



Hypertension (high blood pressure) has long been known to be a problem in people and is being increasingly recognised in pets. Hypertension is very common in older people and is often associated with smoking, or with stressful living. In animals, hypertension is almost always caused by an underlying disease.

What is blood pressure?

When the heart contracts a pulse of blood is forced through the arteries. This pulse generates the *systolic* blood pressure. In between the heart contractions the pressure in the arteries falls - this is the *diastolic* blood pressure. In animals we mostly measure systolic blood pressure.

Systolic pressure does not stay the same at all times. Arteries are constantly being constricted (narrowed) or dilated (widened) so that blood can be diverted to whichever organs are most active at the time. A dilated artery has a larger diameter, making it easier for blood to flow through. Less pressure is needed to pump blood through the dilated artery and so blood pressure is lower if arteries are dilated.

Blood pressure also tends to increase a little with age. The arteries of older pets tend not to be as elastic as in younger animals. These arteries do not dilate easily so the overall resistance to blood flow is increased, resulting in higher blood pressure.

What causes hypertension?

Hypertension in animals is almost always secondary to other problems. In dogs the main causes of hypertension are kidney disease and hormonal conditions such as diabetes mellitus and hyperadrenocorticism (Cushing's disease).

Why does hypertension cause problems?

In hypertension the increased pressure in the blood vessels damages the vessel walls, causing bleeding and blood clot formation. This causes particularly severe problems if blood vessels in the eye, kidney, heart or brain are affected. In addition when blood pressure is high the heart has to pump against a greater resistance and this places increased strain on the heart muscle.

What signs does hypertension cause?

In the early stages of disease there are few, if any, signs of hypertension itself, but because hypertension is commonly associated with an underlying disease you may notice signs of that disease in your pet. Appetite may be decreased in kidney failure, or may be increased in diabetes, and both conditions can cause weight loss, excessive drinking and occasionally vomiting.

Signs related to secondary damage to blood vessels will depend upon the organ affected. Damage to the blood vessels in the eye may cause sudden onset blindness, and this is often the first recognisable indication of hypertension in cats. Damage to blood vessels in the brain can cause "strokes" and other neurological disorders, and increased blood pressure in the blood vessels that supply the kidney can cause further deterioration in kidney function.

How will my vet know my dog has hypertension?

If your vet suspects hypertension they will want to examine your dog's eyes for areas of haemorrhage (bleeding) or detachment of the retina (at the back of the eye). Examination of the eyes can be a very useful way to identify the disease but the best way to confirm the diagnosis, and to monitor the response to any treatment, is by measurement of blood pressure.

How is blood pressure measured?

Measurement of blood pressure is becoming more common in veterinary practice although it is not yet part of the routine examination in most cases.

The method used to measure blood pressure is very similar to that used routinely in people, but because of the small size of the arteries more specialised equipment is needed. An inflatable cuff is placed around one of the dog's legs (or sometimes round its tail) and the vet uses a small receiver held against the

Hypertension (high blood pressure)



arteries in the foot (or tail) to detect the pulse. The cuff is then inflated and deflated a number of times and the vet listens for changes in the sound of the pulse as the pressure in the cuff increases and decreases.

The process only takes a few minutes; does not hurt and most animals do not object at all. Blood pressure needs to be monitored regularly in animals that have been diagnosed with hypertension and most pets soon become used to the procedure.

What is the normal blood pressure range for a dog?

Most healthy dogs have a systolic blood pressure of between 120 and 180 mmHg. A dog with a blood pressure that is consistently over 180-190 mmHg is considered to be hypertensive, although older animals do tend to have slightly higher blood pressure than young dogs. Sight hounds, eg Greyhounds and overweight dogs tend to have higher blood pressure.

Can hypertension be treated?

If an underlying cause of hypertension can be identified this disease should be treated, and if the blood pressure is only slightly elevated then this may be sufficient to bring blood pressure down into the normal range. However in most cases it will be necessary to use additional treatments which are specifically aimed at lowering the blood pressure. For long-term management of hypertension in dogs ACE inhibitors, eg enalapril or benazapril may be used, but if these are not producing enough effect other drugs may be added. Other groups of drugs which may be effective include "calcium-channel blockers" and "beta-blockers". Animals with hypertension have individual responses to treatment and it is important to monitor the blood pressure closely once treatment has been started, altering the dose of the drugs, or altering the medication as necessary. In patients with kidney failure, it is also important to monitor kidney function when using anti-hypertensive drugs.

Feeding a low salt diet may also be of value although it is unlikely to be sufficient as a sole treatment of hypertension. You should avoid feeding pet treats to dogs with high blood pressure since most of these are quite high in salt. Most hypertensive dogs can be fed a normal commercial dog food, although your vet may recommend the use of a prescription diet for management of underlying disease, eg chronic kidney failure.

If your dog has suffered sudden onset blindness emergency treatment to rapidly lower the blood pressure may be recommended. Blood pressure must be measured regularly whilst this emergency treatment is given to ensure blood pressure does not drop too low - so your dog may need to be admitted to hospital during the first stages of emergency treatment. If treatment can be started at an early stage of the disease then there is a chance that your dog may regain its sight.

Will my dog get better?

If an underlying cause can be identified and treated then blood pressure may return to normal without the need for any specific medication. Unfortunately in most cases this is not possible and additional drugs are needed to reduce blood pressure. Fortunately in most cases treatment is effective, and blood pressure can be brought into the normal range within a few weeks of starting treatment. For the majority of animals treatment will be required lifelong and in all cases it remains important to continue to monitor blood pressure as accurately as possible in order to identify any recurrence of the problem.

If you want any other information on health issues concerning your dog please contact your local Veterinary Surgeon.