Toxins and Environmental:
SNAKEBITE (VENOMOUS)

Goals: To aid EMS Providers in the recognition and treatment of patients with a bite by a venomous snake, in order to minimize spread of venom into the central and lymphatic circulation, and to identify and treat potentially limb- and life-threatening symptoms of envenomation
Inclusion Criteria: Any person with a proven or suspected venomous snake bite
Exclusion Criteria: Bites by snakes confirmed to be non-venomous. When in doubt, transport!
Refer to: Allergic Reaction, Shock and Pain Management CPGs for additional guidance

Clinical Presentation

- Bites typically occur while walking in an area known to be inhabited by venomous snakes
- Signs of envenomation of an extremity bite from the majority of U.S. native pit vipers include:
  - Sudden onset of pain
  - Swelling
  - Ecchymosis
- NOTE: Fang marks and local swelling may be absent
- NOTE: Victims may present with cranial nerve deficits or other paralysis, due to venom neurotoxicity
- NOTE: Very young and elderly patients are likely to have more severe envenomation

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
   a. A and B (Airway and Breathing): Assess for and treat airway/breathing compromise due to anaphylaxis and cardiovascular collapse (rare, but life-threatening)
      i. Administer epinephrine via auto-injector per Allergic Reaction CPG
   b. C (Circulation): Initiate continuous ECG and SpO_2 monitoring; monitor for signs of hemorrhage
   c. D (Disability): Document GCS and neurologic deficits
   d. E (Exposure and Environmental): Immediately remove jewelry/restrictive clothing from the extremity
   e. Obtain POC Glucose and treat according to Diabetic Emergencies CPG
2. Place the patient in a position of comfort
   a. If there is evidence of shock, position the patient supine with the feet elevated
   b. Closely monitor airway status and respiratory effort
3. Immobilize the extremity with a splint or other immobilization device and maintain the extremity parallel to the ground at the level of the heart or slightly elevated (no more than 15° of elevation):
   a. Do NOT constrict circulation with a tourniquet, Ace bandage, cravat or other device
   b. Do NOT apply ice or heat to the affected extremity
   c. Do NOT incise the wound or apply suction
4. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
5. Secondary Survey
   a. With pen/marker, outline the area of swelling on the patient's skin and NOTE the TIME
   b. Assess for pulses, capillary refill and sensation in the affected extremity
   c. Assess for persistent oozing from the bite site
6. Obtain SAMPLE and other pertinent history:
   a. Did patient see the snake?
      i. If so, document: colors, scale pattern, patient's location when bitten (near water, on dry land, etc.), and TIME BITTEN and TIME TO ONSET of SYMPTOMS
   b. If snake can be located, attempt to obtain photos (from a safe distance), using smartphone or camera
   c. If photography is unavailable and snake has been killed, consider transporting dead animal in a secure container for expert identification
   d. **CAUTION:** NEVER ATTEMPT TO PICK UP A PRESUMED DEAD ANIMAL WITH BARE HANDS!*
      i. PRIMITIVE BITE REFLEX MAY PERSIST FOR HOURS AFTER ANIMAL DEATH
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Continue assessment and management of airway compromise due to anaphylaxis or cardiovascular collapse
    a. For suspected anaphylaxis with upper and/or lower airway compromise and hypotension/shock:
        i. **Epinephrine (1 mg/mL):** Adults – Administer 0.3-0.5 mg (0.3-0.5 mL) IM

> i. **Pediatric (Infants and children under 14 years of age) - Epinephrine (1 mg/mL)**
> Administer 0.01 mg/kg (0.01 mL/kg) IM (maximum dose = 0.3 mg (0.3 mL))

        ii. Additional management of anaphylaxis: Refer to Allergic Reaction CPG
9. Establish IV/IO access in an unaffected extremity:
    a. For shock/hypotension, administer Normal Saline 20 mL/kg (maximum of 1000 mL (1L) per bolus)
    b. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
    c. Repeat fluid bolus once, if no response
    d. For additional fluid administration, consult BioTel
10. For refractory shock or hypotension after fluid administration, consider vasoactive medication infusion:
    a. Norepinephrine bitartrate infusion IV/IO, starting a 2 mcg/min
    b. Consult BioTel for dosage calculations and administration details
11. Monitor for and treat respiratory compromise, and initiate continuous waveform capnography ($ETCO_2$) monitoring according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
12. Monitor for and treat cardiac dysrhythmias
    a. Obtain 12-Lead ECG, if possible
13. Secondary Survey
    a. Frequent reassessment and documentation of response to interventions
    b. Frequent reassessment and documentation of progression of swelling (with time noted)
14. Treat pain according to the Pain Management CPG
15. Transport to a Level I or Level II Trauma Center
    a. Consult BioTel for destination decision-making guidance and assistance

***Additional Patient and Rescuer Safety Considerations**

1. If the live animal is in the vicinity, do NOT attempt to capture it (except with a camera)
2. If the animal is dead, lift the body with a long stick or other long object and place it into a sturdy, sealable container
    a. Transport the dead animal with patient for expert identification
3. Collection of NON-NATIVE venomous snakes is a popular hobby among reptile enthusiasts
    a. If dispatched to the scene of a bite by a NON-NATIVE venomous snake:
        i. Attempt to establish the location of the offending snake
        ii. Use GREAT CAUTION retrieving the patient if the snake's whereabouts are unknown
        iii. Once the patient and rescuers are in a safe location, attempt to obtain information from the patient or persons on-scene about:
            1. The scientific name and/or common name of the non-native snake
            2. The toxicities associated with this type of non-native snake (collectors usually know this)