Update on Heart Failure 2013

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I will discuss off label use and/or investigational use in my presentation:
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Pharma, Merck, Momentum Research, Myogen, NovaCardia,
Novartis, Protein Design Labs, Sanofi-Aventis, Scios/Johnson & Johnson, Trevena, Wyeth, Zealand Pharma, National
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Heart Failure 2013

• Who should treat heart failure patients?
• How should HF be diagnosed?
• What are the current guidelines for heart failure therapy and the evidence supporting them?
• What are the potential new CHF therapies?
Heart Failure 2013

- Who should treat heart failure patients?
- How should HF be diagnosed?
- What are the current guidelines for heart failure therapy and the evidence supporting them?
- What are the potential new CHF therapies?

Who Manages HF?

<table>
<thead>
<tr>
<th>IM</th>
<th>FP/GP</th>
<th>CARD</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>43%</td>
<td>29%</td>
<td>17%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Specialty Care in New Onset HF

Predictors of 2-year death or CV admission


<table>
<thead>
<tr>
<th>Variable</th>
<th>HR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low EF</td>
<td>1.92</td>
<td>1.27-2.89</td>
<td>.002</td>
</tr>
<tr>
<td>Cardiology care</td>
<td>0.62</td>
<td>0.42-0.93</td>
<td>.02</td>
</tr>
</tbody>
</table>

Non-significant variables in stepwise logistic regression model: age, sex, CAD, A Fib, DM, COPD, PAD

Heart Failure 2013

- Who should treat heart failure patients?
- How should HF be diagnosed?
  - Definition of Heart Failure
  - Symptoms and Physical Exam Findings
  - Biomarkers
  - Genetic Cardiomyopathies

UCSF
**Definition of Heart Failure**

- HF is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood.
- Because not all patients have volume overload at the time of initial or subsequent evaluation, the term “heart failure” is preferred over the older term “congestive heart failure.”

**Diagnosis of Heart Failure**

**Symptoms**
- Dyspnea (Exertional, PND, Orthopnea)
- Cough
- Fatigue
- Abd discomfort (bloating, anorexia)
- Sleep disturbances

**Physical Exam**
- Edema (Legs, Abd, Sacral)
- Rales, Effusion
- JVP, HJR/AJR
- Weight
- Cool extremities
- MR murmur
- S3 (S4)
- Blood/ pulse pressure
- Pulsus alternans

**The Role of BNP in the Diagnosis of HF**

**What is BNP?**

**Potential roles of diagnostic BNP**
- Screening
- Diagnosis
- Management
- Prognosis

**Types of diagnostic tests**
- BNP
- NT-proBNP

“First, strike for the jugular and let the rest go”

- Oliver Wendell Holmes, Jr.
BNP on Admission May Improve Morbidity in Patients Admitted with Dyspnea

NP-Guided Therapy in CHF: Effect on All-Cause Mortality

NP-Guided Therapy in CHF: Effect on Heart Failure-related Hospitalizations

Effect of BNP-guided therapy on Hospitalizations: Meta-Analysis
Potential Limitations to BNP in the Evaluation of AHF

T eerlink JR. Acute Heart Failure. Braunwald’s Heart Disease, 2008

TABLE 24-6
Conditions that Influence B-Type Natriuretic Peptide (BNP) Concentrations

Increased BNP concentrations may be found in:
- Age (>60yr)
- Sex (female)
- Ethnicity (black)
- Heart failure
- Myocardial Infarction
- Acute coronary syndromes
- Right-sided heart failure (cor pulmonale, acute pulmonary embolus)
- High output failure (endotoxemia, septic shock)

Decreased BNP concentrations may be found in:
- Obesity
- Early acute heart failure (less than 1 hr)
- Acute mitral regurgitation
- Mitral stenosis (in the absence of right ventricular failure)
- Stable NYHA Class I patients with decreased LV ejection fraction

Practical Diagnostics in the Evaluation of Heart Failure

- History
  - Etiology: CAD, HTN, Familial, Toxins (EtOH, drugs, chemo, alternative rx, etc.)
  - Symptoms, exercise tolerance (specific personal markers)
- Physical exam: Diagnosis and Monitoring
- Labs include Chem-7, HgbA1c, Ca, Mg, CBC, ferritin/TIBC, TSH, U/A, Lipid profile, LFT
- CXR, ECG
- Echocardiogram: probably single most useful; RVG/MUGA useful at some centers
- Cardiac catheterization: right and left heart
- Other: HIV, sleep disordered breathing, disease specific tests, BNP/NT-pro-BNP (diagnosis/risk stratification)

Heart Failure 2013

- Who should treat heart failure patients?
- How should HF be diagnosed?
- What are the current guidelines for heart failure therapy and the evidence supporting them?
Current Heart Failure Guidelines

  2013 guidelines IN PRESS!!!


- HFSA 2010 (updated on-line)

Clinical Classifications of Heart Failure Severity

Table 2: Clinical Classifications of Heart Failure Severity.

<table>
<thead>
<tr>
<th>NYHA Functional Classification</th>
<th>ACC-AHA Stages of Heart Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I No limitation of physical activity; ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea</td>
<td>Stage A At high risk for heart failure; no identified structural or functional abnormality; no signs or symptoms</td>
</tr>
<tr>
<td>Class II Slight limitation of physical activity; comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea</td>
<td>Stage B Developed structural heart disease that is strongly associated with the development of heart failure but without signs or symptoms</td>
</tr>
<tr>
<td>Class III Marked limitation of physical activity; comfortable at rest, but less than ordinary activity results in fatigue, palpitation, or dyspnea</td>
<td>Stage C Symptomatic heart failure associated with underlying structural heart disease</td>
</tr>
<tr>
<td>Class IV Unable to carry on any physical activity without discomfort; symptoms present at rest; if any physical activity is undertaken, discomfort is increased</td>
<td>Stage D Advanced structural heart disease and marked symptoms of heart failure at rest despite maximal medical therapy</td>
</tr>
</tbody>
</table>

* The American College of Cardiology (ACC)-American Heart Association (AHA) classification is from Hunt et al. The New York Heart Association (NYHA) functional classification is from the Criteria Committee of the New York Heart Association.

At Risk for Heart Failure

- Stage A: At high risk for HF but without structural heart disease or symptoms of HF.
  - Therapy Goals: Treat hypertension, encourage smoking cessation, treat lipid disorders, encourage regular exercise, discourage alcohol intake, illicit drug use, control metabolic syndrome, use ACE or ARB in appropriate patients for vascular disease or diabetes.

- Stage B: Structural heart disease but without current symptoms.
  - Therapy Goals: All measures under stage A, consider measures under stage A for heart failure, consider medications as deemed necessary.

Stage C: Structural heart disease with prior or current symptoms of HF.

- Therapy Goals: All measures under stages A and B, diuretics, restricted salt宜, targeted for fixed retention, consider ACE, use diuretics, consider use of selected patients.

Stage D: Refractory HF requiring specialized interventions.

- Therapy Goals: All measures under stages A, B, and C, consider more aggressive therapy for heart failure, consider medications as deemed necessary, consider other treatment options.

The image also includes a diagram showing the clinical classifications of heart failure severity, with Stage A being "When you’re a hammer, everything looks like a nail!" and the conclusion being "... and then I heard a loud bang and when I turned back he was gone!"
Risk Factor Modification in HF

- Weight loss
- Smoking cessation
- Hypertension therapies
- Diabetes management
- Lipid control
- Sleep apnea
- Exercise

Lifetime Risk of Heart Failure According to Number of Healthy Lifestyle Factors

- Physicians Health Study cohort (20,900 men)
- Six modifiable risk factors:
  - Maintained Body weight
  - No Smoking
  - Exercise
  - Less Alcohol intake
  - Eats breakfast cereals
  - Eats fruits and vegetables

Importance of Afterload Reduction

Effect of ACE Inhibitors on All-Cause Mortality in Stage A Patients


<table>
<thead>
<tr>
<th>Trial</th>
<th>ACEI</th>
<th>Controls</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAVE</td>
<td>20%</td>
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<td>AIRE</td>
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<td>SMILE</td>
<td>6.5%</td>
<td>8.3%</td>
<td>0.78 (0.52–1.12)</td>
</tr>
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</table>

Effect of ACE Inhibitors on Mortality in Patients With Post MI LV Dysfunction

Teerlink - Heart Failure 2010

**At Risk for Heart Failure**

- **Stage A**: At high risk for HF but without structural heart disease or symptoms of HF.
  - e.g.: Patients with hyperthyroidism, diabetes, CAD, metabolic syndrome, or atrial fibrillation.
- **Stage B**: Structural heart disease but without symptoms of HF.
  - e.g.: Patients with known structural heart disease and shortness of breath.
- **Stage C**: Structural heart disease with prior or current symptoms of HF.
  - e.g.: Patients with known structural heart disease and shortness of breath and fatigue, reduced exercise tolerance.

**Heart Failure**

- **Stage D**: HF with reduced ejection fraction (HFrEF)
- **Stage E**: HF with preserved ejection fraction (HFP EF)

**Therapy Goals**

- Treat hypertension
- Encourage smoking cessation
- Treat sleep disorders
- Encourage regular exercise
- Discourage alcohol intake
- Restrict diet
- Control metabolic syndrome

**Drugs**

- ACEI or ARB in appropriate patients
- Beta-blockers in appropriate patients (see text)
- Digitalis
- Hydralazine/nitrates

**Patients**

- Implantable defibrillators

**Enrollment Criteria:**

- LVEF ≤ 35%
- NYHA II-IV
- Optimal Rx x 6 wks

**Study Groups:**

- Usual Care
- Exercise: 36 supervised sessions in 3 mo
- Home-based with provided treadmill/ bike and HRM

**HF-ACTION: Time to Cardiovascular Mortality or Heart Failure Hospitalization**

Precipitants of HF: Medications

- Inappropriate medications
  - Non-Steroidal Anti-Inflammatory Drugs
  - Anti-arrhythmics (non-Amiodarone)

NSAIDs in Heart Failure

107,092 patients surviving first HF hospitalization in Denmark
Similar effect on HF Hospitalizations

Therapeutic Algorithm for Symptomatic Systolic Heart Failure (1)

Heart Failure Case (1)

- 50 yo man with non-ischemic CM, EF 12%, diabetes mellitus, chronic kidney disease (baseline Cr~1.8)
- 3-4 week h/o progressive wt gain (+25 lbs), resistant to increased oral diuretics
- Presents to OSH ER with massive edema, dyspnea, decreased urination, BP 132/76, HR 88, Cr 3.8, BNP 4200 (no comment on JVP)
**ARS #1**

Therapeutic interventions should include (choose single “best” answer):

1. Hold furosemide
2. Continue oral dose of furosemide
3. Initiate intravenous furosemide
4. Hold carvedilol

---

**Heart Failure Case (2)**

- Pt admitted to OSH:
  - Diuretics, lisinopril, carvedilol discontinued
  - Bedrest for 3 days (gained 1 kg; Cr 4.2)
  - Echo
  - Transferred to SFVAMC for refractory HF/RF

- At SFVAMC:
  - Exam: JVP to ear, massive edema
  - Furosemide 160 mg iv bolus, 10 mg/hr infusion
  - Lost 11 kg; Cr 4.2 → 2.1
  - Carvedilol reinitiated hosp day 2

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**Therapeutic Algorithm for Symptomatic Systolic Heart Failure (1)**


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**Pathophysiology of cardiorenal syndrome**

Prevalence of Worsening Renal Function during Hospitalization by Selected Hemodynamics


Use of Diuretics in Heart Failure Patients

- Self-titration: need “dry” weight on patient’s scale
  - Daily weights (routine; daily log with symptoms, etc.)
  - If weight increased by >3-5 lbs, take double diuretic
  - If patient requires supplemental potassium, also double
  - If worsening at any time or no improvement after 2-3 days, call
- Often increasing creatinine can be evidence of worsening heart failure, elevated CVP and need for more diuretics
- Diuretic resistance may be treated with switch to bumetanide/torsemide, or adding spironolactone or metolazone
- Many patients may not require diuretics when ACE inhibitor, beta blocker, aldosterone antagonist, etc. are optimized

Use of ACE Inhibitors in Heart Failure Patients

- Indicated in potentially ALL pts with HF and EF≤40%
- Some ACE Inhibitor is better than none
- Start low dose, up-titrate q2 wks or so; check labs within 1-2 weeks of dose adjustment, then about q4 months
- Asymptomatic low blood pressure: usually no change
- Symptomatic Hypotension: often improves with time (reassure); re-evaluate other meds (nitrates, diuretics, etc.)
- Cough: Other causes, rechallenge, consider ARB
- Worsening renal function: Smaller of an increase in creatinine up to 50% above baseline or 3 mg/dL or eGFR <25 ml/min/1.73m² is acceptable; K<5.5
- ARBs are probably INFERIOR to ACEi in CHF

Effect of ACE Inhibitors on Mortality Reduction in Patients With Heart Failure


<table>
<thead>
<tr>
<th>Trial</th>
<th>ACEI</th>
<th>Controls</th>
<th>RR (95% CI)</th>
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<tbody>
<tr>
<td>Chronic CHF</td>
<td></td>
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<tr>
<td>CONSENSUS I</td>
<td>39%</td>
<td>54%</td>
<td>0.56 (0.34–0.91)</td>
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<tr>
<td>SOLVD (Treatment)</td>
<td>35%</td>
<td>40%</td>
<td>0.82 (0.70–0.97)</td>
</tr>
<tr>
<td>SOLVD (Prevention)</td>
<td>15%</td>
<td>16%</td>
<td>0.92 (0.79–1.08)</td>
</tr>
<tr>
<td>Post MI</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Average</td>
<td>21%</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>
Use of Beta blockers in Heart Failure Patients

- Indicated in potentially ALL pts with HF and EF ≤ 40%
- Some beta blocker is better than none: Some beta blocker probably better than more ACE inhibitor
- Start low dose, up-titrate q2 wks or so; check labs within 1-2 weeks of dose adjustment, then about q4 months
- Severe asthma is a contraindication (NOT COPD)
- Asymptomatic low blood pressure: usually no change
- Symptomatic Hypotension: often improves with time (reassure); re-evaluate other meds (nitrates, diuretics, etc.)
- Worsening HF: Congestion, Increase diuretic; Fatigue, usually reassurance
- Low heart rate: if < 50 bpm, halve dose
- Other beta blocker side effects minimal in HF patients

Eplerenone Improves Survival in Patients with HF (EMPHASIS-HF)

2737 patients
NYHA II
LVEF ≤ 35%
Randomized to Eplerenone (≤ 50 mg qd) or Placebo

K+ > 5.5 in 11.8% Epl vs 7.2% Placebo (p < 0.001)
Use of Mineralocorticoid Receptor Antagonists (MRAs) in HF Patients

- Indicated in potentially ALL NYHA II-IV pts with HF and EF ≤ 35%
- Start low dose, up-titrate after q4-8 wks or so; check labs within 1 and 4, 8 and 12 weeks of dose adjustment, at 6, 9, 12 months, and then q4 months
- Avoid potassium repletion and K-containing salt substitutes
- Hyperkalemia: If K>5.5 or Cr ≥ 2.5 mg/dL, halve dose and f/u; if K>6.0 or Cr ≥ 3.5 mg/dL, d/c close and f/u. Consider rechallenge if reversible cause identified.
- Gynecomastia in males: change to eplerenone

Evidence-Based Pharmacologic Treatment of Heart Failure

Therapeutic Algorithm for Symptomatic Systolic Heart Failure (2)
SCD-HeFT: All-Cause Mortality

Enrollment Criteria
2,521 patients
Moderately symptomatic HF (NYHA II or III)
LVEF ≤35%
Study Groups:
Placebo
Amiodarone (200/300/400 qd)
ICD (VF only)

2009 ACC/AHA Guidelines: Patients With Reduced LV Ejection Fraction

Primary Prevention: Implantable Cardioverter-Defibrillator

ICD therapy is recommended for primary prevention of sudden cardiac death to reduce total mortality in patients with nonischemic dilated cardiomyopathy or ischemic heart disease at least 40 days post-myocardial infarction, have an LVEF less than or equal to 35%, with NYHA functional class II or III symptoms while receiving chronic optimal medical therapy, and who have reasonable expectation of survival with a good functional status for more than 1 year.

CARE-HF: Primary Endpoint

Enrollment Criteria
813 Patients
Symptomatic HF (NYHA III/IV)
LVEF ≤35%
LVEDD>30 mm
QRS>120 msec
Study Groups:
Medical therapy
CRT

CARE-HF: All-Cause Mortality


Percentage of Patients Free of Death from Any Cause Unplanned Hospitalization for HF

No. at Risk
Cardiac resynchronization
Medical therapy

<table>
<thead>
<tr>
<th></th>
<th>426</th>
<th>376</th>
<th>351</th>
<th>213</th>
<th>29</th>
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</thead>
<tbody>
<tr>
<td>Deaths</td>
<td>0</td>
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<td>5</td>
<td>12</td>
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P<0.001

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Cardiac resynchronization
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P<0.001
2009 ACC/AHA Guidelines: Patients With Reduced LV Ejection Fraction

Resynchronization Therapy

Patients with LVEF less than or equal to 35%, sinus rhythm, and NYHA functional class III or ambulatory class IV symptoms despite recommended, optimal medical therapy and who have cardiac dyssynchrony, which is currently defined as a QRS duration greater than or equal to 0.12 seconds, should receive cardiac resynchronization therapy, with or without an ICD, unless contraindicated.

MADIT-CRT: Kaplan-Meier Estimates of the Probability of Survival Free of Heart Failure

MADIT-CRT: Risk of Death or Heart Failure, According to Selected Sub-Groups

Cardiac Resynchronization Therapy in NYHA Class II Patients
Therapeutic Algorithm for Symptomatic Systolic Heart Failure (2)


CHARM-Added: Primary outcome
CV death or CHF hospitalisation

Effects of Digoxin on Survival

A-HeFT: All-Cause Mortality
**Management of Co-morbidities in Patients with Stage C HF**

- Hypertension
- Hyperlipidemia
- Obesity
- Coronary artery disease
- Peripheral vascular disease
- Diabetes mellitus
- Chronic obstructive pulmonary disease
- Sleep apnea
- Depression
- Atrial fibrillation

**Maintenance of Sinus Rhythm in Heart Failure: AF-CHF**

**Enrollment Criteria:**
- Age >18 years
- LVEF ≤ 35%
- Hosp with HF
- h/o HF NYHA II - IV
- h/o atrial fib episode >6h or with cardioversion

**Study Groups:** Unblinded
- Rhythm-control
- Rate-control

**HR= 1.06; 95% confidence interval, 0.86 to 1.30; P=0.59 by log-rank test**

**Maintenance of Sinus Rhythm in Heart Failure: AF-CHF**


**ANDROMEDA: Dronedarone in Chronic Heart Failure**

**Enrollment Criteria:**
- Age >18 years
- Hosp with HF Episode of dyspnea (NYHA III or IV)
- Wall motion index ≤ 1.2 (approx LVEF ≤ 35%)

**Study Groups:**
- Placebo
- Dronedarone (400 mg po bid)

**Trial stopped early for safety concerns**
- Only 617 patients of planned 1000 enrolled with median follow-up of only 2 months

HR = 2.13; 95% confidence interval [CI], 1.07 to 4.25; P = 0.03
Remote Patient Monitoring in Heart Failure Management: Parameters Monitored


Remote Patient Monitoring in Heart Failure Management: Effect on All-cause Mortality


Remote Patient Monitoring in Heart Failure Management: Effect on HF Hospitalizations


Remote Patient Monitoring in Heart Failure Management: Effect on All Hospitalizations

Multidisciplinary Approaches to HF Management


<table>
<thead>
<tr>
<th></th>
<th>All-Cause Mortality</th>
<th>HF Hospital</th>
<th>All Hospital</th>
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<tbody>
<tr>
<td>Multidisc F/U</td>
<td>0.75* (0.59-0.96)</td>
<td>0.74* (0.63-0.87)</td>
<td>0.81* (0.71-0.92)</td>
</tr>
<tr>
<td>Multidisc Self-care</td>
<td>1.14 (0.67-1.97)</td>
<td>0.66* (0.52-0.83)</td>
<td>0.73* (0.57-0.93)</td>
</tr>
<tr>
<td>Telephone &amp; 1st Care</td>
<td>0.91 (0.67-1.29)</td>
<td>0.75* (0.57-0.99)</td>
<td>0.98 (0.80-1.20)</td>
</tr>
</tbody>
</table>

Relative Risk (95% Confidence intervals)

An Approach to Management of Patient with Stage C Symptomatic HF-REF

• Control volume overload with diuretics
• Initiate ACE inhibitor therapy (2.5-5 mg lisinopril); substitute with ARB only if absolutely necessary
• Initiate Beta blocker therapy (prefer Carvedilol 3.125 or 6.25 mg po bid) and up-titrate to max
• Initiate spironolactone (switch to eplerenone if needed)
• Maximize ACE inhibitor
• If after stable therapy and meets criteria, ICD/CRT
• If still symptomatic, initiate digoxin (earlier if AF)
• If still symptomatic, consider ARB or ISDN/ Hydral

Heart Failure with Reduced EF

Only part of the problem...

Prevalence of Heart Failure with Preserved EF

Framingham (N=73) EF>50% 51
Olmstead (N=137) EF>50% 43
CHS Prevalence (N=269) EF>45% 78
CHS Incidence (N=597) EF>50% 57
NHF Project (N=6,700) EF>50% 35
Prognostic Importance of Diastolic Dysfunction


Mechanisms for Diastolic Dysfunction


Diagnosis of Diastolic Heart Failure/ HFPEF

- Confirm EF (assure test quality)
- Exclude non-cardiac causes (Hx, PE, chest Xray, labs to exclude pulmonary disease, anemia, deconditioning, various causes of edema)
- Echo to exclude valvular, pericardial, cardiomyopathic causes (HCM, restrictive CM), and to evaluate for substrate for DHF (LVH, LA enlargement)
- Stress test or angiography for selected patients
- Specific measurements of diastolic function not necessary and may be misleading
**Stage C:**
**Preserved EF with Symptoms**


**Recommended Therapies for Routine Use:**
- Treating known risk factor (hypertension) with therapy consistent with contemporary guidelines
- Ventricular rate control for all patients
- Drugs for all patients –
  - Diuretics
- Drugs for appropriate patients –
  - ACEI
  - ARBs
  - Beta-Blockers
  - Digitalis
- Coronary revascularization in selected patients
- Restoration/maintenance of sinus rhythm in appropriate patients

**Randomized Controlled Trials of Therapies for HF with Preserved EF**

- **CHARM-Preserved**  
- **PEP-CHF**  
  (Cleland JG, et al. Er Heart J 2006;27:2338-45.)
- **I-PRESERVE**  

**I-PRESERVE: Kaplan-Meier Curves for the Primary Outcome**


**Primary Outcome:**
Death from any cause
Hospitalization for:
- Worsening HF
- Myocardial infarction
- Stroke
- Atrial arrhythmia
- Ventricular arrhythmia

In-hospital:
- Myocardial infarction
- Stroke

**HR = 0.95 [0.86 to 1.05; p=0.35 by log –rank]**

**RAS Inhibition in Heart Failure with Preserved Ejection Fraction (HF-PEF)**


**Pooled effect on All-cause Mortality**

**Pooled effect on HF Hospitalization**
STICH Hypothesis 1: CABG vs Medical Therapy


- 1,212 pts EF ≤35%, CAD amenable to CABG
- Randomized to CABG vs Medical Rx
- Median f/u: 56 mo
- 17% of pts in MedRx group had CABG

STICH Hypothesis 1: CABG vs. Medical Therapy


Rare Complications of Heart Transplantation
Stage D Therapies: Refractory End-Stage Heart Failure

Recommended Therapies Include:
- Control of fluid retention
- Referral to a HF program for appropriate pts
- Discussion of options for end-of-life care
- Informing re: option to inactivate defibrillator
- Device use in appropriate patients
- Surgical therapy –
  - Cardiac transplantation
  - Mitral valve repair or replacement
  - Other
- Drug Therapy –
  - Positive inotrope infusion as palliation in appropriate patients

Continuous-flow Ventricular-Assist Device

Enrollment Criteria:
Transplant listed
Body Surface Area (BSA) > 1.2 m²
NYHA class IV HF sx
On inotropic support, if tolerated
Listing as Status 1A/1B

CHF Therapies

UCSF
Management of Systolic Heart Failure

- Stage A: High Risk
  - Rx risk factors, limit Na, limit alcohol, monitor weight, activity Rx

- Stage B: LV Dysfxn
  - Diuretics
  - ACE Inhibitors (ARB if intolerant or as additional therapy)
  - Beta-Blockers
  - Hypokalemia
  - Aldosterone Antagonists

- Stage C: Symptomatic HF
  - Nitrates/hydralazine
  - Digoxin (Low dose; Rate control or Sx)

- Stage D: End-Stage HF
  - IV inotropes; LVAD
  - Transplantation

Heart Failure 2013

- Who should treat heart failure patients?
- How should HF be diagnosed?
- What are the current guidelines for heart failure therapy and the evidence supporting them?
- What are the potential new CHF therapies?

New Treatments for HF

- Inhibitors of the RAAS system
  - Vasopeptidase inhibitors
  - Renin inhibitors
- I<sub>1</sub> channel blockers (ivabradine)
- Endothelin receptor antagonists
- Cytokine antagonists/Immune modulation
- Vasopressin antagonists, Diuretics and Aquaretics
- Sarcomere-based positive inotropic agents
- Myocardial metabolic modulators
- Hormone therapies
- Stem cell-based therapies

Thank you!