



Evaluation of the Patient with Cardiovascular Disease

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DEFINITION AND EPIDEMIOLOGY

Cardiovascular disease is a major cause of morbidity and mortality around the world, and its spectrum is wide-reaching. Included in this population of patients are people with coronary artery disease (CAD), congestive heart failure, stroke, hypertension, peripheral arterial disease, atrial fibrillation and other arrhythmias, valvular disease, and congenital heart disease. In the United States alone, these diseases affect more than 82 million individuals at any given time. The impact of cardiovascular disease is unmistakable: It accounted for more inpatient hospital days in the years of 1990-2009 than other disorders such as chronic lung disease and cancer. The high number of inpatient days associated with cardiovascular disease led to a total economic cost of more than \$297 billion in the year 2008 alone. Cardiovascular disease was also the number one cause of death in the United States in 2008; more than half of these deaths were from CAD, which was the top cause of mortality among individuals older than 65 years of age.

Given these facts, the proper evaluation of a patient with cardiovascular disease can have a major impact on multiple fronts, from an economic standpoint as well as an individual's morbidity and mortality. Therefore, one must obtain a very thorough history and detailed physical examination to accurately assess and manage patients with cardiovascular disease.

PATHOLOGY

A patient with cardiovascular disease may have one or more of a number of problems. *Coronary artery disease*, discussed in depth in [Chapter 8](#), is a leading cause of morbidity and mortality. At presentation, patients with CAD may have stable angina or an acute coronary syndrome such as unstable angina, non-ST segment elevation myocardial infarction (NSTEMI), or ST segment elevation myocardial infarction (STEMI). For some patients, their first presentation with CAD is sudden cardiac death, the result of arrhythmia often caused by atherosclerosis of the coronary vasculature.

Congestive heart failure is the end result of many cardiac disorders and is generally classified as systolic or diastolic in etiology. Various forms of cardiomyopathy, such as dilated cardiomyopathy or hypertrophic cardiomyopathy, may lead to systolic dysfunction and a decline in ejection fraction. Without proper management, this will inevitably lead to alterations in hemodynamics that result in development of pulmonary vascular

congestion, edema, and a decline in functional capacity. Diastolic dysfunction can be present with systolic dysfunction and is often the result of uncontrolled hypertension or infiltrative disorders such as hemochromatosis or amyloidosis. Heart failure with a preserved ejection fraction is often caused by diastolic dysfunction. Various forms of heart failure are further discussed in [Chapter 5](#).

Stroke is caused by cerebral hypoperfusion, which can result from such problems as carotid disease, thromboembolism, or emboli of infectious origin. A more detailed discussion can be found in [Chapter 116](#).

Peripheral arterial disease (PAD), addressed in [Chapter 12](#), includes such entities as aneurysms of the ascending, descending, and abdominal aorta; aortic dissection; carotid disease; and atherosclerosis of branch vessels of the aorta and vessels in the limbs. PAD is often present in patients with CAD.

Atrial fibrillation and hypertension (see [Chapters 9](#) and [12](#)) are not uncommon and increase in prevalence with age. Although they are not typically the primary cause of mortality, these problems often predispose to other causes of cardiovascular disease mortality, such as stroke and heart failure. Arrhythmias other than atrial fibrillation are also common and can lead to significant morbidity and mortality.

Valvular heart disease may lead to cardiomyopathy and is found in all age groups.

Congenital heart disease includes a wide variety of disorders, ranging from valve abnormalities and coronary anomalies to cardiomyopathy and other structural abnormalities including shunts and malformations of the cardiac chambers. With advances in surgical techniques and medical therapy, these patients are often living beyond previous expectations, increasing the likelihood that they will live into adulthood. For more detailed information on congenital heart diseases, see [Chapter 6](#).

CLINICAL PRESENTATION

There have been major advances in technology over the years that allow for specialized testing to assist in the diagnosis of cardiovascular diseases. We now rely on such tests as angiography, ultrasound scanning, and advanced imaging modalities such as high-resolution computed tomography and magnetic resonance imaging to determine how to manage an individual case. However, these techniques should be used not as a primary method of assessment but rather to supplement the findings from a thorough history and physical examination. Despite the availability