



HYPERTENSION

What is Hypertension?

It is a sustained elevation in either systolic (the high pressure pulse) or diastolic (lower pressure between pulses) arterial blood pressure above the normal range. Hypertension is currently defined as the following:

- Dog: Systolic greater than 180 mmHg or diastolic greater than 100 mmHg (or 170 mmHg with signs)
- Cat: Systolic greater than 170-180 mmHg or diastolic greater than 120 mmHg

What Causes Hypertension?

The regulation of systemic arterial blood pressure is dependent upon the integration of complex mechanisms between the brain and peripheral nerves, kidney and heart tissues, and body fluid factors, all of which together affect heart output and blood vessel resistance.

Systemic blood pressure equals heart output times peripheral vascular resistance. Heart output is determined by heart rate and stroke volume with the latter related to blood volume. Blood volume is primarily controlled by kidney fluid volume mechanisms that lead to activation of the renin-angiotensin-aldosterone system. Renin is secreted within the kidney in response to reduced kidney blood flow, several other factors, and angiotensin II. Angiotensin II is a potent vasoconstrictor and stimulator of aldosterone secretion. Aldosterone promotes sodium and subsequent water retention leading to plasma volume expansion.

Hypertension also can be secondary to: Kidney disease (end stage kidney disease, glomerulonephritis, amyloidosis, or kidney artery stenosis); Hyperadrenocorticism (Cushing's disease); Hyperthyroidism; Diabetes mellitus; Pheochromocytoma (rare tumor of the adrenal gland); Hyperaldosteronism (rare condition of too much male hormone); Central nervous system (brain) disease.

Why is Hypertension a Problem?

Complications of hypertension are seen in the target organs that are most affected by sustained, arterial blood pressure (i.e. eye, kidney, heart-vascular, and brain-vascular systems). Vascular damage in these

tissues leads to hemorrhage, clots, swelling, and tissue death.

The systems affected are mainly the cardiovascular (heart & blood vessels), renal/urologic (kidneys), and ophthalmic (eyes).

How Common is Hypertension in Dogs and Cats?

We don't really know yet, but it is diagnosed more frequently now that more veterinarians are monitoring blood pressure. Up to 65% of cats with chronic renal failure and up to 87% of cats with hyperthyroidism have hypertension.

What are the Signs of Hypertension?

The signs can include: Acute blindness, ocular hemorrhage, dilated pupils, retinal detachment, swollen kidneys, bloody urine, blood from nose, seizures, congestive heart failure with or without cardiac murmur, hyperdynamic arterial pulse quality, and palpable thyroid gland. Many animals, just like many people with hypertension, show little indication of the disease until a vascular accident occurs.

How is It Diagnosed?

The history and signs may be suggestive, the blood pressure measurement is diagnostic. Various other tests and procedures may be indicated to rule out some of the associated causes.

How is Hypertension Treated?

Diets low in sodium are helpful. Any underlying causes are treated. Various medications are used to control the blood pressure including ACE inhibitors, calcium channel blockers, beta blockers, and diuretics. Usually treatment is lifelong for that pet.

PATIENT MONITORING can consist of :

- Monitoring blood pressure and possible complications (especially eye and kidney disease).
- Laboratory tests to measure clinical disease response and side effects of medications (e.g., proteinuria, hematuria, anemia, thrombocytopenia, potassium balance, sodium balance, azotemia, albumin) may be indicated.

Call us if: • You are unsure if the response you are seeing is as expected. • You have trouble giving the medicine.

Thank you for this opportunity to serve you!