

THE COLORADO SOCIETY FOR POST-ACUTE AND LONG-TERM CARE MEDICINE

**Heart Failure in Post-Acute Care Patients:  
A Practical Approach**

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Tufts Medical Center

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**Objectives**

- Overview of heart failure in PAC patients
- Discuss the differential and assessment of dyspnea among patients in post acute or long-term care.
- Highlight select recent relevant updates to the management of HFREF and HFpEF as they relate to patients in PAC
- Introduce practical strategies for treating medically complex heart failure patients

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**PACC - Background**

- Independent cardiac consulting practice for SNFs with expressed focus on improving care for high risk cardiac patients and developing CHF programs
- Source of referrals: MDs, APRNs, rehabilitation staff, unit supervisors, DON, admissions, discharging hospitalists, hospital case management/social work
- Weekly bedside medical rounds
- Program development, In-servicing staff
- Facility Level and Corporate consultation, Hospital SNF network

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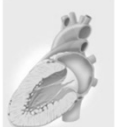
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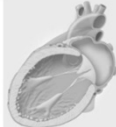
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**Defining of Heart Failure** Tufts Medical Center


A clinical syndrome that results from any structural or functional impairment of ventricular filling or ejection of blood



Normal Heart



HF with Reduced Ejection Fraction (HFrEF)



HF with Preserved Ejection Fraction (HFpEF)

Heide M, Brzezina SA. *New Engl J Med*. 2013; 368:2007-2018  
2013 ACC/AHA Guideline for the Management of Heart Failure. Nancy CW, et al. *Circulation*. 2013;128:e440-442.

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**CARDIAC FAILURE** Latest of Many.....

CONDENSING STATEMENT / ARTICLES IN PRESS

**Universal Definition and Classification of Heart Failure**  
 A Report of the Heart Failure Society of America, Heart Failure Association of the European Society of Cardiology, Japanese Heart Failure Society and Writing Committee of the Universal Definition of Heart Failure

Shyam Baskin, MD, PhD, Chair, A, et al; Andrew J.S. Coats, DM, DSC; Hiroaki Tsutsui, MD, Co-Chair; et al; Han Zhang, MD, PhD; Shelley Zieroth, MD. Show all authors

Published March 01, 2021. DOI: <https://doi.org/10.1016/j.jacc.2021.01.022>

Symptoms and/or signs of HF caused by a structural and/or functional cardiac abnormality

and corroborated by at least one of the following

- Elevated natriuretic peptide levels
- or
- Objective evidence of cardiogenic pulmonary or systemic congestion

**HF with reduced EF (HFrEF):**

- HF with LVEF ≤ 40%

**HF with mildly reduced EF (HFmrEF):**

- HF with LVEF 41-49%

**HF with preserved EF (HFpEF):**

- HF with LVEF ≥ 50%

**HF with improved EF (HFimpEF):**

- HF with a baseline LVEF ≤ 40%, a ≥ 10 point increase from baseline LVEF, and a second measurement of LVEF > 40%

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

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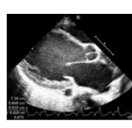


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**HF - A Clinical Syndrome of Insufficient Cardiac Output** Tufts Medical Center

- 60 YO male with long-standing HF
- 3 weeks of worsening SOB
- BP 95/40

- 80 yo female with long-standing hypertension
- 1 hours of sudden onset of SOB
- BP 185/120

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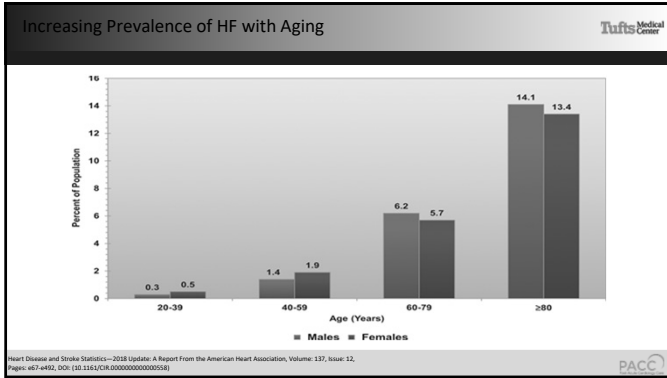
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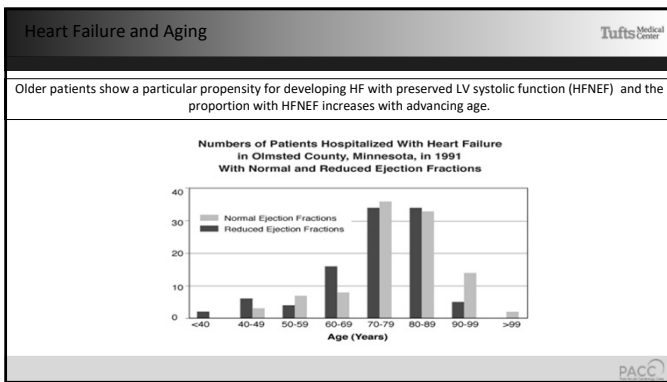
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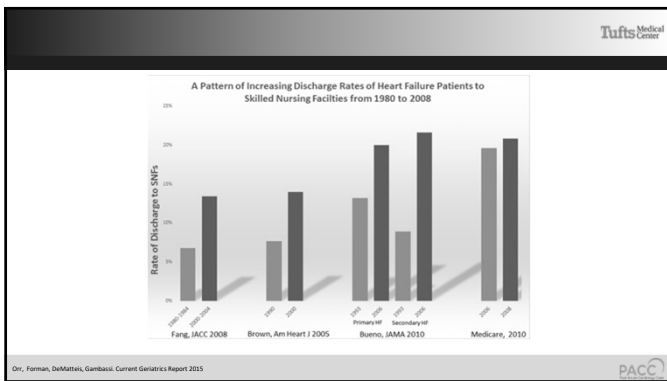
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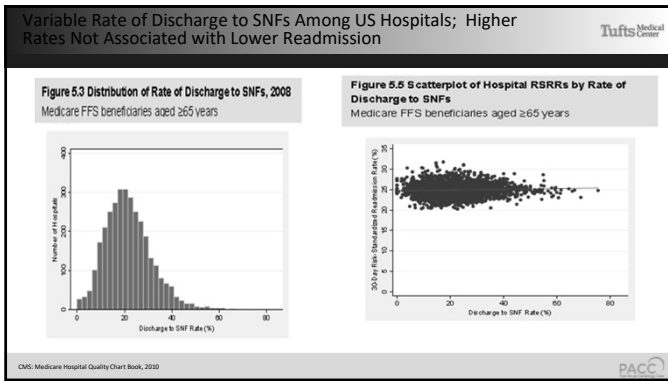
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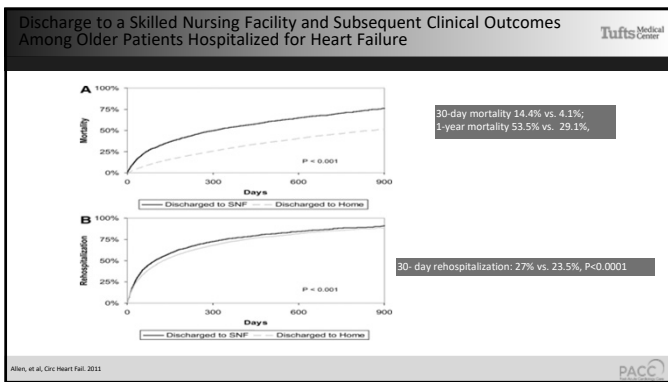
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**Heart Failure in Post-Acute Care - Management Framework**

**GOALS:**

- Improve or maintain medical stability
- Optimize function
- Prepare for community D/C if possible
- Prevent hospital readmission

Diagnosis often made pre-SNF admission

- Extensive diagnostic work up not necessary

Source: PACC

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**Management Overview**

1. Is the patient stable?  
2. Cardinal signs of heart failure?

**YES!**      **NO!**

<ul style="list-style-type: none"> <li>1. Reduce Congestion</li> <li>2. WHY?</li> <li>3. Obtain/Determine LVEF</li> <li>4. Patient-centered GDMT                             <ul style="list-style-type: none"> <li>&gt; Improve exertional tolerance/function</li> <li>&gt; Return to desired place of dwelling</li> <li>&gt; Avoid hospital admission</li> <li>&gt; Prolong survival</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• History of HF</li> <li>• WHAT'S HAPPENING IN REHAB?</li> <li>• Risk factors for HF (HFpEF Score)?</li> <li>• Comorbidities?</li> <li>• Treatment strategy aligned with GOC</li> </ul>
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Post-Acute Cardiology Care experience 2014-present  
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**Evaluation - Criteria for Hospitalization (if not DNH)**      **Tufts Medical Center**

<p><b>HEMODYNAMICALLY UNSTABLE</b></p> <ul style="list-style-type: none"> <li>• Tachycardia, &gt;120 bpm</li> <li>• Hypotension, SBP&lt;80mmHg</li> <li>• Tachypnea/hypoxia</li> <li>• Cardiogenic shock</li> <li>• Altered mentation</li> </ul>	<p><b>MANAGEMENT FAILURE</b></p> <ul style="list-style-type: none"> <li>• Persistent dyspnea</li> <li>• Edema or weight gain</li> <li>• Worsening CKD</li> </ul>
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**Reduce Congestion**      **Tufts Medical Center**

- Initial IV dose = 2.5 x or more maintenance  
e.g., 40 mg oral Furosemide = IV bolus of 40-100 mg
- Urine output should be 3-5 liters per day

Helpful Diuretic References

<p><b>If not responding:</b></p> <ul style="list-style-type: none"> <li>• Double daily dose</li> <li>• Triple daily dose</li> <li>• BID dosing</li> <li>• Switch to an alternative loop diuretic</li> <li>• *Furosemide –variable bioavailability</li> <li>• Add potentiating diuretic</li> <li>• Reduce exogenous sodium</li> <li>• Address symptoms according to GOC</li> </ul>	<p><b>Conversion:</b> Furosemide 40mg = Furosemide 20mg IV = Torsemide 20mg = Bumetanide 1 mg</p> <p><b>Distal tubule:</b> Metolazone 2.5-5 mg daily Chlorothiazide 500-1000 mg daily Hydrochlorothiazide 25-50 mg daily</p>
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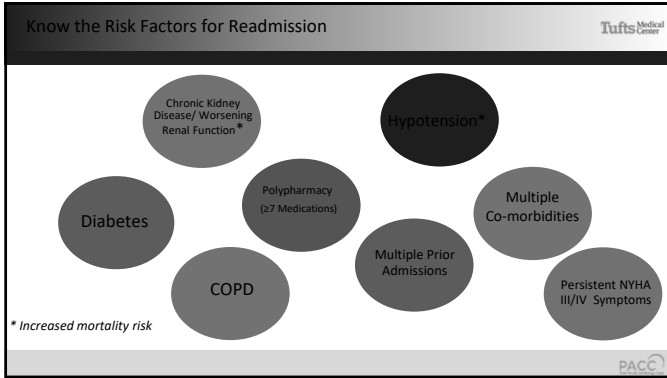
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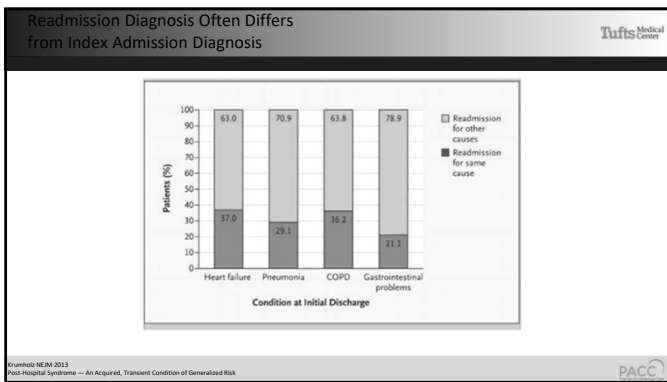
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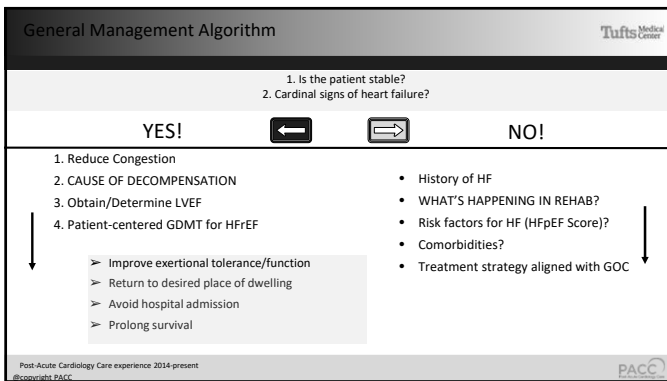
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**Discern the Cause of Decompensation - New Admissions and Decompensation**

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- Noncompliance
- Inadequate pre-treatment  
\*before/during hospital admission
- Hypertension
- Iatrogenic volume overload
- NSAIDs
- Arrhythmia
- Infection
- Addition or increase of negative inotropes (beta blockade/CCB)
- Ischemia
- Thyroid dysfunction
- Anemia

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**General Management Algorithm**

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1. Is the patient stable?  
2. Cardinal signs of heart failure?

**YES!**    ←    →    **NO!**

1. Reduce Congestion

2. WHY?

3. Obtain/Determine LVEF

4. Patient-centered GDMT for HFrEF

- Improve exertional tolerance/function
- Return to desired place of dwelling
- Avoid hospital admission
- Prolong survival

- History of HF
- WHAT'S HAPPENING IN REHAB?
- Risk factors for HF (HFpEF Score)?
- Comorbidities?
- Treatment strategy aligned with GOC

Post-Acute Cardiology Care experience 2014-present  
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**Match SNF Based Pharmacologic Therapy to HF Phenotype**

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- When appropriate, patients should be treated with guideline directed medical therapies, if tolerated and aligned with GOC
- Focused updates include Class I indications for newer agents (ARNIs and SGLT2 inhibitors)
- Know the indications, pharmacology, and side effects on these newer agents as they apply to the geriatric patient admitted post initiation of SNF level care

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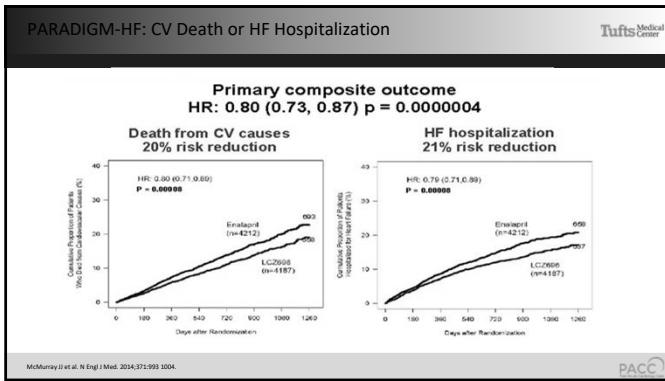
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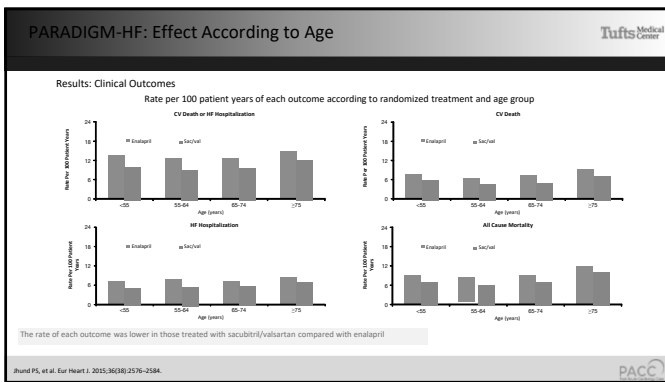
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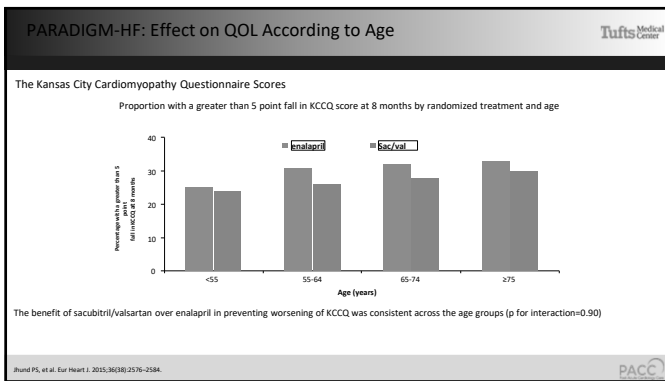
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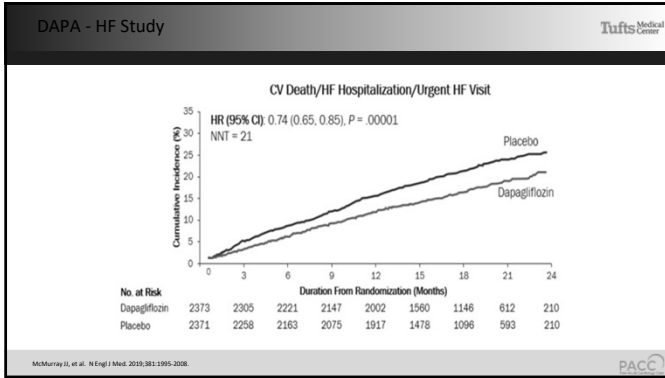
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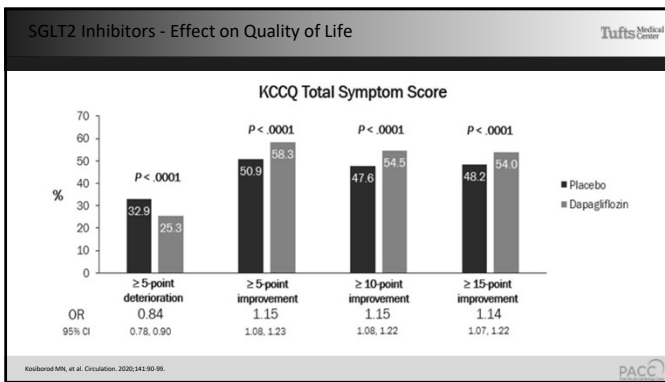
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- Practical Tips for the Management of SNF HFrEF Patients Post Hospitalization** Tufts Medical Center
- Sacubitril/Valsartan and SGLT2 Inhibitors will be seen more frequently  
\*\* Diuretic properties, check volume status with hemodynamic alterations
  - Diuretic requirements may decrease with positive remodeling
  - ARBs – less vasodilatory, so may consider in setting of hypotension
  - Carvedilol - more vasoactive, start if patient hypertensive.
  - Furosemide – variable bioavailability, consider other loop agents: torsemide bumetanide
  - Monitor magnesium
  - Don't start BB while patient is still volume overloaded
  - Once euolemic, resume or titrate GDMT according to patient preferences
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**What to Do with Chronic Maintenance Therapy in ADHF** Tufts Medical Center

- Continue ACE/ARB unless hypotensive, AKI, hyperkalemic
- Beta-blockers:
  - Mild HF - Continue
  - Moderate HF - Drop 50%
  - Severe HF (shock, inotrope needed) - Hold before transfer
- Don't start BB while patient is still volume overloaded
- Avoid non-dihydropyridine CCB in HFrEF
- Once euvolemic, resume or titrate GDMT according to patient preferences

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**HFpEF - Evolving Understanding of the Pathophysiology** Tufts Medical Center

Hypertension

↓

Concentric LVH  
Fibrosis

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↓

Diastolic Dysfunction

The diagram illustrates the pathophysiology of HFpEF. It shows a flow from 'Hypertension' leading to 'Concentric LVH Fibrosis' and 'Diastolic Dysfunction'. A central box labeled 'Endothelium' contains 'eNOS' and 'NO'. Above it, a box lists risk factors: 'Chronic Kidney Disease', 'Hypertension', 'Diabetes Mellitus', 'COPD', and 'Iron Deficiency'. To the right, a box lists 'ACE Inhibitors', 'ARBs', 'Beta-blockers', and 'PDE5 Inhibitors'. Below the endothelium, a box lists 'LV, RV, LA, RA Cardiomyocytes'. To the right of the cardiomyocytes is a box for 'Skeletal Muscle' with 'Myosin' and 'Myofibrils' listed below it. Arrows indicate interactions between these components.

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**Co-Morbidities - Mimics or Makers** Tufts Medical Center

Chronic Lung Disease  
 Diabetes  
 Age  
 Obesity  
 HTN  
 Renal dysfunction  
 Dyslipidemia  
 Anemia

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### Mechanisms of Dyspnea in HFpEF – Not Just Volume Overload\*

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- Chronotropic incompetence
- Impaired vasodilation
- Increased left-sided filling pressures from either venoconstriction or diastolic dysfunction,
- Peripheral muscular changes
- Endothelial dysfunction

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### Normal NT-proBNP Does NOT Exclude HFpEF

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NT-proBNP cutoff used (pg/ml)	% of HFpEF patients
<125	~18%
<200	~30%
<300	~40%

30% of HFpEF patients have Normal BNP Levels

Obokata, *Berling Circulation*. 2017

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### HFpEF Management - #1 Diuretics Work

Tufts Medical Center

Diuretics should be used for relief of symptoms due to volume overload in patients with HFpEF.

Adelman, *Circ Heart Fail*. 2014

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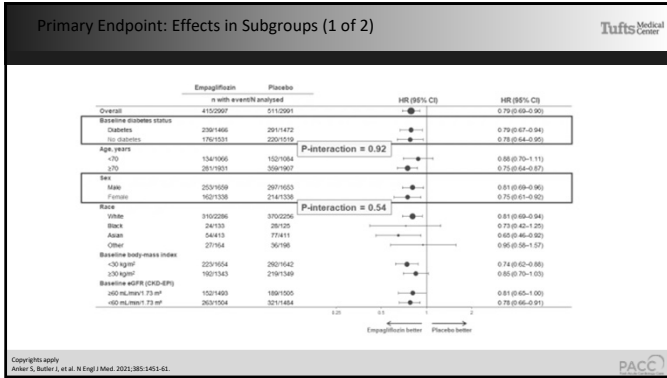
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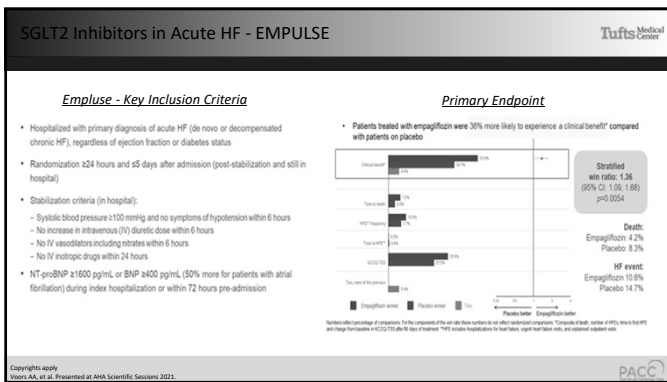




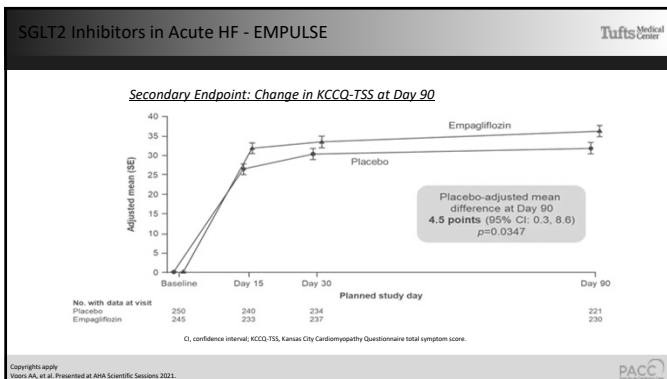




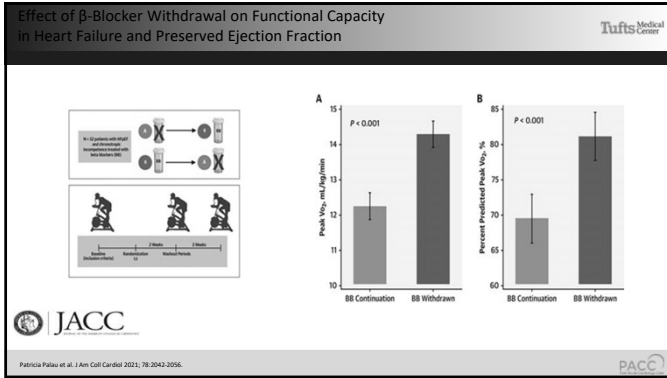
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- DRUGS TO AVOID IN CHF**
- NSAIDs and COX-2 inhibitors
  - Nondihydropyridine CCBs (avoid only for systolic heart failure)
  - -Diltiazem
  - -Verapamil
  - Pioglitazone, rosiglitazone-Frequently exacerbates edema
  - Cilostazol (Pletal) – decrease survival in Class II-IV CHF
  - Dronedarone (Multaq) – risk of death doubles with decompensated CHF or Class IV CHF

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- A Few Pearls**
- Diuretics:**
    - No mortality benefit, may increase mortality in long term use, now need to really reconsider use in the setting of newer therapies.
  - ACE/ARB/ARNI**
    - Monitor for volume depletion and electrolyte disturbances, Hypotension can occur within hours, hyperkalemia within a few days
  - Beta Blockers:**
    - Not indicated for HFpEF patients
    - Monitor for fatigue, diminished exercise tolerance, bradycardia or increased dyspnea. Check an EKG orthostatics and consider dose adjusting

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**PROGRAMATIC CONSIDERATIONS – The 7 M's** Tufts Medical Center

Monitoring	
WEIGHTS	Multiple Co-Morbidities
Labs	Optimize pulmonary and renal disease management
Meals	Movement
Healthy, low sodium options	Daily activity, not just for CV benefits, but provides clinical insight
Medications	Mentoring
HFREF – thoughtful use of diuretics BB, ACE/ARB, MRA, hydralazine/nitrates	Engage the patient/caregiver in the process, if community discharge, make weights interactive, tell them what their medications are for
HFpEF – thoughtful use of diuretics, SGLT2, ARNI antihypertensives	Motivations
	What does patient want, what are goals of care

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**Non-Congested Symptomatic HFpEF Patients - Practical Tips** Tufts Medical Center

- SNF setting may be ideal for initiation of MRA
  - Ease of monitoring/laboratory evaluation
- Chronotropic Incompetence
  - Indication/Dosing of Beta Blockers
- Peripheral Vasculature Dysfunction
  - Exercise
- Set-up for Success!
  - Dietary and exercise education
  - Collaboration with HF Clinic/Community Cardiologist



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**Review Article** Tufts Medical Center

**Skilled Nursing Facility Care for Patients With Heart Failure: Can We Make It "Heart Failure Ready?"**



Nicole M.Orr MD, Rebecca Boxer MD, MS, Mary Dolansky RN, PhD, Larry Allen MD, MHS, Daniel E. Forman MD

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CASE Tufts Medical Center

- 71 yo female with HFpEF, COPD, AFIB, SSS s/p PPM, obesity hypoventilation syndrome, s/p 6 day inpatient stay for dyspnea.
- Hospital course: Slight suggestion of CHF by lab and radiographic data. Developed AKI after 2 doses IV furosemide 40 mg. Diuretics held, discharged on 40 mg oral furosemide daily to SNF level care for restorative rehab
- Medications: Furosemide 40 mg daily, Carvedilol 6.25 mg BID, aspirin 81 mg, Coumadin 2.5 mg, pravastatin 20 mg
- Had been started on CHF protocol
- CC – CHF/SOB

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