

VIRGINIA POISON CENTER

Provider Factsheet/Recommendations for Copperhead Envenomations

CONSULT THE VIRGINIA POISON CENTER (1-800-222-1222 or 804-828-9123)

REFER TO THE PACKAGE INSERT FOR COMPLETE RECOMMENDATIONS FOR ADMINISTERING CROFAB® AND ANAVIP® ANTIVENOM

Venomous snakes native to VA:

- 1) *Agkistrodon contortix* (Copperhead) - most common in central Virginia
- 2) *Agkistrodon piscivorus* (Cottonmouth/water moccasin) (largely near bodies of water)
- 3) *Crotalus horridus* (Timber Rattlesnake (mountain areas), Canebrake Rattlesnake (coastal areas))

Copperhead Bite Evaluation and Management:

- Signs of Envenomation
 - Local signs and symptoms
 - Pain, edema, color changes/ecchymoses
 - Continued seepage of blood from bite site
 - Vesicles or blistering (can have hemorrhagic bullae)
 - Systemic signs and symptoms: Occur rarely in copperhead envenomations
 - Most common: anxiety, nausea, metallic taste, diaphoresis, circumoral numbness or tingling
 - Less common: tachycardia, hypotension, lightheadedness, adenopathy, rhabdomyolysis, anaphylaxis
 - Hematologic effects: Rare in copperhead envenomations but may include coagulopathy, thrombocytopenia, spontaneous bleeding
 - Admit patients with signs of envenomation for observation (generally ~23 hours or greater) to monitor for progression of swelling, pain, and tissue destruction
- Dry bite
 - **If normal CBC and no local effects as above after 6 hours from bite**, this can be considered a dry bite and patient can be discharged
 - Any significant pain, swelling, ecchymosis likely represents envenomation
- Recommendations for care:
 - Local wound care
 - Update TDAP if indicated
 - Obtain CBC. If normal or baseline, no need for repeat labs.
 - Pain management (can use NSAIDs if no individual contraindications)
 - KEEP THE EXTREMITY ELEVATED (above the level of the heart if possible)
 - This is crucial for adequate care
 - Monitor for progression of local effects
 - Mark the site and leading edge. Circumferential measurements are not needed
 - Remember that elevation can and should mobilize some edema proximally and is not solely indicative of need for antivenom
 - NO ice, tourniquet, compression wrapping, antibiotics (snakebites do not generally become infected)
 - Exceptions may be made to administer antibiotics if wound is grossly contaminated

- or if patient introduced oral flora to wound by attempting to suck out the venom
- Consult the poison center for antivenom indications/recommendations
- Surgical intervention is RARELY indicated. Please consult toxicology/poison center prior to surgical service
 - Compartment syndrome is not anticipated. The fangs rarely penetrate deep enough to cause elevated pressures
 - Compartment pressures may appear falsely elevated in envenomations, and can be improved with antivenom
 - It is more important to monitor for adequate distal capillary refill/perfusion. Pulses may be difficult to palpate due to edema
- Encourage early mobilization and weight bearing as tolerated. Patient may need PT/OT, mobility aids for the first few days/weeks after envenomation

• Antivenom

- Discuss indications with the Virginia Poison Center
- Halts progression of local tissue destruction from venom by antibody binding (does not reverse damage that has already occurred)
- **Studies have shown that antivenom shortens time of recovery by approximately 2 weeks, but the majority of patients are at similar functional levels by 4 weeks post-envenomation**
- Indications for antivenom include
 - Uncontrolled pain
 - Significant progression of swelling, tissue necrosis
 - Limited function of limb (particularly if pt is dependent on the limb occupationally or recreationally)
 - Systemic symptoms (thrombocytopenia, coagulopathy, hypotension, etc.)
- Patients may consider cost. A full course of either antivenom alone can exceed \$12,000

A comparison of Fab and F(ab')₂ antivenoms.

	CroFab (Crotalidae polyvalent immune Fab)	ANAVIP (Crotalidae equine immune F(ab') ₂)
Manufacturer	BTG International	Instituto Bioclon
Fab fragments	Ovine derived Fab fragments One venom binding site	Equine derived F(ab') ₂ fragments Two venom binding sites
Snakes used in antivenom creation	Snakes found in the US: -Eastern diamondback rattlesnake (<i>C. adamanteus</i>) -Western diamondback rattlesnake (<i>C. atrox</i>) -Mojave rattlesnake (<i>C. scutulatus</i>) -Cottonmouth (<i>A. piscivorus</i>)	Snakes found in Mexico/Central America: -Terciopelo (<i>B. asper</i>) -South American rattlesnake (<i>C. durissus</i>)
Elimination half life	12-23 hours	5.5 days
Dosing	Initial: 4-6 vials Maintenance: 2 vials every 6 hours for 3 doses for all pts with coagulopathy, additional doses to control symptoms	Initial: 10 vials Maintenance: 4 vials only if needed to control symptoms
Relative contraindications	Allergy to: -Sheep -Pineapple -Papaya -Alpha gal	Allergy to: -Horses -Alpha gal
Adverse effects	Allergic reaction Anaphylaxis Serum sickness	Allergic reaction Anaphylaxis Serum sickness

- The initial dose of CroFab® antivenom is 4 vials for significant envenomations. The initial dose of ANAVIP® antivenom is 10 vials.
 - The loading dose may need to be repeated if there is lack of control of swelling, worsening lab abnormalities, or clinical deterioration.
 - **Most Copperhead envenomations do NOT need maintenance dosing**
- Monitor closely for hypersensitivity reactions (see table above for possible cross-reactions)
- For an allergic reaction (rash, bronchospasm, hypotension, airway edema, nausea, vomiting, hoarseness, pruritus) **pause antivenom** administration
 - Give antihistamines, steroids and epinephrine if needed
 - Be ready to manage the airway with intubation or by surgical means
 - Minor reactions (urticaria only, etc.) may be treated and prevented by antihistamines and slowing the rate of infusion
 - Speak with a toxicologist at the Poison Center regarding advisability of further antivenom therapy
- Serum sickness is rare but may occur days to weeks from anti-venom administration (fever, arthralgias, headache, myalgias, rash, gastrointestinal upset). The patient should seek medical care and may be treated with steroids
- Discharge planning
 - Dry bite: As above, patient can be discharged if CBC is at baseline and is 6 hours post-bite if NO signs of envenomation
 - Envenomation: Recommend observation admission for pain control, monitoring for progression of swelling, need for antivenom or repeat dosing of antivenom
 - Counsel patients with envenomation that full recovery can take > 2-4 weeks
 - After discharge, patients may see increased soft tissue swelling distal to the bite site. This can be expected if the extremity is not adequately elevated
 - Snakebite information sheets for patients in English and Spanish can be printed from the Virginia Poison Center website (poison.vcu.edu)
 - Patients can follow-up with their PCP, PT/OT on a PRN basis
 - Patients can contact the Virginia Poison Center to request follow-up or with any questions. Their case will be on-file if they have previously been discussed with us.

Note: This factsheet is specific to COPPERHEAD (*Agkistrodon contortrix*) envenomations. Expected signs/symptoms and management differ for other venomous snakes native to Virginia and can be discussed by phone with your regional poison center.