Preventing Heart Failure: Risk Factor Modifications

Maria Fe White, NP-BC, AACC, FHFS, CHFN
Lead Nurse Practitioner
Heart Failure Program
Comprehensive Transplant Center
Cedars-Sinai Medical Center

Disclosure: None

Objectives

- Discuss risk factors for heart failure
- Describe how risk factors such as diabetes, hypertension and obesity lead to heart failure
- Identify key strategies nurses can implement to modify risk factors to prevent heart failure

Heart Failure Incidence/Prevalence

- Estimated 6.5 million Americans >20 yrs of age had HF – (NHANES data 2011-2014)
- 960,000 new cases annually (ARIC 2005-2013 NHLBI data)
- Approaches 21 per 1000 population after 65 years of age (higher in AA <75 years of age)
- Projections show HF will increase by 46% in 2030 equals >8 million (>18 years of age)
- Survival from HF improved 1979-2000 (Olmstead)
- Death rate remains 50% in 5 years
- One in 8 deaths has HF on death certificate

Heart Failure Risks Overview

- **Lifetime risks for developing HF (ARIC)**
  - Age 45-95 years – 20%-45%
  - White males - 30%-42%; Black females - 24%-46%; White females - 32-39%; Black males – 20-29%
  - Risks higher with higher BP & BMI in all ages
- AA had the highest risk of developing HF, risk reflected by prevalence of HTN, DM, low socioeconomic status, not preceded by MI
- **Targets for prevention:**
  - Hypertension
  - Obesity
  - Systolic dysfunction

The 23 leading diagnoses for direct health expenditures, United States, average annual 2012 to 2013 (in billions $).
Percentage breakdown of deaths attributable to cardiovascular disease (United States: 2014)

- Coronary Heart Disease: 45.1%
- Other: 17.6%
- Diseases of the Arteries: 3.2%
- High Blood Pressure: 9.1%
- Heart Failure*: 8.1%
- Stroke: 16.5%

Hospital discharges for heart failure by sex (United States: 1980–2010)

Risks for HF & Modification Strategies

- Hypertension
- Diabetes Mellitus
- Obesity
  - Sleep disorders
- Other Risks
  - Elevated Cholesterol
  - Tobacco use
- Risk Modifications
- Implications for the HF Nurse
High Blood Pressure


Extent of awareness, treatment, and control of high blood pressure by age (NHANES 2007–2012)
Summary and Conclusions

- Examined effects of more intensive anti-HTN therapy than currently recommended
- 9361 US hypertensive adults ≥50 yrs & additional CVD risks (2% per yr = Framingham 20% per 10 yrs)
- Stopped early, due to benefit, median f/u - 3.26 years
- Primary outcome (composite of CVD events) 25% lower in Intensive (T<120 mmHg) compared to Standard Gr (T<140 mmHg & all-cause mortality ↓27%.
- The “NNT” to prevent primary outcome event or death 61 and 90, respectively

Wright JT et al, Systolic blood Pressure Intervention Trial, NEJM 2015

Systolic BP During Follow-Up

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Average SBP (During Intensive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Mean SBP 136.2 mm Hg</td>
</tr>
<tr>
<td>Intensive</td>
<td>Mean SBP 121.4 mm Hg</td>
</tr>
</tbody>
</table>

Guidelines: Hypertension

Treating Hypertension to Reduce the Incidence of HF

<table>
<thead>
<tr>
<th>COR</th>
<th>LOE</th>
<th>Recommendations</th>
<th>Comment/Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>B-R</td>
<td>In patients at increased risk, stage A HF, the optimal blood pressure in those with hypertension should be less than 130/80 mm Hg.</td>
<td>NEW: Recommendation reflects new RCT data.</td>
</tr>
</tbody>
</table>

Comments: Generally office setting BP typically 5-10 mm Hg higher than research measurements, thus the goal of <130/80 mm Hg is an approximation of the target blood pressure in conventional practice.
Diabetes Mellitus


Diabetes mellitus awareness, treatment, and control in adults ≥20 years of age (NHANES 2011–2014).

### Sleep Disorders

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>IIa</td>
<td>C-LD</td>
<td>In patients with NYHA class II–IV HF and suspicion of sleep disordered breathing or excessive daytime sleepiness, a formal sleep assessment is reasonable.</td>
<td><strong>NEW:</strong> Recommendation reflects clinical necessity to distinguish obstructive versus central sleep apnea.</td>
</tr>
<tr>
<td>IIb</td>
<td>B-R</td>
<td>In patients with cardiovascular disease and obstructive sleep apnea, CPAP may be reasonable to improve sleep quality and daytime sleepiness.</td>
<td><strong>NEW:</strong> New data demonstrate the limited scope of benefit expected from CPAP for obstructive sleep apnea.</td>
</tr>
<tr>
<td>III: Harm</td>
<td>B-R</td>
<td>In patients with NYHA class II–IV HF and central sleep apnea, adaptive servo-ventilation causes harm.</td>
<td><strong>NEW:</strong> New data demonstrate a signal of harm when adaptive servo-ventilation is used for central sleep apnea.</td>
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### Cholesterol Lowering


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**HF Risk Modifications**

Simple 7 – AHA & Metrics 2020 Campaign

- Smoking cessation
- Body Mass Index
- Physical Activity
- Healthy Diet
- Cholesterol
- Blood Pressure
- Diabetes

**Physically active >150 minutes/week**

**BMI 18.5 to < 25**

**Diet: Mediterranean, DASH, 5-6% saturated fat, reduce trans fat, < 2400 mg Na (BP)**

**Physical Activity: 3 to 4 sessions a week, lasting on average 40 mins/session of moderate-to-vigorous intensity physical activity**

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**Percentage of sodium from dietary sources in the United States, 2005 to 2006.**

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Percent distribution of meeting the 2008 Federal Physical Activity Guidelines for Americans among adults ≥18 years of age by poverty level and type of activity (NHIS: 2010).
CR Referral in Heart Failure: Proportion and Predictors at Hospital Discharge Findings From GTWG-HF Registry

Percentage of patients who were admitted to a hospital with heart failure who were referred for cardiac rehabilitation (CR) Depicted are positive and negative factors associated with CR referral at discharge that resulted in higher and lower likelihoods of CR referral, respectively.

doi:10.1016/j.jacc.2015.06.1089

Long-term trend in current cigarette smoking prevalence (%) for adults ≥18 years of age by sex (NHIS, 1965–2015, selected years).


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Prevalence (%) of current cigarette smoking for adults ≥18 years of age by sex and race/ethnicity (NHIS, 2013–2015).


Emelia J. Benjamin et al. Circulation. 2017;135:e146-e603. Copyright © American Heart Association, Inc. All rights reserved.
### Biomarkers Indications for Use (Stage A/B)

<table>
<thead>
<tr>
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<th>Recommendation for Prevention</th>
<th>Comment/ Rationale</th>
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</thead>
<tbody>
<tr>
<td>Ia</td>
<td>B-R</td>
<td>For patients at risk of developing HF, natriuretic peptide biomarker-based screening followed by team-based care, including a cardiovascular specialist optimizing GDMT, can be useful to prevent the development of left ventricular dysfunction (systolic or diastolic) or new-onset HF.</td>
<td><strong>NEW</strong>: New data suggest that natriuretic peptide biomarker screening and early intervention may prevent HF.</td>
</tr>
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</thead>
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<tr>
<td>I</td>
<td>A</td>
<td>In patients presenting with dyspnea, measurement of natriuretic peptide biomarkers is useful to support a diagnosis or exclusion of HF.</td>
<td><strong>ADDED</strong>: 2013 acute and chronic recommendations, combined into a diagnosis section</td>
</tr>
</tbody>
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*Other biomarkers of injury or fibrosis include soluble ST2 receptor, galectin-3, and high-sensitivity troponin.*

ACC indicates American College of Cardiology; AHA, American Heart Association; ADHF, acute decompensated heart failure; BNP, B-type natriuretic peptide; COR, Class of Recommendation; ED, emergency department; HF, heart failure; NT-proBNP, N-terminal pro-B-type natriuretic peptide; NYHA, New York Heart Association; and pts, patients.

NEW: New data suggest that natriuretic peptide biomarker screening and early intervention may prevent HF.
ASCVD Risk Assessment

- includes: age, total cholesterol, HDL, systolic BP, DM, smoking status
- Assess ASCVD scores every 4-6 years in 20-79 yrs old adults, free from ASCVD
- Assess 10-year ASCVD risk Q 4-6 years in 40-79 years of age, free from ASCVD
- Web-based Risk calculator:
  - http://myamericanheart.org/cvriskcalculator

Summary

- Assess Risk factors in patients at risk for developing Heart Failure
- Implement Guideline directed or Evidence driven care personalized to specific risks
- Engage patients to increase adherence to Healthy lifestyle – Simple 7
- Nurses play pivotal role in risk identification and modification in primary prevention of Heart Failure

Thank you

Mariafe.White@cshs.org
310-423-2077