Heart Disease Prevention and Management in Women

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Scripps Mercy Hospital
January 22, 2013
- Prevalence of CVD
- Prevention and Management of CVD
  - ACC/AHA guidelines for prevention of CVD in women 2011 update
  - Pregnancy related cardiac mortality
    - CMQCC/PAMR Report 2011
- Gender Differences
- Key points
Cardiovascular Disease

- Leading cause of death among women
  - > 500,000 women/yr
  - 6 X breast cancer
CVD is the Leading Cause of Death in Women

CVD Accounts for More Deaths Than the Next “7” Leading Causes of Death In Women!

Adapted from Thom T et al. Circulation 2006;113:e85–e151.

Cardiovascular disease in women

- CVD still causes more deaths in women than cancer, chronic lung disease, Alzheimer's, and trauma combined

Graph showing mortality rate per 100,000 people by age and cause of death. The graph indicates that 50% of women (1 in 2) will die from CVD compared with 4% (1 in 25) who will die from breast cancer.
All Age Groups ..........

- Young women
  - Cardiac risk factors
  - Metabolic syndrome
- Older women
  - Prevention & treatment
- Pregnant
  - Diagnosed/ undiagnosed cardiac disease
Maternal Mortality Rate, California and United States; 1991-2008


This project was supported by federal Title V block grant funds received from the California Department of Public Health; Center for Family Health; Maternal, Child and Adolescent Health Division
Maternal Mortality

❖ **African American Women**
  - 4 x likely to die (only 6% of all births)
  - Leading cause of death is cardiomyopathy

❖ **Hispanic Women**
  - Hispanic women have the largest number of pregnancy-related deaths (account for 51% of all births)
  - Preeclampsia/eclampsia leading clinical cause of death
Preventable Deaths

❖ Chance to alter outcomes
  ▪ 38% of all cases were found to have good or strong chance to alter the outcome
    • Health care professional factors (97%)
    • Facility factors (75%)
    • Patient factors (75%)
• Increased incidence of pregnancy-related deaths in California for 2002-2003

• Cardiac disease, especially cardiomyopathy, is the leading cause of pregnancy-related deaths in California
3 million women age 18-44 in the US have cardiac disease
~ 1-2% of pregnant women
PDAY study: US Adults 30-34 years of age

LAD Stenosis
(>40% dia. lesion)
19% of men
8% of women

Female: white
Male: black

Prevalence of Cardiovascular Diseases in Americans Age 20 and Older by Age and Sex

NHANES: 1999-2002

Source: CDC/NCHS and NHLBI. These data include coronary heart disease, congestive heart failure, stroke and hypertension.
PREVENTION AND MANAGEMENT OF CARDIOVASCULAR DISEASE
“I try to eat healthy. I never sprinkle salt on ice cream, I only eat decaffeinated pizza, and my beer is 100% fat free.”
Evaluation of CVD Risk

- **History**
  - Medical history
  - Family history
  - Pregnancy complication history

- **Symptoms of CVD**
- **Physical exam** - BP, BMI, waist size
- **Laboratory tests** - fasting lipids & glucose
- **Framingham risk assessment if no CVD or diabetes**

Prevention of CVD in Women - AHA Guidelines 2011 update
### Framingham Risk Score in Women

#### Age, years

<table>
<thead>
<tr>
<th>Points</th>
<th>20 to 34</th>
<th>35 to 39</th>
<th>40 to 44</th>
<th>45 to 49</th>
<th>50 to 54</th>
<th>55 to 59</th>
<th>60 to 64</th>
<th>65 to 69</th>
<th>70 to 74</th>
<th>75 to 79</th>
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<tr>
<td>-7</td>
<td>-5</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** These risk estimates for the development of coronary heart disease do not account for all important cardiovascular risk factors. Not included are diabetes mellitus (which is considered a CHD equivalent), family history of CHD, alcohol intake, and the serum C-reactive protein concentration.

#### Total cholesterol mg/dL (mmol/L)

<table>
<thead>
<tr>
<th>Age, years</th>
<th>&lt;150 (3.8)</th>
<th>150 to 199 (3.8 to 5.15)</th>
<th>200 to 239 (5.17 to 6.19)</th>
<th>240 to 275 (6.2 to 7.21)</th>
<th>≥280 (7.24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 39</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40 to 49</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>50 to 59</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>60 to 69</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>70 to 79</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Non-smoker

<table>
<thead>
<tr>
<th>Points</th>
<th>Age, years</th>
<th>Age, years</th>
<th>Age, years</th>
<th>Age, years</th>
<th>Age, years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20 to 39</td>
<td>40 to 49</td>
<td>50 to 59</td>
<td>60 to 69</td>
<td>70 to 79</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>20 to 39</td>
<td>40 to 49</td>
<td>50 to 59</td>
<td>60 to 69</td>
<td>70 to 79</td>
</tr>
</tbody>
</table>

#### HDL cholesterol mg/dL (mmol/L)

<table>
<thead>
<tr>
<th>Age, years</th>
<th>&lt;60 (1.55)</th>
<th>60 to 89 (1.29 to 1.53)</th>
<th>90 to 99 (1.03 to 1.27)</th>
<th>≥100 (1.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 39</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>40 to 49</td>
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<td>2</td>
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<td>2</td>
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<tr>
<td>50 to 59</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
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<tr>
<td>60 to 69</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>70 to 79</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

#### Systolic blood pressure, mmHg

<table>
<thead>
<tr>
<th>Age, years</th>
<th>Untreated</th>
<th>Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
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<td>0</td>
</tr>
<tr>
<td>120 to 129</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>130 to 139</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>140 to 159</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>≥160</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

### Point total

<table>
<thead>
<tr>
<th>Point total</th>
<th>10 year risk, percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;9</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>11</td>
<td>21</td>
</tr>
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<td>12</td>
<td>22</td>
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<td>13</td>
<td>24</td>
</tr>
<tr>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>17</td>
<td>28</td>
</tr>
</tbody>
</table>

*Adapted from Adult Treatment Panel III at http://www.nhlbi.nih.gov/ The point total is determined in each category and the 10 year risk determined in the bottom row.*
CVD Risk Factors

- Family History of premature CHD
  - male <55, female <65 years
- Diabetes
- Hypertension
- Dyslipidemia
- Smoking
- Obesity
- Physical inactivity
Additional CVD Risk Factors

- History of preeclampsia, gestational diabetes, or pregnancy induced hypertension
- Metabolic syndrome
- Systemic autoimmune collagen vascular diseases - lupus or rheumatoid arthritis

Prevention of CVD in Women - AHA Guidelines 2011 update
Risk Factors in Women >20 yrs

- High Blood Pressure 30-45%
- Abnormal Lipids 40-55%
- Overweight 60-75%
- High Glucose 5-25%
- Physical Inactivity 35-60%
- Tobacco Use ~20%
- Hypertension
- Diabetes
- Dyslipidemia
- Smoking
- Obesity/Inactivity
- Metabolic syndrome
Prevention of Cardiovascular Disease

**Lifestyle Interventions**

- Smoking cessation
- Physical activity - at least 150 min/wk
- Weight - <25 kg/m²
- Dietary intake - fruits and vegetables, fish twice a week, limit saturated fat
- Omega-3 fatty acids

Prevention of CVD in Women - AHA Guidelines 2011 update
Mediterranean Dietary Pattern

- Emphasis on plant foods
- Legumes
- Nuts and seeds
- Whole grains
- Fresh fruits as dessert
- Olive oil as the main source of dietary fat
- Cheese and yogurt as main dairy food
- Moderate amounts of fish and poultry
  - 2x/week: fish favored over poultry
  - Small amounts of red meat—few times a month
Vegan Diet

Vegan Food Pyramid

Omega-3 Fatty Acids
Vitamin D
Vitamin B-12

Calcium-Rich Foods
4-6 Servings

Protein-Rich Foods
Beans, Legumes, Alternatives
2-3 Servings

Vegetables
3-5 + Servings

Fruits
2-4 + Servings

Whole Grains, Cereals, Pastas: 6-11 Servings
Vegan Diet

- Emphasizes protein from plant sources
- No animal source, including dairy/eggs
- This diet maybe more effective for those with severe CAD (after multiple bypass surgeries, multiple stents)
## Classification of HTN 2003

**Joint National Commission VII**

### BP Classification vs SBP vs DBP vs Lifestyle Modification

<table>
<thead>
<tr>
<th>BP Classification</th>
<th>SBP</th>
<th>DBP</th>
<th>Lifestyle Modification</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
<td>Encourage</td>
<td>No meds</td>
</tr>
<tr>
<td>Pre-HTN</td>
<td>120-139</td>
<td>80-89</td>
<td>Yes</td>
<td>Thiazide diuretics</td>
</tr>
<tr>
<td>Stage I HTN</td>
<td>140-159</td>
<td>90-99</td>
<td>Yes</td>
<td>2 drug combination</td>
</tr>
<tr>
<td>Stage II HTN</td>
<td>≥160</td>
<td>≥100</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Increased CV Risk in Women
Starts at 120/80 mmHg
CV death, MI, Stroke, and HF Among 3,892 Women in the Framingham Cohort

- Adjusted Hazard Ratio = 2.5
- p < 0.001 across categories
- Continuous assoc b/t BP and CV risk!

Cumulative Incidence, %

Time, years

High Normal
130–139/84–89

Normal
120–129/80–84

Optimal
<120/<80

Hypertension in Women

- Who has it (BP > 140/90)?
  - 25% > age 18
  - 60% caucasian > age 45
  - 80% African American > age 45

- Equal treatment benefit M/ F
  - 25% reduction in CHD and CHF
  - 36% reduction in CVA
HTN – Major Independent Risk Factor for MI and Heart Failure

- BP >140/90 mm Hg associated with:
  - 69% of first MI
  - 91% of cases of HF
- Increased risk of HF
  - 3 X in females and 2 X in males
  - Increased risk of LVH in females vs. males

Adapted from Thom T et al. Circulation. 2006;113:e85–e151
- Hypertension
- Diabetes
- Dyslipidemia
- Smoking
- Obesity/Inactivity
- Metabolic syndrome
Diabetes

Confers greater CVD risk in women

3-7 x vs. 2-3 x risk of CV death in F vs. M

Risk MI:  19% F vs 4% M

2nd MI:  45% F vs 20% M

NEJM 1998 339; 229,  JAMA 1998 53; 96
Abnormal Lipids

- Half of all women > 55 yrs have TC > 240
  
  Low HDL and high TG are stronger predictors of CV death in women than in men

- Treatment benefit is equal M/F (statin Rx)
Smoking in Women

- Doubles the risk of CHD
- Increases the risk of sudden cardiac death
- Increases blood pressure and stroke risk
- More susceptible to lung cancer
33% of U.S. women >18 yrs of age are obese

Women who are ≥ 30 pounds overweight are more likely to develop CHD even if they have NO other risk factors

CVD risk is greater if the weight is around the waist than around the hips (“apple” vs. “pear”)
Hypertension Increases With Obesity in Women

Multivariate RR* for Hypertension (140/90) according to Weight Change

*Adjusted for age, BMI at age 18 years, height, family history of myocardial infarction, parity, oral contraceptive use, menopausal status, postmenopausal hormone use, and smoking.

Nurses Health Study data n=82,473

Obesity and Diabetes: Why Does It Matter?

<table>
<thead>
<tr>
<th>Body Mass Index (kg/m²)</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;22</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>&lt;23</td>
<td>2.9</td>
<td>1.0</td>
</tr>
<tr>
<td>23</td>
<td>4.3</td>
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<td>24</td>
<td>5.0</td>
<td>1.5</td>
</tr>
<tr>
<td>25</td>
<td>8.1</td>
<td>2.2</td>
</tr>
<tr>
<td>26</td>
<td>15.8</td>
<td>4.4</td>
</tr>
<tr>
<td>27</td>
<td>27.6</td>
<td>6.7</td>
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<tr>
<td>28</td>
<td>40.3</td>
<td>11.6</td>
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<td>29</td>
<td>54.0</td>
<td>21.3</td>
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<td>30</td>
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<td>42.1</td>
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<td>32</td>
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<td></td>
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<tr>
<td>35</td>
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</tr>
</tbody>
</table>

DM CV death risk:
- 3-7 x F vs. 2-3x in M
- Risk MI: 19%F vs. 4% M
- 2nd MI: 45% F vs. 20% M

60% of US adults lack a regular physical exercise routine
30% women have no leisure time activity
Risk Reduction for CHD Associated with Exercise in Women

- Physically Active Women can reduce CVD risk by nearly 50%

- Hypertension
- Diabetes
- Dyslipidemia
- Smoking
- Obesity/Inactivity
- Metabolic syndrome
# Metabolic Syndrome

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist circumference</td>
<td>&gt;35 inches (88 cm)</td>
<td>&gt;40 inches (102 cm)</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>≥150 or drug Rx</td>
<td>≥150 or drug Rx</td>
</tr>
<tr>
<td>HDL-cholesterol</td>
<td>&lt;50 or drug Rx</td>
<td>&lt;40 or drug Rx</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>≥130/85 or drug Rx</td>
<td>≥130/85 or drug Rx</td>
</tr>
<tr>
<td>Fasting plasma glucose</td>
<td>≥100 or drug Rx</td>
<td>≥100 or drug Rx</td>
</tr>
</tbody>
</table>

3 out of 5 = metabolic syndrome

National Cholesterol Education Program (NCEP) / Adult Treatment Panel (ATP) III Guidelines 2005
Metabolic Syndrome

- Risk increase:
  - Diabetes 10 X
  - Cardiovascular disease 2 X
  - Polycystic ovaries
  - Obstructive sleep apnea
  - Fatty liver disease
  - Gout / increased uric acid
  - Cognitive decline/ dementia

- Rx
  - Weight loss, diet, exercise
Prevention of Cardiovascular Disease

Major Risk Factor Interventions

❖ Blood pressure: optimal level & life style
  ▪ <120/80 mm Hg
  ▪ Weight, exercise, moderate alcohol, sodium restriction, fruits & vegetables, low fat dairy products

❖ Blood pressure: Pharmacotherapy
  ▪ BP >140/90 or >130/80 with DM or Chronic renal disease
  ▪ Thiazide diuretics in most
  ▪ Beta blockers and/ or ACE inhibitors/ ARBs in CAD

Prevention of CVD in Women - AHA Guidelines 2011 update
Prevention of Cardiovascular Disease

**Major Risk Factor Interventions**

- **Lipid and lipoprotein levels: optimal levels and lifestyle**
  - LDL-C <100
  - HDL-C >50
  - TG <150

- **Lipids: Pharmacotherapy for LDL-C**
  - > 60 years of age with increased risk and hs-CRP >2 mg/dl - consider statin therapy
  - HDL-C therapy if <50 mg/dl

Prevention of CVD in Women - AHA Guidelines 2011 update
Interventions

Class III - Not Effective / May Harm for primary or secondary prevention of CVD

- Hormone therapy or SERMs
- Antioxidant supplementation (vitamin B, C, beta carotene)
- Folic acid
- Aspirin for healthy women <65 years of age
Goals

- Total Cholesterol
  - < 200 mg/dL
- LDL
  - < 100 mg/dL
- HDL
  - < 50 mg/dl
- Triglycerides
  - < 150 mg/dl
Goals ....

❖ Blood pressure
  ▪ < 140/90, normal is 120/80

❖ Waist Circumference
  ▪ < 30 inches

❖ BMI
  ▪ < 25 kg/ m²

❖ CRP
  ▪ < 1 mg/ L
Ideal Cardiovascular Health

- Absence of clinical CVD
- BMI <25 kg/m²
- Blood pressure <120/80 mm Hg
- Total Cholesterol <200 mg/dl
- Fasting blood glucose <100 mg/dl
- Non-smoker
- Patricipation in physical activity
- Healthy diet - DASH

Prevention of CVD in Women - AHA Guidelines 2011 update
Interesting facts ...

- Heart attacks are caused by blockages that are less than 70%
- Cholesterol is not the only reason to have heart disease, inflammation plays a key role
Role of inflammation

- Key for an “event” to occur
- Need plaque (built up from high cholesterol, high blood pressure, smoking, high blood sugar)
- In order for the plaque to rupture you need inflammation
Measure of Inflammation

- Hs-CRP
  - Less than 1 mg normal
  - 2-3 mg moderate
  - >3 high
Higher CRP causes higher number of heart attacks

hsCRP concentration and risk of cardiovascular events: 2010

Emerging Risk Factor Collaborators, Lancet January 2010
Treating inflammation is important

- Large trial of statin therapy
- Women with normal cholesterol levels, but CRP levels higher than 1 mg/L, treating with a statin - decreased MI by ~50%

**JUPITER**

<table>
<thead>
<tr>
<th>LDL reduction, hsCRP reduction, or both?</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Placebo</td>
</tr>
<tr>
<td>LDL&lt;70mg/dL, hsCRP&lt;1 mg/L</td>
</tr>
<tr>
<td>LDL&lt;70mg/dL, hsCRP&lt;1 mg/L</td>
</tr>
<tr>
<td>LDL&lt;70mg/dL, hsCRP&lt;1 mg/L</td>
</tr>
<tr>
<td>LDL&lt;70mg/dL, hsCRP&lt;1 mg/L</td>
</tr>
</tbody>
</table>

*P < 0.001*

**Full Adjusted Hazard Ratio**

0.21, 95% CI 0.09-0.52, P < 0.0001
How do we treat inflammation

- Statins are not the only answer for treating inflammation
- Exercise
- Diet
Weight influences CRP levels

Risk of having high CRP increased 4-fold in obese vs overweight women

GENDER DIFFERENCES

How is heart disease different in women?
Biological Differences in Heart Disease

- Women get CVD ~10 yrs later
- Differences in risk factors
  - Women tend to have lower LDL cholesterol
  - Have lower HDL cholesterol
  - Higher Triglycerides
  - Increased relative risk from hypertension, diabetes, triglycerides

Canto et. al. JAMA 2012
Biological Differences in Heart Disease

Women can have different symptoms of MI

- Chest pain (58% vs. 70% in males)
- Shortness of breath, dizziness, nausea, sweating, shoulder or jaw pain

*Canto et. al. JAMA 2012*
Have we been looking at the wrong risk factors in women?

- Events in pregnancy (preeclampsia, diabetes) are important in determining your risk for heart disease
- Women have more elevated CRP and BNP than men when they come in with heart attacks
- Endothelial dysfunction higher in women than men
Have we been looking at wrong measures of atherosclerosis in women?

- Men usually present with significant major coronary artery stenoses
- Women get obstructive disease (70%)
  - Small vessel disease (microvascular disease) more likely
- Women lay down plaque differently
  - More diffuse disease
Small vessel disease

- Women's Ischemia Syndrome Evaluation (WISE) study
- Women with significant myocardial ischemia in the absence of obstructive disease
- Disease of the small branches.
- Women with symptoms, but angiogram doesn't show blockage
- We don't know the prevalence, but it certainly is more prevalent than we thought 10 years ago
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of breath</td>
<td>50%</td>
<td>35%</td>
</tr>
<tr>
<td>Arm/shoulder pain</td>
<td>38%</td>
<td>27%</td>
</tr>
<tr>
<td>Nausea</td>
<td>30</td>
<td>16%</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>Mid-back pain</td>
<td>13</td>
<td>2%</td>
</tr>
<tr>
<td>Palpitations</td>
<td>10</td>
<td>3%</td>
</tr>
</tbody>
</table>

Am J Cardiol 1999;84,396
Women do worse with heart disease

- Higher chance of death when admitted to the hospital with heart attack
- Higher risk of not obtaining procedures
- Higher risk of complications with procedures
- Younger women do worse than younger men
Cardiac Evaluation During Pregnancy

- Limitations of diagnostic tests:
  - Diagnostic yield
  - Potential risk to the fetus

- Interpretation of test results - account for physiologic changes
B-Type Natriuretic Peptide

- Neurohormone secreted from cardiac ventricles in response to ventricular volume expansion/pressure overload

Hameed. et. al. Clin Cardiol 2009
Troponins

- Cardiac Troponin I and T
- cTn I specific to the heart
- cTn T present in minor amount in skeletal muscle
- Cardiac troponins rise **2-3 hours** after the onset of AMI
- Persist for ~ **10 days** after AMI
Troponins - Pregnancy

- Minimal increase in pregnancy
  - Well below the threshold levels
- Increased levels seen in PIH
  - 0.155 ng/ml vs. 0.089 ng/ml*
- Increased with prolonged tocolytic therapy
  - 0.35 ug/l vs. 0.08 ug/l

Creatine Kinase

- Isoenzymes - dimers or M and B chains
  - MM, MB, BB

- Starts rising in 4-6 hours and returns to baseline 36-48 hours
Cardiac Markers of Ischemia in Pregnancy

- 51 healthy pregnant women in labor
- Troponin I, myoglobin, creatine kinase and CK MB were measured
- Four measurements
  - During labor
  - 30 minutes
  - 12 hours and
  - 24 hours after delivery

Cardiac Markers of Ischemia in Pregnancy

- Myoglobin and CK increase two fold @ 30 minutes after delivery
  - Peak at 24 hours
- Troponin remained undetectable

Key Points

- Cardiovascular disease is the leading cause of death among women
- Risk factors should be identified in women of all ages
- Awareness and education is needed to modify cardiovascular risk profile
Key Points

- Leading killer of women
  500,000/yr
- 1400 deaths/day; 1 death/minute
- Often fatal…if not on 1\textsuperscript{st} MI
  …38\% in next year
- 2/3 without previously recognized symptoms
Key Points

❖ Cardiac symptoms should be fully evaluated
  ▪ Pregnant & non-pregnant