A Practical Guide to Evaluating Women for Heart Disease

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Making healthcare remarkable
Epidemiology of Heart Disease in the USA

- More woman than men die every year of heart disease
- 52% of the US population is female
- 42 million women are living with heart disease
- In 2006, $403 Billion was spent as a result of heart disease
- 1 woman dies of a heart attack every 60 seconds!
- More than 200,000 women die each year from heart attacks
What is Cardiovascular Disease

- Any disease of the heart (cardio) and the blood vessels (vascular) constitute CVD Examples:
  
  - **Coronary Artery Disease (CAD)**
    - Blood flow to part of the heart is blocked causing injury or heart attack
  
  - **Arteriosclerosis**
    - Hardening of arteries causing high blood pressure
  
  - **Heart Failure**
    - Malfunction of the heart as a pump, leads to decreased nourishment and oxygenation of tissues
How is Cardiovascular Disease Presentation Different in Women

**Typical Heart Attack Warning Signs**

- Chest tightness, burning or squeezing of the chest
- Discomfort in one or both arms, shoulders, neck or jaw, stomach or back
- Shortness of breath
- Fatigue, nausea, cold sweats or weakness

**Less Typical Symptoms of Heart Disease in Women**

- Pain in upper back, neck or jaw
- Shortness of breath
- Flu-like symptoms nausea or vomiting, cold sweats
- Fatigue or weakness
- Feeling of anxiety, loss of appetite, insomnia
Risk Factors for Cardiovascular Disease (CVD)

• Cigarette Smoking
• Physical Inactivity
• Hypertension
• Dyslipidemia
• Diabetes
• Poor Diet
• Obesity, especially central adiposity
• Family History of premature CVD (< 65 years for women)
• Anyone with established CVD (heart, brain, aorta)
Mortality Rates in Women

At Every Age, More Women Die From Heart Disease Than From Cancer

50% of women (1 in 2) will die from CVD compared with 4% (1 in 25) who will die from breast cancer.
Leading Causes of Death by Race
United States: 2001

Black
- Total CVD: 40.1%
- Cancer: 20.8%
- Diabetes: 5.1%
- Nephritis: 2.9%
- Accident: 2.8%

Hispanic or Latino
- Total CVD: 32.6%
- Cancer: 21.1%
- Diabetes: 6.1%
- Accident: 4.2%
- Influenza/pneumonia: 2.8%

White
- Total CVD: 40.5%
- Cancer: 21.7%
- Chronic lower respo. disease: 5.5%
- Alzheimer’s: 3.3%
- Influenza/pneumonia: 2.9%

*Nephritis, nephrotic syndrome, and nephrosis.

Cardiovascular Disease: Race, Ethnicity and Socioeconomic Status

• Cardiovascular disease is an *Equal Opportunity Killer!*

• It kills women across all ages, all races and all ethnic groups with similar lethality

• Lower socioeconomic status and women of color tend to have higher mortality after a cardiovascular event
Heart Disease Affects More Women Than Men

• 23% of women and 18% of men will die within 1 year of first heart attack

• 35% of deaths in American women over the age of 20 (432,000) are due to cardiovascular causes

• 48% of adult women have a total cholesterol of at least 200 mg/dL

• 58% of Caucasian, 74% Hispanic and 80% of African American women are overweight or obese
Excess weight – high BP, diabetes, cholesterol, stroke1,2

Risk is greater if the weight is around the stomach instead of around the hips (“apple” versus “pear” shape)1

Overweight individuals at risk without other risk factors1

A minimal weight loss (5-10% of body weight) helps reduce risk of heart disease and control diabetes1
Smoking & Heart Disease

Smoking:

- Causes plaque to form in blood vessels
- May cause clots to form
- Reduces HDL ("good") cholesterol
- May cause irregular heart rhythms that could lead to cardiac arrest
- Increases blood pressure
- Puts women who smoke at a much higher risk of developing cardiovascular disease

Risk decreases after quitting
1/3 in 2 years
Equal to a non-smoker in 10-14 years
Steps to Control Blood Pressure

- Smoking cessation
- Increase physical activity
- Choose foods low in salt and sodium
- Limit alcohol intake
  - Women should have <1 drink/day
- Weight loss
- Medication compliance
Some “Pearls” of Knowledge

- If a patient has difficult to control BP and is on multiple medications for HTN, consider a sleep study for obstructive sleep apnea

- For overweight or obese patients, aldactone will often provide excellent reductions in systolic BP

- Don’t forget to remind your patients to eliminate ALL sodium intake
Benefits of Lowering Blood Pressure

- Reduces major CV events by 10% to 22%
- Larger BP reductions correlate with larger reductions in major CV events

Diabetes

• Is considered a risk comparable to someone who has had a CV event in the NCEP guidelines

• Requires a team approach- Internist, Dietician, Exercise Physiologist, Ophthalmologist, Podiatrist and Clinical Nurse-follow up for successful treatment

• Adequate BP control, lipid therapy, exercise and blood glucose management
High Cholesterol Is Bad News

- High levels of bad (LDL) cholesterol and triglycerides (TG’s) increase your risk of heart disease
  - Low levels of good (HDL) cholesterol are stronger predictors of heart disease mortality in women than men
Reynolds Risk Score

• Age

• Systolic BP

• Smoker

• Total Cholesterol

• HDL

• hsCRP

• Parent history of MI before age 60
Coronary Artery Calcium Score

- Coronary Artery Calcium score is predictive of future cardiac events
- Should be used in conjunction with other risk factor calculations
- A CAC > 300-400 has the highest predictive value of future MI
- NOT recognized by the ACC or AHA as a standardized test
- Radiation dose must be considered
So What Do I Want to Know to Prevent Future Cardiovascular Events in Women?

• Age
• Weight/BMI
• Waist size
• Comorbidities- HTN, DM, Dyslipidemia
• Family history- especially if a sibling
• hsCRP
• Vitamin D level
• Hormonal status- Pre/Post menopause
• Tobacco or Recreational Drug use
• Mental Status- Stress/Anxiety level, Depression
46 y/o Woman with Chest “Pain”

- Recurrent CP - occurs at rest and with exertion
- Going through a divorce
- Working fulltime in house keeping (40-60 hours per week)
- T2 DM (age 17), HTN, smoker, depression
- TAH & BSO (age 28 for endometriosis)
- FHx- positive for premature CAD in mother
- Meds- glimperide, pioglitazone, metformin, ramipril, chlorthalidone, amlodipine, asa, premarin (tapering)
- BMI 28.5, normal CV exam
- Normal ECG, Normal troponin, HgbA1C 6.4
- TC 175, TG 99, HDL 53, LDL 103
What would you do now?

- hs-CRP and nicotine dependence consult
- Exercise treadmill
- Exercise Echo
- Adenosine Spect Scan
- Coronary Angiogram
- 64 slice CT
- None of the above
Why All The Fuss?

Between 2000 and 2002 annual CAD death rate for women 35-54

*INCREASED by 1.5% per year*

J Amer Coll Card 2007; 50:2128-2132
Women and Chest Pain

• Atypical Chest discomfort is much more common in women

• Men are 2.7x more likely to have obstructive CAD

• BUT: There are 2-3x more coronary angios with non-obstructive CAD in women vs. men

• YET: Women with chronic persistent angina, and non-obstructive CAD have a worse prognosis
Algorithm for Evaluation of Symptomatic Women at Risk

[Diagram showing a flowchart for the evaluation of symptomatic women at risk for ischemic heart disease.]
Exercise Stress Echocardiogram

- Positive at 8.6 METS
- Anteroapical Ischemia
- ST depression in V leads
Markedly Abnormal Stress Echocardiograms & Gender Discordance for Angiographically significant CAD

From AM, J Am Soc Echocardiogr 2010;2:207-14
Coronary Angiography

- Mild Non-obstructive disease
- LM- normal
- LAD- 20-30% proximal
- LCx- 10-20% mid vessel
- RCA- large dominant diffuse 10%
- Normal LV size with EF of 60%
- FFR of LAD 0.92
46 yo female: Rx

- Aggressive risk factor reduction/lifestyle modification
  - Smoking cessation
  - Low fat/chol diet
- Metoprolol
- Amlodipine
- NTG
- L-Arginine
- Statin
WISE- Chest Pain and No/Nonobstructive CAD

Approximately 1/3 women have evidence of vascular dysfunction

Chest Pain Assessment in Women—New Concepts

Sex-Specific Precursors
PCOS
Hypoestrogenemia
Menopause

Hormonal Alterations
Coupled with:

Pro-Atherogenic Factors
Hypertlipidemia, HTN, Smoking, Metabolic Dysfunction, Inflammation

Nonobstructive Atheroma

Subendocardial or Epicardial Ischemia

Advanced Imaging Modalities
Intravascular Coronary Ultrasound (IVUS)
Coronary Artery Calcium (CAC)
Computed Tomography Angiography (CTA)

Magnetic Resonance Perfusion
Positron Emission Perfusion

Advanced Imaging Modalities
Coronary Reactivity Testing with QCA and Doppler Flow
Magnetic Resonance Angiography (MRA)
Transthoracic Doppler Coronary Flow

Vascular Dysfunction Symptoms
Atypical Symptoms, including:
- Prolonged Symptoms at Rest
- Shortness of Breath
- Unusual Fatigue
- More Frequent Pattern

Menopause—a Risk Factor Unique to Women

MI annual incidence/1,000

Baseline age (yr)

Framingham Data

Premenopausal
Postmenopausal

RR=41.7
P<0.001

50-54
45-49
40-44
HRT Timing and CAD
“early good – bad late” (Timing Hypothesis)

Ovariectomy

Primate studies*

Healthy diet  CEE + atherogenic diet  70%

Healthy diet  Atherogenic diet  CEE + healthy diet  0%

Human studies

Premenopause  Perimenopause  Postmenopause

70%

0%
WHI: Risk for MI by age

- CEE
- Placebo

Decade of life (years)
- 70-79
- 60-69
- 50-59

HR: 0.66, CI: 0.45-0.96
Conclusions: How do you prevent Heart Disease?

• Know your numbers: blood pressure, lipids, weight, waist size and blood sugar

• Get your numbers treated!

• Exercise every day for at least 40 minutes or 10,000 steps of walking

• Eat smaller portions of heart healthy foods- fruits, vegetables, lean meats

• Lower stress levels at home and work

• Allow yourself the chance to get a good night’s rest- 8 hours

***HRT in selected patients
On Line Sources for More Information

www.CardioSmart.org

www.AHA.org

www.WomanHeart.org
Forsyth Medical Center Women’s Heart Center

- Complete screening for women ages 18-98
- Will check BP, Weight, ABI, Fasting Blood Sugar, Fasting Lipid Profile
- Stress, Anxiety and Depression assessment
- Detailed family history
- Risk calculation with Reynold’s Risk Score
- Referral to Primary Care MD or Cardiologist
- Cost $25.00