Improving Outcomes in Patients with Heart Failure: Closing the Gaps

Summary/Key Points

Introduction

- Scope of Heart Failure (HF)
  - 6.5 million Americans ≥20 years of age have HF
  - 960,000 new cases of HF diagnosed annually
  - 5-year survival rate for HF is ~50%

- Classification of HF
  - HF with reduced ejection fraction (HFrEF)
    - Also referred to as systolic HF
    - Typically enrolled in clinical trials for HF treatments
  - HF with preserved ejection fraction (HFpEF)
    - Also referred to as diastolic HF
    - Challenging diagnosis (exclusion)
    - No efficacious therapies have been identified to date

- HF Staging and Therapeutic Goals
  - Stage A: Patients at high risk for HF but without structural heart disease or symptoms of HF
    - Heart-healthy lifestyle
    - Prevent vascular and coronary disease
    - Prevent LV structural abnormalities
    - Improve survival
  - Stage B: Patients with structural heart disease but without signs or symptoms of HF
    - Prevent HF symptoms
    - Prevent further cardiac remodeling
    - Improve survival
  - Stage C: Patients with structural heart disease with prior or current symptoms of HF
    - Control symptoms
    - Patient education
    - Improve HRQOL
    - Prevent hospitalization/mortality
    - Improve survival
  - Stage D: Patients with refractory HF
    - Control symptoms
    - Improve HRQOL
    - Prevent hospital readmissions
    - Establish end-of-life goals
    - Improve survival
Hospitalized HF

- Acute HF Treatment Goals
  - Improve symptoms, especially congestion and low-output symptoms
  - Optimize volume status
  - Identify etiology
  - Identify precipitating factors
  - Optimize diuretic therapy; minimize side effects
  - Identify who might benefit from revascularization
  - Educate patients regarding medication and HF self-assessment
  - Consider enrollment in a disease management program

- ACCF/AHA 2013 Guidelines for Hospitalized (Acute) HF
  - IV diuretics for fluid overload
  - Continue guideline-directed medical therapy (GDMT) for HFREF patients
    - Except in cases of hemodynamic instability or where contraindicated
  - Initiate beta blockers (low-dose) following volume status optimization/IV discontinuation
    - Initiate at low dose in stable patients only
    - Use caution in patients who have required inotropes during their hospital course
  - Thromboembolism prophylaxis during stay
  - Inotropes in very select circumstances
  - When diuresis is inadequate:
    - Higher doses of IV loop diuretics, or
    - Add a second diuretic (eg, thiazide)
  - The following may be considered:
    - Low-dose dopamine infusion in addition to loop diuretic therapy to improve diuresis and better preserve renal function and renal blood flow
    - Ultrafiltration for patients with refractory congestion not responding to medical therapy
    - If symptomatic hypotension is absent, IV nitroglycerin, nitroprusside, or nesiritide as an adjuvant to diuretic therapy for relief of dyspnea
    - Vasopressin antagonists to improve serum sodium concentration in hypervolemic, hyponatremic states

- Hospital Readmission
  - 30-day hospital readmission is a quality of care measure
  - The median 30-day hospital readmission rate for HF patients between 2009 and 2012 was 23%
  - Predictors of rehospitalization/mortality (OPTIMIZE-HF Trial)
  - HF Rehospitalization Predicts Mortality

- Follow-Up Care
Utilize effective systems of care coordination with special attention to care transitions

Ensure each patient has a clear, detailed, and evidence-based plan of care
- Achievement of GDMT goals
- Effective management of comorbid conditions
- Timely follow-up with health care team
- Appropriate lifestyle interventions
- Compliance w/secondary prevention guidelines for CVD

Utilize palliative and supportive care in symptomatic advanced HF

### Management of Comorbidities

**Anemia**
- Independently associated with HF disease severity, reduced exercise capacity
- Consider IV iron replacement to improve functional status and QOL in patients with NYHA class II/III HF and iron deficiency
- Erythropoietin-stimulating agents should not be used (III: No Benefit)

**Sleep apnea**
- Consider sleep assessment in NYHA class II-IV HF and suspicion of sleep disordered breathing or excessive daytime sleepiness
- Consider CPAP
- In NYHA class II-IV HFrEF and central sleep apnea, adaptive servo-ventilation causes harm (III: Harm)

**Hypertension**
- Goal of <130/80 mmHg
- Titrate GDMT to attain goal in both HFrEF and HFpEF

### Individualizing Discharge/Transition Plans

- Discharge instructions
- Scheduling follow-up within 7-14 days post-discharge
- Communication between inpatient and outpatient team members
- Coordination of care among multidisciplinary and multispecialty providers (social workers, other specialty consultations, HF specialists, etc)

### Patient Education and Self-Care

- Patient education improves knowledge, self-monitoring, medication adherence, time to hospitalization, and days in the hospital
- Important teaching points:
  - How to monitor symptoms and weight fluctuations
  - How to restrict sodium intake
  - How to take medications as prescribed
    - Function and importance of medications
  - How to stay physically active
Chronic HF in Outpatient Setting

- Follow-Up Visits: Clinical Considerations
  - Is patient’s heart failure progressing?
    - Activity
    - Symptoms
    - Weight
  - Is patient compliant with diet and medications?
  - Is there anything else that can/should be done?

- Individualizing Chronic HF Management
  - Treat according to etiology
  - Sequence of therapy initiation may differ for each patient
  - Precision and targeted therapies are as important as GDMT
  - Toxicity and tolerance may differ for each patient
  - Adjust treatment based on patient preference
    - Shared decision making

- ACCF/AHA 2013/2017 Guidelines: Overview of GDMT
  - Stage A
    - ACEI or ARB in appropriate patients for vascular disease or diabetes
    - Statins as appropriate
  - Stage B
    - ACEI or ARB as appropriate
    - Beta blockers as appropriate
    - In select patients:
      - ICD
      - Revascularization or valvular surgery as appropriate
  - Stage C
    - HFpEF
      - Diuresis
      - Guideline-driven indications for comorbidities
    - HFrEF
      - Diuretics
      - ACEI or ARB
      - Beta blockers
      - Aldosterone antagonists
      - Ivabradine
      - Sacubitril/valsartan
    - In select patients:
      - Hydralazine/ isosorbide dinitrate
      - ACEI or ARB
      - Digitalis
      - CRT
ICD
- Revascularization or valvular surgery as appropriate

- Stage D
  - Advanced care measures
  - Heart transplant
  - Chronic inotropes
  - Temporary or permanent MCS
  - Experimental surgery or drugs
  - Palliative care and hospice
  - ICD deactivation

- ACEIs in Stage C HF
  - ACEIs reduce morbidity and mortality in HFrEF with mild, moderate, or severe symptoms of HF with or without CAD
  - No difference among available ACEIs
  - Start at low dose and titrate upward
    - If maximal doses are not tolerated, intermediate doses should be attempted
  - Abrupt withdrawal of ACEIs can lead to clinical deterioration and should be avoided
  - ACEIs may produce angioedema
    - Use caution in patients with low systolic BP, renal insufficiency, elevated serum potassium
  - ACEIs inhibit kininase and increase bradykinin
    - May induce cough

- Beta Blockers in Stage C HF
  - Beta blockers (bisoprolol, carvedilol, or metoprolol succinate sustained-release) recommended for all patients with current or prior symptoms of HFrEF, unless contraindicated, to reduce morbidity and mortality
    - Initiate as soon as HFrEF is diagnosed
      - Even when symptoms are mild or improve with other treatments
    - Beta blockers may be added to low-dose ACEI therapy
    - Prescribe with diuretics in patients with a current or recent history of fluid retention
    - May be considered in patients with reactive airway disease
      - Use with caution
  - Initiate at very low doses and increase gradually (with monitoring) to target dose
  - Watch for adverse events (AEs)
    - Fluid retention and worsening HF
      - Intensify conventional therapy
    - Fatigue
      - Consider/treat other causes
Bradycardia or heart block
  - Consider decreasing dose
Hypotension
  - Administer beta blocker and ACEI at different times during the day
  - Consider decreasing diuretic dose
  - Decrease dose or discontinue beta blocker upon evidence of hypoperfusion

- Mineralocorticoid Receptor Antagonists (MRAs) in Stage C HF
  - Indication:
    - NYHA class II-IV HF who have LVEF of ≤35%, unless contraindicated
    - Following acute MI in patients with LVEF ≤40% who develop HF symptoms or who have a history of diabetes mellitus
    - Creatinine should be:
      - ≤2.5 mg/dL in men
      - ≤2.0 mg/dL in women
    - Potassium should be <5.0 mEq/L
  - Monitor potassium, renal function, and diuretic dosing to minimize risk of hyperkalemia
    - Inappropriate use of MRAs is potentially harmful due to life-threatening hyperkalemia or renal insufficiency when serum creatinine is >2.5 mg/dL in men or >2.0 mg/dL in women

- Treatment of HF: What’s New?
  - Angiotensin receptor-neprilysin inhibitor (ARNI): Sacubitril/valsartan
    - Approved July 2015 for the treatment of HF
  - Sinoatrial node modulator: Ivabradine
    - Approved April 2015 to reduce hospitalization from worsening chronic HFrEF

Conclusions
- Acute assessment and management
  - Goals
    - Improve symptoms
    - Identify etiology/precipitating factors
    - Optimize volume status and chronic oral treatment
  - Look for factors associated with increased risk
    - ↑SCr, ↓BP, presence of biomarkers, etc
- Discharge and transition
  - Ensure adequate (and timely!) follow-up
  - Provide patient education
  - Utilize care coordination, multidisciplinary care, and shared decision making
- Chronic management
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- Utilize GDMT
- New 2017 recommendations include...
  - Ivabradine can be beneficial in symptomatic (NYHA class II-III) stable chronic HFrEF (LVEF ≤35%) patients who are receiving guideline-directed evaluation and management
  - Sacubitril/valsartan: ACEI, ARB, OR ARNI recommended in patients with HFrEF
- Avoid:
  - Calcium channel blockers (stage B)
  - ACEI + ARB + aldosterone antagonist (stage C)
  - ACEI + ARNI (stage C)
  - Chronic infusion of inotropes as an outpatient, except for palliation (stage D)
- Up-titrate slowly
- Monitor patients carefully
- Educate patients on potential AEs
- Manage comorbidities appropriately