

AHA/ACC Guidelines for Preventing Heart Attack and Death in Patients With Atherosclerotic Cardiovascular Disease: 2001 Update

A Statement for Healthcare Professionals From the American Heart Association and the American College of Cardiology

Sidney C. Smith, Jr, MD; Steven N. Blair, PED; Robert O. Bonow, MD; Lawrence M. Brass, MD; Manuel D. Cerqueira, MD; Kathleen Dracup, RN, DNSc; Valentin Fuster, MD, PhD; Antonio Gotto, MD, DPhil; Scott M. Grundy, MD, PhD; Nancy Houston Miller, RN, BSN; Alice Jacobs, MD; Daniel Jones, MD; Ronald M. Krauss, MD; Lori Mosca, MD, PhD; Ira Ockene, MD; Richard C. Pasternak, MD; Thomas Pearson, MD, PhD; Marc A. Pfeffer, MD, PhD; Rodman D. Starke, MD; Kathryn A. Taubert, PhD

Since the original publication (in 1995) of the American Heart Association (AHA) consensus statement on secondary prevention, which was endorsed by the American College of Cardiology (ACC), important evidence from clinical trials has emerged that further supports the merits of aggressive risk reduction therapies for patients with atherosclerotic cardiovascular disease. As noted in that statement, aggressive risk factor management clearly improves patient survival, reduces recurrent events and the need for interventional procedures, and improves the quality of life for these patients.

The compelling evidence from recent clinical trials was the impetus to revise the 1995 guidelines (Table). As examples, the many lipid reduction trials have generated significant changes in the National Heart, Lung, and Blood Institute's Adult Treatment Panel III report. This report further defined target cholesterol levels, expanded indications for drug treatment, and initiated therapy earlier. Accumulating β -blocker data have resulted in broader indications for a larger patient group. The Heart Outcomes Prevention Evaluation (HOPE) trial has demonstrated the benefit of ACE inhibitor therapy in high-risk patients with cardiovascular disease without a history of an acute event. Further data from ongoing trials should provide insight into the potential benefits of treating lower risk patients with combined therapies. The Clopidogrel versus Aspirin in Patients at Risk of Ischemic Events (CAPRIE) trial has provided evidence for clopidogrel benefit in certain patients. Diabetes management recommendations have been updated to include recent guidelines from the

American Diabetes Association for risk factor management of diabetics and the growing body of evidence showing diabetics at high risk for cardiovascular events. The Heart and Estrogen/progestin Replacement Study (HERS) documented that hormone replacement therapy is ineffective for secondary prevention. The writing group revising this document also considered other important trials and reports, and they are included in the selected reading list.

In the 6 years since the guidelines were first published, 2 other developments have made them even more important in clinical care: the aging of the population continues to expand the number of patients living with a diagnosis of cardiovascular disease (now estimated at 12.4 million), and the multiple studies of the actual use of these recommended therapies in appropriate patients, while showing slow improvement, have continued to support the discouraging conclusion that a large proportion of patients in whom therapies are indicated are not receiving those therapies in actual clinical practice. The AHA and ACC continue to urge that all medical care settings in which these patients are managed organize a specific plan to identify appropriate patients, provide practitioners with useful reminder clues based on the guidelines, and continuously assess the success achieved in providing all appropriate therapies to all of the patients who can benefit from them.

Selected Reading

1. Adult Treatment Panel III. Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on

The American Heart Association makes every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

This statement was approved by the American Heart Association Science Advisory and Coordinating Committee in June 2001 and by the American College of Cardiology Board of Trustees in July 2001. A single reprint is available by calling 800-242-8721 (US only) or writing the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596. Ask for reprint No. 71-0214. To purchase additional reprints: up to 999 copies, call 800-611-6083 (US only) or fax 413-665-2671; 1000 or more copies, call 214-706-1466, fax 214-691-6342, or e-mail pubauth@heart.org. To make photocopies for personal or educational use, call the Copyright Clearance Center, 978-750-8400.

(*Circulation*. 2001;104:1577-1579.)

© 2001 American Heart Association, Inc.

Circulation is available at <http://www.circulationaha.org>

AHA/ACC Secondary Prevention for Patients With Coronary and Other Vascular Disease: 2001 Update

Goals	Intervention Recommendations		
Smoking: <u>Goal</u> complete cessation	Assess tobacco use. Strongly encourage patient and family to stop smoking and to avoid secondhand smoke. Provide counseling, pharmacological therapy, including nicotine replacement and bupropion, and formal smoking cessation programs as appropriate.		
BP control: <u>Goal</u> <140/90 mm Hg or <130/85 mm Hg if heart failure or renal insufficiency <130/80 mm Hg if diabetes	Initiate lifestyle modification (weight control, physical activity, alcohol moderation, moderate sodium restriction, and emphasis on fruits, vegetables, and low-fat dairy products) in all patients with blood pressure ≥ 130 mm Hg systolic or 80 mm Hg diastolic. Add blood pressure medication, individualized to other patient requirements and characteristics (ie, age, race, need for drugs with specific benefits) if blood pressure is not <140 mm Hg systolic or 90 mm Hg diastolic or if blood pressure is not <130 mm Hg systolic or 85 mm Hg diastolic for individuals with heart failure or renal insufficiency (<80 mm Hg diastolic for individuals with diabetes).		
Lipid management: <u>Primary goal</u> LDL <100 mg/dL	Start dietary therapy in all patients (<7% saturated fat and <200 mg/d cholesterol) and promote physical activity and weight management. Encourage increased consumption of omega-3 fatty acids. Assess fasting lipid profile in all patients, and within 24 hr of hospitalization for those with an acute event. If patients are hospitalized, consider adding drug therapy on discharge. Add drug therapy according to the following guide:		
	LDL <100 mg/dL (baseline or on-treatment) Further LDL-lowering therapy not required Consider fibrate or niacin (if low HDL or high TG)	LDL 100–129 mg/dL (baseline or on-treatment) Therapeutic options: Intensify LDL-lowering therapy (statin or resin*) Fibrate or niacin (if low HDL or high TG) Consider combined drug therapy (statin+fibrate or niacin) (if low HDL or high TG)	LDL ≥ 130 mg/dL (baseline or on-treatment) Intensify LDL-lowering therapy (statin or resin*) Add or increase drug therapy with lifestyle therapies
Lipid management: <u>Secondary goal</u> If TG ≥ 200 mg/dL, then non-HDL $\dagger$ should be <130 mg/dL	If TG ≥ 150 mg/dL or HDL <40 mg/dL: Emphasize weight management and physical activity. Advise smoking cessation. If TG 200–499 mg/dL: Consider fibrate or niacin <i>after</i> LDL-lowering therapy* If TG ≥ 500 mg/dL: Consider fibrate or niacin <i>before</i> LDL-lowering therapy* Consider omega-3 fatty acids as adjunct for high TG		
Physical activity: <u>Minimum goal</u> 30 minutes 3 to 4 days per week <u>Optimal</u> daily	Assess risk, preferably with exercise test, to guide prescription. Encourage minimum of 30 to 60 minutes of activity, preferably daily, or at least 3 or 4 times weekly (walking, jogging, cycling, or other aerobic activity) supplemented by an increase in daily lifestyle activities (eg, walking breaks at work, gardening, household work). Advise medically supervised programs for moderate- to high-risk patients.		
Weight management: <u>Goal</u> BMI 18.5–24.9 kg/m ²	Calculate BMI and measure waist circumference as part of evaluation. Monitor response of BMI and waist circumference to therapy. Start weight management and physical activity as appropriate. Desirable BMI range is 18.5–24.9 kg/m ² . When BMI ≥ 25 kg/m ² , goal for waist circumference is ≤ 40 inches in men and ≤ 35 inches in women.		
Diabetes management: <u>Goal</u> HbA _{1c} <7%	Appropriate hypoglycemic therapy to achieve near-normal fasting plasma glucose, as indicated by HbA _{1c} . Treatment of other risks (eg, physical activity, weight management, blood pressure, and cholesterol management).		
Antiplatelet agents/ anticoagulants:	Start and continue indefinitely aspirin 75 to 325 mg/d if not contraindicated. Consider clopidogrel 75 mg/d or warfarin if aspirin contraindicated. Manage warfarin to international normalized ratio=2.0 to 3.0 in post-MI patients when clinically indicated or for those not able to take aspirin or clopidogrel.		
ACE inhibitors:	Treat all patients indefinitely post MI; start early in stable high-risk patients (anterior MI, previous MI, Killip class II [S ₃ gallop, rales, radiographic CHF]). Consider chronic therapy for all other patients with coronary or other vascular disease unless contraindicated.		
β -Blockers:	Start in all post-MI and acute ischemic syndrome patients. Continue indefinitely. Observe usual contraindications. Use as needed to manage angina, rhythm, or blood pressure in all other patients.		

BP indicates blood pressure; TG, triglycerides; BMI, body mass index; HbA_{1c}, major fraction of adult hemoglobin; MI, myocardial infarction; and CHF, congestive heart failure.

*The use of resin is relatively contraindicated when TG >200 mg/dL.

$\dagger$ Non-HDL cholesterol=total cholesterol minus HDL cholesterol.

- detection, evaluation, and treatment of high blood cholesterol in adults. *JAMA*. 2001;285:2486–2497.
2. American Diabetes Association clinical practice recommendations 2001. *Diabetes Care*. 2001;24(suppl 1):s33–s43.
 3. Antiplatelet Trialists' Collaboration. Secondary prevention of vascular disease by prolonged antiplatelet treatment. *Br Med J (Clin Res Ed)*. 1988;296:320–331.
 4. Antiplatelet Trialists' Collaboration. Collaborative overview of randomised trials of antiplatelet therapy. I: prevention of death, myocardial infarction, and stroke by prolonged antiplatelet therapy in various categories of patients. *BMJ*. 1994;308:81–106.
 5. Braunwald E, Antman EM, Beasley JW, et al. ACC/AHA guidelines for the management of patients with unstable angina and non-ST-segment elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). *Circulation*. 2000;102:1193–1209.
 6. CAPRIE Steering Committee. A randomized, blinded trial of clopidogrel versus aspirin in patients at risk of ischemic events (CAPRIE). *Lancet*. 1996;348:1329–1339.
 7. Cairns JA, Markham BA. Economics and efficacy in choosing oral anticoagulants or aspirin after myocardial infarction. *JAMA*. 1995;273:965–967.
 8. DeBusk RF, Miller NH, Superko HR, et al. A case-management system for coronary risk factor modification after acute myocardial infarction. *Ann Intern Med*. 1994;120:721–729.
 9. Fletcher GF, Balady GJ, Amsterdam E, et al. Exercise standards for testing and training: a statement for healthcare professionals from the American Heart Association. *Circulation*. In press.
 10. Fonarow GC, Gawlinski A, Moughrabi S, et al. Improved treatment of coronary heart disease by implementation of a cardiac hospitalization atherosclerosis management program (CHAMP). *Am J Cardiol*. 2001;87:819–822.
 11. Gibbons RJ, Chatterjee K, Daley J, et al, and the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). Guidelines for the management of patients with chronic stable angina. *Circulation*. 1999;99:2828–2848.
 12. Grundy SM, Benjamin IJ, Burke GL, et al. Diabetes mellitus: a major risk factor for cardiovascular disease: a joint editorial by the American Diabetes Association, the National Heart, Lung, and Blood Institute, the Juvenile Diabetes Foundation International, the National Institute of Diabetes and Digestive and Kidney Diseases, and the American Heart Association. *Circulation*. 1999;100:1132–1133.
 13. Hambrecht R, Niebauer J, Marburger C, et al. Various intensities of leisure time physical activity in patients with coronary artery disease: effects on cardiorespiratory fitness and progression of coronary atherosclerotic lesions. *J Am Coll Cardiol*. 1993;22:468–477.
 14. Yusuf S, Sleight P, Pogue J, et al. Effects of an angiotensin-converting enzyme inhibitor, ramipril, on cardiovascular events in high-risk patients: the Heart Outcomes Prevention Evaluation (HOPE) Study Investigators. *N Engl J Med*. 2000;342:145–153.
 15. Hulley S, Grady D, Bush T, et al. Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women: Heart and Estrogen/progestin Replacement Study (HERS) Research Group. *JAMA*. 1998;280:605–613.
 16. Krumholz HM, Cohen BJ, Tsevat J, et al. Cost-effectiveness of a smoking cessation program after myocardial infarction. *J Am Coll Cardiol*. 1993;22:1697–1702.
 17. Mosca L, Collins P, Herrington DM, et al. Hormone replacement therapy and cardiovascular disease: a statement for healthcare professionals from the American Heart Association. *Circulation*. 2001;104:499–503.
 18. Timolol-induced reduction in mortality and reinfarction in patients surviving acute myocardial infarction. *N Engl J Med*. 1981;304:801–807.
 19. O'Keefe JH, Wetzel M, Moe RR, et al. Should an angiotensin-converting enzyme inhibitor be standard therapy for patients with atherosclerotic disease? *J Am Coll Cardiol*. 2001;37:1–8.
 20. Pearson T, Rapaport E, Criqui M, et al. Optimal risk factor management in the patient after coronary revascularization: a statement for healthcare professionals from an American Heart Association writing group. *Circulation*. 1994;90:3125–3133.
 21. Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). *Lancet*. 1994;344:1383–1389.
 22. Pepine CJ. Aspirin and newer orally active antiplatelet agents in the treatment of the post-myocardial infarction patient. *J Am Coll Cardiol*. 1998;32:1126–1128.
 23. Pfeffer MA. ACE inhibition in acute myocardial infarction. *N Engl J Med*. 1995;332:118–120.
 24. Pfeffer MA, Braunwald E, Moyé LA, et al, on behalf of the SAVE Investigators. Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction: results of the survival and ventricular enlargement trial. *N Engl J Med*. 1992;327:669–677.
 25. Pfeffer MA, Domanski M, Verter J, et al, for the PEACE Investigators. The continuation of the Prevention of Events with Angiotensin-Converting Enzyme inhibition (PEACE) trial. *Am Heart J*. 2001;142:375–377.
 26. Quinn TG, Alderman EL, McMillan A, et al. Development of new coronary atherosclerotic lesions during a 4-year multifactor risk reduction program: the Stanford Coronary Risk Intervention Project (SCRIP). *J Am Coll Cardiol*. 1994;24:900–908.
 27. Ryan TJ, Anderson L, Antman EM, et al. ACC/AHA guidelines for the management of patients with acute myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). *J Am Coll Cardiol*. 1996;28:1328–1428.
 28. Sharis PJ, Cannon CP, Loscalzo J. The antiplatelet effects of ticlopidine and clopidogrel. *Ann Intern Med*. 1998;129:394–405.
 29. The Sixth Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI). *Arch Intern Med*. 1997;157:2413–2446.
 30. Smith SC Jr, Blair SN, Criqui MH, et al. Preventing heart attack and death in patients with coronary disease. *Circulation*. 1995;92:2–4.
 31. Smith P, Arnesen H, Abdelnoor M. Effects of long-term anticoagulant therapy in subgroups after acute myocardial infarction. *Arch Intern Med*. 1992;152:993–997.
 32. Smith P, Arnesen H, Holme I. The effect of warfarin on mortality and reinfarction after myocardial infarction. *N Engl J Med*. 1990;323:147–152.
 33. Viscoli CM, Horwitz RJ, Singer BH. Beta-blockers after myocardial infarction: influence of first-year clinical course on long-term effectiveness. *Ann Intern Med*. 1993;118:99–105.

KEY WORDS: AHA Scientific Statements ■ prevention ■ risk factors
■ atherosclerosis