Examining the Role of Family Physicians in the Early Recognition and Management of Chronic Heart Failure

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Disclosure

Michael King, MD has no financial conflicts of interest to report related to this activity.
Learning Objectives

1. Implement evidence-based guidelines for early recognition and diagnosis of heart failure
2. Apply available heart failure therapy based on ACC/AHA guidelines and clinical efficacy and safety data
3. Identify strategies to improve multidisciplinary coordination of heart failure care and promote patient self-monitoring and management of disease symptoms
Initial Evaluation and Diagnosis of the Heart Failure Patient
## Heart Failure (HF) in America

### Health and Economic Burden
- >5 million Americans are diagnosed with HF
- Nearly 100 new patients are diagnosed every hour
- The US spends $21 billion every year on HF

### Hospitalizations
- 1 million hospitalizations each year
- #1 cause of hospitalizations for patients aged 65 years and older
- Hospitalizations account for 80% of all money spent on HF

### Death
- Risk of death is increased after a hospitalization for HF
- Up to 50% of patients die within 5 years of a diagnosis of HF
Natural History of Chronic and Acute Heart Failure

ADHF: acute decompensated heart failure; ER: emergency room.

Primary Care Physician Diagnosis

Team approach to care
- Establish diagnosis whenever possible prior to referring to a cardiologist
- Partner with a cardiologist to manage side effects and tolerability to medication

In-office diagnosis
- Identify signs and symptoms of HF

Better clinical outcomes
- **EARLY** diagnosis and treatment of HF is important for better clinical outcomes, including quality and length of life

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- Identify signs and symptoms of HF
Rich, Age 70 Years With a History of Hypertension

**Presents with** shortness of breath, coughing at night, edema in lower extremities

**Exam notes:** Euvolemic, BP 135/85 mmHg, heart rate 68 bpm

**Laboratory results:** Cr 1.5, K 4.6, NT-proBNP 1,050 pg/mL

**Current medications:** lisinopril 10 mg once daily, carvedilol 12.5 mg twice daily, spironolactone 25 mg once daily

- Would you evaluate this patient for heart failure?
- Is noninvasive imaging appropriate for initial evaluation of heart failure?
Rich, Age 70 Years With a History of Hypertension: Alternate Scenario

**Presents with** shortness of breath, coughing at night, edema in lower extremities

**Exam notes:** Euvolemic, BP 135/85 mmHg, heart rate 68 bpm

**Laboratory results:** Cr 1.5, K 4.6

**Current medications:** lisinopril 10 mg once daily

- Would you evaluate this patient for heart failure?
- Is noninvasive imaging appropriate for initial evaluation of heart failure?
## Definitions of HFrEF and HFpEF

<table>
<thead>
<tr>
<th>Classification</th>
<th>Ejection Fraction</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. HF with reduced ejection fraction (HFrEF)        | ≤40%              | • Also referred to as systolic HF  
• Randomized controlled trials have mainly enrolled patients with HFrEF                                                                 |
| 2. HF with preserved ejection fraction (HFpEF)      | ≥50%              | • Also referred to as diastolic HF  
• Several different criteria have been used to further define HFpEF  
• Diagnosis of HFpEF is challenging because it is largely one of excluding other potential noncardiac causes of symptoms suggestive of HF |
| a. HFpEF, borderline                                | 41%-49%           | • These patients fall into a borderline or intermediate group  
• Their characteristics, treatment patterns, and outcomes appear similar to those of patients with HFpEF                                      |
| b. HFpEF, improved                                 | >40%              | • It has been recognized that a subset of patients with HFpEF previously had HFrEF; these patients with improvement or recovery in EF may be clinically distinct from those with persistently preserved or reduced EF  
• Further research is needed to better characterize these patients |

EF: ejection fraction

## Classification of HF: ACCF/AHA Stages of HF

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>High risk for HF but without structural heart disease or symptoms of HF</td>
</tr>
<tr>
<td>B</td>
<td>Structural heart disease but without signs or symptoms of HF</td>
</tr>
<tr>
<td>C</td>
<td>Structural heart disease with prior or current symptoms of HF</td>
</tr>
<tr>
<td>D</td>
<td>Refractory HF requiring specialized interventions</td>
</tr>
</tbody>
</table>

ACCF: American College of Cardiology Foundation; AHA: American Heart Association.

## Classification of HF: NYHA Functional Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>No limitation of physical activity</td>
</tr>
</tbody>
</table>
| II    | Slight limitation of physical activity  
|       | Comfortable at rest  
|       | Ordinary physical activity results in symptoms of HF |
| III   | Marked limitation of physical activity  
|       | Comfortable at rest  
|       | Less-than-ordinary activity causes symptoms of HF |
| IV    | Unable to carry on any physical activity without symptoms of HF |

Initial Workup of Newly Diagnosed HF

In All Cases
- History, exam, electrocardiogram
- Echocardiogram
- Laboratory testing
- Assessment of functional capacity
- Assessment for CAD in patients at risk

In Selected Cases
- Cardiac catheterization
- Cardiac MRI
- Endomyocardial biopsy
- Genetic testing

CAD: coronary artery disease.
Diagnosing Heart Failure: Diagnostic Tests

- Serum BNP in the acute setting can help hone the diagnosis of HF
- Serum BNP serial monitoring has not been definitively found to be clinically useful in monitoring the stable patient

BNP: B-type natriuretic peptide.
Patients Presenting to ER With Dyspnea

Hx: history.
2017 Guidelines Biomarkers Indications for Use\textsuperscript{1,2}

ACC/AHA stage A/B HF

- At risk for HF
  - BNP or NT-proBNP (COR IIa)

ACC/AHA stage C/D HF

- Ambulatory pts w/new-onset dyspnea
  - BNP or NT-proBNP (COR I)

- NYHA class II-IV
  - BNP or NT-proBNP (COR I)

ACC/AHA acute/hospitalized HF

- Acute dyspnea to ER
  - BNP or NT-proBNP (COR I)

- Hospitalized for ADHF
  - BNP or NT-proBNP and cardiac troponin (COR I)

Prevention

- BNP or NT-proBNP (COR IIa)

Diagnosis

Prognosis or added risk stratification

- Other biomarkers of myocardial injury or fibrosis (COR IIb)

ACC: American College of Cardiology; ADHF: acute decompensated heart failure; COR: Class of Recommendation.

Common Electrocardiogram Findings

• Electrocardiogram findings of:
  – LV hypertrophy
  – Left bundle branch block
  – Intraventricular conduction delay
  – Non-specific ST-segment and T wave changes

• Q waves in contiguous leads strongly implicate a previous myocardial infarction and coronary artery disease as the cause

LV: left ventricular.
Rich, Age 70 Years With a History of Hypertension

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Current medications: lisinopril 10 mg once daily, carvedilol 12.5 mg twice daily, spironolactone 25 mg once daily

• Is noninvasive imaging appropriate for initial evaluation of heart failure?
Improving Heart Failure Management and Coordinating Care Throughout the Disease Continuum
Pathophysiology of HF with Reduced EF

Cardiomyopathy
Cardiac overload
Coronary disease

Left ventricular dysfunction

Vasoconstriction

↓ Peripheral organ blood flow
↓ Skeletal bloodflow
↓ RBF, Na retention

Neurohormonal activation

Cardiac remodeling

↓ LV dilatation
LV hypertrophy

Arrhythmias

Symptoms, fluid retention, death

Na: sodium; RBF: renal blood flow.
Neurohormonal Balance in HF with Reduced EF

↑ RAAS activation
• Angiotensin II
• Aldosterone
• Norepinephrine
• Vasopressin
• Endothelin

↓ Compensatory mediators
• Natriuretic peptides
• Nitric oxide
• Prostaglandins
• Bradykinin

Vasoconstriction
Fluid retention
Fibrosis
Hypertrophy

Vasodilation
Diuresis
Antifibrotic
Antihypertrophic

RAAS: renin angiotensin aldosterone system
Neprilysin as a Therapeutic Target

- Neprilysin is responsible for the breakdown of a number of endogenous vasoactive peptides, including the natriuretic peptides.
- Inhibition of neprilysin potentiates the action of those peptides.
- Because angiotensin II is also a substrate for neprilysin, neprilysin inhibitors must be coadministered with a RAAS blocker.
- The combination of a neprilysin inhibitor and an ACEI is associated with unacceptably high rates of angioedema.

ACEI: angiotensin-converting enzyme inhibitor.
PARADIGM-HF: CV Death or HF Hospitalization (Primary Endpoint) \(^1\)

PARADIGM-HF: Other Key Endpoints

Sacubitril/Valsartan: Greater Mortality Reduction Than with ACEI/ARB\textsuperscript{1,2}

ARB: angiotensin II receptor blocker


Estimated 1-2 year increase in life expectancy with sacubitril/valsartan over enalapril
PARADIGM-HF: Summary of Findings

- Sacubitril/valsartan was **more effective** than enalapril
  - Reducing the risk of CV death and HF hospitalization
  - Reducing the risk of CV death by **incremental** 20%
  - Reducing the risk of HF hospitalization by **incremental** 21%
  - Reducing all-cause mortality by **incremental** 16%
  - Incrementally improving symptoms and physical limitations
- Sacubitril/valsartan was **better tolerated** than enalapril
  - Less likely to cause cough, hyperkalemia, or renal impairment
  - Less likely to be discontinued because of an adverse event
  - More hypotension, but no increase in discontinuations
  - Not more likely to cause serious angioedema

In heart failure with reduced ejection fraction, when compared with recommended doses of enalapril

<table>
<thead>
<tr>
<th>Prospectively identified adverse events, % of patients</th>
<th>Sacubitril/Valsartan (n = 4,187)</th>
<th>Enalapril (n = 4,212)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic hypotension</td>
<td>14.0</td>
<td>9.2</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Serum potassium &gt;6.0 mmol/L</td>
<td>4.3</td>
<td>5.6</td>
<td>.007</td>
</tr>
<tr>
<td>Serum creatinine ≥2.5 mg/dL</td>
<td>3.3</td>
<td>4.5</td>
<td>.007</td>
</tr>
<tr>
<td>Cough</td>
<td>11.3</td>
<td>14.3</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Discontinuation for adverse event</td>
<td>10.7</td>
<td>12.2</td>
<td>.02</td>
</tr>
<tr>
<td>Discontinuation for hypotension</td>
<td>0.9</td>
<td>0.7</td>
<td>NS</td>
</tr>
<tr>
<td>Discontinuation for hyperkalemia</td>
<td>0.3</td>
<td>0.4</td>
<td>NS</td>
</tr>
<tr>
<td>Discontinuation for renal impairment</td>
<td>0.7</td>
<td>1.4</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Angioedema (adjudicated)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications; no hospitalization</td>
<td>0.2</td>
<td>0.2</td>
<td>NS</td>
</tr>
<tr>
<td>Hospitalized; no airway compromise</td>
<td>0.1</td>
<td>0.1</td>
<td>NS</td>
</tr>
<tr>
<td>Airway compromise</td>
<td>0</td>
<td>0</td>
<td>—</td>
</tr>
</tbody>
</table>

Influence of Sacubitril/Valsartan on 30-Day Readmission

In PARADIGM-HF, sacubitril/valsartan increased levels of BNP and decreased levels of NT-proBNP vs enalapril.

Improvement in QOL with Sacubitril/Valsartan: Secondary Analysis of the PARADIGM-HF Trial

KCCQ: Kansas City Cardiomyopathy Questionnaire.

## 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure\(^1\)

<table>
<thead>
<tr>
<th>COR</th>
<th>LOE</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>B-R</td>
<td>ACEI or ARB or ARNI in conjunction with β-blockers + MRA (where appropriate) is recommended for patients with chronic HFrEF to reduce morbidity and mortality.</td>
</tr>
<tr>
<td>I</td>
<td>B-R</td>
<td>In patients with chronic, symptomatic HFrEF NYHA class II or III who tolerate an ACEI or ARB, replacement by an ARNI is recommended to further reduce morbidity and mortality.</td>
</tr>
<tr>
<td>III</td>
<td>B-R</td>
<td>ARNI should NOT be administered concomitantly with ACEI or within 36 hours of last ACEI dose.</td>
</tr>
<tr>
<td>III</td>
<td>C-EO</td>
<td>ARNI should NOT be administered to patients with a history of angioedema.</td>
</tr>
</tbody>
</table>

### Sacubitril/Valsartan

- **Dosage:** Start with 49/51 mg twice daily. Double the dose after 2 to 4 weeks as tolerated to maintenance dose of 97/103 mg twice daily.
- **Switching from an ACEI:** Stop ACEI for 36 hours before starting treatment.

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**ARNI:** angiotensin receptor–neprilysin inhibitor; **B-R:** Level of Evidence B-Randomized; **C-EO:** Level of Evidence C-Expert Opinion; **HFSA:** Heart Failure Society of America; **LOE:** Level of Evidence; **MRA:** mineralocorticoid receptor antagonist.

The Funny Current (If) and Ivabradine

Impact of Heart Rate on Outcomes in HF

Overall CHARM Population Kaplan-Meier Survival Analysis by Baseline Heart Rate

Median Heart Rate (interquartile ranges)
- 85 (80-91)
- 72 (70-75)
- 60 (57-64)

Number at risk
- T1: 2,553, 2,478, 2,405, 2,323, 2,230, 2,073, 1,565, 663
- T2: 2,689, 2,582, 2,501, 2,412, 2,306, 2,109, 1,634, 686
- T3: 2,355, 2,239, 2,127, 2,019, 1,922, 1,755, 1,338, 585

Stratified by β Blocker Use at Baseline

P for interaction = .55

SHIFT Trial Primary Composite Endpoint: CV Death or Hospital Admission for Worsening HF

HR = 0.82 (95% CI, 0.75-0.90)

\[ P < .0001 \]

Ivabradine Treatment Discontinuation

<table>
<thead>
<tr>
<th></th>
<th>Patients with an Adverse Event Leading to Withdrawal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ivabradine, % (n = 3,232)</td>
</tr>
<tr>
<td>All adverse events</td>
<td>14</td>
</tr>
<tr>
<td>Symptomatic bradycardia</td>
<td>1</td>
</tr>
<tr>
<td>Asymptomatic bradycardia</td>
<td>1</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>4</td>
</tr>
<tr>
<td>Phosphenes</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>&lt;1</td>
</tr>
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2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure

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<th>Recommendations</th>
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<tbody>
<tr>
<td>IIa</td>
<td>B-R</td>
<td>Ivabradine can be beneficial to reduce HF hospitalization for patients with symptomatic (NYHA class II-III), stable, chronic HFrEF (LVEF ≤35%) who are receiving GDMT, including a β-blocker at maximally tolerated dose, and who are in sinus rhythm with a heart rate ≥70 bpm at rest</td>
</tr>
</tbody>
</table>

- Incremental benefits of ivabradine are more pronounced in patients with higher resting heart rates
- Magnitude of heart rate reduction achieved with ivabradine + β blockade is the principal determinant of subsequent outcome

GDMT: guideline-directed medical therapy; LVEF: left ventricular ejection fraction.
## Optimization of Ivabradine

- Starting dose is 5 mg twice daily
- Target heart rate is 50-60 bpm

<table>
<thead>
<tr>
<th>After 2 Weeks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate &gt;60 bpm</td>
<td>Increase dose to 7.5 mg twice daily (maximum dose)</td>
</tr>
<tr>
<td>Heart rate 50-60 bpm</td>
<td>Maintain initial dose</td>
</tr>
<tr>
<td>Heart rate &lt;50 bpm or symptomatic bradycardia</td>
<td>Lower dose to 2.5 mg twice daily</td>
</tr>
<tr>
<td>Heart rate &lt;50 bpm or symptomatic bradycardia and 2.5 mg twice-daily dose</td>
<td>Discontinue</td>
</tr>
</tbody>
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Rich, 70-Year-Old Man with HFrEF

Laboratory results: Cr 1.5, K 4.6, NT-proBNP 1,050 pg/mL

Current medications: lisinopril 10 mg once daily, carvedilol 12.5 mg twice daily, spironolactone 25 mg once daily

- Switch from lisinopril to sacubitril/valsartan
  - Stop ACEI for 36 hours before sacubitril/valsartan
- Start with sacubitril/valsartan 49/51 mg twice daily
- Double the dose after 2 to 4 weeks as tolerated to maintenance dose of 97/103 mg twice daily
Serial Elevation and Titration of Medications

<table>
<thead>
<tr>
<th>Intensification</th>
<th>Stabilization</th>
<th>End-intensification/maintenance</th>
<th>Assess response to therapy and cardiac remodeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4 months</td>
<td>~3 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1-4 week cycles)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Serial elevation and titration of medications**
- Clinic visit with history/symptoms, vitals, exams, labs
- If volume status requires treatment, adjust diuretics; follow-up 1-2 weeks
- If euvolemic and stable, start/increase/switch GDMT; follow-up 1-2 weeks via phone or repeat clinic visit with basic metabolic panel as may be indicated
- Repeat cycle until no further changes are possible or tolerated

**End-intensification/maintenance**
- Ongoing assessment
- Additional adjustments as indicated
- Repeat objective data as needed to re-establish prognosis

**Assess response to therapy and cardiac remodeling**
- Repeat laboratory tests (e.g., BNP/NT-proBNP and basic metabolic panel)
- Repeat echocardiogram (or similar imaging modality for cardiac structure and function)
- Repeat electrocardiogram
- Consider EP referral for those eligible for CRT or ICD

CRT: cardiac resynchronization therapy; ICD: implantable cardioverter-defibrillator.
Managing Lack of Response to HF Therapy/Instability\textsuperscript{1}

Remember this acronym to assist in decision-making for referral to advanced HF specialist

\textbf{I-NEED-HELP}

\begin{itemize}
\item \textbf{I} IV inotropes
\item \textbf{N} NYHA IIIB/IV or persistently elevated natriuretic peptides
\item \textbf{E} End-organ dysfunction
\item \textbf{E} Ejection fraction $\leq 35\%$
\item \textbf{D} Defibrillator shocks
\item \textbf{H} Hospitalizations $>1$
\item \textbf{E} Edema despite escalating diuretics
\item \textbf{L} Low blood pressure, high heart rate
\item \textbf{P} Prognostic medication—progressive intolerance or down-titration of GDMT
\end{itemize}

\textsuperscript{1} Yancy CW et al. \textit{J Am Coll Cardiol.} 2018;71:201-230.
## Triggers for HF Patient Referral to a Specialist/Program

1. New-onset HF (regardless of EF) for evaluation of etiology, guideline-directed evaluation and management of recommended therapies, and assistance in disease management

2. Chronic HF with high-risk features, such as development of 1 or more of the following risk factors

3. To assist with management of GDMT, including replacement of ACEI or ARB therapy with ARNI for eligible patients, or to address comorbid conditions such as chronic renal disease or hyperkalemia, which may complicate treatment

4. Persistently reduced LVEF <35% despite GDMT for >3 mo for consideration of device therapy in those patients without prior placement of ICD or CRT, unless device therapy contraindicated

5. Second opinion regarding etiology of HF

6. Annual review for patients with established advanced HF in which patients/caregivers and clinicians discuss current and potential therapies for both anticipated and unanticipated events, possible HF disease trajectory and prognosis, patient preferences, and advanced care planning

7. Assess the possibility of participation in a clinical trial

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# HFpEF: ACCF/AHA Guidelines

## Class I
- Control hypertension
- Chronotropic control
- Judicious use of diuretics

## Class II
- Revascularization
- Management of AF
- β-blockers, ACEI, ARBs for hypertension
- Consider ARBs to reduce hospitalization

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

AF: atrial fibrillation.
Rich, 70-Year-Old Man With HFrEF

Exam notes: Euvolemic, BP 135/85 mmHg, heart rate 68 bpm

Current medications: carvedilol 12.5 mg twice daily, spironolactone 25 mg once daily

Switched from lisinopril to sacubitril/valsartan

• Which methods should we use to encourage self-monitoring care, ensure adherence to treatment, and improve patient outcomes?
## Characteristics and Components of HF Management Programs

**HF management should employ a multidisciplinary approach**

- PCPs
- Cardiologists
- Nurses
- Pharmacists
- Physiotherapists
- Dieticians
- Social workers
- Surgeons
- Psychologists

<table>
<thead>
<tr>
<th>Components of HF Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimized medical and device management</td>
</tr>
<tr>
<td>Adequate patient education, with special emphasis on adherence and self-care</td>
</tr>
<tr>
<td>Patient involvement in symptom monitoring and flexible diuretic use</td>
</tr>
<tr>
<td>Follow-up after discharge (regular clinic and/or home-based visits; possibly telephone support or remote monitoring)</td>
</tr>
<tr>
<td>Increased access to healthcare (through in-person follow-up and by telephone contact; possibly through remote monitoring)</td>
</tr>
<tr>
<td>Facilitated access to care during episodes of decompensation</td>
</tr>
<tr>
<td>Assessment of (and appropriate intervention in response to) an unexplained change in weight, nutritional status, functional status, QOL, or laboratory findings</td>
</tr>
<tr>
<td>Access to advanced treatment options</td>
</tr>
<tr>
<td>Provision of psychosocial support to patients and family and/or caregivers</td>
</tr>
</tbody>
</table>

Multidisciplinary Framework to Optimize Health Outcomes in HF and Multimorbidity (ARISE-HF)

<table>
<thead>
<tr>
<th>A</th>
<th>Acknowledge multimorbidity as a clinical syndrome that is associated with poor health outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Routinely profile all patients hospitalized with HF to determine the extent of concurrent multimorbidity (using a standardized protocol, adapted to the local healthcare system)</td>
</tr>
<tr>
<td>I</td>
<td>Identify individualized priorities and person-centered goals based on the extent and nature of multimorbidity</td>
</tr>
<tr>
<td>S</td>
<td>Support individualized, home-based, multidisciplinary, case management to supplement standard HF management</td>
</tr>
<tr>
<td>E</td>
<td>Evaluate health outcomes well beyond acute hospitalization and encompass all-cause events</td>
</tr>
</tbody>
</table>
## Monitoring Patients with Heart Failure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requires Face-to-Face Encounter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms (PND, orthopnea, etc.)</td>
<td></td>
</tr>
<tr>
<td>Jugular venous pressure</td>
<td>✔</td>
</tr>
<tr>
<td>Hepatojugular reflex</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>✔</td>
</tr>
<tr>
<td>Rales</td>
<td>✔</td>
</tr>
<tr>
<td>Daily weight</td>
<td>✔</td>
</tr>
<tr>
<td>BNP</td>
<td></td>
</tr>
<tr>
<td>Intrathoracic impedance</td>
<td></td>
</tr>
<tr>
<td>Heart rate variability</td>
<td>✔</td>
</tr>
</tbody>
</table>

PND: paroxysmal nocturnal dyspnea.
Requirements for Self-Care

Adherence to Treatment
- Medications
- Diet
- Follow-up

Preventative Behaviors
- Exercise
- Weight loss
- Alcohol and smoking cessation
- Caution with nonprescription medications

Self-Monitoring
Other Self-Care Recommendations

• Fluid restriction (1.5-2.0 L/d) only for those with refractory symptoms and hyponatremia
• Moderation of alcohol intake
  – Abstinence recommended for those with alcoholic cardiomyopathy
• Smoking cessation
• Influenza/pneumonia vaccination
• Avoidance of NSAIDs, herbal medications
• Exercise
Adherence to Sodium Restriction Is Poor

Estimated Usual Intake of Sodium Among US Adults Aged ≥20 y (N = 12,581)¹

- 60% of patients (N = 2,331) discharged from hospital recalled dietary advice about sodium restriction
- 38% reported following the advice

EuroHeart Failure Survey²

IOM: Institute of Medicine.
Challenges in Adhering to a Low-Sodium Diet

- Lack of knowledge of sodium content of foods
- Inability to read food labels
- Reliance on prepared foods
- Multiple dietary restrictions
  - Two-thirds of patients trying to follow 2 or more diets
- Cost/availability of low-sodium alternatives
- Lack of culturally-relevant dietary guidance

A consultation with a nutritionist may help

The Role of the PCP in HF Care

You are the captain of the ship!

- Prevention
- Diagnosis
- Management of comorbidities
- Gatekeeper for referrals
- Advanced care planning
- Central role in care transition
Audience Q&A
Please remember to complete and submit your Post-Test and Evaluation for CME credit.

Missed anything?

Visit us at: www.peerview.com/HeartFailure

- Download slides and Practice Aids
- Watch the online version of this activity
- Join the conversation on Twitter @PeerView

Thank you and have a good day.