

# Aspirin in the Secondary Prevention of Cardiovascular Disease

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Cardiovascular disease causes one of every three deaths in the United States and costs this country about \$450 billion annually.<sup>1</sup> Each year, despite recent improvements in prevention and treatment, heart disease kills nearly 600,000 Americans, and stroke kills nearly 130,000. People with a history of atherosclerotic cardiovascular disease (e.g., myocardial infarction, stroke, or peripheral arterial disease) are at significantly elevated risk for a new or recurrent cardiovascular event and associated illness and death. It is estimated that more than 16 million U.S. adults are living with coronary heart disease, including prior myocardial infarction and angina, another 7 million have had a stroke, and approximately 8 million currently have peripheral arterial disease.<sup>2</sup>

Effective interventions for secondary prevention in these patients include lifestyle modifications such as smoking cessation, weight control, increased physical activity, and dietary modifications, as well as pharmacotherapy to control blood pressure and cholesterol levels. Another important evidence-based intervention is the use of aspirin and other antiplatelet agents (see the table in the Supplementary Appendix, available with the full text of this article at NEJM.org). With few exceptions, patients with coronary heart disease, peripheral arterial disease, or a history of ischemic stroke are candidates for aspirin use.

The role of aspirin in the secondary prevention of myocardial infarction, stroke, and death from vascular causes is well established.

Results from a meta-analysis of randomized trials of the Anti-

thrombotic Trialists' Collaboration have shown that aspirin can reduce the risk of recurrent major coronary events and stroke by 20% and 19%, respectively.<sup>3</sup> In addition, a more recent Australian study shows that aspirin use for secondary prevention not only provides a health outcomes benefit, but may also result in cost savings: the number needed to treat to prevent any type of event (nonfatal myocardial infarction, stroke, or death from any cause) was 48, and on average, the use of aspirin resulted in savings of \$69 per person.<sup>4</sup>

In light of this evidence, recent data from the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey of the Centers for Disease Control and Prevention on the recommended use of aspirin and other antiplatelet medications in adults for the secondary prevention of cardiovascular events are sobering. In 2007 to 2008, antiplatelet medications were prescribed at only 46.9% of visits for patients with ischemic vascular disease (a rate that was virtually unchanged from the 2005–2006 period). In addition, general medicine or primary care physicians prescribed antiplatelet medications for this population only 34.8% of the time (a decrease from 37.9% in 2005–2006).<sup>5</sup> The results of these surveys and the strong evidence of the benefit of aspirin in terms of cardiovascular outcomes underscore the substantial opportunity before clinicians and patients. Though some patients may not be receiving antiplatelet medications because of valid contraindications, the vast majority of these patients would be candidates.

Increasing aspirin use should be straightforward. Aspirin is an inexpensive, over-the-counter drug that need be taken only once a day. In addition, clinical management is relatively uncomplicated.

Though current guidelines reference a range of doses, the generally accepted dose is 81 mg and does not require adjustment. There are no screening tests needed or follow-up laboratory tests to guide aspirin therapy. From the patient's perspective, aspirin use does not require substantial behavior change or modification. Common barriers to aspirin use, such as lack of clarity regarding the benefit and mild but bothersome bruising, can be addressed through informed and shared decision making.

From the provider's perspective, the shifting guidance in the past regarding dosage and target population has contributed to less-than-optimal prescribing patterns. Uptake of current guidelines can be improved with focused communications to all members of the medical team and by embedding aspirin reminders within electronic health record systems. In addition, there are increasing numbers of incentives for clinicians and their organizations to focus on aspirin use for secondary prevention. The Physician Quality Reporting System includes measures of appropriate aspirin administration for secondary prevention and will, in 2013, allow eligible professionals to earn a 0.5% incentive payment (based on all the services they provide that are covered by Medicare Part B) by satisfactorily reporting on a set of quality measures that can include aspirin use. The quality

measures for accountable care organizations participating in the Medicare Shared Savings Program created by the Affordable Care Act also include measures of both daily aspirin use for patients with diabetes and ischemic vascular disease and use of aspirin or another antithrombotic agent for patients with ischemic vascular disease as part of their initial pay-for-reporting and subsequent pay-for-performance approaches. And the state-based Quality Improvement Organizations supported by the Centers for Medicare and Medicaid Services are working to increase the use of aspirin as a secondary preventive measure to improve the care of Medicare beneficiaries who present with ischemic heart disease.

Fortunately, there are also a number of broad public- and private-sector initiatives under way to increase awareness and appropriate use of aspirin in secondary prevention. First, **Million Hearts is a national initiative that aims to focus, coordinate, and enhance activities for cardiovascular disease prevention across the public and private sectors in an effort to prevent 1 million heart attacks and strokes by 2017.** Million Hearts is scaling up proven clinical and community strategies for preventing heart disease and stroke throughout the country by encouraging a targeted focus on aspirin for people at risk, blood-pressure control, cholesterol management, and smoking cessation. The program will be providing materials for health care providers and the public that assist in translating the evidence into practice and help in achieving excellence in a measure that profoundly affects health.

Second, **the appropriate administration of aspirin is an integral component of national efforts by**

many private and nonprofit organizations to improve the quality of cardiovascular care. For example, the prescription of aspirin at discharge for patients hospitalized for coronary heart disease or ischemic stroke has been a focus of the Get with the Guidelines Program of the American Heart Association and the Paul Coverdell National Acute Stroke Program of the Centers for Disease Control and Prevention. Counseling about regular use of aspirin is also one of the key ways to improve the quality of care and disease prevention in the outpatient setting according to the Guideline Advantage program, a joint effort by the American Heart Association, the American Cancer Society, and the American Diabetes Association. The PINNACLE (Practice Innovation and Clinical Excellence) program of the American College of Cardiology allows participating clinicians to track their performance in prescribing aspirin (among many other quality measures related to cardiovascular health) and provides benchmarks for comparison with other clinicians across millions of patient encounters.

There is an important and urgent opportunity to engage all health care providers, particularly primary care providers, in a singular, simple intervention with the potential to prevent heart attacks and strokes and save lives. Provision of aspirin to patients with coronary artery disease, atherosclerotic peripheral artery disease, or a history of cerebrovascular disease (transient ischemic attack or stroke) should be the norm; everyone without a contraindication should receive it. Clinicians need to be reminded of evidence-based guidelines through continuing education and profes-

sional activities. In addition, system-based interventions such as clinical decision support and reinforcement by each member of the care team can ensure that all those who can benefit from aspirin therapy receive it. Ultimately, many heart attacks and strokes can be prevented by simplifying the message to both clinicians and their patients with a history of coronary artery disease, peripheral vascular disease, or stroke and no allergy or recent history of bleeding: it's good medicine to take a daily low-dose aspirin.

The views expressed in this article are those of the authors and do not necessarily represent those of the U.S. Department of Health and Human Services or its operating divisions.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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DOI: 10.1056/NEJMp1213380

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