Developing a Patient-Centered Approach to Heart Failure Management in Skilled Nursing Facilities

September 7, 2019

Nicole M. Orr, MD, FACC
President, Post-Acute Cardiology Care
Assistant Professor, Tufts Medical Center
Dr. Orr has no financial relationship(s).
A Clinical Syndrome of Insufficient Cardiac Output

HF with Reduced EF (HFrEF)  
Systolic HF  
Eccentric Hypertrophy  
EF < 40%

HF with Preserved EF (HFP EF)  
Diastolic HF  
Concentric Hypertrophy  
EF > 50%

Systolic Heart Failure
Less blood pumped out of ventricles
Weakened heart muscle can’t squeeze as well

Diastolic Heart Failure
Less blood fills the ventricles
Stiff heart muscle can’t relax normally
A Clinical Syndrome of Insufficient Cardiac Output

Males
- CHD
- Viral
- Valvular
- Idiopathic
- Familial

Females
- DM
- HTN
- Afib
- Obesity
- COPD
- Infiltrative dz

EF < 40%

EF > 50%
Increasing Prevalence of HF with Aging

![Graph showing the increasing prevalence of HF with aging. The graph displays the percentage of the population affected by HF in different age groups for males and females. The data shows a significant increase in prevalence as age increases, with a notable rise in the 60-79 and ≥80 age groups.]
Prevalence of HFpEF and HFrEF by Age and Sex

Median survival was 20 months for patients >85 years and 50 months for the other age groups combined.
Hospital Discharges for Heart Failure (United States: 1997–2014)

Among All Diagnoses

Principal HF diagnosis

Heart Disease and Stroke Statistics—2018 Update: A Report From the American Heart Association, Volume: 137, Issue: 12, Pages: e67-e492
Heart Failure Hospital Readmission

- Readmissions within 30 days ~ 20-25%
- Payments for readmission account for 60% Medicare HF expenditure
Legislative Initiatives - The Issue of Re-Hospitalizations

- Medicare cost of $14.3 billion in 2011

- Readmissions Reduction Program

- *Protecting Access to Medicare Act of 2014*
  - Authorized CMS to create a SNF Value-based Purchasing Program (VBP)

- Readmission Penalties
A Pattern of Increasing Discharge Rates of Heart Failure Patients to Skilled Nursing Facilities from 1980 to 2008

- 1990: Primary HF, Bueno, JAMA 2010
- 2006: Secondary HF, Medicare, 2010
- 2006-2008:
Variable Rate of Discharge to SNFs among US hospitals; Higher Rates Not Associated with Lower Readmission

Figure 5.3 Distribution of Rate of Discharge to SNFs, 2008
Medicare FFS beneficiaries aged ≥65 years

Figure 5.5 Scatterplot of Hospital RSRRs by Rate of Discharge to SNFs
Medicare FFS beneficiaries aged ≥65 years
Discharge to a Skilled Nursing Facility and Subsequent Clinical Outcomes Among Older Patients Hospitalized for Heart Failure

30 day rehospitalization: 27% vs. 23.5%, P<0.0001
Factors Associated with Poor Outcomes in SNFs

**Systems Factors**
- Hospital factors (discharge disposition, med reconciliation, attention to geriatric clinical factors)
- Transitions - discharge planning/summaries, provider to provider communication
- Logistics of meeting specified follow up appointments

**Facility Factors**
- Complexity of patients vs. staffing ratio, education/ services available
- Standardized readmission policies, facility capabilities
- Lack of disease management programs

**Patient Factors**
- Selection bias: age, frailty, multiple co-morbidities, Geriatric Syndromes, possible lack of GDMT
- Readiness for discharge, Expectations of rehabilitation - ?
Post-Acute Care Heart Failure Statistics

- 2013: 40.6% of patients with HF were discharged to PAC:
  - 38% to SNFs; 58% to HHC

- Characteristics associated with SNF discharge:
  - Longer length of hospital stay
  - Advanced age, female
  - EF > 45%, higher prevalence of HFpEF
  - Comorbidities: CKD, electrolyte abnl, COPD, DM, Frailty, Geriatric syndromes
  - > 80% suffer from at least moderate physical limitations
  - ~ 40% have cognitive impairment
  - In patients hospitalized with HFpEF, 20% are readmitted within 30 days.
  - In population-based community studies, well over 50% of all hospitalizations in patients with HFpEF are for noncardiovascular causes

• Legislative initiatives under the Affordable Care Act recently in effect to penalize health care institutions with larger than average 30-day readmission rates.

• No standardized disease management programs, organizational structures in pace.

• No significant improvement in quality metrics since legislation.
SNF HF Programs

- Daily weights
- Daily Vitals
- Nutrition consult
- Titrate Diuretics for > 2 or 3 lb weight gain overnight
- Anything worse…Call the Cardiologist
Readmission Due to Different Diagnosis of Index Admission

Heart Failure patients are only readmitted for HF in 1/3 of cases

Krumholz NEJM 2013
Post-Hospital Syndrome — An Acquired, Transient Condition of Generalized Risk

HFpEF Patients More Likely to have a NON-HF Hospital Admission

An Increasing number of noncardiac comorbidities was associated with a higher risk for all-cause admissions (p < 0.001)
## Mostly Non-cardiovascular Characteristics Associated with Hospitalization in SNF Users with HF

Arrhythmia, asthma, chronic kidney disease, and physical/functional impairment

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>1.03</td>
</tr>
<tr>
<td>Age at HF</td>
<td>0.96</td>
</tr>
<tr>
<td>Married</td>
<td>1.03</td>
</tr>
<tr>
<td>Body mass index category at HF</td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>1.00</td>
</tr>
<tr>
<td>Underweight</td>
<td>0.15</td>
</tr>
<tr>
<td>Overweight</td>
<td>0.80</td>
</tr>
<tr>
<td>Obese</td>
<td>0.96</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2.15</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>1.25</td>
</tr>
<tr>
<td>Arrhythmia</td>
<td>2.08</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>0.90</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.84</td>
</tr>
<tr>
<td>Arthritis</td>
<td>0.86</td>
</tr>
<tr>
<td>Asthma</td>
<td>1.59</td>
</tr>
<tr>
<td>Cancer</td>
<td>1.19</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>1.29</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>1.21</td>
</tr>
<tr>
<td>Dementia</td>
<td>0.84</td>
</tr>
<tr>
<td>Depression</td>
<td>0.68</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.12</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>0.72</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>0.95</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>1.15</td>
</tr>
<tr>
<td>Reduced ejection fraction</td>
<td>0.80</td>
</tr>
<tr>
<td>No. of limited/extensive assistance ADLs</td>
<td>1.00</td>
</tr>
</tbody>
</table>

---

**SNF use associated with 50% increased risk of hospitalization compared with no SNF use**

Pathophysiology of HFpEF

LV Diastolic Dysfunction
Traditional HFpEF Paradigm

Hypertension
\downarrow
Concentric LVH
Fibrosis
\downarrow
Diastolic Dysfunction
Pathophysiology of HFpEF

• Not all patients with HFpEF have LVH - 30% have normal geometry

• Fibrosis is not invariant - HFpEF can occur in the setting of severe fibrosis or no fibrosis
Co-Morbidities - Mimics or Makers

- Chronic Lung Disease
- Diabetes
- Age
- Obesity
- HTN
- Renal dysfunction
- Dyslipidemia
- Anemia
HFpEF pathophysiology

Comorbidity driven microvascular endothelial inflammation

- Overweight/Obesity
- Hypertension
- Diabetes Mellitus
- COPD
- Iron Deficiency

Endothelium

LV, RV, LA, RA Cardiomyocytes

Skeletal Muscle

Paulus W. JACC 2013; Stasch JP. JCI 2006
Microvascular inflammation

Endothelial dysfunction

Microvascular destruction or rarefraction

Reduced microvascular density and impaired coronary flow reserve,

Sensation of angina despite the absence of epicardial coronary disease.

HFpEF Pathophysiology
Impaired Peripheral Vascular Vasodilatory Reserve in HFpEF

Vasodilatation at matched low level exercise

Vasodilation (reduction in arterial elastance [Ea] and systemic vascular resistance index [SVRI]) is impaired in HFpEF.
Decreased Systolic Reserve in HFpEF
EF doesn’t increase with exercise
Pulmonary Hypertension:
PA Pressure > 40 mmHg, mean PA pressure > 25 mmHg
RV Enlargement and Dysfunction

HFpEF - NOT Just the Left Ventricle

Borlag, Circ 2006, Brubaker, Circ 2011
Exertional Dyspnea in HFpEF

• While EF doesn’t increase with exercise, LV EDP does, which drives symptoms as it contributes to generation of high LA and PCWP.

• This is a hallmark of HFpEF

• The HR increase is blunted in HFpEF, which in combination with lack of ability to vasodilate and increase EF leads to significant symptoms.
Mechanisms of Dyspnea in HFpEF

- Chronotropic incompetence
- Impaired vasodilation
- Increased left-sided filling pressures
- Peripheral muscular changes
- Endothelial dysfunction.
# Summary of RCTs for HFpEF

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Agent</th>
<th>N</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARM-PRE</td>
<td>candesartan</td>
<td>3023</td>
<td>No effect</td>
</tr>
<tr>
<td>I-PRESERVE</td>
<td>irbesartan</td>
<td>4128</td>
<td>No effect</td>
</tr>
<tr>
<td>PEP-CHF</td>
<td>perindopril</td>
<td>850</td>
<td>No effect</td>
</tr>
<tr>
<td>SENIORS</td>
<td>nebivolol</td>
<td>2128</td>
<td>No effect</td>
</tr>
<tr>
<td>TOPCAT</td>
<td>spironolactone</td>
<td>3445</td>
<td>No effect</td>
</tr>
</tbody>
</table>
### Treatment of HFpEF

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic and diastolic blood pressure should be controlled according to published clinical practice guidelines</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Diuretics should be used for relief of symptoms due to volume overload</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>Coronary revascularization for patients with CAD in whom angina or demonstrable myocardial ischemia is present despite GDMT</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>Management of AF according to published clinical practice guidelines for HFpEF to improve symptomatic HF</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>Use of beta-blocking agents, ACE inhibitors, and ARBs for hypertension in HFpEF</td>
<td>IIa</td>
<td>C</td>
</tr>
<tr>
<td>ARBs might be considered to decrease hospitalizations in HFpEF</td>
<td>IIb</td>
<td>B</td>
</tr>
<tr>
<td>Nutritional supplementation is not recommended in HFpEF</td>
<td>III: No Benefit</td>
<td>C</td>
</tr>
</tbody>
</table>

2013 ACCF/AHA Guideline for the Management of Heart Failure
Guidelines for Treatment of HFpEF...

2005 similar to 2001

2009 similar to 2005

2013 similar to 2009

HFpEF not addressed in 2016 update
Patients with HFpEF and Co-morbidities are more likely to be discharged to a SNF.

Rates of utilization of PAC for HF patients continues to increase.

SNF patients have persistently high rates of hospital readmission and death.

Readmission tends to be driven by non-HF related illness.

........Are we thinking about heart failure management in SNFs the right way?
SNF- Based Heart Failure Care
KNOW YOUR PATIENT!

- Which Flavor of HF do they Have?
- Not all heart failure
- is the same,
- can be assessed the same,
- can be managed the same
Patient Centered Heart Failure Care

Consider the type of SNF HF patient and their goals of care

“Rehabilitation Group”

“Uncertain Prognosis Group”

“Long Term Care Residents”

• Try to see the patient in Rehab!
• Case Presentation:
• 74 yo woman with chronic HFpEF, SSS s/p PPM, OSA, COPD s/p admission for SOB. CXR showed pulmonary edema. Treated with IV Furosemide and creatinine improved from 1.7 to 1.4 suggesting cardiorenal syndrome, but subsequent IV dose cause worsening creatinine. Diuretics held, sent out on 40 mg oral furosemide daily
CASE Presentation

- Asked to see for her SOB with exertion, not responding to increasing Lasix.
- In SNF the patient was relatively hypotensive, BPs 106/60s, HR 60s (atypical for hypertensive HfPEF patients who need better afterload reduction)
- Described more of a “wiped out” feeling with exertion rather than SOB
- Arranged to see patient in rehab and with increasing exercise despite deconditioning, her HR never went above 60 pm. PPM had not been interrogated, and I requested to increase her rate responsiveness.
- Bedside lesson – Further diuresis would have caused AKI, worsening hypotension, fatigue.
- **Don’t assume all SOB is HF in HF patients. They have competing illnesses.**
The Many Faces of CHF in the elderly

- Fatigue
- Exercise intolerance
- Dyspnea
- Nocturnal cough
- Altered mental status/worsening cognition
- Lethargy
- Restlessness
- Worsening appetite

**Fatigue:** depression, frailty, aging, reduction in activities to avoid symptoms, anemia, hypothyroidism

**Exercise intolerance:** chronicotropic incompetence, deconditioning,

**Dyspnea:**
- Chronic pulm. disease, PNA, pulmonary HTN,
- changes in vascular tone, lung capacity

**Edema:**
- venous tone, decreased skin turgor, prolonged sedentary states, idiopathic, medications, renal or hepatic disease

**Anorexia:**
- polypharmacy, depression, palatability, Dietary restrictions

**Altered mental status:**
- psychosocial stressors, medications, infections
## Challenges in the Clinical History of Heart Failure in Older Adults

<table>
<thead>
<tr>
<th>Atypical Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaise, Confusion, Irritability, Anorexia, Sleep Disturbance, Decreased Activity, Abdominal Complaints</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative Explanations for Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid Retention: Drugs (NSAIDS), Venous Insufficiency</td>
</tr>
<tr>
<td>Dyspnea: COPD, Anemia, Pneumonia</td>
</tr>
<tr>
<td>Fatigue: Anemia, Hypothyroidism, Obesity, Deconditioning, Depression</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimize Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I just can’t get around, I’m 87”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fewer Exertional Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoarthritis, Sarcopenia, Loss of Balance, Poor Vision</td>
</tr>
</tbody>
</table>
Initial Assessment

• Background data – LV/RV function, EKG, # prior HF admissions, diuretic requirements
• Chief complaint at hospital presentation
• Co-Morbidities
• Baseline and current vitals, labs
• Volume:
  • Ideal body weight
  • Did they diurese/weight change during hospitalization?
Short-Term Rehab Group – Practical Approach

• Daily weights before breakfast, after am void
• Call for > 2 lb weight gain overnight or > 4 lb 1 week
• BID vitals x first 5 days then as clinically indicated
• Baseline EKG
• BMP in 1 week (from last BMP), +/- BNP, digoxin level
• See the patient during exercise or get rehab hemodynamic data

May need more rapid achievement of euvolemia.
Often can’t tolerate robust therapies initiated during hospitalization during rehabilitation due fatigue, orthostasis that limits their exercise capacity.
Short Term Rehab patients with anticipated discharge to community

- Optimization of volume and close monitoring of daily weights and weekly labs
- Is patient progressing and tolerating therapies?
  - Yes
    - Advance therapies as tolerated, focus on discharge care coordination and education
  - No
    - Do limitations seem cardiac?
      - Yes
        - Address fatigue/orthostasis, arrhythmia/angina to augment rehab participation
      - No
        - No
          - Address co-morbidities, consider deprescribing, address goals of care

Orr, N,M.
Heart Failure with reduced ejection fraction (systolic HF)

- **Therapy Goals:** reduce morbidity, mortality, symptoms, improving health-related quality of life and functional status, decrease the rate of hospitalization.
- **Management Principles:**
  - lifestyle modification: smoking cessation, restriction of alcohol and salt, weight reduction in obese patients, as well as daily weight monitoring
  - drug therapy: improve symptoms, slow or reverse deterioration in myocardial function due to pathologic remodeling, and reduce mortality
  - device therapy as indicated
  - cardiac rehabilitation: Stable NYHA functional class II to III without advanced arrhythmias or other limitations to exercise (IB)
  - preventive care
- **Treatment:** management of contributing conditions - hypertension, ischemic heart disease, valvular heart disease, diabetes, thyroid dysfunction, and infection.
- **Evaluate patients regularly:** to assess status, response to therapy, and need for changes in management.
  - Titrate to Guideline recommended target doses
  - Patients at high risk for hospitalization should be referred to a multidisciplinary disease management program, if available.
- **Refractory HF** despite optimum therapy may require advanced care, including review of potential options such as mechanical circulatory support, cardiac transplantation, and palliative care.
Treatment of HFrEF Stage C and D

**Step 1**
Establish Dx of HFrEF; assess volume; initiate GDMT

**Step 2**
Consider the following patient scenarios

- NYHA class II–IV, provided est. CrCl >30 mL/min & K+ <5.0 mEq/L
  - Aldosterone antagonist (COR I)

- NYHA class II–III HF, Adequate BP on ACEI or ARB*, No CI to ARB or sacubitril
  - Discontinue ACEI or ARB; initiate ARNI* (COR I)

- NYHA class III–IV, in black patients
  - Hydrat-Nitrates† (COR I)

- NYHA class II–III, LVEF ≤35%; (caveat: >1 y survival, ≥40 d post MI)
  - ICD† (COR I)

- NYHA class II–IV, LVEF ≤35%, NSR & QRS ≥150 ms with LBBS pattern
  - CRT or CRT-D‡ (COR I)

- NYHA class II–III, NSR, heart rate ≥70 bpm on maximally tolerated dose beta blocker
  - Ivabradine (COR IIa)

**Step 3**
Implement indicated GDMT. Choices are not mutually exclusive, and no order is inferred

**Step 4**
Reassess symptoms

- NYHA class III–IV
  - Symptoms improved
  - Palliative care‡ (COR I)

- Refractory NYHA class III–IV (Stage D)
  - Transplant† (COR I)

- LVAD‡ (COR IIa)

**Step 5**
Consider additional therapy

- Investigational studies‡

Continue GDMT with serial reassessment & optimized dosing/adherence

---

American College of Cardiology
American Heart Association

---
Diuretics

- No mortality benefit, may increase mortality in long term use
- No data to show one diuretic is superior
- Initiated low doses, increased until urine output increases and weight decreases, generally by 0.5 to 1.0 kg daily.
- Adjust to maintain euvolemia, once desired volume status is achieved, doses should be reduced
- Can reduce dosage if combined with sodium restrictions
Renin-Angiotensin-Aldosterone System Blockade

- Decrease mortality by mediating pump failure
- Improve QOL by reducing symptoms and enhancing exercise tolerance
- SOLVD data showed ACEIs may be beneficial for patients age 65-80 yo and in patients with Stage III CKD (GFR 30-59 ml/min/1.73m²)
- Monitor for volume depletion and electrolyte disturbances
  - Hypotension can occur within hours, hyperkalemia within a few days
  - Monitor renal function with initiation and increasing doses
- Be aware that cough can also occur with ARBs

The SOLVD Investigators NEJM 1991
Beta-Adrenergic Blockers - Carvediol, Metoprolol Succinate, Nebivolol

- Improve survival by reducing sudden cardiac death and death attributable to pump failure, reduce hospitalizations for HF exacerbation
- Reduce arrhythmia risk, can increase LVEF
- Safe to use when euvolemic even in severe HF
- Low to intermediate dose (25-50%) of recommended target dose might be appropriate
- If develop SE, decrease to prior tolerated dose
- Has not been studied in patients >80 yo, but some data supporting Metoprolol succinate use in patients 75-80 yo (MERIT-HF)
Beta-Adrenergic Blockers - Carvediol, Metoprolol Succinate, Nebivolol

- Should only be started when patients are euvoletic
- Can either increase or decrease QOL if worsens fatigue
- Should be used in context of goals of care, possibly avoided with poor prognosis, poor QOL
- Choice of BB in comorbid illness?

Deedwania et al, Eur Heart J 2004
**HFrEF Mortality ↓ With Medical Therapy**

- **ACE inhibitors**: 17% ↓ NNT = 26
- **+ Beta blockers**: Additional 34% ↓ Beyond ACEi NNT=9
- **+ Aldo blockers**: Additional 30% ↓* NNT=6
- **+ ARNi**: Additional 16% ↓ Beyond GDMT NNT=27

NNT for mortality standardized to 36 months

* Beta blocker use ≈ 10-11%

---

Yancy et al, J Am Coll Cardiol 2013; Pitt et al, NEJM 1999; Fonorow et al, JAMA Cario 2016
<table>
<thead>
<tr>
<th>Medicine</th>
<th>Starting Dose</th>
<th>Target Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoprolol succinate</td>
<td>25 mg daily</td>
<td>200 mg daily</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125 mg twice daily</td>
<td>25 mg twice daily</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>5 mg daily</td>
<td>40 mg daily</td>
</tr>
<tr>
<td>Ramipril</td>
<td>1.25 mg daily</td>
<td>10 mg daily</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5 mg daily</td>
<td>20 mg twice daily</td>
</tr>
</tbody>
</table>
Patient Centered Heart Failure Care

Consider the type of SNF HF patient and their goals of care

“Rehabilitation Group”

“Uncertain Prognosis Group”

“Long Term Care Residents”

Jurgens et al, Circ Heart Fail. 2015;8:655–687
“Uncertain Prognosis Group” – Practical Approach

“Full Court Press”
- Measures for STR group
- At least weekly assessments by medical staff
- Multi-disciplinary approach to care
- Heightened focus on addressing co-morbidities
- Detailed review of medical therapies in consideration of functional goals
- Consider out-of-facility specialty consultation
“Uncertain Prognosis Group”

– What I do

- Daily weights before breakfast, after am void
  - Call for > 2 lb weight gain overnight or > 4 lb 1 week
- BID vitals x fist 5 days, orthostatic x 3 days
- Baseline EKG, BMP in 1 week, BNP
- Review medications for polypharmacy
- Do they have systolic dysfunction?
- See the patient during exercise or get rehab hemodynamic data
- What are their most limiting co-morbidities
- What has driven their prior hospital admissions
  - Arrange for appropriate subspecialty follow up within 1 – 2 weeks
Short Term Rehab patients with anticipated discharge to community

Optimization of volume and close monitoring of daily weights and weekly labs

Is patient progressing and tolerating therapies?

Yes

Advance therapies as tolerated, focus on discharge care coordination and education

No

Do limitations seem cardiac?

Yes

Address fatigue/orthostasis, arrhythmia/angina to augment rehab participation

No

Address co-morbidities, consider deprescribing, address goals of care

Orr, N,M.
Developing Heart Failure Algorithms of Care

• **Treatment of HF in the context of multiple co-morbidities – examples:**
  ◦ Dietary modifications if CKD limits diuretics
  ◦ Smaller more frequent, staggered dosing of antihypertensives if orthostatic
  ◦ Aggressive use of postural modifications for deconditioning/orthostasis
  ◦ Adjusting beta blockade therapies for bronchospasm, poor glucose control, fatigue
  ◦ Consider stopping/holding preventive therapies

• **Multidisciplinary care coordination**
  ◦ Pharmacy – deprescribing, dietary – patient centered diets, activities

• **Aggressive monitoring and proactive treatment of CHF triggers (sepsis/PNA/COPD)**

• **Meticulous attention with medication changes**
• **Check vitals and labs more frequently**
Patient Centered Heart Failure Care

Consider the type of SNF HF patient and their goals of care

“Rehabilitation Group”

“Uncertain Prognosis Group”

“Long Term Care Residents”
Long Term Care Residents – Practical Approach

“SNF residents with frailty and dependency who are expected to remain in a SNF until death.”

- Aim to optimize or at least maintain functionality
- Reduce pain, anxiety, symptoms related to cardiac disease
- Emphasis on appropriate deprescribing
  - Assess hemodynamic goals
- Regular assessments of goals of care, code status
A Few Pearls at a Glance

Diuretics:
- No mortality benefit, may increase mortality in long term use – it's OK to stop and see what happens

ACE/ARB
- 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
In-House Cardiology Consultation Reduces Readmission Rates and Costs: Experience in Heart Failure Bundle Payments for Care Improvement Initiative

<table>
<thead>
<tr>
<th>SNFs Participating in Genesis BPCI Model 3 (N = 32)</th>
<th>Number of SNF Centers</th>
<th>Total Episode Count</th>
<th># of Episodes with a Readmission</th>
<th>HF Episodic Readmission Rate (# Patients Readmitted/Total HF Episodes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Joseph’s Center</td>
<td>1</td>
<td>22</td>
<td>1</td>
<td>4.5%</td>
</tr>
<tr>
<td>All Other SNFs in BPCI Program</td>
<td>31</td>
<td>813</td>
<td>192</td>
<td>23.6%</td>
</tr>
<tr>
<td>All SNFs with HF Program excluding St. Joseph's Center</td>
<td>7</td>
<td>291</td>
<td>69</td>
<td>23.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Episode Count</th>
<th># of Episodes with a Readmission</th>
<th>HF Episodic Readmission Rate (# Patients Readmitted/Total HF Episodes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>6</td>
<td>27.3%</td>
</tr>
<tr>
<td>817</td>
<td>365</td>
<td>44.7%</td>
</tr>
<tr>
<td>292</td>
<td>142</td>
<td>48.6%</td>
</tr>
</tbody>
</table>

A. 30 – Day Readmission Rate

B. 90 – Day Readmission rate
In-House Cardiology Consultation Reduces Readmission Rates and Costs: Experience in Heart Failure Bundle Payments for Care Improvement Initiative

<table>
<thead>
<tr>
<th>Increasing DRG Complexity</th>
<th>HF Episodes at St Joseph’s Center</th>
<th>All HF Episodes in Other 31 BPCI Centers</th>
<th>All HF Episodes in Other 7 BPCI Centers with HF Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-DRGs of HF Episodes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>293: Heart Failure &amp; Shock without Complication or Comorbidity</td>
<td>0 0%</td>
<td>50 6%</td>
<td>19 6%</td>
</tr>
<tr>
<td>Complication or Comorbidity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>292: Heart Failure &amp; Shock with Complication or Comorbidity</td>
<td>5 23%</td>
<td>234 29%</td>
<td>98 34%</td>
</tr>
<tr>
<td>291: Heart Failure &amp; Shock with Major Complication or Comorbidity</td>
<td>17 77%</td>
<td>533 65%</td>
<td>175 60%</td>
</tr>
</tbody>
</table>

Decreasing Percentage of Complex Patients

![Graph showing cost and savings comparison between St. Joseph's Center and All Other BPCI Centers](https://via.placeholder.com/150)

- Target Price/Episode
- Total Cost/Episode
- Total Gain/Episode

Nicole M. Orr · Leah R. Nazarian
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
Conclusions

HF management in SNFs requires an understanding of HF pathophysiology

Treatment must be tailored to the individual’s unique clinical status, within the context of their co-morbidities and preferences and goals of care

Prevention via close monitoring and subspecialty consultation if aligned with goals of care may be a good use of resources

Traditional pharmaceuticals aimed at modification of cardio-specific processes do not significantly modify outcomes for the majority of SNF HFpEF patients. Enhanced research efforts are needed for this population
The Future

The Subspecialized SNF

- "Heart Failure Ready"

Able to focus resources on HF disease management and acquire adequate staffing and resources

Function within a greater CHF network
Thank You

Nicole M. Orr, MD FACC

www.postacutecardiologycare.com
norr@postacutecardiologycare.com
norr@tuftsmedicalcenter.org
Skilled Nursing Facility Use and Hospitalizations in Heart Failure: A Community Linkage Study.

“Characteristics associated with hospitalization in SNF users were mostly noncardiovascular, including reduced ability to perform activities of daily living.

These findings underscore the effect of physical functioning on hospitalizations in patients with HF in SNFs and the importance of strategies to improve physical functioning.”
Why Hasn’t Anything Worked?

**Negative Trials in HFpEF**

- RELAX – sildenafil
- NEAT HF – Isosorbide mononitrate
- CHARM, I-PRESERVE – ACE / ARBs
- TOPCAT – spironolactone
### Stages, Phenotypes and Treatment of HF

#### STAGE A
At high risk for HF but without structural heart disease or symptoms of HF

- **Goals**
  - Prevent HF symptoms
  - Prevent further cardiac remodeling
- **Drugs**
  - ACEI or ARB as appropriate
  - Beta blockers as appropriate
- **In selected patients**
  - ICD
  - Revascularization or valvular surgery as appropriate

#### STAGE B
Structural heart disease but without signs or symptoms of HF

- **Goals**
  - Diuretics to relieve symptoms of congestion
  - Follow guideline driven indications for comorbidities, e.g., HTN, AF, CAD, DM
  - Revascularization or valvular surgery as appropriate

#### STAGE C
Structural heart disease with prior or current symptoms of HF

- **Goals**
  - Control symptoms
  - Improve HRQOL
  - Prevent hospitalization
  - Prevent mortality
- **Drugs for routine use**
  - Diuretics for fluid retention
  - ACEI or ARB
  - Beta blockers
  - Aldosterone antagonists
- **In selected patients**
  - hydralazine/isosorbide dinitrate
  - ACEI and ARB
  - Digoxin
  - CRT
  - ICD

#### STAGE D
Refractory HF

- **Goals**
  - Control symptoms
  - Prevent mortality
  - Establish patient’s end-of-life goals
- **Options**
  - Advanced care measures
  - Heart transplant
  - Chronic inotropes
  - Temporary or permanent MCS
  - Experimental surgery or drugs
  - Palliative care and hospice
  - ICD deactivation

### At Risk for Heart Failure

- **Patients with:**
  - HTN
  - Atherosclerotic disease
  - DM
  - Obesity
  - Metabolic syndrome or AAA
  - Using cardiotoxins
  - With family history of cardiomyopathy

- **Goals**
  - Heart healthy lifestyle
  - Prevent vascular, coronary disease
  - Prevent LV structural abnormalities

- **Drugs**
  - ACEI or ARB in appropriate patients for vascular disease or DM
  - Statins as appropriate

### Heart Failure

- **Goals**
  - Improve HRQOL
  - Reduce hospital readmissions
  - Establish patient’s end-of-life goals
- **Options**
  - Advanced care measures
  - Heart transplant
  - Chronic inotropes
  - Temporary or permanent MCS
  - Experimental surgery or drugs
  - Palliative care and hospice
  - ICD deactivation
Overview of Guideline directed therapy

HFrEF Stage C
NYHA Class I – IV
Treatment:

Class I, LOE A
ACEI or ARB AND
Beta Blocker

For all volume overload, NYHA class II-IV patients
Add
Class I, LOE C
Loop Diuretics

For persistently symptomatic African Americans, NYHA class III-IV
Add
Class I, LOE A
Hydral-Nitrates

For NYHA class II-IV patients, provided estimated creatinine >30 mL/min and K+ <5.0 mEq/dL
Add
Class I, LOE A
Aldosterone Antagonist

Yancy et al.
2013 ACCF/AHA Heart Failure Guideline: Full Text