

level that obliterates the radial pulse and then deflated at a rate of 3 to 5 mm Hg per second. BP should be measured in both arms and after 5 minutes of standing, the latter to exclude a significant postural fall in BP, particularly in older persons and in those with diabetes or other conditions (e.g., Parkinson's disease) that predispose the patient to autonomic insufficiency.

However, out-of-office readings either obtained by home or ambulatory BP monitoring are required to accurately assess a person's typical BP. Because of the anxiety of going to the physician, BPs often are higher in the physician's office than when measured at home or during normal daily life outside the home. Self-monitoring of BP outside the physician's office actively engages a patient in his or her own health care and provides a better estimate of the usual BP for medical decision making. BP should be measured in the early morning and in the evening. Three BP readings should be obtained during each measurement, separated by at least 1 minute. Because the first BP measurement tends to be the highest, average BP should be used to assess home BP levels. Many electronic home monitors are available, but only a handful of models have been rigorously validated against mercury sphygmomanometry and can be recommended.

Ambulatory monitoring provides automated measurements of BP over a 24- or 48-hour period while patients are engaged in their usual activities, including sleep (Fig. 12-8). With ambulatory monitoring, current recommendations for *upper limits of normal* are a mean daytime BP of less than 135/85 mm Hg, a mean nighttime BP of 120/70 mm Hg, and a mean 24-hour BP of less than 130/80 mm Hg. However, an *optimal* mean daytime ambulatory BP is lower, less than 130/80 mm Hg. To avoid undertreating hypertension, these lower treatment thresholds must be used when incorporating ambulatory monitoring in medical decision making. With self-monitoring of BP at home, an average value of less than 135/85 mm Hg should be considered the upper limit of normal.

Up to one third of patients with elevated office BP levels have normal home or ambulatory BPs. If the 24-hour BP profile is

completely normal and no target organ damage has occurred despite consistently elevated office readings, then the patient has *office-only*, or *white-coat*, hypertension, presumably the result of a transient adrenergic response to the measurement of BP in the physician's office (see Fig. 12-8).

In other patients, office readings underestimate ambulatory BPs, presumably because of sympathetic overactivity in daily life owing to job or home stress, tobacco abuse, or other adrenergic stimulation that dissipates when coming to the office (Fig. 12-9). Such documentation prevents underdiagnosis and undertreatment of this *masked hypertension*, which is also associated with high cardiovascular risks. Masked hypertension is identified in 10% of all hypertensive patients, in up to 40% of those with diabetes, and in 70% of African American patients with hypertensive kidney disease.

Goal 2: Cardiovascular Risk Stratification

The great majority of patients with BPs in the prehypertensive or hypertensive range have one or more additional modifiable risk factors for atherosclerosis (e.g., hypercholesterolemia, cigarette smoking, diabetes). The patient's global cardiovascular risk should be calculated from the 2013 ACC/AHA pooled atherosclerotic cardiovascular disease (ASCVD) risk calculator (<http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards/2013-Prevention-Guideline-Tools.aspx>).

Goal 3: Identification of Secondary (Identifiable) Causes of Hypertension

A thorough search for secondary causes is not cost-effective in most patients with hypertension, but it becomes critically important in two circumstances: (1) when a compelling cause is found on the initial evaluation, or (2) when the hypertensive process is so severe that it either is refractory to intensive multiple-drug therapy or necessitates hospitalization. Table 12-5 summarizes the major causes of secondary hypertension that should be

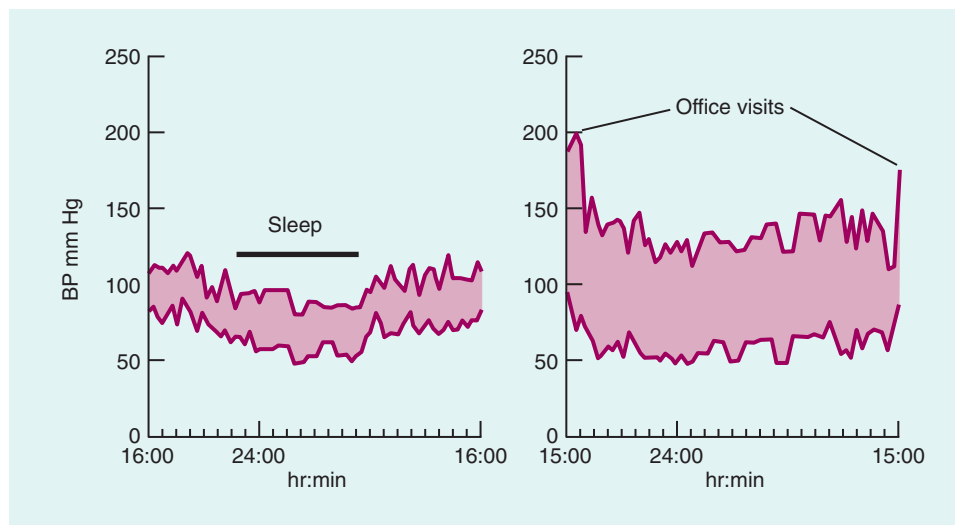


FIGURE 12-8 Twenty-four hour ambulatory blood pressure (BP) monitor tracings in two different patients. **A**, Optimal BP in a healthy 37-year-old woman. The normal variability in BP, the nocturnal dip in BP during sleep, and the sharp increase in BP on awakening are shown. **B**, Pronounced white-coat syndrome in an 80-year-old woman referred for evaluation of medically refractory hypertension. Documentation of the white-coat effect prevented overtreatment of the patient's isolated systolic hypertension.