

# Heart Disease in Women: The Real Heartbreak - Disparities in Womens Cardiovascular Health

Maya Bass, MD  
Anna Lowell, DO, MPH, AAHIVS



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The logo consists of the letters "FMX" in a bold, white, sans-serif font. To the left of the text is a horizontal bar with a repeating diagonal striped pattern in orange and light orange.

## Maya Bass, MD

Assistant Professor, Department of Family, Community, and Preventive Medicine, Drexel University College of Medicine, Philadelphia, Pennsylvania

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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# Anna Lowell, DO, MPH, AAHIVS

Family Physician, Manatee County Rural Health Services Southwest Health Center, Bradenton, Florida

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 FAPP 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.
2. Determine criteria for screening and diagnostic testing for cardiovascular disease in women.
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.
5. Using shared decision making, develop a prevention/treatment plan for women at risk for cardiovascular disease utilizing evidence-based guidelines and recommendations.

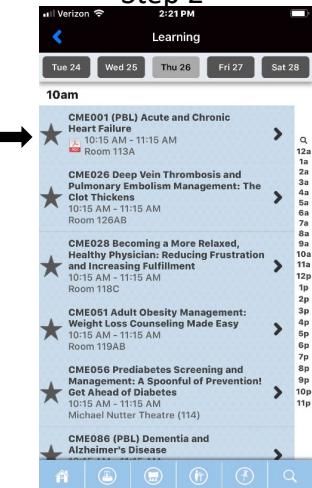


# Audience Engagement System

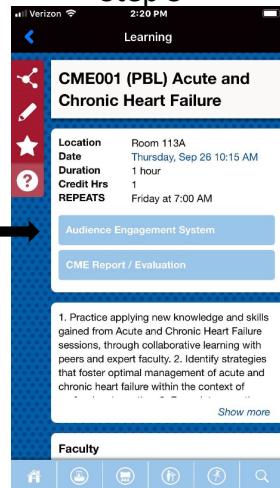
Step 1



Step 2



Step 3



**FMX**

## 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](#), 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**

## 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 are 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,  $\beta$ -blockers, & statin in women post-MI, especially **minority women**
- **Less likely to be referred** to Cardiac Rehab

## CVD Outcomes Worse in Women

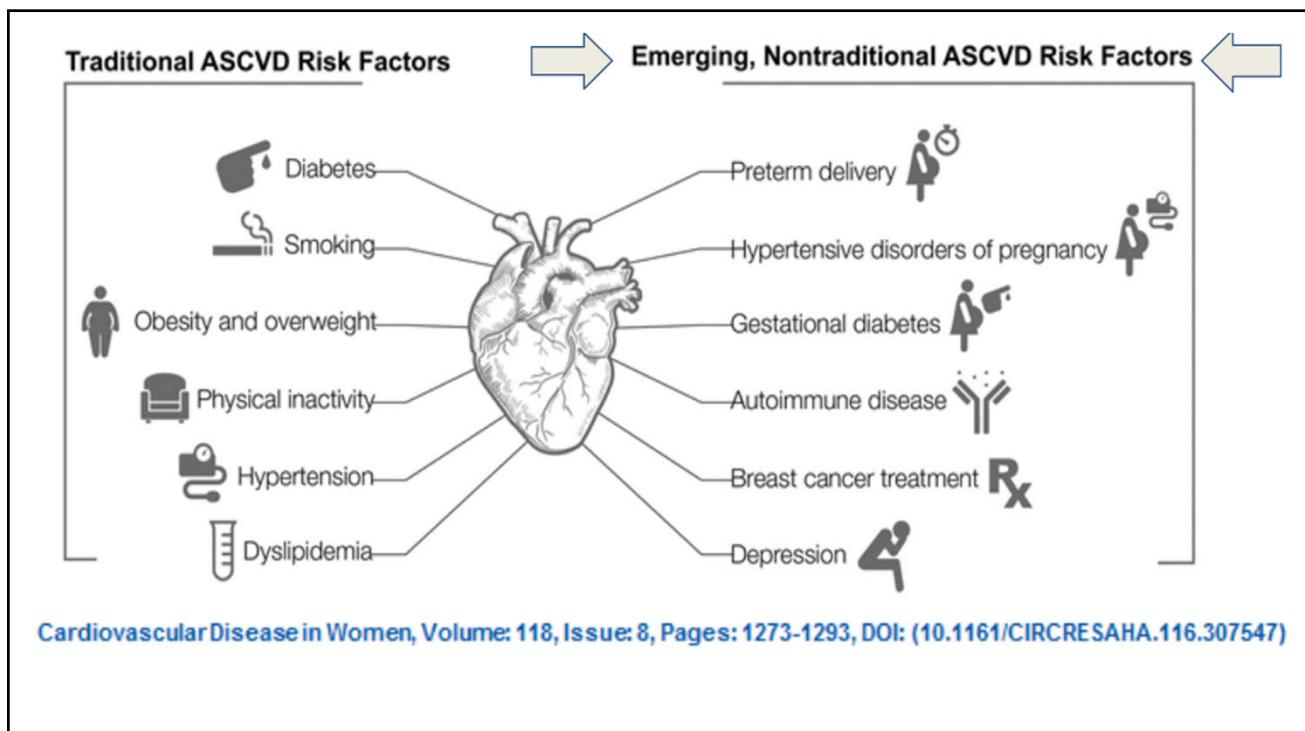
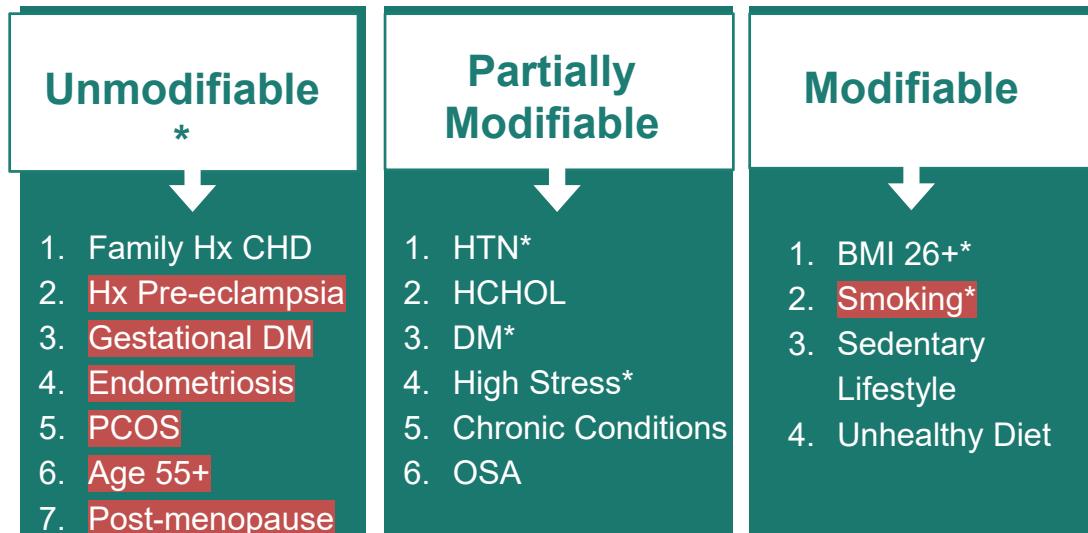
- Women with (+) exercise test more likely to have **no further cardiac evaluation** vs. men (**62% vs. 38%**)
- After STEMI, women have **higher rate of cardiogenic shock & higher in-hospital mortality**
- Women less likely to adhere to prescribed cardiac rehab
  - Due to **patient-level barriers** 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



## **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

Population	Recommendation	Grade (What's This?)
Adults at low risk of CVD events	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.	D
Adults at intermediate or high risk of CVD events	<p>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.</p> <p>See the <a href="#">Clinical Considerations</a> section for suggestions for practice regarding the I statement.</p>	I



## Cardiovascular Disease: Risk Assessment With Nontraditional Risk Factors

Release Date: July 2018

### Recommendation Summary

Population	Recommendation	Grade (What's This?)
Adults	<p>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.</p> <p>See the <a href="#">Clinical Considerations</a> section for suggestions for practice regarding the I statement.</p>	I

## 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 ( $\geq 7.5$  to <20%)**
  - **High ( $\geq 20\%$ )**





ASCVD Risk Estimator Plus

Estimate Risk

Therapy Impact

Advice

Current Age  \* Sex  Male  Female  Race \*  
Age must be between 20-79

Systolic Blood Pressure (mm Hg) \* Diastolic Blood Pressure (mm Hg)  
Value must be between 90-200 Value must be between 60-130

Total Cholesterol (mg/dL) \* HDL Cholesterol (mg/dL) \* LDL Cholesterol (mg/dL)  
Value must be between 130 - 320 Value must be between 20 - 100 Value must be between 30-300

History of Diabetes? \* Smoker? \*  
 Yes  No  Current *i*  Former *i*  Never *i*

On Hypertension Treatment? \* On a Statin? \* On Aspirin Therapy? \*  
 Yes  No  Yes  No  Yes  No

## 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  $\geq 10\%$

Recommendations for Issues Specific to Women Referenced studies that support recommendations are summarized in Online Data Supplements 33 to 35.		
COR	LOE	Recommendations
I	B-NR	1. Clinicians should consider conditions specific to women, such as premature menopause (age <40 years) and history of pregnancy-associated disorders (hypertension, preeclampsia, gestational diabetes mellitus, small-for-gestational-age infants, preterm deliveries), when discussing lifestyle intervention and the potential for benefit of statin therapy. <sup>\$4.5.3-1-\$4.5.3-6</sup>
I	C-LD	2. Women of childbearing age who are treated with statin therapy and are sexually active should be counseled to use a reliable form of contraception. <sup>\$4.5.3-7-\$4.5.3-12</sup>
I	C-LD	3. Women of childbearing age with hypercholesterolemia who plan to become pregnant should stop the statin 1 to 2 months before pregnancy is attempted, or if they become pregnant while on a statin, should have the statin stopped as soon as the pregnancy is discovered. <sup>\$4.5.3-7-\$4.5.3-12</sup>

Source:  
<https://www.ahajournals.org/doi/10.1161/CIR.00000000000000625>

## Vitamin Supplementation to Prevent Cancer and CVD: Preventive Medication

Release Date: February 2014

Population	Recommendation	Grade (What's This?)
Use of Multivitamins to Prevent Cardiovascular Disease or Cancer	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the use of multivitamins for the prevention of cardiovascular disease or cancer.	I
Single- or Paired-Nutrient Supplements for Prevention of Cardiovascular Disease or Cancer	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the use of single- or paired-nutrient supplements (except β-carotene and vitamin E) for the prevention of cardiovascular disease or cancer.	I
Use of β-carotene or Vitamin E for Prevention of Cardiovascular Disease or Cancer	The USPSTF recommends against the use of β-carotene or vitamin E supplements for the prevention of cardiovascular disease or cancer.	D

## 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



Assess patients' risk of ASCVD	Discuss patients' lifestyle	Consider drug therapy benefits	Consider the cost of treatment plans	Make treatment decisions together
Use the ASCVD Risk Calculator to estimate 10-year ASCVD risk for patients aged 40-75 years  Assess patients' other risk-enhancing factors, such as family history and metabolic syndrome	Review patients' lifestyle habits (eg, diet, exercise, BMI, tobacco use)  Provide trustworthy information for ways to create a healthier lifestyle	Recommend statins first, and consider combining with nonstatins for select patients  Discuss the potential for both reducing risk and identifying any adverse effects of the drugs	Discuss the potential cost of therapy and whether patients will be able to pay  Consider patients' insurance plan coverage, tier level, and copayment	Ensure that patients understand, and encourage them to contribute to the discussion  Ask about patients' preferences, and collaborate with them on treatment and follow-up plans

Source: [https://www.heart.org/-/media/files/health-topics/cholesterol/chlstrmngmntqd\\_181110.pdf](https://www.heart.org/-/media/files/health-topics/cholesterol/chlstrmngmntqd_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 ( $\geq 5\%$  initial wt.)**
  - Goal waist size **<35 inches**
- **Smoking Cessation, Limit Alcohol, & Stress Reduction**



### Healthful Diet and Physical Activity for Cardiovascular Disease Prevention in Adults With Cardiovascular Risk Factors: Behavioral Counseling

Release Date: August 2014

#### Recommendation Summary

##### *Summary of Recommendation and Evidence*

Population	Recommendation	Grade (What's This?)
Adults who are overweight or obese and have additional CVD risk factors	The USPSTF recommends offering or referring adults who are overweight or obese and have additional cardiovascular disease (CVD) risk factors to intensive behavioral counseling interventions to promote a healthful diet and physical activity for CVD prevention.	<b>B</b>

## Motivational Interviewing (MI)

### Engage

- The “Hello”
- Create **trusting** relationship
- Find common **values**

### Focus

- The “What”
- Find clear **direction & goal**
- **Patient picks** target behavior

### Evoke

- The “Why”
- Identify **internal motivation** for change

### Plan

- The “How”
- Create **SMART** goals
- **Be Specific**

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

R  
U  
L  
E

- RESIST** telling them what to do
- UNDERSTAND** their motivation
- LISTEN** with empathy
- EMPOWER** them

## Summary of Practice Recommendations

- USPSTF: Screen women  $\geq 45$  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

- Maya Bass

[mayaalexabass@gmail.com](mailto:mayaalexabass@gmail.com)

- Anna Lowell

[annalowell@gmail.com](mailto:annalowell@gmail.com)

## Questions



**FMX**

## CVD Care Resources

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

## References

1. National Heart Lung and Blood Institute. Heart Disease in Women. 2017; <https://www.nhlbi.nih.gov/health-topics/heart-disease-women>. Accessed November 1, 2018.
2. Centers for Disease Control and Prevention. Women and Heart Disease Fact Sheet. 2017; [https://www.cdc.gov/dhdsp/data\\_statistics/fact\\_sheets/fs\\_women\\_heart.htm](https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_women_heart.htm). Accessed November 1, 2018.
3. Appelman Y, van Rijn BB, Ten Haaf ME, Boersma E, Peters SA. Sex differences in cardiovascular risk factors and disease prevention. *Atherosclerosis*. 2015;241(1):211-218.
4. Sotos-Prieto M, Mattei J, Cook NR, Hu FB, Willett WC, Chiuve SE, Rimm EB, Sesso HD. Association Between a 20-Year Cardiovascular Disease Risk Score Based on Modifiable Lifestyles and Total and Cause-Specific Mortality Among US Men and Women. *J Am Heart Assoc*. 2018 Nov 6;7(21):e010052.
5. Potu KC, Raizada A, Gedela M, Stys A. Takotsubo Cardiomyopathy (Broken-Heart Syndrome): A Short Review. *S D Med*. 2016 Apr;69(4):169-71.
6. Mosca, L., Barrett-Connor, E., & Wenger, N. K. (2011). Sex/gender differences in cardiovascular disease prevention: what a difference a decade makes. *Circulation*, 124(19), 2145–2154. doi:10.1161/CIRCULATIONAHA.110.968792
7. Ridker PM, Buring JE, Rifai N, Cook NR. Development and Validation of Improved Algorithms for the Assessment of Global Cardiovascular Risk in Women: The Reynolds Risk Score. *JAMA*. 2007;297(6):611–619. doi:10.1001/jama.297.6.611
8. CDC, NCHS. Underlying Cause of Death 1999-2013 on [CDC WONDER Online Database](http://CDC WONDER Online Database), released 2015.