

which, when heard, represents the systolic pressure. As the cuff continues to deflate, the sounds will disappear; this point represents the diastolic pressure.

In normal situations, the pressure in both arms is relatively equal. If the pressure is measured in the lower extremities rather than the arms, the systolic pressure is typically 10 to 20 mm Hg higher. If the pressures in the arms are asymmetric, this may suggest atherosclerotic disease involving the aorta, aortic dissection, or obstruction of flow in the subclavian or innominate arteries. The pressure in the lower extremities can be lower than arm pressures in the setting of abdominal aortic, iliac, or femoral disease. Coarctation of the aorta can also lead to discrepant pressures between the upper and lower extremities. Leg pressure that is more than 20 mm Hg higher than the arm pressure can be found in the patient with significant aortic regurgitation, a finding called Hill's sign. A common mistake in taking the arterial blood pressure involves using a cuff of incorrect size. Use of a small cuff on a large extremity leads to overestimation of pressure. Similarly,

use of a large cuff on a smaller extremity underestimates the pressure.

Examination of the arterial pulse in a cardiovascular patient should include palpation of the carotid, radial, brachial, femoral, popliteal, posterior tibial, and dorsalis pedis pulses bilaterally. The carotid pulse most accurately reflects the central aortic pulse. One should note the rhythm, strength, contour, and symmetry of the pulses. A normal arterial pulse (Fig. 3-2A) rises rapidly to a peak in early systole, plateaus, and then falls. The descending limb of the pulse is interrupted by the incisura or dicrotic notch, which is a sharp deflection downward due to closure of the aortic valve. As the pulse moves toward the periphery, the systolic peak is higher and the dicrotic notch is later and less noticeable.

The normal pattern of the arterial pulse can be altered by a variety of cardiovascular diseases (see Fig. 3-2B to F). The amplitude of the pulse increases in conditions such as anemia, pregnancy, thyrotoxicosis, and other states with high cardiac output. Aortic insufficiency, with its resultant increase in pulse

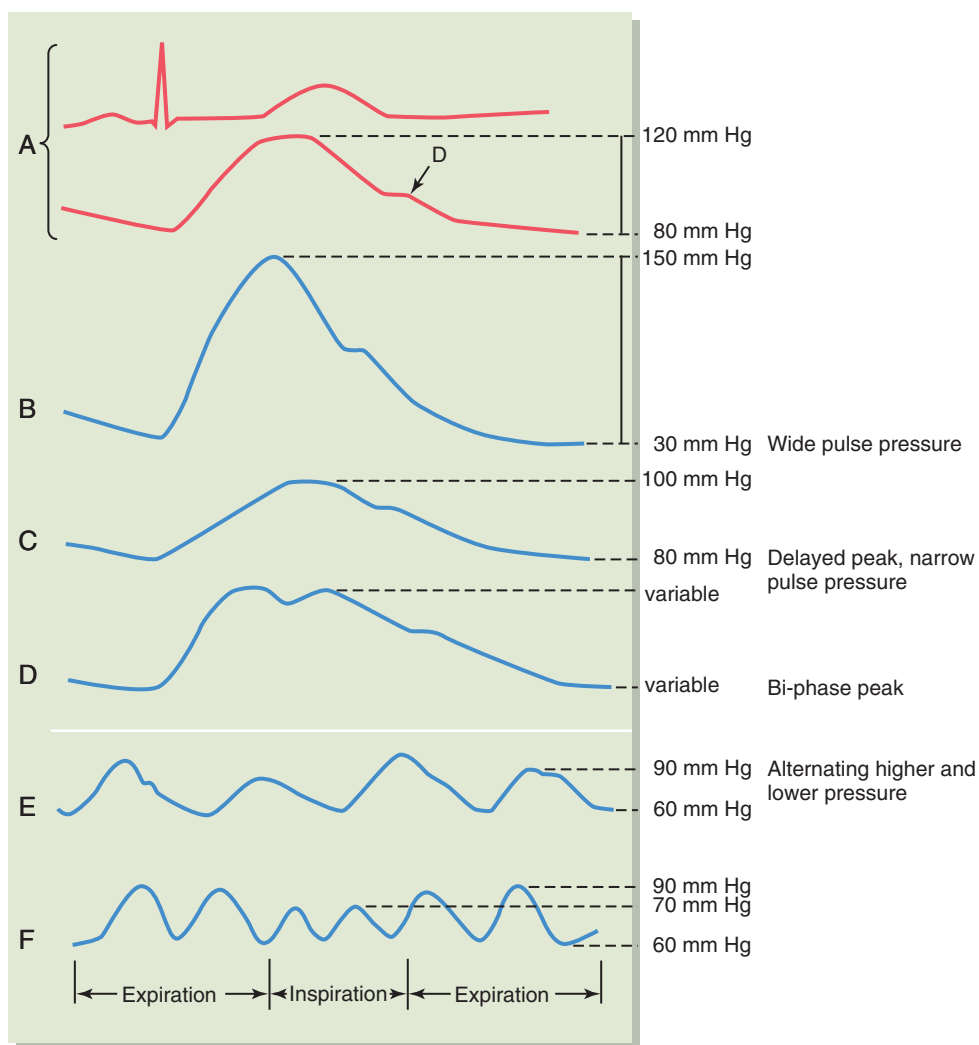


FIGURE 3-2 Normal and abnormal carotid arterial pulse contours. **A**, Normal arterial pulse with simultaneous electrocardiogram (ECG). The dicrotic wave (*D*) occurs just after aortic valve closure. **B**, Wide pulse pressure in aortic insufficiency. **C**, Pulsus parvus et tardus (small amplitude with a slow upstroke) associated with aortic stenosis. **D**, Bisferiens pulse with two systolic peaks, typical of hypertrophic obstructive cardiomyopathy or aortic insufficiency, especially if concomitant aortic stenosis is present. **E**, Pulsus alternans, characteristic of severe left ventricular failure. **F**, Paradoxical pulse (systolic pressure decrease >10 mm Hg with inspiration), most characteristic of cardiac tamponade.