CARDIOLOGY

Systemic Hypertension in Dogs and Cats

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Chronic systemic arterial hypertension is an underdiagnosed but prevalent condition in veterinary patients.[1] Systemic hypertension is defined as a sustained increase in blood pressure that increases the risk of target organ damage (TOD). Organ systems most at risk of TOD include the ocular, renal, cardiac, and neurologic systems. Commonly reported signs of TOD include hypertensive retinopathy; new cardiac murmur; azotemia; proteinuria; changes in behavior or consciousness; and, in severe cases, seizures.[2]

Systemic hypertension can be classified as primary (idiopathic or essential) or secondary. Primary hypertension is a diagnosis of exclusion that refers to disease without an identifiable cause. Secondary hypertension is more common in veterinary patients and refers to hypertension associated with an underlying disease state, medication, or toxin. Chronic renal disease is the most common disease state associated with systemic hypertension in dogs and cats. Other conditions associated with systemic hypertension in both species include hyperadrenocorticism, pheochromocytoma, primary hyperaldosteronism, and hyperthyroidism.[2] Diabetes mellitus has been associated with systemic hypertension in 46% to 55% of dogs but is an uncommon risk factor in cats (< 2%).[3-5]

Hypertension can be further classified based on the level of risk for TOD:

- Minimal risk (normotensive): < 150 mm Hg
- Low risk (borderline hypertensive): 150 to 159 mm Hg
- Moderate risk (hypertensive): 160 to 179 mm Hg
- High risk (severely hypertensive): > 180 mm Hg

DIAGNOSTIC EVALUATION

Indirect arterial blood pressure assessment is most frequently used for routine screening and management of systemic hypertension.[2] Considerations for obtaining accurate blood pressure readings include minimizing patient stress and selecting an appropriate cuff size and location. A minimum set of 5 to 6 systolic blood pressure readings is recommended.[2] This allows the clinician to observe trends and provides a representative average systolic reading for that set.

WHEN TO TREAT

The decision to treat is based on clinical judgment, reliable systolic blood pressure measurements, and supporting clinical evidence. The clinician should take into consideration the patient's anxiety and stress level, the reason for screening, and the presence or absence of TOD signs. All patients diagnosed with hypertension on an initial blood pressure screening should be evaluated for potential causes of secondary hypertension and managed appropriately. Ideally, sustained systemic hypertension is confirmed as a systolic blood pressure > 160 mm Hg on more than 1 occasion prior to commencing treatment.[2] However, if the average systolic blood pressure is consistent with

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severe hypertension and the patient has evidence of active TOD, treatment may need to be initiated based on a single set of readings.

The goal of treatment is to reduce systolic blood pressure to below 160 mm Hg while avoiding hypotension.[2,6] This lowers the risk of TOD and may reverse early TOD lesions. Details of treatment and monitoring are provided in the algorithms.

Treatment of Hypertension in Cats

There are 2 main options for monotherapy treatment of systemic hypertension in cats: amlodipine besylate and telmisartan. Amlodipine besylate is a calcium channel blocker and potent peripheral arterial dilator. Starting dosages range from 0.625 to 1.25 mg PO q24h.[6] It has a rapid onset of action, reaching a steady state within 3 to 5 days, and is generally cost-effective for owners. Up to 40% of cats may need a second-line medication in addition to amlodipine.[7]

Telmisartan is an angiotensin II receptor blocker and is FDA approved and licensed in the United States for management of feline hypertension. It has a longer onset of action, reaching peak effect around 14 days of onset.[7] Typical starting dosage is 1.5 mg/kg PO q12h to q24h.[7] Refractory cases may require the addition of a second medication.

Treatment of Hypertension in Dogs

Angiotensin-converting enzyme (ACE) inhibitors such as enalapril or benazepril are the typical initial therapeutic choice for management of hypertension in dogs due to their antiproteinuric effect and potential use as monotherapy. The recheck schedule after starting or changing a dose of an ACE inhibitor for hypertension varies depending on the severity of the hypertension and the presence of TOD signs. Since renal proteinuria is a commonly encountered concurrent concern, this should also be evaluated at each recheck and addressed accordingly. In dogs with concurrent protein-losing nephropathy, a combination of an ACE inhibitor and telmisartan has been shown to produce a greater reduction in blood pressure than an ACE inhibitor alone.[8]

Once hypertension is well controlled, blood pressure monitoring is recommended at 3-month intervals.

Management of Systemic Hypertension in Dogs

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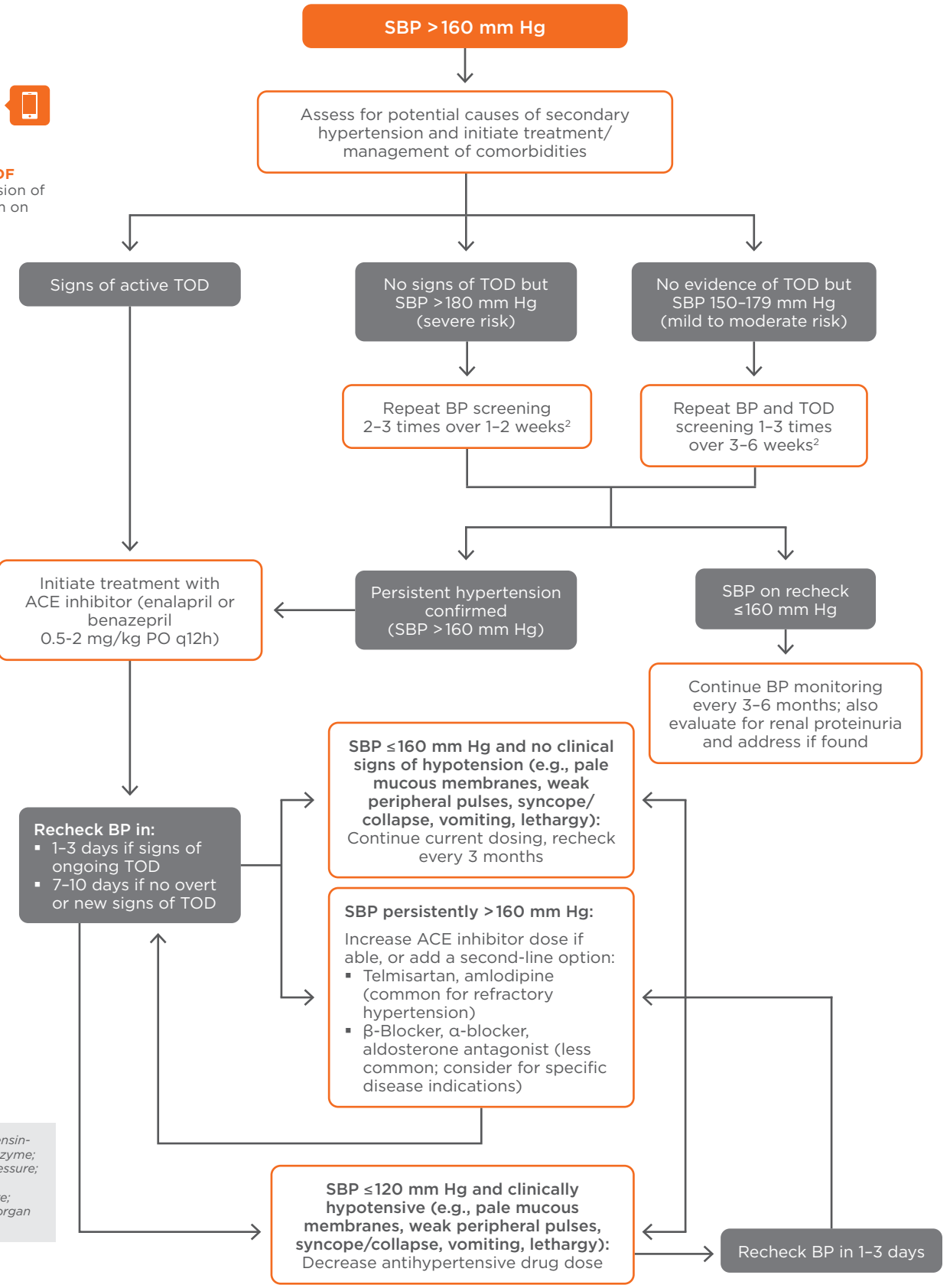

ACE = angiotensin-converting enzyme; BP = blood pressure; SBP = systolic blood pressure; TOD = target organ damage

Management of Systemic Hypertension in Cats

**Systemic hypertension may be considered refractory in cats with SBP not well controlled on amlodipine at 2.5 mg/day.[6] In these cases, owner compliance should be evaluated and the patient assessed for primary hyperaldosteronism.*

SBP >160 mm Hg

Assess for potential causes of secondary hypertension and initiate treatment/management of comorbidities

- Signs of active TOD
- No evidence of TOD but SBP 150–179 mm Hg (mild to moderate risk)
- No signs of TOD but SBP >180 mm Hg (severe risk)

Repeat BP and TOD screening 1–3 times over 3–6 weeks

Repeat BP screening 2–3 times over 1–2 weeks

Persistent hypertension confirmed (SBP >160 mm Hg)

SBP on recheck ≤160 mm Hg

Continue BP monitoring every 3-6 months[6,7]

Initiate treatment with one of the following:
- Amlodipine 0.625 mg PO q24h[6]
- Telmisartan 1.5 mg/kg PO q12–24h[7]

Recheck BP in:
- 3–5 days (amlodipine)[6]
- 14 days (telmisartan)[7]

SBP ≤160 mm Hg and no clinical signs of hypotension: Continue current dosing, recheck every 3 months

SBP persistently >160 mm Hg:
- Amlodipine: Increase dose in 0.625-mg increments (maximum 2.5 mg/day) if possible[6,*]
- Telmisartan: Increase dose in 0.5-mg/kg increments (maximum 2 mg/kg) if possible[7]

or

Add second-line option:
- Telmisartan or benazepril (common for refractory hypertension)
- Atenolol or spironolactone (less common; consider for specific disease indications)

SBP ≤120 mm Hg and clinically hypotensive (e.g., pale mucous membranes, weak peripheral pulses, syncope/collapse, vomiting, lethargy): Decrease antihypertensive drug dose

Recheck BP in 1–3 days

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Dr. Gagne received her veterinary degree from Iowa State University's College of Veterinary Medicine in 2018. She then went on to complete an American Board of Veterinary Practitioners (ABVP) residency in canine and feline practice at Weare Animal Hospital in New Hampshire. She became an ABVP diplomate in canine and feline practice in 2021 and followed it up by becoming a diplomate in feline practice in 2023. She is a member of AAFP, ASV, AVMA, and IVAPM with special interests in cardiology, respiratory disease, and shelter medicine. Dr. Gagne is currently serving as the director of veterinary services for Salem Animal Rescue League, a nonprofit organization dedicated to promoting animal welfare, reducing pet overpopulation, and providing access to veterinary care for underserved communities in the area. Prior to this, she was the managing DVM of Hopkinton Animal Hospital and Weare Animal Hospital in New Hampshire where she coordinated their feline radioactive iodine treatment program. In her spare time, Dr. Gagne enjoys serving on the advisory council and board of directors for the ABVP; hanging out with her backyard chicken flock; snuggling cats; and hiking, camping, and fishing with her husband, their new baby girl, and their dogs.