# Intervention Recommendations with Class of Recommendation and Level of Evidence

## RISK:

**Goal:** to identify people who will benefit from risk reduction strategies

2. Risk factors used in the calculator: age, sex, race, total and HDL cholesterol, systolic bp, antihypertensive therapy, diabetes, and current smoking status.
3. Estimate 10-year risk for a first hard ASCVD event in those 40 to 79 years of age. (IB - IIbC)
4. May consider four markers if treatment decision is uncertain after estimating family history (easiest to consider clinically)
5. High-sensitivity C-reactive protein (hs-CRP)
6. Ankle-brachial index (ABI)
7. Corony artery calcium (CAC) score (IIbB)

## BLOOD PRESSURE CONTROL:

### Women: An optimal blood pressure of <120/80 mm Hg through lifestyle

**Goal:** <140/90 mm Hg

**JNC 8 Goals:** Different treatment targets, less aggressive targets in elderly, simplified drug protocols

**Note:** The writing committee did not think that the 2006 recommendations for blood pressure control (below) should be modified at this time. The writing committee anticipates that the recommendations will be reviewed when the updated JNC guidelines are released.

### Class I

1. All patients should be counseled regarding the need for lifestyle modification: weight control; increased physical activity; alcohol moderation; sodium reduction; and emphasis on increased consumption of fresh fruits, vegetables, and low-fat dairy products. (B)
2. Patients with blood pressure ≥140/90 mm Hg should be treated, as tolerated, with blood pressure medication, treating initially with β-blockers and/or ACE inhibitors, with addition of other drugs as needed to achieve goal blood pressure. (A)

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

1. Age ≥60, bp <150/90 (A)
2. Age <60, bp <140/90 (A)
3. Age >18+Diabetes OR >18+CKD, bp <140/90 (E)
4. If black, 1st treatment option: thiazide-type diuretic or CCB (C)
5. If nonblack, 1st treatment option: thiazide-type diuretic, CCB, ACE inhibitor, or ARB (B)
6. Age >18+CKD, 1st treatment option (regardless of race or diabetes): ACE inhibitor or ARB (B) 4

### Note: The same recommendations apply to all groups of primary- and secondary-prevention patients to focus efforts to reduce ASCVD events. "Intensity" of statin therapy achieves relative reductions in LDL cholesterol.

## LIPID MANAGEMENT:

**Goal:** Treatment with statin therapy; use statin therapy to achieve an LDL-C of <100 mg/dL, for very high risk patients an LDL-C <70 mg/dL is reasonable; if triglycerides are ≥200 mg/dL, non–HDL-C should be <130 mg/dL, whereas non–HDL-C <100 mg/dL for very high risk patients is reasonable

**Women: optimal levels encouraging through lifestyle approaches**

- LDL-C <100 mg/dL
- HDL-C ≥50 mg/dL
- triglycerides <150 mg/dL, non–HDL-C <100 mg/dL (total cholesterol minus HDL-C) <130 mg/dL (Class I; Level of Evidence B).

**Note:** The writing committee anticipates that the recommendations will be reviewed when the updated ATP guidelines are released.

### Class I

1. A lipid profile in all patients should be established, and for hospitalized patients, lipid-lowering therapy as recommended below should be initiated before discharge. (B)
2. Lifestyle modifications including daily physical activity and weight management are strongly recommended for all patients. (B)
3. Dietary therapy for all patients should include reduced intake of saturated fats (to <7% of total calories), trans fatty acids (to <1% of total calories), and cholesterol (to <200 mg/d). (B)
4. In addition to therapeutic lifestyle changes, statin therapy should be prescribed in the absence of contraindications or documented adverse effects. (A)
5. An adequate dose of statin should be used that reduces LDL-C to <100 mg/dL AND achieves at least a 30% lowering of LDL-C. (C)
6. Patients who have triglycerides ≥200 mg/dL should be treated with statins to lower non–HDL-C <130 mg/dL. (B)
7. Patients who have triglycerides >500 mg/dL should be started on fibrate therapy in addition to statin therapy to prevent acute pancreatitis. (C)

### Class IIa

1. It is reasonable to treat very high-risk patients with statin therapy to lower LDL-C to <70 mg/dL. (C)
2. In patients who are at very high risk and who have triglycerides ≥200 mg/dL, a non–HDL-C goal of <100 mg/dL is reasonable. (B)

### Class IIb

1. The use of ezetimibe may be considered for patients who do not tolerate or achieve target LDL-C with statins, bile acid sequestrants, and/or niacin. (C)
2. If patients who continue to have an elevated non–HDL-C while on adequate statin therapy, niacin§ or fibrate< therapy is recommended. (B)
3. For all patients, it may be reasonable to recommend omega-3 fatty acids from fish oil or fish oil capsules (1 g/d) for cardiovascular disease risk reduction. (B)

### Women: Note: 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).

- LDL-C <130 mg/dL, there are multiple risk factors, and the 10- y absolute CHD risk is 10% to 20%; OR if LDL-C level is ≥190 mg/dL regardless of the presence or absence of other risk factors or CVD (Class I; Level of Evidence B).

- LDL-C <100 mg/dL 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).

### Note: hs-CRP may be used as a measure of risk; however, evidence is insufficient to recommend testing. This test is not currently covered by Medicare and may not be covered by other health plans.

## ATP 4 Goal: Does not recommend treating to level; add statin to reduce cholesterol

- Individuals ≤75 years of age with clinical ASCVD, HIGH (A)
- Individuals with LDL-cholesterol levels >190 mg/dL, such as familial hypercholesterolemia, HIGH (IB)
- Individuals with diabetes aged 40 to 75 years old with LDL-cholesterol levels between 70 and 189 mg/dL and without evidence of atherosclerotic cardiovascular disease, MODERATE, unless 10 year risk is also >7.5%, then HIGH (IIaB)

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### Coronary Artery Disease (CAD) — Summary of Medical Guidelines

Effectiveness-Based Guidelines for the Prevention of Cardiovascular Disease in Women - 2011 Update: A Guideline From the American Heart Association

**LIFESTYLE:**

**Goal:** prevent progression to cardiovascular disease in at-risk patients.

| **WEIGHT MANAGEMENT:** | **Goals:** Body mass index: 18.5 to 24.9 kg/m².¹,²,³  
**Goat:** For overweight or obese, the initial goal is the loss of 5% to 10% of baseline weight within 6 months.⁴  

| **DIET:**  
1. Advise adults who would benefit from LDL-C lowering* to:  
   - Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontraditional vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats. (IA)  
   - Aim for a dietary pattern that achieves 5% to 6% of calories from saturated fat. (IA)  
   - Reduce percent of calories from saturated and trans fat. (IA)  
2. Advise adults who would benefit from BP lowering to:  
   - Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontraditional vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats. (IA)  
   - Lower sodium intake. (IA)  
   - Consume no more than 2,400 mg of sodium/day (IIaB)  
   - Further reduction of sodium intake to 1,500 mg/day is desirable if it is associated with even greater reduction in BP. (IIaB)  
   - Reduce intake by at least 1,000 mg/day since that will lower BP, even if the desired daily sodium intake is not yet achieved. (IIaB)  
3. PHYSICAL ACTIVITY:  
   - In general, advise adults to engage in aerobic physical activity to reduce LDL-C and non-HDL-C: 3 to 4 sessions a week, lasting on average 40 minutes per session, and involving moderate-to-vigorous intensity physical activity.⁴ (IIaA)  

| **SMOKING:**  
**Goal:** Complete cessation. No exposure to environmental tobacco smoke.³  

| **WEIGHT MANAGEMENT:** | **Goals:** Body mass index: 18.5 to 24.9 kg/m².¹,²,³  
**Goal:** For overweight or obese, the initial goal is the loss of 5% to 10% of baseline weight within 6 months.⁴  

| **DIET:**  
1. Calculate BMI at annual visits or more frequently. (IC)  
2. BMI ranges:  
   - <18.5 (underweight)  
   - 18.5 to 20 (normal)  
   - 20 to 24.9 (overweight)  
   - 25 to 29.9 (class I obese)  
   - 30 to 34.9 (class II obese)  
   - 35 to 39.9 (class III obese)  
3. BMI may be used to identify adults who may be at elevated risk of CVD (overweight) and at elevated risk of mortality from all causes (obese) (IB)  
4. Measure waist circumference at annual visits or more frequently. (IIaB)  
5. Waist circumference ≥ 40 inches (men), ≥ 35 inches (women) at increased risk (IIaB)  
6. Weight loss encouraged at BMI ≥ 25 with 1 comorbidity (including waist circumference)  
7. Clinically meaningful health improvements can be seen with 3% to 5% loss, although goal is usually 5% to 10% loss. (IA)  
8. Prescribe a diet to achieve reduced calorie intake for obese or overweight individuals who would benefit from weight loss, as part of a comprehensive lifestyle intervention. (IA)  
9. No one eating plan is recommended.  
10. Advise overweight and obese individuals who would benefit from weight loss to participate for ≥6 months in a comprehensive lifestyle program that assists participants in adhering to a lower calorie diet and in increasing physical activity through the use of behavioral strategies. (IA)  
   
   - providing advice on how to increase physical activity and reduce calorie intake for at least 6 months or longer as part of an on-site, high-intensity program, either in group or individual sessions, with a qualified healthcare provider (IA)  
   - but if this option is unavailable, approaches such as web-based, telephone, or even some commercial programs can be used (IIaA)  
11. Bariatric surgery referral  
   - in patients with a BMI of ≥35 and 1 comorbidity or a BMI of 40 or more (IIaA)  

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- There is insufficient evidence to recommend for or against bariatric surgery at a BMI<35 (n/a).
- Reviewed only through 2011 (new drugs).
- Treatment algorithm based on expert opinion.
  - BMI of 330 or 327 with comorbidities
  - 12 weeks treatment (FDA recommended)

### DIABETES MANAGEMENT: Type 2 diabetes mellitus management

<table>
<thead>
<tr>
<th>Class</th>
<th>Recommendation</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>1. Care for diabetes should be coordinated with the patient’s primary care physician and/or endocrinologist. (C)</td>
</tr>
<tr>
<td>lb</td>
<td>1. Metformin is an effective first-line pharmacotherapy and can be useful if not contraindicated. (A)</td>
</tr>
<tr>
<td>Ia</td>
<td>2. It is reasonable to individualize the intensity of blood sugar–lowering interventions based on the individual patient’s risk of hypoglycemia during treatment. (C)</td>
</tr>
<tr>
<td>Ia</td>
<td>2. Metformin is an effective first-line pharmacotherapy and can be useful if not contraindicated. (A)</td>
</tr>
<tr>
<td>lb</td>
<td>2. A target HbA1c of &lt;7% may be considered. (C)</td>
</tr>
<tr>
<td>Ia</td>
<td>3. Less stringent HbA1c goals may be considered for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, or extensive comorbidities, or those in whom the goal is difficult to attain despite intensive therapeutic interventions. (C)</td>
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### DEPRESSION:

<table>
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<tbody>
<tr>
<td>Ia</td>
<td>1. For patients with recent coronary artery bypass graft surgery or myocardial infarction, it is reasonable to screen for depression if patients have access to case management, in collaboration with their primary care physician and a mental health specialist. (B)</td>
</tr>
<tr>
<td>lb</td>
<td>1. Treatment of depression has not been shown to improve cardiovascular disease outcomes but may be reasonable for its other clinical benefits. (C)</td>
</tr>
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### INFLUENZA VACCINATION:

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<tbody>
<tr>
<td>I</td>
<td>1. Patients with cardiovascular disease should have an annual influenza vaccination. (B)</td>
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**Women: not specifically mentioned**

### CARDIAC REHABILITATION:

<table>
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<th>Class</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>I</td>
<td>1. All eligible patients with ACS or whose status is immediately post coronary artery bypass surgery or post-PCI should be referred to a comprehensive outpatient cardiovascular rehabilitation program either prior to hospital discharge or during the first follow-up office visit. (A)</td>
</tr>
<tr>
<td>I</td>
<td>2. All eligible outpatients with the diagnosis of ACS, coronary artery bypass surgery or PCI (A), chronic angina (B), and/or peripheral artery disease (A) within the past year should be referred to a comprehensive outpatient cardiovascular rehabilitation program.</td>
</tr>
<tr>
<td>I</td>
<td>3. A home-based cardiac rehabilitation program can be substituted for a supervised, center-based program for low-risk patients. (A)</td>
</tr>
<tr>
<td>I</td>
<td>1. A comprehensive exercise-based outpatient cardiac rehabilitation program can be safe and beneficial for clinically stable outpatients with a history of heart failure. (B)</td>
</tr>
</tbody>
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ApoB = apolipoprotein B; ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; bp = blood pressure; CKD = Chronic kidney disease; CIMT = carotid intima-media thickness; CVD = cardiovascular disease; FDA = Food and Drug Administration
ANTIPATELLE AGENTS/ANTICOAGULANTS:

Class I
1. Aspirin 75–162 mg daily is recommended in all patients with coronary artery disease unless contraindicated. (A)
   - Clopidogrel 75 mg daily is recommended as an alternative for patients who are intolerant of or allergic to aspirin. (B)
2. A P2Y12 receptor antagonist in combination with aspirin is indicated in patients after ACS or PCI with stent placement. (A)
   - For patients receiving a bare-metal stent or drug-eluting stent during PCI for ACS, clopidogrel 75 mg daily, prasugrel 10mg daily, or ticagrelor 90 mg twice daily should be given for at least 12 months. (A)
3. For patients undergoing coronary artery bypass grafting, aspirin should be started within 6 hours after surgery to reduce saphenous vein graft closure. Dosing regimens ranging from 100 to 325 mg daily for 1 year appear to be efficacious. (A)
4. In patients with extracranial carotid or vertebral atherosclerosis who have had ischemic stroke or TIA, treatment with aspirin alone (75–325 mg daily), clopidogrel alone (75 mg daily), or the combination of aspirin plus extended-release dipyridamole (25 mg and 200 mg twice daily, respectively) should be started and continued. (B)
5. For patients with symptomatic atherosclerotic peripheral artery disease of the lower extremity, antiplatelet therapy with aspirin (75–325 mg daily) or clopidogrel (75 mg daily) should be started and continued. (A)
6. Antiplatelet therapy is recommended in preference to anticoagulant therapy with warfarin or other vitamin K antagonists to treat patients with atherothrombosis. (A)
   - If there is a compelling indication for anticoagulant therapy, such as atrial fibrillation, prosthetic heart valve, left ventricular thrombus, or concomitant venous thromboembolic disease, warfarin should be administered in addition to the low-dose aspirin (75–81 mg daily). (A)
   - For patients requiring warfarin therapy, aspirin should be administered to achieve the recommended INR for the specific condition. (B)
   - Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding and should be monitored closely. (A)

Class IIa
1. If the risk of morbidity from bleeding outweighs the anticipated benefit afforded by thienopyridine therapy after stent implantation, earlier discontinuation (eg, <12 months) is reasonable. (C) (Note: the risk for serious cardiovascular events because of early discontinuation of thienopyridines is greater for patients with drug-eluting stents than those with bare-metal stents.)
2. After PCI, it is reasonable to use 81 mg of aspirin per day in preference to higher maintenance doses. (B)
3. For patients undergoing coronary artery bypass grafting, clopidogrel (75 mg daily) is a reasonable alternative in patients who are intolerant of or allergic to aspirin. (C)

Class IIb
1. The benefits of aspirin in patients with asymptomatic peripheral artery disease of the lower extremities are not well established. (B)
2. Combination therapy with both aspirin 75 to 162 mg daily and clopidogrel 75 mg daily may be considered in patients with stable coronary artery disease. (B)

RENNIN-ANGIOTENSIN ALDOSTERONE SYSTEM BLOCKERS:

Class I
1. ACE inhibitors should be started and continued indefinitely in all patients with left ventricular ejection fraction <40% and in those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. (A)
2. Use of aldosterone blockade (eg, spironolactone) 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 β-blocker and have LVEF ≤ 40% with symptomatic heart failure (Class I; Level of Evidence B). (A)
3. The use of ARBs is recommended in patients who have heart failure or who have had a myocardial infarction with left ventricular ejection fraction <40% and who are ACE-inhibitor intolerant. (A)
4. Women: ACE inhibitors are contraindicated in pregnancy and ought to be used with caution in women who may become pregnant. (A)
5. Women: ARBs are contraindicated in pregnancy. (A)

Class IIa
1. It is reasonable to use ARBs in other patients who are ACE-inhibitor intolerant. (B)

Class IIb
1. The use of ARBs in combination with an ACE inhibitor is not well established in those with systolic heart failure. (A)

β-BLOCKERS:

Class I
1. β-blocker therapy should be used in all patients with left ventricular systolic dysfunction (ejection fraction <40%) with heart failure or prior myocardial infarction, unless contraindicated. (Use should be limited to carvedilol, metoprolol succinate, or bisoprolol, which have been shown to reduce mortality.) (A)
2. β-blocker therapy should be started and continued for 3 years in all patients with normal left ventricular function who have had myocardial infarction or ACS. (B)
3. It is reasonable to give β-blocker therapy in patients with left ventricular systolic dysfunction (ejection fraction ≤40%) without heart failure or prior myocardial infarction. (C)

Class IIa
1. β-blockers may be considered as chronic therapy for all other patients with coronary or other vascular disease. (C)

Class IIb
1. β-blockers should be used for up to 12 mo (Class I; Level of Evidence A) or up to 3 y (Class I; Level of Evidence B) in all women after MI or ACS with normal left ventricular function unless contraindicated. (B)
2. Women: β-blockers should be used for up to 12 mo (Class I; Level of Evidence A) or up to 3 y (Class I; Level of Evidence B) in all women after MI or ACS with normal left ventricular function unless contraindicated. (B)

[Note: Close monitoring of serum potassium recommended, especially in patients also on ACE inhibitors or ARBs.]

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JNC indicates the report of the National Heart, Lung, and Blood Institute’s Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure guidelines; ACE, angiotensin-converting enzyme; ATP, Adult Treatment Panel; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; HbA1c, hemoglobin A1c; ACS, acute coronary syndrome; PCI, percutaneous coronary intervention; TIA, transient ischemic attack; INR, international normalized ratio; and ARB, angiotensin receptor blocker. *Presence of established CVD plus (1) multiple major risk factors (especially diabetes), (2) severe and poorly controlled risk factors (especially continued cigarette smoking), (3) multiple risk factors of the metabolic syndrome (especially high triglycerides <200 mg/dL plus non–HDL-C <130 mg/dL with low HDL-C <40 mg/dL), and (4) patients with ACSs. †Non–HDL-C=total cholesterol minus HDL-C. ‡The use of bile acid sequestrants is relatively contraindicated when triglycerides are ≥200 mg/dL and is contraindicated when triglycerides are ≥500 mg/dL. §Dietary supplement niacin must not be used as a substitute for prescription niacin. ¶Pregnant and lactating women should limit their intake of fish to minimize exposure to methylmercury. #Estimated creatinine clearance should be >30 mL/min. **Potassium should be <5.0 mEq/L.

(These footnotes not specifically called out for women)2

Source: 1AHA/ACC Secondary Prevention and Risk Reduction Therapy for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2011 Update; Available at: http://circ.ahajournals.org/content/early/2011/11/01/CIR.0b013e318235eb4d.full.pdf; 2AHA Guideline: Effectiveness-Based Guidelines for the Prevention of Cardiovascular Disease in Women: Update, 2011; Available at: http://circ.ahajournals.org/content/116/23/2762.full.pdf; 32013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk; Available at: http://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437741.48606.98 42014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults (JNC 8); Available at: http://jama.jamanetwork.com/article.aspx?articleid=1791497 52013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults (ATP4); Available at: http://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437738.63853.7a 62013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk; Available at: http://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437740.48606.d1 72013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults; Available at: http://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437739.71477.ee

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