Women & Heart Disease Prevention

Should we be doing anything new...

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• Disclosures

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“Coronary heart disease is also a woman’s disease, not a man’s disease in disguise.”

- Bernadine Healy MD 1991
- NIH funded Women’s Health Initiative
Women & Heart Disease

• “When it comes to treating women, medical professionals tend to focus on the bikini-defined areas, concentrating on the breasts and reproductive organs, while ignoring the rest of the woman.”

  • Nanette Wenger MD
Women & CV Disease - The Journey

- CV Mortality Gap - 1990 - 2000
- Bikini medicine?
- Identify/ Educate/ Advocate - closing the gap
- Risk Factors - Traditional & Emerging Risk factors
- CV Risk calculators and Women
- Future research
Cardiovascular Disease Mortality Trends for Males and Females (United States: 1979-2014)

First time since 1983 that fewer women than men died of CV disease.
Women & CV Disease - Perspectives

• **Present** - what have we learned?

  • Gender specific CV risks
    • **Pregnancy** - gestational hypertension, pre-eclampsia, pregnancy associated hypertension
    • **Vasculitis**
    • **Cardio Oncology** - Cancer needs a heart doctor
    • **Hypertension** through the ages
    • **DM and obesity**
Women & CV Disease:  The Magnitude and Impact

- Cardiovascular disease—especially ischemic heart disease and stroke—is the **leading cause of death in women**

- For women in the US, 1 in 3 will die from CV disease which is more than the numbers of women who die from all cancer related deaths.

- Cardiovascular disease prevention - 80% or more of CV disease is preventable, but it requires early intervention.

- Women present at an older age and are less likely to be diagnosed and treated....
**NHANES (2003-2006): 10-Year and Lifetime Risk for CVD**

- **Men**
  - Risk Strata:
    - Low 10-year/low lifetime
    - Low 10-year/high lifetime
    - High 10-year
  - Individuals (millions) by Age (years):
    - 20-29: 10
    - 30-39: 15
    - 40-49: 20
    - 50-59: 25
    - 60-79: 30

- **Women**
  - Risk Strata:
    - Low 10-year/low lifetime
    - Low 10-year/high lifetime
    - High 10-year
  - Individuals (millions) by Age (years):
    - 20-29: 5
    - 30-39: 10
    - 40-49: 15
    - 50-59: 20
    - 60-79: 25

- Many middle-aged women have low 10-year risk but high lifetime risk

\[ n=6329 \text{ nonpregnant NHANES participants (20-79 years of age) free of CVD representing 156 million US adults.} \]

Low risk (<10%), low lifetime (<39%), high 10-year (≥10%), high lifetime (≥39%).


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Cardiovascular Disease Mortality Trends for Males and Females (United States: 1979-2014)

First time since 1983 that fewer women than men died of CV disease.
In-hospital mortality after coronary angiography. Among patients with stable chest pain, white women with 1- to 3-vessel CAD had 1.67- to 2.02-fold higher in-hospital mortality than white men (P=0.013).

Women & Sudden Cardiac Death

- Sudden cardiac death before arrival at a hospital
  - Women 42%
  - Men 25%
Women & CV Disease

• Less than half of women who filled a statin Rx following MI received a high intensity statin.
  • Peters SAE, et al. JACC. 2018;doi:10.1016
Women & CV Disease

- Traditional Risk Factors -
  - Diabetes
  - Smoking
  - Hypertension
  - Lipids
  - Physical inactivity
  - Obesity
Women and Hypertension

Nanette K. Wenger et al. JACC 2018;71:1797-1813
Blood Pressure Patterns in the General Population (NHANES III)

Women and Hypertension - mortality

Deaths Attributable to Individual Risks (Thousands) in Women

- High Blood Pressure
- Smoking
- Physical Inactivity
- Overweight-Obesity (High BMI)
- High Blood Glucose
- High Dietary Sodium (Salt)
- High LDL Cholesterol
- Low Dietary Omega-3 Fatty Acids (Seafood)
- High Dietary Trans Fatty Acids
- Low Intake of Fruits and Vegetables
- Alcohol Use
- Low PUFA (In Place of SFA)

Cardiovascular | Cancer | Diabetes | Respiratory | Other NCDs | Injury

Nanette K. Wenger et al. JACC 2018;71:1797-1813
Women & CV Disease: Risk Factors

- **Diabetes mellitus** (type 1 or 2) confers as much as 40% greater risk in women than men
- **High triglyceride (TG) levels** (or TG/HDL ratio) is a stronger predictor of IHD risk in women than men
- **Smoking** imparts about 25% higher risk in women than men, independent of smoking intensity and other CV risk factors
- **Nondiagnosed hypertension** more common in women
- **Weight gain** and/or weight redistribution after menopause, which may increase rates of obesity and/or dyslipidemia
- Women have higher rates of **physical inactivity** than men
- **Depression**, interpersonal psychosocial stress, and lack of social relationships may be risk factors for incident and recurrent IHD in women
  - Depression is twice as common in women than men

Emerging Risk Factors for Women & CV Dx

- Elevated Lp(a) may improve risk identification in those at intermediate or high risk for developing CVD

- **Rheumatoid arthritis** and **systemic lupus erythematosus** associated with increased risk in several studies

- History of **preeclampsia** associated with 3-6-fold higher risk of developing hypertension and 3-4-fold higher risk of developing diabetes mellitus
  - Any pregnancy-induced hypertension also associated with increased risk

- **Gestational diabetes** associated with ongoing increased risk for diabetes
  - At least 50% increase in risk for CVD

Emerging Risk Factors for Women & CV Dx

- **Oral contraceptives**: CV risks unacceptably high in women who
  - Are smokers and >35 years of age
  - Have hypertension
  - Have a history of IHD

- **Polycystic ovary syndrome (PCOS)** associated with development of metabolic syndrome and insulin resistance

- Some evidence that **amenorrhea and irregular menstrual cycles** may be risk factors, but further research needed.

- **Breast Cancer**: Ionizing radiation dose-dependently increases risk of heart disease

- **Sleep apnea**: Under-recognized
  - Associated with 3.5–fold higher risk of dying from CVD

Women & CV Disease - Cardio Oncology

Figure 1. Number of deaths due to heart disease and cancer: United States, 1950–2014

NOTES: Leading cause is based on number of deaths. Access data table for Figure 1 at: http://www.cdc.gov/nchs/data/databriefs/db254_table.pdf#1.
Since the 1990s:
Mortality Down, Survivorship Up
In the United States...

Women & CV Disease

Cardio Oncology

• Shared risk factors:
  • Smoking
  • Obesity
  • Non prudent diet
  • Physical inactivity
Women & CV Disease

Cardio Oncology

- >50% of patients exposed to chemo will show some degree of cardiac dysfunction 10-20 years after chemotherapy
- 5% overt heart failure
- 40% arrhythmias
- 8 fold higher CV mortality when compared with the general population
Women & CV Disease Cardio Oncology

- Cancer survivors by site as of 2014
Women & CV Disease
Cardio Oncology
Women & CV Disease: Risk Factors & Clinical Implications

- Accurate risk assessment is challenging
- The ASCVD Risk Calculator is now the most widely accepted risk calculator
- Women have lower rates of treatment for dyslipidemia and hypertension, and are less likely to be treated to targets
- Cardiac rehabilitation: Women less likely to be referred, and have lower rates of completion
- Less than half of women who filled a statin Rx following MI received a high intensity statin.

“Healthcare providers tend to underestimate risk of IHD in women regardless of the tool used”

- McSweeney JC et al. Circulation 2016;133:1302-1331
Women & CV Disease: Risk Factors & Clinical Implications

- ASCVD Risk Calculator

- Does not include pregnancy associated hypertension, pre eclampsia, vasculitis, cancer treatments,

- Are our risk calculators trivializing CV risk in women?
Women & CV Disease - The Journey

- Gender specific medicine

- 2015 - Congress passed Research for All legislation mandating appropriate representation of women, elderly and minorities in federally funded studies.

- “To provide optimal care for women it has to be based on research studies conducted in women or basic science data using female cells, tissues or animals.”  
  
  Nanette Wenger MD
Women & CV Disease - The Journey

- “We are not there yet”....
- CV Research and representation
- Education
- Advocate
Beyond the bikini....
Women & Cardiovascular Disease