

# Systemic Hypertension

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## BASIC INFORMATION

### Description

Systemic hypertension (SH) is elevated blood pressure (BP), defined as a systolic BP greater than 180 mm Hg or a diastolic BP greater than 95 mm Hg. In dogs and cats pressure is measured with a BP cuff in a manner similar to that in people, but special equipment must be used to detect blood flow in their tiny arteries. SH can cause damage to the kidneys, eyes, heart, and other organs.

### Causes

In both dogs and cats, SH can be associated with chronic kidney disease or be idiopathic, which means that a primary cause cannot be found. In dogs, hyperadrenocorticism (Cushing's disease) and a tumor of the adrenal gland (pheochromocytoma) can cause SH. In cats, hyperthyroidism is a cause. Hypertension is a rare complication of some medications.

### Clinical Signs

SH does not cause any clinical signs until a serious problem occurs. In some animals, the first sign is detachment of the retinas of the eyes, with sudden blindness. Other sign of the underlying disease may be present. (See also the handouts on **Hyperadrenocorticism in Dogs**, **Hyperthyroidism in Cats**, **Chronic Kidney Disease in Dogs**, and **Chronic Kidney Disease in Cats**.) Dogs with pheochromocytoma have vague symptoms that may include lethargy and weakness. A few animals with chronic SH develop left-sided heart failure and show signs of exercise intolerance, increased respiratory rate and effort, and coughing.

### Diagnostic Tests

Hypertension is confirmed by repeated BP measurements. Once the diagnosis is established, further tests are needed to find the underlying cause. These may include routine laboratory and urine tests, thyroid tests (in cats), chest x-rays, and cortisol tests (in dogs). Abdominal x-rays and ultrasound studies may also be recommended. An echocardiogram (heart ultrasound) is often done in animals with signs of heart failure or with murmurs detected on physical examination. A diagnosis of idiopathic hypertension is reached only if all other test results are normal.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Treatment is indicated in all affected animals to prevent further damage to various organs from the hypertension. The goal is to

reduce the systolic BP to less than 160 mm Hg. Hypertension in most cats responds well to oral amlodipine given once or twice daily. The dosage and frequency are determined by repeated BP measurements. Amlodipine rarely causes side effects, but a few cats can become weak if hypotension (low BP) develops. Notify your veterinarian if your cat seems lethargic after starting the drug. If the amlodipine does not work, it may be replaced or combined with an angiotensin-converting enzyme (ACE) inhibitor. Occasionally, beta-blocker drugs are used, alone or in combination with other drugs.

Dogs are similar to people in that no single drug works all the time in every dog. Dogs may need a combination of amlodipine and an ACE inhibitor to control their SH. A few dogs may have beta-blockers added to their therapy. In dogs with SH that is refractory to the most common therapies, hydralazine can be tried. All these drugs can cause hypotension, so notify your veterinarian if your dog acts weak after starting them. Hydralazine also causes vomiting and diarrhea in about half of treated dogs, so it is not well tolerated. Research is being done to find other drugs that may control SH in dogs.

If a cause of the SH is found, then it is also treated. If the underlying cause can be cured (such as hyperthyroidism) or controlled (such as hyperadrenocorticism), then the SH may eventually disappear, and antihypertensive drugs may be discontinued.

### Follow-up Care

BP is commonly monitored every 7-14 days until normal, after which it is measured every few months for awhile. If the hypertension remains well controlled, BP monitoring may eventually be decreased to every 6 months. The frequency of follow-up visits also depends on the underlying disease and what is required to treat that disease.

### Prognosis

Patients with idiopathic SH have a good prognosis if the SH can be controlled with medication. Prognosis is variable in patients whose SH is associated with other diseases, depending on their severity. If the animal has gone acutely blind from detached retinas, the retinas can reattach if the SH is diagnosed early and treated aggressively and quickly. It is rare that cats regain sight, even with the adequate therapy; however, some dogs may regain vision.