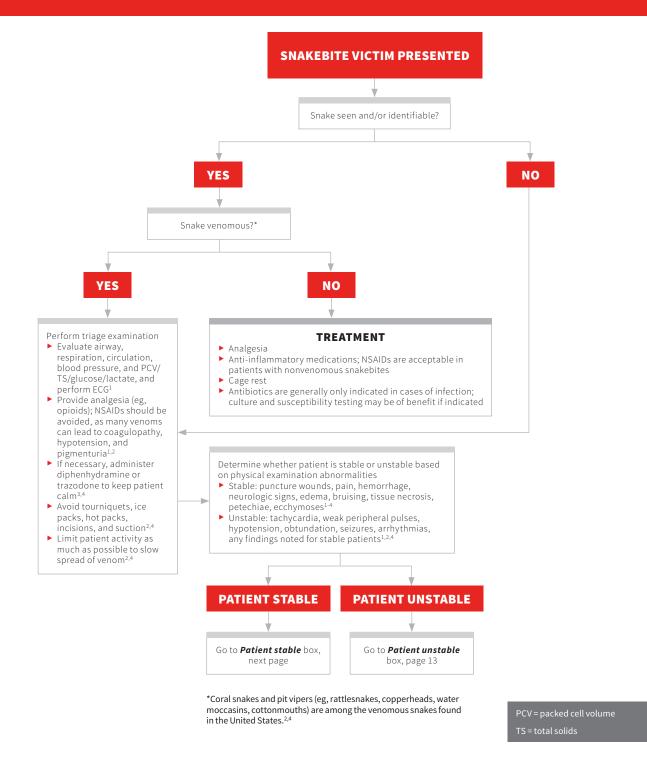
SNAKE ENVENOMATION

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PATIENT STABLE

Conduct diagnostic investigation (eg, CBC, serum chemistry profile, urinalysis, ECG, blood pressure, coagulation profile) and snakebite severity score evaluation (see Suggested Reading). Diagnostic investigation findings may include:

- Echinocytes (may be present for up to 24-48 hours), thrombocytopenia, and leukocytosis on CBC4-6
- ► Coagulation abnormalities on coagulation testing^{4,7,8}
- Alterations in ALT, ALP, GGT, AST, creatine phosphokinase, creatinine, blood urea nitrogen, sodium, potassium, calcium, chloride, and glucose on serum chemistry profile1-
- Pigmenturia, glucosuria, and casts on urinalysis²

Determine outpatient versus inpatient status

- $\,\blacktriangleright\,$ Consider outpatient therapy in stable patients with minimal pain and/or no clinical or blood work abnormalities (eg, thrombocytopenia, evidence of coagulopathy or hypotension)
- Consider inpatient therapy in unstable patients and/or any patient with significant pain, pigmenturia, casts, elevated hepatocellular or cholestatic liver enzyme activity, azotemia, and/or hypotension⁴

OUTPATIENT

TREATMENT

- ► Analgesia (eg, buprenorphine, gabapentin, fentanyl patch)
- Shaving and cleaning area around puncture wounds, if able
- Providing specific monitoring instructions to the pet owner
- ► Antibiotics are indicated only in patients with evidence of an infected wound^{2,9}
- ► Glucocorticoids are controversial and typically not recommended 2,4,10
- ► The efficacy of the rattlesnake vaccine is controversial and not indicated in the immediate treatment of a snakebite5,11

INPATIENT

TREATMENT

- Fluid therapy to treat hypovolemia and dehydration and provide daily maintenance fluid requirement
- Antivenom, if indications (eg, hypotension, neurologic signs, coagulopathy, tissue necrosis, rapid progression of swelling; see Antivenom

Recommendations) persist^{10,12}

- Analgesia (ie, opioids); NSAIDs should be avoided^{1,2,4}
- Shaving and cleaning area around puncture wounds, if able
 Hyperbaric oxygen treatment, ^{13,14} if available
- ▶ Long-term antiepileptic medications (eg, levetiracetam) in patients with seizures
- ▶ Packed RBC transfusion in bleeding anemic patients
- ▶ Passive range of motion and frequent changes in recumbency in patients with muscle weakness and/or paralysis
- Mechanical ventilation in patients with upper airway obstruction and/or hypoventilation^{1,5}
- Antibiotics are indicated only in patients with evidence of an infected wound^{2,9}
- Glucocorticoids are controversial and typically not recommended^{2,4,10}

Consider outpatient therapy when patient is clinically stable (eg, pain is under control, patient has interest in food, wounds are clinically static)

ALT = alanine transaminase



TREATMENT

Address life-threatening abnormalities

- ▶ Fluid bolus of isotonic crystalloids (10-25 mL/kg over 15 minutes) in patients with hypotension, then reassessment of patient.¹⁵ Vasopressors may be required in certain patients
- ▶ Benzodiazepines in patients with active seizures
- ▶ Analgesia (ie, opioids); NSAIDs should be avoided¹,²,⁴
- ► Antivenom (see Antivenom Recommendations)^{2,11}
- ▶ Antiarrhythmics (eg, lidocaine, procainamide, amiodarone) as needed
- Oxygen supplementation as needed¹⁰
- Intubation and mechanical ventilation in patients with airway obstruction and/or hypoventilation^{1,5}
- Vasopressors in patients with hypotension unresponsive to fluid therapy

After patient is stable, go to **Patient stable** box

ANTIVENOM RECOMMENDATIONS

- ► Clinicians should start with one vial of antivenom per patient; however, patients with a lower body weight may require more antivenom, 1-5 as smaller patients tend to receive a larger amount of venom per kg of body weight when bitten (eg, a Chihuahua vs a Great Dane injected with the same amount of venom).5
- If the antivenom is lyophilized, one vial should be reconstituted with crystalloid fluids (100-250 mL).⁵
- Antivenom should be administered intravenously over 1 to 2 hours.^{2,3}
- Patients should be monitored for signs of anaphylactoid/anaphylactic reactions.
- ▶ Diphenhydramine may be considered if anaphylaxis or a mild anaphylactoid reaction to the antivenom is suspected, whereas epinephrine and intravenous fluids should be administered for severe anaphylaxis/anaphylactoid reactions.² Administration of antivenom should be stopped in both instances.⁴ However, if the reaction is not severe, administration of antivenom should be slowly resumed after approximately 20 to 60 minutes.⁴ Additional support in patients with hypotension (eg, vasopressors) and/or respiratory signs (eg, mechanical ventilation) may be required.¹

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Suggested Reading

Peterson ME, Matz M, Seibold K, Plunkett S, Johnson S, Fitzgerald K. A randomized multicenter trial of Crotalidae polyvalent immune F(ab) antivenom for the treatment of rattlesnake envenomation in dogs. *J Vet Emerg Crit Care (San Antonio)*. 2011;21(4):335-345.