

**UAMS MEDICAL CENTER  
TRAUMA SERVICES MANUAL**

**SUBJECT:** Management of Snakebites and Envenomation

**REVIEWED:**

**PAGE:** 1 of 4

---

**RECOMMENDATION(S):** Dr. Nolan Bruce

**APPROVAL:** 11/20/2020

**CONCURRENCE(S):** Dr. Wes Watkins

**EFFECTIVE:** 11/20/2020

---

**PURPOSE:** To provide a treatment algorithm for the management of snakebites and envenomation.

**INCLUSIONS:**

- Adult patients with bites from venomous snakes including common Arkansas denizens such as the **cottonmouth** AKA water moccasin (*Agkistrodon piscivorus*), the **copperhead** (*Agkistrodon contortrix*), **western diamondback rattlesnake** (*Crotalus atrox*), **timber rattlesnake** (*Crotalus horridus*), **western pigmy rattlesnake** (*Sistrurus miliarius*), and **Texas coral snake** (*Micrurus tener*)
- OR adult patients with bite from unknown species and local tissue reaction that is concerning for envenomation.

**EXCLUSIONS:**

- For non-indigenous snakebites with concern for envenomation, please contact poison control center (Poison Help hotline 1-800-222-1222) and follow further instructions as different antivenin may be needed for non-indigenous venomous snakes.

**BACKGROUND:**

- Arkansas is home to 6 types of venomous snakes, most commonly the cottonmouth which is usually found near water across the state.
- These snakes can be aggressive and often expose their mouths as a warning before preparing to strike (they have a lightly colored mouth, hence the name cottonmouth).
- The vast majority of venomous snake bites in America are non-lethal, but can result in soft tissue damage and loss of limb function<sup>1</sup>.
- CroFab is a snake antivenin used for treatment of four types of North American pit vipers (which includes the rattlesnakes, cottonmouths, or copperheads seen in Arkansas).
- CroFab is effective in mild or moderate envenomation injuries at preventing further tissue loss and limb function. It is somewhat effective in mitigating systemic toxicity in severe cases of envenomation<sup>2</sup>.
- CroFab is derived from inoculating sheep with one of four snake venoms and purifying antigen-binding proteins from the sheep serum. These are then mixed so that the final product has all four venom fragmented antigen-binding proteins.

**CROFAB ADMINISTRATION:**

- Because it is an animal-derived protein, there is an 8% risk of allergic or anaphylactic reaction with CroFab and patients should be monitored for adverse reactions.

**UAMS MEDICAL CENTER  
TRAUMA SERVICES MANUAL**

**SUBJECT:** Management of Snakebites and Envenomation

**REVIEWED:**

**PAGE:** 2 of 4

**RECOMMENDATION(S):** Dr. Nolan Bruce

**APPROVAL:** 11/20/2020

**CONCURRENCE(S):** Dr. Wes Watkins

**EFFECTIVE:** 11/20/2020

- CroFab should be administered within 6 hours of envenomation and the usual initial dose is 4-6 vials mixed in 250ml of normal saline.
  - For more severe envenomation with systemic shock or active bleeding, an initial dose of 8-12 vials can be used.
- This initial dose can be repeated at 1 hour if there is no response.
- Maintenance dosing should then be considered with 2 vials every 6 hours for a total of 18 hours.

**CARE ALGORITHM:**

- Initial evaluation and determination of need for antivenom should be investigated by the emergency department physician
  - Assess injury for evidence of bite marks, degree of swelling, tissue loss.
  - Assess injured extremity for compartment syndrome, if applicable
  - Routine vitals and lab work plus assessment of coagulopathy including PT/INR, PTT, fibrinogen, and ROTEM (if bite marks plus signs of envenomation are present).
  - Objective evidence of initial exam should be documented, including outlining borders of swelling and photographs in the electronic medical record.
- If there is no envenomation or minor envenomation (minor swelling or tissue injury, no systemic signs of shock, no coagulopathy), do not administer antivenom and the patient can be placed in CDU for observation from 12-24 hours.
  - If swelling/tissue loss does not progress, discharge home
  - If patient progresses, re-assess need for antivenom CroFab and consult surgery.
- If there is need for antivenom CroFab (major swelling or tissue loss, systemic signs, evidence of coagulopathy), proceed with administration and consult trauma surgery team for evaluation and admission.
  - All envenomation injuries should be admitted to the trauma service unless extenuating circumstances such as complex comanagement of medical conditions.
  - Patient should be evaluated every 6 hours by the trauma team to assess need for re-dosing of CroFab and assessed for compartment syndrome of the affected extremity if applicable.
  - If there are any signs of systemic shock or active bleeding, labs should be repeated at 6 hour intervals until resolved.
- See flowsheet below for full algorithm<sup>3</sup>.

**UAMS MEDICAL CENTER  
TRAUMA SERVICES MANUAL**

**SUBJECT:** Management of Snakebites and Envenomation

**REVIEWED:**

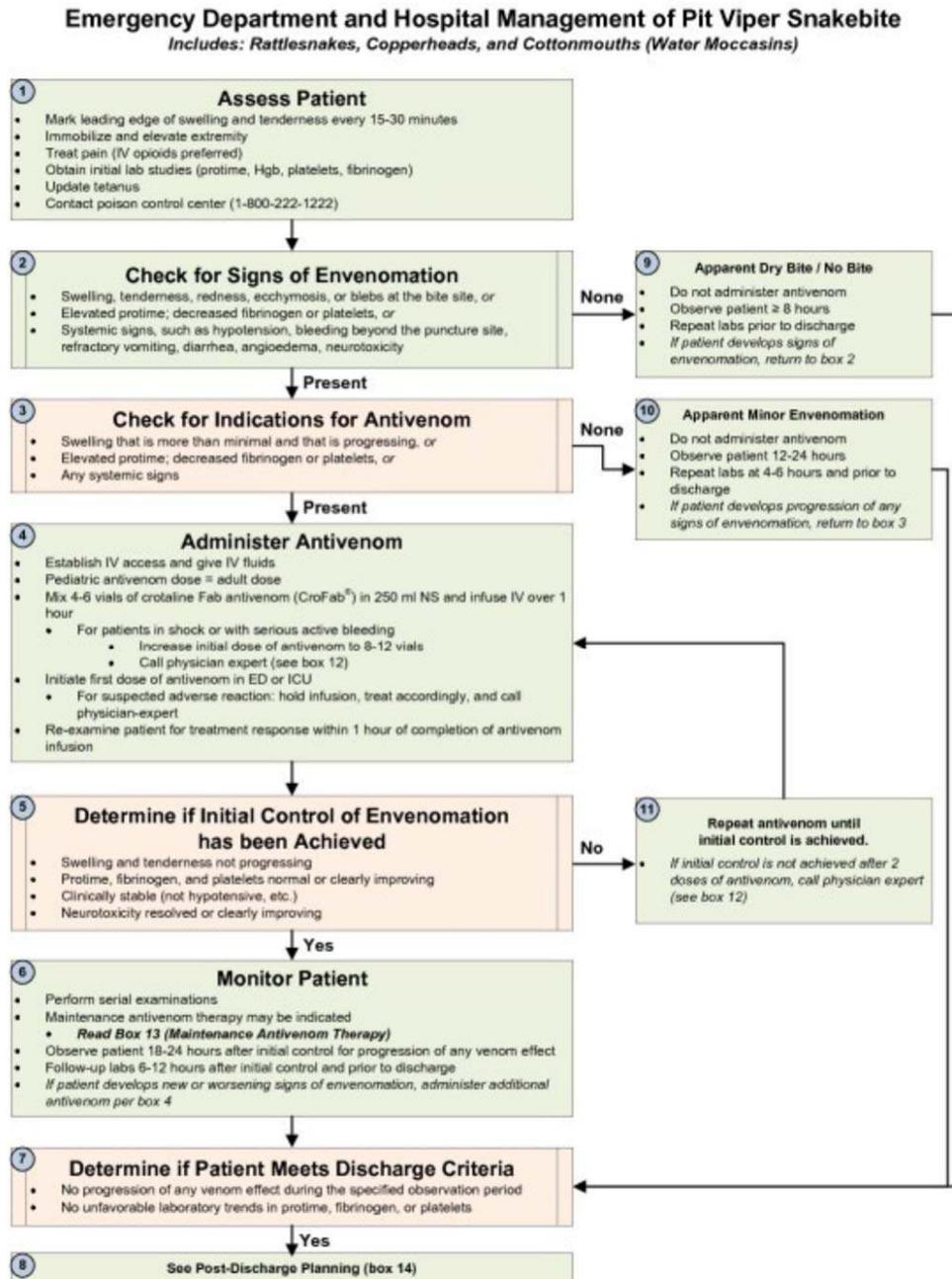
**PAGE:** 3 of 4

**RECOMMENDATION(S):** Dr. Nolan Bruce

**APPROVAL:** 11/20/2020

**CONCURRENCE(S):** Dr. Wes Watkins

**EFFECTIVE:** 11/20/2020



These guidelines were prepared by the UAMS Trauma Service. They are intended to serve only as a guideline based on current review of the medical literature and practice. They are neither policies nor protocols. Their use is at the discretion of the managing physician

UAMS MEDICAL CENTER  
TRAUMA SERVICES MANUAL

SUBJECT: Management of Snakebites and Envenomation

REVIEWED:

PAGE: 4 of 4

RECOMMENDATION(S): Dr. Nolan Bruce

APPROVAL: 11/20/2020

CONCURRENCE(S): Dr. Wes Watkins

EFFECTIVE: 11/20/2020

**12 When to Call a Physician-Expert**

Direct consultation with a physician-expert is recommended in certain high-risk clinical situations:

- **Life-threatening envenomation**
  - Shock
  - Serious active bleeding
  - Facial or airway swelling
- **Hard to control envenomation**
  - Envenomation that requires more than 2 doses of antivenom for initial control
- **Recurrence or delayed-onset of venom effects**
  - Worsening swelling or abnormal labs (protime, fibrinogen, platelets, or hemoglobin) on follow-up visits
- **Allergic reactions to antivenom**
- **If transfusion is considered**
- **Uncommon clinical situations**
  - Bites to the head and neck
  - Rhabdomyolysis
  - Suspected compartment syndrome
  - Venom-induced hives and angioedema
- **Complicated wound issues**

*If no local expert is available, a physician-expert can be reached through a certified poison center (1-800-222-1222) or the antivenom manufacturer's line (1-877-377-3784).*

**15 Treatments to Avoid in Pit Viper Snakebite**

- Cutting and/or suctioning of the wound
- Ice
- NSAIDs
- Prophylactic antibiotics
- Prophylactic fasciotomy
- Routine use of blood products
- Shock therapy (electricity)
- Steroids (except for allergic phenomena)
- Tourniquets

**16 Notes:**

- All treatment recommendations in this algorithm refer to crotalidae polyvalent immune Fab (ovine) (CroFab®).
- This worksheet represents general advice from a panel of US snakebite experts convened in May, 2010. No algorithm can anticipate all clinical situations. Other valid approaches exist, and deviations from this worksheet based on individual patient needs, local resources, local treatment guidelines, and patient preferences are expected. **This document is not intended to represent a standard of care.** For more information, please see the accompanying manuscript, available at [www.biomedcentral.com](http://www.biomedcentral.com).

**13 Maintenance Antivenom Therapy**

- Maintenance therapy is additional antivenom given after initial control to prevent recurrence of limb swelling
  - Maintenance therapy is 2 vials of antivenom Q6H x 3 (given 6, 12, and 18 hours after initial control)
- Maintenance therapy may not be indicated in certain situations, such as
  - Minor envenomations
  - Facilities where close observation by a physician-expert is available.
- Follow local protocol or contact a poison center or physician-expert for advice.

**14 Post-Discharge Planning**

- Instruct patient to return for
  - Worsening swelling that is not relieved by elevation
  - Abnormal bleeding (gums, easy bruising, melena, etc.)
- Instruct patient where to seek care if symptoms of serum sickness (fever, rash, muscle/joint pains) develop
- Bleeding precautions (no contact sports, elective surgery or dental work, etc.) for 2 weeks in patients with
  - Rattlesnake envenomation
  - Abnormal protime, fibrinogen, or platelet count at any time
- Follow-up visits:
  - Antivenom not given:
    - PRN only
  - Antivenom given:
    - Copperhead victims: PRN only
    - Other snakes: Follow up with labs (protime, fibrinogen, platelets, hemoglobin) twice (2-3 days and 5-7 days), then PRN

revision of  
SA-9102.pdf  
ent immune Fab  
n Med.

it of crotaline  
: Emerg Med

These guidelines were prepared by the UAMS Trauma Service. They are intended to serve only as a guideline based on current review of the medical literature and practice. They are neither policies nor protocols. Their use is at the discretion of the managing physician