01 - SECTION 1 Introduction to Cardiovascular Disorders

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Disorders of the Cardiovascular System PART 6 Section 1 Introduction to Cardiovascular Disorders Joseph Loscalzo

Approach to the

Patient with Possible Cardiovascular Disease ■ ■THE MAGNITUDE OF THE PROBLEM Cardiovascular diseases comprise the most prevalent serious disor ders in industrialized nations and are a rapidly increasing problem in developing nations (Chap. 245). Age-adjusted death rates for coronary heart disease have declined by two-thirds in the past four decades in the United States, reflecting the identification and reduction of risk factors as well as improved treatments and interventions for the management of coronary artery disease, arrhythmias, and heart failure. Nonetheless, car diovascular diseases remain the most common causes of death, respon sible for nearly 700,000 deaths each year. Approximately one-third of these deaths are sudden. In addition, cardiovascular diseases are highly prevalent, diagnosed in nearly half of the adult population. The growing prevalence of obesity (Chap. 414), type 2 diabetes mellitus (Chap. 415), and metabolic syndrome (Chap. 420), which are important risk factors for atherosclerosis, now threatens to reverse the progress that has been made in the age-adjusted reduction in the mortality rate of coronary heart disease. Globally, the impact of cardiovascular diseases is steadily mounting, with an estimated 19 million deaths worldwide. For many years, cardiovascular disease was considered to be more common in men than in women. In fact, cardiovascular disease is the leading cause of all deaths among women and men (Chap. 410). In addition, although the absolute number of deaths secondary to cardio vascular disease has declined over the past decades in men, this num ber has actually risen in women. Inflammation, obesity, type 2 diabetes mellitus, and the metabolic syndrome appear to play more prominent roles in the development of coronary atherosclerosis in women than in men. Coronary artery disease (CAD) is more frequently associated with dysfunction of the coronary microcirculation in women than in men. Exercise electrocardiography has a lower diagnostic accuracy in the prediction of epicardial obstruction in women than in men. ■ ■NATURAL HISTORY Cardiovascular disorders often present acutely, as in a previously asymp tomatic person who develops an acute myocardial infarction (Chap. 286), or a previously asymptomatic patient

with hypertrophic cardiomyopathy (Chaps. 266–270) or with a prolonged QT interval (Chap. 259) whose first clinical manifestation is syncope or even sudden death. However, the alert physician may recognize the patient at risk for these complications long before they occur and often can take measures to prevent them. For example, a patient with acute myocardial infarction will often have had risk factors for atherosclerosis for many years. Had these risk factors been recognized, their elimination or reduction might have delayed or even prevented the infarction. Similarly, a patient with hypertrophic cardio myopathy may have had a heart murmur for years and a family history of this disorder. These findings could have led to an echocardiographic examination, recognition of the condition, and appropriate therapy long before the occurrence of a serious acute manifestation. Patients with valvular heart disease or idiopathic dilated cardiomy opathy, by contrast, may have a prolonged course of gradually increas ing dyspnea and other manifestations of chronic heart failure that is punctuated by episodes of acute deterioration only late in the course of

the disease. Understanding the natural history of various cardiac dis orders is essential for applying appropriate diagnostic and therapeutic measures to each stage of the condition, as well as for providing the patient and family with the likely prognosis. ■ ■CARDIAC SYMPTOMS The symptoms caused by heart disease result most commonly from myocardial ischemia, disturbance of the contraction and/or relaxation of the myocardium, obstruction to blood flow, or an abnormal cardiac rhythm or rate. Ischemia, which is caused by an imbalance between the heart’s oxygen supply and demand, is manifest most frequently as chest discomfort (Chap. 15), whereas reduction of the pumping ability of the heart commonly leads to fatigue and elevated intravascular pressure upstream of the failing ventricle. The latter results in abnormal fluid accumulation, with peripheral edema (Chap. 43) or pulmonary con gestion and dyspnea (Chap. 39). Obstruction to blood flow, as occurs in valvular stenosis, can cause symptoms resembling those of myocar dial failure (Chap. 264). Cardiac arrhythmias often develop suddenly, and the resulting symptoms and signs—palpitations (Chap. 45), dys pnea, hypotension, and syncope (Chap. 23)—generally occur abruptly and may disappear as rapidly as they develop. Although dyspnea, chest discomfort, edema, and syncope are cardinal manifestations of cardiac disease, they occur in other conditions, as well. Thus, dyspnea is observed in disorders as diverse as pulmonary disease, marked obesity, and anxiety (Chap. 39). Similarly, chest discomfort may result from a variety of noncardiac and cardiac causes other than myo cardial ischemia (Chap. 15). Edema, an important finding in untreated or inadequately treated heart failure, also may occur with primary renal disease and in hepatic cirrhosis (Chap. 43). Syncope occurs not only with serious cardiac arrhythmias but in a number of neurologic condi tions as well (Chap. 23). Whether heart disease is responsible for these symptoms frequently can be determined by carrying out a careful clinical examination (Chap. 246), supplemented by noninvasive testing using electrocardiography at rest and during exercise (Chap. 247), echocar diography, and cardiopulmonary imaging (Chap. 248). Myocardial or coronary function that may be adequate at rest may be insufficient during exertion. Thus, dyspnea and/or chest discom fort that appear during activity are characteristic of patients with heart disease, whereas the opposite pattern, that is, the appearance of these symptoms at rest and their remission during exertion, is rarely observed in such patients. It is important, therefore, to question the patient carefully about the relation of symptoms to exertion. Many patients with cardiovascular disease may be asymptomatic both at rest and during exertion but may present with an abnormal physical finding such as a heart murmur, elevated arterial pressure, or an abnormality of the electrocardiogram (ECG) or imaging test. It is important to assess the global risk of CAD in asymptomatic indi viduals, using a combination of clinical assessment and measurement of

cholesterol and its fractions, as well as other biomarkers, such as C-reactive protein, in some patients. Since the first clinical manifesta tion of CAD may be catastrophic—sudden cardiac death, acute myo cardial infarction, or stroke in previous asymptomatic persons—it is mandatory to identify those at high risk for such events and institute further testing and preventive measures. ■ ■DIAGNOSIS As outlined by the New York Heart Association (NYHA), the elements of a complete cardiac diagnosis include the systematic consideration of the following:

1. The underlying etiology. Is the disease congenital, hypertensive, isch emic, or inflammatory in origin?
2. The anatomic abnormalities. Which chambers are involved? Are they hypertrophied, dilated, or both? Which valves are affected? Are they regurgitant and/or stenotic? Is there pericardial involvement? Has there been a myocardial infarction?

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