

Women and cardiovascular disease

Understand women's unique risks and symptoms to ensure early identification and treatment of CVD.

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CARDIOVASCULAR DISEASE

(CVD), which includes diseases of the heart, brain blood supply, and vascular system, is the number one cause of death in the United States. About 2,200 American adults die of CVD every day—that's one out of every three deaths. Almost 2 million Americans live with CVD, which can lead to myocardial infarction (MI), strokes, heart failure, renal disease, and peripheral artery disease.

Despite improvements in treatment, CVD remains the leading cause of mortality in women. (See *By the numbers.*) Women—and many healthcare providers—lack knowledge about CVD risk factors and MI symptoms unique to women, which leads to late recognition and inadequate treatment.

Risk factors

Women's CVD risk factors are somewhat different from men's. For example, women with diabetes and those who smoke are at higher risk than men who have diabetes or smoke. Other risk factors for women include age, inflammatory diseases, and pregnancy complications (specifically, pre-eclampsia, pregnancy-induced hypertension, and gestational diabetes).



LEARNING OBJECTIVES

1. State risk factors for cardiovascular disease (CVD) in women.
2. Compare signs and symptoms of myocardial infarction between men and women.
3. Discuss strategies for preventing CVD in women.

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Natural estrogen in premenopausal women is believed to be cardioprotective, but replacement estrogen taken during menopause doesn't help prevent CVD. Researchers are asking why, if estrogen is cardioprotective, we're seeing more MIs in younger women. No clear answer exists. However, younger women who have MIs are more likely to be obese or to have hypertension, tachycardia, or type 2 diabetes, but that doesn't completely answer the question.

Women of color are at greater risk for CVD than white women. Black women in the United States are at higher risk for an MI than all other women, and many experience an MI at a younger age. Because they may have no symptoms, they have higher rates of sudden cardiac death. Typically, Hispanic and Black women have more comorbidities (such as diabetes, hypertension, and obesity) than white women. When

By the numbers

Learn about cardiovascular disease (CVD) and women so you can provide the best care. And share this information with your female patients so they understand their risks.

- More women than men have CVD.
- CVD mortality is greater for women than men.
- The average age for a woman to have her first myocardial infarction (MI) is 71.8 years old; for men, it's 65 years old.
- In the United States, over 6.5 million women die annually from CVD and over 53,000 women die from an MI.
- CVD is the leading cause of death for Hispanic and Black women.
- 26% of women die within 1 year of having an MI, compared to 19% of men.
- MIs in younger women (45 to 54 years old) are increasing.
- An estimated 35,000 women younger than 65 years old have an MI each year.
- Hispanic women are likely to develop heart disease 10 years earlier than white women.

Sources: goredforwomen.org/about-heart-disease/facts_about_heart_disease_in_women-sub-category/statistics-at-a-glance; cdc.gov/dhdsp/data_statistics/fact_sheets/fs_women_heart.htm

black women present to the emergency department (ED), they're less likely than white women to be treated using the American Heart Association (AHA) guidelines. This is particularly true for younger women of color, who are less likely to be prescribed angiotensin-converting enzyme (ACE) inhibitors and beta-blockers after an MI. Furthermore, prevention efforts, such as healthy eating or exercise programs, are less likely to be recommended to women of color.

MI symptoms

Many women aren't aware that their MI symptoms may be different from those of men. For example, women may have prodromal symptoms for up to a year prior to a cardiac event. (See *Prodromal symptoms*.) Researchers believe that men develop blockages in their main cardiac arteries but that women develop blockages in the main arteries as well as smaller cardiac arteries (coronary microvascular disease), resulting in different MI symptoms. Chest pain is still the number one symptom of MI in women, but it's not the "elephant sitting on your chest" type of pain frequently experienced

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by men; instead, women feel it as pressure or discomfort. (See *MI symptoms*.) Women's symptoms are vague and easy to miss, by both women and healthcare providers.

Several factors contribute to women's higher MI morbidity and mortality rates. Women (and some

healthcare providers) may believe that CVD is a "man's disease," so they ignore symptoms and delay seeking treatment. In some cases, they delay going to the ED up to 2 hours longer than men; women of color delay going to the hospital longer than white women. Although women's awareness of CVD risk has improved, a knowledge gap still exists, and it's even larger for women of color and those who live in rural areas.

AHA guidelines

The 2011 updated AHA guidelines for the prevention of heart disease in women identify three risk levels: ideal cardiovascular health, at risk, and high risk. (See *Know the risk*.) Women who have ideal cardiovascular health have no presence of CVD, total cholesterol level < 200 mg/dL, blood pressure \leq 120/80 mmHg, body mass index < 25 kg/m², and fasting blood glucose < 100 mg/dL. At-risk women have one or more major risk factor for CVD—cigarette smoking, dyslipidemia, family history of premature CVD, hypertension, obesity, and a sedentary lifestyle. Other women deemed to be at risk are those with a history of pre-eclampsia, gestational diabetes, pregnancy-induced hypertension, or systemic autoimmune collagen vascular diseases (such as rheumatoid arthritis). Women designated as high risk have known coronary heart disease, cerebral vascular disease, abdominal aortic aneurysm, peripheral vascular disease, end-stage or chronic kidney disease, diabetes, or a 10-year predicted CVD risk \geq 10%.

The gold standard of treatment and risk reduction for all women, regardless of their risk category, is adhering to a healthy lifestyle, including diet, exercise, adequate sleep, stress reduction, and smoking cessation.

Diet

Let your patients know that the ideal diet consists primarily of whole

grains, vegetables, fruits, and protein sources low in saturated fats, such as lean meats and tofu. The AHA recommends no more than 6% of daily calories (about 13 grams) should come from saturated fats found in foods such as red meat, chicken with the skin, cheese, and butter, and that processed breads and baked goods made with refined flour and sugar should be avoided.

The AHA supports the Dietary Approaches to Stop Hypertension (DASH) eating plan for weight loss and hypertension control. Reading food labels can help people reduce sodium, sugar, and saturated fat consumption because it might reveal, for example, that something high in all three. The DASH plan recommends eating no more than 2,400 mg of sodium per day. In general, processed foods such as deli meats, canned soups, and frozen meals are very high in sodium and should be avoided.

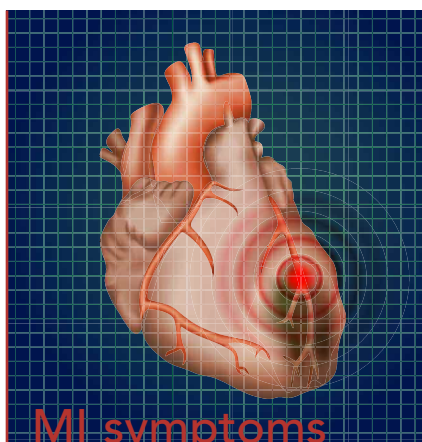
Exercise

According to the U.S. Department of Health and Human Services (DHHS) Physical Activity Guidelines for Americans, women should strive for a minimum of 150 minutes per week of moderate-intensity exercise, such as brisk walking. These guidelines are in DHHS's review process; an update may be available at the end of 2018. The AHA guidelines recommend 150 minutes per week of moderate exercise or 75 minutes per week of vigorous exercise. Examples of vigorous-intensity exercise include running, fast cycling, fast swimming, and heavy shoveling or digging. Two days per week of muscle-strengthening activities that involve all major muscle groups offer additional cardiovascular benefit. For weight loss, women should participate in at least 60 to 90 minutes of moderate-intensity physical activity—such as brisk walking, dancing, house cleaning, and gardening—on most days of the week.

Prodromal symptoms

Women may experience any of these symptoms for up to a year before having a myocardial infarction:

- unusual fatigue
- difficulty sleeping
- shortness of breath, especially in black women
- indigestion
- anxiety
- chest pressure.



Women usually don't experience the same type of pain as men when they have a myocardial infarction (MI). Instead, they'll present with these symptoms:

- chest pain, pressure, or discomfort
- fatigue
- shortness of breath
- pain in the neck, jaw, shoulder, arms, or upper back
- nausea or vomiting, sweating, or dizziness (less common symptoms).

Adequate sleep

The American Academy of Sleep Medicine and the Sleep Research Society recommend that healthy adults sleep 7 or more hours per night. Recommend that your patients go to bed and get up at the same time every day; remove electronic devices from the bedroom; avoid alcohol, caffeine, and large meals before bedtime; and get regular exercise.

Stress reduction

Reducing stress can be challenging for many women. Suggest that patients try meditation, yoga, listening to music, and walking. For success, stress-reduction plans should be individualized; for example, walking a dog might relieve stress in one person but be stress-inducing in another.

Smoking cessation

Cigarette smoking is contraindicated for a heart-healthy lifestyle. If your patient smokes, help her develop a cessation plan. Start by establishing her readiness to quit. Until she says she's ready to quit, provide education that outlines the risks associated with smoking. Then, when she's ready, work with her to develop a plan and direct her to supportive resources, including the "Create my quit plan" tool smokefree.gov/build-your-quit-plan and "Smokefree Women" (women.smokefree.gov). The latter site has tools such as text messages (including ones specific for pregnant women), mobile apps, and a craving journal.

AHA guidelines and medication

The AHA guidelines suggest adding medications when lifestyle interventions alone fail to achieve optimal blood pressure, glycosylated hemoglobin (A1C), and low-density lipoprotein (LDL) cholesterol levels. The patient's provider should consider prescribing medications when blood pressure is $\geq 140/90$ mmHg for most women or $\geq 130/80$ mmHg for those with diabetes or chronic kidney disease. The guidelines recom-



Patient story

Jan Kent* is a 62-year-old white woman who presents to her family nurse practitioner, Sarah, with flulike symptoms, headache, fatigue, and nausea. Vital signs are pulse 78 beats/minute and blood pressure (BP) 180/110 mmHg. Sarah's concerned about Ms. Kent's symptoms and vital signs and sends her via emergency medical services to the emergency department (ED) for evaluation.

In the ED, Ms. Kent's pulse is 80 beats/minute and her BP is 195/116 mmHg. She complains of a "bad" headache and tingling in both arms, and she is diaphoretic, with nausea and vomiting. Her troponin level is 0.918 ng/mL, and the electrocardiogram shows N-STEMI (non-ST-elevation myocardial infarction [MI]).

History

Ms. Kent has no previous history of cardiovascular disease (CVD) or hypertension. She's been postmenopausal for 12 years and has sleep apnea, but she doesn't use a continuous positive pressure airway device. Ms. Kent is overweight; she tries to eat a healthy diet but isn't always successful. She doesn't smoke or exercise regularly, and she drinks alcohol occasionally. Ms. Kent says she's had insomnia and unusual fatigue with no apparent cause for months. She's not taking any medications.

Both of Ms. Kent's parents had a history of hypertension and CVD. Her mother died of an MI at 74 years. Her father had a quadruple bypass after an MI. Both of Ms. Kent's siblings have hypertension.

Treatment

Cardiac catheterization shows that Ms. Kent has a 95% blockage in her left anterior or descending artery, so a stent is placed. She's admitted to the cardiac intensive care unit (ICU), where she recovers and is discharged 2 days later. At discharge, her total cholesterol is 212 mg/dL (high-density lipoprotein [HDL] 39 mg/dL, low-density lipoprotein [LDL] 173 mg/dL), and her BP is stabilized to 120/74 mmHg. Ms. Kent's discharge medications are carvedilol (a beta-blocker), two 3.125-mg tablets twice a day; losartan potassium (an angiotensin II antagonist), 25 mg every day; aspirin, 81 mg every day; and atorvastatin, 10 mg every day.

AHA guidelines

According to the American Heart Association (AHA) guidelines, Ms. Kent is at risk for heart disease because of her family history, age, weight, and lifestyle. She needs education about preventive measures—lowering cholesterol, increasing physical activity, and consistently making heart-healthy food choices—to reduce her CVD risk. In addition, she needs education about prodromal and MI symptoms unique to women.

If Ms. Kent experiences similar symptoms in the future, she should call 911 to be transported to the ED. She also can share her story with others so more people become aware of MI symptoms in women and what to do if they occur.

*Names are fictitious.

ment including a thiazide diuretic medication unless contraindicated. If women are at high risk, treatment also should include a beta-blocker, an ACE inhibitor, or an angiotensin II receptor blocker. The guidelines also recommend LDL-lowering medications such as statins for women with diabetes whose A1C levels are < 7%, at-risk women whose LDL is < 130 mg/dL, high-risk women whose LDL is < 100 mg/dL, and in some high-risk women whose LDL is < 70 mg/dL.

For most women who've had a cardiac event, angiotensin II receptor blockers, beta-blockers, and spironolactone should be prescribed. Avoid aspirin therapy in women younger than 65 years old with ideal cardiovascular health because of bleeding risk; however, it should be considered in high-risk women and in those over 65 years old when their blood pressure is controlled and the benefit of stroke and MI prevention outweighs the risk of bleeding. The AHA guidelines also recommend treating women who have atrial fibrillation with aspirin, warfarin, or dabigatran. Postmenopausal hormone therapy and antioxidant and folic acid supplements are class-three interventions that aren't useful or effective and may even be harmful.

Nursing implications

Many cardiovascular health disparities exist related to race, ethnicity, and gender, particularly among Black and Hispanic women. Culturally sensitive care and education about CVD risk factors and MI symptoms enhance patient adherence to prescribed treatment plans.

When discussing healthy lifestyle changes, assess patients' change readiness and what's important to them by using motivational interviewing techniques. Develop individualized care plans, offering patients options for maintaining their health. For example, logging food intake and daily exercise may work best for some patients, while others may pre-

Know the risk

The American Heart Association Guidelines include three cardiovascular disease (CVD) risk categories for women. Use these guidelines to help you identify at-risk women and provide timely care.

Category	Criteria
Ideal cardiovascular health	<ul style="list-style-type: none">• No presence of cardiovascular disease• Total cholesterol level < 200 mg/dL• Blood pressure ≤ 120/80 mmHg• Body mass index < 25 kg/m²• Fasting blood glucose < 100 mg/dL• Nonsmoker• Regular exercise
At risk for CVD	<ul style="list-style-type: none">• One or more major risk factors for CVD:<ul style="list-style-type: none">• cigarette smoking• dyslipidemia• family history of premature CVD• hypertension• obesity (central)• sedentary lifestyle• poor diet• Advanced subclinical atherosclerosis• Metabolic syndrome• Poor exercise capacity on treadmill test• History of pre-eclampsia, gestational diabetes, or pregnancy-induced hypertension• History of systemic autoimmune collagen vascular disease, such as rheumatoid arthritis
High risk for CVD	<ul style="list-style-type: none">• Known coronary heart disease, cerebral vascular disease, abdominal aortic aneurysm, peripheral arterial disease, end-stage or chronic kidney disease, or diabetes• 10-year predicted CVD risk > 10%

Source: Mosca et al. 2011

fer using smartphone apps to encourage adherence to treatment plans and medication regimens. Research is needed to determine the effectiveness of these apps.

For those who are interested in support groups, provide resources and information. Also, direct women to the Go Red for Women website (goredforwomen.org) to learn more about heart disease, discover ways to live healthy, and participate in activities to spread the word about women and heart disease.

Despite education, patients don't always follow treatment plans. When that happens, explore possible reasons, such as lack of access to primary care providers, time constraints, and resistance to lifestyle modifica-

tions. Be nonjudgmental when exploring these reasons, and collaborate with the patient to revise the treatment plan.

Risk reduction begins with education

Education is the cornerstone to reducing CVD risk and death among women. Remind your female patients of the MI symptoms unique to women, and explain that they should seek immediate medical care if they experience any of them.

To ensure early identification and treatment of women at risk for a cardiovascular event, all healthcare professionals should adhere to the AHA guidelines for all female patients regardless of race or ethnicity

and provide culturally sensitive care. Empower at-risk women to make wise lifestyle choices, and support and encourage adherence to prescribed treatment plans. ★

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Please mark the correct answer online.

1. Which statistics related to women and cardiovascular disease (CVD) are correct?

- Myocardial infarctions (MIs) in younger women (45 to 54 years old) are decreasing.
- More than 2.5 million women die annually from CVD and over 53,000 women die from an MI.
- 26% of women die within 1 year of having an MI, compared to 19% of men.
- The average age for a woman to have her first MI is 65 years old; for men, it's 71 years old.

2. Which of the following statements about CVD risk factors in men and women is correct?

- Older women have risk factors similar to men's.
- Men who smoke have a higher risk of CVD than women who smoke.
- Women with diabetes have a higher risk of CVD than men with diabetes.
- Younger women have risk factors that are similar to men's.

3. Which statement about estrogen and CVD in women is correct?

- Natural estrogen is believed to be cardioprotective in premenopausal women.
- Natural estrogen does not provide cardioprotection for premenopausal women.
- Replacement estrogen taken during menopause helps prevent CVD.
- Replacement estrogen taken after the age of 60 helps prevent CVD.

4. Which statement about risk of CVD for women of color is correct?

- Hispanic women in the United States are at higher risk for an MI than all other women.
- Black women are more likely than white women to be treated using American Heart Association (AHA) guidelines.
- Women of color are at less risk for CVD than white women.

d. Women of color are at greater risk for CVD than white women.

5. Which statement about prodromal symptoms is correct?

- Women may experience them for up to a year before having an MI.
- Women may experience them for up to 4 years before having an MI.
- They frequently occur in men, but only rarely occur in women.
- They include shortness of breath, especially in Hispanic women.

6. Which of the following symptoms of an MI is a woman least likely to have?

- Fatigue
- Shortness of breath
- Pain in the neck or jaw
- Severe chest pain

7. Your patient smokes one pack of cigarettes a week and has hypertension. Tests show that she has metabolic syndrome. What is her CVD risk category according to AHA guidelines?

- At low risk for CVD
- At moderate risk for CVD
- At risk for CVD
- At high risk for CVD

8. Which of the following is a criterion for the AHA's ideal cardiovascular health category?

- Fasting blood glucose < 160 mg/dL
- Body mass index < 25 kg/m²
- Total cholesterol level < 250 mg/dL
- Blood pressure ≤ 120/72 mmHg

9. The Dietary Approaches to Stop Hypertension (DASH) plan recommends consuming no more than how many milligrams of sodium per day?

- 1,500
- 2,400
- 3,000
- 3,600

10. The AHA recommends that no more than how many grams of daily calories come from saturated fats?

- 13
- 15
- 17
- 19

11. Your 55-year-old patient wants to ensure that she is getting enough exercise. Which advice would be correct?

- Complete 150 minutes of moderate exercise per week.
- Complete 30 minutes of vigorous exercise per week.
- Avoid muscle-strengthening exercises.
- Do muscle-strengthening exercises monthly.

12. Despite making lifestyle changes, your patient's blood pressure is 146/92 mmHg. She does not have any other risk factors. Which of the following medications is her primary care provider most likely to prescribe?

- Thiazide diuretic
- Beta-blocker
- Angiotensin-converting enzyme (ACE) inhibitor
- Angiotensin II receptor blocker

13. Which of the following women is most likely to be prescribed a low-density lipoprotein (LDL) cholesterol-lowering medication?

- A woman with diabetes whose A1C is > 8%
- A woman with diabetes whose A1C is < 7%
- A woman at risk whose LDL is < 50 mg/dL
- A woman at risk whose LDL is < 60 mg/dL

14. Appropriate nursing actions to help women prevent CVD include all the following except:

- Use motivational interviewing techniques.
- Stress the importance of seeking treatment promptly.
- Provide resources such as the Go Red for Women website.
- Recommend always using a smartphone app to log calories.