

Cardiovascular Disease in Women: A Nurse Practitioner's Guide to Prevention

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ABSTRACT

Cardiovascular disease (CVD) is the number 1 cause of death in women, accounting for about 1 in 3 deaths. This article reviews the 2011 American Heart Association effectiveness-based guidelines for CVD prevention in women. Risk assessment, prevention, and management of risks through lifestyle changes and pharmacotherapy are discussed. The article concludes with implications for nurse practitioners on ways to improve cardiovascular health among women in their practice.

Keywords: assessment, awareness, cardiovascular disease, prevention, women

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One in 3 women will die from cardiovascular disease (CVD), equating to approximately 1 death per minute among women.¹

Moreover, coronary heart disease (CHD), about half of all of CVD, outranks breast cancer as a cause of death for women by 10-fold.¹ Despite the fact that heart disease remains the leading cause of death for women, mortality rates have declined dramatically between 1980 and 2000.¹ Nearly half (47%) of the decline is attributed to increased use of evidence-based therapies for secondary prevention of myocardial infarction (MI), treatment of heart failure, revascularization for CHD, and treatment for cardiovascular risk factors (eg, hypertension and dyslipidemia).¹ Another 44% of the decline is attributed to a change in risk-factor modification related to lifestyle and environmental changes (eg, decrease in cholesterol, systolic blood pressure [BP], smoking, and physical inactivity). Thus, nurse practitioners (NPs) have a major role in empowering women in their practice to engage in healthy-heart living *and* in providing evidence and effectiveness-based therapies to further improve outcomes.

USING CLINICAL GUIDELINES IN PRACTICE

The American Heart Association (AHA) periodically publishes clinical practice guidelines related to various cardiovascular conditions. As part of this process the AHA may collaborate with other organizations, including the American College of

Cardiology, to systematically develop such guidelines based on strict criteria to support the recommendations provided. NPs may use information from guidelines, supplemented with clinical experience and patient preferences, to inform their treatment decisions—all of which make up an evidence-based practice.

Many advances have been made since the first clinical guideline directed toward CVD prevention in women was published by the AHA in 1999.² The 2011 Update to the AHA Guidelines for Prevention of CVD in Women highlights the evidence for control of major risk factors in women and encourages the application of preventive therapies.³ The 2011 guidelines have switched from using “evidence-based” to “effectiveness-based” therapies to encompass the benefits and risks observed in clinical practice.³ Other modifications made to the 2011 guidelines included defining a new concept of “ideal cardiovascular health” that is associated with a longer lifespan. In addition, several new factors that have been associated with an increased risk of CVD in women were identified.

However, more research is needed to determine whether there is utility in screening for widespread use.³ The Class III interventions—those interventions that are deemed not useful, not effective, and potentially harmful—were unchanged from the prior 2007 guidelines. This was because of no new evidence related to these Class II interventions, also discussed below.

RISK ASSESSMENT

Risk assessment is the cornerstone of prevention in women. As part of the evaluation for CVD risk, NPs should obtain a comprehensive medical and cardiac history (including history of congenital heart disease, heart murmurs, rheumatic heart disease, hypertension, and CHD), family history (including premature CHD), and a pregnancy-complication history. NPs should also screen for depression. Although depression may not directly affect CVD outcomes, it is self-reported by 26% of women surveyed⁴ and may affect CVD risk for lack of adherence to preventive interventions.³

When obtaining the history, NPs should also determine if the woman has ongoing or past symptoms of CHD. NPs need to keep in mind that there are substantial differences between men and women in perceptions of pain and reporting of symptoms, as well as in type, frequency, and quality of symptoms. It is now recognized that shortness of breath is often the presenting symptom for CHD in women over age 65.

Also, many women do not present with the “typical” complaint of chest pain or discomfort, arm or neck pain but will report overwhelming fatigue. The absence of chest pain at presentation is associated with an increase in mortality, especially among younger women.⁵ Furthermore, women who have chest pain and undergo coronary angiography often show no evidence of obstructive coronary disease. However, half of the women in the Women’s Ischemic Syndrome Evaluation (WISE) study had microvascular disease, a disorder of blockages in the smallest vessels that are not seen in coronary angiography.⁶

Physical exam should include measurement of BP, body mass index (BMI), and waist size. Laboratory tests should include a fasting lipid panel and a fasting glucose level. In addition, a Framingham risk assessment should be conducted if the woman does not have evidence of CVD or diabetes. Traditionally, the Framingham Risk Score was used to assess risk for CHD. However, a limitation of the score is that it focuses on 10-year risk, especially that of MI and death, while not considering family history.

In 2007 the AHA guidelines used an algorithm simplifying risk stratification of women to reflect

lifetime risk for CVD to incorporate stroke risk, rather than solely looking at CHD.⁷ Stroke accounts for a higher proportion of CVD events than CHD for women compared to men, in part because women have unique risk factors for stroke (pregnancy, hormone therapy, and a greater prevalence of hypertension in older women).³

Categories of Cardiovascular Risk

According to the 2011 AHA guidelines, women should be classified into 1 of 3 categories; high risk, at risk, and ideal cardiovascular health. Goals for ideal cardiovascular health include total cholesterol (TC) less than 200 mg/dL (untreated), BP of 120/80 or less that is untreated, and fasting blood sugar of less than 100 mg/dL (untreated).³ Other goals include abstinence from smoking, lean BMI of < 25 kg/m², physical activity as recommended for the person’s age, and a healthy diet (such as the Dietary Approaches to Stop Hypertension [DASH] or a similar diet).³ If patients meet all of these guidelines, they are considered to be in the category of ideal cardiovascular health (Table 1).

At-risk assessment is generated by examining specific risk factors. Major risk factors used to define at-risk women include cigarette smoking, hypertension, hypercholesterolemia, obesity, poor diet, physical inactivity, family history of premature CVD, and metabolic syndrome.³ Importantly, the 2011 guidelines added subclinical atherosclerosis, poor exercise capacity on a treadmill or abnormal heart rate recovery after stopping exercise, and systemic autoimmune collagen-vascular disease (eg, lupus or rheumatoid arthritis).

Table 1. Goals for Ideal Cardiovascular Health for Adults ≥ 20 years

- Total cholesterol < 200 mg/dL (untreated)
- BP < 120/80 mm Hg (untreated)
- Fasting serum glucose < 100 mg/dL (untreated)
- Body mass index < 25 kg/m²
- Abstinence from smoking
- Physical activity > 150 min/week at moderate intensity, > 75 min/week vigorous intensity, or a combination of the 2 (may be cumulative)
- Heart-healthy diet (eg DASH-like diet)

BP = blood pressure; DASH = Dietary Approaches to Stop Hypertension.
Data from Mosca et al.³

A history of pregnancy complications was also added as a nontraditional risk factor, including gestational diabetes, pre-eclampsia, pregnancy-induced hypertension, preterm birth, or birth of an infant small for gestational age. These abnormalities appear in response to the vascular and metabolic stress of pregnancy and may be early indicators of cardiovascular risk. Although more research is needed in this area, a detailed pregnancy history may identify women who have a higher lifetime risk of CVD.

The high-risk classification is characterized by symptomatic CHD, symptomatic cerebrovascular disease, symptomatic peripheral arterial disease, abdominal aortic aneurysm (with or without symptoms), end-stage or chronic kidney disease, diabetes mellitus, or a 10-year predicted CVD risk of $\geq 10\%$. In 2011, more women are classified as high risk because of a change in the cut-point of a 10-year predicted risk for all CVD (not just CHD alone); the 2007 guidelines used $\geq 20\%$ 10-year predicted risk to define high risk.³

INTERVENTIONS TO PREVENT CVD

The 2011 guidelines are divided into sections by various lifestyle and pharmacological interventions for women aimed toward primary and secondary prevention. Lifestyle approaches to prevention are the most cost effective and widely applicable strategy. Major risk-factor interventions and preventive drug interventions vary, in some cases, by risk status.³

LIFESTYLE INTERVENTIONS

The following lifestyle interventions are adapted from Table 4 in the 2011 guidelines for the prevention of CVD in women.³ Additional evidence related to these interventions is included to provide NPs with more recent information to use in practice.

Smoking Cessation Counseling

Every woman should be advised by all health care providers *not* to smoke and to avoid environmental tobacco smoke.³ NPs should provide counseling at every patient visit by using the 5 As (ask about smoking use, advise all tobacco users to quit, assess willingness to quit, assist with treatments/referral for treatment, and arrange for follow-up for ongoing

support to maintain cessation efforts), developed by the US Department of Health and Human Services, to provide support for smoking cessation.⁸ However, a study that evaluated the effectiveness of the 5 As determined that persons who smoke tobacco need more than just advice; tobacco users were more likely to report quitting if they were offered cessation medications or behavioral counseling.⁹ The guidelines indicated that nicotine replacement and other medications (eg, bupropion and varenicline) should be used in conjunction with a behavioral program or formal smoking cessation program for women who would like to quit.³ This recommendation is supported by a Cochrane Review that determined that the combination of pharmacotherapy with behavioral support increases smoking cessation success compared to less intensive programs.¹⁰

Physical Activity

Women who need to lose weight or sustain weight loss should be advised to accumulate a minimum of 60 to 90 minutes of at least moderate-intensity physical activity (eg, brisk walking) on most, and preferably all, days of the week.³ All other women should be advised to engage in at least 150 minutes per week of moderate exercise, which translates to 30 minutes, 5 times a week, and may be accumulative (eg, 10 minutes of exercise 3 times a day).³

Alternatively, they may participate in 75 minutes per week of vigorous exercise or an equivalent combination of moderate- and vigorous-intensity aerobic physical activity.³ However, the aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week.³ Additional cardiovascular benefits may be obtained by doubling the recommended amount of time exercising.³ Furthermore, women should be advised to engage in muscle-strengthening activities that involve all major muscle groups at least 2 days per week.³

Overall, it is important for NPs to get their patients up and moving. Some women have difficulty finding time for exercise. One technique is to tell women to walk in place while watching television (eg, during commercials) and hold a soup can in each hand, which will help in strength training. Another idea is to tell women to take the stairs any time they

are available in lieu of using an elevator or park their vehicle farther away from their destination to promote walking on a daily basis.

Cardiac Rehabilitation

A comprehensive CVD risk-reduction regimen (eg, cardiovascular or stroke rehabilitation or a physician-guided home- or community-based exercise training program) should be recommended to women with a recent acute coronary syndrome (ACS) or coronary revascularization, new onset or chronic angina, recent cerebrovascular event, peripheral arterial disease, or current/prior symptoms of heart failure and a left ventricular ejection fraction (LVEF) of $\leq 35\%$.³ Research has shown that women are less likely to be referred for cardiac rehabilitation and are more likely to drop out of a program.¹¹ Some women have competing social demands or are frequently responsible for caregiving of others; some believe they can return to their baseline activity without a formal program; some are uncomfortable participating in programs that have a predominantly male enrollment; and some do not want to participate because they may have little experience exercising before their cardiac diagnosis.¹¹

Furthermore, Medicare Part B and insurance companies reimburse only for certain cardiac diagnoses (eg, MI in the past 12 months, stable angina, status after revascularization, valve surgery, or heart/lung transplantation). For those individuals and conditions covered, co-pays and deductibles may be prohibitive, especially if patients are financially challenged.

While NPs are unable to order cardiac rehabilitation based on current regulations, they have a responsibility to advocate for referrals and encourage eligible patients to attend. Strategies to facilitate referral and increased participation include automatically referring all eligible patients at the time of hospital discharge, providing patients with a choice of where they can attend, providing written invitations and culturally and age-appropriate program brochures, arranging for transportation or parking assistance if needed to attend, following up with those who are referred yet have not attended, and openly discussing potential barriers to not enrolling into cardiac rehabilitation and secondary prevention programs, despite being referred.¹¹

Dietary Intake and Weight Maintenance/Reduction

Women should maintain or lose weight through an appropriate balance of physical activity, caloric intake, and formal behavioral programs when indicated, to maintain or achieve an appropriate body weight (eg, BMI < 25 kg/m² in US women), waist size (eg, < 35 in), or other target metric of obesity.³ Women should be advised to consume a diet rich in fruits and vegetables; choose whole-grain, high-fiber foods; consume fish, especially oily fish, at least twice a week; and limit intake of saturated fat, cholesterol, alcohol, sodium, and sugar.

Women also should be encouraged to avoid trans-fatty acids and artificial trans-fats. The latter occur when hydrogen is added to a vegetable oil to make it form a solid (like shortening or margarine), which is intended to increase the food's shelf life, taste, and texture. However, ingestion of trans-fat increases low-density lipoprotein cholesterol (LDL-C). Foods that are likely to contain trans-fat include processed, fried, and packaged foods. However, some brands avoid using trans-fat, so it is important for NPs to teach women to read food labels. To read more about trans-fatty acids, refer to <http://www.cdc.gov/nutrition/everyone/basics/fat/transfat.html>.

Women should also be provided with education on obtaining a dietary plan customized to their weight and physical activity. Refer to www.choosemyplate.gov for more information about how to increase consumption of healthy foods and encourage weight reduction.

NPs are encouraged to assist patients in weight reduction through a variety of support options (eg, in-person support and remote options such as the Internet or smartphone applications). For example, health behavior coaches combined with remote support have been used to obtain and maintain substantial weight loss in adults who were obese and had 1 or more cardiovascular risk factors.¹² Motivational interviewing was the primary approach used in the intervention, and the level of behavior change was noteworthy.¹²

Omega-3 Fatty Acids

Women with hypercholesterolemia or hypertriglyceridemia should consume omega-3 fatty acids in the form of fish or in capsule form.³ However, there are widely variable amounts of eicosapentaenoic acid

(EPA) and docosahexaenoic acid (DHA) in fish or in the supplements. Research has shown that protection against CHD is inversely related to tissue levels of EPA and more so with DHA levels.¹³ The recommended dose of EPA, per the guidelines, is 1800 mg/day.³ NPs can educate their patients that 2 oily fish meals per week contain an equivalent of approximately 500 mg/day of combined EPA and DHA.¹³ Furthermore, the following fish contain high levels of oil: herring, mackerel, salmon, albacore tuna, or trout.¹³ However, pregnant women should be counseled against eating fish with the potential for the highest level of mercury contamination (eg, shark, swordfish, king mackerel, or tile fish).³

INTERVENTIONS TO CONTROL MAJOR RISK FACTORS

The following interventions to control major risk factors are adapted from Table 4 in the 2011 guidelines for the prevention of CVD in women.³ Additional evidence is included to provide NPs with more recent information to be used in practice.

BP

An optimal BP of < 120/80 mm Hg should be encouraged through lifestyle approaches, such as weight control, increased physical activity, alcohol moderation, sodium restriction, and increased consumption of fruits, vegetables, and low-fat dairy products. Pharmacotherapy is indicated when BP is $\geq 140/90$ mm Hg ($\geq 130/80$ mm Hg with chronic kidney disease or diabetes mellitus). Thiazide diuretics should be part of the drug regimen for most patients unless contraindicated or unless there are compelling indications for other agents in specific vascular diseases. Initial treatment of high-risk women with ACS or MI should be with beta-blockers or angiotensin-converting enzyme (ACE) inhibitors (or angiotensin receptor blockers [ARBs], if allergic) with the addition of other medications (such as thiazide diuretics) as needed to achieve targeted BP. However, ACE inhibitors are contraindicated in pregnancy and should be used with caution in women who may become pregnant.

Lipid and Lipoprotein Levels

The following lipid levels for women should be encouraged through lifestyle approaches: LDL-C

< 100 mg/dL, HDL-C > 50 mg/dL, triglycerides < 150 mg/dL, and non-HDL-C (total cholesterol minus HDL) < 130 mg/dL. All women who have lipid levels above these values should continue lifestyle modifications and start LDL-lowering therapy based on goals for their level of risk. For example, women who are considered high-risk should combine lifestyle modifications with medication (eg, statins) to achieve an LDL-C < 100 mg/dL. Furthermore, a reduction to < 70 mg/dL is reasonable in very high risk women (eg, those with recent ACS or multiple poorly controlled cardiovascular risk factors) or those with established CHD, but this may require an LDL-lowering drug combination.

Likewise women who have very high LDL-C levels (≥ 190 mg/dL), LDL lowering therapy should be started, regardless of the presence of other risk factors or CVD. Otherwise, therapy is based on the LDL-C level. The guidelines also provide recommendations for women with abnormal high-sensitivity C-reactive protein (hsCRP) levels (> 2 mg/dL), low HDL-C (< 50 mg/dL), or elevated non-HDL-C levels (> 130 mg/dL) in high-risk women after their LDL-C goal is reached (Table 2).

Diabetes Mellitus

Lifestyle and pharmacotherapy can be useful in women with diabetes mellitus to achieve an HbA1C < 7% if this can be accomplished without significant hypoglycemia. Since the 2011 guidelines were published, the American Diabetes Association guidelines from 2013 indicated that HbA1C goals should be more individualized.¹⁴

PREVENTIVE DRUG INTERVENTIONS

The following preventive drug interventions are adapted from Table 4 in the 2011 guidelines for the prevention of CVD in women.³

Aspirin Therapy

Aspirin therapy, if indicated, should be given in the form of enteric-coated pills to prevent gastric upset. For women with CHD, aspirin therapy (75–325 mg/d) should be used, unless contraindicated. Aspirin therapy is also reasonable for women with diabetes mellitus, unless contraindicated. If a high-risk woman

Table 2. Recommendations for Lipid Goals and Therapy Based on Risk Level

Risk Level	Recommended Therapy	Goal for LDL-C
High-risk women Women with other atherosclerotic CVD Women with diabetes Women with a 10-yr absolute risk > 20%	Lifestyle therapy plus drug therapy to lower LDL-C; may require combination pharmacologic therapy to get to goal	LDL-C < 100 mg/dL LDL-C < 70 mg/dL for very-high risk women with CHD (eg, recent ACS, multiple poorly controlled CV risk factors)
Other at-risk women with LDL-C \geq 160 mg/dL, multiple risk factors, and 10-yr absolute risk < 10% Other at-risk women with LDL-C \geq 190 mg/dL regardless of presence or absence of other risk factors or CVD	Lifestyle therapy plus therapy to lower LDL-C	LDL-C < 130 mg/dL
Other at-risk women with LDL-C \geq 130 mg/dL, multiple risk factors, and 10-yr absolute risk 10%-20%	Lifestyle therapy alone	LDL-C < 130 mg/dL
Women age < 60 with CHD risk > 10%	Lifestyle therapy; add statin therapy if hsCRP is > 2 mg/dL	hsCRP < 2 mg/dL
Women with low HDL-C (< 50 mg/dL) Women with high non-HDL-C (> 130 mg/dL) who are high risk after LDL-C goal is reached	Niacin or fibrate therapy	HDL-C > 50 mg/dL Non-HDL-C < 130 mg/dL in very high-risk women with recent ACS or multiple poorly controlled CV risk factors

ACS = acute coronary syndromes; CHD = coronary heart disease; CV = cardiovascular; CVD = cardiovascular disease; HDL-C = high-density lipoprotein cholesterol; hs-CRP = high-sensitivity C-reactive protein; LDL-C = low-density lipoprotein cholesterol.

Data from Mosca et al.³

is intolerant of aspirin, clopidogrel should be substituted. For women who are classified as “at-risk” or “healthy,” aspirin can be useful for those older than 65 (81 mg daily or 100 mg every other day) if BP is controlled. The benefits for ischemic stroke and MI prevention are likely to outweigh the risk of gastrointestinal bleeding and hemorrhagic stroke. Lower doses of aspirin are recommended for these women to offset the risk of bleeding with higher doses. However, for women who are younger than 65, the evidence for primary prevention of CVD is less compelling.

Medications for Atrial Fibrillation (AF)

Aspirin 75–325 mg/day should also be used in women with chronic or paroxysmal AF who have a contraindication to warfarin or are at low risk of stroke (< 1%/year) or have a CHADS₂ score of 0–1. For example, a patient with a CHADS₂ score of 0–1 would, in addition to having AF, have 1 or fewer of the following risk factors for stroke: congestive heart failure, hypertension, age > 75, diabetes, or a history

of stroke/TIA. For women with chronic or paroxysmal AF, warfarin should be used to maintain the international normalized ratio at 2.0 to 3.0, unless they are at low risk for stroke (< 1%/year) or high risk of bleeding.

Dabigatran is useful as an alternative to warfarin for the prevention of stroke and systemic thromboembolism in patients with paroxysmal to permanent AF and risk factors for stroke or systemic embolization who do not have a prosthetic heart valve or hemodynamically significant valve disease, severe renal failure (creatinine clearance < 15 mL/min), or advanced liver disease (impaired baseline clotting function). Note, however, that since the 2011 guidelines were published, 2 other anticoagulants, rivaroxaban and apixaban, have also been approved by the Food and Drug Administration as alternatives to warfarin.

Beta-Blockers

Beta-blockers should be used for up to 3 years in all women after MI or ACS with normal left ventricular function, unless contraindicated. Long-term beta-blocker

therapy, however, should be used indefinitely for women with decreased left ventricular function, unless contraindicated. Long-term beta-blocker therapy (> 3 years) may be considered in other women with coronary or vascular disease and normal left ventricular function.

Renin-Angiotension-Aldosterone System (RAAS) Blockers

ACE inhibitors should be used (unless contraindicated) in women after MI and in those with clinical evidence of heart failure, LVEF \leq 40%, or diabetes mellitus. If these women are intolerant of ACE inhibitors, ARBs should be used instead. However, both of these drug classes have contraindications and precautions and require ongoing monitoring for side effects. Use of aldosterone blockade (eg, spiroinolactone) after MI is indicated in women who do not have significant hypotension, kidney dysfunction, or hyperkalemia, who are already receiving therapeutic doses of an ACE inhibitor and beta-blocker and have an LVEF \leq 40% with symptomatic heart failure.

INTERVENTIONS THAT SHOULD NOT BE USED

The 2011 guidelines identified and retained class III recommendations (not useful/maybe harmful) for hormone therapy for menopause.³ Hormone replacement and selective estrogen-receptor modulators for primary or secondary prevention of CVD should not be used. Furthermore, the routine use of aspirin for women younger than 65 for primary prevention of MI is potentially harmful, thus should not be used.³ Antioxidant supplements (specifically, vitamins E and C and beta carotene) and folic acid supplements (with or without B6 and B12) for the primary or secondary prevention of CVD have not been found to improve outcomes. There is an exception for women of childbearing years; folic acid 0.4 mg should be taken to prevent neural tube defects.

IMPLICATIONS FOR NP PRACTICE

Considering Patient Diversity

The 2011 guidelines provide a new section on considering diversity of patients with each encounter. According to the guideline, diversity is defined broadly as considering age, language, culture, literacy, disability, frailty, socioeconomic status, occupational

status, religious affiliation, race, and ethnicity.³ One of the main causes of health disparities in outcomes is lack of understanding of health beliefs, cultural values and preferences, and patients' inability to communicate their needs in their own language.³ NPs should assess cultural and social differences in their patients to provide culturally competent care.

Educating Women about Heart Disease

Risk-factor modification is tightly linked to knowledge of heart disease and use of preventive actions by women who are at risk for CVD. In 2012 the AHA surveyed 2,432 women over 25 to assess their awareness of heart disease, knowledge of CVD symptoms, and their use and barriers to preventive behaviors.⁴ Data from this national survey were compared to findings from a survey done in 1997. As a result of widespread educational and awareness campaigns regarding heart disease in women over the 15-year period, awareness of CVD as the leading cause of death nearly doubled (56% versus 30%; $P < 0.001$) and awareness of atypical symptoms of CVD improved yet remained low (18% versus 10%; $P < 0.0001$).⁴

As in the past, all racial/ethnic groups improved in their level of awareness. However, black and Hispanic women have lower rates of awareness compared to white women. Insight into awareness among black women may increase through outreach programs in places of worship at the local level.⁴ These programs encourage women to take preventive action because many black women believe that God or a higher power determines their health.⁴

In addition, only 21% of the women surveyed reported that their physicians had ever discussed their risk for heart disease when discussing their health; reporting was lower among Hispanic and younger women. These findings are consistent with past studies that report health care providers continue to underestimate cardiovascular risk in women and underuse preventive therapies.⁴ NPs have an opportunity to improve cardiovascular health by targeting these subgroups for more intensive patient education related to awareness of heart disease and adopting a heart-healthy lifestyle. Each patient encounter should be viewed as an opportunity to assess patient's knowledge of CV risk and to provide education.

Improving Adherence

According to the 2012 AHA National Survey by Mosca and colleagues,⁴ women engaged in preventive behaviors to improve their health and feel better, not to live longer (with the exception of black women and women older than 65). Thirty-five percent of the women reported they had no barriers to engaging in preventive behaviors, reporting that they lived a heart-healthy lifestyle. However, in the remaining 65% of the women, the most frequent barriers included lack of money or insurance coverage (16%), lack of confidence in their ability to achieve behavior change (14%), and lack of time to care for themselves (13%).

Lack of time to engage in heart-healthy behaviors was an issue for younger women. The youngest age group (25–34) cited not having enough time to take preventive action along with women ages 35–44 who reported family obligations as a barrier to living a heart-healthy lifestyle. Thus, taking the additional time to counsel women for risk factors and educating them on the importance of prioritizing their own health, in addition to the health of their families, is imperative.

NPs should also develop strategies to educate women and reduce system barriers to adherence. Many improvements have occurred to make women aware of risk factors, treatment, and control. Programs such as Go Red for Women[®], Million Hearts[™], and the Heart Truth Professional Education Campaign[®] have made significant strides in improving cardiovascular health in women and reducing death and disability from CVD and stroke.

NPs face many challenges: lack of time available for patient visits, comorbidities, and lack of training in behavioral modification and reimbursement issues.¹⁵ At-risk populations of women who are nonadherent include those with low literacy level or low socioeconomic status, depression, older age, hearing impairment, poor cognitive function, and lack of fluency in English.^{4,16} However, more research is needed to develop evidence and effectiveness-based methods to improve adherence in all of these women.

Areas of Further Research

Research related to the identification of nontraditional risk factors and novel risk markers is ongoing. However, this research is not currently recommended

by the guidelines for use in risk stratification for women. New imaging technologies are also under investigation, although these variables remain topics for research.

CONCLUSION

Despite declining mortality rates from CVD and improvements in knowledge of heart disease, symptoms, and preventive behaviors compared to 15 years ago, challenges lie ahead. NPs should remain diligent in assessing and treating women who are at risk for CVD throughout their lifespan. Pregnancy complications and atypical symptoms should alert the NP to assess for risk of CVD.

Lifestyle adaptation is the cornerstone for primary and secondary prevention of CVD. NPs should advocate for policy changes, such as referral of eligible women to cardiac rehabilitation and other formal secondary prevention programs and further research in risk stratification. Furthermore, NPs should use innovative educational strategies, such as those incorporating motivational interviewing, to empower patients to be increase adherence to living a heart-healthy lifestyle. Finally, NPs should strive to obtain BP and cholesterol levels within the targeted range through pharmacologic therapy and lifestyle measures to improve outcomes, especially for those at highest risk. **JNP**

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