

Definition

Blood pressure is the force of the blood against the artery walls. High blood pressure (hypertension) and low blood pressure (hypotension) can both cause cardiovascular problems. Ambulatory blood pressure monitoring or tilt table tests may be used to diagnose these conditions. There are many types of high blood pressure, which may be treated with antihypertensive medications, such as diuretics, beta blockers and ACE inhibitors.

Blood pressure is a physiological variable—like body temperature, respiratory rate, or heart rate. Blood pressure is not constant throughout the day; each time the heart squeezes and relaxes, there is a new blood pressure. It increases before awakening and declines with sleep. The level of blood pressure is regulated by the kidneys, brain, heart, endocrine glands, and blood vessels. In the United States, the actual level of blood pressure gradually increases from birth to adulthood. Due to difference in diet and activity levels in nonindustrialized countries, however, blood pressure does not increase beyond the age of eighteen.

Whereas temperature is measured with a thermometer, blood pressure is measured with a sphygmomanometer, preferably a mercury sphygmo-manometer, though aneroid and electronic devices are sometimes used.

Blood pressure should be measured after a five-minute period of rest, with the back supported and the legs uncrossed. Constrictive clothing should be removed from around the upper arm, which must be resting on a table at heart level. The blood pressure cuff is evenly and snugly applied around the upper arm above the elbow, and a stethoscope is placed over the crease of the elbow. The cuff is inflated to 15 millimeters of mercury (mmHg) above the point where radial artery pulse (the artery above the thumb at the wrist) disappears. The pressure in the cuff is then slowly released at 2 mmHg per second. The first of two consecutive sounds as cuff pressure decreases is called the systolic blood pressure—the pressure to open the artery occluded with the cuff. The diastolic blood pressure is recorded at the absence of sounds with continued deflation of the blood pressure cuff. Blood pressure is generally recorded to the nearest 2 mmHg. For example, a blood pressure of 142/86 mmHg indicates a systolic blood pressure of 142 mmHg and a diastolic blood pressure of 86 mmHg. Pain and emotional disturbance, as well as caffeine, tobacco, and alcohol, can elevate systolic blood pressure.

Hypertension

An abnormal blood pressure requires confirmation on two subsequent days. An optimal blood pressure is less than 120/80 mmHg. High blood pressure, or hypertension, is defined as either a systolic blood pressure greater than 140 mmHg or a diastolic blood pressure greater than 90 mmHg. Systolic blood pressure is a more powerful predictor of cardiovascular events than diastolic blood pressure. With increasing age, the diastolic blood pressure may actually decrease while systolic blood pressure increases; this indicates increased stiffening of the arteries throughout the body.

Hypertension is not a nervous disorder or an anxiety state, but rather a disease of the blood vessels that increases blood vessel constriction of the small arteries. It particularly damages the blood vessels inside the brain, heart, kidneys, eyes, and the largest artery, the aorta. Damaged arteries may rupture, thicken, or harden and narrow—resulting in strokes, heart attacks, kidney failure, visual impairment, or tearing or rupture of the aorta. Also, the left heart chamber thickens as a consequence of increased blood pressure. When the heart can no longer thicken or enlarge to overcome the increased pressure in the blood vessels, the squeezing function of the heart decreases, resulting in congestive heart failure.

Causes of Hypertension

Fifty million Americans (about one-fifth of the U.S. population) have hypertension. Over 90 percent of the causes of hypertension remain unknown. Four groups are predisposed to developing hypertension: the obese, the elderly, diabetics, and African Americans. Certain drugs are known to elevate blood pressure,

including most arthritis medications (except acetaminophen and aspirin), many cold remedies, nose sprays, weight-reducing pills, and alcohol. Increased heart rate, anemia, excessive thyroid hormone, or stiff

(nondistensible) arteries can increase systolic blood pressure. Blocked arteries to the kidney, kidney failure, and decreased production of thyroid hormone are common causes of hypertension. Other rare causes include tumors of the adrenal gland.

Classification of blood pressure for adults

Category	systolic, mmHg	diastolic, mmHg
<i>Hypotension</i>	< 90	<i>or</i> < 60
<i>Normal</i>	$90 - 119$	<i>and</i> $60 - 79$
<i>Prehypertension</i>	$120 - 139$	<i>or</i> $80 - 89$
<i>Stage 1 Hypertension</i>	$140 - 159$	<i>or</i> $90 - 99$
<i>Stage 2 Hypertension</i>	≥ 160	<i>or</i> ≥ 100