

Acute presentations of hypertension in cats

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Recognizing a
hypertensive
crisis

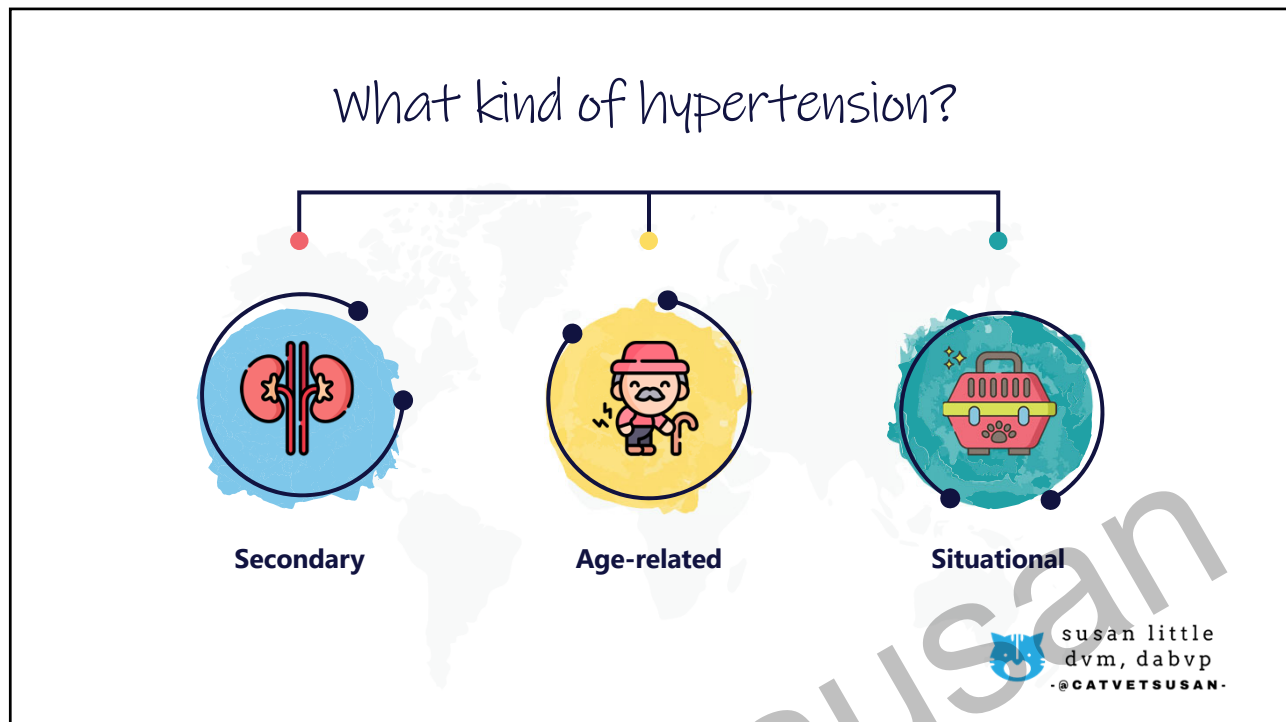
Target organ
damage

Therapeutics

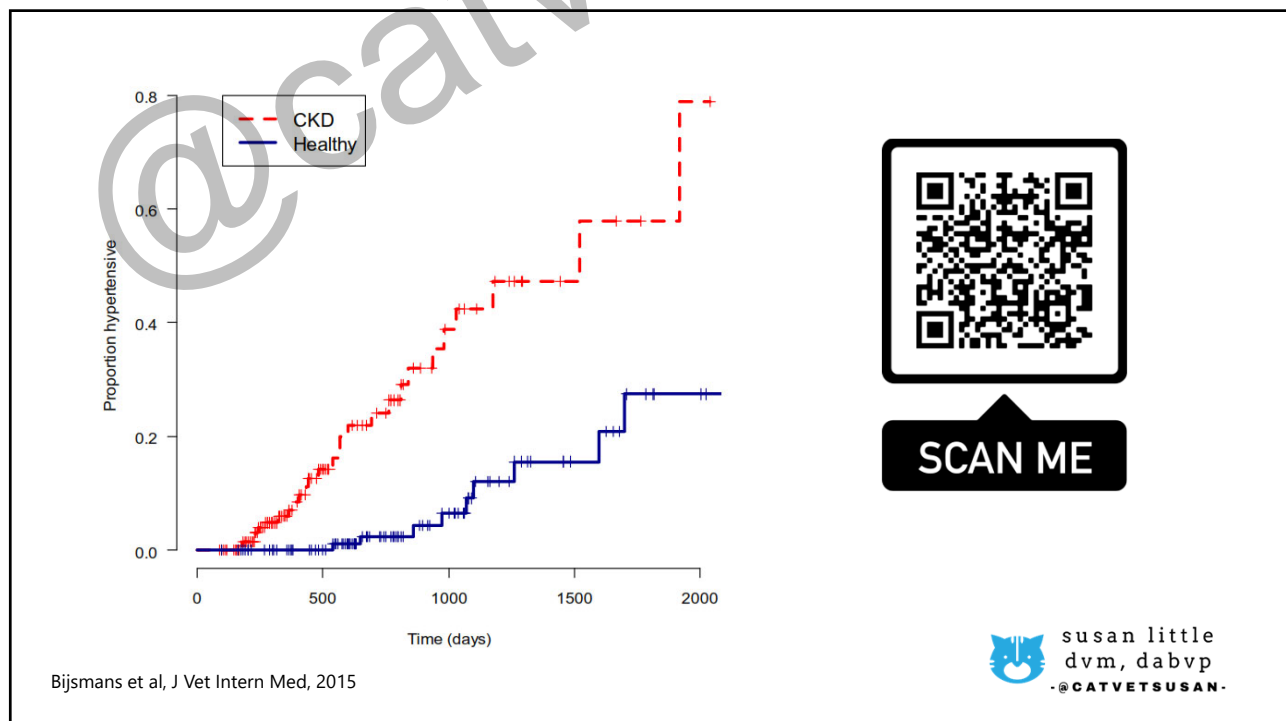


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Bijmans et al, J Vet Intern Med, 2015

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<http://www.iris-kidney.com>

Systolic Blood Pressure mmHg	Blood Pressure Substage	Risk of Future Target Organ Damage
<140	Normotensive	Minimal
140 – 159	Prehypertensive	Low
160 – 179	Hypertensive	Moderate
≥ 180	Severely hypertensive	High

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Blood pressure assessment videos: YouTube



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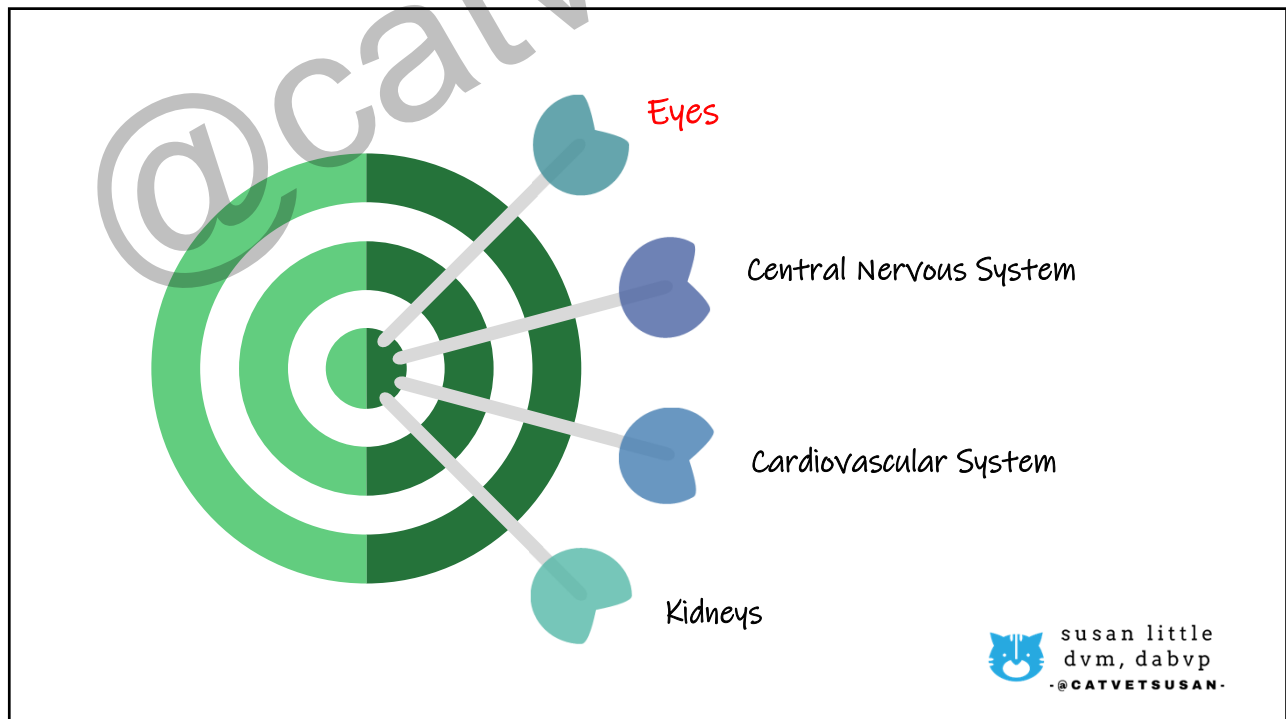


What's a hypertensive crisis?

- Acute onset ocular, neurologic, cardiovascular signs
- Must have an index of suspicion!

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Panoptic (Welch Allyn)



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Effects of hypertension on the fundus

Retinal detachment

Risk of permanent photoreceptor damage.

Retinal edema

From subretinal fluid accumulation.

Optic neuropathy

Ischemia of optic nerve head.

Retinal hemorrhage

Can extend to vitreal hemorrhage & hyphema



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Partial retinal detachment



Retinal edema,
hemorrhage,
detachment,
vessel
tortuosity

Complete
retinal
detachment



Hyphema

Sanders NA. Recognition & treatment of hypertensive crises,
August's Consultations in Feline Internal Medicine, Vol 7



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Intact menace & pupillary light response = **possibly reversible**



167 mmHg, visual eye

Blindness, bilateral mydriasis, hemorrhage, large areas of detachment = **probably permanent**



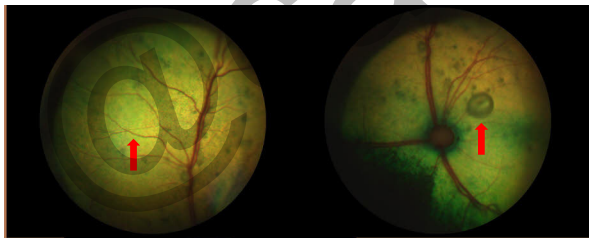
ISFM Consensus Guidelines on the Diagnosis and Management of Hypertension in Cats
Article Copyright © 2017 Authors, Source DOI: [10.1177/1098612X17693500](https://doi.org/10.1177/1098612X17693500)

Sanders NA. Recognition & treatment of hypertensive crises.
August's Consultations in Feline Internal Medicine, Vol 7



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Pre-treatment, 200 mmHg



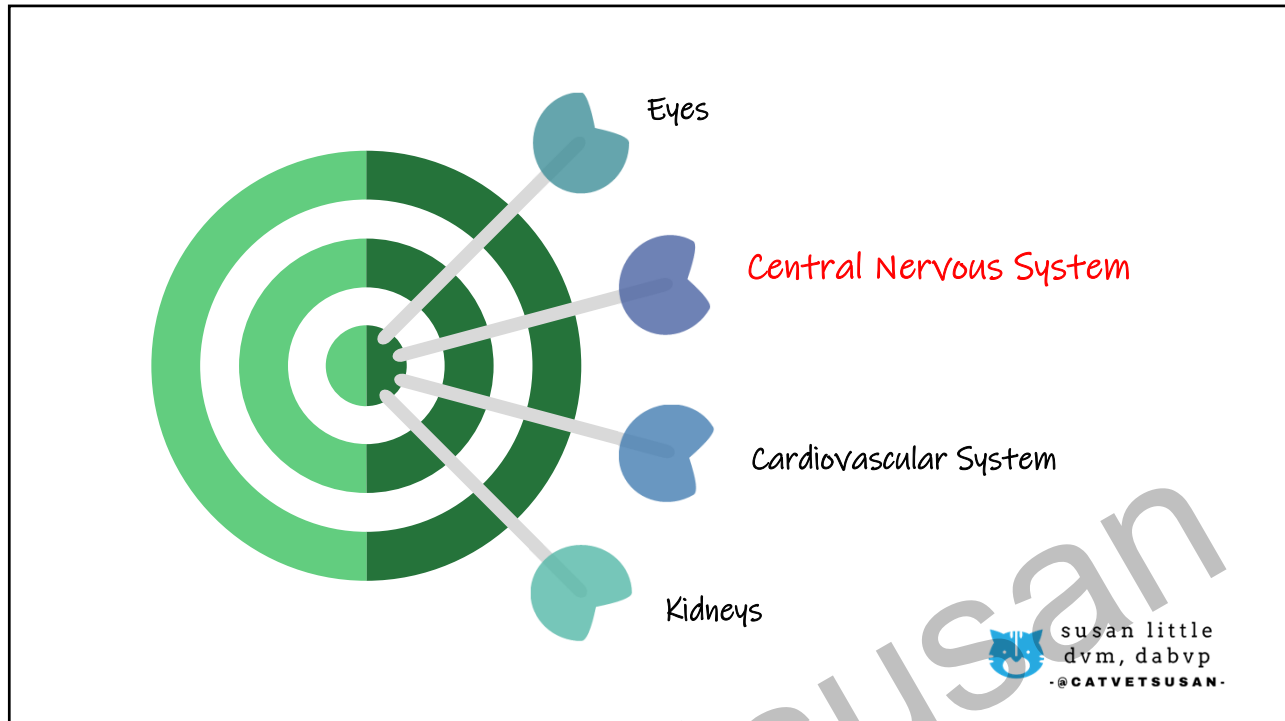
Normotensive for 6 weeks

Courtesy Dr. Steve Bailey

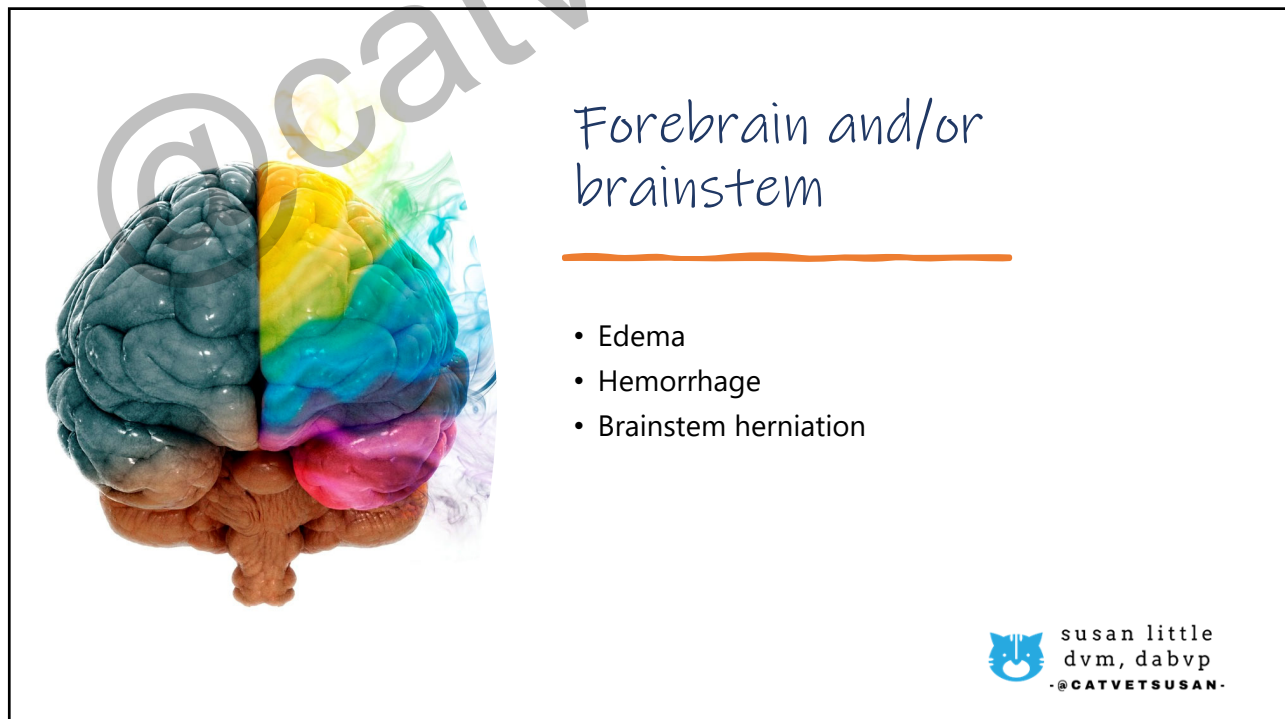


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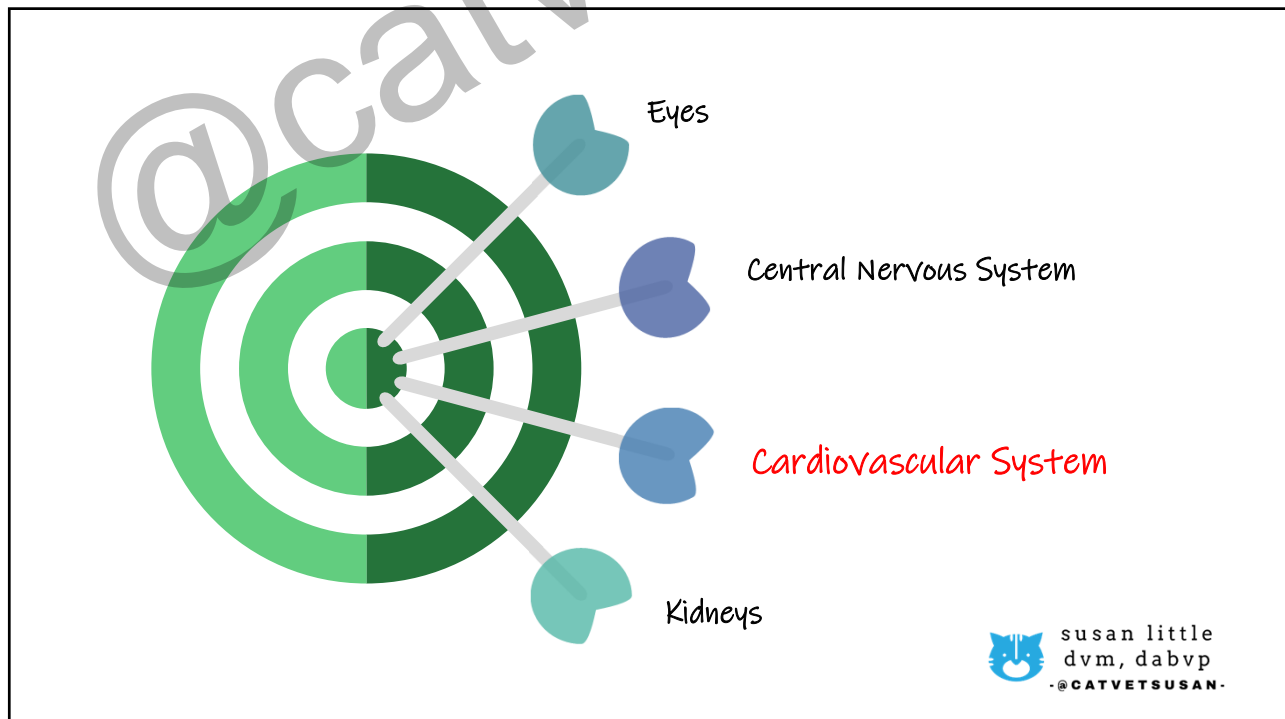
Hypertensive encephalopathy

Often acute onset

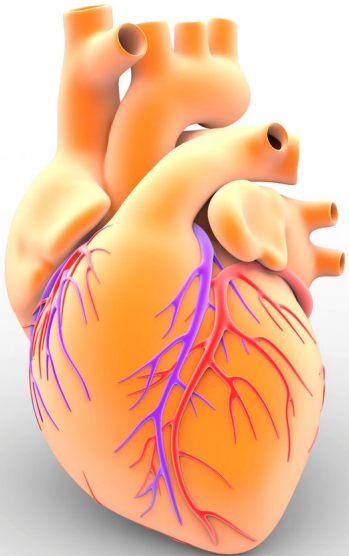
- Absent menace response, absent pupillary light reflex, anisocoria, blindness
- Altered mentation ranging from dull to comatose
- Seizures or seizure-like episodes
- Circling, ataxia

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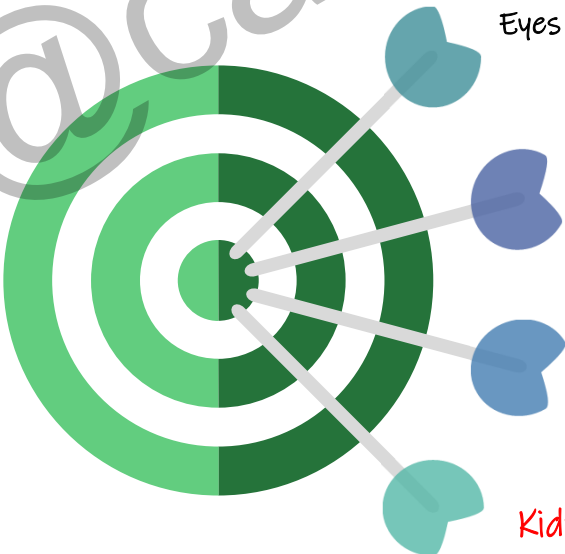


Cardiovascular signs are less common than neurologic or ocular signs

- Congestive heart failure
- Dissecting aortic aneurism
- Severe left ventricular hypertrophy

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Eyes

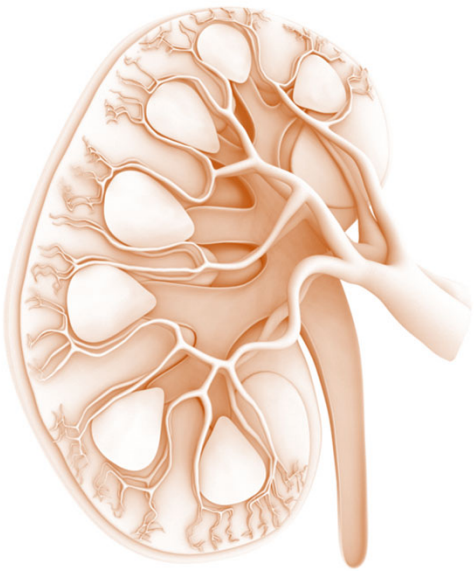
Central Nervous System

Cardiovascular System

Kidneys

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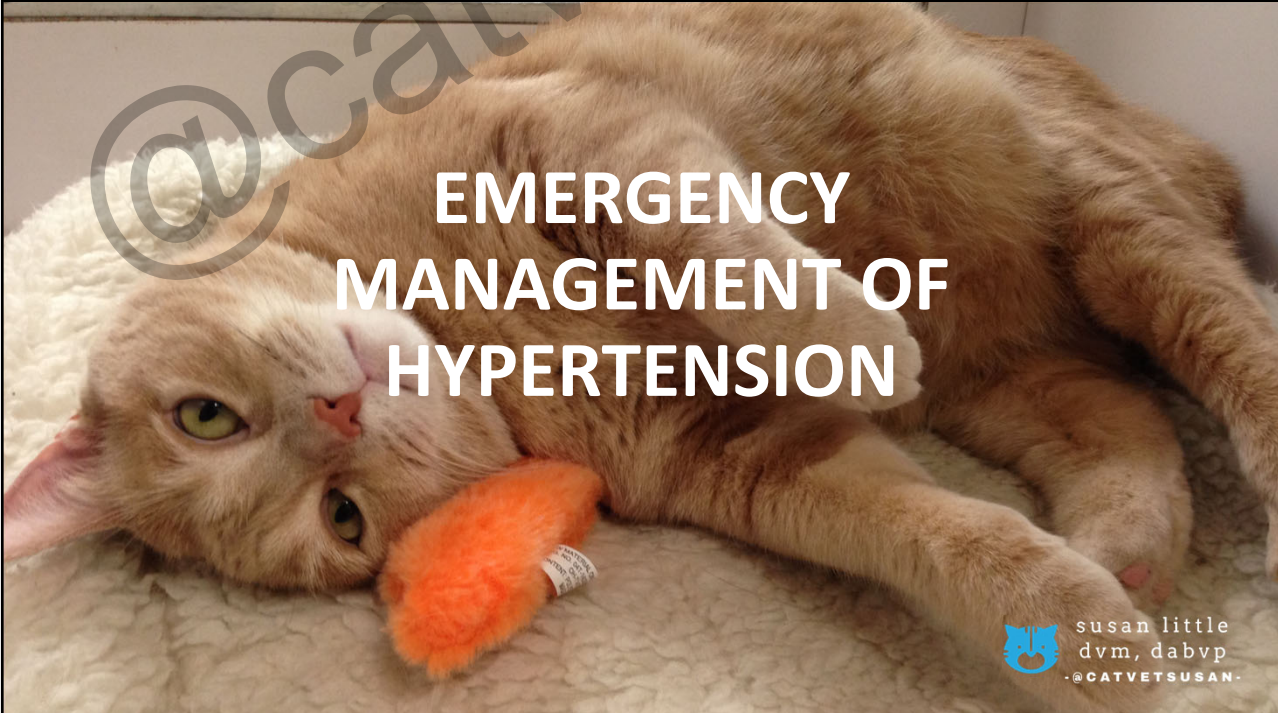


Least common presentation

- Acute kidney injury
 - About 50% are hypertensive
 - Not associated with degree of kidney injury
- Acute-on-chronic

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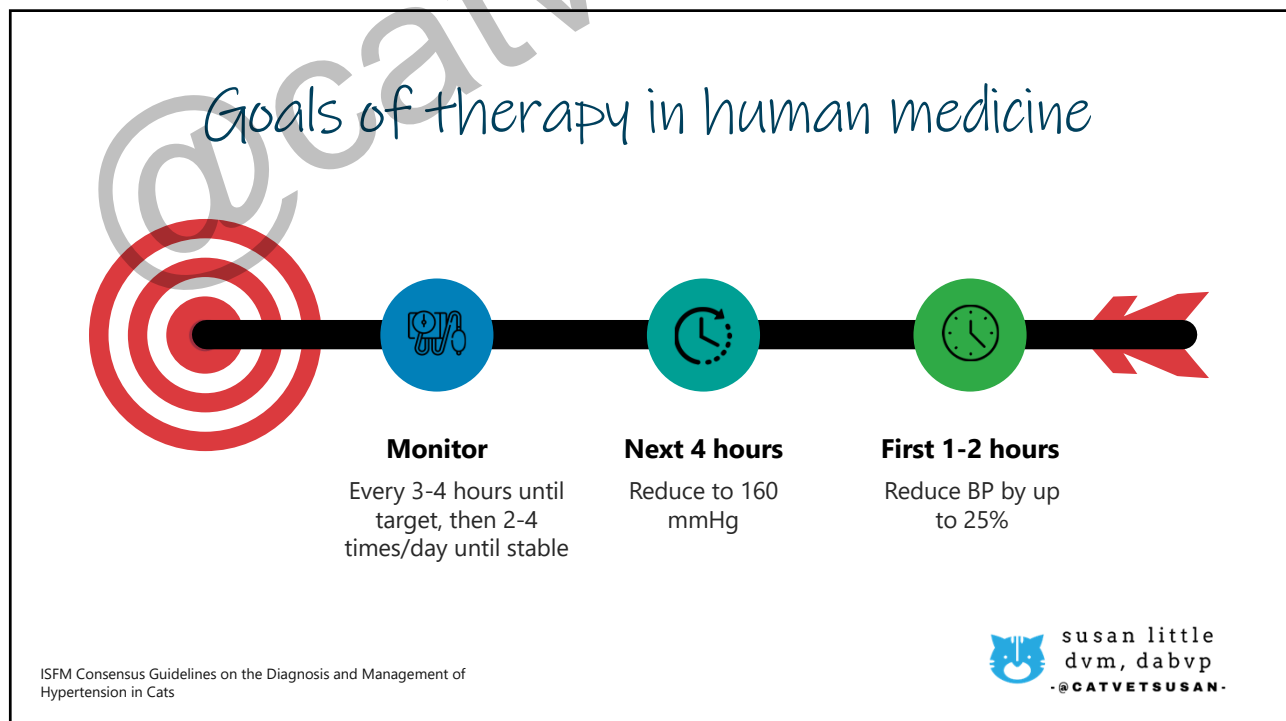
EMERGENCY
MANAGEMENT OF
HYPERTENSION

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Emergency drug of choice – oral amlodipine

START

0.625–1.25 mg/cat
Based on severity, presence
of hypokalemia

ADD

Short acting parenteral drug
if amlodipine alone not
effective

REPEAT

Within 4-8 hours
Maximum of 2.5 mg in 24
hours

EXPECT

Onset of action within 4 hours
Duration up to 30 hours

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Table 6 Parenteral drugs for emergency management of hypertension

Drug	Suggested dose	Comments
Hydralazine	0.2–0.5 mg/cat SC; repeat after 15 mins if necessary	Direct arterial vasodilator. Add a β -blocker if reflex tachycardia occurs ^{1,102,112}
Acepromazine	50–100 μ g/cat IV or SC	Phenothiazine and α -blocker, non-specific vasodilator ^{102,117}
Nitroprusside	1 μ g/kg/min CRI; titrate up to 3 μ g/kg/min if needed	Nitric oxide donor, non-specific vasodilator ¹¹²
Labetolol	0.25 mg/kg IV over 2 mins, repeat up to a total of 3.75 mg/kg, then 25 mg/kg/min as CRI	α - and β -blocker ¹
Esmolol	50–100 μ g/kg/min CRI	β -blocker ^{1,112}

SC = subcutaneously; IV = intravenously; CRI = constant rate infusion

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Hyphema



Amlodipine plus

- topical **prednisolone acetate** (1%) or topical **dexamethasone** (0.1%)
- 1 drop every 4-6 hours
- +/- 1 drop of topical **atropine** 1%, repeat in 12-14 hours if needed



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Abrupt reductions in BP or hypotension may lead to myocardial, cerebral, or renal ischemia



Caution



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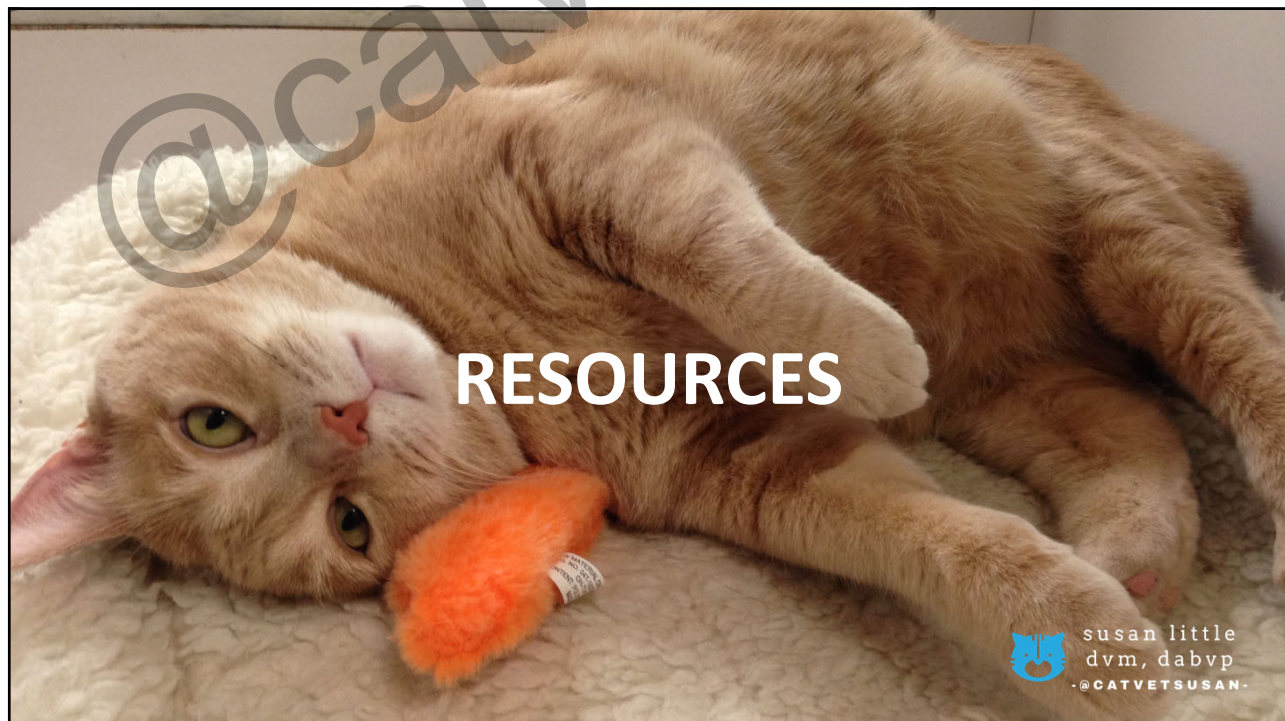
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Table 5 Drugs used for management of feline hypertension

Drug	Suggested dose	Comments
Amlodipine	0.625–1.25 mg/cat (0.125–0.25 mg/kg) q24h PO	Calcium channel blocker and drug of first choice. Dose may be doubled if response is inadequate up to a maximum of 2.5 mg/cat (0.5 mg/kg) q24h ^{1,12}
Benazepril	0.5–1.0 mg/kg q24h PO	ACE inhibitor ^{24,25,108,110}
Enalapril	0.5 mg/kg q12–24h PO	ACE inhibitor ^{24,25}
Ramipril	0.125–0.25 mg/kg q24h PO	ACE inhibitor ¹⁰⁶
Telmisartan	1 mg/kg q24h PO (experimentally, a dose of 3 mg/kg produced a greater effect on blood pressure) ¹⁰⁷	ARB, licensed at 1 mg/kg q24h in some regions for management of CKD-associated proteinuria. Not assessed clinically for managing feline hypertension, but one study showed greater response than benazepril to angiotensin I-induced pressor response when given at 1–3 mg/kg ¹⁰⁷
Atenolol	1–2 mg/kg q12h PO	β -blocker ¹⁰⁹

PO = orally; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker

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2018 ACVIM consensus statement: Guidelines for the identification, evaluation, and management of systemic hypertension in dogs and cats

acvim.org



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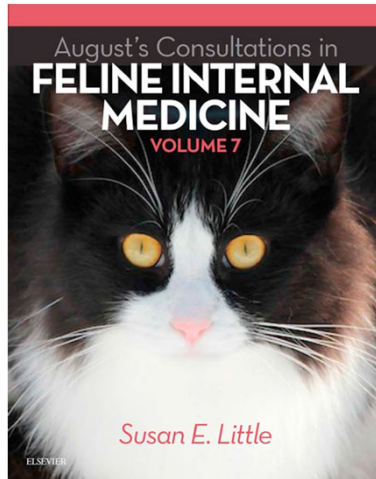
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2017 ISFM Consensus Guidelines on the Diagnosis and Management of Hypertension in Cats
journals.sagepub.com/home/jfm



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CHAPTER 87

Recognition and Treatment of Hypertensive Crises

Nancy A. Sanders

Veterinary knowledge of systemic hypertension (SH) has considerably evolved for the better over the past few decades for numerous reasons. The exponential growth of the human and pet population, coupled with benefits of computerized record data collection has led to an abundance of information regarding feline hypertension. Improved accuracy and availability of blood pressure (BP) measurement devices for companion animals have facilitated the ability to better diagnose feline SH. Finally, advances in the understanding of hypertension and antihypertensive pharmaceuticals in human medicine have aided the progress in effective treatment of feline SH.

Despite the many advances in the recognition and treatment of feline hypertension, cats still present in hypertensive crises without warning of pre-existing disease. This is in part due to the fact that SH is difficult to diagnose in general, let alone in aloof feline patients.



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<https://catvets.com/hypertension-toolkit>

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Final thoughts ...

- Evaluate blood pressure in cats with acute onset of neurologic, cardiovascular, ocular signs
- Evaluate the fundus on every cat – early lesions more amenable to treatment
- Use the most effective drugs for emergency management



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Reading list

- Carter, J. Hypertensive ocular disease in cats: A guide to fundic lesions to facilitate early diagnosis. J Feline Med Surg, 2019.
- Church, M. Neuropathology of spontaneous hypertensive encephalopathy in cats. Vet Pathol, 2019.
- Oricco, S. Aortic dissection in four cats: clinicopathological correlations. J Vet Cardiol, 2019.
- Brown, CA. Hypertensive encephalopathy in cats with reduced renal function. Vet Pathol, 2005.

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The Cat
Clinical Medicine and Management
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