

Systemic Hypertension

ABOUT THE DIAGNOSIS

Systemic hypertension is defined as persistently high blood pressure. As in humans, high blood pressure is initially a silent disease, meaning that it exists without producing any obvious symptoms. When symptoms do occur in pets, the most common one is sudden blindness due to hypertension-induced retinal damage inside the eyes. Since blood pressure monitoring has become more available in veterinary hospitals, more pets are diagnosed before severe damage occurs. Pets with any of several disorders known to predispose to high blood pressure should have blood pressure measurements taken. These disorders include chronic kidney disease, hyperthyroidism, diabetes, hyperadrenocorticism (Cushing's disease), and pheochromocytoma (a rare tumor of the adrenal glands). In addition, certain medications can contribute to high blood pressure, including corticosteroids, cyclosporine, erythropoietin, and phenylpropanolamine (a drug sometimes used for controlling urinary incontinence).

In healthy dogs and cats, as in humans, regulation of systemic blood pressure is dependent on complex interactions between the nervous system, endocrine system, kidneys, and cardiovascular system. Blood pressure is determined by cardiac output (the amount of blood pumped by the heart per unit of time) and resistance of the small blood vessels (vascular resistance). This is similar to pumping water through a system of pipes—if the size of the pipes is made smaller, resistance to the flow of water is higher, and pressure within the system increases. If the pump is made to pump a larger volume of water, the pressure will also increase.

One of the hormonal regulators of blood pressure is the renin-angiotensin-aldosterone system. Many diseases increase the activity of this important system in the body, and therefore, manipulation of this hormonal system (giving medications to reduce its activity) is one method of treating hypertension. Other treatments are aimed at reducing vascular resistance by causing dilation of small blood vessels. Still other medications regulate the heart rate and cardiac output.

Systemic hypertension damages many of the same organs in pets as in people. However, pets do not develop significant arteriosclerosis; therefore, stroke is not as common a consequence of systemic hypertension in pets as it is in people. One of the most frequent cardiovascular changes in hypertensive pets is heart enlargement, but this often does not produce any outward symptoms other than a heart murmur that a veterinarian can hear with his/her stethoscope. As mentioned above, another one of the most common complaints leading to a diagnosis of systemic hypertension in pets is sudden blindness due to retinal damage or retinal detachment. This occurs because hypertension damages the small blood vessels in the eyes. Kidneys are also involved with systemic hypertension. Although high blood pressure does not seem to damage healthy kidneys, the hypertension that develops in chronic kidney disease does contribute to further worsening of

the kidney disease. Very high blood pressure, especially if it develops suddenly, also can cause swelling of the brain (hypertensive encephalopathy), which can result in stupor, coma, seizures, and even death. Cats are more susceptible to hypertensive encephalopathy than are dogs.

LIVING WITH THE DIAGNOSIS

If the underlying disease can be treated (such as hyperthyroidism) or controlled (such as hyperadrenocorticism), the blood pressure may normalize on its own. However, in the majority of cases, the underlying problem cannot be entirely eliminated and pets with systemic hypertension generally need medication indefinitely. If your hypertensive pet is taking any medications that can cause high blood pressure, eliminating those hypertension-causing medications or reducing their dosage is advised. Consult your veterinarian before making any changes in medications.

TREATMENT

A variety of medications is used for treating hypertension in pets. Some pets require combination treatment with more than one medication to maintain normal blood pressure. Examples of common treatments used include:

- Calcium channel blockers (e.g., amlodipine)—promote dilation of blood vessels, thereby reducing vascular resistance; generally the most effective, safest form of medication.
- Salt restriction—not effective alone, but recommended in conjunction with medications.
- Diuretics (e.g., furosemide)—used commonly in humans, but less frequently as a treatment for systemic hypertension in pets. Diuretics reduce circulating blood volume and therefore reduce cardiac output.
- β -Adrenergic blockers (e.g., atenolol or propranolol)—lower heart rate and cardiac output. Frequently used in hypertensive, hyperthyroid cats.
- Angiotensin-converting enzyme (ACE) inhibitors (e.g., enalapril or benazepril)—lower vascular resistance by blocking a step in the renin-angiotensin-aldosterone system.

DOs

- Feed a low-salt diet if your pet will accept it.
- Give all antihypertensive medications as instructed.
- Consider having a second opinion from a veterinary internal medicine specialist if the cause or treatment remains unclear, or for the latest treatment options. Your veterinarian can refer you to one of these specialists (directory: www.acvim.org [North America], www.ecvim-ca.org [Europe]).

DON'Ts

- Do not feed treats high in salt.

WHEN TO CALL YOUR VETERINARIAN

- If general signs of illness occur, such as lack of appetite, vomiting, lethargy, or weakness.
- If you observe that your pet has sudden vision loss or sudden behavior change.

ROUTINE FOLLOW-UP

- Regular visits are needed to monitor blood pressure and look for possible side effects of therapy until satisfactory response to treatment is obtained. After hypertension is well-controlled, less frequent monitoring is required. Unless the underlying disease can be controlled, treatment will likely be lifelong.

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