Improving Heart Failure Outcomes

A Specialized Science

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Disclosures

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- Employee of American College of Cardiology Accreditation Services
Objectives

1. Understand the current state of heart failure (HF) as an increasing burden economically and its relation to process of care.
2. List outcomes related to improved patient care and their relevance to process.
4. Discuss transitions of care and processes to assist in success of outpatient services.
5. Summarize current barriers to providing guideline driven medical therapy and science implementation.
Heart Failure Realities

- Heart failure effects close to 7 million people annually
  - 870,000 new cases diagnosed annually
  - 50/50 HFrEF and HFpEF
- Attributes to over 6.5 million hospital days
  - >80% of HF inpatients >65 years old
  - Remains virtually unchanged over the years
- 7.2% of all CV deaths in the U.S. are attributed to HF
  - 11.6% mortality rate in first 30 days following hospitalization
- Yearly, over 700,000 ED visits for primary diagnosis of HF
  - >80% of ED patients are admitted
- Average 30-day all cause HF readmission rate is 21.9%
  - 61% within 0-15 days post discharge
Heart Failure Realities

- Average LOS 4.5 days = readmissions and mortality rates
- Lack of specialized management
- Underutilization of GDMT order sets
- Incomplete multidisciplinary involvement
- Increasing advanced therapy needs
  - Mechanical Circulatory Support
  - Heart Transplant
  - Palliative Medicine and Hospice
Advanced Therapy Needs

- Advancing and terminal nature of HF
- Yearly over 200,000 patients require advanced therapy of some kind
- 3,191 heart transplants performed in 2016 and an additional 2700 plus implanted mechanical circulatory support devices (LVAD, RVAD, BiVAD)
- 136 heart transplant centers and 185 mechanical circulatory support implanting centers across the U.S.
Within 5 years...

50% of our patients won’t be with us anymore
What is Heart Failure?

A Pathophysiology Review
A New Language

- **2013 ACCF/AHA Guidelines**
  - HFrEF and HFpEF introduced

- **Out with the old and in with the new**
  - No longer use the terminology CHF or Congestive in terms of defining HF
  - Update education for both patients and providers

<table>
<thead>
<tr>
<th>Classification</th>
<th>Ejection Fraction</th>
<th>Description</th>
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<tbody>
<tr>
<td>I. Heart Failure with Reduced Ejection Fraction (HFrEF)</td>
<td>≤40%</td>
<td>Also referred to as systolic HF. Randomized clinical trials have mainly enrolled patients with HFrEF and it is only in these patients that efficacious therapies have been demonstrated to date.</td>
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<tr>
<td>II. Heart Failure with Preserved Ejection Fraction (HFpEF)</td>
<td>≥50%</td>
<td>Also referred to as diastolic HF. Several different criteria have been used to further define HFpEF. The diagnosis of HFpEF is challenging because it is largely one of excluding other potential noncardiac causes of symptoms suggestive of HF. To date, efficacious therapies have not been identified.</td>
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<tr>
<td>a. HFpEF, Borderline</td>
<td>41% to 49%</td>
<td>These patients fall into a borderline or intermediate group. Their characteristics, treatment patterns, and outcomes appear similar to those of patient with HFpEF.</td>
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<tr>
<td>b. HFpEF, Improved</td>
<td>&gt;40%</td>
<td>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.</td>
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</table>
Cause of Heart Failure

• Hypertension
• Myocardial Infarction
• Valve disease
• Cardiomyopathies
  – viral, dilated, hypertrophy
• Diabetes
• Congenital heart disease
• Drug and ETOH abuse
• Post-partum Cardiomyopathy
• Immune Disorders
  – Amyloid, Sarcoid
Effect On Our Patients

- Dyspnea and orthopnea
- Fatigue
- Loss of appetite, nausea, vomiting
- Volume overload, edema
- Multi-system organ disease
- Need for advanced therapies
- Multiple hospital admissions
- Poor quality of life
Types of Heart Failure: HFrEF vs. HFpEF

NORMAL
Normal ejection (squeeze) = Systolic function
Normal relaxation (filling) = Diastolic function

SYSTOLIC HEART FAILURE
HFrEF
Weakened pump
Relaxation ± abnormal
→ Blood backs up and overloads the heart

DIASTOLIC HEART FAILURE
HFpEF
Normal ejection
Abnormal relaxation: Stiff or scarred
→ Won’t allow enough blood to fill the heart before it squeezes

Aorta
LA
LV
Dilated
Thickened or stiff heart walls

Pg 238, Lilly 3rd edition
Once stage is reached, cannot regress

Can improve, regress with treatment
Guideline Directed Medical Therapy

**STAGE A**
At high risk for HF but without structural heart disease or symptoms of HF
- e.g., Patients with:
  - HTN
  - Atherosclerotic disease
  - DM
  - Obesity
  - Metabolic syndrome or Patients
  - Using cardiotoxins
  - With family history of cardiomyopathy

**THERAPY**
- 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

**Development of symptoms of HF**
- e.g., Patients with:
  - Known structural heart disease and HF signs and symptoms

**STAGE B**
Structural heart disease but without signs or symptoms of HF
- e.g., Patients with:
  - Previous MI
  - LV remodeling including LVM and low EF
  - Asymptomatic valvular disease

**THERAPY**
- Goals
  - Control symptoms
  - Improve HRQOL
  - Prevent hospitalization
  - Prevent mortality
- Drugs for routine use
  - Diuretics for fluid retention
  - ACEI or ARB
  - Beta blockers
  - Aldosterone antagonists
- Drugs for use in selected patients
  - Hydralazine/isosorbide dinitrate
  - ACEI and ARB
  - Digoxin
- In selected patients
  - CRT
  - ICD
  - Revascularization or valvular surgery as appropriate

**STAGE C**
Structural heart disease with prior or current symptoms of HF
- e.g., Patients with:
  - Marked HF symptoms at rest
  - Recurrent hospitalizations despite GDMT

**THERAPY**
- Goals
  - Control symptoms
  - Patient education
  - Prevent hospitalization
  - 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

**STAGE D**
Refractory HF
- e.g., Patients with:
  - Known structural heart disease and HF signs and symptoms

**THERAPY**
- 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

**HFpEF**
- Diuretics to relieve symptoms of congestion
- Follow guideline driven indications for comorbidities, e.g., HTN, AF, CAD, DM

**HFREF**
- Revascularization or valvular surgery as appropriate

**HF**
- e.g., Patients with:
  - Previous MI
  - LV remodeling including LVM and low EF
  - Asymptomatic valvular disease

**HF**
Outcomes, Metrics and The Revolving Door
## Improvement Beyond 30 Day Readmissions

### Value Based Purchasing

<table>
<thead>
<tr>
<th>30 Day Readmissions</th>
<th>LOS</th>
<th>IP Mortality</th>
<th>Patient Experience</th>
<th>Process of Care Measures</th>
<th>Efficiency</th>
</tr>
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Additional Metrics For Consideration

• Daily process and patient level care
  – Door to provider and therapy
  – Daily assessment and functional capacity
  – Order set utilization
  – Referral to HF Specialist or Advanced Therapy
  – Inpatient LOS reviews
  – 30 Day readmission case reviews

• Pre-Hospital
  – NIPPV utilization
  – Intubation avoidance
  – Opportunities for improvement
The Vicious Cycle

1. Patient ignores or fails to recognize worsening HF symptoms

2. Office unable to meet needs of patient

3. Patient resorts to only alternative

4. Initiative to reduce LOS results in failure to fully treat volume overload

All HF Patients Presenting to ED

>80% admitted
THE REVOLVING DOOR

The Vicious Cycle

DISEASE PROGRESSION

Jain P et al. Am Heart J 2003

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Median survival (50% mortality) and 95% confidence limits in Patients with HF after each HF hospitalization.

Setoguchi et al
Directed Interventions

• Assess and evaluate to find breakdowns
• Large scope and high level metrics only tell part of the story
• Data utilization and feedback should be transparent
• Engage and empower staff to make positive change
Care Across The Continuum
Community

Outpatient Services

Pre-Hospital

Transitions

Emergency Department

Acute Care

Observation Services
Community

• Education
  – Both members and providers
  – Simple, appropriate, marketed

• Screenings
  – Blood pressure
  – Weight
  – HR
  – Depression
  – High Risk populations

• Collaboration
  – Primary Care
  – Post Acute Care providers
Pre-Hospital

- Emergency Medical Services
- Defined Protocols
  - Hyper vs. Hypotensive patient
  - Vasodilator, NIPPV utilization
- Communication
- Education
- Metric Sharing
  - Add HF metrics to already shared ACS metrics
- Paramedicine
  - These programs are becoming more and more common in practice and can be vitally important to improving community health and reducing readmissions
Emergency Department

• Defined pathways
  – Named order set
  – Should include but not limited to; ECG, Vitals, BMP, BNP, actual weight, functional capacity (NYHA), vasodilators, diuretics, response to therapy, CXR

• Early and aggressive management
  – Ex. Double home dose of diuretic
  – Timely management here can expedite LOS even if patient is admitted

• Time utilization

• Response to therapy
  – Diuretic and vasodilator responses
Observation Services

• Inclusion and exclusion criteria
  – Will be different for each facility
  – Dependent on services offered and resources available

• Risk stratification

• Defined protocols
  – Order set must look different than both ED and Inpatient
  – Limited consults and treatment of comorbidities
  – Still includes GDMT

• Response to therapy
  – More timely than Inpatient
  – Recommend q2 hour vitals, response to therapy and symptom assessment
Acute Care

• Order Sets
  – Guideline based, standardized, utilization
  – Provide as much guidance as possible
  – ACE, ARB, ARNi, BB, Spironolactone, Hydralazine, CRT

• Cohorting
  – Within one location whenever possible
  – By provider group

• Multidisciplinary approach

• Specialized management

• Palliative Care
  – Add structure, strengthen and increase involvement
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  - Prevent hospitalization  
  - Prevent mortality

- **Drugs**  
  - ACEI or ARB as appropriate  
  - Beta blockers as appropriate

- **Strategies**  
  - Identification of comorbidities

- **Treatment**  
  - Diuresis 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**  
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- **Drugs for routine use**  
  - Diuretics for fluid retention  
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- **Drugs for use in selected patients**  
  - Hydralazine/Isosorbide dinitrate  
  - ACEI and ARB  
  - Digoxin

- **In selected patients**  
  - CRT  
  - ICD  
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- **Options**  
  - Advanced care measures  
  - Heart transplant  
  - Chronic inotropes  
  - Temporary or permanent MCS  
  - Experimental surgery or drugs  
  - Palliative care and hospice  
  - ICD deactivation
Advanced Therapy

• Many more options for HFrEF population
  – Involve HF Transplant Cardiologist/Specialist
  – Transplant, LVAD

• Palliative Care

All patients who are not candidates for advanced therapy become a palliative care patient with a pure focus on symptom management
  – Inotrope
  – Hospice
“There’s no easy way I can tell you this, so I’m sending you to someone who can.”
Transitions

- Occurs minute one in every care setting
- Inclusion
  - Patient
  - Family
  - Providers
- Communication
- Education
  - Assess for cognition, learning and understanding
- Follow up care and planning
  - Scheduled within 7 days
  - High risk patients treated differently
Outpatient Services

- **Transition Clinic**
  - True transition clinic only used for post discharge follow-up
  - Typically run by specialized NP
  - Obtain buy in and “give patients back” to primary provider

- **HF Clinic**
  - Specialized HF clinic managed by HF NP and Cardiologist (HF Specialist)
  - Long term management, “own” the patient
  - Referrals for advanced therapy

- **Innovative Strategies**
  - Home diuretic protocols
  - IV Diuretic
  - Same day clinic
Strategies For Achieving Optimal GDMT

1. Up-titrate in small increments
2. More frequent visits, lab value monitoring during medication titration
3. Monitor vital signs closely
4. Alternate adjustments of different medication classes
5. Monitor renal function and electrolytes closely
6. Be aware of fatigue and weakness, this can be normal
7. Discourage sudden discontinuation of GDMT
8. Carefully review dosages of other medications
9. Consider temporary adjustments of GDMT in small increments
10. Educate patient, family members, providers
Struggles and Solutions
Problems in Healthcare Delivery

• Knowledge disparity
  – Major need for increased and improved provider education

• Specialization of services/providers
  – Recognizing need for specialized education for the non-cardiologist
  – Over 50% of inpatients are cared for by a non-cardiologist
  – Proven higher quality care from specialist

• Early evaluation and referral of patients needing advanced therapy
  – Annually over 250,000 people need a heart transplant or mechanical circulatory support device and only about 6,000 receive one or the other
  – Due to poor referral rates and untimely evaluation
  – Lack of standardized care and criteria for evaluation and referral
  – HF has the highest incidence of mortality among the cardiac diseases
Problems in Healthcare Delivery

• Palliative Care
  – No inclusion until end of life
  – Chronic terminal nature of illness
  – Lack of education
    • As to what PC is vs. hospice and what these services offer
  – Lack of resources
    • Many facilities do not have any PC resources or specialty team members
  – Recent call to action from ANA and HPNA for Palliative Care in all settings including; increased education in undergraduate nursing school, orientation for hospital staff, continued education
    (http://www.nursingworld.org/FunctionalMenuCategories/MediaResources/PressReleases/Call-for-Palliative-Care-in.html)
  – PAL-HF results add validity to use for improved outcomes
Problems in Healthcare Delivery

• Reimbursement
  – New code for increased billing with an HF Cardiologist, initiated 10/2/17
  – Lack of reimbursement and billing for transitional services typically given to HF population such as follow up phone calls, transition clinic visits with ANP
  – No beneficial RCT done to show benefit of transitional interventions thus no financial gain

• Cardiac rehabilitation for HFP EF Population
  – Currently only those patients with reduced ejection fraction (HFrEF) are eligible for cardiac rehab and even those patients it is extremely difficult criteria to meet
  – Most patients suffering from HFP EF (preserved ejection fraction) suffer from comorbidities that exacerbate or have even caused their HF, namely hypertension, obesity, diabetes
Solutions

- Education
- Science Implementation
- Standardization
- Specialization
- Awareness
- Team work
Please feel free to contact me at and follow me on Twitter for news and updates regarding HF and ACC Accreditation!

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Thank You!