Heart Disease in Women:
The Real Heartbreak - Disparities in Women's Cardiovascular Health

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Dr. Bass earned her medical degree and completed a family and community medicine residency at Jefferson Medical College (now called Sidney Kimmel Medical College) in Philadelphia, Pennsylvania. She earned a master’s degree in stem cell and developmental biology from Wesleyan University in Middletown, Connecticut. In addition to her role at Drexel University College of Medicine, she provides family planning services at South Wind Women’s Center in Oklahoma City, Oklahoma. Her main interests are women’s health, care for gender nonconforming people, wellness, chronic pain, addiction, underserved care, and family planning.
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Dr. Lowell earned her medical degree and a Master’s in Public Health degree (MPH) from Nova Southeastern University (NSU) in Fort Lauderdale, Florida. During this time, she had unique opportunities to partner with youth shelters, free clinics, and health centers locally and internationally. She chose family medicine as her career path because she can morph into a listener, observer, teacher, advocate, and healer all in a day’s work! In 2017, she graduated from the Mount Sinai Downtown Residency in Urban Family Medicine in New York City, where she cared for diverse patient populations and chaired the residency’s Advocacy Committee and Community Service Committee. Currently, Dr. Lowell works full-time at a federally qualified health center (FQHC) and is a part-time provider with Planned Parenthood. She provides primary care services with a focus on care of patients living with HIV infection and hepatitis C infection. In 2018, she completed a fellowship through the Physicians for Reproductive Health Leadership Training Academy. She has served as the Florida Academy of Family Physicians Minority Delegate and currently serves as a member of the FAFP Government Relations Committee. She is passionate about addressing health care disparities, especially in medically underserved areas, reproductive health care, LGBTQ care, and global health.

Learning Objectives

1. Implement an evidence-based gender specific risk classification strategy into practice.
3. Identify barriers specific to the risk identification and prevention strategies for female patients.
4. Counsel female patients on the impact of cardiovascular disease in women with a focus on reduction of modifiable risk factors.
Poll Question #1

Which of the following statements is **accurate** per the AHA Scientific Statement on Acute Myocardial Infarction (AMI) in Women?

A. Nausea & vomiting are symptoms of AMI that are more common in women.

B. Women have more obstructive coronary artery disease than men.

C. Variation in clinical presentation does not explain the excess mortality risk in women following AMI.

D. Caucasian women have a higher risk for cardiovascular disease compared to non-Caucasian women.
Answer A was Right

- Women tend to present with **atypical** CVD signs & symptoms
- Women **less likely than men to have obstructive CAD**
- Variations in symptoms do play a role in **delaying care & treatment** which likely play a role in **women’s ↑ mortality risk**
- **Black women, Asian Indian, Hispanic women have ↑ risks of CVD** compared to Caucasian women

1 in 4
American women **die** of heart disease

CDC, NCHS. Underlying Cause of Death 1999-2013 on [CDC WONDER Online Database](https://wonder.cdc.gov), released 2015.
CVD Disparities

• Women **undertreated & underserved** when it comes to CVD

• CVD long associated as a “man’s disease”
  – **Men** tend to be **treated more aggressively & earlier**

• **More women than men die** from heart disease in U.S.
  – Women **present later & have more extensive disease**

CVD = Women's #1 Health Threat

• Between **age 45 - 64**:
  – 1 in 9 **women** develop some form of CVD
  – By age 55, **CVD deaths surpass breast cancer deaths**

• After **age 65+**:
  – Ratio of developing CVD climbs to **1 in 3 women**
Biopsychosocial Determinants

• CVD death rate **25% higher for Black Women** vs. Caucasian Women (in 2015)

• Black women have **higher prevalence of AMI & CVD** vs. Caucasian women (48% vs. 35%)

• Asian Indian women have **higher mortality rate after AMI**

• Hispanic women have **higher overall risk of AMI & stroke**

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**Why Such a Gap?**

• Lack of **awareness**

• **Unrecognized** signs, symptoms, & risk factors

• **Women underrepresented** in clinical trials
  – Generally make up only ~20% of enrolled patients

• **Underuse** of **sex-specific** screening, diagnostic testing, preventative measures & treatment options
Lack of Awareness

• Only 36% of Black women & 34% of Hispanic women knew CVD is their #1 cause of death
  – Vs. 65% of Caucasian women

• Only one third of women recall discussing CVD risks with their physician
  – < 25% of women can name HTN & HLD as CHD risk factors
  – ~90% of PCPs unaware that CHD kills more women vs men

We Don’t See the Signs

• Misperception by patients & physicians that women at inherently low risk for developing heart disease

• Women not referred as often for appropriate diagnostic or therapeutic procedures vs. men

• Women more likely to be misdiagnosed or sent home
  – GI vs. Anxiety
Diagnostic Challenges in Women

- **Smaller coronary arteries & thinner heart walls**
  - Angiography, angioplasty, & CABG more difficult
  - Reduces chances of proper diagnosis & good outcomes

- **Exercise stress test has lower accuracy in women**
  - Due to **older age at presentation**
  - ↑ frequency of **co-morbidities** & ↓ **exercise capacity**

We Aren’t as Good at Treating Them

- **Lower** utilization rates of coronary angiography & revascularization

- **Less likely to prescribe** ASA, ACEi/ARB, β-blockers, & statin in women post-MI, especially **minority women**

- **Less likely to be referred** to Cardiac Rehab
CVD Outcomes Worse in Women

• Women with (+) exercise test more likely to have no further cardiac evaluation vs. men (62% vs. 38%)

• After STEMI, women have higher rate of cardiogenic shock & higher in-hospital mortality

• Women less likely to adhere to prescribed cardiac rehab
  – Due to patient-level barriers ie, family responsibilities

Barriers to Care

• Women still more likely to be primary caretakers leading to:
  • ↑ Stress
  • ↑ Sleep deprivation
  • ↑ Fatigue
  • ↑ Lack of personal time
  • ↑ Unhealthy eating habits
  • ↑ Sedentary lifestyle
### CVD Risk Factors in Women

#### Unmodifiable

* 1. Family Hx CHD
* 2. Hx Pre-eclampsia
* 3. Gestational DM
* 4. Endometriosis
* 5. PCOS
* 6. Age 55+
* 7. Post-menopause

#### Partially Modifiable

1. HTN*
2. HCHOL
3. DM*
4. High Stress*
5. Chronic Conditions
6. OSA

#### Modifiable

1. BMI 26+*
2. Smoking*
3. Sedentary Lifestyle
4. Unhealthy Diet

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*Cardiovascular Disease in Women, Volume: 118, Issue: 8, Pages: 1273-1293, DOI: (10.1161/CIRCRESAHA.116.307547)
Women May Have CVD Risk Factors that Men Don’t

- Oral contraceptive or HRT use
- PCOS; endometriosis; early menarche
- Pregnancy & its complications
  - Gestational HTN/DM, pre-eclampsia
- Post-menopausal status; prior hysterectomy

Mechanisms of CVD in Women

- Abnormal coronary reactivity, microvascular dysfunction, plaque erosion, distal microembolization
- Differences in hormones
  - Post-menopause → ↑ total cholesterol, ↑ BP
- Differences in management of psychosocial stress
- Autonomic influences
- Certain autoimmune diseases
CVD Can Be “Silent Killer”

**Women**
- Chest pressure/tightness
- Nausea/Vomiting
- Fatigue
- Dizziness
- Abdominal pain
- No symptoms

**More likely to be triggered by mental stress, non-exertional**

**Men**
- Squeezing chest pain
- Angina
- Cold sweats

**More likely to be triggered by physical exertion**

Poll Question #2

Which screening measure has the most impact on assessing women’s CVD risk?

A. Screening EKG in asymptomatic women
B. CVD Risk Calculator ie, Framingham risk score
C. High sensitivity C-reactive protein (hs-CRP) blood test
D. CT-derived coronary artery calcium (CAC) score
E. The History and Physical
### Cardiovascular Disease Risk: Screening With Electrocardiography

**Release Date:** June 2018

**Recommendation Summary**

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
<th>Grade (What’s This?)</th>
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<tbody>
<tr>
<td>Adults at low risk of CVD events</td>
<td>The USPSTF recommends against screening with resting or exercise electrocardiography (ECG) to prevent cardiovascular disease (CVD) events in asymptomatic adults at low risk of CVD events.</td>
<td>D</td>
</tr>
<tr>
<td>Adults at intermediate or high risk of CVD events</td>
<td>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening with resting or exercise ECG to prevent CVD events in asymptomatic adults at intermediate or high risk of CVD events. See the Clinical Considerations section for suggestions for practice regarding the I statement.</td>
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### Cardiovascular Disease: Risk Assessment With Nontraditional Risk Factors

**Release Date:** July 2018

**Recommendation Summary**

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<tr>
<td>Adults</td>
<td>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of adding the ankle-brachial index (ABI), high-sensitivity C-reactive protein (hsCRP) level, or coronary artery calcium (CAC) score to traditional risk assessment for cardiovascular disease (CVD) in asymptomatic adults to prevent CVD events. See the Clinical Considerations section for suggestions for practice regarding the I statement.</td>
<td>I</td>
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CVD Screening in Women

- Assessment of **CVD risk** is foundation of primary prevention

- Risk assessment must be **sex-specific**
  - Risk factors & their relative importance differ between women & men

- **Hormonal status, diabetes, smoking, & family hx of premature CHD** appear to be more important in women

CVD Risk Assessment

1. **History**: PMHx, FHx, SHx, & **Pregnancy Complication** Hx
2. **Symptoms** of CVD
3. **Depression screening** in women with CVD
4. **Physical Exam**: including BP, BMI, **waist size**
5. **Lab tests**: including fasting lipoproteins, glucose
6. CVD Risk Assessment **Calculator**
Patient Case

- RG is a 65 y.o. Black woman establishing care with you.
- **Hx:** Currently lives with her female partner & their dog. Denies ever smoking & does Qi Gong 5 days a week. No FHx of CHD.
- **Medication:** Alendronate for osteoporosis.
- **You ask her if she has had any pregnancy complications?**
  - She had 3 spontaneous vaginal deliveries (SVD).
  - Last delivery induced at 39 weeks for pre-eclampsia.

Poll Question #3

What history detail most increases her CVD risk?

A. Qi gong practice
B. Hx of pre-eclampsia
C. Sexual Orientation
D. Osteoporosis status
E. Having more than 2 pregnancies
Current CVD Prediction Models

• ID pts more likely to develop CVD within defined period
• Based on Framingham CHD Risk Score
  – Study conducted in mostly Caucasian male patients
• Do NOT:
  – Consider lifetime risk
  – Include FHx premature CHD or reproductive factors
  – Include race, socioeconomic status, geographic info

2019 ACC/AHA Guideline on Primary Prevention of CVD

• Suggests race- & sex-specific Pooled Cohort Equation (PCE) (ASCVD Risk Estimator Plus) to estimate 10-year ASCVD risk for asymptomatic adults aged 40-79 years
  – Low Risk (<5%)
  – Borderline (5 to <7.5%)
  – Intermediate (≥7.5 to <20%)
  – High (≥20%)
Back to RG’s Case...

- Recall: 65 y.o., Black female, non-smoker, no FHx premature CHD, (+) hx of pre-eclampsia.
- Her PHQ-2 score is 0. BP is 120/80. BMI is 26.
- Her ROS and physical examination is normal.
- Labs reveal: Total cholesterol of 200 mg/dL, HDL 40 mg/dL, LDL 100 mg/dL, and triglycerides of 145 mg/dL. A1C of 5.6%.
Take out your phones & Calculate her CVD risk

Think about recommendations you would discuss in regards to her CVD health...

Poll Question #4

What recommendation would you make to RG?
A. Refer for cardiac rehab program
B. Start aspirin 81 mg
C. Consider statin therapy
D. Supplement vitamin E
E. Start hormone replacement therapy
Answer C was Right

- **Use Your Clinical Judgment**
- Her 10-year ASCVD Risk is **7.3% (borderline)**
  - Consider low or moderate intensity statin since she has (+) “risk-enhancing factor” with hx of pre-eclampsia
  - Emphasize **lifestyle modification** to maintain her healthy BMI, BP, lipid, glucose levels
  - ASA 81 mg NOT necessary unless ASCVD risk ≥10%

Source:
https://www.ahajournals.org/doi/10.1161/CIR.00000000000000625
CVD Treatment

- **Primary/Secondary** Interventions
  - Remember unique **non-modifiable** risk factors

- **Address Modifiable Risk Factors**
  - ie, Women significantly less likely to meet Federal Guidelines for Physical Activity
  - 39% of Caucasian women vs. 57% of non-Caucasian do not get enough exercise
2019 ACC/AHA Guideline on Primary Prevention of CVD

- Emphasizes patient-physician **shared decisions**
- **Multidisciplinary** team-based approach
- Sensitivities to **social determinants of health**
  - **Barriers** to care
  - Limited **health literacy/education level**
  - **Financial distress**
  - **Cultural** influences
  - Other socioeconomic risk factors

Source: https://www.heart.org/-/media/files/health-topics/cholesterol/chlstrmngmntgd_181110.pdf
Lifestyle Changes in Women

- **Control BMI, BP, lipid, & glucose**
  - ↓ by 500 kcal or 800-1500 kcal/day
  - Mediterranean Diet; DASH Diet

- **High levels of physical activity**
  - 200-300 minutes/week

- **Clinically meaningful weight loss (≥ 5% initial wt.)**
  - Goal waist size <35 inches

- **Smoking Cessation, Limit Alcohol, & Stress Reduction**
Motivational Interviewing (MI)

<table>
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<th>Engage</th>
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<th>Plan</th>
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<tbody>
<tr>
<td>The “Hello”</td>
<td>The “What”</td>
<td>The “Why”</td>
<td>The “How”</td>
</tr>
<tr>
<td>Create trusting relationship</td>
<td>Find clear direction &amp; goal</td>
<td>Identify internal motivation for change</td>
<td>Create SMART goals</td>
</tr>
<tr>
<td>Find common values</td>
<td>Patient picks target behavior</td>
<td></td>
<td>Be Specific</td>
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</tbody>
</table>

Physicians who reported **time as a barrier** were less likely to discuss smoking cessation with their **female** patients.
MI doesn’t take as long as you think

Please turn to your neighbor, use MI to come up with a lifestyle modification for each of you.

We can all get healthier!

Remember the “RULE” of MI

- **RESIST** telling them what to do
- **UNDERSTAND** their motivation
- **LISTEN** with empathy
- **EMPOWER** them
Summary of Practice Recommendations

- **USPSTF**: Screen women ≥45 y.o. for lipid disorders if at increased CHD risk. (Grade A)

- **USPSTF**: Screen women 20-45 y.o. for lipid disorders if at increased CHD risk. (Grade B)

Practice Recommendations

- Primary prevention with statin based on ASCVD risk score
  - Caution if planning pregnancy

- Utilize CDC’s U.S. Medical Eligibility Criteria for Contraceptive Use to find option with least CVD risks

- Consider metformin in patients with pre-DM/DM
  - Potential wt. loss & CVD benefits
Practice Recommendations

- **USPSTF**: Aspirin 81 mg/d if 50-59 y.o. with ≥10% 10-year CVD risk (Grade B)

- **USPSTF**: Aspirin 81 mg/d as preventive medication after 12 weeks of gestation if at high risk for preeclampsia. (Grade B)

Practice Recommendations

- **Secondary prevention** with statin therapy post-CVD event

- **ASA, ACEi/ARBs, β-blockers** may be of benefit in select patients following ACS/AMI (SOR A)

- Post-ACS or revascularization, eligible pts should be referred to comprehensive cardiac rehab (SOR A)
Changes in Clinical Practice

• Engage with female patients of all ages & advocate to ensure they get the very best cardiovascular care

• Use Motivational Interviewing & ASCVD Risk Estimator tools
  – ie, Demo calculator & show how risk changes if not smoker

• Have CVD discussions throughout women’s life cycle so risk factors can be monitored & controlled
  – ie, Counseling during preconception, contraception, intra-/post-partum, post-menopause

Have a “Heart to Heart” Talk with Women

• Emphasize CVD health especially at well visits & at follow-up visits for HTN/DM/HLD/BMI or lab review

• Take detailed history especially pregnancy complications
  – ie, Focused questions on hx of gestational DM, pre-eclampsia, preterm birth, birth of SGA infant

• Be familiar with patient’s socioeconomic status
  – Healthy lifestyles & medication adherence may be difficult
Help Close the Gap

• Very few women perceive CVD as greatest threat to health

• CVD largely preventable
  – Emphasize use of proven primary/secondary treatments
  – Pay close attention to underserved populations

• CVD has widely different presentations, effects, & outcomes in women vs. men
  – Pay close attention to traditional & non-traditional risk factors, especially female reproductive factors

CVD Advocacy for Women

• Heart disease Education, Analysis, Research, and Treatment for Women Act (HEART for Women Act S. 438/H.R. 3526)
  – Bill to improve prevention, diagnosis & treatment of CHD & stroke in women
  – AHA is monitoring implementation of 27 steps in FDA's Action Plan

• AHA supports legislation addressing barriers to cardiac rehab for women (S. 1361/ H.R. 1155)

• AHA supports funding for “WISEWOMAN” Program
  – Provides free CVD screening & lifestyle counseling to low income women

• AHA supports improved reporting of health care data by sex, race, & ethnicity

• AHA supports equitable use of female cells, tissues, & animals in basic research

• “GoRedForWomen” Campaign; Women’s Preventive Services Initiative (WPSI)
Contact Information

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• Anna Lowell
  annalowell@gmail.com

Questions
CVD Care Resources

- “AFP By Topic” > “Coronary Artery Disease/Coronary Heart Disease”: aafp.org/afp
- Download ASCVD Risk Estimator: tools.acc.org/ASCVD-Risk-Estimator-Plus
- 2019 ACC/AHA Guideline on Primary Prevention of Cardiovascular Disease: ahajournals.org/doi/10.1161/CIR.0000000000000678
- U.S. Preventive Services Task Force > Category: “Cardiovascular Disorders (Heart & Vascular Diseases)”: uspreventiveservicestaskforce.org/BrowseRec/Index
- ACLS Training Center: acls.net/heart-disease-in-women.htm
- CDC MEC for Contraceptive Use: cdc.gov/reproductivehealth/contraception/mmwr/mec/
- http://www.motivationalinterview.net
- Americans in Motion-Healthy Interventions (AIM-HI): www.americansinmotion.org
- Dietary Guidelines & Physical Activity Guidelines: Health.gov
- CDC Toolkit “WISEWOMAN”: cdc.gov/wisewoman/evaluation_toolkit.htm

References

8. CDC, NCHS. Underlying Cause of Death 1999-2013 on CDC WONDER Online Database, released 2015.