What is hypertension?
Hypertension is an elevation of the animal's "normal" blood pressure. Normal is in quotes because normal depends on the health status of the animal and the technique used to measure blood pressure.

Blood pressure is defined as the force that is generated within the body's blood vessels by the beating of its heart. The higher the resistance within the blood vessels, the higher the blood pressure will be and conversely, the lower the resistance—the lower the blood pressure.

We are probably all familiar with hypertension or high blood pressure in people. A large segment of the human population is suffering from and/or is being treated medically for hypertension. As in people, hypertension can and does lead to a host of medical problems in dogs and cats including kidney damage, heart disease, strokes and damage to the retina of the eye.

What causes hypertension?
Hypertension is not a disease entity in and of itself. Hypertension is typically the result of an underlying disease. In dogs, Cushing's disease or hyperadrenocorticism is a primary cause. In cats, hyperthyroidism and kidney disease are common causes of hypertension.

How is hypertension measured?
There are two common ways that blood pressure is measured in dogs and cats: the direct and indirect methods. Both methods measure the systolic pressure, which is the highest pressure during the cardiac cycle and the diastolic pressure which is the lowest. In addition, the mean (or average) arterial pressure (MAP) is also calculated using the systolic and diastolic blood pressure readings.

To measure blood pressure using the direct method, a device needs to be introduced into one of the patient's major arteries. The direct method is accurate but fairly invasive making it largely impractical.

Blood pressure can also be measured indirectly. Indirect blood pressure measurements are obtained two ways; one, called the Doppler method, uses ultrasonic waves to measure blood pressure using a pressure cuff placed on one of the animal's limbs. The other indirect technique is called the oscillometric method which uses a sensor within a pressure cuff that is also placed on one of the animal's limbs. This sensor detects pulse pressure differences within the blood vessel during the cardiac cycle.

Some veterinarians will advise that your pet's blood pressure needs to be measured up to six times with the highest and lowest readings eliminated and the remaining values averaged. In either case, the animal's position and level of stress at the time of measurement are critically important. In dogs, the patient is best placed on his left side and restrained by someone the dog knows. In cats, the patient needs to assume a natural position that reduces their stress level; this is almost always resting on the chest (sternal position). It may take time to allow the cat to relax in a clinical setting.

Too much restraint by persons unfamiliar to the patient will result in inaccurate readings. Stress artificially elevates blood pressure readings. This is similar to the "white-coat syndrome" observed in human patients. There are some people who experience stress and an elevation in their blood pressure simply as a result of visiting their doctor's office. This needs to be taken into account when blood-pressure values are collected.

Care must also be taken when choosing a cuff to measure blood pressure using the indirect methods. An improperly fitting cuff, either too big or too small, will yield inaccurate results. Because accurate readings may be difficult to obtain using the methods described above, the veterinarian should look for additional symptoms in the patient such as an examination of the patient's retina. In hypertensive animals, a change in the blood vessels in the retina may indicate or help confirm an increase in the patient's blood pressure.

What is a normal and what is an abnormal blood pressure reading in dogs and cats?
Normal systolic arterial blood pressure ranges from: 60-90 mm of Hg. Normal diastolic arterial blood pressure ranges from: 60-90 mm of Hg. Normal MAP is in the range from 85-120 mm of Hg. To calculate the MAP, veterinarians use the formula: MAP = diastolic pressure + 1/3 (systolic pressure - diastolic pressure). Systolic blood pressure is considered elevated in cats and dogs when the readings, gathered while the animal is not under stress, are consistently greater than 170 mm Hg in cats and 180 mm Hg in dogs.

How often should your animal's blood pressure be measured?
In patients diagnosed with hypertension, their blood pressure should be measured every three months. Other tests, such as a complete blood count, blood chemistry panel and a urinalysis should be performed every six months.

What is hypertension treated?
First and foremost, any underlying medical condition that is causing an elevation is treated. In addition, medication is often prescribed to help reduce the blood pressure and prevent or reduce further damage to the animal's body. In many situations, this will include both oral medication and a change in diet. It is important for the owner to follow the treatment advice given to reach the patient's goal of normal blood pressure.
in blood pressure will need to be addressed and treated. The management of hypertension is aimed at lowering cardiac output, decreasing the blood vessels peripheral resistance or both.

In milder cases of hypertension, diet modifications may be helpful. A low sodium diet,

In more severe cases, medications may be needed to lower the blood pressure. Medications that have been used to control hypertension in veterinary patients include vasodilators and diuretics. Vasodilators, such as amlodipine for cats (a calcium-channel blocker), the vasodilator hydralazine, and the ace inhibitor enalapril for cats and dogs, are all considered front-line treatments for hypertension. These medications relax the peripheral blood vessels and lower the resistance to blood flow. Diuretics, such as spironolactone and furosemide lower the body's overall fluid load which helps lower blood pressure. Care needs to be taken when diuretics are used in patients with kidney disease. This is not an exhaustive list of possible medications to treat hypertension in dogs and cats. Your veterinarian will need to prescribe the appropriate medications on a case-by-case basis.

Now that my pet has been diagnosed with hypertension, what can I expect in the future? Again, hypertension in dogs and cats is the result of an underlying disease condition. If the disease that is leading to the increase in blood pressure can be managed or cured, typically an increase in blood pressure will correct itself. Most often, the hypertension needs to be managed along with the underlying medical condition.

Blood pressure needs to be monitored in any patient that has demonstrated an increase in blood pressure or that has a disease condition associated with an increase in blood pressure.