

From the:

**Effectiveness-Based Guidelines for the  
Prevention of Cardiovascular Disease in Women—2011 Update**



## Guidelines for Preventing CVD in Women

### Lifestyle Interventions

#### Cigarette smoking

Women should be advised not to smoke and to avoid environmental tobacco smoke. Provide counseling at each encounter, nicotine replacement, and other pharmacotherapy as indicated in conjunction with a behavioral program or formal smoking cessation program (**Class I; Level of Evidence B**).

#### Physical activity

Women should be advised to accumulate at least 150 min/wk of moderate exercise or 75 min/wk of vigorous exercise, or an equivalent combination of moderate-and-vigorous-intensity aerobic physical activity. Aerobic activity should be performed in episodes of at least 10 min, preferably spread throughout the week (**Class I; Level of Evidence B**).

Women should also be advised that additional cardiovascular benefits are provided by increasing moderate-intensity aerobic physical activity, to 5 h (300 min) per week or 2 h, 30 min per week of vigorous-intensity physical activity, or an equivalent combination of both (**Class I; Level of Evidence B**).

Women should be advised to engage in muscle-strengthening activities that involve all major muscle groups performed on  $\geq 2$  d per week (**Class I; Level of Evidence B**).

Women who need to lose weight or sustain weight loss should be advised to accumulate a minimum of 60 to 90 min of at least moderate-intensity physical activity (eg, brisk walking) on most, and preferably all, days of the week (**Class I; Level of Evidence B**).

#### Cardiac rehabilitation

A comprehensive CVD risk-reduction regimen, such as 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 or coronary revascularization, new-onset or chronic angina, (**Class I; Level of Evidence A**) or current/prior symptoms of heart failure and an LVEF  $\leq 35\%$ , recent cerebrovascular event, or peripheral arterial disease (**Class I; Level of Evidence B**).

#### Dietary intake

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; limit intake of saturated fat, cholesterol, alcohol, sodium and sugar, and avoid *trans*-fatty acids (**Class I; Level of Evidence B**). See Appendix.

*Note: Pregnant women ought to be counseled to avoid eating fish with the potential for the highest level of mercury contamination (eg, shark, swordfish, king mackerel, or tilefish).*

#### 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/m<sup>2</sup> in US women), waist size (eg,  $< 35$  inches), or other target metric of obesity (**Class I; Level of Evidence B**).

#### Omega-3 fatty acids

Consumption of omega-3 fatty acids in the form of fish or in capsule form (eg, EPA 1800 mg/d) may be considered in women with hypercholesterolemia and/or hypertriglyceridemia for primary and secondary prevention (**Class IIb; Level of Evidence B**).

*Note: Fish oil dietary supplements may have widely variable amounts of EPA and DHA (likely the only active ingredients).*

## Major Risk Factor Interventions

### Blood pressure: optimal level and lifestyle

An optimal blood pressure 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 (**Class I; Level of Evidence B**).

### Blood pressure: pharmacotherapy

Pharmacotherapy is indicated when blood pressure is  $\geq 140/90$  mm Hg ( $\geq 130/80$  mm Hg in the setting of chronic kidney disease and diabetes). Thiazide diuretics should be part of the drug regimen for most patients unless contraindicated or if there are compelling indications for other agents in specific vascular diseases. Initial treatment of high-risk women with acute coronary syndrome or MI should be with  $\beta$ -blockers and/or ACE inhibitors/ARBs, with addition of other drugs such as thiazides as needed to achieve goal blood pressure (**Class I; Level of Evidence A**).

*Note: ACE inhibitors are contraindicated in pregnancy and ought to be used with caution in women who may become pregnant.*

### Lipid and lipoprotein levels: optimal levels and lifestyle

The following levels of lipids and lipoproteins in 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 (**Class I; Level of Evidence B**).

### Lipids: pharmacotherapy for LDL-C lowering, high-risk women

LDL-C-lowering drug therapy is recommended simultaneously with lifestyle therapy in women with CHD to achieve an LDL-C <100 mg/dL (**Class I; Level of Evidence A**) and is also indicated in women with other atherosclerotic CVD or diabetes mellitus or 10-year absolute risk >20% (**Class I; Level of Evidence B**).

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) with CHD and may require an LDL-lowering drug combination (**Class IIa; Level of Evidence B**).

### Lipids: pharmacotherapy for LDL-C lowering, other at-risk women

LDL-C-lowering with lifestyle therapy is useful if LDL-C level is  $\geq 130$  mg/dL and there are multiple risk factors and 10-year absolute CHD risk 10% to 20% (**Class I; Level of Evidence B**).

LDL-C-lowering is useful with lifestyle therapy if LDL-C level is  $\geq 160$  mg/dL and multiple risk factors even if 10-year absolute CHD risk is <10% (**Class I; Level of Evidence B**).

LDL-C-lowering with lifestyle therapy is useful if LDL  $\geq 190$  mg/dL regardless of the presence or absence of other risk factors or CVD (**Class I; Level of Evidence B**).

In women >60 years of age and with an estimated CHD risk >10%, statins could be considered if hsCRP >2 mg/dL after lifestyle modification and no acute inflammatory process is present (**Class IIb; Level of Evidence B**).

### Lipids: pharmacotherapy for low HDL-C or elevated non-HDL-C

Niacin or fibrate therapy can be useful when HDL-C is low (<50 mg/dL) or non-HDL-C is elevated (>130 mg/dL) in high-risk women after LDL-C goal is reached (**Class IIb; Level of Evidence B**).

### Diabetes mellitus

Lifestyle and pharmacotherapy can be useful in women with diabetes to achieve an HbA<sub>1C</sub> <7% if this can be accomplished without significant hypoglycemia (**Class IIa; Level of Evidence B**).

## Preventive Drug Interventions

### Aspirin: high-risk women

Aspirin therapy (75–325 mg/d) should be used in women with CHD unless contraindicated (**Class I; Level of Evidence A**). Aspirin therapy (75–325 mg/d) is reasonable in women with diabetes mellitus unless contraindicated (**Class IIa; Level of Evidence B**).  
If a high-risk woman has an indication but is intolerant of aspirin therapy, clopidogrel should be substituted (**Class I; Level of Evidence B**).

### Aspirin: other at-risk or healthy women

Aspirin therapy can be useful in women and in women  $\geq 65$  years of age, (81 mg daily or 100 mg every other day) if blood pressure is controlled and benefit for ischemic stroke and MI prevention is **likely to outweigh risk** of gastrointestinal bleeding and hemorrhagic stroke (**Class IIa; Level of Evidence B**) and may be reasonable for women  $< 65$  years of age for ischemic stroke prevention (**Class IIb; Level of Evidence B**).

### Aspirin: atrial fibrillation

Aspirin 75–325 mg should be used in women with chronic or paroxysmal atrial fibrillation with a contraindication to warfarin or at low risk of stroke ( $< 1\%$  per year or CHADS2 score of  $< 2$ )<sup>140</sup> (**Class I; Level of Evidence A**).

### Warfarin\*: atrial fibrillation

For women with chronic or paroxysmal atrial fibrillation, warfarin should be used to maintain the INR at 2.0 to 3.0 unless they are considered to be at low risk for stroke ( $< 1\%$  per year or high risk of bleeding) (**Class I; Level of Evidence A**). 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) (**Class I; Level of Evidence: B**).

### $\beta$ -Blockers

$\beta$ -Blockers should be used for up to 12 months (**Class I; Level of Evidence A**) and up to 3 years (**Class I; Level of Evidence B**) in all women after MI or ACS with normal left ventricular function unless contraindicated.  
Chronic  $\beta$ -blocker therapy should be used indefinitely for women with left ventricular failure unless contraindications are present (**Class I; Level of Evidence A**).  
Chronic  $\beta$ -blocker therapy may be considered in other women with coronary or vascular disease and normal left ventricular function (**Class IIb; Level of Evidence C**).

### ACE inhibitors/ARBs

ACE inhibitors should be used (unless contraindicated) in women after MI and in those with clinical evidence of heart failure or an LVEF  $\leq 40\%$  or with diabetes mellitus (**Class I; Level of Evidence A**).  
In women after MI and in those with clinical evidence of heart failure or an LVEF  $\leq 40\%$  or with diabetes mellitus who are intolerant of ACE inhibitors, ARBs should be used instead (**Class I; Level of Evidence B**).  
*Note: ACE inhibitors are contraindicated in pregnancy and ought to be used with caution in women who may become pregnant.*

### Aldosterone blockade

Use of aldosterone blockade (eg, spirololactone) after MI is indicated in women who do not have significant hypotension, renal dysfunction or hyperkalemia who are already receiving therapeutic doses of an ACE inhibitor and  $\beta$ -blocker, and have LVEF  $\leq 40\%$  with symptomatic heart failure (**Class I; Level of Evidence B**).

LVEF indicates left ventricular ejection fraction; BMI, body mass index; EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid; ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; LDL-C indicates low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; CHD, coronary heart disease; CVD, cardiovascular disease; ACS, acute coronary syndrome; hsCRP, high-sensitivity C-reactive protein; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>; MI, myocardial infarction; CHADS2, Congestive heart failure, Hypertension, Age, Diabetes, prior Stroke; and INR, international normalized ratio.

## Explanation of Recommendation Classifications

<b>Classification</b>	<b>Strength of Recommendation</b>
Class I	Intervention is useful and effective
Class IIa	Weight of evidence/opinion is in favor of usefulness/efficacy
Class IIb	Usefulness/efficacy is less well-established by evidence/opinion
Class III	Procedure/test not helpful OR treatment has no proven benefit
Class III	Procedure/test excess cost without benefit or harmful OR treatment harmful to patients
<b>Level of Evidence</b>	
A	Sufficient evidence from multiple randomized trials
B	Limited evidence from single randomized trial or other non-randomized studies
C	Based on expert opinion, case studies or standard of care