Hypertension -
High Blood Pressure, HTN, HBP
Benign HTN - 401.1
Malignant HTN - 401.0
Unspecified HTN - 401.9

Guidelines

Blood pressure is defined as the force exerted on the arterial walls by the blood flowing from the heart. Blood pressures are measured in terms of millimeters of mercury (mm Hg.) and are expressed as a relationship between pressures recorded at two different times during a heartbeat: the first being during the Systolic phase and the second during the diastolic phase.

Systolic pressure is the measure of the force exerted by the heart while the muscle is contracting. Diastolic pressure is the measure of the force exerted by the heart while the muscle is relaxing. The normal range of blood pressure is less than 140 mm Hg. for systolic pressure, and less than 90 mm Hg. for diastolic pressure. The "average" blood pressure for the population is approximately 120/80. Blood pressure levels will fluctuate throughout the day depending on changes in physical activity, emotional stress, acute illness and other factors. Blood pressure readings are most accurate when they are taken on an individual who has been resting quietly for at least 10 minutes prior testing.

Hypertension (High Blood Pressure)

Hypertension or High Blood Pressure is defined as a consistent elevation in blood pressure to a level of 140/90 or greater on three consecutive visits over a six to eight week period. The diagnosis of hypertension is complicated by the fact that a patient's blood pressure may vary considerably from visit to visit and that the stress of visiting the physician sometimes leads to falsely elevated readings. There are two forms of hypertension:

1.) Essential, Idiopathic, Primary: This form of hypertension accounts for greater than 90%of all adults with hypertension and is defined as hypertension of unknown cause. Risk factors include a positive family history for hypertension, high dietary salt intake, obesity, smoking, heavy alcohol intake, and certain psychological stress.

2.) Secondary: Hypertension is associated with and secondary to an underlying disease. These include: Renal diseases, Endocrine disorders, Neurogenic disorders, and other miscellaneous disorders. This type of hypertension will usually resolve with successful treatment of the cause. This type of hypertension is seen more often in children (<10 years old) than in adults. See the specific manual section associated with the causative agent for underwriting details.

3.) Malignant or Accelerated Hypertension: There is a sustained or sudden rise in diastolic blood pressure levels higher than 120 mm Hg, with accompanying evidence of end organ damage, papilledema, decreased renal function, encephalopathy. This situation is a medical emergency, requiring intensive therapeutic intervention.

4.) Pre-hypertension: This category has recently been added to refer to individuals with blood pressures between 120-139/80-89. Such individuals are typically not prescribed medication but are advised to adopt lifestyle modifications where necessary to help keep blood pressure from rising and prevent the complications of strokes and heart attacks. These include weight loss, diet, exercise, reduce salt intake and quit smoking.

Risk Factors for Hypertension

Family History: Hypertension tends to aggregate in families; the ratio of genetic to environmental factors in the hypertensive population at large is thought to be about 30% and 70%, respectively. The fact that prolonged hypertension is associated with an increased prevalence of atherosclerosis in those individuals with high cholesterol and other risk factors; a family history of early cardiac deaths is correlated with increased morbidity.

Smoking: Nicotine in cigarettes enters the bloodstream and constricts the small blood vessels. This increases the peripheral resistance and increases blood pressure. Nicotine also stimulates the adrenal gland to over secrete Adrenalin, which elevates heart rate and blood pressure. Cigarette smoking is strongly associated with reduced HDL cholesterol levels. HDL cholesterol is the "good" cholesterol which has the protective effect of reducing the total amount of cholesterol that is available to adhere to the walls of the arteries, resulting in arteriosclerosis.

Build: Obesity in early life has been found to be a predictor of subsequent hypertension. The overweight individual places excess demands on the heart by forcing it to supply oxygen and nutrients to more body tissue. The heart has to work harder to pump blood to the additional network of capillaries and this tends to increase blood pressure.

Alcohol: The consumption of more than 1 to 2 ounces of alcohol per day is associated with a higher prevalence of hypertension, poor adherence to antihypertensive therapy, and occasionally uncontrollable hypertension.

Cholesterol: high levels of serum cholesterol or a high cholesterol/HDL ratio in combination with hypertension is associated with an increased incidence of Coronary Artery Disease (CAD). High levels of HDL cholesterol tend to have a protective effect. HDL cholesterol levels can be increased through regular aerobic exercise and refraining from cigarette smoking.

Other Factors Specific to the Hypertension

History: The average readings over the past year must be taken into consideration, even if the current pressures are within acceptable limits. Look for changes in medications. Sometimes there may be slight fluctuations in blood pressure as medication is adjusted. An acute illness can also cause a temporary increase in blood pressure. Look for trends in the readings. A downward trend would be considered more favorable than an upward trend.

Duration of Elevated Pressures: A high pressure sustained over a period of many years is much worse than a high pressure that is brought under control in about 2 to 6 months.

Current BP levels: The blood pressure levels within 3 to 6 months prior to the application should be consistently within an acceptable range. If the applicant has unacceptable elevated readings (as determined by the underwriting guidelines), but there is no history of hypertension, this indicates that further medical investigation is needed. No offer should be extended until the condition is brought under control or within acceptable limits for at least six months.

Treatment: Hypertension is a condition which requires constant monitoring. In order to properly evaluate an individual, they should be following a treatment plan as indicated by the attending physician. Documentation of steadily improving or stabilized readings suggests an effective program.

Medication: Blood pressures that can be lowered to a normal level are generally considered to be favorable. The type and dosage of medications can indicate the degree of severity of the condition. Poor medical management would be indicated by BP readings that remain elevated even after treatment.

Complications: Complications of hypertension include many types of organ damage including, left ventricular hypertrophy (LVH), sclerosis of the renal arteries leading to chronic renal failure, atherosclerosis, encephalopathy, neuropathy, and stroke. Hypertension is the major predisposing risk factor for stroke.

Other Impairments: When combined with certain impairments, hypertension can create a combined risk which is greater than the sum of the two impairments. Individuals with hypertension and even a mild form of Chronic Obstructive Pulmonary Disease should be declined coverage.

Secondary Hypertension: Investigate the hypertension to see if a cause has been identified and then underwrite for this cause. Secondary hypertension occurs in approximately 10% of cases. Some of the causes of secondary hypertension include Renal disease; Pyelonephritis, Polycystic kidney disease, Glomerulonephritis, and atherosclerotic renal disease, Endocrine Disorders; Cushing's Syndrome, Pheochromocytoma, Hypothyroidism, and Hyperparathyroidism, Coarctation of the Aorta, Polycythemia, Toxemia of Pregnancy, Brain Tumors, Oral Contraceptive usage, and Drugs (Amphetamines and Cocaine). Oral contraceptive usage, especially, in women over the age of 35, make up the most common population of secondary hypertension.

Treatment of Hypertension

The American Heart Association advocates the stepped care approach for the treatment of hypertension. With this approach, the physician begins with non-drug treatments as the first step in therapy, depending on how high the blood pressure is. The physician moves to step 2 if needed by adding the drug or combination of drugs least likely to produce adverse effects, yet

adequately controlling the blood pressure. Subsequent steps involve adding to the initial drug(s), or changing medications or combinations, until the desired blood pressure is achieved.

The Stepped-Care Approach to Hypertension: The patient on stepped-care therapy requires blood pressure monitoring. Depending on the results, the physician may adjust the patient's therapy, as appropriate, by stepping the regimen up or down. With some exceptions, therapy usually continues for life. After the patient has maintained good blood pressure control for more than three months, the physician will step the therapy down as long as this does not compromise control. If the patient is receiving a single drug and the diastolic pressure remains continuously below 88 mm Hg, the physician will probably stop the medication temporarily to see if the patient can maintain a normal pressure without medication.

There is, however, a certain population of individuals which will usually be started initially on medication; foregoing the non-drug therapy. This population includes males (especially African-Americans), early age of onset, family history of hypertension-related complications, the predetermined additional risk factors for Coronary Artery disease (See section on CAD for additional details), accompanying cardiac disease, diabetes, left ventricular hypertrophy, or renal dysfunction.

Non-drug therapy includes weight reduction, reducing alcohol consumption, reducing dietary salt intake, decrease stress, and increase in activity level.

The **goal of treatment** is to attain a normal level of blood pressure with as few adverse effects as possible. Some of the adverse effects of antihypertensive medications include: impotence, dry mouth, dizziness, fatigue, and nausea. Drug therapies for hypertension include the following categories:

1.) **Diuretics:** The most widely used diuretics are the Thiazide diuretics, closely followed by the potassium sparing diuretics. Loop diuretics were used in the past to control hypertension, but due to their adverse side effects and the efficacy of other diuretics, they have been used primarily to treat Congestive Heart Failure and edema from other causes. Diuretics act to increase urine output thus removing excess fluid and sodium.

- **Thiazide Diuretics:** Hydrochlorthiazide, Diuril, Naturetin, Lozol, Hygroton, Hydromox.
  Potassium-sparing Diuretics: Spironolactone (Aldactone), Triamterene.
  Loop Diuretics: Lasix, Bumex

2.) **Sympatholytic Agents:** Including Beta Blockers and other drugs that act to inhibit the sympathetic nervous system from secreting hormones that speed up the heart rate. This category of drugs acts to decrease the heart rate and force of contraction.

- **Beta-blockers:** Sectral, Tenormin, Lopressor, Corgard, Visken, Inderal, Kerlone, Cartrol, Levatol and Blocadren
  Alpha-Blockers: Cardura, Minipress, and Hytrin
  Central-acting blockers: Catapress, Wytensin, Tenex, and Aldomet
  Mixed blockers (alpha and beta): Normodyne (Trandate)

3.) **Calcium-Channel Blockers:** These drugs also act to slow the heart rate and force of contraction by affecting how much calcium is distributed into the muscles in the heart and other arteries. Calcium is essential to all muscle activity in the body.

- **Calcium-channel blockers:** Cardizem, Cardene, Procardia, Calan.

4.) **Angiotensin-Converting Enzyme (ACE) Inhibitors-** These drugs act to dilate (widen) the peripheral blood vessels in the body and therefore decrease the resistance on these vessels.

- **ACE Inhibitors:** Capoten, Vasotec, Zestril (Prinivil)

5.) **Direct Vasodilators-** These drugs act to relax the smooth muscle in the arteries and thus lead to their dilation. This dilation decreases peripheral vascular resistance and lowers the blood pressure.

- **Direct Vasodilators:** Apresoline, Minoxidil, Nipride.