# Bites and Envenomations

**History:**
- Type of bite/sting
- Description or bring creature with patient (preferably dead)
- Time, location, size of bite/sting
- Previous reaction to bite/sting
- Domestic vs. wild
- Tetanus and Rabies risk
- Immunocompromised?

**Signs and Symptoms:**
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from wound
- Evidence of infection
- SOB, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

**Differential:**
- Animal Bite
- Human Bite
- Snake Bite (poisonous)
- Spider Bite (poisonous)
- Insect sting/bite
- Infection risk
- Rabies risk
- Tetanus risk

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## Universal Patient Care Protocol

- Position Patient Supine
- Immobilize area or limb

## Allergic Reaction Protocol

- Medical # 2

## Signs/Symptoms of Allergic Reaction?

- Yes
- No

## Pain Control Protocol

- General # 8

## Contact Medical Control

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**LEGEND**
- EMT-B
- EMT-B I/V
- EMT-I
- EMT-P
- MC ORDER

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### Pearls:

- **Exam:** Mental Status, Skin, Extremities, Neck, Lungs, Heart, Abdomen, Back, Neuro
- If bee sting with visible stinger, remove stinger.
- Human bites are much worse than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacterium (Pasteurella multocida).
- Poisonous snakes in this area are few and are generally of the pit viper family, i.e. Rattlesnakes.
  - Amount of envenomation is variable, generally worse with larger snakes and early in spring.
- Black Widow spider bites tend to be minimally painful, bur over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the nest few days. (brown spider with fiddle shape on back)
- Consider contacting Poison Control for assistance.
Burns

**History:**
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus/Immunization Status

**Signs and Symptoms:**
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise
- Singed facial/nasal hair
- Hoarseness/wheezing
- Soot in oropharynx

**Differential:**
- Superficial (1°)
  - Red/Painful
- Partial Thickness (2°)
  - Blistering
- Full Thickness (3°)
  - Painless and charred or leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

**Universal Patient Care Protocol**
- Insure Patent Airway/Oxygen
  - Provide 100% O² for any potential CO Exposure
  - Remove rings, bracelets, and other constricting items

**Thermal Burns**
- Cover burns with moist, sterile dressing with cold pack.

**Chemical Burns**
- Flush involved areas with water or Normal Saline for 10-15 minutes, unless contraindicated by MSDS.
- Cover burns with moist, sterile dressing with cold pack.

**IV Protocol/NS Challenge**
- Contact Medical Control for Fluid Rate in Burns Greater than 10% BSA
- Contact Medical Control
  - Consider early trauma team activation if indicated.

**Pearls:**
- **Exam:** Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **Critical Burns:** > 25% body surface area (BSA); 3 burns > 10% BSA; 2 and 3 degree burns to face, eyes, hands, or feet; electrical burns; respiratory burns; deep chemical burns; burns with extremes of ages; circumferential burns; and burns associated with major traumatic injury. These burns may require transfer to a burn center.
- **Early intubation is crucial in significant inhalation injuries.**
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to tissue swelling.
- **Burn patients are prone to hypothermia**
  - Do not overlook the possibility of multiple system trauma.
  - Do not overlook the possibility for child abuse with children and burn injuries.
  - See APPENDIX for rule of nines.
**Drowning/Near Drowning**

**History:**
- Submersion in water regardless of depth
- Possible history of trauma
- Duration of immersion
- Temperature of water

**Signs and Symptoms:**
- Unresponsive
- Mental Status Change
- Decreased or absent vital signs
- Vomiting
- Coughing

**Differential:**
- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
  - Barotrauma
  - Decompression sickness

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### Universal Patient Care Protocol

**Spinal Immobilization Procedure**
Skill # 21 – If Indicated

**High Flow Oxygen**

Respiratory Distress?

- Yes → Consider Airway Management
  - Contact Medical Control
  - Consider Order For Albuterol 2.5mg/3cc NS Nebulizer

- No → Appropriate Protocol based on symptoms

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**LEGEND**

- EMT-B
- EMT-B I/V
- EMT-I
- EMT-P
- MC ORDER

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**Pearls:**
- **Exam:** Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Neuro
- **Consider hypothermia in all drowning or near drowning.**
- In cold water drowning, resuscitate all patients with submersions up to 2 hours.
- Drowning is the leading cause of death among would-be rescuers.
- Allow appropriately trained rescuers to remove victims from areas of danger.
Electrical Injuries

<table>
<thead>
<tr>
<th>History:</th>
<th>Signs and Symptoms:</th>
<th>Differential:</th>
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</table>
| • Lightning or electrical exposure  
• Single or multiple victims  
• Trauma secondary to incident  
• Duration of exposure  
• Voltage and current (AC/DC) | • Burns – Fern Patterns are seen in Lightning strikes.  
• Pain  
• Entry and exit wounds  
• Hypotension and shock  
• Arrest | • Cardiac Arrest  
• Seizure  
• Burns (see Burn Protocol)  
• Multiple Trauma |

**Universal Patient Care Protocol**

- Consider
  - **Multiple Systems Trauma Protocol**
    - Trauma # 9
  - **Burn Protocol**
    - Trauma # 2

**Focused history and Exam:**
- Look for entry/exit wounds

- **Cardiac Monitor**

- **Appropriate Dysrhythmia Protocol(s) if indicated**

- **Consider**
  - **Pain Control Protocol**
    - General # 8

- **Contact Medical Control**

**Pearls:**
- **Exam:** Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- Ventricular fibrillation and asystole are the most common dysrhythmias.
- Damage is often hidden; the most severe damage will occur in muscle, vessels and nerves.
- In a mass casualty lightning incident, **attend to victims in full arrest first.** If the victim did not arrest initially, it is likely they will survive.
- Do not overlook other trauma (i.e. falls)
- Lightning is a massive DC shock most often leading to asystole as a dysrhythmia.
- In lightning injuries, most of the current will travel over the body surface producing flash burns.
Extremity Trauma

**History:**
- Type of injury
- Mechanism: Crush/penetrating/amputation
- Time of injury
- Open vs. closed
- Wound contamination
- Medical history
- Medications

**Signs and Symptoms:**
- Pain, swelling
- Deformity
- Altered sensation/motor function
- Diminished pulse/capillary refill
- Decreased extremity temperature

**Differential:**
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation

**Indications for reducing fractures/dislocations:**
- Vascular Compromise
- Severe angulations

**Universal Patient Care Protocol**

**Wound Care/Hemorrhage Control**

**Splint/Immobilize**

**Life or Limb Threatening Event?**
- Yes
- No

**Reduce for severe angulations or vascular compromise**

**Initiate Rapid Transport/Activate Trauma Team if indicated**

**IV Protocol/NS Challenge**

**Request ALS Ground Intercept for Pain Medications**

**IV Protocol**

**Request ALS Ground Intercept for Pain Medications**

**Contact Medical Control**

**Pearls:**
- **Exam:** Mental Status, Head, Neck, Chest, Extremities, Neuro
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture/dislocations have a high incidence of vascular compromise.
- Patients with vascular compromise should be transported urgently.
- Severe blood loss may be concealed or not apparent with extremity injuries, especially femur fractures.
# Head Trauma

## History:
- Time of injury
- Mechanism of injury
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-systems trauma

## Signs and Symptoms:
- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress
- Vomiting
- Seizure

## Differential:
- Skull fracture
- Brain injury
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

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### Universal Patient Care Protocol

#### Isolated Head Trauma?
- No
- Yes

#### Spinal Immobilization Procedure
- Skill # 21

#### Oxygen/Ventilation as Appropriate

#### Does patient respond to voice?
- No
- Yes

#### Airway Management

#### Intubate/Insure adequate ventilation

#### IV Protocol

#### Contact Medical Control

### Rapid Air Transport
- Advised for:
  - Severe MOI
  - Unresponsive or decreasing LOC
  - Airway Management Required

### Pearls:
- **Exam:** Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **If GCS < 12** consider rapid transport and if GCS < 8 intubation should be anticipated.
- Ventilate the patient at a rate of 20/min if evidence of herniation (blown pupil, posturing, bradycardia) is present.
- Increased intracranial pressure may cause hypertension and bradycardia.
- Hypotension usually indicates injury or shock unrelated to the head injury.
- The most important item to monitor and document is changes to LOC.
- Consider Restraints if necessary per Restraint Procedure.
- Limit IV Fluids unless patient is Hypotensive.
Heat Emergencies

History:
- Age
- Exposure to increased temperatures and/or humidity
- Past medical history
- Extreme exertion
- Time and length of exposure
- Poor fluid intake
- Fatigue and/or muscle cramping

Signs and Symptoms:
- Altered mental status or unconsciousness
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential:
- Fever
- Dehydration
- Medications
- Heat cramps
- Heat exhaustion
- Heat stroke
- CNS lesions or tumors

Universal Patient Care Protocol
Assess Patient's Temperature

Remove patient from heat source/Remove clothing and cover with wet sheet

Initiate cooling methods:
Increase cool airflow
Ice packs in arm pits and/or groin

IV Protocol
NS Challenge if indicated

Contact Medical Control

Legend
- EMT-B
- EMT-B I/V
- EMT-I
- EMT-P
- MC ORDER

Pearls:
- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro
- Extremes of ages are more prone to heat emergencies (i.e. young and old)
- Prescription medications and recreational drugs may elevate body temperatures.
- Sweating generally disappears as body temperature rises above 104°F.
- Intense shivering may occur as patient is cooled.
- Heat Cramps consist of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- Heat exhaustion consists of dehydration, salt depletion, dizziness, fever, electrolyte changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and elevated temperature.
- Heatstroke must be suspected and treated if an altered mental status is present.
Hypothermia

**History:**
- Past medical history
- Medications
- Exposure to environment
- Exposure to extreme cold
- Extremes of age
- Drug use: ETOH, barbiturates
- Infections/sepsis
- Length of exposure

**Signs and Symptoms:**
- Cold, clammy
- Shivering
- Mental status changes
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

**Differential:**
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord damage

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**Universal Patient Care Protocol**

Remove wet clothing and stop heat loss

If Pulseless and Apneic

**Automatic External Defibrillator**

Assess Responsiveness, breathing and pulse

Pulses/Respirations Present

**Handle patient gently, keeping supine**

**Heated, Humidified Supplemental Oxygen**

Initiate Warming Measures:
- Dry Patient Gently
- Blankets
- Heat packs to arm pits and groin

**IV Protocol – NS Challenge**
- Warm IV Fluid

Contact Medical Control

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**LEGEND**
- EMT-B
- EMT-B I/V
- EMT-I
- EMT-P
- MC ORDER

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**Pearls:**
- Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro
- **NO PATIENT IS DEAD UNTIL THEY ARE WARM AND DEAD**
- Hypothermia is defined as a core temperature of less than 95° F (35° C)
- Extremes of age are more susceptible.
- With temperature less than 88° F, ventricular fibrillation is a common cause of death. Handling patients gently may prevent this occurrence.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 90° F.
- **Consider withholding CPR if patient has an organized rhythm. Discuss with Medical Control.**
Multiple Systems Trauma

History:
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and impact details of MVA
- Restraints/Protective equipment
- Past medical history
- Medications

Signs and Symptoms:
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status
- Hypotension or shock
- Arrest

Differential:
- Chest
  - Tension Pneumothorax
  - Flail Chest
  - Cardiac Tamponade
  - Open chest wound
  - Hemothorax
- Intra abdominal bleeding
- Pelvis/Femur fracture
- Spine/Cord injury
- Head Injury
- Extremity fractures
- HEENT (Airway)
- Hypothermia

Universal Patient Care Protocol

Spinal Immobilization Procedure
Skill # 21

Airway Protocol/High Flow Oxygen
General Protocols # 2

Initiate Rapid Transport
Trauma Team Activation if indicated

Assess Vital Signs/Perfusion

IV Protocol:
2 Large Bore IVs – One with Blood Tubing
NS Challenge: Repeat as Needed

Consider ALS Ground Intercept for Pain Medications

Consider Chest Decompression if indicated

Contact Medical Control

LEGEND
- EMT-B
- EMT-B I/V
- EMT-I
- EMT-P
- MC ORDER

Pearls:
- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro & Detailed Physical Exam.
- Mechanism of Injury is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation rendezvous to decrease transport times to trauma centers.
- Consider SAM Sling in situations with suspected pelvic fractures.
- Early activation of Trauma System is beneficial to patient care if criteria are met.
# Pelvic Fracture (possible)

## History:
- Type of injury
- Mechanism: Crush, Impact, fall
- Time of injury
- Open vs. closed
- Wound contamination
- Medical history
- Medications

## Signs and Symptoms:
- Pain, swelling
- Deformity / Instability on palpation
- Altered sensation/motor function
- Diminished pulse/capillary refill distal to injury
- Decreased extremity temperature
- Hypotension
- Externally rotated lower extremities

## Differential:
- Contusion
- Dislocation
- Fracture
- Spinal injury

## Universal Patient Care Protocol

**Wound Care/Hemorrhage Control**

Wound Care – Skill # 29

**Apply SAM Sling or Sheet**

Package Pt. in Position Found

**IV Protocol**

Maintain Pressure

**Initiate Rapid Transport**

Activate Trauma Team if indicated

**Consider ALS Ground Intercept for Pain Medications**

**Contact Medical Control**

## Pearls:
- **Exam:** Mental Status, Head, Neck, Chest, Extremities, Neuro
- Patients with neurologic deficits or vascular compromise should be transported urgently.
- Blood loss may be **severe** and concealed.
- Consider helicopter transport for severe MOI or unstable Vital Signs
Spinal Immobilization Protocol

**Universal Patient Care Protocol**

**LEGEND**

**ALL LEVELS**

**Spinal Immobilization Considerations**

- Backboards have NOT been shown to be of any benefit for spinal injuries, but they may cause patient harm.
- We wish to reduce the use of backboards in patients with traumatic injuries where appropriate.
- Backboards are useful tools for carrying patients to a gurney. Patients who do not need a backboard should be gently slid off of the board and onto the gurney.
- Self-extrication from a vehicle with assistance is likely better than standard extrication procedures.
- The goal of spinal “immobilization” is to reduce stress on the spine. Patients should not be “forcefully” restrained if they can be managed with verbal calming techniques.
- Vacuum mattresses should be used preferentially over a backboard if readily available and practical.
- If for any reason, you are uncomfortable in NOT immobilizing a patient, then place them on a backboard.
- When possible, use a scoop type backboard and always pad pressure points.

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**LEGEND**

**ALL LEVELS**

**Spinal Immobilization Considerations**

- Does patient have a history or signs of traumatic injuries?
  - No
  - Yes

- Did patient sustain only penetrating trauma?
  - Yes
  - No

- Was the patient ambulatory on scene upon EMS arrival?
  - Yes
  - No

- Is patient able to follow commands?
  - Yes
  - No

- If mental status is altered, is it due to a known seizure disorder (post-ictal stage) or Dementia?
  - Yes
  - No

- Immobilize patient using scoop or backboard and c-collar with standard technique.

- Patient does NOT require a backboard. Have them lie still on the gurney which will provide sufficient immobilization.

- Does patient have/complain of:
  - Neck Pain?
  - Neck tenderness on palpation?
  - Neurological deficits/parathesias?
  - Distracting injuries?
  - Yes
  - No

- Place c-collar on patient and ask them not to move.

- Cervical Collar is NOT needed.