

Hypertension (High Blood Pressure)

High blood pressure is an extremely important concern in human medicine. High stress lifestyle, smoking, and high salt diet all contribute to this potentially dangerous condition and virtually everyone in the U.S. knows how serious it can be. But what about our pets? They don't smoke or worry about the mortgage and they don't deposit cholesterol in their blood vessels. They do, however, get high blood pressure especially in old age, and here is what you probably should know.

What does High Blood Pressure Do?

Problems from high blood pressure arise when a blood vessel gets too small for the high pressure flow going through it. Imagine attaching a garden hose to a fire hydrant. The pressure would cause the garden hose to explode and that is what happens to a blood vessel too small for the pressure going through it. Instead of water going everywhere, bleeding results. Since these vessels are small, the bleeding may not be noticeable but a lot of little bleeds and a lot of blood vessel destruction can create big problems over time.

The retina of the eye is especially at risk, with blindness (either sudden or gradual) often being the first sign of latent high blood pressure in cats. The kidney also is a target as it relies on tiny vessels to filter toxins from the bloodstream. In addition to being a result of untreated high blood pressure, kidney disease is an important cause of high blood pressure and also progresses far more rapidly in the presence of high blood pressure.

High blood pressure also increases the risk of embolism: the formation of tiny blood clots that form when blood flow is abnormal and can lodge in an assortment of inopportune locations including the brain and lung.

What Causes High Blood Pressure in Pets?

There are numerous diseases in pets that are associated with high blood pressure:

- Chronic kidney (renal) failure. In one study, 93% of dogs with chronic renal failure and 61% of cats with chronic renal failure also had systemic hypertension (high blood pressure).
- Hyperthyroidism in cats (almost unheard of in dogs, but common in geriatric cats). In one study, 87% of cats with untreated hyperthyroidism had systemic hypertension.
- Cushing's disease (an adrenal gland cortisone excess)
- Diabetes mellitus (inability to properly reduce blood sugar)
- Acromegaly (growth hormone excess)
- Glomerular disease (a disease of the kidney filtration system which results in protein loss in the urine)
- Polycythemia (an excess in red blood cells)
- Pheochromocytoma (an adrenaline secreting tumor of the adrenal gland)

In humans, high blood pressure is frequently considered primary, meaning there is no other disease causing it. In animals, primary hypertension is unusual; there almost always is another disease causing it and if routine screening does not identify the problem, more tests may be in order.

How is High Blood Pressure Identified?

In human medicine, high blood pressure is called the silent killer because most people have no reason to think they might be hypertensive. To find high blood pressure in people, we screen for it. This means that virtually any time you see a doctor of any kind, a nurse will take your blood pressure. Similarly, in pets, a great deal of high blood pressure is identified by screening for it. If a pet has one of the above diseases conditions, blood pressure is generally checked. It has recently been recommended that older pets have their blood pressure checked whenever they have a physical examination. If you own a pet over 9 years old, be sure to ask for a blood pressure check if one has not been recommended to you.

The other time high blood pressure is discovered is when it makes its presence known. This usually means some degree of blindness or some other obvious eye problem. The retina of a hypertensive patient develops tortuous looking retinal blood vessels. Some vessels may even have broken showing smudges of blood on the retinal surface. Some areas of the retina simply detach. Sometimes the entire retina detaches. With early identification, some vision may be restored. Do not let minor vision changes go unreported. Let your veterinarian know if you think your pet's vision is not normal.

Retinal changes can be complicated to interpret. Do not be surprised or alarmed if your veterinarian recommends referral to a veterinary ophthalmologist.

How Do we Measure Blood Pressure in Pets?



Doppler Blood Pressure Monitor

Blood pressure measurement is performed similarly to the way it is in humans. An inflatable cuff is fit snugly around the foot or foreleg of the pet. Sometimes the base of the tail can be used. The cuff is inflated so as to occlude blood flow through the superficial artery. In a person, as the cuff is slowly deflated a stethoscope is used to listen for the point when the blood pressure is adequate to pump through the partially occluded vessel. This point on the pressure gauge is the systolic blood pressure. The cuff is further deflated until the vessel is open and no more sounds are made. This point represents the diastolic blood pressure.

In animals, the stethoscope just is not sensitive enough and an ultrasonic probe must be taped or held over the artery. Using ultrasound, the sound of the systolic pressure is converted into an audible signal. It is not possible to measure diastolic pressure in a pet without actually placing a catheter inside an artery so we make do with just a systolic measurement. In pets, measurement of blood pressure using Doppler should not exceed 160 mm Hg.

Some pets (obviously) are nervous at the vet's office and this factor must be taken into account when reading blood pressure. It is possible for a pet to have high blood pressure at the vet's office and normal pressure at all other times. One might think this would be a common situation, but most pets are able to maintain normal blood pressure despite being surrounded by hospital staff.

What Treatment is Available for Hypertension?

When ocular disease is present, special eye drops may be required depending on how much bleeding is present in the eye and whether or not return of vision is likely. (Here is one area where an ophthalmology specialist may be especially able to help.)

When hypertension is identified, a search for the underlying cause is indicated. It may be that controlling the underlying disease totally reverses the hypertension (especially true for hyperthyroid cats).

Beyond these methods, as with people, medication to actually lower blood pressure is often in order. This typically involves some type of pill that dilates peripheral blood vessels, effectively making them larger so as to accommodate the high pressure blood flow going through them. Enalapril, an angiotensin converting enzyme inhibitor, or atenolol, a beta blocker, is the usual first choice for dogs. Hydralazine, an arterial dilator may be used in dogs when hypertension is especially stubborn. These medications are typically given once or twice daily.

Amlodipine, a calcium channel blocker, is the usual first choice for cats, and is sometimes given to small dogs. It is typically given once daily.

Salt restriction in the diet is a good idea. This generally means a diet limited to dry dog food, with no salty snacks (dogs love them, just like people). Appropriate home cooked diets may be designed through a veterinary nutritionist such as Dr. Rebecca Remillard at www.petdiets.com.

Hypertensive patients may need to be rechecked every week or two until proper to of antihypertensive drugs is determined. Then blood pressure should be checked every 4-6 months to keep their blood pressure in a healthy range, and adjust medications as needed.