



DHS-Wide EMS Basic Life Support (BLS) & Advanced Life Support (ALS) Protocols



Homeland
Security

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Foreword

The following protocols outline the care that emergency medical technicians and paramedics should administer to patients. The Department of Homeland Security's (DHS) Office of Health Affairs (OHA) has approved these protocols for emergency medical service (EMS) programs to use in their official DHS duties.

The protocols should be implemented under two conditions: (1) with the approval of a local or agency medical director, and (2) as part of a comprehensive medical oversight program. For a practicing provider to be proficient with these protocols, he/she must be certified and licensed at the appropriate level, and demonstrate and document all the skills and knowledge the protocols require. A provider's scope of practice may expand (e.g., administration of intravenous therapy by Basic Life Support providers) only with additional training and confirmation of competency by a medical director.

The protocols in this set use the following format:

- A Review of Injury/Illness that provides an overview of the condition and any special issues that should be considered
- Signs and Symptoms presented in a bullet list
- Management divided into Basic Life Support (BLS) and Advanced Life Support (ALS)

It is all-too-common to discover that a patient's clinical presentation does not obviously conform to any of the available EMS protocols. In such cases, a provider is encouraged to consult online medical direction for additional guidance. Opportunities to review patient presentations and treatment options with local medical directors and/or other supervisory staff should be available to all providers as needed.

I. General Procedural Protocols

A. Prevention of Infectious Exposures

To keep the protocols current, once a year and during major incidents that involve infectious agents, review CDC recommendations and OSHA standards for preventing exposure to infectious diseases.

1. “Universal Precautions” are routinely used to prevent exposure to HIV and Hepatitis B.
 - a. These involve placing barriers (e.g., gloves) between potentially infectious body fluids, such as blood, and the skin or mucous membranes of the health care provider.
 - b. Universal precautions require methods and devices that decrease the likelihood of needle stick or other injury that could carry infectious material through broken skin into EMS personnel.
2. Separate guidelines and standards regarding respiratory protection of health care providers are published by OSHA (29 CFR 1910.134), and periodically updated for specific threats by CDC.
3. It is the responsibility of all EMS programs to train their personnel and to provide all necessary equipment for compliance with current guidelines and standards.
4. Use “Standard Barriers” for every response involving patient contact. These include:
 - a. Non-Latex Gloves for every patient contact.
 - b. N95 Masks (when recommended by CDC or required by OSHA)
 1. If airborne or highly contagious droplet pathogen such as tuberculosis is suspected, wear high-efficiency particulate air (HEPA) respirator if available.
 - c. Gowns (as recommended).
 - d. Eye protection and face shield (as recommended, and especially during wound care and/or placement of advanced airway).
 - e. Washing hands with soap and water or alcohol-based hand cleaners before and after contact with each new patient and during patient care as indicated.
5. If **two or more** of the “Symptoms Requiring Extra Measures” listed below exist, use “Extra Measures” along with “Standard Barriers.” Extra measures are intended to prevent the spread of highly transmissible infections/pathogens.
 - a. Fever greater than 102°F (38.9°C).
 - b. Bleeding from gums or nose.
 - c. Yellow eyes, skin, or tongue.
 - d. Small red or purple spots on palate, throat, mouth, or anywhere on body.
 - e. “Bloodshot” eyes.

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- f. Painful, goose-egg shaped, bruised-appearing or draining lymph nodes.
 - g. Insect bites (fleas, ticks, mosquitoes).
 - h. Any report of “pox” or “pox-like” skin rash or lesion.
 - i. History of exposure to sewage, body fluids, animals (dead or alive).
 - j. Febrile Illness that progressed rapidly over a period of less than three days.
 - k. Bloody stools, black “tarry” stools, or vomiting of blood.
 - l. Report of a “positive tourniquet test” or petechiae where skin has been compressed.
 - m. If two or more patients present with same symptoms.
6. Use all standard barriers, plus the following “Extra Measures,” to protect medical providers from potentially infectious patients who satisfy the criteria outlined in #5:
- a. Put a surgical mask (if no difficulty breathing or hypoxia) or non-vented oxygen mask on the patient.
 - b. Contact medical director, receiving hospital, or appropriate designated occupational medical provider to report symptoms and potential for exposure.
 - c. In the field, keep patient downwind of all personnel.
 - d. Minimize the number of people who treat or are in contact with the patient.
 - e. Decontaminate, with sterilizing solutions/wipes, all items that came in contact with the patient.
 - f. Talk with appropriate medical resource (receiving facility and/or service infection control officer) about post-exposure prophylaxis for oneself and anyone who may have been exposed to the patient.

B. Scene and Patient Assessment Protocol

Scene Size-Up

Conduct safety assessment of scene for hazards to EMS personnel. If scene is unsafe and cannot be made safe, **DO NOT** enter.

Patient Assessment

BLS

1. Institute appropriate measures for prevention of infectious exposure as outlined in Protocol I.A.
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures as outlined in Protocol I.G.
3. Determine mechanisms of injury (MOI), nature of illness, and number of patients.
4. Perform primary assessment (airway, breathing, circulation). Then control serious bleeding and assess level of consciousness with “AVPU”—**A**lert and aware, **V**erbal stimuli, **P**ainful stimuli, and **U**nresponsive—and the Glasgow Coma Scale (Refer to Protocol XII.F.).
5. Initiate BLS measures as outlined by the American Heart Association, including CPR, and use of automated electrical defibrillator (AED), for cardiac arrest. (Refer to Protocol VI.D.)
6. Be prepared to assist ventilations with a bag valve or mechanical ventilator
7. Administer oxygen at the appropriate flow rate via endotracheal tube (ETT) if inserted by paramedic on scene, bag valve mask, non-rebreathing mask, or nasal cannula if indicated;
8. Apply pulse oximeter if available.
9. Correct other life-threatening problems if possible and according to protocol.
10. Monitor and repeat vital signs at 15 minute intervals for stable patients, and 5 minute intervals for unstable patients.
11. Consider cervical immobilization if appropriate (see “Selective Spine Immobilization”).
12. Obtain full patient history in **SAMPLE & OPQRST** format.

S – Signs/Symptoms

O – Onset

A – Allergies

P – Provocation/Palliative

M – Medications

Q – Quality

P – Past Med Hx/Past Surgical Hx

R – Region/Radiation/Referral

L – Last Oral Intake

S – Severity

E – Precipitating Events

T – Timing

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13. Perform focused exam.
 14. Continue assessment employing **(DCAPBTLS)**.
 - a. **D** – Deformities
 - b. **C** – Contusions
 - c. **A** – Abrasions
 - d. **P** – Punctures
 - e. **B** – Burns
 - f. **T** – Tenderness
 - g. **L** – Laceration
 - h. **S** – Swelling
 15. Determine the patient’s transport priority and whether paramedic care is required.
Priority conditions include:
 - a. Unable to obtain or maintain open airway.
 - b. Clinical deterioration or death appears imminent.
 - c. Altered mental status, includes not following commands.
 - d. Difficulty breathing/inadequate ventilation and oxygenation.
 - e. Hypoperfusion (Shock).
 - f. Complicated childbirth.
 - g. Chest pain with Systolic BP < 100 mm Hg.
 - h. Uncontrolled bleeding.
 - i. Severe pain.
 16. Treat according to applicable protocols; transport, if capable.
 17. Determine the need for ALS care, ground transport, or Aeromedical service.
 18. Consider the need for additional resources.
 19. Document all findings and medical interventions on patient care report.
 20. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS steps 1-19.
2. Assess need for advanced airway management. (Refer to Protocol I.C.)
3. Institute ALS measures for resuscitation as outlined in the most recent guidelines for Advanced Cardiac Life Support (ACLS) by the American Heart Association.
4. Obtain 12-lead ECG and maintain cardiac monitoring, if appropriate.
5. Initiate fluid line of 0.9% Normal Saline or LR via IV/IO at KVO or saline lock or as required by local protocol.

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6. Administer medications as required by local protocol. **ALWAYS** ask about allergies to medication before administering any drug to a patient.
 7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.

Pediatrics

1. Follow BLS guidelines, adjusting for patient age/size.
2. Adjust IV drip rates and medication dosage, as appropriate, for patient age/size. (Refer to Protocol XIII.E.)

C. Airway Management

Review of Injury/Illness

The obstruction or compromise of an airway can be caused by: (1) a variety of injuries and illnesses that result in narrowed air passages or excessive secretions or (2) the presence of solid foreign bodies that block air flow to the lungs.

Signs and Symptoms

- * Wheezing
- * Stridor
- * Gasping - (when ineffective, sometimes called agonal respirations)
- * “Tripoding” or other positioning
- * Anxious
- * Skin color changes (cyanosis)
- * Nasal flaring, accessory muscle use, diminished or absent breath sounds
- * Difficulty swallowing – swollen tongue, and lips, drooling
- * Inability to breathe – weak respirations
- * Inability to speak
- * Abnormal respiratory rate
- * Rapid heart rate
- * Altered mental status

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. If choking, attempt Heimlich maneuver.
5. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
6. Assess adequacy of airway and ventilatory effort:
 - a. Ability to speak
 - b. Color (note pallor or cyanosis)
 - c. Vigor of cough/cry

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- d. Rate and depth of respirations
 - e. Unusual breath sounds on auscultation, including rales, wheezing, stridor
 - f. Accessory muscle use and/or nasal flaring
7. For respiratory distress, apply pulse oximeter and administer 100% oxygen via non-rebreathing mask at high flow rate.
 8. Assist ventilations with bag valve mask (BVM) as required.
 9. Complete vital signs and determine likely cause of airway difficulty, such as:
 - a. Potential aspiration of small objects or food
 - b. Fever or cough
 - c. Chest pain
 - d. History of asthma, COPD, CHF
 - e. In infants, a history of prematurity
 10. Consider applying CPAP device if this is a BLS skill in the local EMS system. (Refer to “Ventilation Using CPAP.”)
 11. Place patient in position of comfort.
 12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS (Advanced Airways and Ventilation)

1. Confirm completion of BLS steps 1-11. These guidelines should be followed for all attempts at advanced airway management, or when assuming responsibility for an airway already established by another agency or provider.
2. The term “advanced airway” refers to endotracheal tube and dual lumen devices such as the Combitube and King LT Airway. Securing an airway with these devices is a lifesaving measure that has the potential for devastating harm if not performed or maintained correctly.
3. Advanced airways may be used **ONLY** by paramedics who have received training and been certified by local medical direction. Advanced airways should be attempted **ONLY** if BLS ventilatory support and oxygen are insufficient to sustain respirations.
4. Dual lumen airway devices may be deployed as either preferred or “rescue” methods for airway control only after all providers have been trained on them according to the manufacturer’s instructions, and certified as “competent” in the technique by local medical direction.
5. The procedure for endotracheal intubation with or without adjunct medication must be outlined in detail in local protocols that have been approved by medical direction and are available to all ALS providers.

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6. Forceps (e.g., Magill) should be available during laryngoscopy of a choking patient so that a solid object obstructing the airway can be mechanically removed. If unable to remove object obstructing airway using forceps, immediately consider surgical airway.
 7. Mobile or portable suction devices should be available during placement of advanced airways to clear airway secretions present in the tube or oral pharynx.

Ventilation Using CPAP

By distending the airways and alveoli—and thus increasing gas exchange and reducing the patient’s work of breathing—continuous positive airway pressure (CPAP) ventilation provide rapid, effective therapy for acute pulmonary edema/congestive heart failure. Services that elect to carry CPAP devices must ensure that all EMTs receive appropriate initial and refresher training, as approved by local medical direction. No EMT shall use any CPAP device unless he/she has completed formal training on that specific device.

Significant differences exist between devices, so EMTs who work for more than one service may need to receive complete training on more than one device.

Indications

1. Patients ≥ 15 years with a patent airway, demonstrating spontaneous respirations and respiratory distress or failure due to:
 - a. Acute pulmonary edema
 - b. Asthma/COPD
 - c. Submersion/near-drowning

Contraindications

1. Respiratory or cardiac arrest
2. Inability to maintain patent airway
3. Altered level of consciousness
4. Cardiogenic shock
5. Head injury with increased intracranial pressure
6. Significant chest trauma
7. Vomiting/upper GI bleeding
8. Signs and symptoms of pneumothorax
9. Patient continuing to deteriorate despite CPAP

Procedure

BLS/ALS

1. Assure patent airway.
2. Administer 100% oxygen.
3. Perform patient assessment, including vital signs, and pulse oximetry.
4. Explain procedure to patient.
5. Have patient hold mask to face and instruct patient to take deep, slow breaths.
6. Attach CPAP device to patient and adjust size per manufacturer's instructions.
7. Begin at 0-2.0 cm H₂O, and gradually increase pressure to desired cm H₂O, to a maximum of 10 cm H₂O for CHF, 5.0 cm H₂O for other respiratory conditions.
8. Continuously monitor pulse oximetry, vital signs, and patient condition.
9. Continue treatment of underlying condition in accordance with protocols.
10. Make early notification to receiving facility to allow for ED preparation (availability of CPAP equipment and respiratory therapist.)

If the patient does not improve, or worsens, despite CPAP and/or medical therapy, remove CPAP and perform BVM ventilation as indicated.

Dual Lumen Airways

Indication

Unconscious patient who is not breathing, if this is a BLS skill in a local EMS system.

Contraindications

1. Responsive patients with an intact gag reflex
2. Patients under 35.5 inches (90 cm)
3. Known esophageal disease or ingestion of caustic substances

Procedure

BLS/ALS

1. Inspect all components of the dual lumen tube for damage.
2. Select appropriate size:
 - a. 28 Fr (Small): Patients 35-51 inches (90-130 cm) in height.
 - b. 41 Fr (Large): Patients over 51 inches (130 cm) in height.

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3. Test cuffs and lubricate with water soluble jelly.
 4. Maintain cervical immobilization (if indicated) and lift tongue and jaw upward with one hand.
 5. Insert dual lumen airway to the indicated depth; **DO NOT force**.
 6. Inflate cuffs.
 7. Ventilate through primary tube #1 and evaluate lung ventilation (breath sounds, gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
 8. If lung ventilation is absent, immediately ventilate through secondary tube (#2) and reevaluate (breath sounds, gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
 9. If no lung ventilation, then deflate the cuff #1, withdraw dual lumen airway 2.0-3.0 cm, re-inflate cuff, and reevaluate ventilation through tube #1. (Refer to steps 7 and 8.)
 10. Once effective ventilation is confirmed using an end tidal carbon dioxide (ETCO₂), continue to monitor oxygen saturation and ventilate to desired ETCO₂ level.
 11. If unable to achieve adequate ventilation using dual lumen airway, remove device, reinsert, and re-attempt ventilation. If unable to ventilate, consider obstructed airway maneuvers (if not yet performed).

Cricothyroidotomy

Cricothyroidotomy is a surgical procedure for obtaining an airway directly through the neck, bypassing the upper airway. Two different procedures can be used:

- Surgical Cricothyroidotomy
- Needle Cricothyroidotomy

In the field, cricothyroidotomy is a last option—a rescue procedure when more conservative airway measures are unsuccessful.

Indications

1. Inability to ventilate despite having tried BVM with oropharyngeal/nasopharyngeal airway, ET placement, and alternative airway device (if not contraindicated).
2. Inability to place ET in the setting of life-threatening upper airway hemorrhage.
3. Completely obstructing upper airway foreign body that cannot be removed via BLS maneuvers or Magill Forceps with direct visualization.

Procedure

Surgical Cricothyroidotomy

1. Prepare suction and cricothyroidotomy kit.
2. Begin at sternal notch and locate cricoid cartilage.
3. Palpate cricothyroid membrane anteriorly between cricoid cartilage and thyroid cartilage.
4. Prepare skin with betadine or alcohol swabs. (Surgical cricothyroidotomy should be performed for patients > 8 years old.)
5. Stabilize thyroid cartilage and make vertical incision (1-1½”) over cricothyroid membrane. Alternatively, a needle puncture dilator device may be used.
6. Palpate cricothyroid membrane with gloved finger and carefully make transverse incision through membrane. Insert scalpel handle and rotate 90°.
7. Insert a 5.0-6.0 mm cuffed ET tube, using the natural curve of tube.
8. Insert ET tube to just beyond cuff.
9. Inflate cuff and ventilate patient.
10. Monitor oxygen saturation and end tidal carbon dioxide level.
11. Secure ET tube. (DO NOT cut or trim ET tube.)
12. If significant resistance to ventilation develops, or if patient develops difficulty in tolerating successful cricothyroidotomy, monitor pulse oximetry device and consider sedation.

Only needle cricothyroidotomy should be performed for patients less than age 8 who may require cricothyroidotomy.

Needle Cricothyroidotomy

1. Prepare suction, needle, and syringe.
2. Begin at sternal notch and locate cricoid cartilage.
3. Palpate cricothyroid membrane anteriorly between cricoid cartilage and thyroid cartilage.
4. Prepare skin with betadine or alcohol swabs.
5. Stabilize thyroid cartilage. Insert 12 or 14 ga over-the-needle catheter through the cricothyroid membrane at a 45-degree angle toward the feet. Aspiration of air with a syringe indicates tracheal entry.
6. Hold needle in place and advance catheter, then remove needle.
7. Attach catheter hub to intermittent jet oxygen insufflator valve.
8. Manually secure catheter at hub at all times to prevent kinking or displacement.
9. Monitor pulse oximetry.
10. If significant resistance to ventilation develops, or if patient develops difficulty in tolerating cricothyroidotomy, despite good O₂ saturation, consider sedation.

Confirming Secure Airway

1. Confirmation of objective methods for tube placement (quantitative electronic capnography) must be used to continuously ensure that an advanced airway is positioned correctly.
2. The following steps are designed to assist the paramedic in verifying initial airway placement, and maintaining the airway until the emergency department (ED) staff assumes patient care.
 - a. The paramedic who initially establishes an advanced airway is responsible for maintaining it until the patient is transferred to the ED (or evacuation personnel).
 - Barring extraordinary circumstances, this responsibility will not be delegated to another EMS provider (e.g., a first responder paramedic handing off to a transport paramedic). While mechanical ventilation may be delegated to another provider, the paramedic is responsible for all aspects of tube placement (lung sounds, capnography, and pulse oximetry).
 - If the intubating paramedic is unable to transport, the transporting paramedic should clearly document the intubating paramedic's name, agency, and reason for non-transport.
 - The transporting paramedic should re-confirm tube placement before assuming responsibility for the patient.
 - b. Quantitative ETCO_2 confirmation and continuous monitoring are required for all field intubations (adult and pediatric and dual lumen devices).
 - Must be maintained until patient care is transferred to the ED or care is otherwise terminated, including during patient transfer to and from the ambulance.
 - Quantitative capnography should include continuous display of the ETCO_2 waveform and numerical value (normal = 35-40 mm Hg).
 - Mechanical esophageal detector devices (bulb or syringe types) may also be used to supplement ETCO_2 in equivocal cases, but some form of ETCO_2 detection is mandatory.
 - If a patient's apparent ETCO_2 value or tracing deteriorate, the EMT should immediately search for an explanation. Possible reasons include:
 - Lack of perfusion.
 - Equipment sensor contamination due to body fluids.
 - Other equipment malfunction.
 - Inadvertent extubation due to tube movement.

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- If, after 30 seconds, the EMT is unable to correct the problem and there is no return of ETCO_2 measurement, then the patient should be extubated and ventilated with a BVM and airway adjunct.
 - The patient may be re-intubated; however, the airway device will be left in place only as long as an acceptable ETCO_2 reading can be documented.
 - Upon transfer of care to an ED or transporting personnel, the EMT should record a final quantitative capnography reading in the patient care report, and request confirmation of airway placement by the accepting provider, preferably before the patient is physically transferred from ambulance stretcher to hospital bed.

Documentation

Documentation is a key component in protecting a EMT against claims of a misplaced airway device or inadequate respiratory care. The documentation should include initial and final assessment of airway placement, regardless of transportation decision (hospital transport or field termination). Documentation should also reflect a re-assessment performed after each patient movement. The mnemonic “EMS BREATH” may be used as a memory aid for verifying a patent airway, and as evidence of effective ventilation:

- E** = End Tidal CO_2 reading
- M** = Measure (size/depth of tube)
- S** = SaO_2 reading
- B** = Bilateral breath sounds
- R** = Rise/fall of chest
- E** = Esophageal detection
- A** = Absent gastric sounds
- T** = Tube misting
- H** = Hospital confirmation

Documentation should be included on the patient care report as well as any special airway forms that may be used by individual services for quality management.

D. Pain Management

Review of Injury/Illness

Many illnesses and injuries produce moderate to severe pain that must be evaluated, quantified on a standardized scale, documented, and treated in the pre-hospital environment. Patients vary greatly both in their perception and tolerance of pain and their response to pain medications.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Measure level of pain. Ask adults to rate their pain on a scale from 0 (no pain) to 10 (worst pain imaginable). Young children can be asked to rate their pain using the faces scale, which provides 5 levels of pain perception:



10 - **Hurts Worst** – Worst Pain Possible

Unbearable and unable to do any activities because of pain.



9 – Varies between 9-10.

8 - **Hurts Whole Lot** – Intense/Dreadful/Horrible

Unable to do any activities because of pain.



7 – Varies between 7-8.

6 - **Hurts Even More** – Miserable/Distressing

Unable to do some activities because of pain.



5 – Varies between 5-6.

4 - **Hurts Little Worse** – Nagging/Uncomfortable

Can do most activities with rest periods.



3 – Varies between 3-4.

2 - **Hurts Little Bit** – Mild Pain – Annoying

Pain is present but does not limit activity.



1 – Varies between 1-2.

0 - **No Hurt** – No Pain.

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6. Allow patient to remain in position of comfort unless contraindicated.
 7. Monitor airway and vital signs at 15 minute intervals for stable patients, and every 5 minutes for unstable patients.
 8. Administer Acetomenophen 325-650 mg PO/PR every 6-8 hours for **mild pain**, as needed, up to a maximum of 4.0 gm per 24 hours.
 - a. Indications:
 - Isolated musculoskeletal injuries such as sprains and strains.
 - Pain related to childhood illnesses such as headache, ear infection, and pharyngitis.
 - b. Contraindications:
 - Head injury
 - Hypotension
 - Administration of acetaminophen or medications containing acetaminophen within the previous four hours.
 - Ingestion of alcoholic beverages in the previous 24 hours
 - Inability to swallow or take medications by mouth
 - Respiratory distress
 - Persistent vomiting
 - Known or suspected liver disease
 - Allergy to acetaminophen

ALS

1. Confirm the completion of BLS steps 1-8.
2. **Always continuously monitor and record heart rate, blood pressure, and O₂ saturation level when administering narcotics or sedatives!**

Morphine

1. Acute MI: Administer 2.0 mg slow IV/IO followed by 1.0 mg, every 5 minutes, up to a maximum of 20 mg or until pain is relieved.
2. Isolated injury (e.g., burns, frostbite, eye trauma): Administer 5.0-10 mg slow IV/IO at a rate of 2.0 mg/min until pain is relieved. (Paramedic may administer without consulting on-line medical direction.) For doses above 20 mg, contact on-line medical direction.
3. May also be administered as 5.0-15 mg IM, based on patient weight (0.1 mg/kg).

Indications

1. Acute myocardial infarction (chest pain)
2. Burns
3. Isolated injuries requiring pain relief such as suspected fractures, dislocations, frostbite, bites, or stings
4. Acute sickle cell pain crisis
5. Abdominal or flank pain (Consult with on-line medical direction.)
6. Terminally ill patient who is DNR and in pain

Contraindications

1. Head injury
2. Hypotension
3. History of allergy or intolerance to morphine, codeine, or other opiates.

Pediatric

BLS/ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Administer acetaminophen to patients ≥ 3 years who are in mild to moderate discomfort (2-5 on faces scale) by child or parent. Standard unit dosing of liquid preparation:
 - a. < 3 years: Not indicated
 - b. 3-5 years: Unit dose 160 mg/5 ml
 - c. 6-9 years: Unit dose 325 mg/10-15 ml
 - d. ≥ 10 years: Administer two unit doses of 325 mg/10-15 ml each for total of 650 mg/20.3 ml. Obtain online medical direction for appropriate dosing for patients who are significantly underweight or overweight.

ALS

Morphine

1. 0.1 mg/kg slow IV/IO/IM at a rate of 1.0-2.0 mg/min, up to a maximum dose of 5.0 mg. For doses above 5.0 mg, contact on-line medical direction. May repeat x1 during transport.
2. Monitor and record patient's level of pain and vital signs.

E. Emergency Incident Rehabilitation

Review of Injury/Illness:

DHS/EMS personnel may be assigned to assist with disasters, exercises, and other emergency operations throughout the United States. This protocol describes the roles of EMS providers in the process of rehabilitating of emergency responders. Rehab is designed to prevent, detect, and treat such conditions as heat exhaustion, hyperthermia, and dehydration among the workforce, and to remove operational personnel from duty if they cannot safely rotate back into emergency response efforts.

1. An **Emergency Incident Rehabilitation (EIR)** area:
 - a. Should be designated by the incident commander (IC) or designated sector officer. It should be in a safe location, and upwind and uphill from the hot zone if the incident involves airborne or waterborne threats.
 - b. The specific incident will dictate the type and configuration of the rehab area to be established. For example, if hazardous materials are involved, a decontamination corridor must separate the hot zone from the rehab area.
2. **Responsibilities:**
 - a. **Incident Commander:** The incident commander has discretion as to how to implement formal emergency incident rehabilitation (EIR). The IC should consider the circumstances of each incident, and make adequate provisions early in the incident for the rest and rehabilitation of all members operating at the scene. These provisions may include: physical and mental rest; fluid and food replenishment; relief from extreme climatic conditions and other environmental parameters of the incident; and medical evaluation, treatment, and monitoring.
 - b. **Rehab Officer:** An EMT-B, EMT-P, or other DHS team members such as RNs, APNs, PAs, and physicians, should/may be assigned to the rehab area, and, if appropriate, may be designated by the IC as the Rehab Officer (RO). If available and practical, it is preferable that ALS-level personnel and equipment be present, as indicated in NFFPA 1500. Rehab sector medical personnel and other assets should be dedicated to support of firefighters and other operational emergency responders, and should be assigned no other responsibilities.
 - c. **Rehab Team:** Should include sufficient personnel to perform rehab sector functions for the maximum number of personnel anticipated to be in the Rehab Area at any given time. A ratio of one Rehab Team member for every 10 personnel on scene is recommended. The team should include sufficient EMS personnel to perform medical monitoring tasks, but may include non-EMS personnel also.

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- d. **Supervisors/Company Officers:** All supervisors and company officers should maintain their awareness of the condition of all personnel operating within their span of control, and ensure that adequate steps are taken to provide for each member's safety and health. The ICS structure should be used to request relief and/or reassignment of fatigued crews.
- e. **Personnel:** Any member who believes that fatigue or exposure to heat or cold is approaching a level that could affect his performance or the operation in which he/she is involved should advise his supervisor or company officer. Personnel should also remain aware of the health and safety of other members of the crew.

3. Establishing the Rehabilitation Sector:

- a. The IC should establish a Rehab Sector or Group when conditions indicate that rest and rehabilitation is needed for personnel operating at an incident scene or training exercise. This determination should be made based upon the anticipated duration of the operation, level of physical exertion, and environmental conditions, including temperature, humidity, and windchill. Guidelines to consider include:
- Heat stress index > 90° F
 - Wind chill index < 10° F
 - Personnel have completed (or will complete) exertional work with second 30 minute SCBA cylinder, if fire fighting involved
 - Personnel have used (or will use) SCBA or other protective breathing devices for > 45 minutes of physical exertion
 - It is recommended that an EMS vehicle, not otherwise involved in emergency operations at the scene, be positioned at the Rehab Area. If required, an additional ambulance should be requested to the scene for this purpose. Except under extreme circumstances, this ambulance should not be used for transport of civilian patients.
- b. The location of the Rehab Area will be designated by the IC and/or the RO, and should:
- Be far enough from the scene to allow personnel to safely remove (and leave outside the area) SCBA and/or PPE, and remove personnel from the imminent dangers the scene presents, yet close enough to allow prompt re-entry completion
 - Provide adequate protection from environmental conditions and exhaust fumes
 - Be easily accessible by EMS units
 - Be large enough to accommodate several crews

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- For extreme heat conditions, have shaded areas, misting systems and/or fans, and an area to sit down
 - For extreme cold and/or wet conditions, have dry, protected, heated areas, and dry clothing
 - Be integrated with departmental system for personnel accountability, using a single entry and exit point when feasible. Sites that have been used include a nearby building, garage, or lobby; a school bus or large van; and an open, shaded area

4. Rehab Operations:

- a. Resources: The RO should secure, through the IC or Logistics Officer, all necessary resources to properly supply the sector. These may include oral fluids, foods, medical supplies, paperwork, lighting, heaters, fans, a means of access to toilet facilities, and other assets as appropriate to the incident.
- b. Rotation of Personnel/Accountability: Working units will be assigned to the Rehab Sector by the IC or his designee (e.g., Operations Officer). When possible, the entire unit should be assigned to the Rehab Sector as a group. The crew designation, names of members, times of entry and exit, and appropriate medical information should be documented by the Rehab Officer or designee on a PCR form or similar document. Personnel rotated to the Rehab Sector should not leave until directed by the RO. If any member requires transport to a medical facility, the IC shall be notified immediately.
- c. Hydration: During exertional activity, in both hot and cold weather, personnel should consume at least one quart per hour of water, activity beverage, or combination. Carbonated and caffeinated beverages should be avoided. During a typical 20-minute rehab cycle, 12-32 ounces of fluids are recommended.
- d. Nutrition: Food should be provided whenever operations exceed 3 hours. Fatty and salty foods should be avoided.

5. Medical Evaluation:

- a. Ask members arriving at the Rehab Area if they have any symptoms of dehydration, heat/cold stress, physical exhaustion, cardiopulmonary abnormalities, or emotional/mental stress.
- b. Complete a medical evaluation, and appropriate treatment and/or transport, for all members who report such symptoms.
- c. A medical evaluation, with appropriate treatment and/or transport, should also be completed for any member meeting any of the following criteria:
 - The RO or Rehab Sector EMS staff observes evidence of one of the above conditions displayed by a member.
 - Another member, officer, or supervisor indicates he/she does not appear well.

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- The member had to leave an evolution for reasons of excessive fatigue or symptoms.
 - d. Consider the possibility of toxic exposure in ill or injured responders at fire, hazmat, and certain law enforcement operational scenes.
 - e. Carbon monoxide levels can be determined non-invasively when pulse oximetry with this capability (CO-oximetry) is available.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. For personnel with signs or symptoms of dehydration or fatigue, check for toxic exposure, heat-related illness, chest pain, and/or change in mental status. These are medical emergencies; obtain ALS treatment if available and transport to a hospital emergency department.
6. For symptomatic personnel with no evidence of the conditions listed in step 5 and vital signs within the following ranges:
 - a. Systolic BP > 90 and < 200 mm Hg
 - b. Pulse rate > 50 and < 100 bpm
 - c. Respirations > 12 and < 24 per minute
 - d. Temperature < 100.5° F

Then manage them in rehab as follows:

- a. Remove as much clothing as possible and minimize exposure to sun and wind.
- b. Limit as much energy exertion as possible.
- c. Oral hydration may be administered using a carbohydrate/electrolyte drink, diluted 1:4 with water.
- d. Place member in cool place and apply evaporative measures. Avoid shivering as this may raise core temperature. (Apply cool—not cold—water-soaked towels to as much exposed skin as possible.)

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- e. Administer oxygen and apply pulse oximetry, if available.
 - f. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. (Even if the patient is not transported to the hospital, he/she may not return to active duty for the duration of that duty cycle or 24 hours, whichever is longer.)

ALS

1. Confirm the completion of BLS steps 1-6.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 10 ml/kg/hr, up to a maximum of 3 L if the patient is severely dehydrated. If the patient's condition does not improve, or worsens at any time during the trial of rehydration, he/she should be transported to the hospital. Oral hydration may be administered using a carbohydrate/electrolyte drink, diluted 1:4 with water.
3. Continue to monitor vital signs, administer oxygen, and pulse oximetry, if available.
4. Continue cold packs and maintain a cool environment. Avoid shivering, as this may raise body core temperature.
5. Obtain 12-lead ECG to check for myocardial ischemia and monitor cardiac rhythm, as necessary.
6. If elevated carbon monoxide levels are documented or suspected, ensure that the patient is on high flow oxygen via non-rebreathing mask (NRBM) and IV access is established.
7. If cyanide exposure is suspected, administer antidote, if available, and advise on-line medical direction of the situation.
8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

F. Hazmat Response

Review of Injury/Illness:

Scene safety and protection of providers from chemical or other hazardous exposure are of primary importance at incidents that potentially involve hazardous materials (hazmat).

1. **DO NOT enter the scene unless properly trained and equipped to do so.**
2. **Proper levels of personal protective equipment (PPE) must be worn by all personnel, depending on the material involved and the zone occupied.** (This will be determined by the Incident Commander and/or the Safety Officer.)
3. The EMS provider in charge should notify potential receiving hospital(s) regarding the nature of the hazmat event, the specific product involved if known, the number of patients that could be transported, and the ETA of the first patient(s).
4. Triage and decontaminate (or confirm decontamination by other responders) if indicated.
5. Any patient exposed to a hazardous material is considered contaminated until the patient is decontaminated thoroughly.

Management

BLS

1. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
2. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
3. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 - a. Only ground units should transport patients, even after decontamination.
The use of aeromedical transport is contraindicated for any potentially contaminated patient.
 - b. Protect the patient from the environment and ensure the patient is not/does not become hypothermic, especially following decontamination.
4. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.
5. All emergency response personnel who come in close contact with hazmat should notify medical direction or occupational health providers (consistent with agency protocol) immediately following the incident. Personnel who routinely respond to hazmat emergencies should have periodic pre-incident examinations and medical surveillance for potential and chronic toxic exposures.

ALS

1. Confirm the completion of BLS steps 1-4.
2. If ventilatory support is required, a bag valve mask (BVM) is generally preferable to advanced airways, unless there is no danger of introducing hazmat into the airway with intubation.
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock in a clean area, if medication administration is anticipated.
4. Consider antidote to specific chemical, if available.
5. Consider antibiotic specific to biologic agent in mass casualty incident, if available.
6. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

All emergency response personnel who come into close contact with hazmat should notify medical direction or occupational health providers (consistent with agency protocol) immediately following the incident. Personnel who routinely respond to hazmat emergencies should have periodic pre-incident examinations and medical surveillance for potential toxic exposures.

G. Mass Casualty Incident

Review of Injury/Illness

EMS is typically one of many public safety services that respond to a mass casualty incident (MCI). The complexity of the incident and its consequences, combined with the large number and different responsibilities of the responders, require that the emergency response be organized to be effective. Responsibility for organizing the overall response seldom rests with EMS, so it is critical that EMS providers understand how to integrate with the command structure to carry out their medical operations at the incident scene.

Disaster Scene EMS Operations

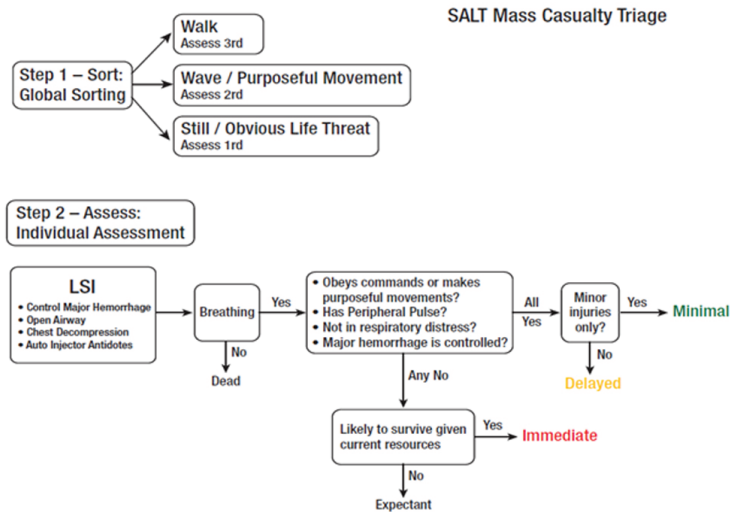
1. Follow approved area or agency-specific Incident Management System procedures. Integrate medical activities with law enforcement, fire, and EMS agencies as directed by Incident Commander.
2. When managing patients in a potentially hazardous area:
 - a. Survey scene for potential hazards, number of patients, and possible need for specialized help.
 - Protect rescuers first; wait until gas spills are treated, power lines de-energized, etc.
 - Call for medical or technical backup as needed
 - Implement hazardous materials management procedures
 - Stage vehicles prior to entry
 - b. Initiate patient triage using SALT algorithm
 - c. If patient has no pulse or respirations and extrication is necessary before CPR can be provided, the patient should be considered dead
 - d. Expedite safe extrication by specialists after management of life-threatening problems
 - Perform or repeat complete secondary survey once patient is extricated
 - e. In treatment areas or as soon as possible after triage:
 - Apply cervical collar; immobilize spine prior to extrication if feasible
 - Perform quick secondary survey as possible; splint extremity fractures, if possible
 - Perform routine BLS/ALS procedures
 - Re-prioritize for transport according to SALT algorithm

3. Organize medical parts of response.

- a. **Triage area:** The triage area should be safely located away from the dangers of the hazard, generally uphill and upwind of the hazard.
- b. **Staging area:** As incoming ambulances arrive, they should be directed to the staging officer at the staging area. They should not go directly to the triage area.
- c. **Ambulance assignments:** Ambulance crews should remain with their ambulances until given an assignment by the medical or staging officer. Keys should remain in the vehicles.
- d. **Ambulance supplies:** The ambulance supplies and equipment should be placed in a supply pool that is near the treatment area, if so directed by medical officer. A responsible EMT provider should be placed in charge of the pool.
- e. **After discharge of patient:** As ambulances discharge their patients and return to the scene, they should return to the staging area and report to the staging officer.
- f. **Temporary morgue:** It may be necessary to establish a temporary morgue since bodies will not be removed from the scene until all the injured have been transported.
- g. **Volunteers:** Volunteers can and should be used at a disaster scene to free firefighters, rescuers, and ALS personnel from activities that take them away from rescue and patient care duties. Volunteers may be used to:
 - Block or control the flow of traffic if there are not enough police officers on the scene
 - Assist medical personnel in carrying patients to triage and treatment points
 - Help to load the ambulances
 - Assist the “walking wounded”
 - Comfort victims and care for children
 - Carry items from the supply pool to the treatment area when requested

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4. **Communications:** Incident Command and local protocol(s) will determine radio channels or other alternatives that should be used for medical communications during disaster operations. EMS personnel should follow local protocol and/or IC direction for designating and communicating with receiving hospitals for their patients. EMS personnel should follow local protocol and/or IC direction for patient tracking, medical documentation, and transfer of care to hospital or other providers. If possible, the following information should accompany the patient and be kept by EMS as part of the record of treatment:
- a. Triage tag
 - b. Patient care record (electronic or written)
 - c. Name
 - d. Age
 - e. Date of Birth
 - f. Injuries
 - g. Initial status (immediate, delayed, minimal)
 - h. Current status (immediate, delayed, minimal)
 - i. Treatment or procedures performed
 - j. Transportation location and time transported
5. **Triage System:** The SALT mass casualty incident (MCI) triage system should be used whenever many patients require pre-hospital medical treatment and/or transport. This allows for an organized approach to treatment that includes a system for prioritizing the patients who require immediate medical care for survival. Triage is a continuous process; it is necessary to reevaluate patient priorities as their clinical status improves or deteriorates and more resources become available.

The Sort, Assess, Life-Saving Intervention, Treatment/Transport (SALT) triage system assigns patients into one of five categories based on the urgency of their medical conditions and their potential for survival:



Triage Categories

MINIMAL (Green Tag)

- Also referred to as “walking wounded.”
- Example: Small burns, lacerations, abrasions.
- Typically able to care for themselves with self-aid or buddy aid and can still be employed for mission requirements (e.g., scene security).

DELAYED (Yellow Tag)

- May need surgery (general condition permits a delay in surgical treatment without unduly endangering life or limb).
- Example: Patients with no evidence of shock, potential large soft tissue wounds, fractures of major bones, intra-abdominal or thoracic wounds, or burns to less than 20% of total body surface area.

IMMEDIATE (Red Tag)

- Patients who require immediate life-saving intervention (LSI) and/or surgery. If medical attention is not provided, the patient will die.
- Example: Hemodynamically unstable patients with airway obstruction, chest or abdominal injuries, massive external bleeding, or shock.

EXPECTANT (Grey Tag)

- Patients in this category have wounds that are so extensive that even if they were the sole patient and had the benefit of optimal medical resources, their survival would be highly unlikely.
- Example: Patients with penetrating or blunt head wounds, or with absent radial pulses.
- Should not be neglected. Provide comfort measures, pain medications, if feasible. Re-triage as appropriate.

DEAD (Black Tag)

- Patients in this category are considered deceased. Only local guidelines can be used to declare a patient dead.
- Example: Decapitation or decomposition.

* In civilian EMS tags, grey and black tags are interchangeable.

II. Altered Mental Status and Unconsciousness

Review of Injury/Illness

The term “altered mental status” (AMS) indicates a dysfunction of the central nervous system. Common causes of altered mental status in the field include seizures, shock, diabetic emergencies, drug or alcohol intoxication, medication overdose, stroke, infection, environmental exposure (heat or cold), and traumatic brain injuries. AMS may present anywhere on the spectrum from minimal impairment to unconsciousness.

Signs and Symptoms

- * Slurring or other change in speech
- * Memory loss (inability to recall recent events)
- * Unsteady gait
- * Seizure activity
- * Impaired judgment
- * Inability to verbally respond or follow commands (unresponsiveness)
- * Unconsciousness

A. Unconscious person

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Attempt to determine cause of altered mental status (e.g., overdose, intoxication, stroke, diabetes, trauma).
6. Check for hypoxia and provide supplemental oxygen via non-rebreathing mask at high concentration.

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7. Check blood sugar level with a glucometer, if available and part of the scope of practice:
 - a. If hypoglycemic (blood sugar < 60 mg/dL) and conscious, administer glucose paste (10-15 gm) between cheek and teeth. May repeat x1 after 10 minutes, if no response. **DO NOT** give glucose paste to patients who are unconscious and/or do not have the capacity to swallow. Be cautious of vomiting/aspiration after administration and protect the airway.
 - b. Recheck blood sugar after all interventions, every 30 minutes during transport, and with any change in mental status.
 8. Check temperature, if a thermometer is available.
 9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS steps 1-8.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock. If hypotensive, administer a fluid bolus at 20 ml/kg of 0.9% Normal Saline or LR via IV/IO.
4. If hypoglycemic, administer D50W 50 ml (25 gm) slow IV push.
 - a. Important to have free-flowing IV access due to risk of vein sclerosis.
 - b. If unable to obtain IV access, administer Glucagon (1.0 mg) IM.
 - c. If Finger Stick Blood Glucose < 60 mg/dL, or if there is a history of alcohol abuse, give 100 mg thiamine IV.
5. If unconscious, or with depressed respiratory function, consider narcotic overdose and administer naloxone 0.4-2.0 mg IV/IO/IM every 2-3 minutes as needed, up to a maximum of 10 mg.
6. Obtain 12-lead ECG and treat dysrhythmias, as appropriate. Continue monitoring cardiac rhythm.

Pediatric

BLS

1. Follow BLS guidelines.
2. Assess for possible closed head injury.
3. **If hypoglycemic:** Administer glucose paste (10-15 gm) between cheek and teeth, if awake and able to swallow.

ALS

1. Follow BLS guidelines.
2. If hypoglycemic:
 - a. Newborn-2 months: D10W 2.0-4.0 ml/kg IV/IO.
 - b. 2 months-2 years: D25W 2.0-4.0 ml/kg IV/IO.
 - c. > 2 years: D50W 1.0-2.0 ml/kg to max of 50 ml IV/IO.
3. If overdose of narcotic is suspected, administer one dose of naloxone 0.1 mg/kg up to 2.0 mg IV/IM/IO.
4. If hypoperfusing, initiate 0.9% Normal Saline or LR fluid therapy 20 ml/kg bolus IV/IO, except in volume-sensitive children. Titrate to a systolic pressure of 100 mm Hg.
 - a. Volume-sensitive children: Administer an initial fluid bolus of 10 ml/kg 0.9% Normal Saline or LR via IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 10 ml/kg 0.9% Normal Saline or LR via IV/IO. Volume-sensitive children include neonates (0-28 days) and children with congenital heart disease, chronic lung disease, or chronic renal failure.
 - b. If patient's condition does not improve, and the lung sounds are clear, administer the second bolus of fluid at 20 ml/kg 0.9% Normal Saline or LR via IV/IO.
 - c. Administer third (and subsequent) fluid boluses at 10 ml/kg IV/IO, while monitoring lung sounds.
 - d. Consider additional fluid administration, up to a maximum of 3,000 ml, without consulting on-line medical direction.
5. Consider obtaining a blood sample, using a closed system.
6. If patient has constricted pupils and respiratory depression, or is unresponsive, consider narcotic overdose.
 - a. Administer naloxone 0.4-2.0 mg slow IV/IM/IO/Intranasal (if delivery device is available). Titrate to adequate respiratory effort.
 - b. If there is no improvement in respiratory function or level of consciousness, consider an additional dose of naloxone, every 2-3 minutes as needed, up to a maximum of 10 mg.
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

B. Seizure

Review of Injury/Illness:

Seizures are caused by abnormal electrical bursts in the brain. Partial, or focal, seizures may cause uncontrolled movements of one or more limbs or the face, though patients typically remain conscious during focal seizure activity. Generalized seizures, sometimes referred to as “fits” or “convulsions,” involve both sides of the brain, and therefore typically produce unconsciousness. Generalized seizures may involve tonic (rigid stretching of the body and limbs) and/or clonic (rhythmic jerking of the limbs and/or head) activity. Many, but not all, patients experience an “aura” of symptoms that warn them of a coming seizure, allowing them to sit or lie down to prevent injury. Others have no warning, and may be seriously injured by falls, blunt trauma, motor vehicle accidents, near drowning, or other incidents caused by their sudden loss of consciousness and body control.

Seizures may be caused by head trauma, low blood sugar, infections, fevers, tumors, hypoxia, environmental exposure, toxic chemical exposure (e.g., a nerve agent, insecticide), or other metabolic abnormalities. They may also occur periodically in individuals without evidence of one of these causes—a condition called “epilepsy,” which typically is controlled to some extent by medication. Febrile seizures in children do not predict underlying epilepsy and seldom last long enough to require treatment in the field, but should always be evaluated by a physician when they occur.

Epileptic seizures generally last from 30 seconds to a couple of minutes, and may be followed by a postictal state of deep sleep or agitation lasting from a few minutes to several hours. Generalized seizures that last for 5 minutes or more are considered “prolonged seizures.” These may require treatment to be stopped, and the patient should be transported as expeditiously as possible. Continuous or recurrent generalized seizures without regaining consciousness over a period of 30 minutes is called “status epilepticus” or “status seizure.” This is a true medical emergency, with the potential for permanent brain damage.

Signs and Symptoms

Focal seizures

- * **Uncontrolled, rhythmic jerking of one or more limbs or facial muscles**
- * **Abnormal, but stereotyped behavior or sensations such as smells not related to the environment**
- * **Patients typically remain awake and may be variably responsive during focal seizures**

Generalized seizures

- * May be preceded by an aura
- * Patients are unconscious
- * Tonic/clonic muscle activity
- * Likely to have associated injuries

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. For generalized (typically tonic-clonic) seizure, monitor airway:
 - a. **DO NOT** attempt to restrain a patient that is actively seizing.
 - b. **DO NOT force any device into the patient's mouth, if the patient is still seizing.**
 - c. Position patient to maintain open airway; turn onto side if patient is at risk for aspirating excess secretions or is vomiting.
6. For prolonged seizures or status epilepticus (status seizure), request ALS support for medication, and/or transport to hospital ASAP.
7. When seizure activity has stopped:
 - a. Identify and treat injuries.
 - b. If patient is a known diabetic, and patient is awake/able to control airway, glucose paste (10-15 gm) should be administered between the gum and cheek. Consider a single additional dose of glucose paste if condition does not improve after 10 minutes.
8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS steps 1-7.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Check blood sugar.
4. For prolonged seizure or status epilepticus, treat with the IV/IO benzodiazepine, according to local protocols:
 - a. Lorazepam: 1.0-2.0 mg IV/IO, administer at a rate up to 2.0 mg/min
 - b. Midazolam: 5.0 mg IV/IO, administer over 1-2 min
 - c. Diazepam: 5.0 mg IV/IO administer over 1 min
 - d. Patients \geq 69 years: Reduce any of these medications by 50%.
 - e. If IV is unavailable, check with on-line medical direction for alternative route and dosing.
5. If suspected nerve agent exposure, administer one of the benzodiazepines listed above or a diazepam 10 mg auto-injector (CANA), **in addition** to atropine and 2-PAM.
6. Pregnant women require on-line medical consultation prior to the administration of any benzodiazepines. (Refer to Protocols VII.A and VII.B.)
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Check blood sugar.
4. For prolonged seizure or status epilepticus, treat with the IV/IO benzodiazepine, according to local protocols:
 - a. Lorazepam: Administer 1.0-2.0 mg (0.1 mg/kg, max 2.0 mg/dose) IV/IO/IM; repeat every 5 minutes, up to a maximum of 4.0 mg.
 - b. Midazolam: Administer 1.0-5.0 mg (0.05 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.1 mg/kg, if needed.
 - c. Diazepam: Administer 5.0-10.0 mg (0.1 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.3 mg/kg, if needed.
 - d. **If medications are administered**, monitor cardiac rhythm and pulse oximetry.

C. Diabetic Emergencies

Review of Illness/Injury

Diabetes mellitus is a group of conditions in which the body does not produce enough or cannot properly use insulin.

Insulin shock (hypoglycemia or low blood sugar) occurs when a patient has received more insulin than was needed. This causes low blood sugar levels, so metabolically active cells (e.g., brain) do not have enough energy to function normally. Altered mental status, including unconsciousness, may occur and is treated by administering glucose.

Diabetic coma (hyperglycemia, diabetic ketoacidosis, and hyperosmolar coma) occurs when insulin is insufficient or not working. This results in excessive sugar circulating in the bloodstream, and other metabolic changes.

Signs and Symptoms

Insulin Shock

- * **Rapid respirations and/or heartbeat**
- * **Dizziness**
- * **Sweating**
- * **Headache**
- * **Confusion**
- * **May progress to unresponsiveness**

Diabetic Coma

- * **Drowsiness**
- * **Confusion**
- * **Thirst, dehydration**
- * **Change in level of consciousness**
- * **Sweet or fruity-smelling breath**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.

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3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
 4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 5. Determine blood sugar level using a glucometer, if available and usage permitted by local protocols.
 6. If hypoglycemic (blood sugar < 60 mg/dL) and conscious, administer glucose paste (10-15 gm) between cheek and teeth. May repeat x1 after 10 minutes, if no response. **DO NOT** give glucose paste to patients who are unconscious and/or do not have the capacity to swallow. Be cautious of vomiting/aspiration after administration and protect the airway.
 7. If a patient's condition improves, and he/she does not wish further evaluation, no medical direction is required, if all the following are present:
 - a. This was an acute hypoglycemic event in a diabetic patient and he/she has returned to an alert and oriented mental status.
 - b. Oral glucose was administered.
 - c. The current glucose reading is > 80 mg/dL.
 - d. A responsible adult is present.
 - e. Further caloric intake is assured.
 - f. There are no clinical findings consistent with acute illness.
 8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Patients on oral hypoglycemic agents who have a hypoglycemic's episode **must** be transported for further monitoring.

ALS

1. Confirm completion of BLS steps 1-8.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. **If hypoglycemic (blood sugar < 60 mg/dL):** Administer Dextrose (D50W) 50 ml of 50% solution slow IV push.
 - a. If unable to obtain IV/IO access, administer Glucagon (1.0 mg) IM.
 - b. Patients on oral hypoglycemic agents who have a hypoglycemic's episode **must** be transported for further monitoring.
4. **If hyperglycemic (blood sugar > 400 mg/dL):** Run IV 0.9% Normal Saline or LR wide open.
 - a. Re-assess bilateral lung sounds and pulse oximetry after each 250 ml of fluid.
 - b. Do not exceed 2 L of IV fluid without consulting on-line medical direction.

-
5. Re-check glucometer reading every 30 minutes, or for altered mental status, during transport.
 6. Refer to “Refusal of Further Evaluation” in this section, if patient does not wish further evaluation or transport.

Pediatric

BLS/ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Re-check glucometer reading:
 - a. **If hypoglycemic (blood sugar < 60 mg/dL):** Administer glucose paste (10-15 gm) between cheek and teeth. May repeat x1 after 10 minutes, if no response. **DO NOT** give glucose paste to patients who are unconscious and/or do not have the capacity to swallow. Be cautious of vomiting/aspiration after administration and protect the airway.
 - b. **If hyperglycemic (blood sugar > 400 mg/dL):** Contact on-line medical direction.

Refusal of Further Evaluation

1. If a patient’s condition improves, and he/she does not wish further evaluation, no assistance from on-line medical direction is required if all the following are present:
 - a. This was an acute hypoglycemic event in a diabetic patient and he/she has returned to an alert and oriented mental status.
 - b. Oral glucose was administered.
 - c. The current glucose reading is > 80 mg/dL.
 - d. A responsible adult is present.
 - e. Further caloric intake is assured.
 - f. There are no clinical findings consistent with acute illness.
 - g. The patient is not using prescribed oral hypoglycemic agents.

D. Confusion, Agitation

Review of Injury/Illness

“Confusion” is a state in which a patient has difficulty both understanding his surroundings and ascertaining a response. “Agitation” suggests heightened anxiety and frequently includes combative behavior. There are many causes for acute onset of confusion and/or agitation. These include but are not limited to behavioral emergencies, metabolic emergencies including hypoxia and hypoglycemia, hypo/hyperthermia intoxication or over-medication, and head injury. All these conditions are covered elsewhere in these protocols, and all require transportation for full medical evaluation and treatment.

Signs and Symptoms

This protocol pertains to patients who are awake and alert, but present with an acute change from their normal mental status. It is important to establish and convey to the receiving facility whether the patient is oriented (knows who and where he/she is and the day and date). This can only be established by asking these questions.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 - a. Restrain only if necessary for patient and staff safety, following local protocols for methods of restraint and documentation requirements.
5. Check for hypoxia and provide supplemental oxygen via non-rebreathing mask at high concentration if present.
6. Assess patient for possible closed head injury, and follow trauma protocol if appropriate.
7. Check blood sugar level.
 - a. If hypoglycemic (blood sugar less than 60 mg/dL), administer glucose paste. (Refer to Protocol II.C.)
 - b. Recheck blood sugar after all interventions, every 30 minutes during transport, if indicated, and with any change in mental status.

-
8. Check for signs of dehydration and provide oral or IV rehydration. (Refer to Protocol VIII.A.)
 9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS Steps 1-9 (above).
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock. If hypotensive, administer a fluid bolus at 20 ml/kg of 0.9% Normal Saline or LR via IV/IO.
3. If hypoglycemic, refer to Protocol II.C.
4. If patient has constricted pupils and respiratory depression, or is unresponsive, consider narcotic overdose.
 - a. Administer naloxone 0.4-2.0 mg slow IV/IM/IO/Intranasal (if delivery device is available). Titrate to adequate respiratory effort.
 - b. If there is no improvement in respiratory function or level of consciousness, consider an additional dose of naloxone, every 2-3 minutes as needed, up to a maximum of 10 mg.
5. Obtain 12-lead ECG and treat dysrhythmias, as appropriate. Continue monitoring cardiac rhythm.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Assess for possible closed head injury.
3. **If hypoglycemic:** Administer glucose paste (10-15 gm) between cheek and gum, if awake and able to swallow.

ALS

1. Follow BLS guidelines, adjusting for patient age/size
2. If unable to establish IV/IO access, administer Glucagon 0.01-0.03 mg/kg IM, up to a maximum dose of 1.0 mg.

III. Acute Respiratory Distress

General Review

A variety of conditions can cause acute difficulty breathing or inadequate oxygenation. Examples include asthma (including allergic reactions involving the airway or allergic bronchospasm), chronic obstructive pulmonary disease (including emphysema), congestive heart failure, respiratory tract infections, pulmonary emboli, and others. Any of these processes can lead to respiratory failure, or loss of the ability to inhale oxygen and exhale carbon dioxide. EMS care of patients in acute respiratory distress should determine what is causing the difficulty breathing and use the appropriate protocols to improve ventilation and oxygenation in the field environment.

A. Asthma

Review of Injury/Illness

Asthma is a chronic lung disease that causes inflammation and narrows the air passages (bronchospasm). It affects people of all ages but usually begins in childhood. In the field, all causes of acute bronchospasm are treated essentially the same.

Signs and Symptoms

- * **Coughing**
- * **Wheezing**
- * **Difficulty exhaling**
- * **Shortness of breath**
- * **Chest tightness**
- * **Retractions and nasal flaring in pediatric patients**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.

-
5. Provide supplemental oxygen.
 6. Be prepared to assist ventilations with a bag valve mask (BVM), if necessary.
 7. Allow patient to assume position of comfort.
 8. If patient has prescribed inhaler available, assist the patient to administer; repeat once in a 30 minute period, if difficulty breathing persists.
 9. If patient's asthma is historically precipitated by allergies, and he/she has an EpiPen[®] prescribed by a physician for that purpose, assistance may be offered for administration.
 10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Administer Albuterol 2.5 mg in 3 ml 0.9% Normal Saline unit dose with or without ipratropium bromide (Atrovent[®]) 0.5 mg via nebulizer. Repeat nebulizer treatments, with Albuterol **only**, every 5 minutes as needed.
3. If ventilatory support is needed, continue nebulized Albuterol treatment via BVM or while assisting respirations through advanced airway.

NOTE: Although sometimes needed, intubation further narrows the airway restriction in a severe asthma exacerbation, and this may worsen some cases.

Aggressive use of bronchodilators is generally the most important therapy for severe asthma exacerbation.

4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Administer epinephrine 0.3-0.5 mg of 1:1,000 solution SQ, may repeat x1 in patients < 40 years old with no history of cardiac disease, if there is no improvement with nebulizer treatment or if in extreme respiratory distress.
6. Consider solumedrol 2.0 mg/kg IV/IO, up to a maximum of 125 mg, if transport time will be longer than 30 minutes.
7. For severe asthma exacerbation, consider magnesium sulfate: 2.0 gm in 50 ml 0.9% Normal Saline or LR via IVPB over 30-60 minutes. Stop infusion if hypotension or bradycardia develops. **DO NOT** use magnesium sulfate in patients with renal failure.
8. Monitor cardiac rhythms and pulse oximetry.

Pediatric

BLS

1. Follow BLS guidelines, adjusting to patient age/size.

ALS

1. Follow BLS guidelines, adjusting to patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer Albuterol with or without ipratropium bromide (Atrovent®), adjusting for patient age/size, via nebulizer. Repeat nebulizer treatments, with Albuterol **only**, every 5 minutes as needed.
4. Epinephrine: 0.01 mg/kg SQ, up to a maximum of 0.5 mg
5. Magnesium: 25.0-50.0 mg/kg IVPB, up to a maximum of 2.0 gm
6. Solumedrol: 2.0 mg/kg IV/IO, up to a maximum of 125 mg

B. COPD (Chronic Bronchitis and/or Emphysema)

Review of Injury/Illness

Chronic obstructive pulmonary disease (COPD) comprises several problems that impede the flow of gases through the airways and gas exchange in the lungs. Most, but not all, cases result from smoking or long-time asthma. Acute exacerbations of COPD are frequently caused by bronchospasm, which may in turn be triggered by infections, changes in air quality, or other environmental factors.

Signs and Symptoms

- * Shortness of breath
- * Wheezing, rhonchi, or sometimes severely decreased breath sounds
- * Chronic cough with large amounts of mucus
- * Frequent respiratory infections

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Provide supplemental oxygen.
 - a. Administer oxygen at high-flow rate to all patients in severe respiratory distress.
 - b. COPD patients not in respiratory distress should be given oxygen to maintain adequate O₂ saturation (e.g., > 90%).
6. Be prepared to assist ventilations if necessary with a bag valve mask.
7. Allow patient to assume position of comfort.
8. If patient has a prescribed inhaler available, assist the patient to administer.
9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-8.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer Albuterol with or without ipratropium bromide (Atrovent®), adjusting for patient age/size, via nebulizer. Repeat nebulizer treatments, with Albuterol **only**, every 5 minutes as needed.
4. Consider Methylprednisolone 1.0-2.0 mg/kg IV/IO, up to a maximum dose of 125 mg.
5. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
6. Obtain 12-lead ECG and treat dysrhythmias, as appropriate. Continue monitoring cardiac rhythm.
7. Monitor pulse oximetry.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Epinephrine: Administer 0.01 mg/kg SQ, up to a maximum of 0.5 mg.
4. Consider solumedrol 1.0-2.0 mg/kg IV/IO, up to a maximum of 125 mg, after consulting on-line medical direction and if transport time will be longer than 30 minutes.
5. Monitor cardiac rhythm and pulse oximetry.

C. Hyperventilation

Review of Injury/Illness

Hyperventilation is rapid, deep breathing. It may be seen in panic or anxiety attacks.

Signs and Symptoms

- * **Agitation**
- * **Weakness**
- * **Dizziness**
- * **Confusion**
- * **Numbness or parathesia of fingers and around the mouth**
- * **Syncope**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Allow patient to assume position of comfort.
6. Administer oxygen via non-rebreathing mask, if needed.
7. Coach patient to slow breathing with a calm demeanor.
8. If no oxygen is available and other possible causes are unlikely, have patient breathe into a paper bag until respirations slow.
9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-8.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Confirm patient is not hypoxic with pulse oximetry, and coach to slow breathing.
4. Consider any of the following sedatives as a last resort:
 - a. Midazolam: 2.0 mg IV/IO, up to maximum of 4.0 mg; repeat once, if needed.
 - b. Diazepam: 5.0 mg IV/IO, up to maximum of 10 mg; repeat once, if needed.

-
- c. Haloperidol: 5.0 mg IM, up to maximum of 10 mg; repeat once, if needed.
- d. If medications are administered, place on cardiac monitor.**

Pediatric

BLS/ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Confirm patient is not hypoxic with pulse oximetry, and coach to slow breathing.

IV. Behavioral Emergencies

Review of Injury/Illness

Many factors can influence a person's behavior. A pattern of disruptive behavior can become an emergency at any time. Behavioral emergencies may be psychiatric or medical. Always search for underlying medical causes such as head trauma, hypoxia, drug overdose, postictal following a seizure, or hypoglycemia.

Signs and Symptoms

- * Talking to imaginary person or object
- * Agitation
- * Threat of suicide or homicide
- * Inability to care for self
- * Threatening or violent behavior

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Maintain calm demeanor and respect the dignity of the patient.
6. Move slowly and deliberately.
7. Assess for underlying medical issues.
8. Check blood sugar and monitor pulse oximetry, if possible.
9. If the patient is spitting, cover his/her face with a surgical mask or non-rebreathing mask (NRBM) with high flow oxygen.
10. If the patient remains combative, belligerent, or uncontrollable, consider restraints and reasonable physical force **ONLY** if attempts at verbal control are unsuccessful. Teamwork between EMS personnel and law enforcement will improve patient care.
 - a. **Evaluate circulation to the extremities frequently, if patient is restrained.**
 - b. Thoroughly document reasons for restraining the patient, the restraint method used, and results of frequent reassessment.

-
11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-10.
2. Establish IV/IO of 0.9% Normal Saline or LR via IV/IO at KVO or saline lock, if appropriate.
3. If patient remains combative, belligerent, or uncontrollable, consider any of the following sedatives as a last resort, according to local protocols:
 - a. Lorazepam: Administer 1.0-2.0 mg IV/IO/IM; repeat every 5 minutes, up to a maximum of 10 mg.
 - b. Midazolam: Administer 2.0 mg IV/IO; repeat once, up to maximum of 4.0 mg.
 - c. Diazepam: Administer 5.0 mg IV/IO; repeat once, up to a maximum of 10 mg.
 - d. Haloperidol: Administer 5.0 mg IM; repeat once, up to a maximum of 10 mg.

e. If medications are administered, place on cardiac monitor. Monitor cardiac rhythm and pulse oximetry.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Attempt to locate parent or guardian, if not on scene.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Establish IV/IO of 0.9% Normal Saline or LR via IV/IO at KVO or saline lock, if appropriate.
3. If patient remains combative, belligerent, or uncontrollable, consider any of the following sedatives as a last resort, according to local protocols:
 - a. Lorazepam: Administer 1.0-2.0 mg (0.1 mg/kg, max 2.0 mg/dose) IV/IO/IM; repeat every 5 minutes, up to a maximum of 4.0 mg.
 - b. Midazolam: Administer 1.0-5.0 mg (0.05 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.1 mg/kg, if needed.
 - c. Diazepam: Administer 5.0-10.0 mg (0.1 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.3 mg/kg, if needed.

d. If medications are administered, place on cardiac monitor. Monitor cardiac rhythm and pulse oximetry.

V. Burns

Review of Injury/Illness

A burn injury can result from direct or indirect contact with any heat source, including a flame, electrical, chemical, lightning, flammable liquid, flashes, radiation, or scalding liquids. Injuries can range from minor (1st and 2nd degree) to life-threatening (3rd and 4th degree burns). (Also refer to Protocol IX.G - Electrical Burns and Lightning Injuries.)

Signs and Symptoms

Inhalation (airway burns)

- * Difficulty breathing and/or swallowing
- * Hoarseness
- * Stridor
- * Wheezing
- * Soot/singed hairs
- * May or may not exhibit facial burns

First degree (superficial thickness burn to skin)

- * Redness
- * Pain
- * Swelling

Second degree (partial thickness burn to skin)

- * Redness
- * Pain
- * Swelling
- * Blistering

Third degree (full thickness burn to skin)

- * May be white, leathery or charred appearance
- * Swelling
- * Underlying tissue is damaged
- * May or may not have pain

Fourth degree (full thickness burn to skin; not universally used term)

- * Burns extend through skin and muscle, sometimes into bone

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Provision of supplemental oxygen is crucial to patients with smoke inhalation due to possible carbon monoxide poisoning. Start with 100% O₂ by non-rebreathing mask (NRBM) if patient has altered mental status.
6. Be prepared to assist ventilations with a bag-valve-mask, if necessary.
7. For singed nasal hair or burns around the mouth or nose, request ALS support and transport as quickly as possible, as airway burns and edema can result in rapid loss of airway.
8. Evaluate burn surface area (BSA) using the "Rule of Nines" or estimate using the patient's palm as 1%. Measuring BSA does not predict severity of injury for electrical burns.
9. Determine if there is any associated traumatic injury.
10. Remove jewelry and any clothing that is not stuck to the wound.
11. Cool burned skin with room temperature saline, do not apply ice to burned tissues.
12. Cover burns with dry, sterile dressing if irrigation is discontinued prior to hospital arrival.
13. Keep patient warm to protect against hypothermia.
14. For a chemical burn, wear protective equipment as needed, and consider field decontaminant. Remove contaminated clothing and irrigate areas with copious amounts of water. If dry/powdered chemical, brush off prior to any irrigation. Bring the container and/or substance identification to the hospital, if it can be transported safely.
15. Consider pain control, if patient is able to take oral medication. (Refer to Protocol I.D.)
16. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Burn Center or Trauma Center, if available.

ALS

1. Confirm the completion of BLS steps 1-15.
2. Continue high flow 100% O₂ by non-rebreathing mask (NRBM) if CO poisoning is possible or if it is documented by CO-oximetry.
3. Monitor airway as airway edema may progress rapidly to complete obstruction. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Initiate 0.9% Normal Saline or LR via IV/IO through unburned skin, if possible. If BSA > 20% second degree or higher burns, administer fluid bolus with 500 ml of 0.9% Normal Saline or LR via IV/IO.
 - a. Check lung sounds after each 250 ml fluid bolus.
 - b. If hypotensive, repeat fluid bolus, as needed.
 - c. Use caution with IV fluids to avoid hypothermia and fluid overload.
 - d. Calculate IV fluid resuscitation using Parkland formula.
 - Total IV fluid for first 24 hours = 4 x % BSA x Weight (kg)
 - Deliver first half of IV fluids in the first 8 hours, second half in the following 16 hours.
5. Administer IV/IO morphine for pain control. (Refer to Protocol I.D.)
6. Obtain 12-lead ECG and monitor cardiac rhythm.
7. For unconscious patients burned in an enclosed structure or transportation fires, with suspected cyanide poisoning, use an antidote kit.
8. Escharotomy per local protocol, if patient meets criteria.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Adjust estimates of involved BSA for pediatric patients using the Lurd-Broaden chart for age-adjusted Rule of Nines.
 - a. For patients < 1 year, head = 18% and each leg is 15%.
 - b. Add 0.5% to each leg, and subtract 1% from head for each year over age 1.
3. Suspect child abuse when injuries and/or story are inconsistent. Report to authorities, as required by state or local laws.
4. Consider Aeromedical evacuation or ground transportation to a Pediatric Trauma Center or Burn Center, if available.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Adjust estimates of involved BSA for pediatric patients using the Lurd-Broaden chart for age-adjusted Rule of Nines.
 - a. For patients < 1 year, head = 18% and each leg is 15%.
 - b. Add 0.5% to each leg, and subtract 1% from head for each year over age 1.
3. Initiate 0.9% Normal Saline or LR via IV/IO through unburned skin, if possible. If BSA > 20% second degree or higher burns, administer fluid bolus with 20 ml/kg of 0.9% Normal Saline or LR via IV/IO.
 - a. Check lung sounds after each fluid bolus.
 - b. If hypotensive, repeat fluid bolus 20 ml/kg, as needed.
 - c. Use caution with IV fluids to avoid hypothermia and fluid overload.
 - Total IV fluid for first 24 hours = $4 \times \% \text{BSA} \times \text{Weight (kg)}$
 - Deliver first half of IV fluids in the first 8 hours, second half in the following 16 hours.
4. Administer morphine sulfate for pain control 0.1 mg/kg slow IV/IO/IM, up to a maximum dose of 5.0 mg. (Refer to Protocol I.D.)
5. Suspect child abuse when injuries and/or story are inconsistent. Report to authorities as required by state or local laws.
6. Consider the need for Aeromedical evacuation or ground transportation to the nearest Burn Center or Pediatric Trauma Center, if available.

VI. Cardiac Emergencies

A. Chest Pain (Angina, Acute Coronary Syndrome)

Review of Injury/Illness

In addition to cardiac ischemia, chest pain may be caused by inflammation of the lungs or pleural linings, pneumothorax, pulmonary embolus, indigestion, gastric reflux, and other problems. It is sometimes difficult to distinguish cardiac chest pain from these other problems.

“Acute coronary” syndrome (ACS) refers to a set of symptoms resulting from inadequate blood flow to the heart muscle. The blood supply for the myocardium is provided by the coronary arteries, and when one or more of the coronaries is narrowed or blocked, ACS results. ACS includes angina pectoris, or chest pain, indicating inadequate blood flow to the myocardium. Myocardial infarction (MI) occurs when the muscle has been deprived of blood and oxygen long enough for it to be permanently damaged. Electrocardiograms (ECG) of patients having acute MI may show elevation of the ST segment in leads corresponding to the part of the heart that is being damaged. This is called ST elevation, MI, or STEMI. **NOTE:** Many patients who are having acute MI do not show ST elevations.

Signs and Symptoms

- * Chest pain/discomfort that may radiate to the left or right arm, shoulders, jaw, or back
- * Frequently described as pressure or a crushing pain
- * Shortness of breath, sweating, nausea, or vomiting
- * Diaphoresis
- * Women, elderly, and diabetic patients have a higher incidence of atypical presentations such as generalized weakness or fatigue, nausea, and epigastric pain

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.

-
5. Provide supplemental oxygen:
 - a. 2.0-6.0 L/min via nasal cannula, if pulse oximetry is normal and patient is not short of breath.
 - b. 100% by non-rebreathing mask if O₂ saturation is < 90% or if patient is subjectively short of breath.
 6. Be prepared to assist ventilations with a bag valve mask (BVM), if necessary.
 7. Allow patient to assume position of comfort.
 8. If the patient has prescribed nitroglycerin, and there are no contraindications, assist the patient to administer nitroglycerin 0.4 mg sublingual (SL); may repeat every 5 minutes up to a maximum of 3 doses, provided Systolic BP ≥ 100 mm Hg and chest pain persists.
 - a. Contraindications to first dose of SL nitroglycerin:
 - Use of erectile dysfunction medications in previous 24 hours
 - Systolic BP < 100 mm Hg
 9. For chest pain consistent with ACS, administer aspirin 162-325 mg, after confirming the following:
 - a. No history of ulcers or gastrointestinal bleeding
 - b. No history of allergy or sensitivity to aspirin
 10. Continue to assess pain level.
 11. Assess and treat for hypotension or shock, if indicated. (Refer to Protocol X.I.)
 12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-12.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Obtain a 12-lead ECG and monitor cardiac rhythm. Providers may perform a 15-lead ECG, if trained.
4. Administer aspirin (162-325 mg) orally, if patient is awake, able to swallow, and denies aspirin allergy.
5. If patient does not have a prescription or previous history of nitroglycerin use:
 - a. Establish a 0.9% Normal Saline or LR via IV/IO at KVO **prior** to administration;
 - b. Administer nitroglycerin 0.4 mg sublingual (SL); may repeat every 5 minutes up to a maximum of 3 doses, provided Systolic BP ≥ 100 mm Hg and chest pain persists.
 - c. If IV/IO or saline lock cannot be established, consult on-line medical direction before nitroglycerin use.

-
6. Withhold administration of nitroglycerin if the patient has an obvious inferior MI (> 1 mm ST segment elevation in at least 2 of the inferior leads II, III, AVF) or with ECG evidence of a right ventricular infarct.
 7. If patient has evidence of STEMI defined as > 1 mm ST segment elevation in 2 or more contiguous limb leads or > 2 mm in two or more contiguous precordial leads or new Left Bundle Branch Block, consideration should be given to transporting to a facility capable of performing percutaneous coronary intervention if time permits.
 8. If Systolic BP < 90 mm Hg, place patient in supine position with legs elevated and administer 250 ml fluid bolus of 0.9% Normal Saline or LR via IV/IO.
 9. Morphine sulfate: Administer 2.0-5.0 mg IV/IO; titrate for pain relief, if Systolic BP remains \geq 100 mm Hg.
 10. Consider repeating ECG every 15 minutes, as indicated by changes in chest pain.
 11. Monitor cardiac rhythm and treat any dysrhythmia according to current AHA/ACLS guidelines.

B. Cardiogenic Shock

Review of Injury/Illness

Cardiogenic shock indicates failure of the heart's pump function. Like other forms of shock, it presents with low blood pressure and evidence of inadequate perfusion of the brain and other vital organs. It is caused by profound weakness of the left ventricular muscle, most often due to a large area of myocardial ischemia or infarct, or to a severe inflammatory process (myocarditis).

In cardiogenic shock, the low blood pressure is due entirely to loss of pump function, not to hypovolemia. Therefore, patients are often in congestive heart failure with distended neck veins and pulmonary edema despite the hypotension. Other processes that impede cardiac pump function (e.g., tension pneumothorax, cardiac tamponade) may cause patient presentations similar to cardiogenic shock.

Signs and Symptoms

- * **Distended neck veins**
- * **Pulmonary edema (rales on auscultation)**
- * **Decreased heart sounds**
- * **Hypotension**
- * **Tachycardia**
- * **Electrocardiographic changes consistent with current or recent MI**
- * **Sudden deterioration in condition (respiratory failure, decreased mentation)**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions. as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Provide supplemental oxygen (100% by non-rebreathing mask [NRBM]). Consider CPAP for non-cardiogenic pulmonary edema.
6. Be prepared to assist ventilations if necessary with a bag valve mask.
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock; titrate to achieve a Systolic BP \geq 100 mm Hg.
3. If Systolic BP $<$ 90 mm Hg, administer 250 ml fluid bolus with 0.9% Normal Saline or LR via IV/IO, and re-assess both BP and lung sounds. If lung sounds are clear, repeat with a second 250 ml fluid bolus with 0.9% Normal Saline or LR via IV/IO.
4. If Systolic BP remains $<$ 90 mm Hg after fluid bolus, begin dopamine drip at 5.0 mcg/kg/min IV/IO; titrate dose up to achieve Systolic BP $>$ 90 mm Hg. This protocol should be followed for any patient who is in shock, but not dehydrated or hemorrhaging.
5. Consider other causes of the patient's shock:
 - a. If circumstances and clinical signs are consistent with tension pneumothorax, perform needle decompression. (Refer to protocol XIII.B.)
 - b. If circumstances and clinical signs are consistent with cardiac tamponade, consult on-line medical direction for further guidance.
6. Obtain 12-lead ECG and monitor cardiac rhythm.
7. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)

C. Congestive Heart Failure (Pulmonary Edema)

Review of Injury/Illness

Congestive heart failure (CHF) occurs when the heart is not strong enough to pump the blood that returns to it via the venous system out to the rest of the body against the resistance produced by the arteries. This causes the body to retain fluid as it tries to build up enough “head pressure” to compensate for the failing pump. Eventually, the combination of increased circulating volume and ineffective pumping action causes fluid to build up in the limbs and abdomen (right-sided CHF), and the lungs (left-sided CHF, pulmonary edema). Patients may present with biventricular, or both right and left-sided CHF. This protocol deals primarily with pulmonary edema, a life-threatening emergency.

The pump failure of CHF can be caused by long-standing hypertension, damage to the heart’s valves, and loss of myocardial muscle strength due to inflammation or infarct.

Signs and Symptoms

- * **Edema, most often in legs and ankles**
- * **Fatigue**
- * **Difficulty breathing on exertion or when lying down**
- * **Pulmonary edema causes severe shortness of breath and hypoxia at rest; may be improved by sitting upright**
- * **Frothy sputum, may be pink-tinged**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Provide supplemental oxygen (100% by non-rebreathing mask [NRBM]).
6. Assist ventilations with a bag valve mask (BVM), if necessary.

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7. If the patient has prescribed nitroglycerin, and there are no contraindications, assist the patient to administer nitroglycerin 0.4 mg sublingual (SL); may repeat every 5 minutes up to a maximum of 3 doses, provided Systolic BP \geq 100 mm Hg and chest pain persists.
 - a. Contraindications to first dose of SL nitroglycerin:
 - Use of erectile dysfunction medications in previous 24 hours
 - Systolic BP < 100 mm Hg
 8. Continue to monitor vital signs, including pulse oximetry, if available.
 9. Initiate CPAP and other advanced airway support for severe respiratory distress, if available and trained. (Refer to Protocol I.C.)
 10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Obtain a 12-lead ECG and monitor cardiac rhythm.
4. If patient is not improved with oxygen and nitroglycerin, consider furosemide 40 mg IV bolus, or twice the patient's prescribed oral dose, up to 200 mg.
5. Morphine sulfate: Administer 2.0 mg every 5-10 minutes, up to a maximum of 10 mg, for relief of anxiety and to lower blood pressure, if necessary.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Administer Albuterol 2.5 mg in 3.0 ml Normal Saline.
4. Consider furosemide 0.5-1.0 mg/kg, slow IV/IO push.
5. Monitor cardiac status and pulse oximetry.

D. Cardiac Arrest

Ventricular Fibrillation, Non-Perfusing Ventricular Tachycardia, Asystole, Pulseless Electrical Activity

Review of Injury/Illness

BLS and ALS protocols to resuscitate patients in cardiac arrest should be based on the most recent American Heart Association guidelines and approved by local medical direction. The protocols below require that all BLS providers be trained to use and have access to automatic or semi-automatic defibrillators (AED).

Signs and Symptoms

- * Unresponsive
- * No palpable pulse
- * Electrical activity on ECG is absent or shows coarse/fine ventricular fibrillation or ventricular tachycardia
- * No respirations (possible agonal gasping in initial stage)

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. **If witnessed arrest:** Defibrillate one time **prior** to starting CPR. (Refer to step 6.)
6. **If unwitnessed arrest:** Start CPR according to current American Heart Association (AHA) guidelines.
 - a. Resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 - Push hard and fast (chest compression of 2 inches at a ratio of 30:2 with a rate of 100 compressions/min. (**DO NOT** wait to check rhythm or pulses.) Apply an AED as soon as possible.
 - Change compressors every 2 minutes.
 - Ensure complete chest recoil during CPR.

- b. **Defibrillate one time**, ASAP, if indicated; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 - c. Re-check rhythm on AED or cardiac monitor and check pulses.
 - d. **Defibrillate one time**, ASAP, if indicated; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 - e. Re-check rhythm and pulses.
 - f. **Defibrillate one time**, ASAP, if indicated; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 - g. Re-check rhythm and pulses.
7. Manually ventilate with a bag valve mask (BVM) and high flow O₂ every 6-8 seconds with minimal interruption (< 10 seconds) ASAP. Avoid excessive ventilation.
 8. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue this support.
 9. Continue CPR until patient is turned over to a higher level of medical care.
 10. If there is no return of spontaneous circulation, refer to Protocol XI.C.

ALS (VF, Pulseless VT - Adult)

1. Confirm the completion of BLS steps 1-6.
2. Resume CPR, administer supplemental oxygen, attach manual defibrillator, and verify that VF/VT is present on the monitor.
3. **Defibrillate one time.** If a shockable rhythm (VF/VT) develops, resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
4. Initiate intubation, or provide advanced airway support, and verify correct placement with capnography with minimal interruption of CPR (< 10 seconds).
5. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock with minimal interruption of CPR (< 10 seconds).
6. Administer epinephrine 1.0 mg IV/IO/ET, every 3-5 minutes, with minimal interruption of CPR (< 10 seconds). Consider Vasopressin 40 units IV/IO in place of first or second dose of epinephrine.
7. **Defibrillate one time.** If a shockable rhythm (VF/VT) develops, resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
8. **Defibrillate one time.** If a shockable rhythm (VF/VT) develops, resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
9. **If refractory VF/VT:** Administer Amiodarone 300 mg bolus IV/IO; may repeat x1 at 150 mg bolus IV/IO. If Amiodarone is unavailable, consider Lidocaine® 1.0 mg/kg bolus.
10. Consider magnesium sulfate 1.0-2.0 gm IV over 15 minutes **only** for torsades de pointes.

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11. **Defibrillate one time.** If a shockable rhythm (VF/VT) develops, resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 12. Identify and treat reversible causes:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Tamponade, cardiac
 - Tension Pneumothorax
 - Thrombosis, coronary
 - Thrombosis, pulmonary
 - Toxins
 13. If spontaneous circulation returns, monitor vital signs, support airway and breathing per local protocols.
 14. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue therapeutic hypothermia.
 15. If there is no return of spontaneous circulation, refer to Protocol XI.C.

ALS (Asystole/PEA - Adult)

1. Confirm the completion of BLS steps 1-6.
2. Resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
3. Administer supplemental oxygen, attach manual defibrillator, and verify that Asystole is present on the monitor.
4. Continue to monitor cardiac rhythms.
5. **Defibrillate one time**, if a shockable rhythm (VF/VT) develops. Follow the guidelines for “ALS (VF, Pulseless VT - Adult).”
6. Initiate intubation, or provide advanced airway support, and verify correct placement with capnography with minimal interruption of CPR (< 10 seconds).
7. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock with minimal interruption of CPR (<10 seconds).
8. Administer epinephrine 1.0 mg IV/IO/ET, every 3-5 minutes, with minimal interruption of CPR (<10 seconds). Consider Vasopressin 40 units IV/IO in place of first or second dose of epinephrine.

9. Identify and treat reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen Ion (acidosis)
- Hypo/hyperkalemia
- Hypothermia
- Tamponade, cardiac
- Tension Pneumothorax
- Thrombosis, coronary
- Thrombosis, pulmonary
- Toxins

10. Give all medications with minimal interruption of CPR (< 10 seconds).

11. If spontaneous circulation returns, monitor vital signs, support airway and breathing, and provide medications appropriate for BP, heart rate, and rhythm per local protocols.

12. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue therapeutic hypothermia.

13. If there is no return of spontaneous circulation, refer to Protocol XI.C.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

2. Start CPR according to current American Heart Association (AHA) guidelines (30:2 with one rescuer [15:2 with two rescuers]):

a. Compress chest at a rate of 100 compressions/min.

- **Neonates < 28 days:** Compress lower third of the sternum 1/3 of the anterior-posterior diameter of the chest.
- **Infants 28 days-1 year:** Compress chest 1½ inches.
- **Children 1-8 years:** Compress chest 2 inches.

b. Manually ventilate with appropriate-sized bag valve mask (BVM), if available. If not, use a mouth-to-mask/barrier device. Administer supplemental oxygen.

c. **Defibrillate one time**, if a shockable rhythm (VF/VT) develops; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds); if possible, use AED with pediatric pads.

d. **Defibrillate one time**, if a shockable rhythm (VF/VT) develops; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).

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- e. **Defibrillate one time**, if a shockable rhythm (VF/VT) develops; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
 3. If spontaneous circulation returns, monitor vital signs, support airway and breathing per local protocols.
 4. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue therapeutic hypothermia.
 5. If there is no return of spontaneous circulation, refer to Protocol XI.C.

ALS (VF, Pulseless VT – Pediatric)

1. Follow Pediatric BLS guidelines, adjusting for patient age/size.
2. Attach manual defibrillator and verify that VF/VT is present on the monitor.
3. **Defibrillate one time at 2 J/kg**. If a shockable rhythm develops; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
4. Initiate intubation, or provide advanced airway support, and verify correct placement with capnography with minimal interruption of CPR (< 10 seconds).
5. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock with minimal interruption of CPR (<10 seconds).
6. Administer epinephrine, every 3-5 minutes, with minimal interruption of CPR (< 10 seconds):
 - a. **IV/IO:** 0.01 mg/kg (0.1 ml/kg 1:10,000), up to a maximum of 1.0 mg
 - b. **ET:** 0.01 mg/kg (0.1 ml/kg 1:1,000), up to a maximum of 2.5 mg. Flush with 5 ml of Normal Saline and follow with 5 ventilations.
7. **Defibrillate one time at 4 J/kg**. If a shockable rhythm develops; resume 5 cycles of CPR (2 minutes) with minimal interruption (< 10 seconds).
8. **Defibrillate third and subsequent times** at ≥ 4 J/kg, up to a maximum of 10 J/kg or adult dose.
9. **If refractory VF/VT:** Administer Amiodarone 5 mg/kg IV/IO; may repeat x2 at 15 mg/kg, up to a maximum single dose of 300 mg.
10. Consider magnesium sulfate 25-50 mg/kg IV/IO over 10-20 minutes, up to a maximum dose of 2.0 gm, **only** for torsades de pointes.
11. Identify and treat reversible causes:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia

- Tamponade, cardiac
 - Tension Pneumothorax
 - Thrombosis, coronary
 - Thrombosis, pulmonary
 - Toxins
12. Give all medications with minimal interruption of CPR (< 10 seconds).
 13. If spontaneous circulation returns, monitor vital signs, support airway and breathing, and provide medications appropriate for BP, heart rate, and rhythm per local protocols.
 14. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue therapeutic hypothermia.
 15. If there is no return of spontaneous circulation, refer to Protocol XI.C.

ALS (Asystole/PEA - Pediatric)

1. Follow Pediatric BLS guidelines, adjusting for patient age/size.
2. Attach manual defibrillator and verify that Asystole is present on the monitor.
3. **Defibrillate one time at 2 J/kg**, if a shockable rhythm develops. Follow the guidelines for “ALS (VF, Pulseless VT - Pediatric).”
4. Initiate intubation, or provide advanced airway support, and verify correct placement with capnography with minimal interruption of CPR (< 10 seconds).
5. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock with minimal interruption of CPR (<10 seconds).
6. Administer epinephrine, every 3-5 minutes, with minimal interruption of CPR (< 10 seconds):
 - a. **IV/IO:** 0.01 mg/kg (0.1 ml/kg 1:10,000), up to a maximum of 1.0 mg
 - b. **ET:** 0.01 mg/kg (0.1 ml/kg 1:1,000), up to a maximum of 2.5 mg. Flush with 5 ml of Normal Saline and follow with 5 ventilations.
7. Identify and treat reversible causes:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Tamponade, cardiac
 - Tension Pneumothorax
 - Thrombosis, coronary
 - Thrombosis, pulmonary
 - Toxins

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8. Give all medications with minimal interruption of CPR (< 10 seconds).
 9. If spontaneous circulation returns, monitor vital signs, support airway and breathing, and provide medications appropriate for BP, heart rate, and rhythm per local protocols.
 10. Apply cold packs to armpits, groin, and back of knees, if the receiving facility can continue therapeutic hypothermia.
 11. If there is no return of spontaneous circulation, refer to Protocol XI.C.

E. Other Cardiac Arrhythmias

Premature Ventricular Contractions

Review of Injury/Illness

Premature ventricular complexes (PVCs) have three characteristics:

- They occur earlier than the expected sinus beat.
- They do not start with a positive P wave.
- They have an abnormal QRS width (≥ 0.12 seconds).

PVCs in the presence of cardiac symptoms that are and that have the following characteristics are indications for treatment:

- Near the “T” wave
- Multi-focal (different shapes on the monitor tracing)
- Sequential or closely coupled
- Runs of ventricular tachycardia (5 or more consecutive beats)
- Ventricular tachycardia with a pulse
- Once successful electrical conversion from ventricular tachycardia
- Ventricular fibrillation to a supraventricular rhythm

Signs and Symptoms

- * Irregular heart beat of ventricular origin (may or may not be felt by the patient)
- * Sensation of irregular heart beats or pounding/fluttering in chest

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Monitor airway, administer supplemental oxygen, if necessary, and monitor pulse oximetry.

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6. Assess and treat for shock, if indicated. (Refer to Protocol X.I.)
 7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Obtain a 12-lead ECG and monitor cardiac rhythm. Providers may perform a 15-lead ECG, if trained.
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Patients who are symptomatic (e.g., hypotensive, syncope, dizziness):
 - a. Administer an initial bolus of Lidocaine® of 1.0 mg/kg IV/IO.
 - b. Follow with a maintenance infusion of 1.0 mg/min (30-50 mcg/kg/min)
 - c. Administer subsequent boluses of 0.5-0.75 mg/kg IV/IO, up to a maximum dose of 3.0 mg/kg, every 5-10 minutes.
 - d. Increase maintenance infusions by 1.0 mg/min (30-50 mcg/kg/min) after each subsequent bolus.
6. Continue supportive care, monitoring cardiac status and O2 saturation, and transport.

Bradycardia

Review of Injury/Illness

Patient may present with a slow heart rate and chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, congestive heart failure, and/or acute myocardial infarction. It is not unusual for young, healthy athletes to have a resting heart rate below 60 beats per minute. Bradycardia has a number of causes, including damage to the conduction pathways in the heart, medications, hypoxia, and hypothermia.

Signs and Symptoms

- * **Light-headedness**
- * **Syncope**
- * **Fatigue**
- * **Chest pain**
- * **Shortness of breath**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Assess and treat for shock, if indicated. (Refer to Protocol X.I.)
6. Monitor airway, administer supplemental oxygen, if necessary, and monitor pulse oximetry.
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Obtain 12-lead ECG and monitor cardiac rhythm.
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. If hypotensive, and lungs are clear, initiate a 250 ml bolus of 0.9% Normal Saline or LR; repeat to bring Systolic BP > 90 mm Hg, as needed.
5. If symptomatic, with heart rate < 50 bpm, apply pacer pads and treat any underlying causes.
6. If symptomatic, administer atropine 0.5 mg slow IV/IO push; repeat every 3-5 minutes, up to a maximum total dose of 3.0 mg.
 - a. **DO NOT** administer atropine to patients who have had cardiac transplants.
 - b. Hypothermic patients with a pulse should generally be re-warmed before atropine or pacing is attempted.
7. If the patient is hemodynamically unstable, with **NO** response to atropine:
 - a. Administer transcutaneous pacing (TCP), OR
 - b. Administer dopamine infusion at 2.0-20 mcg/kg/min for persistent hypotension; titrate to patient response, OR
 - c. Administer epinephrine infusion at 2.0-10 mcg/min; titrate to patient response.

8. If patient is hemodynamically stable and in Type II, second-degree AV Block or third-degree AV Block:

a. Consider TCP after consulting on-line medical direction.

- If the patient develops discomfort with TCP, and Systolic BP > 110 mm Hg:
 - Consider morphine 1.0-2.0 mg/min IV/IO/IM, or
 - Consider midazolam 0.1 mg/kg in 2.0 mg increments slow IV/IO push over 1-2 minutes, up to a maximum single dose of 5.0 mg to reduce pain/anxiety of pacing. Reduce dosage by 50% for patients ≥ 69 years.
 - Consider Lorazepam 1.0-2.0 mg IV/IO/IM; repeat every 5 minutes, up to a maximum of 10 mg.
 - Consider Diazepam (Valium®): 5.0-10 mg slow IV/IO/IM. Titrate to desired effect, up to a maximum of 20 mg.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Obtain 12-lead ECG and monitor cardiac rhythm.
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Identify and treat any reversible causes.
5. If hypotensive, and lungs are clear, initiate a 20 mg/kg fluid bolus of 0.9% Normal Saline or LR; repeat to bring Systolic BP > 90 mm Hg, as needed.
6. If the patient is hemodynamically unstable (with a pulse and poor perfusion):
 - a. Start CPR, if heart rate < 60 bpm, with poor perfusion, despite oxygenation and ventilation.
 - b. Administer epinephrine, every 3-5 minutes, with minimal interruption of CPR (< 10 seconds):
 - **IV/IO:** 0.01 mg/kg (0.1 ml/kg 1:10,000), up to a maximum of 1.0 mg
 - **ET:** 0.01 mg/kg (0.1 ml/kg 1:1,000), up to a maximum of 2.5 mg. Flush with 5 ml of Normal Saline and follow with 5 ventilations.

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- c. If symptomatic, administer atropine 0.02 mg/kg IV/IO (minimum dose 0.1 mg); may repeat x1, up to a maximum single dose of 0.5 mg.
- **DO NOT** administer atropine to patients who have had cardiac transplants.
 - Hypothermic patients with a pulse should generally be re-warmed before atropine or pacing is attempted.
 - If the patient **DOES NOT** respond to epinephrine and atropine, administer transcutaneous pacing (TCP) after consulting on-line medical direction.

Tachycardia

Review of Injury/Illness

Tachycardia is defined as a heart rate > 100 bpm. Symptoms and potential hemodynamic compromise typically occur when heart rates > 150 bpm. The most common tachycardia is sinus tach, and it is treated by correcting the underlying causes. Atrial tachycardias require transport if they produce hypotension.

Signs and Symptoms

- * **Chest pain (may or may not be felt by the patient)**
- * **Shortness of breath**
- * **Decreased level of consciousness**
- * **Heart failure and/or acute myocardial infarction**
- * **Light-headedness**
- * **Syncope**
- * **Fatigue**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Monitor airway, administer supplemental oxygen, if necessary, and monitor pulse oximetry.

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6. Assess and treat for shock, if indicated. (Refer to Protocol X.I.)
 7. Continue supportive care and monitor vital signs (every 15 minutes, if stable; every 5 minutes, if unstable) until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Obtain a 12-lead ECG and monitor cardiac rhythm. Identify the rhythm and QRS duration. Providers may perform a 15-lead ECG, if trained.
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. If no pulse is present, treat as Asystole/PEA. (Refer to Protocol VI.D “ALS [Asystole/PEA - Adult].”)
6. If patient is hemodynamically stable, identify the rhythm and treat according to current AHA/ACLS guidelines.
7. If patient is hemodynamically unstable with a ventricular rate > 150 bpm, identify and treat reversible causes:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Tamponade, cardiac
 - Tension Pneumothorax
 - Thrombosis, coronary
 - Thrombosis, pulmonary
 - Toxins.
8. Consider vagal maneuvers.
9. If the QRS duration is a regular narrow complex:
 - a. Consider administering adenosine 6.0 mg rapid IV/IO push and follow with 20 ml Normal Saline or LR flush.
 - b. If the rhythm does not convert in 1-2 minutes, administer a second dose at 12 mg IV/IO.
 - c. If the rhythm does not convert in 1-2 minutes, administer a third dose at 12 mg IV/IO.
 - d. If the patient has a history of WPW, a defibrillator **must** be available when adenosine is administered.

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10. Consider **one** of the following for sedation prior to synchronized cardioversion, after consulting on-line medical direction. **DO NOT** delay, if hemodynamically unstable, as low blood pressure may affect ability to administer sedative.
 - a. Diazepam (Valium[®]): 5.0-10 mg slow IV/IO/IM. Titrate to desired effect, up to a maximum of 20 mg.
 - b. Midazolam (Versed[®]): 2.0-5.0 mg slow IV/IO or 0.2 mg/kg IM, if no IV access.
 - c. Lorazepam (Ativan[®]): 2.0-4.0 mg slow IV/IO/IM, up to a maximum of 8.0 mg.
 11. Synchronized cardioversion doses:
 - a. Narrow regular: 50-100 J
 - b. Narrow irregular: 120-200 J
 - c. Wide regular: 100 J
 - d. Wide irregular: defibrillation dose (**NOT** synchronized)
 12. If the QRS duration is a wide complex (≥ 0.12 seconds), consider one of the following:
 - a. Administer procainamide 20-50 mg/min, up to a maximum dosage of 17 mg/kg, until dysrhythmia is suppressed, hypotension ensues, or QRS $> 50\%$ of the baseline. Follow with a maintenance infusion of 1.0-4.0 mg/min. Avoid procainamide if there is prolonged QT interval, heart block, or CHF.
 - b. Administer amiodarone 150 mg, over 10 minutes. Follow with a maintenance infusion of 1.0 mg/min for the first 6 hours.
 - c. **DO NOT** routinely administer amiodarone and procainamide together.
 - d. Consider Diltiazem/Verapamil,[®] beta blockers, and/or magnesium sulfate after consulting on-line medical direction.
 13. If the patient's condition does not improve, or worsens, contact on-line medical direction for further guidance.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. If the patient is hemodynamically stable (with a pulse and appears well perfused):
 - a. Administer oxygen to obtain a saturation of 90-100%.
 - b. Attach cardiac monitor and identify rhythm and QRS duration.
 - c. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
 - d. Identify and treat reversible causes.

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3. If the patient is hemodynamically unstable (with a pulse and poor perfusion) with a heart rate > 220 bpm for an infant, or > 180 bpm for a child:
- Consider vagal maneuvers.
 - Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
 - If cardiac rhythm is regular and narrow and the QRS duration ≤ 0.09 seconds:
 - Administer Adenosine 0.1 mg/kg rapid IV/IO push, up to a maximum of 6.0 mg. Follow with 20 ml Normal Saline or LR flush.
 - If the rhythm does not convert in 1-2 minutes, administer a second dose at 0.2 mg/kg rapid IV/IO, up to a maximum of 12 mg.
 - If the rhythm does not convert in 1-2 minutes, administer a third dose at 0.2 mg/kg rapid IV/IO, up to a maximum of 12 mg.
 - ET dosage is 2-2.5 times the IV/IO dosage.
 - If patient is not improved with Adenosine, or if IV/IO is unavailable, consider immediate synchronized cardioversion.
 - Consider **one** of the following for sedation prior to synchronized cardioversion, after consulting on-line medical direction. **DO NOT** delay, if hemodynamically unstable, as low blood pressure may affect ability to administer sedative.
 - Diazepam (Valium®): 0.3 mg/kg slow IV/IO/IM. Titrate to desired effect, up to a maximum of 10 mg or 0.5 mg/kg PR, up to a maximum of 20 mg.
 - Midazolam (Versed®): 0.1 mg/kg slow IV/IO, up to a maximum of 4.0 mg or 0.2 mg/kg IM, up to a maximum of 4.0 mg, if no IV access.
 - Lorazepam (Ativan®): 0.05-0.1 mg/kg slow IV/IO/IM, up to a maximum of 4.0 mg.
 - Start cardioversion with 0.5-1.0 J/kg. If patient's condition does not improve, or worsens, increase to 2.0 J/kg
 - If a calculated joule setting is lower than the cardioversion device is able to deliver, use the lowest power setting possible or consult on-line medical direction.
 - Be prepared for up to 40 seconds of Asystole after cardioversion.
 - If the QRS duration is a wide complex (> 0.09 seconds), consider one of the following, after consulting on-line medical direction:
 - Administer procainamide 15 mg/kg IV/IO over 30-60 minutes, until dysrhythmia is suppressed, hypotension ensues, or QRS > 50% of the baseline. Monitor ECG and blood pressure during infusion.
 - Administer Amiodarone 5.0 mg/kg over 20-60 minutes.
 - DO NOT** routinely administer amiodarone and procainamide together.

VII. Childbirth and Newborn Care

A. Uncomplicated Delivery

Review of Injury/Illness

Full-term gestation lasts 40 weeks. Babies may be born at any time before or after 40 weeks, but the earlier the birth occurs in the gestation process, the likelier it is that complications, including fetal demise, will arise.

Signs and Symptoms

- * **Abdominal, pelvic pain**
- * **Low back pain**
- * **Vaginal discharge – this may be the mucus plug or it may be a large volume of clear liquid from the amniotic sac**
- * **Urge to defecate**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Time the duration of contractions and the length of the interval between them.
6. Obtain pre-natal history, including number of previous pregnancies and births.
7. Assess for crowning.
8. If crowning is not present, allow patient to assume position of comfort.
9. If crowning is present, delivery is imminent.
10. In addition to gloves, don splash protection garments, if possible, to assist delivery.
11. Alert medical direction and/or receiving hospital of procedure in progress if possible.
12. Assist delivery:
 - a. Apply gentle pressure to the baby's head to prevent tearing of perineum.
 - b. Once head is delivered, suction mouth and nose with bulb syringe.
 - c. Check to see if the umbilical cord is wrapped around the baby's neck.

-
- d. Apply gentle pressure downward while supporting baby's head to ease delivery of superior (upper position) shoulder.
 - e. Once superior shoulder is delivered, apply gentle pressure upward to ease delivery of inferior (lower) shoulder.
 - f. Upon delivery of both shoulders, the rest of the baby should follow quickly.
 - g. Keep the baby at the level of the vagina until the cord is clamped and cut.
 - h. Once fully delivered, clamp the umbilical cord at 8" and 10" from baby, and cut the cord between the two clamps.
 - i. After clamping and cutting the cord, wrap the baby in a warm blanket, place the baby on the mother's abdomen, and allow for delivery of placenta.
 - j. Record time of delivery.
 - k. Refer to "Newborn Care Protocol" (Protocol VII.C).
 - l. Watch for excessive bleeding; perform uterine massage and apply pressure to any lacerations that may be bleeding.
 - m. Encourage mother to breastfeed to help control hemorrhage.
13. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-12.
2. Administer oxygen and monitor pulse oximetry.
3. Resuscitate neonate, if needed. (Refer to Protocol VII.C).
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

B. Complicated Delivery

Review of Injury/Illness

Labor and delivery can be complicated by abnormal presentation of the fetus, including:

- Breech presentation
- Prolapsed cord
- Multiple births
- Vaginal hemorrhage

None of these is optimally handled in the field, and every attempt must be made to move the patient to a higher level of care while EMS care is in progress.

Breech Delivery

Signs and Symptoms

- * Fetal buttocks visible at vaginal opening (breech presentation)
- * Prolapsed umbilical cord

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Provide supplemental oxygen.
6. Support the baby's body as it is delivered.
7. If the head delivers normally, refer to Protocol VII.A.
8. If the head does not deliver within 2 minutes, insert gloved hand into the vagina, keeping palm toward the baby's face and forming a "V" with your fingers. Push the vaginal wall away from the baby's face to allow room for an airway.
9. Maintain this airway until the baby is delivered or turned over to higher level of care.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Resuscitate neonate, if needed. (Refer to Protocol VII.C).
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

Limb Presentation

Signs and Symptoms

- * **Fetal arm or foot visible at vaginal opening**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen and monitor pulse oximetry.
6. Place mother in the Trendelenburg position.
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

Prolapsed Cord

Signs and Symptoms

- * Cord presents first at vaginal opening

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen and monitor pulse oximetry.
6. Place the mother in the knee-to-chest position.
7. Wrap the cord in gauze moistened with saline.
8. Check the cord for a pulse.
9. If no pulse present, insert gloved hand into the vagina and push up on the baby until a pulse returns to the cord.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

Multiple Births

Review of Injury/Illness

Most patients can report whether the impending delivery involves twins or multiple births.

Signs and Symptoms

- * Ongoing labor after first newborn delivered

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen and monitor pulse oximetry.
6. Follow normal delivery protocol for each neonate as it presents. (Refer to Protocol VII.A.)
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

Vaginal Hemorrhage

Review of Injury/Illness

Vaginal hemorrhage can be a sign of miscarriage or can be a pre- or post-partum complication.

Signs and Symptoms

- * Unusually heavy vaginal bleeding
- * May be hypotensive

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen and monitor pulse oximetry.
6. Apply bandages/dressings appropriate for bleeding control in the vaginal area.
7. If pre-delivery, place mother in the left lateral recumbent position for third trimester. Prior to third trimester, place in shock position.
8. If before 20 weeks gestation and baby delivers without vital signs, do not begin resuscitation. If > 20 weeks gestation and baby delivers without vital signs, begin CPR. If unsure of gestational age, begin CPR. (Refer to Protocol VI.D.)
9. If post-partum, begin firm uterine massage.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate Normal Saline or LR via IV/IO at KVO or saline lock.
3. Assess and treat for hypotension or shock, if indicated. (Refer to Protocol X.I.)

C. Newborn Care

Review of Injury/Illness

EMS care for a newborn follows a delivery at which the providers have just assisted, or may be initiated on arrival at the scene of a recent out-of-hospital birth.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Warm and dry the newborn.
6. Stimulate breathing by tapping the heels of the feet or rubbing the newborn's back.
7. If breathing does not begin, or is labored, suction the airway with a bulb syringe to remove mucus and secretions.
8. If no spontaneous respirations occur: Begin manual respirations, as needed, with an appropriate-sized bag valve mask (BVM) at 40-60 breaths per minute with 100% O₂.
9. Assess heart rate.
10. If heart rate is absent or < 60 bpm at 30 seconds, after assisted respirations and supplemental oxygen, begin resuscitation according to current American Heart Association (AHA) Neonatal Resuscitation guidelines.
11. Assess APGAR score at 1 minute and 5 minutes post birth. (Refer to chart.)
12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. If heart rate remains < 60 bpm, despite adequate ventilation with 100% O₂ and chest compressions, administer epinephrine (1:10,000) 0.01-0.03 mg/kg IV/IO or 0.05-0.1 mg/kg ET.
4. Consider hypovolemia and pneumothorax, if condition does not improve.

APGAR Scores

Sign	0	1	2	Points
Appearance (color)	Blue, pale	Body pink, extremities blue or pale	Completely pink	
Pulse rate	Not detectable	Slow (below 100)	Over 100	
Grimace	No response	Grimace	Crying	
Activity	Limp	Some flexion	Active motion	
Respirations (respiratory effort)	Absent	Slow, irregular	Good, crying	
			Total Score	

Score		
Point total	Infant's Condition	Treatment Considerations
10	Very good	Routine
7-9	Good	Re-assess
4-6	Fair	May need oxygen and stimulation
0-3	Poor	Requires CPR

VIII. Environmental Emergencies

A. Dehydration

Review of Injury/Illness

Dehydration can be caused by inadequate fluid intake, inapparent loss of fluids through sweating and evaporation, obvious fluid loss such as vomiting, diarrhea, excessive urination due to diuretic medication, or a combination of these factors. There is increased risk of dehydration in both hot and cold climates and at high altitudes.

Signs and Symptoms

- * **Dry mucosa**
- * **Decreased urine output**
- * **Headache**
- * **Loss of coordination**
- * **Altered mental status**
- * **Decreased blood pressure, increased heart rate**
- * **May progress to shock**

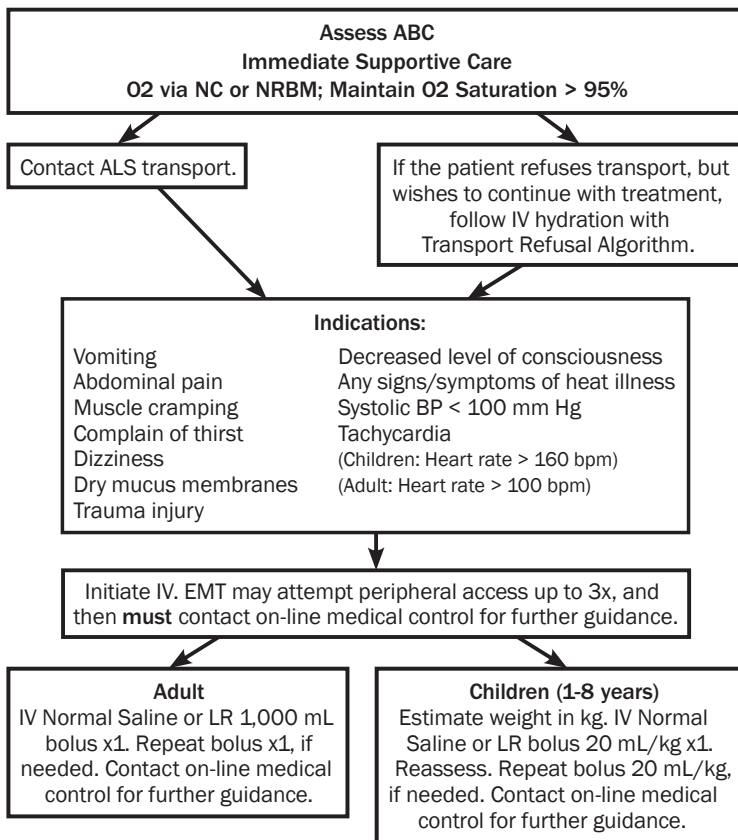
Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. If dehydration is associated with heat exposure, move patient to a cool shaded area.
6. Loosen patient's clothing.
7. If possible, take orthostatic vital signs. If mental status or blood pressure are abnormal with the patient lying down, **DO NOT** attempt to take an orthostatic set of vital signs.
8. Provide oral hydration with water, diluted fruit juice, or diluted sports drink (50:50 with water), if patient is awake and able to swallow and mental status is intact.
9. Inquire about patient medical history, including urine output and color, fluid consumption, and recent alcohol or drug use.
10. Obtain a small urine sample from the patient. If urine is dark brown, dark orange or red, this may be a sign of rhabdomyolysis and requires ALS intervention.

11. If patient is unable to retain oral fluids, contact Expanded Scope BLS or ALS provider for IV therapy.
12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

Expanded Scope BLS

In some services, BLS providers may be specially trained and locally certified to provide IV hydration under specific circumstances. Refer to the following algorithms.



IV Hydration with Transport Refusal

Use this algorithm on patients who refuse ALS transport but accept and meet the criteria for recommended IV hydration therapy:

- Patient must meet proper patient refusal criteria: CAOX4, no ETOH or drugs use, and no neurological insult/injury.
- If patient is a minor, he/she must be accompanied by a legal guardian.
- Patient must have 1 or more signs/symptoms of dehydration, as established by the IV therapy protocol.



Initiate immediate supportive care:

- Ensure airway is open, clear, self-maintained, and supplemented by O₂ therapy, as necessary, to maintain SpO₂ >94%.
- Assess bilateral lung sounds.
- Obtain SAMPLE history.
- Check blood glucose levels, if available.
- Obtain and assess baseline orthostatic vital signs:
Patient is **ORTHOSTATIC POSITIVE** if HR increases more than 15 bpm or Systolic BP drops 10 mm Hg from supine position to standing up.

This protocol **SHOULD NOT** be used on patients with these signs/symptoms:

- Altered mental status.
- ABC compromised (e.g., SOB, chest pain, hemodynamically unstable)
- History of CHF or pulmonary edema
- Mechanism of injury suggests severe trauma
- Any other medical conditions that requires the need for advanced medical emergency care.



ORTHOSTATIC POSITIVE

- BSI/Universal Precautions
- Initiate proper IV therapy technique with 1,000 mL of 0.9% Normal Saline or LR bolus.

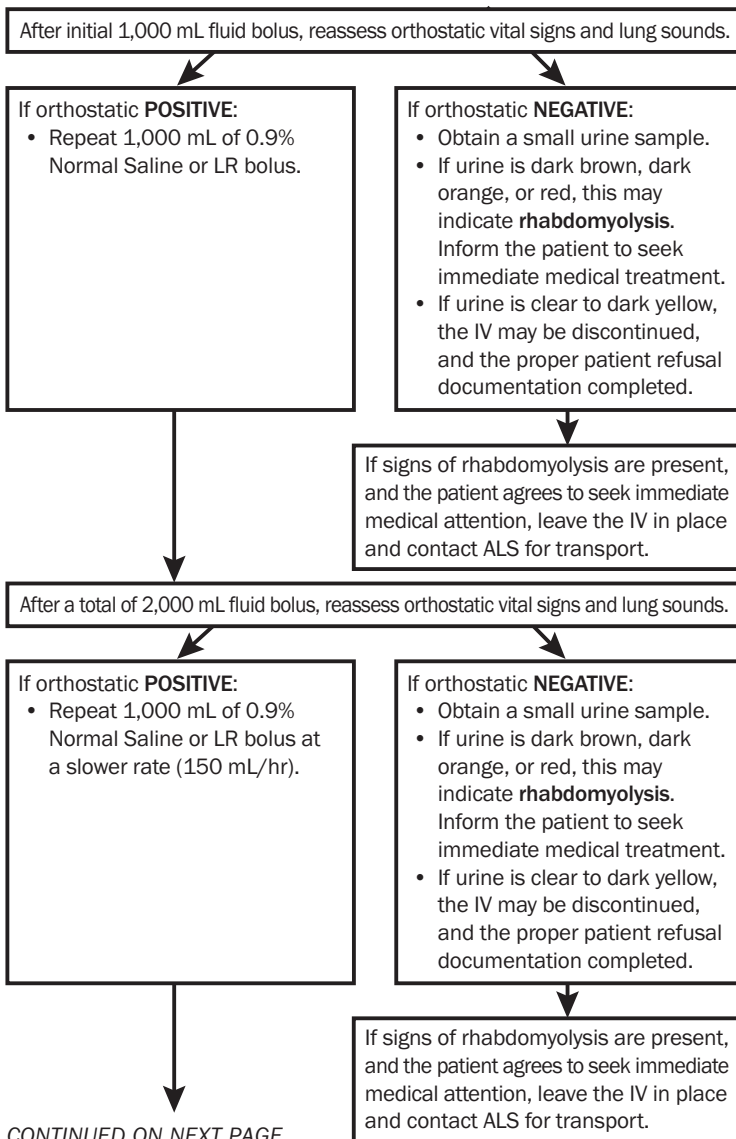


ORTHOSTATIC NEGATIVE

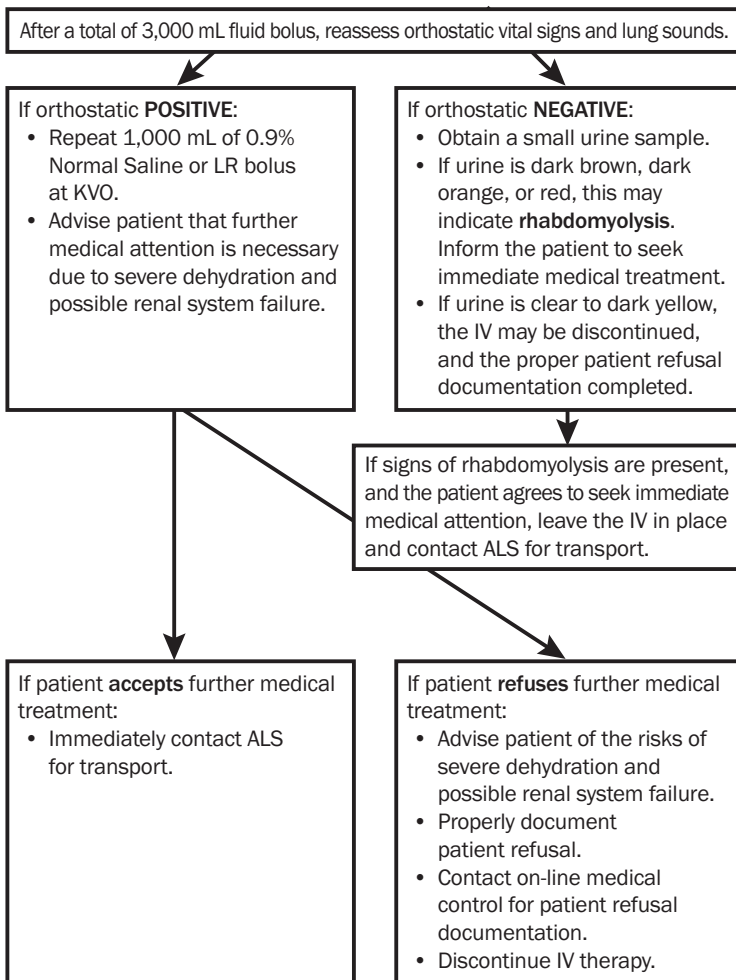
- Encourage oral hydration until urine is produced.
- Continue monitoring and supportive care.

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ALS

1. Confirm the completion of BLS steps 1-11.
2. Monitor for change in mental status.
3. Initiate 0.9% Normal Saline or LR via IV/IO and administer 500 ml fluid bolus.
 - a. If patient age is < 40, repeat 500 ml bolus as needed up to 3,000 ml.
 - b. If patient age is > 40, repeat 500 ml bolus as needed up to 2,000 ml.
4. After each bolus, monitor vital signs, including auscultation of lung sounds, and pulse oximetry, if available.
5. Obtain 12-lead ECG and monitor cardiac rhythm. (An electrolyte imbalance may cause dysrhythmia.)
6. If vomiting, consider administering one of the following:
 - a. Ondansetron (Zofran®) 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - b. Promethazine (Phenergan®) 12.5-25 mg IV/IO/IM/PO/PR (diluted 1:1 with Normal Saline prior to administration), over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
7. Obtain a small urine sample from the patient. If urine is dark brown or red, this may be a sign of rhabdomyolysis.
8. If rhabdomyolysis is suspected, administer 50 mEq of sodium bicarbonate 8.4% IV/IO, provided that lung sounds are clear.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for age/size of patient.

Expanded Scope BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO. Infuse 20 ml/kg bolus. Reevaluate and repeat 20 ml/kg bolus, up to a maximum total infusion of 40 ml/kg. After each bolus, monitor vital signs, lung sounds, and pulse oximetry, if available.

ALS

1. Follow Expanded Scope BLS guidelines, adjusting for age/size of patient.
2. If vomiting, consider administering ondansetron:
 - a. For patients who weigh < 40 kg: 0.1 mg/kg slow IV/IO over 2-5 minutes
 - b. For patients who weigh ≥ 40 kg: 4.0 mg slow IV/IO over 2-5 minutes.

B. Drowning – Near Drowning

Review of Injury/Illness

Drowning and near drowning involve respiratory impairment due to submersion or immersion in liquid. Hypothermia and/or cervical spine injury are frequently associated with drowning and near drowning, and should be considered when caring for such patients.

Signs and Symptoms

- * Respiratory distress/arrest
- * Hypoxia
- * Cough with clear or frothy pink sputum
- * Decreased level or loss of consciousness
- * Decreased or absent pulses

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen and monitor pulse oximetry.
6. Assist respirations if necessary with a bag valve mask and high-flow O₂.
7. Position patient on side to prevent aspiration if coughing/choking, with or without assisted ventilations. Otherwise, allow patient to assume position of comfort.
8. Protect from hypothermia. (Refer to Protocol VIII.D.)
9. Evaluate for additional illness or injury including c-spine injury, diabetes, seizure, cardiac event, or stroke.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock. Use warm fluids, if available.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. Start CPR according to current AHA guidelines, if indicated.
6. If patient is resuscitated from VF or Asystole cardiac arrest, consider therapeutic hypothermia and have receiving facility continue therapy, if available.
7. Continuously monitor vital signs and pulse oximetry.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock. Use warm fluids, if available.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. Start CPR according to current AHA guidelines, if indicated.
6. If patient is resuscitated from VF or Asystole cardiac arrest, consider therapeutic hypothermia and have receiving facility continue therapy, if available.
7. Continuously monitor vital signs and pulse oximetry.

C. Heat-related Illness (Hyperthermia)

Review of Injury/Illness

Heat-related illness is a group of acute conditions in which the body produces or absorbs more heat than it can effectively dissipate into the environment, causing a dangerous increase in core body temperature. The two most common forms of heat-related illness that require EMS treatment are heat exhaustion and heat stroke. These conditions may be associated with dehydration and electrolyte abnormalities, rarely including life-threatening hypernatremia.

Signs and Symptoms

Heat exhaustion

- * Nausea
- * Clammy skin
- * Dizziness
- * Muscle cramps
- * Elevated core temperature

Heat stroke

- * Altered mental status
- * Elevated core temperature (> 105° F)
- * Skin may be hot and dry or sweaty
- * Dilated pupils
- * Rapid heart rate (sometimes with arrhythmia)

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.

-
5. Have patient stop doing any work or physical exertion.
 6. Remove as much clothing from patient as possible.
 7. Have patient rest in shaded or cooler area.
 8. Aggressively cool patient with tepid or cool (not cold or iced) water and/or towels soaked with tepid water; the more skin surface actively cooled, the better.
 - a. Increase airflow over the moist skin to increase evaporation.
 - b. Avoid inducing shivering, which is one of the body's mechanisms for warming itself.
 - c. Monitor mental status and core body temperature (rectal) temperature to avoid over-cooling, if possible.
 - d. Watch for rebound hyperthermia when measures are discontinued after initial cooling, and restart if core body temperature exceeds 101° F.
 - e. Provide supplemental oxygen to keep O₂ saturation at a minimum of 94%.
 9. Provide oral hydration with water, diluted fruit juice, or diluted sports drink (50:50 with water), if patient is awake and able to swallow and mental status is intact.
 10. Provide salty food or snack if able to take PO liquids without difficulty.
 11. For **heat stroke**, consider Aeromedical evacuation or ground transportation to the nearest hospital as rapidly as possible.
 12. Monitor core body temperature, oxygen saturation, lung sounds, and mental status.
 13. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-11.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 250 ml/hr, up to a maximum total of 3,000 ml.
3. Maintain urine output of at least 100 ml/hr for prolonged field treatment.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. If not tolerating PO fluids, consider:
 - a. Ondansetron (Zofran®): 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - b. D50W: 25 gm IV/IO
 - c. Thiamine: 100 mg IV/IO (if patient is a known or suspected alcoholic)
 - d. Diazepam (Valium®) or Midazolam (Versed®): 2.0-5.0 mg IV/IO, up to a maximum of 10 mg, if patient is seizing or combative, and Systolic BP \geq 100 mm Hg.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for age/size of patient.
2. Pediatric patients are more susceptible to heat extremes than adults.
3. Monitor core body temperature (rectal).

ALS

1. Follow BLS guidelines, adjusting for age/size of patient.
2. Pediatric patients are more susceptible to heat extremes than adults.
3. Monitor core body temperature (rectal).
4. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
5. Maintain urine output of at least 50 ml/hr for prolonged field treatment.
6. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
7. If not tolerating PO fluids and is vomiting, consider ondansetron:
 - a. If patient is < 40 kg: 0.1 mg/kg slow IV/IO, over 2-5 minutes; may repeat x1 after 15 minutes, if no response, after consulting on-line medical direction.
 - b. If patient is ≥ 40 kg: 4.0 mg slow IV/IO, over 2-5 minutes; may repeat x1 after 15 minutes, if no response, after consulting on-line medical direction.
 - c. If IV/IO is not available, 0.1 mg/kg IM, up to a maximum single dose of 4.0 mg; may repeat x1 after 15 minutes, if no response, after consulting on-line medical direction.
8. If patient is combative, belligerent, or uncontrollable, consider any of the following sedatives as a last resort, according to local protocols:
 - a. Lorazepam: Administer 1.0-2.0 mg (0.1 mg/kg, max 2.0 mg/dose) IV/IO/IM; repeat every 5 minutes, up to a maximum of 4.0 mg.
 - b. Midazolam: Administer 1.0-5.0 mg (0.05 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.1 mg/kg, if needed.
 - c. Diazepam: Administer 5.0-10.0 mg (0.1 mg/kg) IV/IO/IM; repeat every 5 minutes, up to a maximum of 0.3 mg/kg, if needed.

d. If medications are administered, place on cardiac monitor. Monitor cardiac rhythm and pulse oximetry.

D. Hypothermia and Frostbite

Review of Injury/Illness

Hypothermia results when the body loses more heat to the environment than it can generate metabolically. Hypothermia and frostbite are the cold injuries of greatest significance.

Signs and Symptoms

Mild hypothermia (core body temperature 98.6-92° F)

- * Shivering
- * Unable to perform complex tasks with hands
- * Poor judgment
- * Amnesia

Moderate hypothermia (core body temperature 91-86° F)

- * Violent shivering to potential loss of shivering reflex
- * Dazed consciousness, slurred speech, irrational behavior
- * Loss of fine motor coordination
- * Dilated pupils
- * Mild to moderate hypotension
- * Diminished respiratory rate and effort

Severe hypothermia (core body temperature \leq 85° F)

- * Shivering occurs in waves until it ceases as body temp drops
- * Severe altered mental status
- * Absent response to pain
- * Muscle rigidity, skin becomes pale
- * Pupils dilate, pulse rate decreases, breathing becomes erratic
- * Cardiac abnormalities, hypotension

Frostbite

- * Skin has white or waxy appearance
- * Skin feels hard to the touch
- * Loss of mobility and sensation
- * Poor perfusion (no capillary refill; no pulses in frostbite with proximal extension from extremities toward trunk)

Hypothermia

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Monitor core body temperature (rectal).
6. Assess for possible hypoglycemia and treat. (Refer to Protocol II.C.)
7. Move patient to warm place if feasible:
 - a. Handle gently in moderate to severe hypothermia as jostling can precipitate cardiac arrhythmias.
 - b. **DO NOT** massage or vigorously manipulate patient.
8. Minimize patient's exposure to weather.
9. Replace wet clothing with dry, if possible.
10. Passive re-warming:
 - a. Apply ready heat blanket to torso.
 - b. Wrap in rescue blanket or apply hypothermia wrap using sleeping bags and blankets if available.
 - c. Ensure adequate insulation between patient and ground.
11. Active re-warming:
 - a. Hot water bottles to neck, groin, and armpits, if available.
 - b. Encourage patients with mild hypothermia to eat and drink.
 - c. Discourage PO intake if hypothermia is moderate or severe.
 - d. Assist ventilations with BVM and O₂.
 - e. Begin CPR if patient deteriorates and loses spontaneous respiration or pulses.
In general, CPR should not be considered unsuccessful and terminated until patient has been warmed (core body temperature > 95° F.
12. Continue supportive care and monitor vital signs, including core body temperature (rectal), until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-11.
2. Initiate 0.9% Normal Saline via IV/IO. Administer initial bolus of 250 ml. Use warm fluids, if available.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. If hypoglycemic:
 - a. D50W: 25 gm IV/IO
 - b. Thiamine: 100 mg IV/IO (if patient is a known or suspected alcoholic)
5. If there is suspected opiate overdose, administer naloxone 0.4-2.0 mg slow IV/IO/IM/Intranasal (if delivery device is available), up to a maximum of 10 mg, every 2-3 minutes. Titrate to adequate respiratory effort
6. Continue re-warming and monitoring.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline via IV/IO. Administer initial bolus of 20 ml/kg. Use warm fluids, if available.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. Continue re-warming and monitoring.

Frostbite

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.

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4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 5. Move patient to warm area and do not allow patient to walk if either or both feet are affected.
 6. Do not rub affected areas.
 7. Do not drain blisters; apply antiseptic ointment to any that spontaneously rupture.
 8. Immerse affected area in warm water (no more than 102° F).
 9. Do not actively re-warm if there is a possibility of re-freezing before situation can be stabilized.
 10. Loosely apply well-padded splint to affected area after re-warming.
 11. Cover with loose, dry sterile dressing that is non-compressive and non-adherent.
 12. Affected fingers and toes should be separated with gauze.
 13. Continue supportive care and monitor vital signs, including core body temperature (rectal), until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-12.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer morphine 5.0-10 mg IV/IO initial dose, for pain management; titrate for pain relief. (Refer to Protocol I.D.)
4. Continue re-warming and monitoring.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Establish IV/IO of 0.9% Normal Saline at KVO or saline lock.
3. Continue re-warming and monitoring.
4. Consider morphine 0.1 mg/kg slow IV/IO initial dose at a rate of 1.0-2.0 mg/min, up to a maximum total dose of 5.0 mg for pain management; titrate for pain relief. For doses above 5.0 mg, contact on-line medical direction. (Refer to Protocol I.D.)

E. Diving-related Emergencies

Review of Injury/Illness

The most common dive-related medical presentations involve minor ear disorders, but systemic and life-threatening emergencies occur every year. These include arterial gas emboli (AGE), decompression sickness (DCS), and barotraumas to the ears and other locations.

1. When dealing with a diving-related incident, it is important to transport the diver's equipment with him during evacuation, so it can be inspected and possibly analyzed.
DO NOT clear patient's dive computer. The dive history obtained from a patient by an EMS provider should include at a minimum: the times, duration and depth of dives (includes bottom time), as well as the number of dives over the previous 3 days, surface intervals, activity performed while diving, and whether the dive(s) were complicated by events such as entrapment, running out of air, or rapid ascent. It is also important to record the time and rapidity of onset of symptoms.
2. Flying too soon after diving increases the risk of decompression sickness (DCS) and other dive-related problems. (Refer to Protocol VIII.F, Protocol VIII.G, Protocol VIII.H, and Protocol VIII.I.)

Minimum Flight Delay	Dive History
12 hrs	Single, no-decompression dive
18 hrs	Multi-day diving, no-decompression dives
24 hrs	Decompression required dive(s)
3 days	If treated for DCS or arterial gas embolus (AGE)

3. Diver's Alert Network recommends a flight altitude of < 800 ft unless aircraft safety is compromised.
4. If emergency evacuation is required following recompression, patient should be transported in aircraft capable of pressurizing to sea level pressure, such as a C-130 or Lear Jet (most aircraft pressurize at 6,000-8,000 ft).

Divers Alert Network

To find the location of the nearest decompression chamber and to obtain emergency treatment advice, call:

(919) 684-8111 (for emergencies only) OR **(919) 684-4DAN (4326)**
Tell the operator you have a dive emergency.

F. Decompression Sickness (DCS)

Review of Injury/Illness

DCS, commonly known as “the Bends,” is an emergency condition requiring treatment in a decompression chamber. DCS most often occurs within the first 1-6 hours after diving; further deterioration is unlikely to occur after 24 hours. The onset of symptoms is directly related to the severity of the DCS; in severe cases, symptoms occur more rapidly. Several forms of DCS primarily affect the nervous system, muscles, joints, skin, inner ear and cardiopulmonary system.

At depth and under pressure (P), gas is absorbed into the tissues proportionate to depth and exposure time. Significant absorption most likely occurs following dives to depths > 33 feet of sea water (FSW). DCS results from the formation of bubbles of inert gas (e.g., nitrogen) within the intravascular and extravascular spaces as the diver ascends to the surface, when the ascent is too rapid to allow nitrogen to be released that is absorbed in the tissues during the dive.

Signs and Symptoms

Depending on the distribution of gas bubbles throughout the body, DCS may create a variety of symptoms:

- * Pruritus (early symptom), skin rash
- * Unusual fatigue
- * Joint pain, abdominal or thoracic pain (“girdling” pain)
- * Shortness of breath, frothy sputum, hemoptysis
- * Dizziness, vertigo, tinnitus, parasthesia, paralysis, seizures, tremors, staggering
- * Altered mental status, confusion, amnesia, behavioral changes

Useful field tests for DCS

1. BP cuff decompression
 - a. Inflate over painful joint or muscle 150-200 mm Hg.
 - b. Suspect DCS, if joint or muscle pain is temporarily relieved with cuff pressure.
 - c. Only diagnostic if positive (pain temporarily relieved); failure to temporarily relieve pain does not rule out DCS.
2. Romberg’s Test
 - a. Assists in determining presence of neurologic DCS (Romberg +)
 - b. Patients stand with feet together, eyes closed, and arms out to the side.
 - c. Observe for 1 minute: swaying or collapse indicates patient is Romberg positive.

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3. Differentiation between CVA (stroke) and DCS
 - a. In CVA, the symptoms typically are focal and affect one side of the body (e.g., paralysis of the left arm and left leg and left sided facial droop).
 - b. In DCS, the symptoms are random and may be multi-focal, depending on distribution of gas bubbles.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Primary treatment is recompression in a hyperbaric chamber.
6. If aeromedical evacuation is necessary for rapid access to a hyperbaric chamber, ensure low altitude flight (800-1,000 ft).
7. Keep patient supine.
8. Administer oxygen, if available: 10-15 L/min by non-rebreathing mask to keep O₂ saturation at a minimum of 94%.
9. Transport diver's equipment with patient during evacuation for inspection and possible analysis. **DO NOT clear patient's dive computer.**

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO.
 - a. Administer 1 L during the first 30 minutes and continue IV/IO infusion at 100-175 ml/hr.
 - b. DCS patients are often hypovolemic.
 - c. **DO NOT** use IV fluids that contain dextrose/glucose.
3. **DO NOT** administer aspirin or NSAIDs unless directed by a dive medical officer.
4. If neurological symptoms occur, consult a dive medical officer **before** administering:
 - a. Lidocaine® 0.5-1.0 mg/kg IV bolus at a rate of 25-50 mg/minute; may repeat at 0.5 mg/kg IV bolus, up to a maximum dose of 225 mg or 3.0 mg/kg, as needed. After loading doses, start a maintenance infusion at 2.0-4.0 mg/minute.

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- b. **NOTE: Patients with hypotension, cardiac arrest or biventricular heart failure should receive only a single loading dose of 100 mg.**
 - c. Lidocaine® is contraindicated in patients with known hypersensitivity, Adam-Stokes Syndrome, WPW, severe SA, AV, or heart block without a pacemaker.
5. If seizures develop, consult a dive medical officer **before** administering IV benzodiazepines (e.g., midazolam, diazepam or lorazepam). **DO NOT** give benzodiazepines as prophylaxis; use only to treat active seizing. (Refer to Protocol II.B.)

Other/Special Considerations

BLS/ALS

1. Flying following recompression and treatment for DCS:
 - a. Should not fly for additional 3 days after recompression treatment.
 - b. If further emergency evacuation is required, aircraft capable of sea level pressurization are preferred (C-130).
2. In-water recompression is the province of specially trained dive safety officers, dive medical technicians and professional dive teams and should not be attempted by anyone else.

ALS ONLY

1. Corticosteroids were once recommended as having possible benefit.
 - a. **Latest guidance from current literature states that steroids have been shown to have no effect or benefit and are no longer recommended.**
 - b. May increase risks of hyperbaric (recompression) treatment by increasing CNS oxygen toxicity.

G. Arterial Gas Emboli (AGE)

Review of Injury/Illness

Arterial gas emboli (AGE) is the most common cause of sudden death in diving. Sudden collapse or loss of consciousness immediately or soon after surfacing should always be treated as AGE until proven otherwise. A complication of pulmonary barotrauma (PBT), AGE may cause near-drowning during ascent. It is most commonly seen in panicked or inexperienced divers making a rapid ascent while holding their breath, as the rapidly expanding air ruptures the pulmonary alveoli and allows gas bubbles to enter the blood stream across the capillary membranes. These bubbles may cause sudden loss of perfusion to the brain, heart, and other vital organs. Massive gas loading of the vasculature causes cardiac arrest that is refractory to resuscitation efforts.

Signs and Symptoms

- * **Abrupt onset of symptoms occurring during ascent or within 10 minutes after surfacing**
- * **Stupor, confusion, vertigo, coma, convulsions**
- * **Unilateral or bilateral motor or sensory deficits**
- * **Visual disturbances**

Symptoms may also include:

- * **Aphasia**
- * **Headache**
- * **Chest pain related to myocardial ischemia**
- * **Cardiac arrhythmias, cardiac arrest**
- * **Symptoms of other barotrauma and decompression sickness (DCS) may also be present**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.

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- Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 - Primary treatment is recompression in a hyperbaric chamber.
 - If aeromedical evacuation is necessary for rapid access to a hyperbaric chamber, ensure low altitude flight (800-1,000 ft).
 - Keep patient supine.
 - Administer oxygen, if available: 10-15 L/min NRBM to keep O₂ saturation at a minimum of 94%.
 - Transport diver equipment with patient during evacuation for inspection and possible analysis. **DO NOT clear patient's dive computer.** Urgently transport for decompression.
 - Check with a dive medical officer for consideration of oral pain medications, if patient is awake and able to swallow.

ALS

- Confirm the completion of BLS steps 1-9.
- Initiate 0.9% Normal Saline or LR via IV/IO.
 - Administer 1 L during the first 30 minutes and continue IV/IO infusion at 100-175 ml/hr.
 - DCS patients are often hypovolemic.
 - DO NOT** use IV fluids that contain dextrose/glucose.
- DO NOT** administer aspirin or NSAIDs unless directed by a dive medical officer.
- If neurological symptoms occur, consult a dive medical officer **before** administering:
 - Lidocaine® 0.5-1.0 mg/kg IV bolus at a rate of 25-50 mg/minute; may repeat at 0.5 mg/kg IV bolus, up to a maximum dose of 225 mg or 3.0 mg/kg, as needed. After loading doses, start a maintenance infusion at 2.0-4.0 mg/minute.
 - NOTE: Patients with hypotension, cardiac arrest or biventricular heart failure should receive only a single loading dose of 100 mg.**
 - Lidocaine® is contraindicated in patients with known hypersensitivity, Adam-Stokes Syndrome, WPW, severe SA, AV, or heart block without a pacemaker.
- If seizures develop, consult a dive medical officer **before** administering IV benzodiazepines (e.g., midazolam, diazepam or lorazepam). **DO NOT** give benzodiazepines as prophylaxis; use only to treat active seizing. (Refer to Protocol II.B.)

H. Barotrauma of the Ear

Review of Injury/Illness

There are 3 barotraumas related to the ear:

1. External ear barotrauma: Also known as barotitis externa media interna or “ear canal squeeze”; caused by air trapped in the external auditory canal (EAC) by:
 - a. Cerumen impaction.
 - b. Exocytoses (chronic narrowing of the EAC).
 - c. The use of ear plugs or a tight wet suit hood.
2. Middle Ear Barotrauma:
 - a. Barotitis media or “ear squeeze” and “reverse ear squeeze.”
 - b. Caused by failure of middle ear to equalize to ambient pressure (P).
3. Inner Ear Barotrauma (IEB):
 - a. Also known as barotitis interna or labyrinthine window rupture.
 - b. Caused by the pressure differential between inner ear and ambient pressure.
 - c. IEB may cause injury to the cochleovestibular system of the inner ear, may lead to permanent vestibular dysfunction or deafness.
 - d. It is important to distinguish IEB from the dizziness, balance problems, nausea, and vomiting that are also symptoms of decompression sickness (DCS).

Signs and Symptoms

External Ear Barotrauma

- * Pain, swelling, and erythema to the EAC
- * Petechiae or hemorrhagic blebs may be seen on the walls of the EAC

Middle Ear Barotrauma

- * Pain, begins as slight pain and progressively worsens on descent/ascent
- * Impaired hearing
- * Nasal congestion
- * Tympanic membrane (ear drum) rupture
 - Sudden severe pain
 - Vertigo, as water enters into the middle ear
 - Total loss of hearing in the affected ear
- * Blood may be seen around the mouth and nose as well as in the EAC

Inner Ear Barotrauma

- * Sudden pain, dizziness, vertigo, may be extreme
- * Nausea and vomiting (vomiting underwater may lead to drowning)
- * “Roaring” tinnitus, hearing loss
- * Nystagmus, ataxia, facial nerve paralysis
- * Pallor, diaphoresis, disorientation
- * Ear may feel “blocked” or patient may relate a feeling of “fullness” in the ear
- * Differentiation from inner ear Decompression Sickness (DCS):
 - IEB is usually associated with ear pain and clearing difficulties upon descent
 - In IEB, evidence of other barotraumas may be seen on ear exam
 - In inner ear DCS, symptoms are often noted upon ascent or shortly after surfacing
 - Other symptoms of decompression sickness are often present with inner ear DCS

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. External Ear Barotrauma:
 - a. Discontinue use of ear plugs, switch to larger sized wetsuit hood.
 - b. If tympanic membrane (TM) is not ruptured, use oral pain medications if permitted by local protocol.
 - c. If TM is ruptured:
 - Diver should not resume diving and should be referred for otolaryngologist evaluation
 - Use oral pain medications if permitted by local protocol
6. Middle Ear Barotrauma (MEB):
 - a. If TM is not ruptured:
 - Use oral pain medications if permitted by local protocol
 - Patient should not resume diving until symptoms completely resolve and the diver can auto-inflate (clear) the ears without difficulty

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- b. If TM is ruptured:
 - Use oral pain medications if permitted by local protocol
 - Patient should not resume diving until the TM has completely healed (may take weeks or months)
 7. Inner Ear Barotrauma (IEB)
 - a. Bed rest with head elevated (approximately 30-45 degrees).
 - b. Use oral pain medications, if permitted by local protocol.
 - c. Suspend all diving/water exposure until patient is cleared by an otolaryngologist.
 - d. Urgent transport required, especially if not able to distinguish clinically from DCS.
 8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer pain management drugs, if needed. (Refer to Protocol I.D.)

I. Other Barotraumas

Review of Injury/Illness

Barotraumas develop when a significant difference in pressure occurs between a body organ or tissue and the ambient pressure. Barotraumas of the ears and lungs are described in separate protocols.

- Mask squeeze is caused by failure to equalize mask pressure to ambient pressure during descent via nasal exhalations. The air volume inside the mask contracts and results in negative pressure, which then may cause capillary rupture in the sclera, conjunctiva, and the skin of the face and nose.
- Barosinusitis (sinus squeeze) occurs when the pressure within a sinus fails to equalize and affects the paranasal sinuses (ethmoid, frontal, maxillary, and sphenoid). It usually occurs during descent, with the suction causing damage with bleeding from the sinus wall mucosa. It may also occur during ascent from pressure exerted on the mucosa. Individuals with recent URI are at increased risk.
- Barodontalgia (tooth squeeze) is caused by expansion or contraction of the trapped air in the interior of a tooth or in structures surrounding a tooth, creating pain in and around the tooth.

Signs and Symptoms

Mask squeeze

- * Skin ecchymosis in a mask-like pattern
- * Conjunctival/scleral hemorrhage (similar to strangulation injury)
- * Looks more serious than it is; dramatic presentation

Barosinusitis

- * Sinus pain, may be severe
- * Blood and/or mucous may be noted around the nose, mouth, and/or face mask

Barodontalgia

- * Severe tooth pain
- * Expulsion of a filling or crown
- * Fractured tooth
- * Exploded or imploded tooth

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Administer oxygen (10–15 L/min NRBM) and monitor pulse oximetry.
6. Rule out additional dive-related injuries or disorders.
7. Mask squeeze: Treatment is usually not required, resolves spontaneously.
8. Barosinusitis or Barodontalgia: Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer pain management drugs, if needed. (Refer to Protocol I.D.)

J. Envenomations

Snakes and Spiders

Review of Injury/Illness

Snake and spider bites can cause damage to body tissue at the location of the bite and, if venomous, can cause both local tissue injury and systemic reactions. A snakebite, whether from a venomous or non-venomous snake, may cause severe fright reactions (e.g., nausea, tachycardia, diaphoresis), which may be difficult to distinguish from systemic manifestations of envenomation. Non-venomous snakebites cause only local injury, usually pain and 2-4 rows of scratches from the snake's upper jaw at the bite site. It is important to know and recognize all species of venomous snakes that are indigenous to areas of operation.

Spiders are identified by location and markings. Black widow spiders live outdoors in protected spaces (e.g., rock piles, firewood cords, hay bales, outhouses) and have a red or orange hourglass marking on the ventral (upper side) abdomen. Brown recluse spiders live indoors in protected spaces (e.g., in clothing, behind furniture, under baseboards) and have a fiddle- or violin-like marking from the eyes to the abdomen. This marking may be difficult to recognize even in the intact spider.

Signs and Symptoms

- * **Local bite wound**
- * **Swelling, severe allergic reaction**
- * **Bleeding**
- * **Ecchymosis at site**
- * **Localized pain**
- * **Weakness**
- * **Tachycardia**
- * **Nausea**
- * **Shortness of breath**
- * **Respiratory arrest**
- * **Dim vision**
- * **Vomiting and/or shock**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM), as needed.
8. Assess and treat for shock. (Refer to Protocol X.I.)
9. Prepare for immediate transport. (**DO NOT** delay transport for any first aid/treatment measures or wait for signs of envenomation to occur.)
10. **DO NOT** apply any constricting bands, ice, or suction to the bite.
11. Remove **ALL** watches, rings and jewelry, not just from affected limb.
12. Mark the proximal edge of any discoloration or swelling in ink and write the time on the line. If signs increase during treatment, make new marks with the times, if possible.
13. Dress the wound and immobilize the extremity.
14. If snake or spider is dead, secure the carcass in a suitable container and bring to the receiving medical facility. **DO NOT** attempt to "capture" a live snake believed to be poisonous, as the potential for additional bites exists. If you can identify and securely, and safely, capture the snake or spider in a container, bring it along to the medical facility as well.
15. If the snake or spider is definitely identified in the field, notify receiving facility of type of bite and patient's condition ASAP in case they need to initiate acquisition of antivenin.
16. Notify on-line medical direction of the situation so that antivenins can be obtained.
17. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS steps 1-15.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.

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3. Monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
 4. Administer morphine 5.0-10 mg IV/IO initial dose, for pain management; titrate for pain relief. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. Consider morphine 0.1 mg/kg slow IV/IO initial dose at a rate of 1.0-2.0 mg/min, up to a maximum total dose of 5.0 mg for pain management; titrate for pain relief. For doses above 5.0 mg, contact on-line medical direction. (Refer to Protocol I.D.)

K. Marine Bites and Stings

Corals and Jellyfish

Review of Injury/Illness

Most marine bites and stings are at least transiently painful, while some involve envenomation as well. All create wounds at risk of infection with marine organisms. The most common encounters are with a class of marine animals called Cnidaria and they include the following:

- Corals
- Sea anemones
- Jellyfish (e.g., sea nettles)
- Hydroids (e.g., Portuguese man-of-war)

Cnidaria are responsible for more envenomations than any other marine animal. However, of the 9,000 species, only about 100 are toxic to humans. The multiple, highly developed stinging units (nematocysts) on Cnidaria tentacles can penetrate human skin; one tentacle may fire thousands of nematocysts into the skin on contact.

Signs and Symptoms

- * Lesions vary with the type of Cnidaria.
- * Usually, lesions initially appear as small, linear, papular eruptions that develop rapidly in one or several discontinuous lines, at times surrounded by a raised erythematous zone.
- * Pain is immediate and may be severe; itching is common.
- * The papules may blister and proceed to formation of painful, raised pustules, hemorrhage, and eventual peeling of the skin.
- * Systemic manifestations include weakness, nausea, headache, muscle pain and spasms, tearing of the eyes and nasal discharge, increased perspiration, changes in pulse rate, and pleuritic chest pain.
- * Uncommonly, fatal injuries have been inflicted by the Portuguese man-of-war in North American waters and by the box jellyfish (sea wasp, *Chironex fleckeri*), in Indo-Pacific waters.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM), as needed.
8. Assess and treat for shock. (Refer to Protocol X.I.)
9. For pain relief due to stings, administer hot water or cold packs (whichever feels better).
10. Pain caused by jelly fish, usually short-lived, can be relieved with baking soda in a 50:50 slurry applied to the skin, or by papain (meat tenderizer) applied as a paste for a period not to exceed 15 minutes.
11. Jellyfish-type sting treatment includes removal of adherent tentacles with a forceps (preferably) or fingers (double-gloved if possible) and liberal rinsing to remove invisible stinging cells (nematocysts). The type of rinse varies by the stinging organism:
 - a. For jellyfish stings sustained in non-tropical waters and for coral stings, seawater rinse can be used.
 - b. For jellyfish stings sustained in tropical waters, vinegar rinse followed by seawater rinse should be used. Fresh water should not be used because it can activate undischarged nematocysts.
 - c. For box jellyfish stings, vinegar inhibits nematocyst firing and is used as the initial rinse if available, followed by seawater rinse. Fresh water should not be used because it can activate undischarged nematocysts. Notify on-line medical direction of the situation so that antivenins can be obtained. (Antivenin is only available for *C. fleckeri* species.)
 - d. For Portuguese man-of-war stings, saltwater rinse can be used. Vinegar should not be used because it can activate undischarged nematocysts.

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12. Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
 13. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS Steps 1-12.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. Consider morphine 0.1 mg/kg slow IV/IO initial dose at a rate of 1.0-2.0 mg/min, up to a maximum total dose of 5.0 mg for pain management; titrate for pain relief. For doses above 5.0 mg, contact on-line medical direction. (Refer to Protocol I.D.)

Seabather's Eruption

Review of Injury/Illness

This condition affects swimmers in some Atlantic locales (e.g., Florida, Caribbean, Long Island). It is caused by hypersensitivity to stings from the larvae of the sea anemone (e.g., *Edwardsiella lineate*) or the thimble jellyfish (*Linuche unguiculata*).

Signs and Symptoms

- * **Itchy, stinging rash typically appearing where the bathing suit contacts the skin**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
7. Encourage patient to sit in a shaded area and wait for condition to ease.
8. People exposed to these larvae should shower after taking off the bathing suit.
9. Cutaneous manifestations can be treated with hydrocortisone lotion and an oral antihistamine, if needed.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock, if necessary.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock, if necessary.

Stingrays

Review of Injury/Illness

Stingrays once caused about 750 stings/yr along North American coasts; the present incidence is unknown, and most cases are not reported. Venom is contained in one or more

spines on the dorsum of the animal's tail. Injuries usually occur when an unwary swimmer steps on a stingray buried in the sand and provokes it to thrust its tail upward and forward, driving the dorsal spine (or spines) into the patient's foot or leg. The integumentary sheath surrounding the spine ruptures, and the venom escapes into the patient's tissues.

Signs and Symptoms

- * **The main symptom is immediate severe pain. Although often limited to the injured area, the pain may spread rapidly; reaching its greatest intensity in < 90 min; in most cases, pain gradually diminishes over 6 to 48 hrs but occasionally lasts days or weeks.**
- * **Syncope, weakness, nausea, and anxiety are common and may be due, in part, to peripheral vasodilation.**
- * **Lymphangitis, vomiting, diarrhea, sweating, generalized cramps, inguinal or axillary pain, respiratory distress, and death have been reported.**
- * **The wound is usually jagged, bleeds freely, and is often contaminated with parts of the integumentary sheath. The edges of the wound are often discolored, and some localized tissue destruction may occur. Generally, some swelling and edema are present. Open wounds are subject to infection.**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM), as needed.
8. Assess and treat for shock. (Refer to Protocol X.I.)
9. Elevate the injured limb if possible.
10. Gently irrigate the wound site with salt water in an attempt to remove fragments of spine, glandular tissue, and integument.

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11. The spine should be removed in the field **only** if it is:
 - a. Superficially embedded
 - b. **NOT** penetrating the neck, thorax, abdomen
 - c. **NOT** creating a through-and-through injury of a limb
 12. Embedded spines are treated similarly to other foreign bodies.
 13. Patients stung on the trunk should be evaluated closely for puncture of viscera.
 14. Control any bleeding with direct pressure.
 15. Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
 16. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-15.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Mollusks

Review of Injury/Illness

Mollusks include cones (e.g., cone snails), cephalopods (including octopi and squids), and bivalves (e.g., clams).

1. Cone snails: These snails are a rare cause of marine envenomation among divers and shell collectors in the Indian and Pacific Oceans. They can inject venom through

a harpoon-like tooth. Multiple neurotoxins in the venom block ion channels and neurotransmitter receptors, resulting in paralysis, which is usually reversible but has resulted in some deaths.

- a. *Conus californicus* is the only known dangerous cone in North American waters. Its sting causes localized pain, swelling, redness, and numbness that rarely progresses to paralysis or shock. Treatment is largely supportive.
2. Octopi: Bites from the blue-ringed octopus, most common in Australian waters, cause tetrodotoxin poisoning, with local anesthesia, neuromuscular paralysis, and respiratory failure; treatment is supportive. The bites of North American octopi are rarely serious.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM), as needed.
8. Assess and treat for shock. (Refer to Protocol X.I.)
9. Use auto-injector of epinephrine (EpiPen®), if patient experiences allergic reaction affecting breathing and/or blood pressure. (Refer to Protocol X.A.)
10. Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-10.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Sea Urchins

Review of Injury/Illness

Sea urchins are present worldwide. Most sea urchin injuries result when spines break off in the skin and cause local tissue reactions. A few sea urchins are able to inject venom, but injuries are rare.

Diagnosis is usually obtained by history. Without treatment, the spines can migrate into deeper tissues, causing a granulomatous nodular lesion, or they may wedge against bone or nerve. Joint and muscle pain and dermatitis may also occur.

Signs and Symptoms

- * **Localized pain and tenderness**
- * **Bluish discoloration at the entry site (may help locate the spine)**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.

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6. Assess and treat for anaphylaxis. (Refer to Protocol X.A.)
 7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM), as needed.
 8. Assess and treat for shock. (Refer to Protocol X.I.)
 9. Removal spines immediately. (Vinegar dissolves most superficial spines; soaking the wound in vinegar several times a day or applying a wet vinegar compress may be sufficient.)
 10. Once spines are removed, pain may continue for days; pain beyond 5-7 days should trigger suspicion for infection or a retained foreign body.
 11. Hot soaks may help relieve pain.
 12. Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
 13. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-12.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain management drugs, if need. (Refer to Protocol I.D.)

L. Altitude Related Disorders

Review of Injury/Illness

High altitude illnesses include a continuum of diseases with symptoms ranging from headache to pulmonary and/or cerebral edema. Onset of symptoms is most frequent 2-48 hours after ascent to elevations > 3,000 meters (~6,300 ft). HAPE occurs in ~90% of HACE victims. HACE occurs in ~20% of HAPE victims.

Early descent is the key to effective treatment. Without appropriate treatment, patients can progress rapidly to death. Indication for immediate descent are neurological findings (e.g., ataxia, confusion) and/or pulmonary edema.

Signs and Symptoms

Acute Mountain Illness

- * Headache
- * Anorexia
- * Nausea/vomiting
- * Insomnia

High Altitude Pulmonary Edema (HAPE)

- * Symptoms are on a continuum:
 - Early: Fatigue, Weakness, Dyspnea on Exertion (DOE)
 - Severe: Dyspnea at rest, audible chest congestion
 - Late: Pink or blood tinged sputum

High Altitude Cerebral Edema (HACE)

- * Severe headache, plus one or more of the following:
 - Ataxia, Confusion, Disorientation, Impaired Judgment, Severe Lassitude

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.

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3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
 4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 5. Acute Mountain Illness:
 - a. Halt Ascent. Descend 1,500 ft or more for severe or refractory cases, if operationally feasible.
 6. HAPE, HACE:
 - a. Halt Ascent. Descend 3,000 ft or more for severe or refractory cases, if operationally feasible. Descent is life-saving therapy.
 7. Administer oxygen and monitor pulse oximetry, if available: 10-15 L/min by non-rebreathing mask to keep O₂ saturation at a minimum of 94%.
 8. Manage dehydration. (Refer to Protocol VIII.A.)
 9. Prevent or treat cold related conditions. (Refer to Protocol VIII.D.)
 10. Administer oral pain management drugs, if permitted by local protocol. (Refer to Protocol I.D.)
 11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-10.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Obtain 12-lead ECG, if available, and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. Acute Mountain Illness:
 - a. Administer acetazolamide (Diamox): 250 mg PO, every 12 hours. Check for sulfur allergies **before** administering.
 - b. Administer ondansetron (Zofran[®]) 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - c. Consider dexamethasone (Decadron) 8.0 mg IV/IO/IM/PO initially, followed by 4.0 mg IV/IO/IM/PO every 6 hours for 3 days for severe cases of Acute Mountain Illness.
 - d. Acetazolamide and dexamethasone may initially worsen symptoms.

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6. HAPE:
 - a. Follow procedures for Acute Mountain Illness. (Refer to step 5.)
 - b. Consider nifedipine 10 mg PO once; repeat every 6 hours, if blood pressure is stable and descent is not possible.
 - c. Treat with hyperbaric therapy using a Gamow-bag, if available.
 7. HACE:
 - a. Follow procedures for Acute Mountain Illness. (Refer to step 5.)
 - b. Treat with hyperbaric therapy using a Gamow-bag, if available.

Evacuation/Transport Considerations

1. Urgent evacuation for continuing or worsening symptoms of HAPE, HACE, or severe Acute Mountains Illness, or any change of mental status.
2. Routine evacuation for HAPE and/or HACE patients with resolution of symptoms.
3. Evacuation is usually not required for Acute Mountains Illness that responds to treatment.

Extended Care

1. Descent is the priority for anyone with severe symptoms.
2. Maintain warmth and monitor for hypothermia.
3. Monitor O₂ saturation supplies and pulse oximetry.
4. Dehydration occurs quickly, evaluate frequently.

Other/Special Considerations

1. Gamow-bag (portable, inflatable one-person hyperbaric chamber) can be very effective temporary treatment for HAPE and HACE.
 - a. Inflation of 2 PSI is equivalent to descending 1600 m.
 - b. A few hours of treatment results in symptom improvement.
 - c. Hyperbaric therapy is equivalent to low flow O₂ and can help preserve available O₂ supplies.
2. Carbon Monoxide Poisoning is a constant danger with heating water or cooking in enclosed spaces, such as wind resistant tents at altitude.
 - a. Similar symptoms to Acute Mountain Illness.
 - b. CO-oximetry capability included in some commercially available pulse oximeters; can be used to help make diagnosis.
 - c. Supplemental O₂ combined with forced hyperventilation reverses carbon monoxide poisoning.

IX. Trauma

The following patients should be transported to a Trauma Center:

- Trauma patients with unstable or abnormal vital signs
- Patients with major and/or multiple system trauma
- Complex or extensive injury to hands, tissues, and nerves of low extremity
- Contraindication for Referral to Pediatric or Adult Trauma Center – Patients with toe amputation (partial or complete)

A. Extremity wound hemorrhage

Review of Injury/Illness

Uncontrolled bleeding from an extremity wound, especially one involving major or deep arteries, can result in life threatening blood loss. Massive, rapid swelling of an extremity following blunt trauma with or without bruising or discoloration may suggest bleeding even without obvious surface laceration. Personnel engaged in military and law enforcement operations are at increased risk for penetrating trauma and exsanguinating wounds.

Tourniquets are sometimes the best way to manage life-threatening bleeding from an extremity. Tourniquets placed on conscious patients can be painful and pain management should be considered.

Signs and Symptoms

- * **Obvious bleeding at the site of wound**
- * **Deep scraping of extremity area (e.g., road rash from a motorcycle accident) with substantial, oozing blood**
- * **Swelling of the extremity, usually with obvious bruising**
- * **Altered mental status from blood loss and ensuing shock**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.

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3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
 4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 5. Calm and reassure patient.
 6. Secure and maintain airway and administer supplemental oxygen, as needed.
 7. Assess and treat for shock. (Refer to Protocol X.I.)
 8. Check for obvious glass or foreign body that could cause further injury, if pressed into wound.
 9. Wrap bleeding area with trauma pads or dressing appropriate for the size and location of the wound.
 10. Apply direct pressure and elevate until bleeding is controlled, if possible. If the patient is able, have him/her apply direct pressure after dressing the wound.
 11. If bleeding **CANNOT** be controlled by direct pressure:
 - a. Apply a tourniquet proximal to the wound.
 - Use a commercially available tourniquet, a BP cuff, or improvised "Spanish Windlass," 2-4 inches proximal to the wound.
 - Use wider materials that will not cut into the flesh (1-2 inches minimum).
 - There is an inverse relationship between the width of a tourniquet and the pressure that is required to occlude arterial inflow. Narrower bands are prone to damaging arteries and nerves.
 - b. If necessary, apply the tourniquet just proximal to the joint above the wound.
DO NOT apply tourniquet directly over a joint.
 - c. Tighten the tourniquet just enough to control/stop the bleeding, then secure in place with an appropriate knot (square) or mechanical device such as a buckle on a belt. This is generally tight enough so that pulses distal to the tourniquet are not palpable.
 - d. Use tape or a marker to form a large T on the forehead of the patient. Document the time that the tourniquet was applied to the patient. **NEVER skip these steps when a tourniquet is in place.**
 - e. Always leave the wound and tourniquet sites uncovered so that any additional bleeding can be observed and treated accordingly.
 12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.
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ALS

1. Confirm the completion of BLS Steps 1-11.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. Administer pain medication, as needed. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer pain medication, as needed. (Refer to Protocol I.D.)
4. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

B. Amputations

Review of Injury/Illness

Patients with severe bone and/or soft tissue injury at or distal to the level of the mid-humerus, including complete or incomplete amputations of the hand, crush or degloving injuries, and other trauma resulting in loss of perfusion or suspected nerve injury (e.g., compartment syndrome) should be referred to a designated Hand Center or the nearest Trauma Center if:

- They are stable with an isolated upper extremity injury at or below the mid-humerus
- They have complete/incomplete hand or upper extremity amputation
- There is partial/complete finger or thumb amputation
- There is degloving, crushing, or devascularization injuries of hand or upper extremity
- There is high-pressure injection injury to hand or upper extremity
- There is complicated nerve, vessel, or compartment syndrome (excessive swelling and pain of extremity with possible evolving nerve deficit) injury of the forearm and hand

Use time, distance, weather, and proximity to designated trauma center, to determine mode of transport. If estimated transport time to designated Hand or Trauma Center is less than 30 minutes, use ground transport.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, as needed.
7. Assess and treat for shock. (Refer to Protocol X.I.)
8. Control extremity wound hemorrhage. (Refer to Protocol IX.A.)

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9. Package amputated extremity in sealed plastic bag (keep dry) and place on top of ice to keep cool. **DO NOT submerge in water or freeze amputated part.**
 10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO 250 ml fluid bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. Administer pain medication, as needed. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
3. Administer pain medication, as needed. (Refer to Protocol I.D.)
4. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

C. Multi-system Trauma

Review of Injury/Illness

Multi-system trauma refers to injuries involving more than one organ system and/or more than one area of the body. A patient with limb fracture(s) and significant head/neck injury, or one with trauma to both the chest and abdomen are examples of multi-system trauma. It is associated with an injury severity score ≥ 17 and increased likelihood of death or a complicated clinical course and protracted time to recovery. It is important that EMS providers report scene findings that help estimate the severity of the injury.

Signs and Symptoms

- * Hypovolemic or neurogenic shock
- * Pain, bruising, bleeding
- * Hypertension
- * Rapid or slow heart rate
- * Shallow or absent respirations
- * Decreased distal pulses
- * Decreased motor and sensory function in extremities
- * Deformities or obvious fractures/lacerations
- * Altered mental states or unconsciousness
- * Intracranial herniation
 - Posturing (decerebrate or decorticate)
 - Unequal pupils
 - Paralysis
 - Decreasing Glasgow Coma Scale Scores

While time, distance, and proximity are all factors to be considered in the triage decision, the trauma decision tree should be used to determine who should be transported to the nearest appropriate trauma center and when the transport should occur. Children who have not reached their 15th birthday, should be transported to a Pediatric Trauma center if available.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions. as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM) at high-concentration. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. If patient exhibits signs of intercranial herniation, hyperventilate at 20 breaths/minute, after consulting on-line medical direction.
8. Control extremity wound hemorrhage. (Refer to Protocol IX.A.)
9. Assess and treat for shock. (Refer to Protocol X.I.)
10. Maintain appropriate spine immobilization, according to Protocol IX.E. (Any trauma patient with suspected spinal injuries based on mechanism of injury should have full-body spinal immobilization.)
11. Consider pelvic stabilization, if indicated.
12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR IV/IO 250-500 ml bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to a Systolic BP = 100 mm Hg.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. If patient exhibits signs of intercranial herniation, hyperventilate at 30 breaths/minute (child) or 35 breaths/minute (infant), after consulting on-line medical direction.
3. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. If patient exhibits signs of intercranial herniation, hyperventilate at 30 breaths/minute (child) or 35 breaths/minute (infant), after consulting on-line medical direction.
4. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
5. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

D. Chest and Abdominal Injuries

Review of Injury/Illness

Chest and abdominal injuries are caused by penetrating or blunt forces applied to the torso. Respiratory distress may indicate pneumothorax; hypotension suggests tension pneumothorax or internal bleeding, both of which can cause rapid death if not treated promptly. Myocardial contusion can result in sudden arrhythmias, including ventricular tachycardia and ventricular fibrillation with cardiac arrest.

Signs and Symptoms

- * **Pain, bruising, deformity of chest/abdomen following rapid deceleration (impact) injuries**
- * **Evidence of penetrating wound to the chest/abdomen by knife, bullet, or sharp object**
- * **Difficulty breathing and/or hypotension/shock**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Perform airway management for unconscious patient – Chin lift or jaw thrust maneuver NP or OP airway and ventilate if necessary.
7. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM) at high-concentration. Assist ventilations with a bag valve mask (BVM) device, as needed.
8. All open and/or sucking chest wounds should be treated by immediately applying an occlusive dressing to cover the defect. Release dressing if respiratory distress occurs. Monitor lung sounds and trachea position for development of tension pneumothorax.
9. Control extremity wound hemorrhage. (Refer to Protocol IX.A.)

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10. Assess and treat for shock. (Refer to Protocol X.I.)
 11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.

ALS

1. Confirm the completion of BLS steps 1-10.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR IV/IO 250-500 ml bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to a Systolic BP = 100 mm Hg.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.

Pediatric

BLS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines. Apply pediatric pads.
5. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

E. Spinal Cord Injuries

Review of Injury/Illness

EMS responders are most likely to see spinal cord injuries, resulting from motor vehicle crashes, diving accidents, and falls. Young children and the elderly are especially vulnerable.

Signs and Symptoms

- * **Paralysis, numbness, or tingling sensation in one or more extremities**
- * **Obvious head or facial trauma**
- * **Loss of consciousness (may or may not be present)**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM) at high-concentration. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. Maintain appropriate spine immobilization, according to Protocol IX.E. (Any trauma patient with suspected spinal injuries based on mechanism of injury should have full-body spinal immobilization.)
8. Consider pelvic stabilization, if indicated.
9. Assess and treat for shock. (Refer to Protocol X.I.)
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.

ALS

1. Confirm the completion of BLS steps 1-8.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR IV/IO 250-500 ml bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to a Systolic BP = 100 mm Hg.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.

Pediatric

BLS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
4. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

F. Selective Spinal Immobilization

Review of Injury/Illness

In rescue situations, field evacuation of an immobilized patient on a backboard significantly extends the time required and increases the risk of further injury to both the patient and the rescuers. Under the circumstances, it is imperative that the patient's C-spine be evaluated and if possible, cleared, allowing the patient to participate more in the evacuation and reducing the travel time to definitive care.

C-spine clearance can be performed in the field with approximately 99% certainty, for all eligible and injured patients using the NEXUS protocol.

Procedure (NEXUS Protocol)

BLS/ALS

1. Assess and treat for possible spinal cord injury. (Refer to Protocol IX.E.)
2. It is not necessary to immobilize the C-spine if the patient meets ALL of the following criteria:
 - a. The patient is conscious and not under the influence of drugs or alcohol.
 - b. No other distracting injury that might mask the pain of a cervical injury is present.
 - c. No neck pain is present.
 - d. No cervical tenderness or bony "step off" of the cervical spine is present upon examination and palpation.
 - e. The patient can move all four extremities.
 - f. The patient denies numbness or parasthesia and has intact sensation to light touch in all four extremities.
3. Contact on-line medical direction for further guidance.
4. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

Special Rescue Considerations

1. There may still be instances when the patient can or must be evacuated ambulatory, even though the patient cannot be cleared using the NEXUS protocol (e.g., neck pain with no other findings).
2. The medical provider must use good judgment and balance the clinical findings and mechanism of injury with the risks versus benefits of evacuating an immobilized patient on a backboard.

G. Electrical Burns and Lightning Injuries

Review of Injury/Illness

Electrical burns may be associated with other traumatic injuries, due to being thrown clear of the source and severe muscle contraction, especially following high voltage DC contact. Longer exposure to lower energy current results in skin and deep tissue burns.

Signs and Symptoms

- * “Entry” and “exit” site burns
- * Confusion and/or amnesia, with or without temporary loss of consciousness
- * Ear drum rupture
- * Fractures
- * Cardiac dysrhythmias/arrest

Lightning injuries can range from minor wounds to serious traumatic injuries that can result in death.

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, if necessary. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. Maintain appropriate spine immobilization, according to Protocol IX.E.
8. Splint any fractures.
9. Dress any open wounds and/or burns. (Refer to Protocol V.)

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10. Assess and treat for shock. (Refer to Protocol X.I.)
 11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma or Burn Center.

ALS

1. Confirm the completion of BLS steps 1-8.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. Administer pain medication, as needed. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma or Burn Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow the BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. If hypotensive, initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines. Apply pediatric pads.
5. Consult with nearest Pediatric Trauma or Burn Center to confirm appropriate destination and best mode of transport, if available.

H. Orthopedic Bone and Joint Injuries

Review of Injury/Illness

These injuries are a result of a traumatic direct force or twisting action on a bone or joint. Other than neck or back injuries involving the spinal cord, orthopedic injuries are often not life threatening.

Signs and Symptoms

- * Pain near injury
- * Swelling and/or bruising near injury
- * Obvious bony deformity
- * Limited range of motion

Identify any life threatening injuries. Pelvic and femur fractures can cause severe internal and external hemorrhaging that can lead to death.

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, as needed.
7. Control extremity wound hemorrhage. (Refer to Protocol IX.A.)
8. Apply ice or cold packs to sites of swelling/deformity.
9. Splint obvious fractures and dislocations after checking for pulses distal to the fracture site:
 - a. Splint the joints above and below the fracture site.
 - b. If fracture/dislocation is open (compound), cover the open area with sterile dressing. **DO NOT** push bone back in if it is protruding.
 - c. If fracture is angulated and the distal limb is pulseless, attempt to realign to neutral position using mild traction. If significant resistance is met, stop immediately and splint in position found.

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- d. If fracture/dislocation is angulated with pulse, splint in position found.
 - e. Reassess distal circulation before **and** after splinting.
10. Treat cervical injury, if indicated. (Refer to Protocol IX.E.)
 11. Treat pelvic injury with pelvic stabilization device, if available.
 12. Treat femur fracture with a traction splint, if available. Traction splint is contraindicated if:
 - a. Suspected pelvic fracture
 - b. Femoral neck (hip) fracture
 - c. Avulsion or amputation of the ankle and foot
 - d. Fractures distal to knee
 13. Treat clavicle injury by “sling and swathe” with the patient’s arm in a position of comfort.
 14. Assess and treat for shock. (Refer to Protocol X.I.)
 15. Consider oral pain medication with the approval of on-line medical direction. (Refer to Protocol I.D.)
 16. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS Steps 1-15.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer pain medication, as needed. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Administer pain medication, as needed. (Refer to Protocol I.D.)
4. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

I. Head, Neck and Facial Injuries

Review of Injury/Illness

Head, neck, and facial injuries can also cause Traumatic Brain Injury (TBI), which can be life-threatening. TBIs can present with loss of consciousness or changes in mental status ranging from confusion and combativeness to lethargy.

Signs and Symptoms

Head

- * Visible Wounds
- * AMS
- * Unequal Pupils
- * “Raccoon Eyes”
- * CSF or blood drainage from ear, nose, throat
- * Convulsions/seizures
- * Paralysis
- * Bruising behind the ear

Neck

- * Hemorrhage
- * AMS
- * Hoarseness
- * Dyspnea, stridor
- * Head fixed in an abnormal position
- * Vomiting/spitting blood
- * Paralysis, weakness, or abnormal sensation in upper or lower extremities

Facial

- * Lacerated gums
- * Misaligned/broken teeth
- * Nose bleed
- * Limited eye movements
- * Massive hemorrhage even with minor wounds
- * Facial asymmetry
- * Difficulty swallowing
- * CSF drainage from nose

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions. as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, if necessary. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. Maintain appropriate spine immobilization, according to Protocol IX.E.
8. Assess and treat for shock. (Refer to Protocol X.I.)
9. If a penetrating eye injury is noted or suspected:
 - a. Leave object in eye.
 - b. Perform a rapid field test of visual acuity.
 - c. If object is protruding from the eye socket, stabilize object with bulky dressings and tape; then surround object with cup to prevent jarring.
 - d. If object is not protruding, cover eye with soft patch that does not touch eye.
 - e. Protruding Globe – **DO NOT** put eye back in socket – Apply bulky dressing around eye, moist gauze over globe, and cover with a cup.
 - f. If CSF is found, do not pack or suction nose/ear and transport in upright position.
 - g. Use extreme caution with head injury and esophageal injury.
10. In cases of nasal injury, **DO NOT** tilt head back to control bleeding. Pinch the patient's nostrils and apply ice to the bridge of nose.
11. If CNS injury, perform and record full neurological assessment, including the Glasgow Coma Scales. Repeat and record every 5-10 min. (Refer to Protocol XII.C.)
12. Resuscitation for victims of a blast or penetrating trauma who have no pulse, no respirations, and no other signs of life should not be initiated. (Refer to Protocol XI.D.)
13. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-12.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain medication, as needed. (Refer to Protocol I.D.)
5. Nasal Injury: **DO NOT** attempt nasal intubation.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Administer pain medication, as needed. (Refer to Protocol I.D.)
5. Consult with nearest Pediatric Trauma Center to confirm appropriate destination and best mode of transport, if available.

J. Conducted Energy Weapons (CEW) – Electronic Incapacitation Devices

Review of Injury/Illness

Electronic stun weapons are designed to temporarily disable or stop individuals, providing law enforcement, corrections personnel, or private citizens with an alternative to lethal force where appropriate. These weapons are “less lethal,” but none can be guaranteed to avoid serious injury or death. Originally designed for military and civilian law enforcement use, they are also becoming popular as personal protection devices for civilians. Tasers are deployed using compressed nitrogen to propel two barbed probes up to 15 feet. A series of electrical pulses (approximately 20 pulses/second) is transmitted through the region between the probes. The result is immediate loss of neuromuscular control incapacitating the person. Injuries related to the Taser device range from mild to life-threatening; these are not benign devices.

Signs and Symptoms

- * Ocular injuries directly resulting from Taser darts penetrating the globe
- * Forehead hematomas
- * Decreased level of consciousness
- * Sudden death
- * Linear metal fragments penetrating the outer cortex and marrow space of the skull and extending into the inner table of the calvarium
- * Epidural hematomas
- * New-onset seizures
- * Vascular injury
- * Pneumothorax
- * Excited Delirium Syndrome (EDS) – an acute condition with multiple potential underlying etiologies that can progress rapidly to cardiopulmonary arrest and death in individuals who are struggling violently and are then subdued by CEW

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions. as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.

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4. Ascertain any cardiac history.
 5. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
 6. Monitor for cardiac arrest. Resuscitate, if needed. (Refer to Protocol VI.D.)
 7. Calm and reassure patient.
 8. Secure and maintain airway and administer supplemental oxygen, as needed.
 9. Monitor vital signs and pulse oximetry.
 10. Monitor patient for the onset of seizures. (Refer to Protocol II.B.)
 11. Record the time of Taser discharge and the pre-discharge medical status of patient (e.g., ingestion of mind-altering drugs/stimulants [Phencyclidine – PCP, Methamphetamine – Meth, Cocaine, and alcohol]).
 12. Do not remove any embedded Taser probes in the eyes, neck, groin, or spine. Clean and bandage wound sites when probes are removed.
 13. Determine need for patient restraint. (Refer to Protocol XI.G.)
 14. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-13.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. For patient sedations, consider one of the following:
 - a. Diphenhydramine: 25-50 mg IV/IO/IM
 - b. Haloperidol: 5.0-10.0 mg IV/IO/IM
 - c. Lorazepam: 2.0 mg IV/IO/IM

X. Other Medical Emergencies

A. Allergic Reaction

Review of Injury/Illness

The body's immune system normally helps it to recognize, inactivate and eliminate threats such as bacterial or viral infections. Sometimes the components of that system are activated by foods, medications, or environmental elements like pets, latex, or other chemicals causing allergic reactions. Allergic reactions range from mild cold-like symptoms and rashes to life-threatening airway emergencies and shock (acute anaphylaxis).

Signs and Symptoms

- * Itching, Hives
- * Swelling
- * Difficulty breathing (hoarseness, stridor)
- * Difficulty swallowing
- * Chest pain
- * Weakness
- * Flushing/redness
- * Wheezing
- * Unconsciousness

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.

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6. Acute Anaphylaxis:
 - a. If patient has signs of cardiovascular or respiratory compromise (e.g., difficulty breathing, stridor, hypotension) and has a prescribed epinephrine auto-injector (EpiPen[®]), assistance may be offered for administration; may repeat x1 after 3-5 minutes.
 - b. If patient is wheezing, and has a prescribed MDI, assistance may be offered for administration.
 - c. Continue to monitor vital signs, including pulse oximetry, if available.
 7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Secure and maintain airway and administer supplemental oxygen, if necessary. Assist ventilations with a bag valve mask (BVM) device, as needed.
3. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Administer epinephrine 0.3-0.5 mg 1:1,000 solution SQ; may repeat x1 after 3-5 minutes with a maximum of 2 doses.
6. Administer diphenhydramine 25-50 mg IV/IO/IM; may repeat x1 after 15-20 minutes.
7. If unresponsive, or with no palpable pulses, administer epinephrine 0.5 mg of 1:10,000 IV/IO. Ensure that **only** the 1:10,000 formula is used for IV/IO administration.
8. Initiate 0.9% Normal Saline or LR IV/IO 250-500 ml bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to a Systolic BP = 100 mm Hg.
9. If patient remains hypotensive after fluid boluses, consider an epinephrine infusion 0.1-1.0 mcg/kg/minute. Titrate to a Systolic BP \geq 90 mm Hg.
10. If patient is wheezing, administer Albuterol 2.5 ml in 5.0 ml 0.9% Normal Saline; nebulized every 15 minutes.
11. Consider Solumedrol 2.0 mg/kg IV/IO, up to a maximum total of 125 mg. Epinephrine should be the initial priority, as corticosteroids have minimal effect on the acute phase of anaphylaxis.
12. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
13. For patients taking beta blockers, who are unresponsive to epinephrine, consider Glucagon 1.0 mg IV/IO/IM, every 5 minutes; may repeat x2.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. If pediatric patient is in anaphylaxis, and has a prescribed EpiPen,[®] assistance may be offered for administration.
 - a. Patients weighing < 30 kg may have been prescribed EpiPen Jr[®] (0.15 mg of epinephrine) for IM administration; may repeat x1.
 - b. Patients weighing > 30 kg may have been prescribed an adult dose EpiPen[®] (0.3 mg of epinephrine); may repeat x1.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Secure and maintain airway and administer supplemental oxygen, if necessary. Assist ventilations with a bag valve mask (BVM) device, as needed.
3. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Administer epinephrine 0.01 mg/kg 1:1,000 solution SQ, up to a maximum total dose of 0.5 mg.
5. If patient is wheezing, administer Albuterol 0.03-0.05 ml/kg in 2.5 ml 0.9% Normal Saline; nebulized every 15 minutes.
6. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
7. Consider Solumedrol 1.0 mg/kg IV/IO, up to a maximum total of 125 mg. Epinephrine should be the initial priority, as corticosteroids have minimal effect on the acute phase of anaphylaxis.

B. Hypertensive Crisis

Review of Illness/Injury

A severe increase in blood pressure accompanied by evidence of end organ damage that can lead to a stroke or another neurological manifestations

Signs and Symptoms

- * **Systolic BP usually > 180 mm Hg**
- * **Headache with or without AMS**
- * **Chest pain/ECG changes**
- * **Pulmonary edema**
- * **Neurologic changes consistent with stroke**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, if necessary. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-6.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. If Systolic BP > 180 mm Hg or Diastolic BP \geq 110 mm Hg, monitor blood pressure every 5 minutes.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Contact on-line medical direction for further guidance.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines. Apply pediatric pads.
4. Contact on-line medical direction for further guidance.

C. Epistaxis

Review of Injury/Illness

It is important to recognize when nose bleeds result from head or face trauma. (Refer to Protocol IX.I.)

Signs and Symptoms

- * **Bleeding from one or both nares**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen, as needed.
7. Assess and treat for shock. (Refer to Protocol X.I.)
8. With patient in seated position, and head neutral, squeeze nostrils together with a dressing. If patient is able, he/she can hold compression on the nostrils; monitor for compliance and assist as needed (Must hold constant pressure for a minimum of 5 minutes.)
9. Apply cold pack to forehead/nose bridge area, if possible.
10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. **DO NOT** attempt nasal intubation.

D. Nausea/Vomiting

Review of Injury/Illness

Patients can present with nausea and/or vomiting due to underlying injury, medical condition, active motion sickness, or medication side effect/complication. Sometimes, vomiting or intense nausea can complicate the existing injury or medical condition (e.g., penetrating eye injury, high risk for aspiration, side effects of narcotic administration).

Signs and Symptoms

- * Vomiting or sensation of imminent vomiting
- * Inability to tolerate food or liquids
- * Retching or “dry heaves”

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway.
7. Place patient either in position of comfort or in left lateral position to prevent aspiration, if not contraindicated by spinal immobilization or packaging.
8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-7.
2. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
3. If vomiting, consider administering one of the following:
 - a. Ondansetron (Zofran®) 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - b. Promethazine (Phenergan®) 12.5-25 mg IV/IO/IM/PO/PR (diluted 1:1 with Normal Saline prior to administration), over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
3. Administer ondansetron:
 - a. For patients who weigh < 40 kg: 0.1 mg/kg slow IV/IO over 2-5 minutes
 - b. For patients who weigh ≥ 40 kg: 4.0 mg slow IV/IO over 2-5 minutes.
4. If no IV/IO: 0.1 mg/kg IM, up to a maximum single dose of 4.0 mg; may repeat x1 after consulting on-line medical direction.

E. GI Bleeding

Review of Injury/Illness

Upper or lower GI bleeding can rapidly become a life threatening medical emergency as a result of substantial blood loss with hypotension and shock. There are many potential sources of GI bleeding; most commonly:

- Upper
 - Peptic ulcer disease
 - Esophageal varices
 - Esophageal tears due to vomiting
- Lower
 - Infectious diarrhea
 - Colon cancer
 - Diverticulitis
 - Rectal varices
 - Hemorrhoids

Signs and Symptoms

- * Vomiting bright red blood or material that resembles coffee grounds
- * Bloody diarrhea (may be infectious)
- * Blood visible on the outside of formed stool or noticed on toilet paper after wiping
- * Black, “tarry” stools (typically indicates upper GI source of bleed)
- * Occult blood loss – May present with fatigue, general weakness, or syncope due to bleeding into the GI tract which is only found after testing for occult fecal blood

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Bloody vomiting:
 - a. **DO NOT** allow patient to eat or drink anything.
 - b. Administer supplemental oxygen, as needed.

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- c. Ensure airway is not threatened by severe vomiting; use advanced airway to prevent aspiration, if needed.
 - d. If dehydrated, refer to Protocol VIII.A.
6. Bloody diarrhea:
 - a. Provide oral hydration with water, diluted fruit juice, or diluted sports drink (50:50 with water), if patient is awake, able to swallow and mental status is intact.
 - b. If dehydrated, refer to Protocol VIII.A.
 7. If possible, take orthostatic vital signs. If mental status or blood pressure are abnormal with the patient lying down, **DO NOT** attempt to take an orthostatic set of vital signs.
 8. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-7.
2. Initiate 0.9% Normal Saline or LR via IV/IO 250 ml fluid bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction.
3. If vomiting, consider administering one of the following:
 - a. Ondansetron (Zofran[®]) 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - b. Promethazine (Phenergan[®]) 12.5-25 mg IV/IO/IM/PO/PR (diluted 1:1 with Normal Saline prior to administration), over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
3. If vomiting, consider administering ondansetron:
 - a. For patients who weigh < 40 kg: 0.1 mg/kg slow IV/IO over 2-5 minutes
 - b. For patients who weigh ≥ 40 kg: 4.0 mg slow IV/IO over 2-5 minutes.
4. If no IV/IO: 0.1 mg/kg IM, up to a maximum single dose of 4.0 mg; may repeat x1 after consulting on-line medical direction.

F. Abdominal Pain

Abdominal pain can indicate many different conditions such as ulcers, appendicitis, colitis, inflammation of the gall bladder or pancreas, kidney stone and internal masses that causes obstruction. Any of these conditions generate moderate or severe abdominal pain. The acute (surgical) abdomen indicates an intra-abdominal emergency that requires urgent transport for immediate surgical intervention.

Signs and Symptoms

Peritoneal Inflammation

- * **Abdominal pain, with or without vomiting**
- * **Tenderness with guarding**
- * **Rebound/percussive tenderness**
- * **“Rigid” abdomen**
- * **Patient lying perfectly still (movement causes severe pain)**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient’s condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. **DO NOT** allow patient to eat or drink anything.
7. Ensure airway is not threatened by severe vomiting; use advanced airway to prevent aspiration, if needed.
8. Administer supplemental oxygen, if needed.
9. For suspected GI bleeding, refer to Protocol X.E.
10. Assess and treat for shock. (Refer to Protocol X.I.)
11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm completion of BLS steps 1-10.
2. Initiate 0.9% Normal Saline or LR via IV/IO 250 ml fluid bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to maintain Systolic BP > 90 mm Hg.
3. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
4. If vomiting, consider administering one of the following:
 - a. Ondansetron (Zofran®) 4.0 mg IV/IO, over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
 - b. Promethazine (Phenergan®) 12.5-25 mg IV/IO/IM/PO/PR (diluted 1:1 with Normal Saline prior to administration), over 2-5 minutes, if patient is vomiting; may repeat x1 after 15 minutes, if no response.
5. Consider pain management **ONLY** with direct orders from on-line medical direction. (Refer to Protocol I.D.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Initiate 0.9% Normal Saline or LR via IV/IO at 20 ml/kg fluid bolus, up to a maximum total infusion of 40 ml/kg.
3. If vomiting, consider administering ondansetron:
 - a. For patients who weigh < 40 kg: 0.1 mg/kg slow IV/IO over 2-5 minutes
 - b. For patients who weigh ≥ 40 kg: 4.0 mg slow IV/IO over 2-5 minutes.
4. If no IV/IO: 0.1 mg/kg IM, up to a maximum single dose of 4.0 mg; may repeat x1 after consulting on-line medical direction.
5. Consider pain management **ONLY** with direct orders from on-line medical direction. (Refer to Protocol I.D.)

G. Poisoning/Overdose

Review of Illness/Injury

Depression and other serious mental illness may cause a suicide attempt by overdose.

Poisoning may occur by exposure to toxic substances via inhalation, injection, ingestion, or skin absorption. Children may be accidentally poisoned by medications, alcohol or household cleaners left unsecured. Poisoning may occur in the setting of a hazardous materials incident. Acute or chronic poisoning may also be a result of criminal and/or terrorist activity.

Signs and Symptoms

- * **Altered mental status (AMS) - Lethargy or unconsciousness vs. hyper-excitability**
- * **Vomiting and/or diarrhea**
- * **Tachycardia or bradycardia**
- * **Sweating**
- * **Dilated or constricted pupils**
- * **Difficulty breathing, with or without increased bronchial secretion**
- * **Cardiac dysrhythmias/arrest**

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Remove patient from the toxic environment, using appropriately trained personnel wearing proper level PPE, if necessary; decontaminate as appropriate.
6. In case of ingestion, identify the source, substance, medication and/or amount ingested or inhaled, if possible; transport substance container(s) with patient to hospital. (Refer to Protocol I.F.)
7. Administer supplemental oxygen and monitor pulse oximetry, as needed.
8. Contact Poison Control and follow their instructions 1-800-222-1222.

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9. Consider administering activated charcoal without Sorbitol 1.0 gm/kg PO.
 10. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care.

ALS

1. Confirm the completion of BLS steps 1-9.
2. Secure and maintain airway and administer supplemental oxygen, as needed.
3. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
6. Maintain contact with the Poison Control Center.
7. Administer specific antidote(s) according local protocol and Poison Control Center recommendations, if available:
 - a. Organophosphate poisoning: Consider Atropine 2.0-4.0 mg IV/IO/IM every 5-10 minutes, and 2-PAM Cl, if available. If patient seizes, consider diazepam (Valium®) 5.0 mg IV/IO/IM/PR.
 - b. Beta blocker overdose: Consider Glucagon 1.0 mg IV/IO every 5 minutes, up to a maximum dose of 3.0 mg.
 - c. Calcium channel blocker overdose: Consider calcium chloride; 0.5-1.0 gm slow IV push (50 mg/min).

Calcium chloride is contraindicated in a
calcium channel blocker overdose patient taking digitalis.

- d. Tricyclic antidepressant overdose: Consider sodium bicarbonate 1.0 mEq/kg IV/IO bolus, initially with 0.5 mEq/kg IV/IO, every 10 minutes.
 - e. Carbon Monoxide poisoning: Treat with 100% O₂ by NRBM, if awake; intubate and ventilate, if unconscious and unable to maintain an adequate airway.
 - f. Cyanide poisoning: Treat with cyanide antidote kit (hydroxocobalamin, 5.0 gm IV in 500 ml of 0.9% Normal Saline) according to local protocol and on-line medical direction.
 - g. Dystonic, extrapyramidal, or mild allergic reaction: Consider diphenhydramine (Benadryl®) 25-50 mg IV/IO/IM, up to a maximum single dose of 50 mg.
8. Continue antidotes, if necessary.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consider activated charcoal without Sorbitol 1.0 gm/kg PO.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Secure and maintain airway and administer supplemental oxygen, as needed.
3. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines. Apply pediatric pads.
6. Maintain contact with the Poison Control Center.
7. Consider activated charcoal without Sorbitol 1.0 gm/kg PO.
8. Administer specific antidote(s) according local protocol and Poison Control Center recommendations, if available:
 - a. Organophosphate poisoning: Consider Atropine 0.02 mg/kg IV/IO/IM, up to a maximum single dose of 2.0 mg; may be repeated every 5-10 minutes.
 - b. Beta-blocker overdose: For patients who weigh ≤ 25 kg, consider 0.5 mg IV/IO; For patients who weigh 25-40 kg, consider Glucagon 1.0 mg IV/IO; administer every 5 minutes as necessary, up to a maximum dose of 3.0 mg.
 - c. Calcium channel blocker overdose: Consider calcium chloride 20 mg/kg (0.2 ml/kg) slow IV/IO (50 mg/min), up to a maximum dose of 1.0 gram or 10 ml.
 - d. Tricyclic antidepressant overdose: Consider sodium bicarbonate 1.0 mEq/kg diluted 1:1 with 0.9% Normal Saline slow IV/IO, initially with 0.5 mEq/kg IV/IO, every 10 minutes.
 - e. Carbon Monoxide poisoning: Treat with 100% O₂ by NRBM, if awake; intubate and ventilate, if unconscious and unable to maintain an adequate airway. Obtain 12-lead ECG and cardiac monitor.
 - f. Cyanide poisoning: Treat with cyanide antidote kit according to local protocol and after consulting on-line medical direction.
 - g. Dystonic, extrapyramidal, or mild allergic reaction: Consider diphenhydramine (Benadryl®) 1 mg/kg IV/IO/IM, up to a maximum single dose of 25 mg.
9. Continue antidotes, if necessary.

H. Stroke, TIA

Review of Injury/Illness

A stroke is a loss of brain function due to insufficient blood flow and decreased oxygen reaching the affected area, usually caused by obstruction or rupture of one or more blood vessels in the brain. A TIA or Transient Ischemic Attack is a temporary disruption of function with stroke-like symptoms that typically resolves completely within 24 hours of onset. A TIA is generally considered a warning that a stroke could occur in the same distribution in the near future.

Signs and Symptoms

- * Slurred speech
- * Facial droop
- * Unequal grips/arms drift or other extremity weakness
- * Change in mental status – as documented by friend or family member
- * Sudden change in vision
- * Sudden severe or unexplained headache
- * Syncope/vertigo
- * Ataxia

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure the patient.
6. Secure and maintain airway and administer supplemental oxygen, as needed.
7. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
8. Establish and relay time of symptom onset to receiving facility or transporting service.
9. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider ground transportation to the nearest Stroke Center, if available.

ALS

1. Confirm the completion of BLS steps 1-8.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
4. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.
5. If seizures occur, treat according to seizure protocol. (Refer to Protocol II.B.)

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Evaluate for overdose (e.g., cocaine, methamphetamine, street drugs). If suspected, refer to Protocol X.G.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Evaluate for overdose (e.g., cocaine, methamphetamine, street drugs). If suspected, refer to Protocol X.G.
3. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
4. Initiate 0.9% Normal Saline or LR via IV/IO at KVO or saline lock.
5. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines. Apply pediatric pads.
6. If seizures occur, treat according to seizure protocol. (Refer to Protocol II.B.)

I. Shock

Review of Injury/Illness

The body responds in various ways when blood flow cannot meet the oxygen demands of the cells, depending on the severity and duration of the decreased blood flow/oxygen delivery. Some of the common causes of shock include gastrointestinal bleeding, sepsis, severe dehydration, cardiac dysfunction, or blunt/penetrating trauma.

Signs and Symptoms

- * **General weakness**
- * **Cool, clammy skin (diaphoresis)**
- * **Dilated pupils**
- * **Rapid, weak pulse**
- * **Shallow, labored respirations**
- * **Decreasing pulse pressure**
- * **Altered mental status**
- * **Multi-system organ failure**

Management

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Calm and reassure patient.
6. Secure and maintain airway and administer supplemental oxygen via non-rebreathing mask (NRBM) at high-concentration. Assist ventilations with a bag valve mask (BVM) device, as needed.
7. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
8. Initiate IV fluid resuscitation, if permitted by local protocol. (Refer to Protocol VIII.A.)
9. Control extremity wound hemorrhage, if necessary. (Refer to Protocol IX.A.)
10. Maintain appropriate spine immobilization, according to Protocol IX.E, if indicated. (Any trauma patient with suspected spinal injuries based on mechanism of injury should have full-body spinal immobilization.)

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11. Consider pelvic stabilization, if indicated.
 12. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider Aeromedical evacuation or ground transportation to the nearest Trauma Center, if available.

ALS

1. Confirm the completion of BLS steps 1-11.
2. Provide advanced airway support, if necessary. (Refer to Protocol I.C.)
3. Initiate 0.9% Normal Saline or LR via IV/IO 250 ml fluid bolus, up to a maximum total infusion of 2,000 ml without consulting on-line medical direction. Titrate to maintain Systolic BP > 90 mm Hg. If rales are present, infuse up to 250 ml. Additional fluid requires consulting on-line medical direction.
4. If blood pressure does not respond to fluid challenge, consider Dopamine 2-20 mcg/kg/min. Titrate to a Systolic BP > 90 mm Hg.
5. Obtain 12-lead ECG and monitor cardiac rhythm and treat any dysrhythmia according to current American Heart Association (AHA) ACLS guidelines.

Pediatric

The pediatric patient may present hemodynamically unstable or with hypoperfusion as evidenced by altered mental status, delayed capillary refill (> 2 seconds), pallor, peripheral cyanosis, hypotension. Hypotension is defined as a Systolic BP < 60 mm Hg in neonates (patients < 28 days old), < 70 mm Hg in infants (patients < 1 year old), < $[70 + (2 \times \text{years}) = \text{Systolic BP}]$ for patients > 1 year old.

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Consider Aeromedical evacuation or ground transportation to the nearest Trauma Center or Pediatric Trauma Center, if available.

BLS Extended Scope/ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. If age-related vital signs and patient's condition indicates hypoperfusion, administer initial fluid bolus of 20 ml/kg 0.9% Normal Saline or LR via IV/IO, if permitted by local protocol. (Refer to Protocol VIII.A.)

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3. If patient's condition does not improve:
 - a. Administer the second bolus of fluid at 20 ml/kg 0.9% Normal Saline or LR via IV/IO. If patient's condition still does not improve, administer third and subsequent fluid boluses at 10 ml/kg.
 - b. For volume sensitive children (e.g., neonates [0-28 days], children with congenital heart disease, chronic lung disease, or chronic renal failure), administer initial fluid bolus of 10 ml/kg 0.9% Normal Saline or LR via IV/IO. If patient's condition still does not improve, contact on-line medical direction.
 4. Consider Aeromedical evacuation or ground transportation to the nearest Trauma Center or Pediatric Trauma Center, if available.

XI. Special Medical/Legal Protocols

A. Documentation Requirements

The patient care report (ePCR), or run report, is an official report provided by pre-hospital personnel. All requests for emergency medical services require that an ePCR be completed. Documentation must accurately reflect observations, orders, treatments, and outcomes throughout the patient encounter. Proper documentation is critical to proving adherence to standards of care.

1. Each ePCR should contain the following information:
 - a. Date and time of event
 - b. Chief complaint includes:
 - Patient description of problem
 - Mechanism of injury if trauma related
 - c. History includes:
 - Onset - When did symptoms begin?
 - Provocation/Palliation - What makes them worse? What makes them better?
 - Quality - What do these symptoms feel like?
 - Radiation - Can it be felt in any other body location?
 - Pain Severity - How bad does it hurt? (rate pain using a 0-10 scale)
 - Time - Is the pain constant or does it come and go? Have you had this occur before? How was it treated?
 - Pertinent past medical history, related to complaint
 - Past surgical history
2. Documentation of patient assessment should include:
 - a. Scene survey and mechanism of injury if trauma related
 - b. Initial primary survey, to include signs, symptoms and immediate interventions related to the following:
 - Airway
 - Breathing
 - Circulation
 - Level of Consciousness
 - Spinal precautions (if appropriate)

-
3. Documentation of focused history and physical findings should include signs and symptoms of presenting problem and review of body systems as needed:
 - a. Vital signs, including postural vital signs if indicated
 - b. Color, temperature, appearance of skin
 - c. Blood pressure, both arms if indicated
 - d. Capillary refill
 - e. Pupillary response
 - f. Motor, sensory, circulatory status of extremities, if appropriate
 - g. Orders received, treatment and/or drug therapy initiated and patient response to treatment
 - h. On-going assessment of patient
 4. Transfer summary should include:
 - a. Condition of patient on transfer
 - b. Name and signature of receiving agency/person assuming care of the patient
 - c. Time of transfer
 - d. Legible signature of EMS provider of record, and names of all personnel who performed care, especially if they performed or attempted any procedure

B. Abuse/Neglect

Review of Injury/Illness

Abuse may involve physical, verbal, sexual mistreatment and/or neglect. Abuse may cause serious injury to the patient's mental and/or physical well-being. Perpetrators will often try to cover up, hide or alter information related to the nature of the injury. Victims may have been coached to give an alternate story about how an injury occurred. Particularly at risk populations include pediatric, elderly, and pregnant patients.

Signs and Symptoms

- * **Bruising**
- * **Burns**
- * **Broken bones**
- * **Lethargy or other AMS**
- * **Dehydration, malnutrition**
- * **Injuries inconsistent with the history provided**
- * **Delay in seeking medical care**
- * **Information passed on by family friends**
- * **Information passed on by the victim's friend(s)**

Management

BLS/ALS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Triage and treat patient according to appropriate protocol for injuries sustained.
6. Do not confront suspected abuser.
7. Document all findings including visual inspection of location where patient was found, and any interaction between patient and caregiver.
8. Relay all findings upon transfer of care.

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9. All suspected cases of abuse, exploitation, or neglect should be reported to appropriate Law Enforcement, Adult and/or Child Protective Services according to state and local laws or regulations.
 10. If the individual or caregiver is refusing treatment and transport, authorities and on-line medical direction should be notified prior to clearing the scene.
 11. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care, if indicated.

C. Withholding or Terminating Resuscitation (Non-trauma)

Review of Injury/Illness

In the pre-hospital setting, there are times that it is appropriate or necessary to consider discontinuing cardiopulmonary resuscitation and other life saving interventions.

Management

BLS/ALS

1. Discontinuation of cardiopulmonary resuscitation and other potentially life saving interventions may be considered when ALL of the following criteria have been met:
 - a. Arrest was not witnessed by an EMS provider or first responder.
 - b. Adequate CPR has been administered according to current American Heart Association (AHA) guidelines.
 - c. There is no spontaneous circulation (palpable pulse) and no neurological activity (e.g., spontaneous respiration, eye opening, or motor response) present after appropriate BLS resuscitation efforts.
 - d. The patient is at least 18 years of age.
 - e. Core body temperature is at least 95° F for a patient who was hypothermic due to cold exposure (e.g., submersion).
 - f. All health care providers on scene agree with the decision to cease efforts.
 - g. Family members and others present must be acknowledged and assisted in dealing with this death.
 - h. Contact on-line medical direction prior to termination of efforts.

Documentation

1. The following must be legibly documented (e.g., printed) in addition to documentation protocol requirements. (Refer to Protocol XI.A.):
 - a. Time resuscitation was started and discontinued
 - b. Run Number
 - c. Any procedures performed (e.g., shocks administered by AED, airway management)
 - d. Name, identifying number, and agency of law enforcement official and/or patient's private physician, and/or on-line medical direction contacted, and time of contact

D. Withholding or Terminating Resuscitation (Trauma)

Review of Injury/Illness

Early cardiac arrest in trauma patients is usually due to severe hypoxia, neurologic injury, or massive hemorrhage. If a trauma patient is unresponsive, pulseless, and apneic, the prognosis is generally very poor. As outlined below, there are circumstances where it is appropriate not to initiate resuscitation of a trauma patient, as well as criteria for discontinuing unsuccessful efforts in the field.

Signs and Symptoms

- * No response
- * No pulse
- * No respirations

Management

BLS/ALS

1. For patients with penetrating trauma (e.g., stab or gunshot wounds) it is acceptable **NOT** to attempt resuscitation if the patient has:
 - a. No respirations or respiratory effort; and
 - b. No palpable pulses and no organized electrical activity on AED or ECG; and
 - c. No papillary reflexes; and
 - d. No spontaneous movement.
2. If **ANY** signs of life are present, or if mechanism of injury indicates blunt trauma, the patient should undergo aggressive attempts at resuscitation. (Refer to Protocol IX.C.)
 - a. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider the need for Aeromedical evacuation or ground transportation to the nearest Trauma Center.
3. For patients with either blunt or penetrating trauma, it is acceptable **NOT** to attempt resuscitation if the patient has:
 - a. Injuries such as decapitation, hemicorporectomy, incineration, or submersion > 12 hours, that are obviously incompatible with life, OR
 - b. Evidence that he/she has been pulseless and apneic for a prolonged period (e.g., dependent lividity, rigor mortis, or decomposition).
4. For patients in cardiac arrest, but without injuries or apparent mechanism of injury to account for death, resuscitate according to current American Heart Association (AHA) guidelines.

-
5. For patients with either blunt or penetrating trauma, it is acceptable to terminate resuscitation in the field if the patient:
 - a. Remains in cardiac arrest (after 15 minutes of appropriate resuscitation efforts), OR
 - b. Remains in cardiac arrest and is located more than 15 minutes from a trauma center.
 6. Always document findings and leave scene under Law Enforcement control after presuming an out-of-hospital death.
 - a. Include name, identifying number, and agency of law enforcement officer.

E. Do Not Resuscitate (DNR)

Review of Injury/Illness

1. A DNR or “Do Not Resuscitate Order” is a valid physician’s order to forgo resuscitative efforts. The presence of a valid Withholding Care Form allows providers to withhold specified care on patients.
2. When such a document is produced by the patient, patient’s guardian, or agent designated to act on the patient’s behalf, it should conform to the relevant, state or local requirements. The form must be signed by a physician or medical provider with authority to do so.
3. An Advanced Directive, otherwise known as a living will or health care directive, is a letter to a physician from the patient or responsible party outlining what care they wish to receive or not receive in the event they are incapacitated.

Management

BLS/ALS

1. If presented with a valid DNR form, do not begin resuscitative measures on a patient in or near cardiac or respiratory arrest.
2. If the EMS provider is unsure as to the validity of the DNR contact medical direction for orders. If unable to contact, resuscitative efforts should be initiated until clarification of the Directive is made by a medical direction authority.
3. Proper law enforcement agencies should be notified upon death of the patient when:
 - a. Resuscitative efforts are cancelled by a medical direction authority.
 - b. A valid DNR Form is presented and resuscitative efforts are withheld.
 - c. A patient is being left rather than transported after death has occurred.
4. Documentation regarding the validity of a Pre-hospital Medical Care Directive Form must be included on the patient care reporting document.
5. Take into consideration the sensitivities of family members, whether or not transporting the patient.

Special Considerations

1. Emergency Medical Services (EMS) personnel are not required to accept or interpret medical care directives, if uncertain of their validity.
2. Authorization for the withholding of resuscitative efforts **DOES NOT** include withholding other medical interventions (e.g., IV fluids, pain control) prior to cardiac or respiratory arrest.

F. Refusal of Care or Transport

Review of Injury/Illness

An adult patient with normal mental status and intact judgment (competent) has the right to refuse care if properly informed of the potential consequences of that refusal. A parent or legal guardian must refuse care on behalf of a minor.

Signs and Symptoms

- * Patient refusing medical care or transport for illness or injury
- * Not under the influence of mind-altering substances (e.g., alcohol, drugs)
- * Not demented
- * Oriented x 4 (person, place, time, event)

Management

BLS/ALS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.
5. Upon determination of illness or injury, if patient is refusing care, has a GCS of 15 is oriented x4, explain the potential risks and dangers of not accepting medical intervention to the patient or other authorized responsible party, that could reasonably be expected to occur (e.g., infection of an open wound, pain, death from heart attack).
6. Have patient verbalize understanding of the consequences, and then sign refusal form or patient care record (PCR) and obtain witness signature(s), if possible.

Pediatric

BLS/ALS

1. If the patient is not legally old enough to make independent decisions, or is not an emancipated minor, then such decisions must be made by a parent or legal guardian.
2. Contact on-line medical direction for further guidance.

G. Restraints

Review of Injury/Illness

Properly applied physical restraints may reduce the possibility of patient injury, reduce the potential for injury to EMS providers, and allow for timely and appropriate treatment and transportation of a patient to the closest facility. They may be necessary regardless of whether violent behavior is the result of a medical condition, intoxication, psychiatric emergency, or dementia.

Types of restraints

1. Verbal: The application of verbal techniques in an effort to calm the patient
 - a. Should avoid direct eye contact and encroachment upon the patient's personal space
 - b. Have an escape route available for EMS providers.
2. Physical: The use of materials and techniques that allow for the restriction of movement (e.g., soft restraints [sheets or wrist restraints], hard restraints [plastic ties, locking leather cuffs, handcuffs]); should allow for rapid removal if the patient vomits or develops respiratory distress.
3. Chemical: The use of pharmaceuticals such as anti-psychotics or sedatives to calm the patient

Indications for use

1. Behavior or threats that create or imply danger to the patient or others
2. To provide safe and controlled access for medical procedures
3. Change in behavior that results from improvement or deterioration of patient condition (e.g., hypoglycemia, overdose, seizure)
4. Involuntary evaluation or treatment of uncooperative or combative patients

Management

BLS

1. Evaluate scene safety. **DO NOT** approach patient if scene cannot be rendered safe.
2. Institute appropriate Body Substance Isolation (BSI) measures/Universal Precautions, as outlined in Protocol I.A.
3. Perform patient assessment and initiate routine BLS care, as outlined in Protocol I.B, and as indicated by the patient's condition.
4. Determine need for ALS care and/or transport to hospital for further evaluation and treatment.

-
5. Determine the presence of sufficient personnel to safely accomplish patient restraint.
 6. There should be a plan and a team leader who directs the restraining process.
 7. Use the least restrictive or invasive method of restraint which will protect the patient and others. In many instances, full restraints will be appropriate to insure patient and provider safety during transport.
 8. Nothing restrictive should be placed over the face, head or neck of the patient. A surgical mask, spit sock or oxygen mask may be placed loosely on the patient to prevent spitting.
 9. Use restraints in a humane manner, affording the patient as much dignity as possible. Explain to the patient and family that you are restraining them so that they do not hurt themselves or someone else.
 10. Never place a restrained patient in a prone position due to the potential for airway problems, cardiac arrest, and aspiration.
 11. **DO NOT** use medical restraints in place of law enforcement personnel for arrested or detained persons receiving medical care.
 12. Continue monitoring the restrained patient's airway, circulatory, respiratory, and mental status.
 13. Monitor extremity circulation, motion and sensation distal to the restraints.
 14. Continue supportive care and monitor vital signs until patient is turned over to a higher level of medical care. Consider Aeromedical evacuation or ground transportation to the nearest Trauma Center, if available.

ALS

1. Confirm the completion of BLS steps 1-13.
2. If chemical restraint is indicated to prevent injury or improve treatment, consider **one** of the following:
 - a. Haloperidol: 5.0 mg IM, up to maximum of 10 mg; repeat once, if needed.
 - b. Diazepam (Valium®): 5.0–10 mg slow IV/IO/IM. Titrate to desired effect, up to a maximum of 20 mg.
 - c. Midazolam (Versed®): 2.0–5.0 mg slow IV/IO or 0.2 mg/kg IM, if no IV access.
 - d. Lorazepam (Ativan®): 2.0–4.0 mg slow IV/IO/IM, up to a maximum of 8.0 mg.
3. Monitor cardiac rhythms, respiratory status, and pulse oximetry.

Pediatric

BLS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Enlist aid of a parent, legal guardian, or agent designated on the patient's behalf, if appropriate to circumstances.

ALS

1. Follow BLS guidelines, adjusting for patient age/size.
2. Enlist aid of a parent, legal guardian, or agent designated on the patient's behalf, if appropriate to circumstances.
3. If chemical restraint is indicated to prevent injury or improve treatment, consider **one** of the following to patients > 5 years old. If patient is < 5 years old, contact on-line medical direction for guidance:
 - a. Diazepam (Valium[®]): 0.3 mg/kg slow IV/IO/IM. Titrate to desired effect, up to a maximum of 10 mg or 0.5 mg/kg PR, up to a maximum of 20 mg.
 - b. Midazolam (Versed[®]): 0.1 mg/kg slow IV/IO, up to a maximum of 4.0 mg or 0.2 mg/kg IM, up to a maximum of 4.0 mg, if no IV access.
 - c. Lorazepam (Ativan[®]): 0.05-0.1 mg/kg slow IV/IO/IM, up to a maximum of 4.0 mg.
4. Monitor cardiac rhythms, respiratory status, and pulse oximetry.

Document

At a **minimum**, document:

1. The patient's mental status
2. Lack of response to verbal control
3. The need for restraint
4. The type of restraint used
5. The results of patient restraint
6. Any injuries to patient or EMS personnel resulting from the restraining efforts
7. Methods of monitoring the restrained patient during transport
8. Patient position during treatment and transportation
9. Vital signs
10. Distal neurovascular checks
11. Patient status at time of transfer of care

XII. Specialty Skills

A. IO Procedures

ALS

Intraosseous Infusion (IO)

The administration of fluids and medications via intraosseous infusion has long been known to be a relatively safe and effective procedure in the treatment of critically ill patients.

Indications

Patients in which the following conditions are present:

1. Cardiac arrest, or
2. Profound hypovolemia, or
3. No available vascular access, or
4. Following two unsuccessful peripheral IV attempts for patients with any other life-threatening illness or injury requiring immediate pharmacological or volume intervention, or
5. In pediatric patients in cardiac arrest, go directly to IO if no peripheral sites are obvious.

Contraindications

1. Conscious patient with stable vital signs
2. Peripheral vascular access available
3. Suspected or known fractures in the extremity targeted for IO infusion
4. Previous attempt in the same bone
5. Cellulitis at the intended site of the procedure
6. Patient with known bone disorder
7. Prior knee or shoulder joint replacement

Special Considerations

IO Access

1. Follow each medication with a 20 ml saline flush to promote entry into the central circulation.
2. Use manual pressure, or an infusion pump, to administer viscous drugs or rapid fluid boluses.

Humeral site

1. Stabilize the needle prior to any attempt at removing the driver. The humeral cortex can be considerably “less dense” and failure to stabilize the needle may cause inadvertent dislodgement.
2. In older patients with presumed decreased bone density, it is important to continuously reassess the stability of the IO needle in place.

Procedure

1. Prepare the skin with antiseptic (povidone-iodine [Povidine] or Hibiclens) solution.
2. Allowable sites for IO needle:
 - a. **Manual** placement:
 - Patients \leq 6 years: Use the proximal tibial site, located 1-3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia.
 - Patients $>$ 6 years: Use the distal tibial site, located at the medial surface of the distal tibia just proximal to the medial malleolus.
 - b. **Mechanical** placement:
 - Pediatric patients 3-39 kg: Use a pediatric needle (15 ga, 15 mm length) in the proximal tibial site, located 1-3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia.
 - Pediatric patients \geq 40 kg: Use an adult needle (15 ga, 25 mm length) in the proximal tibial site, located 1-3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia.
 - Pediatric patients \geq 40 kg where the adult needle is not long enough (less than 5 mm of the needle is visible when the tip of the needle touches the bone): Use an adult needle (15 ga, 25 mm length) in the distal tibial site, located at the medial surface of the distal tibia just proximal to the medial malleolus. Or use a longer adult needle (15 ga, 35 mm length) in the proximal tibial site.

-
- Patients \geq 40 kg where a lower extremity site is not available: Use an adult needle (15 ga, 25-35 mm length) proximal humerus site. First, adduct the humerus, position the elbow posteriorly, and place the patient's hand on his/her abdomen near the umbilicus. Go two finger breaths below the tip of the acromium to locate the tuberosity. Insert at 90 degree angle to lateral surface of the tuberosity.
-

Two attempts within 5 minutes are permitted.
Consult on-line medical direction prior to additional attempts.

3. Secure needle in place with bulky dressing.
4. To prevent or treat pain during an IO infusion:
 - a. Adult patients: Administer 20-40 mg of 2% (only 1.0-2.0 ml preservative free/cardiac) Lidocaine® IO.
 - b. Pediatric patients \geq 40 kg: Administer 1.0-2.0 mg/kg of 2% (only 1.0-2.0 ml preservative free/cardiac) Lidocaine® IO.
 - c. Pediatric patients < 40 kg: On-line medical direction **must** be consulted.

Potential Adverse Effects/Complications

1. Extravasation of fluid
2. Infection
3. Fat emboli
4. Compartment syndrome

B. Needle Thoracostomy

Review

The procedure is performed for a patient with progressive respiratory distress and known or suspected thoracic trauma to resolve a tension pneumothorax. It involves introducing a needle/catheter (with flutter valve attached) into the pleural space of the chest cavity.

A needle thoracostomy can be performed by a BLS provider, AFTER training and certification in the procedure has been completed.

Indications

1. Patients who are assessed to have a life-threatening tension pneumothorax in extremis with diminished/absent lung sounds, hypotension, and/or arrest.
2. If traumatic arrest is suspected due to multi-system blunt trauma, or due to penetrating neck, chest, or abdominal trauma, bilateral needle decompression should be performed.
3. Once catheters are secured in place, **DO NOT** remove.

Contraindications

1. Patients with suspected simple pneumothorax
2. Patients whose tension pneumothorax can be relieved by the removal of an occlusive dressing from an open chest wound

Special Considerations

1. Reassessment of catheter patency
2. Additional decompressions may need to be performed, if evidence of re-accumulation or catheter occlusion or dislocation.

Management

BLS/ALS

1. Consider having the patient sit up (30-45 degree incline), if hemodynamically stable.
2. Prepare the skin with antiseptic (povidone-iodine [Povidine] or Hibiclens) solution.

-
3. Decompress the chest on the side of the injury. Insert a 14 gauge, 3.25 inch needle/catheter unit into the:
 - a. Second intercostal space anterior mid-clavicular line on the side of the injury, OR
 - b. Fifth intercostal space mid-axillary line on the side of the injury
 4. Ensure the needle entry into the chest is **NOT** medial to the nipple line and is **NOT** directed toward the heart. **The needle must be inserted above the rib to avoid neurovascular damage.**
 5. After decompression, remove the needle, and secure the catheter in place.
 6. Be aware of possible needle clotting.
 7. If respiratory status does not improve, or worsens, multiple needle decompressions may be required to resolve a tension pneumothorax.
 - a. Decompression attempts are unlimited. Contact on-line medication control for further guidance after 3 attempts.
 - b. During multiple attempts of decompression, remove needles, but secure each catheter in place.

Potential Adverse Effects/Complications

1. Intercostal vascular or nerve injury
2. Pneumo/hemothorax
3. Direct damage to the lung
4. Pericardial/cardiac injury
5. Infection

C. Blisters

Review of Injury/Illness

Under operational conditions, and with approval of local protocols, blister care may be performed by EMS providers according to the following algorithm to decrease pain and improve mission readiness.

Indications

1. Patient has one or more open or closed blisters
2. Pressure and pain at the blister site
3. Area may be exposed to contaminated environment

Contraindications

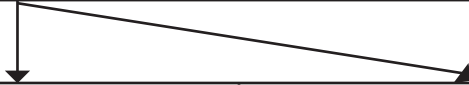
1. Patient has a history of diabetes
2. Patient has signs/symptoms of infection (e.g., cellulitis)
3. Fungal infection is present (e.g., athlete's foot)
4. Small blister is not causing pain or interfering with mission capability

Patient has significant blisters and DOES NOT have contraindications:

- Initiate infection control and routine BLS care.
- Clean entire extremity surrounding the blister with antibacterial solution and water.
- Assess the type of blister.

Patient DOES have contraindications:

- Treat any other underlying medical conditions, according to local protocols.
- Clean site with antibacterial solution and water.
- Protect area with clean/sterile dressing.
- Instruct patient to contact personal physician for follow-up care.



OPEN blister:

- Cut any loose dead skin with sterile scalpel or small scissors.
- Ensure exposed tissue is properly cleaned and free from debris.
- Apply antibiotic ointment to site and surrounding area.
- Cover with non-stick gauze and secure with rolled gauze.
- Instruct patient on proper wound care and signs/symptoms of infection.

CLOSED blister:

- Ensure blister and surrounding area is properly cleaned and free from debris.
- To relieve pressure from blister, using aseptic technique, create a 1.0 cm incision at the base of the blister dome.
- Apply gentle pressure over blister dome in order to drain fluid.
- **DO NOT** apply any ointment over the blister.
- Cover blister with non-stick gauze and secure with medical tape
- Instruct patient on proper wound care and signs/symptoms of infection.

D. Subungual (Toe) Hematoma Care

Review of Injury/Illness

Under operational conditions, and with approval of local protocols, care of subungual hematomas of the toe may be performed by EMS providers according to the following algorithm to decrease pain and improve mission readiness.

Indications

1. Patient has visible blood under > 50% of a toenail
2. Pressure and pain at the site
3. Injury occurred less than 24 hours ago
4. Pain and pressure are compromising ability to stand, walk, or participate in the mission

Contraindications

1. Patient has a history of diabetes
2. Patient has signs/symptoms of infection at the site (e.g., cellulitis)
3. Fungal infection is present (e.g., athlete's foot)
4. Affected foot has delayed capillary refill, decreased or absent pedal pulses, or decreased sensation to light touch
5. Hematoma involves less than 50% of the toenail
6. Subungual hematoma of a fingernail

Patient DOES NOT have contraindications:

- Initiate BSI/Universal Precautions and routine BLS care.
- Clean entire affected foot with antibacterial solution and water.
- Use large gauge needle (14 ga or 16 ga) to penetrate the top portion of the toenail until blood begins to drain through puncture.
- Apply constant pressure on top of toenail to drain blood until patient feels total relief from pressure pain.
- Do not attempt to remove toenail.
- Protect area with clean/sterile dressing.
- Do not apply any antibiotic ointment.

Patient DOES have contraindications:

- Treat any other underlying medical conditions, according to local protocols.
- If indicated, request BLS/ALS transport.



Instruct patient on:

- Proper wound care.
- Signs/symptoms of infection.
- Follow-up care with personal physician if signs/symptoms worsen or are not relieved in the next 24 hours.

E. IV Drip Calculations

Extended Scope BLS/ALS

IV Drip Chart

DISCLAIMER: We have taken considerable care while collecting this information to ensure accuracy and appropriate content. The user is reminded that ultimate responsibility for accuracy of calculations and appropriateness of medication rests with the prescriber and professional actually administering the medication.

IV Infusion Drip Rates

Volume to be Infused in ml/hour	Select IV Drip Chamber Size in Drops/ml			
	10	15	20	60
	Drops/Minute **			
10	1.7	2.5	3.0	10.0
30	5.0	7.5	10.0	30.0
50	8.0	12.5	17.0	50.0
70	12.0	17.5	23.0	70.0
90	15.0	22.5	30.0	90.0
125*	20.8	31.0	42.0	N/A
175	29.0	43.8	58.0	N/A
250	29.0	43.8	58.0	N/A

* Delivers one liter over 8 hours.

** Round to nearest value

1 ml = 1 cc

F. Glasgow Coma Scales

Eye Opening Response	
Spontaneous	4
To Voice	3
To Pain	2
No Response	1

Motor Response	
Obeys Command	6
Localizes Pain	5
Withdraws to Pain	4
Flexion to Pain (Abnormal)	3
Extension to Pain	2
No Response	1

Verbal Response (with Age Adjustments)	
5 YEARS-ADULT	
Oriented and Converses	5
Disoriented and Converses	4
Inappropriate Words	3
Incomprehensible Sounds	2
No Response	1
2 YEARS-5 YEARS	
Appropriate Words	5
Inappropriate Words	4
Cries/Screams	3
Grunts	2
No Response	1
< 2 YEARS	
Smiles/Coos/Cries	5
Cries	4
Inappropriate Cries/Screams	3
Grunts	2
No Response	1

Glasgow Coma Score Total =

XIII. Appendix

Listed as generic name [trade name]:

A. BLS Formulary

Acetaminophen [Tylenol[®]]
Activated charcoal (with/without Sorbitol)
Albuterol [Proventil[®]] – patient assisted
Aspirin [ASA] – patient assisted
Bacitracin (or other topical antibiotic) ointment
Benzoin (compound tincture)
Epinephrine Auto-Injector [EpiPen[®], EpiPen Jr[®]]
Nitroglycerin – patient assisted
Glucose paste (Oral)
Oxygen
Salicylic acid (Aspirin)

B. ALS Formulary

All BLS Formulary items are included, **PLUS:**

Adenosine [Adenocard[®]]
Albuterol [Proventil[®]]
Amiodarone [Cordarone[®]]
Atropine Sulfate (Atropine)
Benzocaine 30% (topical)
Calcium Gluconate
Calcium Chloride
Captopril [Capoten[®]]
Dextrose 50% (D50W)
Diazepam [Valium[®]]
Diltiazem [Verapamil[®] or Cardizem[®]]
Diphenhydramine Hydrochloride [Benadryl[®]]
Dopamine Hydrochloride [Intropin[®]]
Epinephrine (1:1,000 for SC injection; 1:10,000 for IV/IO injection)
Furosemide [Lasix[®]]
Glucagon [GlucaGen[®]]

Haloperidol [Haldol®]
Ipratropium [Atrovent®]
Lactated Ringer's solution (LR)
Lidocaine Hydrochloride [Lidocaine®]
Lorazepam [Ativan®]
Magnesium Sulfate (Magnesium)
Midazolam [Versed®]
Morphine Sulfate (Morphine)
Naloxone [Narcan®]
Nitroglycerin (sublingual tabs or spray, topical paste or patch)
0.9% Normal Saline solution (NS)
Ondansetron [Zofran®]
Oxygen (O₂)
Promethazine [Phenergan®]
Sodium Bicarbonate
Thiamine (Vitamin B1)
Vasopressin [Pitressin®]

C. Acronyms

ACLS	Advanced Cardiac Life Support
ACS	Acute Coronary Syndrome
AED	Automatic External Defibrillator
AGE	Arterial Gas Embolism
ALS	Advanced Life Support
AMI	Acute Mountain Illness
AMS	Acute Mental Status
APN	Advanced Practice Nurse
ASAP	As Soon As Possible
AVPU	Alert, Verbal, Pain, Unresponsive
BID	Twice a day
BLS	Basic Life Support
bpm	Beats per minute
BSA	Burn (Body) Surface Area
BSI	Body Substance Isolation
BVM	Bag Valve Mask
CEW	Conducted Energy Weapons
CHF	Congestive Heart Failure
cm	Centimeters
CNS	Central Nervous System
COPD	Chronic Obstructed Pulmonary Disease
CPAP	Continuous Positive Airway Pressure
CSF	Cerebral Spinal Fluid
CVA	Cerebral Vascular Accident
DCS	Decompression Sickness
dL	Deciliter
D50W	Dextrose 50%
DNR	Do Not Resuscitate
DOE	Dyspnea on Exertion
EAC	External Auditory Canal
ECG	Electrocardiogram
ED	Emergency Department
EDS	Excited Delirium Syndrome
EIR	Emergency Incident Rehabilitation
EMS	Emergency Medical Services

EMT	Emergency Medical Technician
ePCR	Electronic Patient Care Record
ET	Endotracheal
ETA	Estimated Time of Arrival
ETCO ₂	End Tidal Carbon Dioxide
ETOH	Ethyl Alcohol
ETT	Endotracheal Tube
fsw	Feet Sea Water
GCS	Glasgow Coma Scale
GI	Gastrointestinal
gm	Gram
>	Greater than
HACE	High Altitude Cerebral Edema
HAPE	High Altitude Pulmonary Edema
HEPA	High-efficiency Particulate Air
Hg	Mercury
Hx	History
IC	Incident Commander
ICS	Incident Command System
IEB	Inner Ear Barotrauma
IM	Intramuscular
IO	Intraosseous
IV	Intravenous
IVP	Intravenous Push
L	Liter
<	Less than
LOC	Level of Consciousness
LR	Lactate Ringers
kg	Kilogram
KVO	Keep Vein Open
MCI	Mass Casualty Incident
MDI	Metered Dose Inhaler
MEB	Middle Ear Barotrauma
mEq	Milliequivalent
mg	Milligram
MI	Myocardial Infarction
ml	Milliliter

mm	Millimeters
MOI	Mechanism of Injury
NC	Nasal Cannula
NP	Nasal pharyngeal
NPO	Nothing Per Oral (Nothing Orally)
NRBM	Non-rebreathing Mask
NS	Normal Saline
NSAID	Non-steroidal Anti-inflammatory Drug
OP	Oral Pharyngeal
PA	Physician Assistant
PCI	Percutaneous Coronary Intervention
PCR	Patient Care Record
PO	Per Oral (Orally)
PPE	Personal Protective Equipment
PR	Per Rectum (Rectally)
PRN	As needed
PASG	Pneumatic Anti-shock Garment
psi	Pounds per square inch
QD	Once a day
RN	Registered Nurse
RO	Rehab Officer
SBP	Systolic Blood Pressure
SCBA	Self Contained Breathing Apparatus
SpO ₂	Oxygen Saturation
STEMI	ST Elevated MI
TBI	Traumatic Brain Injury
TCP	Transcutaneous Pacing
TIA	Transient Ischemic Attack
TID	Three times a day
TM	Tympanic Membrane
URI	Upper Respiratory Infection
VS	Vital Signs
WPW	Wolff-Parkinson-White Syndrome
wt	Weight

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