

# Diagnostic Tests and Procedures in the Patient with Cardiovascular Disease



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## CHEST RADIOGRAPHY

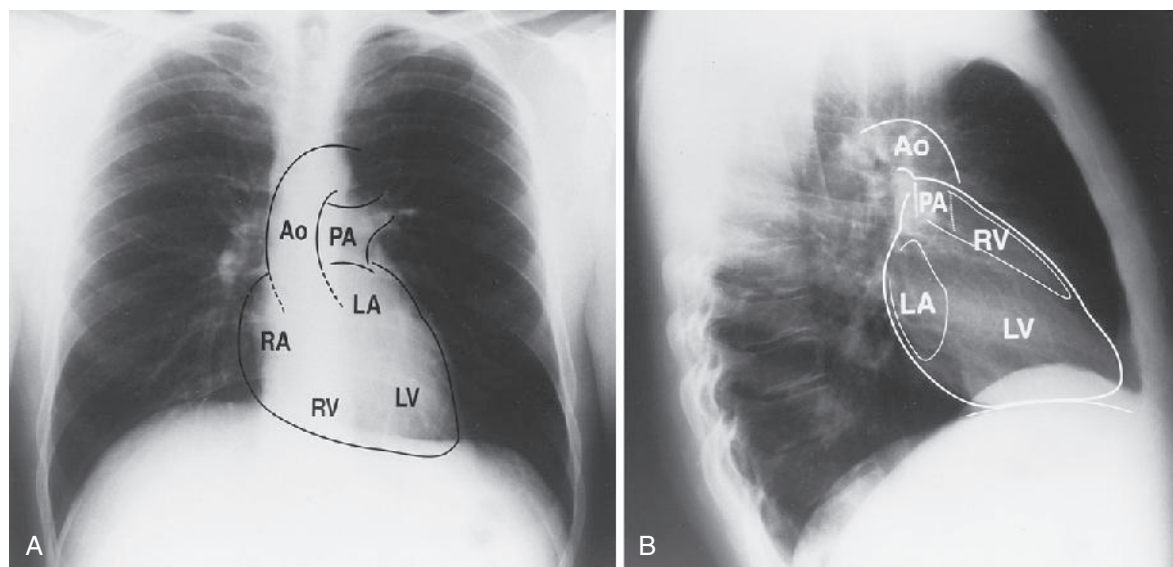
The chest radiograph is an integral part of the cardiac evaluation, and it gives valuable information regarding the structure and function of the heart, lungs, and great vessels. A routine examination includes posteroanterior and lateral projections (Fig. 4-1).

In the posteroanterior view, cardiac enlargement may be identified when the transverse diameter of the cardiac silhouette is greater than one half of the transverse diameter of the thorax. The heart may appear falsely enlarged when it is displaced horizontally, such as with poor inflation of the lungs, and when the film is an anteroposterior projection, which magnifies the heart shadow. Left atrial enlargement is suggested when the left-sided heart border is straightened or bulges toward the left. The main bronchi may be widely splayed, and a circular opacity or *double density* may be seen in the cardiac silhouette. Right atrial enlargement may be confirmed when the right-sided heart border bulges toward the right. Left ventricular enlargement results in

downward and lateral displacement of the apex. A rounding of the displaced apex suggests ventricular hypertrophy. Right ventricular enlargement is best assessed on the lateral view and may be diagnosed when the right ventricular border occupies more than one third of the retrosternal space between the diaphragm and thoracic apex.

The aortic arch and thoracic aorta may become dilated and tortuous in patients with severe atherosclerosis, long-standing hypertension, and aortic dissection. Dilation of the proximal pulmonary arteries may occur when pulmonary pressures are elevated and pulmonary vascular resistance is increased. Disease states associated with increased pulmonary artery flow and normal vascular resistance, such as atrial or ventricular septal defects, may result in dilation of the proximal and distal pulmonary arteries.

Pulmonary venous congestion due to elevated left ventricular heart pressure results in redistribution of blood flow in the lungs and prominence of the apical vessels. Transudation of fluid into the interstitial space may result in fluid in the fissures and along



**FIGURE 4-1** Schematic illustration of the parts of the heart, whose outlines can be identified on a routine chest radiograph. **A**, Posteroanterior chest radiograph. **B**, Lateral chest radiograph. Ao, Aorta; LA, left atrium; LV, left ventricle; PA, pulmonary artery; RA, right atrium; RV, right ventricle.