Reducing the Risk of Heart Attack and Stroke
The American Heart Association/American College of Cardiology Prevention Guidelines

Mariell Jessup, MD, FAHA, FACC; Elliott Antman MD, FAHA, MACC

Clinical Case
A 58-year-old man, JB, schedules a visit with his primary care physician to explore what he could do to prevent a heart attack or stroke. He previously considered himself in good health and is not aware of any medical problems or symptoms. His visit is prompted by his best friend having a heart attack and the recollection that his father suffered a massive heart attack at age 59.

JB continues to smoke ≈10 cigarettes a day. He plays an occasional game of pick-up basketball with friends but has a sedentary job. Over the past 20 years, he acknowledges that he has accumulated ≈25 pounds of excess weight. JB cautions his physician that he does not want to take a lot of pills, but is not clear how best to improve his chances of avoiding his father’s fate.

On physical examination, JB’s weight is 230 pounds, height 72 inches, corresponding to a body mass index of 31.2 kg/m², classified as obese. His blood pressure is 160/95 mmHg, heart rate 78 beat/min and regular. Apart from his truncal obesity, the remainder of his physical examination is normal. His physician orders blood work, a cholesterol panel, and a blood sugar. After the results are available, he begins a discussion with JB.

Strategies for the Prevention of Cardiovascular Disease
Approximately every 34 seconds, someone in the US has a heart attack. Research has shown that there are major risk factors which significantly increase the risk of angina pectoris, heart attack, stroke, and sudden cardiac death—all part of the cardiovascular disease (CVD) spectrum. The modifiable risk factors—factors that can be influenced by healthy behaviors—include hypertension, smoking, elevated blood cholesterol (lipids), and diabetes mellitus. The more risk factors a person has, the greater the chances of developing some form of CVD. Also, the greater the level of each risk factor, the greater the overall risk. Accordingly, clinicians want to provide their patients with the best possible advice as to the management of CVD risk to improve health outcomes. It was for this reason that the American Heart Association (AHA) and the American College of Cardiology (ACC) developed a suite of practice guidelines on the prevention of CVD, including the assessment of cardiovascular risk,1 the management of blood cholesterol,2 overweight and obesity,3 and recommendations about a healthy lifestyle.4

Clinical practice guidelines are scholarly statements that include recommendations for clinicians as they attempt to optimize patient care. In their absence, doctors and other healthcare providers must depend on their own reading of the scientific literature, their acquired knowledge of new therapeutic options, in addition to their experience and individual patient preferences. The committee writing a guideline starts with a systematic review of all relevant evidence—often including scores of scientific reports. Practice recommendations based on the evidence are designed to answer important clinical questions, such as the benefits and risks of various treatments. As new therapies or evidence becomes available, practice guidelines are routinely updated. The ACC/AHA...
Prevention Guidelines are actually an update from similar ones published ≈5 years ago.

The Prevention Guidelines recommend that the first step in a patient such as JB is to formally assess the individual’s CVD risk, to match the intensity of preventive efforts with the absolute risk of the disease. A risk calculator is used to estimate the 10-year risk of developing atherosclerotic cardiovascular disease (ASCVD). The calculator provides an approximation of the risk over the next 10 years of a first ASCVD event (a nonfatal heart attack or a coronary heart disease death, or a fatal or nonfatal stroke) among people free from ASCVD at the time of the initial assessment. The variables in the calculation are age, treated or untreated systolic blood pressure level, total cholesterol and high-density lipoprotein cholesterol (HDL-C) levels, current smoking status, and history of diabetes mellitus. After the 10-year risk is calculated a risk discussion should occur between the patient and their healthcare provider.

As shown in the Table, JB’s 10-year risk was initially calculated to be 19.0%, in contrast to an ASCVD risk of 4.8% in a man of his age without risk factors. This is primarily because JB continues to smoke cigarettes, and has an elevated systolic blood pressure. JB was horrified to see the results of his calculated risk, and vowed to discontinue cigarettes immediately. Fortunately, his blood sugar was within the normal range. JB’s physician turned to the Lifestyle Guidelines to recommend a diet and physical activity regimen designed to lower his blood pressure and improve his cholesterol panel. He reviewed the importance of a diet high in vegetables, fruits, and whole grains, including low-fat dairy products. Fish, legumes, and poultry were the suggested sources of protein; nontraditional vegetable oils and nuts provide healthy type oils. Moreover, he asked JB to limit sugar-sweetened beverages and red meats. Because of JB’s untreated hypertension, he noted that the guidelines further recommend a diet with no more than 2400 mg of sodium/d. He explained that an additional reduction of sodium intake to 1500 mg/d from all sources would lower his blood pressure even more. He encouraged JB to read the nutrition label of foods purchased at the supermarket and review the sodium content on the menu when dining out. His recommended dietary pattern can be achieved by following the DASH (Dietary Approaches to Stop Hypertension) diet, the USDA (the US Department of Agriculture) diet, or the AHA Diet (http://www.heart.org/HEARTORG/GettingHealthy/HealthyEating/Diet-and-Lifestyle-Recommendations).

JB wanted to understand the role of physical activity to help reduce his risk. The Lifestyle Guidelines recommend regular aerobic physical activity, 3 to 4 sessions a week, lasting on average 40 minutes per session, and involving moderate- to vigorous-intensity physical activity. Evidence has shown that this level of physical activity can reduce low-density lipoprotein cholesterol, increase high-density lipoprotein cholesterol, and lower blood pressure. To underscore the impact of JB’s increased weight, his physician cited the Guidelines for the Management of Overweight and Obesity. JB was counseled that at his weight level, a body mass index ≥30 kg/m² identifies adults at increased risk for CVD, type 2 diabetes mellitus, and all-cause mortality. However, his physician emphasized that even modest weight loss (3% to 5% of body weight) can result in clinically meaningful benefits for triglycerides, blood glucose, and development of diabetes mellitus. Greater weight loss (>5%) can further reduce blood pressure, improve lipids, and reduce the need of medications to control blood pressure, blood glucose, and lipids.

Reducing CVD Risk: Putting Recommendations Into Action

His physician asked JB to return for a second visit ≈3 months after his initial consultation. JB and his wife had eliminated much of their dietary sodium, and were consuming a heart healthy diet. Importantly, he had stopped cigarettes completely and was using a treadmill for at least 30 minutes daily. As a result, he had lost 10 pounds; his blood pressure was 140/85 mm Hg—a significant reduction compared with his last visit. His physician wanted to illustrate the impact of JB’s tobacco cessation and blood pressure control, so recalculated his 10-year ASCVD risk, using a repeat lipid panel blood test. As shown in the Table, his 2nd visit 10-year risk score was reduced to 8.5%, mostly attributable to his nonsmoking status and his lowered systolic blood pressure; his lipid panel had slightly improved as well. JB’s physician encouraged him to continue his healthy lifestyle.

Table. Risk Calculator Tool From the 2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk, and the Serial Results of the Sample Patient

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Range of Values</th>
<th>1st Visit: 1/15/14</th>
<th>2nd Visit: 3/15/14</th>
<th>3rd Visit: 9/15/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>M or F</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Age</td>
<td>20–79</td>
<td>58</td>
<td>58</td>
<td>59</td>
</tr>
<tr>
<td>Race</td>
<td>AA or WH</td>
<td>WH</td>
<td>WH</td>
<td>WH</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>130–320 mg/dL</td>
<td>&lt;170 mg/dL</td>
<td>200</td>
<td>190</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td>20–100 mg/dL</td>
<td>&gt;50 mg/dL</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>90–200 mm Hg</td>
<td>&lt;120 mm Hg</td>
<td>160</td>
<td>140</td>
</tr>
<tr>
<td>Rx for HTN</td>
<td>Y or N</td>
<td>N</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Diabetes MELLITUS</td>
<td>Y or N</td>
<td>N</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Smoker</td>
<td>Y or N</td>
<td>N</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>10-year ASCVD risk, %</td>
<td>4.8</td>
<td>19.0</td>
<td>8.5</td>
<td>7.8</td>
</tr>
</tbody>
</table>

AA indicates African American race; ACC, American College of Cardiology; AHA, American Heart Association; ASCVD, atherosclerotic cardiovascular disease; BP, blood pressure; HDL cholesterol, high-density lipoprotein cholesterol; HTN, hypertension; Rx, treatment for; and WH, white race.
Six months later, JB was seen for a third visit. He was conscious that he was now 59, the age at which his father succumbed to a heart attack. He was exercising 45 minutes daily, 5 days a week, with no cardiac symptoms; he had never smoked another cigarette since his first visit. On examination, his systolic blood pressure was still lower, 130 mmHg, consistent with his low sodium diet and his ongoing weight loss—a total of 20 pounds over the 9 months. His lipid panel was a bit better as well. But, JB was very disappointed to see that his 10-year risk score, 7.8%, was still over an optimal level for his age. His physician explained that the new Cholesterol Guidelines recommended that individuals without clinical ASCVD or diabetes mellitus, who are aged 40 to 75 years with low-density lipoprotein cholesterol between 70 to 189 mg/dL, and have an estimated 10-year ASCVD risk of 7.5% or higher should be considered for a statin (HMG-CoA reductase inhibitors), a class of drugs that are very effective in lowering cholesterol; their use has been shown to reduce the risk of heart attacks and stroke. At the end of this discussion, JB agreed to start a statin to help lower his risk of ASCVD. Because JB has never had a heart attack or stroke, as per the Guidelines, his physician prescribed a moderate intensity statin. The guidelines note that it is reasonable to assess ASCVD risk every 4 to 6 years in adults free from ASCVD. A return appointment for JB was scheduled for 1 year.

Disclosures
None.

References
Reducing the Risk of Heart Attack and Stroke: The American Heart Association/American College of Cardiology Prevention Guidelines
Mariell Jessup and Elliott Antman

Circulation. 2014;130:e48-e50
doi: 10.1161/CIRCULATIONAHA.114.010574

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2014 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/130/6/e48

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org//subscriptions/