/useful/effective/beneficial Should not be performed/administered/other 	LEVEL C-LD (Limited Data) <ul style="list-style-type: none"> Randomized or nonrandomized observational or registry studies with limitations of design or execution Meta-analyses of such studies Physiological or mechanistic studies in human subjects
CLASS III: Harm (STRONG) Risk > Benefit Suggested phrases for writing recommendations: <ul style="list-style-type: none"> Potentially harmful Causes harm Associated with excess morbidity/mortality Should not be performed/administered/other 	LEVEL C-EO (Expert Opinion) Consensus of expert opinion based on clinical experience

COR and LOE are determined independently (any COR may be paired with any LOE).

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

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

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

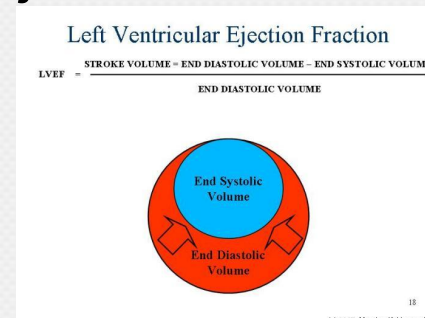
‡ The method of assessing quality is evolving, including the application of standardized, widely used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

NYHA CLASSIFICATIONS OF HEART FAILURE



- 1. Heart Failure with reduced ejection fraction (HF_rEF)
 - Systolic HF
 - Ejection fraction $\leq 40\%$
- 2. Heart Failure with preserved ejection fraction (HF_pEF)
 - Diastolic HF
 - Ejection fraction $\geq 50\%$
- 3. HF_pEF
 - Borderline
 - Ejection fraction 41-49%
- 4. HF_pEF improved; (patients with a history of HF_rEF)
 - Ejection fraction $\geq 50\%$



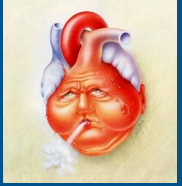
ACC/AHA: Stages of Heart Failure



- **Stage A:** Patients at risk for heart failure who have not yet developed structural heart changes (i.e. those with diabetes, those with coronary disease without prior infarct)
- **Stage B:** Patients with structural heart disease (i.e. reduced ejection fraction, left ventricular hypertrophy, chamber enlargement) who have not yet developed symptoms of heart failure
- **Stage C:** Patients who have developed clinical heart failure
- **Stage D:** Patients with refractory heart failure requiring advanced intervention (i.e. biventricular pacemakers, left ventricular assist device, transplantation)



HEART FAILURE CLINICAL SYNDROME



- Clinical syndrome of reduced cardiac output, tissue hypoperfusion, increased pulmonary pressure, and tissue congestion.
- Presents with dyspnea, decreased exercise tolerance, swelling of the legs, fatigue, and generalized weakness.
- Clinical diagnosis is supported by ancillary tests such as ECG, chest x-ray, B-type natriuretic peptide (BNP), and echocardiogram.
- Diuretics and oxygen are initial treatments for symptom relief. Cardiogenic shock may require pressor support or mechanical ventilation.
- If acute myocardial infarction (MI) is present, early revascularization is essential.

[Yancy, et. al. ACC/AHA/HFSA 2017 Heart Failure Focused Update, www.acc.org](#) [professional.heart.org](#) [www.hfsa.org](#)

Treatment of HF_rEF Stage C and D NEW DRUGs



- Sacubitril / Valsartan
 - sacubitril – angiotensin receptor neprilysin inhibitor (ARNI)
 - valsartan – angiotensin II receptor blocker (ARB)
 - synthetic natriuretic peptides have not improved outcomes in acute HF but modulation of the natriuretic system through inhibition of the enzyme that degrades natriuretic (and other vasoactive) peptides, neprilysin, has proven to be successful.
- PARADIGM-HF trial - Determine Impact on Global Mortality and morbidity in Heart Failure
 - 20% reduction in the primary end point - cardiovascular death or hospitalization for HF;
 - 16% reduction in all-cause mortality;

<http://heart.bmj.com/content/early/2016/05/26/heartjnl-2014-306775>

Treatment of HF_rEF Stage C and D Sacubitril / Valsartan



- **Guidelines for initiation;**
 - STOP ACEi/ARB 36 HOURS PRIOR TO START SACUBITRIL/VALSARTAN
 - Doses – 49/51mg – minimum and starting recommended dose;
 - Target maintenance dose titrated up to 97/103mg;
 - Drug interactions – CYP450, MOA
 - With potassium-sparing diuretics – hyperkalemia
 - NSAIDs – renal impairment
 - Lithium – increased toxicity

<http://heart.bmj.com/content/early/2016/05/26/heartjnl-2014-306775>

ARB vs ACEi



- Angiotensin receptor blockers (ARBs) were developed with the rationale that angiotensin II production continues in the presence of ACE inhibition, driven through alternative enzyme pathways. ARBs do not inhibit kininase and are associated with a much lower incidence of cough and angioedema than ACE inhibitors

Pharmacological Treatment for Stage C HF With Reduced EF

Ivabradine



COR	LOE	Recommendations	Comment/ Rationale
Ia	B-R	Ivabradine can be beneficial to reduce HF hospitalization for patients with symptomatic (NYHA class II-III) stable chronic HFrEF (LVEF $\leq 35\%$) who are receiving GDEM*, including a beta blocker at maximum tolerated dose, and who are in sinus rhythm with a heart rate of 70 bpm or greater at rest.	NEW: New clinical trial data.

Ivabradine



- Indication
 - Added to maximally-tolerated doses of beta blockers and help give appropriate patients with heart rate ≥ 70 bpm and stable, symptomatic chronic heart failure, esp. recently hospitalized.
 - First-in-class, HCN channel blocker to lower heart rate

Guidelines and Indications Ivabradine

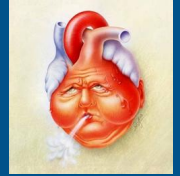


- HF_rEF, maximized on usual GDMT
- Intended to reduce hospitalizations
- Stable, yet with continued HF symptoms
- In normal sinus rhythm
- LVEF <35%
- HR > 70 bpm

**NOT intended to replace
beta blockers**

It can be considered in beta
blocker intolerant patients
after other GDMT is
maximized

Ivabradine



- Contraindications
 - Acute decompensated heart failure, blood pressure $<90/50$ mm Hg, sick sinus syndrome, sinoatrial block, 3rd degree atrioventricular block (unless a functioning demand pacemaker present), resting heart rate <60 bpm prior to treatment, severe hepatic impairment, heart rate maintained exclusively by the pacemaker.

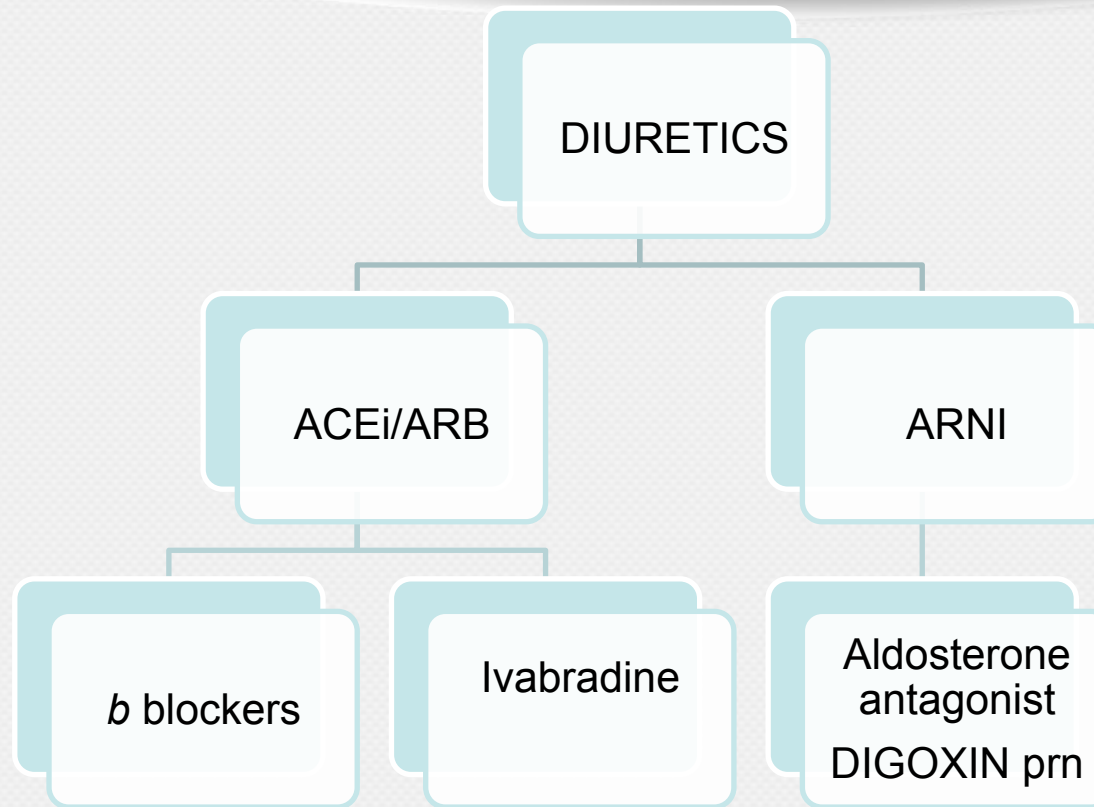
Ivabradine



- Starting dose
 - 5mg BID with meals
 - Assess after 2 weeks, adjust dose to achieve resting heart rate 50-60 beats per minute (bpm)
 - Adjust as needed based on resting heart rate and tolerability
- Max dose
 - 7.5mg BID with meals
- Side Effects $\leq 1\%$ of patients
 - Bradycardia
 - Hypertension
 - Atrial Fibrillation
 - Luminous phenomena (phosphene)
 - Ring or spot of light produced by pressure on the eyeball or direct stimulation of the visual system other than by light

AHA/ACC 2016 HF Guidelines Summary

HF Reduced EF

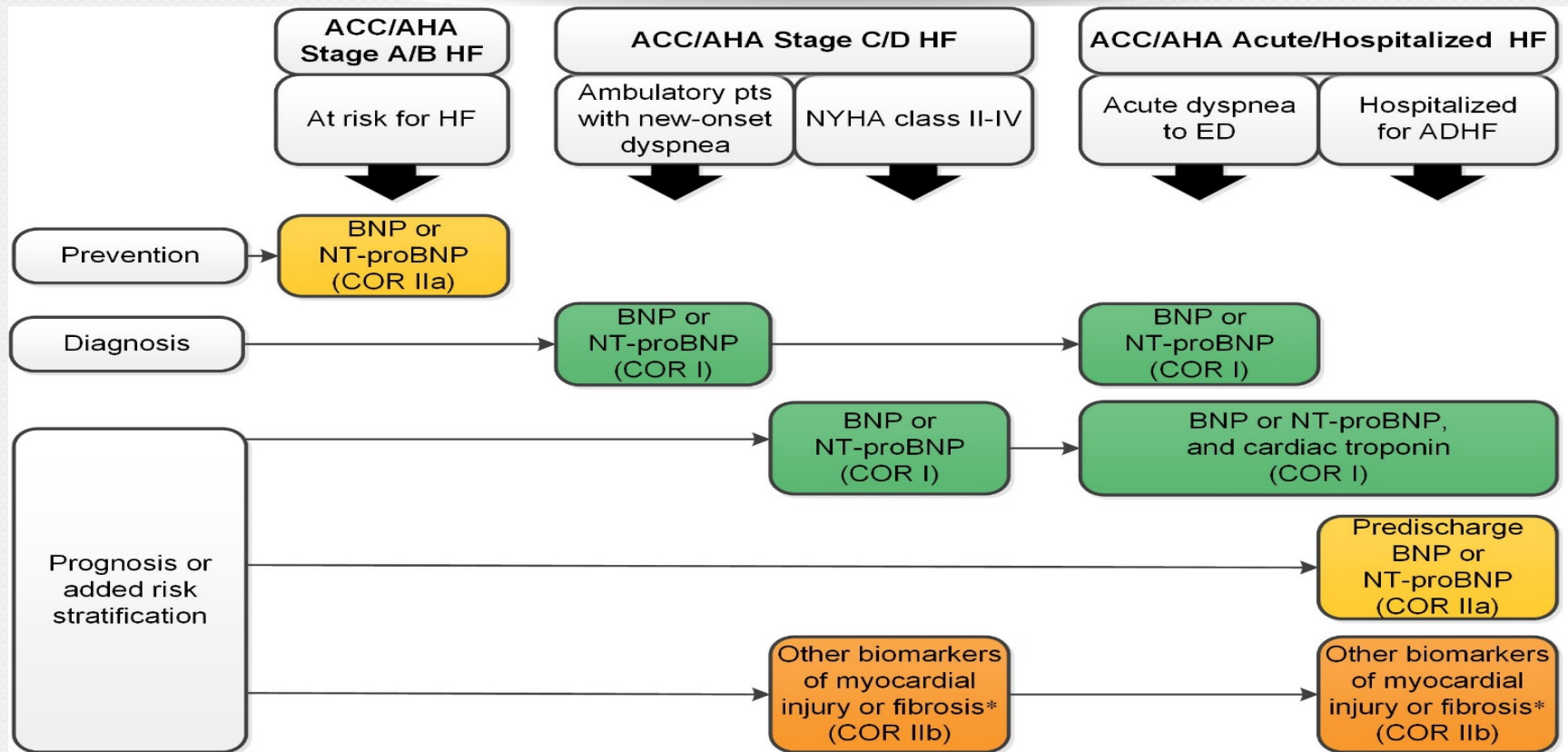


Initial and Serial Evaluation of Heart Failure



- Biomarkers
- New therapies indicated for stage C HF with **reduced** ejection fraction (HF**r**EF)
- Updates on HF with **preserved** ejection fraction (HF**p**EF)
- New data on important comorbidities, including sleep apnea, anemia, and hypertension
- And new insights regarding the prevention of HF

Biomarkers Indications for Use



Yancy, et. al. ACC/AHA/HFSA 2017 Heart Failure Focused Update, www.acc.org professional.heart.org www.hfsa.org

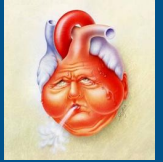
Biomarkers Indications for Use



COR	LOE	Recommendation	Comment/ Rationale
Ia	B-R	For patients at risk of developing HF, natriuretic peptide biomarker–based screening followed by team-based care, including a cardiovascular specialist optimizing GDMT, can be useful to prevent the development of left ventricular dysfunction (systolic or diastolic) or new-onset HF.	NEW: New data suggest that natriuretic peptide biomarker screening and early intervention may prevent HF.

Yancy, et. al. ACC/AHA/HFSA 2017 Heart Failure Focused Update, www.acc.org professional.heart.org www.hfsa.org

Biomarkers for Diagnosis



COR	LOE	Recommendation	Comment/ Rationale
I	A	In patients presenting with dyspnea, measurement of natriuretic peptide biomarkers is useful to support a diagnosis or exclusion of HF.	MODIFIED: 2013 acute and chronic recommendations have been combined into a diagnosis section.

Biomarkers for Prognosis or Added Risk Stratification



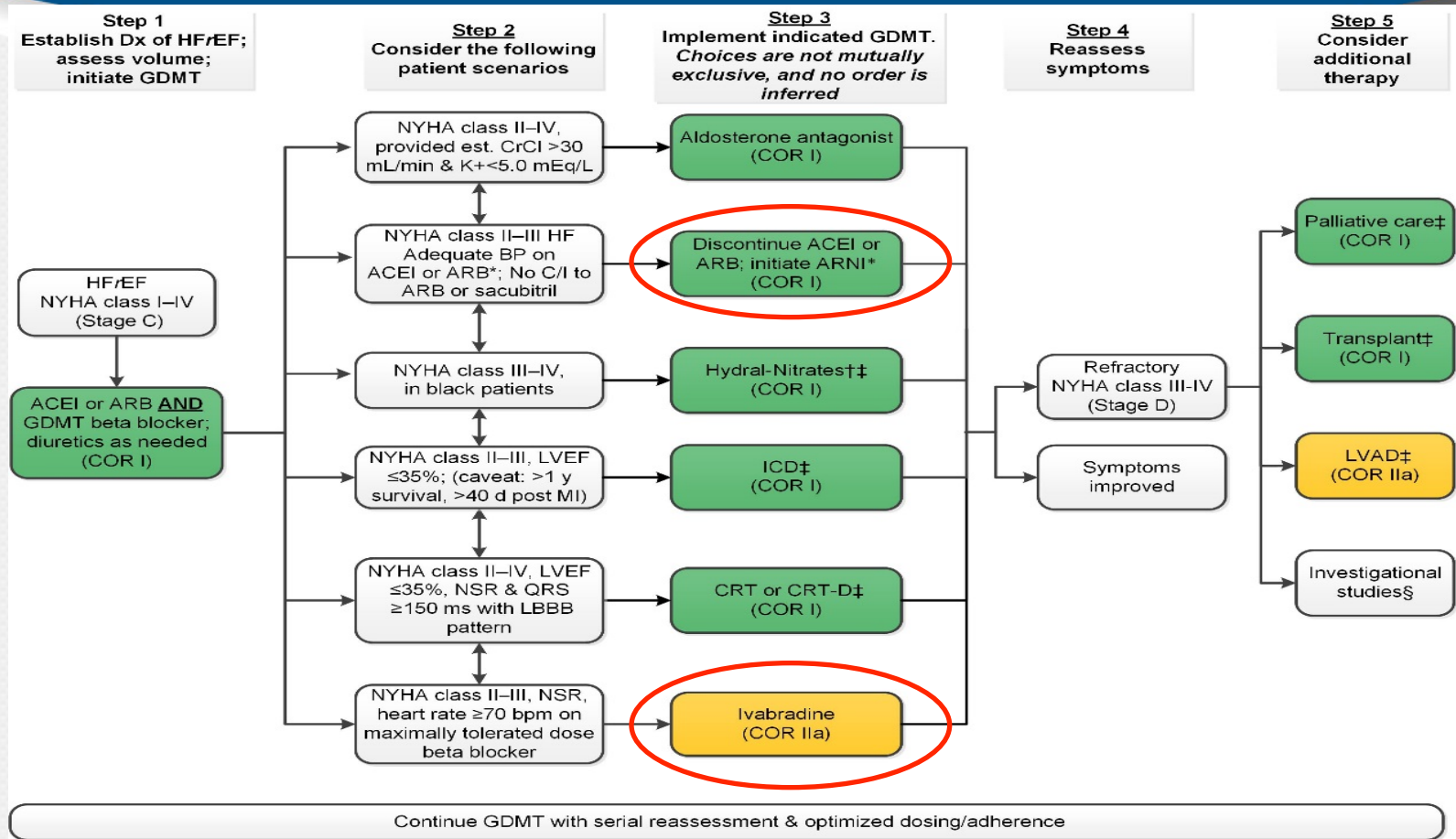
COR	LOE	Recommendations	Comment/ Rationale
I	A	Measurement of BNP or NT-proBNP is useful for establishing prognosis or disease severity in chronic HF.	2013 recommendation remains current.
I	A	Measurement of baseline levels of natriuretic peptide biomarkers and/or cardiac troponin on admission to the hospital is useful to establish a prognosis in acutely decompensated HF.	MODIFIED: Current recommendation emphasizes that it is admission levels of natriuretic peptide biomarkers that are useful.

Biomarkers for Prognosis or Added Risk Stratification



COR	LOE	Recommendations	Comment/ Rationale
Ila	B-NR	During a hospitalization for HF, a predischage natriuretic peptide level can be useful to establish a postdischarge prognosis.	NEW: Current recommendation reflects new observational studies.
Ilb	B-NR	In patients with chronic HF, measurement of other clinically available tests, such as biomarkers of myocardial injury or fibrosis, may be considered for additive risk stratification.	MODIFIED: 2013 recommendations have been combined into prognosis section, resulting in LOE change from A to B-NR.

Treatment of HFrEF Stage C and D



Key:

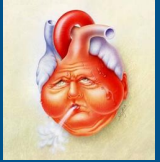


Treatment of HFrEF Stage C and D

- ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor-blocker; ARNI, angiotensin receptor-neprilysin inhibitor; BP, blood pressure; bpm, beats per minute; C/I, contraindication; COR, Class of Recommendation; CrCl, creatinine clearance; CRT-D, cardiac resynchronization therapy–device; Dx, diagnosis; GDMT, guideline-directed management and therapy; HF, heart failure; HFrEF, heart failure with reduced ejection fraction; ICD, implantable cardioverter-defibrillator; ISDN/HYD, isosorbide dinitrate hydral-nitrates; K⁺, potassium; LBBB, left bundle-branch block; LVAD, left ventricular assist device; LVEF, left ventricular ejection fraction; MI, myocardial infarction; NSR, normal sinus rhythm; and NYHA, New York Heart Association.

Treatment of HFrEF

Stage C and D



- †Hydral-Nitrates green box: The combination of ISDN/HYD with ARNI has not been robustly tested. BP response should be carefully monitored.
- ‡See 2013 HF guideline.
- §Participation in investigational studies is also appropriate for stage C, NYHA class II and III HF.

Renin-Angiotensin System Inhibition With ACE-Inhibitor or ARB or ARNI



COR	LOE	Recommendations	Comment/ Rationale
I	ACE-I: A	The clinical strategy of inhibition of the renin-angiotensin system with ACE inhibitors (Level of Evidence: A), <u>OR</u> ARBs (Level of Evidence: A), <u>OR</u> ARNI (Level of Evidence: B-R) in conjunction with evidence-based beta blockers, and aldosterone antagonists in selected patients, is recommended for patients with chronic HF _r EF to reduce morbidity and mortality.	NEW: New clinical trial data prompted clarification and important updates.
	ARB: A		
	ARNI: B-R		

Pharmacological Treatment for Stage C HF With Reduced EF



Renin-Angiotensin System Inhibition With ACE-Inhibitor or ARB or ARNI

COR	LOE	Recommendations	Comment/ Rationale
I	ACE-I: A	The use of ACE inhibitors is beneficial for patients with prior or current symptoms of chronic HFrEF to reduce morbidity and mortality.	2013 recommendation repeated for clarity in this section.
I	ARB: A	The use of ARBs to reduce morbidity and mortality is recommended in patients with prior or current symptoms of chronic HFrEF who are intolerant to ACE inhibitors because of cough or angioedema.	2013 recommendation repeated for clarity in this section.

Renin-Angiotensin System Inhibition With ACE-Inhibitor or ARB or ARNI



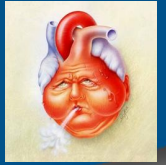
COR	LOE	Recommendations	Comment/ Rationale
I	ARNI: B-R	In patients with chronic symptomatic HF ^r EF NYHA class II or III who tolerate an ACE inhibitor or ARB, replacement by an ARNI is recommended to further reduce morbidity and mortality.	NEW: New clinical trial data necessitated this recommendation.

Renin-Angiotensin System Inhibition With ACE-Inhibitor or ARB or ARNI



COR	LOE	Recommendations	Comment/ Rationale
III: Harm	B-R	ARNI should not be administered concomitantly with ACE inhibitors or within 36 hours of the last dose of an ACE inhibitor.	NEW: Available evidence demonstrates a potential signal of harm for a concomitant use of ACE inhibitors and ARNI.
III: Harm	C-EO	ARNI should not be administered to patients with a history of angioedema.	NEW: New clinical trial data.

Pharmacological Treatment for Stage C HF With **Preserved** EF



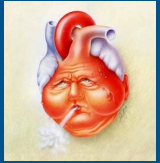
COR	LOE	Recommendations	Comment/ Rationale
I	B	Systolic and diastolic blood pressure should be controlled in patients with HF _p EF in accordance with published clinical practice guidelines to prevent morbidity	2013 recommendation remains current.
I	C	Diuretics should be used for relief of symptoms due to volume overload in patients with HF _p EF.	2013 recommendation remains current.

Pharmacological Treatment for Stage C HF With **Preserved** EF



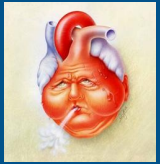
COR	LOE	Recommendations	Comment/ Rationale
IIa	C	Coronary revascularization is reasonable in patients with CAD in whom symptoms (angina) or demonstrable myocardial ischemia is judged to be having an adverse effect on symptomatic HF _p EF despite GDMT.	2013 recommendation remains current.
IIa	C	Management of AF according to published clinical practice guidelines in patients with HF _p EF is reasonable to improve symptomatic HF.	2013 recommendation remains current.
IIa	C	The use of beta-blocking agents, ACE inhibitors, and ARBs in patients with hypertension is reasonable to control blood pressure in patients with HF _p EF.	2013 recommendation remains current.

Pharmacological Treatment for Stage C HF With **Preserved** EF



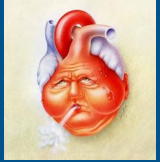
COR	LOE	Recommendations	Comment/ Rationale
IIb	B-R	In appropriately selected patients with HF _p EF (with EF $\geq 45\%$, elevated BNP levels or HF admission within 1 year, estimated glomerular filtration rate >30 mL/min, creatinine <2.5 mg/dL, potassium <5.0 mEq/L), aldosterone receptor antagonists might be considered to decrease hospitalizations.	NEW: Current recommendation reflects new RCT data.
IIb	B	The use of ARBs might be considered to decrease hospitalizations for patients with HF _p EF.	2013 recommendation remains current.

Pharmacological Treatment for Stage C HF With Preserved EF



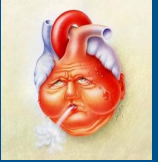
COR	LOE	Recommendations	Comment/ Rationale
III: No Benefit	B-R	Routine use of nitrates or phosphodiesterase-5 inhibitors to increase activity or QoL in patients with HF _p EF is ineffective.	NEW: Current recommendation reflects new data from RCTs.
III: No Benefit	C	Routine use of nutritional supplements is not recommended for patients with HF _p EF.	2013 recommendation remains current.

Anemia



COR	LOE	Recommendations	Comment/ Rationale
IIb	B-R	In patients with NYHA class II and III HF and iron deficiency (ferritin <100 ng/mL or 100 to 300 ng/mL if transferrin saturation is <20%), intravenous iron replacement might be reasonable to improve functional status and QOL.	NEW: New evidence consistent with therapeutic benefit.
III: No Benefit	B-R	In patients with HF and anemia, erythropoietin-stimulating agents should not be used to improve morbidity and mortality.	NEW: Current recommendation reflects new evidence demonstrating absence of therapeutic benefit.

Hypertension



Treating Hypertension to Reduce the Incidence of HF

COR	LOE	Recommendations	Comment/ Rationale
I	B-R	In patients at increased risk, stage A HF, the optimal blood pressure in those with hypertension should be less than 130/80 mm Hg.	NEW: Recommendation reflects new RCT data.

Hypertension



Treating Hypertension in Stage C HF_rEF

I	C-EO	Patients with HF _r EF and hypertension should be prescribed GDMT titrated to attain systolic blood pressure less than 130 mm Hg.	NEW: Recommendation has been adapted from recent clinical trial data but not specifically tested per se in a randomized trial of patients with HF.
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Hypertension



Treating Hypertension in Stage C HF_pEF

COR	LOE	Recommendations	Comment/ Rationale
I	C-LD	Patients with HF _p EF and persistent hypertension after management of volume overload should be prescribed GDMT titrated to attain systolic blood pressure less than 130 mm Hg.	NEW: New target goal blood pressure based on updated interpretation of recent clinical trial data.



Sleep Disorders

COR	LOE	Recommendations	Comment/ Rationale
Ila	C-LD	In patients with NYHA class II–IV HF and suspicion of sleep disordered breathing or excessive daytime sleepiness, a formal sleep assessment is reasonable.	NEW: Recommendation reflects clinical necessity to distinguish obstructive versus central sleep apnea.
Ilb	B-R	In patients with cardiovascular disease and obstructive sleep apnea, CPAP may be reasonable to improve sleep quality and daytime sleepiness.	NEW: New data demonstrate the limited scope of benefit expected from CPAP for obstructive sleep apnea.
III: Harm	B-R	In patients with NYHA class II–IV HF _r EF and central sleep apnea, adaptive servo-ventilation causes harm.	NEW: New data demonstrate a signal of harm when adaptive servo-ventilation is used for central sleep apnea.

[Yancy, et. al. ACC/AHA/HFSA 2017 Heart Failure Focused Update](#), www.acc.org professional.heart.org www.hfsa.org

HISTORY



- **CAUSES OF ACUTE HF;**
 - myocardial ischemia, uncontrolled hypertension, significant valvular disease (both stenosis and regurgitation), arrhythmias, infection, anemia, thyrotoxicosis, and pulmonary embolism
- **PRECIPITATING FACTORS CAUSING EXACERBATION OF CHRONIC HF;**
 - such as dietary indiscretion with excessive salt intake, noncompliance with medications, and excessive alcohol or drug intake
- **CLINICAL SCORING SYSTEM;**
 - useful for the diagnosis of acute heart failure.

HEART FAILURE CAUSES



Cardiac Causes;

Arrhythmias – tachycardia or bradycardia



Structural heart disease

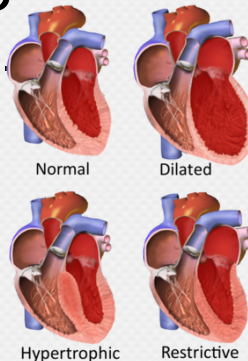
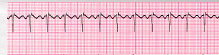
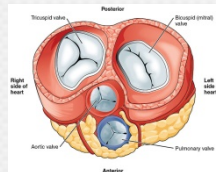
Myocardial dysfunction
systolic or diastolic

Resulting;

Increased Cardiac
Demand

Impaired cardiac function

Valvular Disease



Non-cardiac causes; Increased Preload/Afterload

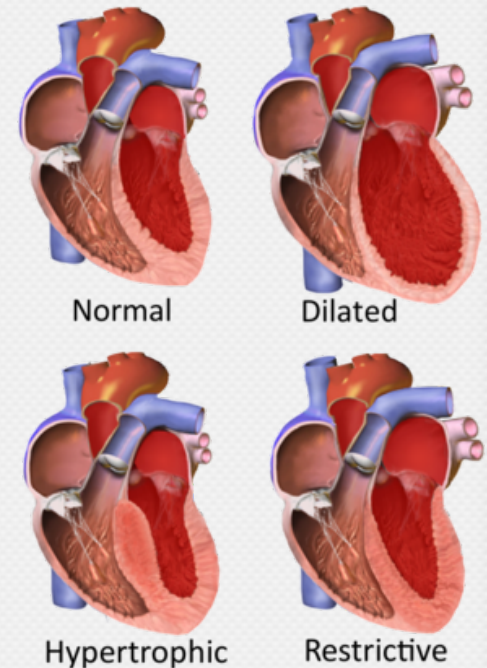
- Renal failure – fluid retention and volume overload – Preload;
- Anemia – reduced oxygen-carrying capacity
- Lymphatic / Venous obstruction – syndromes with resulting edema with increased with hypertension / afterload
- Obesity-Hypoventilation Syndrome (OHS) – can lead to right heart failure and right ventricular hypertrophy Resulting in Increased Preload



HEMODYNAMIC PROFILES



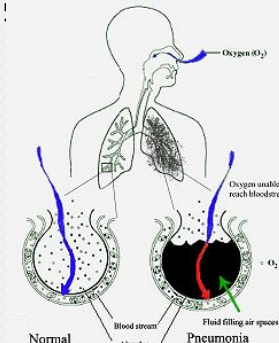
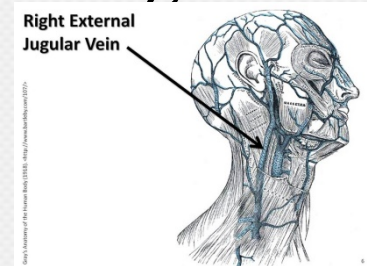
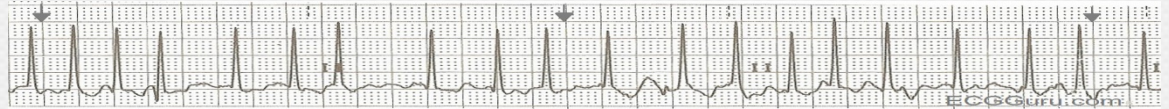
- Based on hemodynamic principles of presence or absence of ;
 - elevated filling pressure (wet or dry)
 - perfusion that is adequate
 - critically limited (warm or cold), include:
 - Warm and dry
 - Warm and wet
 - Cold and dry
 - Cold and wet.
- Severe pulmonary edema present with;
 - severe respiratory distress;
 - reduced oxygen saturation (usually <90% on room air)
 - crackles or wheezes on lung exam.



CLINICAL SIGNS




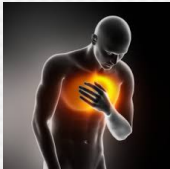
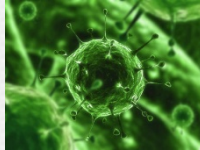


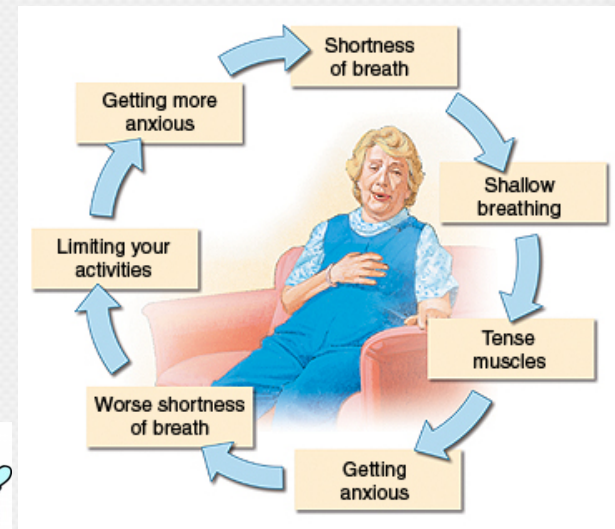
- central cyanosis,
- tachycardia,
- elevated jugular venous pressure (JVP),
- displaced apex beat,
- S3,
- crepitations or pleural effusion,
- hepatomegaly,
- ascites,
- Edema,



SYMPTOMS



- dyspnea, 
- decreased exercise tolerance,
- swelling of the legs, 
- fatigue, 
- generalized weakness.
- chest pain, 
- syncope,
- palpitations, 
- viral prodrome.



Acute Systolic HF Inpatient Management



1. Furosemide 40mg IVP BID first dose now;
2. Oxygen, BiPAP ?;
3. Cardiac Biomarkers now, BMP, Mg, Pro BNP, ECG in AM,
4. CHF Measures;
 1. Strict I&Os;
 2. Daily Weights;
 3. Fluid restriction 1200cc/24 hours for all fluids;
 4. Cardiac 2GM low sodium diet;
 5. Patient and family CHF Education prior to discharge;
 6. ICU or ICU step down telemetry Nursing Unit;

Acute Systolic HF Inpatient Management



1. Add BB, Coreg for reduced EF, or Metoprolol Succ for preserved EF and rate control;
2. Add ACEi low dose, best with DM and reduced EF when BP stabilized;
3. Calculate appropriate oral diuretic dose during hospitalization for long term outpatient discharge;

Acute Systolic HF Inpatient Management;



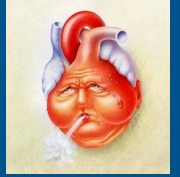
1. Cardiac catheterization to evaluate for coronary artery disease and severity of valvular disease;
2. Monitor heart rate and BP to add BB, ACEi/ARB, ARNI, aldactone, digoxin, ivabradine, diuretic, and optimize pharmacological regime (OPT) prior to discharge;
3. Digoxin contraindicated for AF/RVR with hyperdynamic LV on Echocardiogram;
4. Monitor and repleat Mag (goal ≥ 2.0) and K (goal ≥ 4.0) to reduce risk of arrhythmias with reduced EF
5. Dietician Consult for dietary Heart Failure Education and home instructions;

DISCHARGE



1. OPT with prescriptions and instructions;
2. Printed copy of Home Heart Failure Measures;
3. Refer to Outpatient NP Heart Failure Clinic for long term care and management;
4. Cardiologists and PCP follow up appointments;

ACUTE HEART FAILURE: OBJECTIVES



1. Name the first drug classification of choice with acute decompensated HF?

DIURETICS

2. Discuss the rate control medications appropriate for tachycardia induced HF?

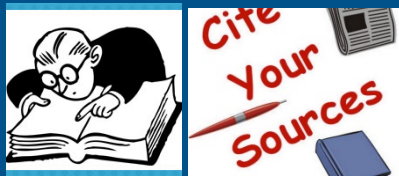
BB, CCB, Ivabradine, Digoxin w/o hyperdynamic LV

3. Review and identify Echo results for valvular culprit for HF?

Significant Mitral or Aortic disease

4. Identify;

1. Which beta blocker is indicated for which HF? **COREG**
2. Why and when to add ACEi / ARB / ARNI? **Reduced EF**
3. When to use Digoxin (ionotrop)? **HF WITH HYPOTENSION**



Citation



- 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure (*Journal of the American College of Cardiology*). Published on April 28, 2017, available at:

[Yancy, et. al. ACC/AHA/HFSA 2017 Heart Failure Focused Update](#)

- The full-text guidelines are also available on the following Web sites:
- American College of Cardiology (www.acc.org)
- American Heart Association (professional.heart.org)
- Heart Failure Society of America (www.hfsa.org)



**THANK YOU
FOR YOUR PARTICIPATION**

SANIBEL BEACH, FLORIDA