East Central Illinois EMS System

Adult Protocol Manual

2024

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Preface

The following medical treatment protocols were developed for use by credentialed providers within the OSF HealthCare East Central Illinois EMS System. Optimal prehospital care results from a combination of careful patient assessment, essential prehospital emergency medical services and appropriate medical consultation. The purpose of this manual is to provide guidance for prehospital care providers within the East Central Illinois EMS System. These protocols were adapted based on the NASEMSO National Model EMS Guidelines Version 3.0, AHA guidelines, as well as other evidence-based information from local and national standards.

The medical protocols are divided into different sections. The upper section includes three boxes (History, Signs and Symptoms and Differential) which serve as a guide to assist in obtaining pertinent patient information and exam findings as well as considering multiple potential causes of the patient's complaint. It is not expected that every historical element or sign / symptom be recorded for every patient, however the pertinent aspects shall be included in the patient evaluation. The protocol section describes the essentials of patient care. Virtually every patient should receive the care outlined in this section. However, each medical emergency must be dealt with individually and appropriate care determined accordingly. Professional judgment is mandatory in determining treatment modalities within the parameters of these protocols. Circumstances will arise where treatment may move from one protocol to another. The *'Pearls'* section provides key points and educational pearls regarding the protocol. The *'Key Documentation Elements'* and the *'Pertinent Assessment Findings'* sections serve to help the prehospital provider in appropriate documentation of the patient encounter. The final section, *'Quality Metrics'*, was added in an effort for continuous quality improvement. These metrics were based on the NASEMSO National Model EMS Guidelines Version 3.0 as well as metrics specific to East Central Illinois EMS.

From time to time, protocols may be added or revised. Additional recommendations are welcome and appreciated at any time. They may be submitted to the East Central Illinois EMS office for consideration.

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Preface

Introductory Letter to the System

The vision of the East Central Illinois EMS System is to be an integrative, high performance EMS system aligning EMS agencies and providers to meet community-centered needs through clinical excellence, education, access and advocacy. These new protocols are one example of the multifaceted strategy we take in order to achieve our vision. These new protocols are intended to be the guidelines and framework of a team-based approach to prehospital care within our system.

These protocols are a “living document” and are subject to continuous review for the sake of providing providers with the most current evidence-based treatment. Updates to these protocols will be made as needed to maintain a current standard of care. We welcome your input and encourage suggestions in an effort to deliver the highest quality of prehospital health care possible.

Sincerely,

Kurt Bloomstrand, MD, FACEP, FAAEM

EMS Medical Director

East Central Illinois EMS

OSF HealthCare

Preface

The protocol section is divided and color coded based on the level of prehospital provider licensure.

Legend	Definition
	Emergency Medical Responder (EMR)
	Emergency Medical Technician—Basic (EMT-Basic)
	Emergency Medical Technician-Intermediate (EMT-I)
	Paramedic Only
	Medical Control

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Universal Patient Care

All Levels

Scene Size-Up

1. Ensure scene safety – identify any hazards.
2. Use appropriate personal protective equipment (PPE).
    a. Wear high-visibility, reflective apparel when deemed appropriate (e.g. operations at night or in darkness, on or near roadways).
3. Determine the number of patients.
4. Identify the mechanism of injury / nature of illness.
5. Call for additional resources if needed.
6. Consider declaration of Mass Casualty Incident (MCI), if needed.

Initial Assessment / Primary Survey

***(A**irway, **B**reathing, **C**irculation is cited below; although there are specific circumstances where **C**irculation, **A**irway, **B**reathing may be indicated such as cardiac arrest or major arterial bleeding)*

1. Obtain a general impression of the patient's condition.
2. **A**irway
    a. Assess airway patency and open the airway as indicated (e.g. head-tilt chin-lift or jaw thrust).
    b. Establish patent airway with cervical spine precautions, per the AIRWAY MANAGEMENT and SPINAL MOTION RESTRICTION Protocol.
    c. For patients with laryngectomies or tracheostomies, remove all objects or clothing that may obstruct the opening of these devices, maintain the flow of prescribed oxygen and reposition the head and/or neck.
    d. Evaluate mental status for ability to protect airway (patients with a GCS less than or equal to 8 are likely to require airway protection).
3. **B**reathing
    a. Evaluate rate, breath sounds, accessory muscle use, retractions, patient positioning.
    b. Monitor oxygen saturation and, if indicated, provide supplemental **OXYGEN** with a target of achieving 94-98% saturation for most acutely ill patients.
    c. Apnea (not breathing) - go to the AIRWAY MANAGEMENT Protocol.
4. **C**irculation
    a. Control any major external bleeding. Refer to EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
    b. Evaluate carotid and radial pulses. If no pulse go to CARDIAC ARREST Protocol
    c. Evaluate perfusion by assessing skin color, temperature, condition and capillary refill.
    d. Establish IV access and administer **IV FLUID** to maintain SBP > 90 mmHg. **(ILS/ALS ONLY)**
5. **D**isability
    a. Asses Level of Consciousness:
        A – Alert; **V** – Responds to verbal; **P** – Responds to pain; **U** – Unresponsive
    b. Evaluate gross motor and sensory function in all extremities.
    c. Check blood glucose in patients with altered mental status and refer to appropriate protocol.
    d. If acute stroke suspected, refer to STROKE Protocol.
6. **E**xposure
    a. Rapid evaluation of entire body to identify injuries. Be considerate of patient modesty.
    b. Prevent hypothermia (remove wet clothing and cover patient to prevent further heat loss).
7. **Critical Transport Decision -** Refer to INTERCEPT CRITERIA Protocol.
    a. When indicated in protocol, call for ALS intercept if available.

All Levels

Secondary Survey

The performance of the secondary survey should not delay transport in critical patients. Secondary surveys should be tailored to patient presentation and chief complaint.

A. Focused History

SAMPLE History
Signs and **S**ymptoms
Allergies
Medications
Past medical history, injuries, illnesses
Last meal/intake
Events leading up to the injury and/or illness

OPQRST History
Onset of symptoms
Provocation / Palliation
Quality of pain
Radiation of pain
Severity of symptoms - pain scale
Time of onset and circumstances around onset

B. Physical Assessment

1. Head
   a. Pupils
   b. Ears
   c. Naso-oropharynx
   d. Skull and scalp
2. Neck
   a. Jugular venous distension
   b. Tracheal position
   c. Palpate the c-spine for tenderness. Refer to SPINAL MOTION RESTRICTION Protocol.
3. Chest
   a. Breath sounds
   b. Retractions
   c. Chest wall tenderness, deformity, crepitus and excursion
   d. Respiratory pattern, symmetry of chest movement with respiration
4. Abdomen / Back
   a. Flank / abdominal tenderness or bruising
   b. Abdominal distension, rebound or guarding
   c. Spinal tenderness, crepitus or step-offs
   d. Pelvic stability or tenderness
5. Extremities
   a. Edema
   b. Pulses / capillary refill
   c. Deformity
6. Neurologic status assessment
   a. Mental status / orientation
   b. Gross exam of motor strength and sensation in all four extremities
7. Evaluate for medical equipment (e.g., pacemaker/defibrillator, left ventricular assist device (LVAD), insulin pump, dialysis fistula)

All Levels

C. Baseline Vital Signs
(An initial full set of vital signs is required: pulse, blood pressure (manual preferred), respiratory rate, glucose, neuro status assessment)

1. Neurologic status assessment involves establishing a baseline and then trending any change in patient neurologic status.
    a. GCS and/or AVPU
2. Patients with cardiac or respiratory complaints:
    a. Pulse oximetry
    b. 12-lead ECG should be obtained within 10-minutes of patient contact with cardiac or suspected cardiac complaints. **(BLS - If Available) (ILS/ALS ONLY)**
    c. Continuous cardiac monitoring **(ILS/ALS ONLY)**
    d. Consider waveform capnography (essential for patients who require invasive airway management). **(ILS/ALS ONLY)**
3. Patients with altered mental status:
    a. Check blood glucose
    b. Consider waveform capnography (essential for patients who require invasive airway management). **(ILS/ALS ONLY)**
4. Stable patients should have at least two sets of pertinent vital signs. Ideally, one set should be taken shortly before arrival at receiving facility.
5. Critical patients should have pertinent vital signs frequently monitored.

Universal Patient Care

PEARLS

- Routine use of lights and sirens is not warranted.
- Even when lights and sirens are in use, always limit speeds to level that is safe for the emergency vehicle being driven and road conditions on which it is being operated.
- Be aware of legal issues and patient rights as they pertain to and impact patient care (e.g. patients with functional needs or children with special healthcare needs).
- Be aware of potential need to adjust management based on patient age and comorbidities, including medication dosages.
- Direct medical oversight should be contacted when mandated or as needed.
- Critical Patients: proactive patient management should occur simultaneously with assessment
    a. Ideally, one provider should be assigned to exclusively monitor and facilitate patient-focused care.
    b. Treatment and Interventions should be initiated as soon as practical, but should not impede extrication or delay transport to definitive care

Abuse and Maltreatment

Definitions

Abuse/Maltreatment: Any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential for harm, or threat of harm to a patient of any age group

Child Maltreatment/Abuse: Child maltreatment includes any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child. An act of commission (child abuse) is the physical, sexual or emotional maltreatment or neglect of a child or children. An act of omission (child neglect) includes, but is not limited to, failure to provide for the child's needs (e.g. physical, emotional, medical / dental, and educational neglect) and failure to supervise (e.g. inadequate supervision or safety precautions, lack of appropriate car seat use, and exposure to violent or dangerous environments).

Human Trafficking: When people are abducted or coerced into service and often transported across international borders. Signs may include, but are not limited to: patient with branding / tattoos and environmental clues such as padlocks and/or doorknobs removed on interior doors, and intact windows that are boarded up.

***Per NASEMSO EMS Clinical Guidelines V 2.2*

All Levels

1. **UNIVERSAL PATIENT CARE.**
2. Assessment and history; note any discrepancies in history, environment or interaction.
3. Address and treat any obvious injuries or life-threatening issues per the appropriate protocol.
4. Attempt to preserve evidence whenever possible; however, the overriding concern should be providing appropriate emergency care to the patient.
5. If no medical emergency exists, the next priority is safe patient disposition / removal from the potentially abusive situation. Call law enforcement for assistance.
6. Do not confront suspected perpetrators of abuse / maltreatment. This can create an unsafe situation for EMS and for the patient.
7. For patients transported, report concerns to receiving facility and to the appropriate agency / hotline per mandatory reporting laws.

The Illinois EMS Act (210 ILCS 50/3.230) and The Illinois Abused and Neglected Child Reporting Act (325 ILCS 5/4) requires all licensed EMS providers to report suspected cases of child abuse or neglect. To report, call the Child Abuse hotline at 1-800-25-ABUSE.

The Illinois EMS Act (210 ILCS 50/3.230) and The Illinois Elder Abuse and Neglect Act (320 ILCS 20/4) requires all licensed EMS providers to report suspected cases of elder abuse or neglect. To report, call the Elder Abuse hotline at 1-866-800-1409. For Nursing Home abuse/neglect, call 1-800-252-4343.

Abuse and Maltreatment

PEARLS

- Clues to abuse or maltreatment can vary with age group of the patient and type of abuse.
- Not all abuse or maltreatment is physical.
- EMS role is to:
    a. Document concerns.
    b. Assess potentially serious injuries.
    c. Disclose concerns to appropriate authorities.
    d. Initiate help to get the patient and any other vulnerable individuals on scene into a safe situation.
    e. Not to investigate or intervene beyond the steps above.
    f. Leave further intervention to law enforcement personnel.
- Potential clues to abuse / maltreatment from caregivers or general environment:
    a. Caregiver apathy about patient's current situation.
    b. Caregiver overreaction to questions about situation.
    c. Inconsistent histories from caregivers or bystanders regarding what happened.
    d. Information provided by caregivers or patient that is not consistent with injury patterns.
    e. Injuries not appropriate for patient's age or physical abilities (e.g. infants with injuries usually associated with ambulatory children, elders who have limited mobility with injury mechanisms inconsistent with their capabilities).
    f. Caregiver not allowing adult patient to speak for themself, or who appears controlling – pay special attention to patients who cannot communicate due to young age or language and/or cultural barriers.
    g. Inadequate safety precautions or facilities where the patient lives and/or evidence of security measures that appear to confine the patient inappropriately.
- Potential clues to abuse / maltreatment that can be obtained from the patient:
    a. Multiple bruises in various stages of healing.
    b. Age-inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way).
    c. Pattern burns, bruises, or scars suggestive of specific weaponry used.
    d. Evidence of medical neglect for injuries or infections.
    e. Unexplained trauma to genitourinary systems or frequent infections to this system.
    f. Evidence of malnourishment and/or serious dental problems.

KEY DOCUMENTATION ELEMENTS

- Meticulous documentation of any statements by the patient and/or parent / caregiver and any physical findings on the patient or the surroundings.
- Document findings by describing what you see ("2cm round burn to back") and not ascribing possible causes ("burn consistent with cigarette").
- Documentation of reporting suspected abuse to appropriate hotline.

PERTINENT ASSESSMENT FINDINGS

- Identify potential life-threatening issues.
- Document thorough secondary survey to identify clues of potential abuse / maltreatment *(See above)*

QUALITY METRICS

- Documentation of reporting suspected abuse.

Airway Management

Transport to the closest appropriate hospital for airway stabilization when respiratory failure cannot be successfully managed in the prehospital setting.

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**
   a. Assess ABC's (Respiratory Rate, Effort, Adequacy)
   b. Pulse Oximetry; $EtCO_2$ (if available)
2. Establish airway patency
   a. Open and maintain airway (i.e. head-tilt chin-lift or jaw thrust) with cervical spine precautions, per the SPINAL MOTION RESTRICTION Protocol
   b. Suction as needed
   c. Clear foreign body obstructions per the FOREIGN BODY AIRWAY OBSTRUCTION Protocol
3. Administer **OXYGEN** as needed for air hunger or respiratory distress and titrate to a target SPO_2 of 94-98%.
4. Consider inserting an oropharyngeal (OPA) or nasopharyngeal (NPA) airway adjunct as indicated.
   a. OPA contraindicated with intact gag reflex.
   b. NPA contraindicated in patients with known or suspected head injuries.
5. Assist ventilations with a bag-valve-mask (BVM) and supplemental oxygen as needed.
   a. Two-person, two-thumbs-up BVM ventilation is more effective than one-person technique and should be used when additional providers are available.
   b. **Rate**: Adult: 10-12 breaths/minute
6. If patient has a tracheostomy tube, refer to RESPIRATORY DISTRESS WITH A TRACHEOSTOMY TUBE / VENTILATOR Protocol.
7. For apnea / respiratory failure or impending respiratory failure with impaired or absent gag reflex consider a system approved BLIND INSERTION AIRWAY DEVICE (BIAD) (i.e. i-gel®).

EMT-Intermediate

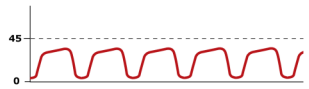
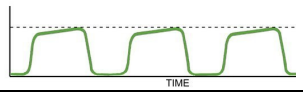
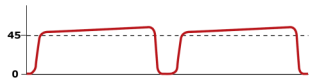
1. Continue **EMR / BLS TREATMENT.**
2. For adults in severe respiratory distress secondary to pulmonary edema / CHF, COPD, asthma, pneumonia, near drowning or undifferentiated respiratory distress, consider use of CPAP.
3. When less-invasive methods (BVM, BIAD) are ineffective, consider OROTRACHEAL INTUBATION.
   a. $EtCO_2$ / waveform capnography is mandatory for all intubations.
   b. Video laryngoscopy may enhance intubation success rates and should be used when available.
   c. Limit of 2 total intubation attempts per patient.
      i. Evaluate reason for failure and change technique or person attempting to increase chance of success.
4. If managing a breathing patient's airway, determine if the patient is relaxed / flaccid enough for intubation. If not, consider employing the MEDICATION ASSISTED INTUBATION Protocol.
5. If successful intubation, perform post-intubation management procedures including:
   a. Verification of proper placement with waveform capnography, absent gastric sounds, and bilateral breath sounds.
   b. Note the centimeter marking of the ET tube adjacent to the teeth or lips.
   c. Secure the ET tube with a commercial device or tape.
6. Ventilate with minimal volume in order to see chest rise, approximately 6-8 mL/kg Ideal Body Weight.
   a. Avoid hyperventilation. Maintain $EtCO_2$ of 35-45 mmHg
7. Continuously monitor placement with waveform capnography during treatment and transport.

Protocol Continues

Airway Management

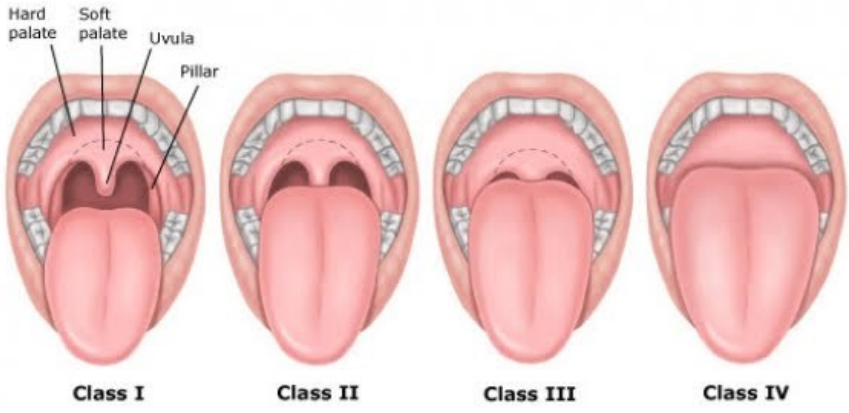
Paramedic

1. When a “can’t ventilate, can’t intubate” situation occurs and ALL attempts to manage the airway and ventilate the patient have failed, the paramedic should utilize a surgical airway device. Only providers that are trained to do so should perform a cricothyroidotomy using an EMS System approved cricothyroidotomy device or technique. Refer to CRICOTHYROIDOTOMY (Pertrach® or QuickTrach®) Procedure.
2. Once the device is successfully inserted follow the post intubation management procedure above and secure the device according to the manufacturers recommendations. Ventilate with 100% oxygen.

$EtCO_2$		
Value	**Waveform**	**State of ventilation**
Less than 35 mmHg Hypocapnia		Hyperventilation. Consider slowing ventilator rate
35 - 45 mmHg Normal		Usually indicates adequate ventilation
Greater than 45 mmHg Hypercapnia		Hypoventilation. Consider increasing ventilator rate, assess adjunct for occlusion

Mallampati Classification

- **Class 1:** Full visibility of tonsils, uvula and soft palate
- **Class 2:** Visibility of hard and soft palate, upper portion of tonsils and uvula
- **Class 3:** Soft and hard palate and base of the uvula are visible *(predicted difficult)*
- **Class 4:** Only Hard Palate visible *(predicted difficult)*



Airway Management

PEARLS

- Avoid excessive pressures or volumes during BVM. Ventilate with minimal volume to see chest rise, approximately 6-8 mL/kg ideal body weight
- Avoid endotracheal intubation, unless less invasive methods fail, since it can be associated with aspiration, oral trauma, worsening of cervical spine injury, malposition of the ET tube (right mainstem intubation, esophageal intubation), or adverse effects of sedation, especially in children.
- An *Intubation Attempt* is defined as passing the laryngoscope blade past the teeth.
- **Bag-Valve-Mask (BVM)**: Appropriately-sized masks should completely cover the nose and mouth and maintain an effective seal around the cheeks and chin
    a. Ventilation should be delivered with only sufficient volume to achieve chest rise
    b. Ventilation rate:
        i. Adult: 10-12 breaths/minute
            - Support spontaneous respirations if the patient is hypoventilating
            - For apnea, provide one breath every 6 seconds adjusting based on pulse oximetry and digital capnometry or capnography (with the goal of 35–45 mmHg)
- **Orotracheal intubation**:
    a. Approximate depth of insertion = (3) x (endotracheal tube size).
    b. In addition to preoxygenation, apneic oxygenation (high-flow oxygen by nasal cannula) may prolong the period before hypoxia during an intubation attempt.
    c. Appropriate attention should be paid to adequate preoxygenation to avoid peri-intubation hypoxia and subsequent cardiac arrest.
    d. Prompt suctioning of soiled airways before intubation attempt may improve first pass success.
    e. Confirm successful placement with waveform capnography. Less optimal methods of confirmation include bilateral chest rise, bilateral breath sounds, and maintenance of adequate oxygenation. Color change on $EtCO_2$ is less accurate than clinical assessment, and wave-form capnography is superior. Misting observed in the tube is not a reliable method of confirmation. Visualization with video laryngoscopy, when available, may assist in confirming placement when unclear due to capnography failure or conflicting information.

KEY DOCUMENTATION ELEMENTS

- Initial vitals signs and physical exam
- Size of equipment used
- Number of intubation attempts
- Reassessment with repeat vital signs
- Document $EtCO_2$ value and record capnography wave initially after intubation, with each set of vital signs, when patient is moved and at the time of patient transfer in the ED

PERTINENT ASSESSMENT FINDINGS

- Complete respiratory and airway assessment
- Ongoing assessment is critical when an airway device is in place
- Acute worsening of respiratory status or evidence of hypoxemia can be secondary to displacement or obstruction of the airway device, pneumothorax or equipment failure

QUALITY METRICS

- First pass intubation success rate
- Documentation of post-intubation confirmation ($EtCO_2$, absent gastric sounds, bilateral breath sounds)
- Waveform capnography used for initial confirmation and continuous monitoring during transport with advanced airway

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Determination of Death / Withholding Resuscitative Efforts

All clinically dead patients will receive all available resuscitative efforts including cardiopulmonary resuscitation (CPR) unless contraindicated by one of the exceptions defined below.

All Levels

1. A person is presumed *Dead on Arrival* (DOA) when all "signs of death" are present and at least one associated "factor of death" is present.

SIGNS OF DEATH (ALL must be present)	FACTORS OF DEATH (At least one must be present)
• Unresponsiveness • Apnea • Pulseless (carotid & femoral by 2 providers) • No obvious signs of life *(spontaneous movement, ECG activity or AED shockable rhythm, or pupillary response)*	• Lividity • Rigor mortis • Decapitation • Decomposition • Transection of the torso • Incineration • Injuries incompatible with life: - massive crush injury - complete exsanguination - severe displacement of brain matter • Massive blunt or penetrating trauma

2. Do not initiate resuscitation in the following:

   Do Not Resuscitate orders: No resuscitation efforts should be initiated when the person or family has evidence of a valid Do Not Resuscitate (DNR) order in hand.

   Scene safety: The physical environment is not safe for the EMS providers to enter.

3. If any of the findings are different than those described above, clinical death is not confirmed and resuscitative measures should be immediately initiated or continued.
4. Contact **MEDICAL CONTROL** to confirm death.
5. Once death confirmation has been made by medical control and resuscitation will not be attempted:
   a. Immediately notify the coroner or medical examiner's office.
   b. Do NOT leave a body unattended. EMS should remain on scene until the coroner arrives or law enforcement is on scene.
   c. Do NOT remove any property from the body or the scene.
   d. Never transport / move a body without permission from the coroner's office except for assessment or its protection.

Determination of Death / Withholding Resuscitative Efforts

PEARLS

- In cases where the patient's status is unclear and the appropriateness of withholding resuscitation efforts is questioned, EMS personnel should initiate CPR immediately and then contact direct medical oversight.
- For scene safety and/or family wishes, provider may decide to implement CPR even if all the criteria for death are met.
- At a likely crime scene, disturb as little potential evidence as possible.
- Medical cause or traumatic injury or body condition clearly indicating biological death (irreversible brain death), limited to:
    a. Decapitation: the complete severing of the head from the remainder of the patient's body.
    b. Decomposition or putrefaction: the skin is bloated or ruptured, with or without soft tissue sloughed off. The presence of at least one of these signs indicated death occurred at least 24 hours previously.
    c. Transection of the torso: the body is completely cut across below the shoulders and above the hips through all major organs and vessels. The spinal column may or may not be severed.
    d. Incineration: 90% of body surface area with full thickness burns as exhibited by ash rather than clothing and complete absence of body hair with charred skin.
    e. Injuries incompatible with life (such as massive crush injury, complete exsanguination, severe displacement of brain matter).
    f. In blunt and penetrating trauma, if the patient is apneic, pulseless, and without other signs of life upon EMS arrival including, but not limited to spontaneous movement, ECG activity, or pupillary response.

KEY DOCUMENTATION ELEMENTS

- Clinical / situational details that may be available from bystanders / caregivers
- Documentation of details surrounding decision to determine death
    - Signs / Factors of death
    - Time of contact with Medical Control
    - Time of death confirmation
    - Name of Physician giving death confirmation

PERTINENT ASSESSMENT FINDINGS

- Signs of death
- Factors of death

QUALITY METRICS

- Documentation of details surrounding determination of death and time of death confirmation.

Functional Needs / Special Needs Populations

Criteria

Patients who are identified by the World Health Organization's International Classification of Functioning, Disability, and Health that have experienced a decrement in health resulting in some degree of disability. According to the U.S. Department of Health and Human Services, this includes, but is not limited to, individuals with physical, sensory, mental health, and cognitive and/or intellectual disabilities affecting their ability to function independently without assistance.

All Levels

1. Identify the functional need by means of information from the patient, the patient's family, bystanders, medic alert bracelets or documents, or the patient's adjunct assistance devices.
2. The physical examination should not be intentionally abbreviated, although the manner in which the exam is performed may need to be modified to accommodate the specific needs of the patient.
3. Medical care should not intentionally be reduced or abbreviated during the triage, treatment, and transport of patients with functional needs, although the manner in which the care is provided may need to be modified to accommodate the specific needs of the patient.
4. For patients with communication barriers (language or sensory), it may be desirable to obtain secondary confirmation of pertinent data (e.g. allergies) from the patient's family, interpreters, or written or electronic medical records. The family members can be an excellent source of information and the presence of a family member can have a calming influence on some of these patients.

Assistance Adjuncts. Examples of devices that facilitate the activities of daily living for the patient with functional needs include, but are not limited to:

a. Extremity prostheses
b. Hearing aids
c. Magnifiers
d. Tracheostomy speaking valves
e. White or sensory canes
f. Wheelchairs or motorized scooters

Service Animals - As defined by the American Disabilities Act, "any guide dog, signal dog, or other animal individually trained to do work or perform tasks for the benefit of an individual with a disability, including, but not limited to guiding individuals with impaired vision, alerting individuals with impaired hearing to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair, or fetching dropped items."

a. Services animals are not classified as a pet and should, by law, always be permitted to accompany the patient with the following exceptions:
    i. A public entity may ask an individual with a disability to remove a service animal from the premises if:
        1. The animal is out of control and the animal's handler does not take effective action to control it; or
        2. The animal is not housebroken
b. Service animals are not required to wear a vest or a leash. It is illegal to make a request for special identification or documentation from the service animal's partner. EMS clinicians may only ask the patient if the service animal is required because of a disability and the form of assistance the animal has been trained to perform.
c. EMS clinicians are not responsible for the care of the service animal. If the patient is incapacitated and cannot personally care for the service animal, a decision can be made whether to transport the animal in this situation.
d. Animals that solely provide emotional support, comfort, or companionship do not qualify as service animals

Functional Needs / Special Needs Populations

PEARLS

- Communication Barriers:
  a. Language Barriers:
     i. Expressive and/or receptive aphasia
     ii. Nonverbal
     iii. Fluency in a different language than that of the EMS professional
     iv. Examples of tools to overcome language barriers include:
        1. Transport of an individual who is fluent in the patient's language along with the patient to the hospital
        2. Medical translation cards
        3. Telephone-accessible services with live language interpreters
        4. Methods through which the patient augments his / her communication skills (e.g. eye blinking, nodding) should be noted, utilized as able, and communicated to the receiving facility
        5. Electronic applications for translation
  b. Sensory Barriers:
     i. Visual impairment
     ii. Auditory impairment
     iii. Examples of tools to overcome sensory barriers include:
        1. Braille communication card
        2. Sign language
        3. Lip reading
        4. Hearing aids
        5. Written communication
- Physical Barriers:
  a. Ambulatory impairment (e.g. limb amputation, bariatric)
  b. Neuromuscular impairment
- Cognitive Barriers:
  a. Mental illness
  b. Developmental challenge or delay

KEY DOCUMENTATION ELEMENTS

- Document all barriers of care
- Document specific physical barriers in the appropriate exam elements
- Document any language or sensory barriers and assistance adjuncts

PERTINENT ASSESSMENT FINDINGS

- Barriers (*see above*)

QUALITY METRICS

- Documentation of barriers of care.

Intercept Criteria

Criteria

The appropriate ALS vehicle will be dispatched to intercept with a BLS or ILS unit / team when:

1. The BLS or ILS unit or team requests intercept or;
2. The ECRN or MD at the receiving hospital deems it necessary based upon the condition of the patient or;
3. The patient meets one or more of the following (including but not limited to):

BLS Intercept Criteria:

a. Active seizures
b. Anaphylaxis
c. Cardiopulmonary Arrest
d. Chest Pain (Acute Coronary Syndrome)
e. Diabetic Emergencies
f. Drowning / Near drowning
g. Electrical injuries (High or Low)
h. Obstetrical emergencies (i.e. prolapsed cord, abnormal presentations)
i. Obstructed airways that cannot be cleared
j. Respiratory Arrest / Distress
k. Severe traumatic injuries
l. Signs/symptoms of shock (i.e. tachycardia, tachypnea, abnormal skin signs, hypotension)
m. Stroke/CVA
n. Symptomatic overdose or poisoning
o. Any patient situation that higher level of care may benefit the patient

ILS Intercept Criteria:

a. Cardiogenic shock
b. Obstructed airways that cannot be cleared
c. Cardiac tamponade
d. Severe traumatic injuries
e. Symptomatic overdose or poisoning
f. Any patient situation that higher level of care may benefit the patient

4. The decision to utilize an intercept may be influenced by various factors such as:
   a. Geographical location
   b. Improvement of patient condition
   c. Refusal of higher level of care by patient with appropriate documentation

Intercept Criteria

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Medication Assisted Intubation

Criteria

- Imminent respiratory arrest
- Patient unable to protect their own airway
- Impending airway compromise due to severe edema secondary to trauma, allergic process, or burns.
- Glasgow Coma Score <8

Paramedic

Pre-Intubation

1. Refer to the AIRWAY MANAGEMENT Protocol.
2. Preoxygenate with 100% oxygen via Bag-Valve Mask (BVM).
3. Make sure all intubation equipment is prepared and medication is ready.
4. Prepare suction equipment.
5. Have BIAD and surgical airway device equipment available for back-up.

Intubation

1. Refer to the AIRWAY MANAGEMENT Protocol and OROTRACHEAL INTUBATION Procedure.
2. Continue to assist ventilations with 100% oxygen during this procedure.
3. Administer medications as long as BP allows (SBP > 90 mmHg or MAP > 65 mmHg):
    a. **MIDAZOLAM 0.1 mg/kg IV/IO (**maximum 10mg).
    b. **FENTANYL 1 mcg/kg IV/IO** (maximum initial dose 100 mcg); may repeat x 1 after 3-5 minutes at 0.5 mcg/kg (maximum second dose 50 mcg)
4. Spray posterior pharynx with **BENZOCAINE SPRAY** (1-2 second spray; may repeat once after 30 seconds if needed).
5. Attempt oral or in-line intubation per AIRWAY MANAGEMENT Protocol.

Post Intubation

1. If after intubation patient exhibits movement that might lead to extubation, administer **FENTANYL** as long as BP allows (SBP > 90 mmHg or MAP > 65 mmHg). If the initial medication is not effective, then use **MIDAZOLAM** at the appropriate dose:
    a. **FENTANYL 1 mcg/kg IV/IO** (maximum initial dose 100 mcg); may repeat x 1 after 3-5 minutes at 0.5 mcg/kg (maximum second dose 50 mcg)
    b. **MIDAZOLAM 0.05mg/kg IV/IO every 3-5 minutes** as needed (total maximum dose 10mg).
2. Continuous monitoring of patient with cardiac monitor, continuous SpO2 and capnography is required.

Medical Control

3. If more sedation or analgesia is needed, contact **Medical Control** for additional orders.

Medication Assisted Intubation

PEARLS

- Avoid endotracheal intubation, unless less invasive methods fail, since it can be associated with aspiration, oral trauma, worsening of cervical spine injury, malposition of the ET tube (right mainstem intubation, esophageal intubation), or adverse effects of sedation.
- Once a successful intubation has been performed, obstruction or displacement of the tube can have further deleterious effects on patient outcome
    a. Tubes should be secured with either a commercial tube holder or tape.
- Use continuous waveform capnography to detect end-tidal carbon dioxide ($EtCO_2$). This is an important adjunct in the monitoring of patients with respiratory distress, respiratory failure, and those treated with positive pressure ventilation. It should be used as the standard to confirm SGA, EGD, and endotracheal tube placement.
- Avoid excessive pressures or volumes during BVM.
- An intubation attempt is defined as passing the laryngoscope blade past the teeth.

KEY DOCUMENTATION ELEMENTS

- Initial vitals signs and physical exam
- Approximate patient weight
- Drug allergies
- Medication administered and dose
- Size of equipment used
- Number of intubation attempts
- Reassessment with repeat vital signs
- Document $EtCO_2$ value and record capnograph wave initially after intubation, with each set of vital signs, when patient is moved and at the time of patient transfer in the ED

PERTINENT ASSESSMENT FINDINGS

- Complete respiratory and airway assessment
- Ongoing assessment is critical when an airway device is in place
- Acute worsening of respiratory status or evidence of hypoxemia can be secondary to displacement or obstruction of the airway device, pneumothorax or equipment failure

QUALITY METRICS

- Automatic review by EMS Medical Director
- First pass intubation success rate
- End-tidal CO2 / Capnography performed on any endotracheal intubation
- Appropriate weight-based dosing of medications

Pain Management

History
- Age
- Location
- Duration
- Severity (1-10)
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement / respiration
- Increased with palpation to area

Differential
- Per the specified protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

EMR

1. **UNIVERSAL PATIENT CARE**.
2. Determine pain score and continue to monitor / trend score.
3. Attempt non-pharmacologic pain management options:
   a. Place patient in a position of comfort.
   b. Apply ice packs and/or splints for pain secondary to trauma.
   c. Verbally reassure patient to control anxiety.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. For *Mild* or *Moderate* pain consider: **ACETAMINOPHEN 1000 mg PO**.
   a. *Contraindicated* in patients with allergy or known liver failure.
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **BLS TREATMENT.**
2. For *Moderate* pain consider: **KETOROLAC 30 mg IM** or **15 mg IV** (no repeat dose)
   a. *Contraindicated* in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, known peptic ulcer disease, known or suspected GI bleed, known or suspected intracranial bleed, severe head injury or patients with high risk of bleeding.
3. For *Severe* pain consider:

   FENTANYL 1 mcg/kg IV/IO/IM/IN (max initial dose 100 mcg); May repeat x 1 after 10-15 minutes at 0.5 mcg/kg (maximum second dose 50 mcg).
   a. IV/IO is a slow push over 2-3 minutes.

   -OR-

   MORPHINE SULFATE 5 mg slow IV/IO or **10 mg IM**. May repeat IV/IO dose x 1 after 15 min if needed.
4. Continuous monitoring of patient with cardiac monitor, continuous SpO2 and capnography is required.

Paramedic

1. Continue **ILS TREATMENT**

Medical Control

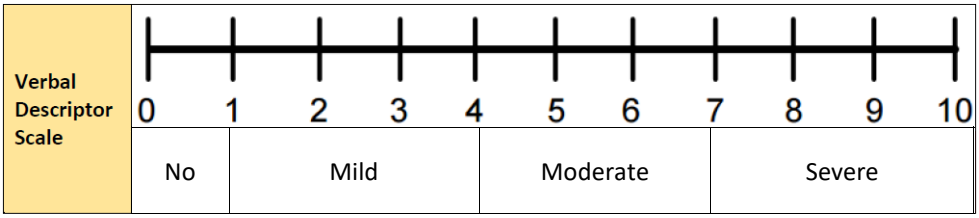
2. Consider **KETAMINE 0.2 mg/kg IV/IO Infusion** (max 25 mg) in 100 mL NS given over 10-15 min for pain refractory to opiates or in patients with hemodynamic compromise
   a. *Contraindicated* in patients with uncontrolled hypertension or known allergy.

Adult General

Pain Management

PEARLS

- All patients should have drug allergies identified prior to administration of pain medication.
- Pain severity (0 - 10) should be recorded before and after analgesic medication administration and upon arrival at destination.
- Opioids contraindicated in patients with GCS less than 15, hypotension, identified medication allergy, hypoxia (oxygen saturation less than 90%) after maximal supplemental oxygen therapy, or signs of hypoventilation.
- Use of splinting techniques and application of ice should be done to reduce the total amount of medication used to keep the patient comfortable.
- Patients with acute abdominal pain should receive analgesic interventions – Use of analgesics for acute abdominal pain does not mask clinical findings or delay diagnosis.



Descriptive Scale	Alert Smiling	No Humor Serious, Flat	Furrowed Brow Pursed Lips Breath Holding	Wrinkled Nose Raised Upper Lip Rapid Breathing	Slow Blink Open Mouth	Eyes Closed Moaning Crying
Activity Tolerance Scale	No Pain	Can be Ignored	Interferes with Tasks	Interferes with Concentration	Interferes with Basic Needs	Bed Rest Required

KEY DOCUMENTATION ELEMENTS

- Vitals signs
- Drug allergies
- Initial pain scale
- Medication administered and dose
- Reassessment with repeat vital signs and pain scale

PERTINENT ASSESSMENT FINDINGS

- Mental status (GCS and pain level)
- Respiratory system (chest rigidity)
- Gastrointestinal (assess for tenderness, rebound, guarding and nausea)

QUALITY METRICS

- Correct dose of pain medication
- Pain assessment documented

Patient Refusal

Criteria

- Patient and/or legal guardian refuses treatment and/or transport to the hospital.
- Patient is > 18 years old, or an emancipated minor.
- Patient is < 18 years old, and one of the following:
    a. Legal guardian is present.
    b. Legal guardian contacted from the scene and consents to refusal.
- Patient or legal guardian is competent and has the mental capacity to make an informed decision.
    a. Patient is alert, oriented and has the ability to understand the circumstances surrounding his / her illness or impairment, as well as the possible risks associated with refusing treatment and/or transport.
    b. The individual's judgement must also not be significantly impaired by illness, injury or drugs / alcohol intoxication.
    c. The "Quick Confusion Scale" was administered and patient received a score of greater than 11.
- Individuals who have attempted suicide, verbalized suicidal intent, or have other factors that lead EMS providers to suspect suicidal intent, should not be regarded as having decision-making capacity and may not decline transport to a medical facility.

All Levels

1. Ensure all refusal criteria are met in accordance with the *"Refusal of Service" Policy.*
2. Obtain a complete set of vital signs and complete an initial assessment, paying particular attention to the individual's neurologic and mental status.
3. Determine the individual's capacity to make a valid judgement concerning the extent of his / her illness or injury. Utilize the "Quick Confusion Scale" to help make determination of patients capacity. If the EMS provider has doubts about whether the individual has the mental capacity to refuse or if the patient lacks capacity, the EMS provider should contact Medical Control
4. Ask patient or guardian to explain reasons for refusal.
5. Clearly explain to the individual and all responsible parties the possible risks and overall concerns with regards to refusing care.
6. If patient or guardian does not demonstrate understanding risks of refusal, initiate care under implied consent.
7. If refusal represents a significant risk to the patient, based upon mechanism of injury or severity of illness, contact Medical Control for advice.
8. Perform appropriate medical care with consent of the individual.
9. If all criteria are met for refusal and risks of refusal have been explained, with reasonable understanding demonstrated by patient or guardian, refusal can be accepted and patient or guardian should sign refusal form.
10. If patient or guardian is unable or unwilling to sign, document circumstances.
11. Contact Medical Control as necessary.
12. Complete the patient care report clearly documenting the initial assessment findings and the discussions with all involved individuals regarding the possible consequences of refusing additional prehospital care and/or transportation.

Patient Refusal

PEARLS

- Refer to the *"Refusal of Service"* Policy.
- An adult or emancipated minor who has demonstrated possessing sufficient mental capacity for making decisions has the right to determine the course of his / her medical care, including the refusal of care. These individuals must be advised of the risks and consequences resulting from refusal of medical care.
- An individual determined to lack decision-making capacity by EMS providers should not be allowed to refuse care against medical advice or to be released at the scene. Mental illness, drugs, alcohol intoxication, or physical / mental impairment may significantly impair an individual's decision-making capacity. Individuals who have attempted suicide, verbalized suicidal intent, or have other factors that lead EMS providers to suspect suicidal intent, should not be regarded as having demonstrated sufficient decision-making capacity.
- The determination of decision-making capacity may be challenged by communication barriers or cultural differences.
- EMS providers should not put themselves in danger by attempting to treat and/or transport an individual who refuses care.
- Always act in the best interest of the patient – EMS providers, with the support of direct medical oversight, must strike a balance between abandoning the patient and forcing care.

KEY DOCUMENTATION ELEMENTS

- Document patient capacity with:
  - Any and all barriers to patient care
  - Physical Exam
  - Mental Status / Neuro Exam (AVPU & GCS)
  - Quick Confusion Scale
  - Alcohol and drug use indicators
  - Blood glucose level
- Any assessments and treatments performed
- Patient age
- For minors: guardian name, contact and relationship
- Patient was advised of risks / benefits of refusal / treatment
- Patient voices understanding of risks of refusal
- Patient was advised that they can changer their mind and re-contact EMS at anytime
- Reason for patient refusing care. A quotation of the patient's actual words is best.
- Medical Control Contact

PERTINENT ASSESSMENT FINDINGS

- Decision-Making Capacity
  a. An individual who is alert, oriented, and has the ability to understand the circumstances surrounding his / her illness or impairment, as well as the possible risks associated with refusing treatment and/or transport, typically is considered to have decision-making capacity.

  b. The individual's judgment must also not be significantly impaired by illness, injury or drugs / alcohol intoxication. Individuals who have attempted suicide, verbalized suicidal intent, or have other factors that lead EMS providers to suspect suicidal intent, should not be regarded as having decision-making capacity and may not decline transport to a medical facility.
- Quick Confusion Scale

QUALITY METRICS

- Patient decision-making capacity was determined and documented
- Guardians contacted or efforts to contact the guardians for minor patients who are not or cannot be confirmed to be emancipated
- Medical direction was contacted as indicated by protocol

Patient Refusal
-Quick Confusion Scale-

The Quick Confusion Scale				
Item	**Scoring System**			
	# Correct	X weight	=	Total
What year is it now?	0 or 1 (score 1 if correct and 0 if incorrect)	2	=	
What month is it?	0 or 1	2	=	
Present memory phrase: "Repeat this phrase after me and remember it: **John Brown 42 Market Street, New York."**				
About what time is it?	0 or 1	2	=	
Count backward from 20 to 1.	0, 1, or 2	1	=	
Say the months in reverse.	0, 1, or 2	1	=	
Repeat the memory phrase. (each underlined portion correct is worth 1 point)	0, 1, 2, 3, 4 or 5	1	=	
Final score is the sum of the totals:			=	

Adapted from: Huff JS, Farace E, Brady WJ, et al. The quick confusion scale in the ED: Comparison with the mini-mental state examination. *Am J Emerg Med* 2001;19:461-464

Explanation of Scoring for Quick Confusion Scale	
The highest number in category indicates correct response; decreased scoring indicates increased number of errors	
What year is it now?	Score 1 if answered correctly, 0 if incorrect.
What month is it?	Score 1 if answered correctly, 0 if incorrect.
About what time is it?	Answer considered correct if within one hour: score 1 if correct, 0 if incorrect
Count backward from 20 to 1.	Score 2 if correctly performed; score 1 if one error, score 0 if two or more errors
Say the months in reverse.	Score 2 if correctly performed; score 1 if one error, score 0 if two or more errors
Repeat the memory phrase: John Brown 42 Market Street, New York."	Each underlined portion correctly recalled is worth 1 point in scoring; score 5 if correctly performed; each error drops score by one.
Final Score is sum of the weighted totals; items one, two, and three are multiplied by 2 and summed with the other item scores to yield the final score.	

Adapted from: Huff JS, Farace E, Brady WJ, et al. The quick confusion scale in the ED: Comparison with the mini-mental state examination. *Am J Emerg Med* 2001;19:461-464

Max score = 15. Score $\leq$ 11 likely cognitive impairment; score $\leq$7 = substantial impairment.

Irons MJ, Farace E, Brady WJ, Huff JS: Mental status screening of emergency department patients: Normative study of the Quick Confusion Scale. Acad Emerg Med 2002; 9:989-994.

Patient Refusal

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Radio Report

All Levels

1. Unit must identify call letters, level of service and city of origin.
    a. Non-transport agencies may use MERCI, local radio frequency or cellular phone to communicate with Medical Control.
    b. Report should be called to receiving facility on all transports.
2. Standard report:
    a. ETA
    b. Age and sex
    c. Mechanism of injury / Nature of illness
    d. Pertinent findings
    e. Vital Signs
    f. Patient care / interventions
3. Orders must be confirmed when received from Medical Control by repeating them verbatim back to Medical Control for verification and clearly documented in the patient care report.
4. In the event of communications system failure, protocols may be used as listed, including Medical Control considerations. Protocol usage must be documented by risk screen and submitted to the EMS system office within 24 hours.
5. In the event that a provider deviates from these protocols, a completed risk screen with written explanation must be completed and submitted to the EMS Medical Director within 24 hours of the occurrence.

Radio Report

PEARLS

- Radio communications is a vital component of prehospital care. Information reported should be concise and provide an accurate description of the patient's condition as well as treatment rendered.
- Early and timely notification of Medical Control or the receiving facility is essential for prompt care to be delivered by all involved.
- Whenever possible, the EMS provider responsible for the highest level of direct patient care should call in the report.

KEY DOCUMENTATION ELEMENTS

- Document report given to receiving hospital
- Document any orders given verbatim as well as name of ordering physician

PERTINENT ASSESSMENT FINDINGS

QUALITY METRICS

Termination of Resuscitation

EMT-Intermediate & Paramedic

1. Contact **MEDICAL CONTROL** to consider Termination of Resuscitation for any of the following:

MEDICAL

- Patient is at least 18 years of age.
- Patient is in cardiac arrest at the time of arrival of advanced life support.
    i. No pulse (carotid and femoral confirmed by two EMS providers)
    ii. No respirations
    iii. No evidence of meaningful cardiac activity (e.g. asystole or wide complex PEA less than 60 bpm, no heart sounds)
- All three of the following are true:
    i. Arrest not witnessed by EMS personnel.
    ii. No Return of Spontaneous Circulation (ROSC) after at least 20 minutes of high quality CPR / ACLS with a patent airway and $EtCO_2$ < 10 mmHg.
    iii. No defibrillation delivered / non-shockable rhythm.
- No evidence or suspicion of hypothermia.
- All EMS personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate.
- Contact **MEDICAL CONTROL** to consider termination of resuscitation if patient meets above criteria.
- For patients with narrow complex PEA with a rate above 40 or refractory and recurrent ventricular fibrillation / ventricular tachycardia, consider continuation of resuscitation and transport.

TRAUMA

- Patient is at least 18 years of age.
- Resuscitation efforts may be terminated in any blunt trauma patient who based on thorough primary assessment, upon EMS arrival, is found to be pulseless, apneic and asystolic.
- Resuscitation efforts may be terminated in any penetrating trauma patient who based on thorough primary assessment, upon EMS arrival, is found to be pulseless, apneic and without other signs of life, including spontaneous movement, ECG activity and pupillary response
- Cardiopulmonary arrest patients in whom mechanism of injury does not correlate with clinical condition, suggesting a non-traumatic cause of arrest, should have standard ALS resuscitation initiated. Refer to CARDIAC ARREST Protocol.
- All EMS personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate.
- Contact **MEDICAL CONTROL** to consider termination of resuscitation if patient meets above criteria.

2. If transport is initiated, resuscitation must be continued until arrival at the receiving hospital.
3. Once termination of resuscitation orders have been received and death confirmation has been made by medical control:
    a. Immediately notify the coroner or medical examiners office.
    b. Do NOT leave a body unattended. EMS should remain on scene until the coroner arrives or law enforcement is on scene.
    c. Do NOT remove any property from the body or the scene.
    d. Never transport / move a body without permission from the coroner's office except for assessment or its protection.

Termination of Resuscitation

PEARLS

- When there is no response to prehospital cardiac arrest treatment, it is acceptable and often preferable to cease futile resuscitation efforts in the field.
- Recent evidence has shown that, in order to capture over 99% of potential survivors from medical cardiac arrest (especially VF and pulseless VT arrests), resuscitation should be continued for approximately 40 minutes. This does not imply, however, that all resuscitations should continue this long (e.g. asystolic rhythms)
- Logistical factors should be considered, such as collapse in a public place, family wishes, and safety of the crew and public.
- Survival and functional neurologic outcomes are unlikely if ROSC is not obtained by EMS. It is dangerous to crew, pedestrians, and other motorists to attempt to resuscitate a patient during ambulance transport.
- Quantitative end-tidal carbon dioxide measurements of less than 10 mmHg or falling greater than 25% despite resuscitation indicates a poor prognosis and provide additional support for termination
- In patients with cardiac arrest, prehospital resuscitation is initiated with the goal of returning spontaneous circulation before permanent neurologic damage occurs. In most situations, ALS providers are capable of performing an initial resuscitation that is equivalent to an in-hospital resuscitation attempt, and there is usually no additional benefit to emergency department resuscitation in most cases.
- CPR that is performed during patient packaging and transport is much less effective than CPR done at the scene. Additionally, EMS providers risk physical injury while attempting to perform CPR in a moving ambulance while unrestrained. In addition, continuing resuscitation in futile cases places other motorists and pedestrians at risk, increases the time that EMS crews are not available for another call, impedes emergency department care of other patients, and incurs unnecessary hospital charges. Lastly, return of spontaneous circulation is dependent on a focused, timely resuscitation. The patient in arrest should be treated as expeditiously as possible, including quality, uninterrupted CPR and timely defibrillation as indicated.
- When cardiac arrest resuscitation becomes futile, the patient's family should become the focus of the EMS providers. Families need to be informed of what is being done, and transporting all cardiac arrest patients to the hospital is not supported by evidence and inconveniences the family by requiring a trip to the hospital where they must begin grieving in an unfamiliar setting. Most families understand the futility of the situation and are accepting of ceasing resuscitation efforts in the field.

KEY DOCUMENTATION ELEMENTS

- Documentation of all details / criteria surrounding decision to terminate resuscitation
  - Signs / Factors of death
  - Time of contact with Medical Control
  - Time of death confirmation
  - Name of Physician giving death confirmation

PERTINENT ASSESSMENT FINDINGS

- Pulse
- Respirations
- Neuro status
- ECG activity
- $EtCO_2$

QUALITY METRICS

- Time to CPR
- Time to AED / Defibrillator application if applicable and/or defibrillation
- Review of CPR quality
- Duration of resuscitative efforts
- Review of biometric data / CPR quality if available
- Appropriateness of termination

Abdominal Pain

History
- Age
- Past Medical / Surgical History
- Medications
- Onset
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (0-10)
- Time (duration / repetition)
- Fever
- Last oral intake
- Last bowel movement / Emesis
- Menstrual history (pregnancy)

Signs and Symptoms
- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding / discharge
- Pregnancy

Differential
- Pneumonia or pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic Ulcer Disease / Gastritis
- Gallbladder
- Myocardial Infarction
- Pancreatitis
- Kidney stone
- Abdominal Aortic Aneurysm
- Appendicitis
- Bladder / Prostate disorder
- Pelvic (PIC, Ectopic pregnancy, Ovarian cyst)
- Splenomegaly
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)

EMR

1. **UNIVERSAL PATIENT CARE**.
2. Maintain the patient NPO (nothing by mouth).
3. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. Consider management of nausea/vomiting per the NAUSEA / VOMITING Protocol.
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue EMR / BLS TREATMENT.
2. Establish IV access.
3. Consider management of nausea/vomiting per the NAUSEA / VOMITING Protocol.
4. Consider management of pain per the PAIN MANAGEMENT Protocol.
5. If signs of shock refer to SHOCK Protocol.

Abdominal Pain

PEARLS

- Abdominal pain / nausea / vomiting is a common finding associated with acute coronary syndrome. Consider obtaining a 12-lead ECG when appropriate.
- Assess for life-threatening causes of abdominal pain, which may include:

Ischemic, necrotic, or perforated bowel
- ◊ Severe tenderness
- ◊ Abdominal pain with motion or "jiggling" of abdomen
- ◊ Fever
- ◊ Bloody stool
- ◊ Nausea and vomiting
- ◊ Possible absence of passage of stool or gas
- ◊ Abdominal distention, with possible tympany to percussion

Dissecting or Ruptured Abdominal Aortic Aneurysm
- ◊ Unequal femoral or distal lower extremity pulses
- ◊ "Pulsatile" abdominal mass
- ◊ Associated back pain and/or chest pain
- ◊ Known history of AAA

Ruptured ectopic pregnancy
- ◊ Vaginal bleeding
- ◊ Recently diagnosed pregnancy

Appendicitis
- ◊ Focal right lower quadrant tenderness
- ◊ RLQ tenderness during palpation of LLQ (Rovsing's sign)
- ◊ Peri-umbilical or diffuse abdominal tenderness with palpation or "jiggling" of the abdomen/pelvis
- ◊ Fever
- ◊ Nausea, vomiting
- ◊ Lack of appetite

Acute Cholecystitis
- ◊ Right upper quadrant or epigastric tenderness
- ◊ Fever
- ◊ Nausea, vomiting
- ◊ Possible history of gallstones

Pyelonephritis
- ◊ Fever
- ◊ Nausea, vomiting
- ◊ Urinary frequency / urgency
- ◊ Dysuria
- ◊ Hematuria
- ◊ Back / Flank pain
- ◊ Costovertebral angle tenderness to percussion

KEY DOCUMENTATION ELEMENTS

- Assessment of abdomen to include findings on palpation / percussion including presence or absence of masses and presence and nature of tenderness / pain
- Treatment and response to treatment

PERTINENT ASSESSMENT FINDINGS

- Rebound tenderness or guarding
- Abdominal distension
- Tenderness focal to a specific abdominal quadrant
- Presence of "pulsatile" abdominal mass
- Rectal bleeding, hematemesis, vaginal bleeding

QUALITY METRICS

- Assessment for life-threatening etiology
- Treatment of pain per the Pain Management Protocol

Agitated or Violent Patient / Behavioral Emergencies

History
- Situational crisis
- Psychiatric illness / medications
- Injury to self or threats to others
- Medical alert tag
- Substance abuse / overdose
- Diabetes

Signs and Symptoms
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative / Violent
- Expression of suicidal / homicidal thoughts

Differential
- *See Altered Mental Status differentials*
- Alcohol intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression / Anxiety disorder
- Bipolar (manic-depressive)
- Schizophrenia
- Seizure / Postictal

EMR, EMT-Basic & EMT-Intermediate

1. **UNIVERSAL PATIENT CARE**.
   a. Maintain and support airway.
   b. Note respiratory status—monitor pulse oximetry. Capnography should also be used if available.
   c. Check blood glucose level.
2. Note medications / substances on scene that may contribute to the agitation or may be relevant to the treatment of a contributing medical condition.
3. If a medical or traumatic condition is suspected as the cause of the behavior, refer to the appropriate protocol.
4. Establish patient rapport
   a. Attempt verbal reassurance and calm patient prior to use of pharmacologic and/or physical management devices.
   b. Engage family members / loved ones to encourage patient cooperation if their presence does not exacerbate the patient's agitation.
   c. Continued verbal reassurance and calming of patient following use of chemical / physical management devices.
5. Physical Management Devices (*See PHYSICAL RESTRAINTS Procedure)*
   a. Patient must be out of control and a threat to themselves and/or others.
   b. If physical restraint is required, make sure adequate personnel are present. This generally means four people, one for each of the patient's extremities.
   c. Stretcher straps should be applied as the standard procedure for all patients during transport.
   d. Secure all four extremities to the stationary frame of the stretcher if needed.
   e. Physical management devices, including stretcher straps, should never restrict the patient's chest wall motion.
6. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

Protocol Continues

Agitated or Violent Patient / Behavioral Emergencies

Paramedic

1. Continue **EMR / BLS / ILS TREATMENT**.
2. Sedate patient as necessary based on patient's presentation and potential for self-harm. Contact medical control prior to sedation if questions / concerns exist regarding care.
3. Administer **MIDAZOLAM** or **KETAMINE** as per the Richmond Agitation-Sedation Scale below.
   - **MIDAZOLAM**
     - **IV/IM/IN: 5 mg**; May repeat after max onset up to a maximum total dose of 10 mg.

       Onset: IV: 3-5 min; IM: 10-15 min; IN: 3-5 min
   - **KETAMINE****
     - **IM: 4 mg/kg** (Maximum dose 400mg)
       - *Onset: 3-5 minutes*
     - **IV: 2 mg/kg** (Maximum dose 400mg)
       - *Onset: 1 minute*
4. If sedation is used, continuous cardiac, pulse oximetry and $EtCO_2$ monitoring and vital signs every 5 minutes are required.

   ** If Ketamine is used, the ECIEMS office shall be notified within 24 hours for QA.

Richmond Agitation-Sedation Scale

Score	Term	Description	ECIEMS Treatment
+4	Combative	Overtly combative, violent, immediate danger to staff	**MIDAZOLAM or KETAMINE****
+3	Very agitated	Pulls or removes tubes and	**MIDAZOLAM**
+2	Agitated	Frequent, nonpurposeful movements, fights interventions	**MIDAZOLAM**
+1	Restless	Anxious but movements are not aggressive or vigorous	Verbal reassurance and calm patient
0	**Alert and Calm**		
-1	Drowsy	Not fully alert but has sustained awakening and eye contact to voice (> 10 seconds)	
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds)	
-3	Moderate Sedation	Movement or eye opening to voice	
-4	Deep Sedation	No response to voice but movement or eye opening to physical stimulation	
-5	Unarousable	No response to voice or physical	

Agitated or Violent Patient / Behavioral Emergencies

Patient Safety Considerations

The management of violent patients requires a constant reevaluation of the risk / benefit balance for the patient and bystanders in order to provide the safest care for all involved. These are complex and high-risk encounters. There is no one size fits all solution for addressing these patients.

1. Don PPE.
2. Do not attempt to enter or control a scene where physical violence or weapons are present.
3. Dispatch law enforcement immediately to secure and maintain scene safety.
4. Urgent de-escalation of patient agitation is imperative in the interest of patient safety as well as for EMS personnel and others on scene.
5. Uncontrolled or poorly controlled patient agitation and physical violence can place the patient at risk for sudden cardiopulmonary arrest due to the following etiologies:
    a. Delirium with agitated behavior: A postmortem diagnosis of exclusion for sudden death thought to result from metabolic acidosis (most likely from lactate) stemming from physical agitation or physical control measures and potentially exacerbated by stimulant drugs (e.g. cocaine) or alcohol withdrawal.
    b. Positional asphyxia: Sudden death from restriction of chest wall movement and/or obstruction of the airway secondary to restricted head or neck positioning resulting in hypercarbia and/or hypoxia.
6. Apply a cardiac monitor as soon as possible, particularly when pharmacologic management medications have been administered.
7. All patients who have received pharmacologic management medications must be monitored closely for the development of hypoventilation and oversedation.
    a. Must utilize capnography
8. Placement of stretcher in sitting position prevents aspiration and reduces the patient's physical strength by placing the abdominal muscles in the flexed position.
9. Patients who are more physically uncooperative should be physically secured with one arm above the head and the other arm below the waist, and both lower extremities individually secured.
10. The following techniques should be expressly prohibited by EMS providers:
    a. Secure or transport in a prone position with or without hands and feet behind the back (hobbling or "hog-tying").
    b. "Sandwiching" patients between backboards.
    c. Techniques that constrict the neck or compromise the airway.
    d. EMS provider use of weapons as adjuncts in managing a patient.

Agitated or Violent Patient / Behavioral Emergencies

PEARLS

- Direct medical oversight should be contacted at any time for advice, especially when patient's level of agitation is such that transport may place all parties at risk.
- Stretchers with adequate foam padding, particularly around the head, facilitates patient's ability to self-position the head and neck to maintain airway patency.
- For patients with key-locking devices, applied by another agency, consider the following options:
    a. Remove device and replace it with a device that does not require a key.
    b. Administer pharmacologic management medication then remove and replace device with another non-key-locking device after patient has become more cooperative.
    c. Transport patient, accompanied in patient compartment by person who has device key.

Use SAFER model:

Stabilize the situation by containing and lowering the stimuli (remove unnecessary personnel, remove patient from stress, reassure, calm and establish rapport.) Keep hands in front of your body (non-threatening posture.) Only one provider should communicate with patient. Outline the patient's choices and calmly set some boundaries of acceptable behavior.

Assess and acknowledge crisis by validating patient's feelings and not minimizing them.

Facilitate resources (Friends, family, police, chaplain).

Encourage patient to use resources available and take actions in their best interest.

Recovery or referral: Leave patient in care of responsible person, professional or transport to medical facility.

KEY DOCUMENTATION ELEMENTS

- Etiology of agitated or violent behavior if known
- Patient's medications, other medications or substances found on scene
- Patients medical history
- Physical evidence or history of trauma
- Adequate oxygenation by pulse oximetry
- Blood glucose measurement
- Measures taken to establish patient rapport
- Dose, route, number of doses and response of medications administered
- Number and physical sites of placement of restraints
- Duration of placement of restraints
- Repeated assessment of ABC's

PERTINENT ASSESSMENT FINDINGS

- Continuous monitoring of:
    a. Airway patency
    b. Respiratory status with pulse oximetery and capnography
    c. Circulatory status with frequent blood pressure measurements
    d. Mental status and trends in level of patient cooperation
    e. Cardiac status, especially if the patient has received pharmacologic management medication
    f. Extremity perfusion with capillary refill in patients in physical management device

QUALITY METRICS

- Incident of injuries to patient, EMS personnel or others on scene or during transport
- Medical or physical complications (including sudden death) in patients
- Use of Ketamine triggers Medical Director review

Allergic Reaction / Anaphylaxis

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medication history

Signs and Symptoms
- Itching or urticaria
- Coughing, wheezing, or respiratory distress
- Chest tightness or throat constriction
- Hypotension or shock
- Persistent gastrointestinal symptoms (nausea, vomiting, and diarrhea)
- Altered mental status

Differential
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

EMR

1. **UNIVERSAL PATIENT CARE**.
2. If signs of anaphylaxis, administer and/or assist patient with **EPINEPHRINE AUTOINJECTOR** if available.
3. If respiratory distress with wheezing is present administer **DuoNeb** nebulizer.
4. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. If signs of anaphylaxis, administer **EPINEPHRINE (1:1,000) 0.3 mg IM**.
3. May repeat **DuoNeb** nebulizer x2, if needed for continued symptomatic relief.
4. For non-anaphylactic allergic reactions, consider **DIPHENHYDRAMINE 50 mg PO**.
5. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **BLS TREATMENT**.
2. If signs of anaphylaxis persist, repeat **EPINEPHRINE (1:1,000) 0.3 mg IM** every 5-15 minutes. (Max 3 doses)
3. Establish IV access.
4. Administer **NORMAL SALINE 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
5. **DIPHENHYDRAMINE 50 mg IM/IV/IO/PO**. (Not to be repeated if already given by BLS provider)
6. **METHYLPREDNISOLONE 125 mg IV/IM**.

   Alternative medication: **DEXAMETHASONE 0.6 mg/kg IV/IM (maximum 10 mg)**
7. Closely monitor respiratory status with/IM waveform capnography and reassess need for intubation if respiratory symptoms worsen or do not improve with treatment. See AIRWAY MANAGEMENT Protocol.

Allergic Reaction / Anaphylaxis

PEARLS

- Allergic reactions and anaphylaxis are serious and potentially life-threatening medical emergencies.
- The shorter the onset from exposure to symptoms, the more severe the reaction.
- Localized allergic reactions (e.g. urticarial or angioedema that does not compromise the airway) may be treated with antihistamine therapy.
- Anaphylaxis should always be treated with Epinephrine as first-line treatment.
- Cardiovascular collapse may occur abruptly, without the prior development of skin or respiratory symptoms.
- Always perform cardiac monitoring when administering Epinephrine
  -Cardiac monitoring should not delay administration of Epinephrine

Severity

- **Anaphylaxis**—More severe and characterized by an acute onset involving:
  1) Skin (urticaria) and/or mucosa with either respiratory compromise or hypotension (SBP < 90 mmHg) or signs of end-organ dysfunction **-OR-**
  2) Hypotension (SBP < 90 mmHg) for that patient after exposure to a known allergen **-OR-**
  3) Two or more of the following occurring rapidly after exposure to a likely allergen:
     i. Skin and/or mucosal involvement (urticaria, itchy, swollen tongue / lips)
     ii. Respiratory compromise (dyspnea, wheezing, stridor, hypoxemia)
     iii. Persistent gastrointestinal symptoms (vomiting, abdominal pain, diarrhea)
     iv. Hypotension or associated symptoms (syncope, hypotonia, incontinence)
- **Non-Anaphylactic Allergic Reaction**—Signs involving only **one** organ system (e.g. localized angioedema that does not compromise the airway or not associated with vomiting; urticaria alone).

KEY DOCUMENTATION ELEMENTS

- Medications given
- Dose and concentration of Epinephrine given
- Route of Epinephrine administration
- Time of Epinephrine administration
- Signs and symptoms of the patient
- Waveform capnography for anaphylaxis

PERTINENT ASSESSMENT FINDINGS

- Presence or absence of angioedema
- Presence or absence of respiratory compromise
- Presence or absence of circulatory compromise
- Localized or generalized urticaria
- Response to therapy

QUALITY METRICS

- Percentage of patients with anaphylaxis that receive Epinephrine
- Airway assessment documented

Altered Mental Status

History
- History from bystanders
- Environment where patient found
- Recent complaints
- Medical alert tags. Accessory medical devices
- Diabetes
- History of trauma
- Drugs, drug paraphernalia
- Past medical history
- Medications

Signs and Symptoms
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia
- Hyperglycemia
- Irritability

Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection
- Thyroid
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Immobilize cervical spine if suspected spinal injury.
3. Check blood glucose level.
4. If blood glucose < 60 mg/dL (or suspected) and patient is conscious with an intact gag reflex, administer **ORAL GLUCOSE one tube (15g)**.
5. Perform Prehospital Stroke Screen. If stroke screen is positive, refer to STROKE Protocol.
6. If opioid overdose suspected and airway compromise or inadequate respiratory effort present refer to POISONING AND OVERDOSE Protocol.
7. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. If blood glucose < 60 mg/dL, administer **DEXTROSE 10% (D10) 25 g**; administer in **50 mL (5g)** IV aliquots.

   Alternative medication: **DEXTROSE 50% (D50) 25 g IV**.
4. Repeat blood glucose. Consider repeating the dose if blood glucose < 60 mg/dL, with symptoms of hypoglycemia.
5. If no IV access available, administer **GLUCAGON 1 mg IM/IN**.
6. If opioid overdose suspected and airway compromise or inadequate respiratory effort present refer to POISONING AND OVERDOSE Protocol.
7. Reassess need for intubation. Refer to the AIRWAY MANAGEMENT Protocol.

Altered Mental Status

PEARLS

- Altered mental status may be caused by many factors including the following: stroke, drug overdose, infection, hypoglycemia, hyperglycemia or trauma.
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure, and protect personal safety and that of other responders.
- A careful assessment of the patient, the scene and the circumstances should be undertaken.
- Pay careful attention to the head exam for signs of trauma / injury.
- DO NOT assume recreational drug use and/or alcohol are the sole reasons for Altered Mental Status.
- DO NOT assume Altered Mental Status is the result solely of an underlying psychiatric etiology.
  - Underlying medical or trauma conditions can precipitate a deterioration of a patient's underlying mental health disease.

GLASGOW COMA SCALE (GCS)

Behavior	Response	Score
Eye Opening	Spontaneous	4
	To Verbal	3
	To Pain	2
	None	1
Verbal Response	Oriented	5
	Confused	4
	Inappropriate Words	3
	Incomprehensible Sounds	2
	None	1
Best Motor Response	Obeys Commands	6
	Localizes Pain	5
	Withdraws from Pain	4
	Flexion to Pain	3
	Extension to Pain	2
	None	1

KEY DOCUMENTATION ELEMENTS

- GCS or AVPU description
- Pupil, neck and head exam were done
- Glucose was documented
- Temperature was taken when able
- Patient and medic safety were considered

PERTINENT ASSESSMENT FINDINGS

- Track marks
- Breath odor
- Skin temperature
- Focal neurologic changes
- Location

QUALITY METRICS

- Hypoglycemia considered and treated appropriately
  - Blood glucose level obtained
- Naloxone is used as therapeutic intervention, not a diagnostic tool

Bronchospasm / Asthma / COPD

History
- Asthma, COPD, Chronic Bronchitis, Emphysema history
- Onset of symptoms
- Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, FBAO)
- Usual triggers of symptoms (cigarette smoke, change in weather, URI)
- Home treatment (oxygen, nebulizers)
- Sick contacts
- Previously intubated

Signs and Symptoms
- Shortness of breath (inability to speak full sentences)
- Wheezing, rhonchi
- Fever, cough, congestion
- Respiratory distress (hypoxia, retractions, nasal flaring, pursed lip breathing, tripoding, cyanosis, tachypnea, etc)

Differential
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Give supplemental oxygen as needed to a target of 94-98% saturation. Escalate from a nasal cannula as needed.
    a. Non-invasive ventilation (NIV) should be administered for severe respiratory distress via a BVM.
3. **DuoNeb** by nebulizer. May repeat x2 if needed for continued symptomatic relief.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT**.
    a. Ensure continuous cardiac monitoring, pulse oximetry and $EtCO_2$.
2. Establish IV access.
3. **METHYLPREDNISOLONE 125 mg IV/IM**.

    Alternative medication: **DEXAMETHASONE 0.6 mg/kg IV/IM (maximum 10 mg)**
4. Consider CPAP application for severe respiratory distress.
5. Assist ventilations with in-line nebulizer kit and BVM if necessary.
6. Reassess need for intubation if respiratory symptoms worsen or do not improve with treatment.
7. Call for intercept per INTERCEPT CRITERIA.

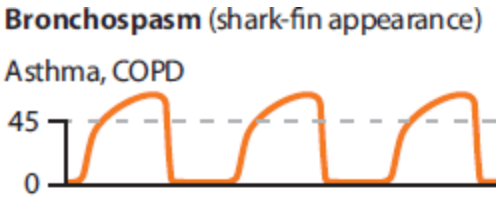
Paramedic

1. Continue **ILS TREATMENT.**
2. In patients with persistent respiratory distress despite the above treatment, consider **MAGNESIUM SULFATE 2 grams IV** in 50 mL NS over 10-15 minutes
3. Continue to monitor need for intubation if respiratory symptoms worsen or do not improve with treatment. See AIRWAY MANAGEMENT Protocol.
4. If in severe distress with impending respiratory failure, consider **EPINEPHRINE (1:1,000)** at **0.3 mg IM**.

Bronchospasm / Asthma / COPD

PEARLS

- Pulse oximetry and end-tidal CO2 ($EtCO_2$) should be routinely used as an adjunct to other forms of respiratory monitoring.



- Normal $EtCO_2$ (35-45 mmHg) with tachypnea and respiratory distress is an indicator of impending respiratory failure.
- Beware of patients with a "silent chest" (absent breath sounds) as this may indicate severe bronchospasm and impending respiratory failure.
- Remember that not all wheezing is caused by asthma and that not all asthmatics wheeze.
  - Patients with congestive heart failure may present with lung sounds that mimic asthma ("cardiac wheeze")
- Consider cardiac etiology for shortness of breath and/or chest pain and refer to CHEST PAIN protocol.
- In the asthmatic patient, pharmacologic intervention should take priority over CPAP and be given in line with CPAP.
- CPAP should not be initiated on patients with a systolic BP < 90mmHg. CPAP increases intrathoracic pressure and can decrease venous return to the heart (compromising the patient's perfusion). Contact Medical Control and use CPAP cautiously if the systolic BP is between 90-100 mmHg for the same reason.
- Invasive airways do not improve bronchospasm. The airway should be managed in the least invasive way possible. Supraglottic devices and endotracheal intubation should be considered only if BVM ventilation fails.
- Positive pressure ventilation in the setting of bronchoconstriction, either via a supraglottic airway or intubation, increases the risk of air trapping which can lead to pneumothorax and cardiovascular collapse. These interventions should be reserved for situations of respiratory failure.

KEY DOCUMENTATION ELEMENTS

- Reparatory rate
- Oxygen saturation and $EtCO_2$
- Use of accessory muscles
- Breath sounds
- Air entry
- Mental status
- Color
- Response to interventions

PERTINENT ASSESSMENT FINDINGS

- In the setting of severe bronchoconstriction, wheezing might not be heard. Patients with known asthma who complain of chest pain or shortness of breath should be empirically treated, even if wheezing is absent.

QUALITY METRICS

- CPAP utilization
- Utilization of continuous pulse oximetry and $EtCO_2$

Diabetic Emergencies

History
- Past medical history
- Medications (insulin, etc.)
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / Irritable
- Seizures
- Nausea / Vomiting
- Dehydration
- Diaphoresis
- Weakness
- Signs of DKA (abdominal pain, fruity breath, Kussmaul respirations)

Differential
- Alcohol / Drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- Stroke
- Altered mental status
- Diabetic Ketoacidosis

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Check a blood glucose level.
3. If blood glucose < 60 mg/dL (or suspected) **and** patient is conscious with an intact gag reflex, administer **ORAL GLUCOSE one tube (15g) PO**.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. If blood glucose < 60 mg/dL, administer **DEXTROSE 10% (D10) 25 g**; administer in **50 mL (5g)** IV aliquots.

   Alternative medication: **DEXTROSE 50% (D50) 25 g IV**.
4. Repeat blood glucose. Consider repeating the dose if blood glucose < 60 mg/dL, with symptoms of hypoglycemia.
5. If no IV access available, administer **GLUCAGON 1 mg IM/IN**. May repeat in 5 minutes if no change in LOC.
6. If blood glucose > 300 mg/dL, administer **NORMAL SALINE 20 mL/kg** fluid bolus. Reassess and re-bolus as needed as lungs remain clear.

Hypoglycemia Refusal Criteria

☎ **Must contact Medical Control** ☎

- Repeat glucose is greater than 80 mg/dL.
- Patient is a known diabetic.
- Patient returns to normal mental status, with no focal neurologic signs / symptoms after receiving glucose / dextrose.
- Patient can promptly obtain and will eat a carbohydrate meal.
- Patient or legal guardian refuses transport and EMS providers agree transport not indicated.
- A reliable adult will be staying with patient.
- No major co-morbid symptoms exist, like chest pain, shortness of breath, seizures, intoxication.
- A clear cause of the hypoglycemia is identified (e.g. missed meal).

Diabetic Emergencies

PEARLS

Hypoglycemia

- Dextrose 10% is the preferred formulation for administration for hypoglycemia.
  - There are no statistically significant differences in the median recovery time following administration of D10% versus D50%.
- Dextrose 50% can cause local tissue damage if it extravasates from vein, and may cause overshoot hyperglycemia.
- Patients taking oral diabetic medications (particularly Sulfonylureas, i.e. glyburide, glipizide) and/or long acting insulin, should be encouraged to allow transportation to a medical facility as they are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established.
- Patients who meet criteria to refuse care after a hypoglycemic event should be instructed to contact their physician and consume a meal.
- If possible, have family / patient turn off insulin pumps.
- Consider potential for intentional overdose of hypoglycemic agents.

Hyperglycemia

- Consider causes for hyperglycemia by thinking about the 3 I's:
  a. Insulin – this refers to any medication changes for insulin or oral medications including poor compliance or malfunctioning insulin pump.
  b. Ischemia – this refers to hyperglycemia sometimes being an indication of physiologic stress in a patient and can be a clue to myocardial ischemia in particular.
  c. Infection – underlying infection can cause derangements in glucose control
- Diabetic ketoacidosis (DKA) is a life-threatening emergency defined as uncontrolled hyperglycemia and the signs and symptoms of ketoacidosis.
  Signs and symptoms of DKA include uncontrolled blood glucose usually greater than 250 mg/dL, weakness, altered mental status, abdominal pain, nausea, vomiting, polyuria (excessive urination), polydipsia (excessive thirst), fruity odor on the breath (from ketones), or tachypnea (Kussmaul respirations—low $EtCO_2$).
- Hyperglycemic Hyperosmolar Nonketotic State (HHNS) is characterized by blood glucose levels usually greater than 600 mg/dL and profound dehydration with significant neurologic deficits (e.g. coma, AMS).

KEY DOCUMENTATION ELEMENTS

- Document glucose level
- Document reassessment of vital signs and mental status after treatment
- Document patient capacity and contacting Medical Control for all diabetic refusals

PERTINENT ASSESSMENT FINDINGS

- Concomitant trauma
- Diaphoresis or hypothermia may be associated with hypoglycemia
- Abdominal pain, "fruity breath," and Kussmaul breathing may be associated with DKA

QUALITY METRICS

- Glucose level checked when appropriate.
- If patient released at scene, criteria documented for safe release.
- Hyper- / Hypoglycemia considered and treated appropriately

Foreign Body Airway Obstruction

History
- Time of onset of symptoms
- Associated symptoms
- Choking or other evidence of upper airway obstruction
- History of trauma

Signs and Symptoms
Sudden onset of respiratory distress:
- Coughing
- Wheezing
- Gagging
- Stridor
- Shortness of breath
- Abnormal color (cyanosis or pallor)

Differential
- Cardiac arrest
- Respiratory arrest
- Anaphylaxis
- Esophageal obstruction

All Levels

Conscious Patient – Able To Speak:

1. **UNIVERSAL PATIENT CARE**.
2. Leave patient alone; offer reassurance.
3. Encourage coughing.

Conscious Patient – Unable To Speak:

1. Administer abdominal thrusts / Heimlich maneuver until the foreign body is expelled or until the patient becomes unconscious.
2. After the obstruction is relieved, reassess the airway, lung sounds, skin color and vital signs.
3. **UNIVERSAL PATIENT CARE**.

Unconscious Patient:

1. Place patient in a supine position and begin chest compressions.
2. Open the airway and check for Foreign Body Airway Obstruction.
    a. If object is visible, remove foreign body.
    b. Caution using OPA or BIAD until airway is open as to not push the object farther into the airway.
3. If object is not visible, continue chest compressions until object dislodged.

EMT-Intermediate

Unconscious Patient:

1. Continue above treatment.
2. Perform advanced airway control measures as available, using the AIRWAY MANAGEMENT Protocol. Utilize Magill forceps as necessary.

Paramedic

Unconscious Patient:

1. Continue above treatment.
2. If unable to clear obstruction, consider surgical airway placement, as outlined in the AIRWAY MANAGEMENT Protocol.

Foreign Body Airway Obstruction

PEARLS

- If air exchange is adequate with a partial airway obstruction, do not interfere; instead, encourage the patient to cough up the obstruction. Continue to monitor the patient for adequacy of air exchange. If air exchange becomes inadequate, continue with the protocol.
- Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.

KEY DOCUMENTATION ELEMENTS

- Initial vital signs and physical exam
- Interventions attempted and the number of attempts to achieve a successful result
- Subsequent vital signs and physical exam to assess for change after interventions

PERTINENT ASSESSMENT FINDINGS

- Acute worsening of respiratory status or evidence of hypoxemia

QUALITY METRICS

Nausea / Vomiting

History
- Appearance of emesis (bloody, etc)
- Time of last meal
- Last bowel movement / emesis
- Improvement or worsening with food or activity
- Duration of symptoms
- Sick contacts
- Past medical history
- Past surgical history
- Medications
- Last Menstrual Period / Pregnancy
- Travel history
- Suspected food poisoning

Signs and Symptoms
- Fever
- Pain
- Constipation
- Diarrhea
- Anorexia
- Hematemesis

Differential
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic Ketoacidosis (DKA)
- Gynecologic disease (ovarian cyst, PID)
- Infections
- Electrolyte abnormalities
- Food or toxin induced
- Substance abuse
- Pregnancy
- Psychological

EMR

1. **UNIVERSAL PATIENT CARE**.
2. Consider trial of inhalation from an isopropyl alcohol prep pad.
3. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. Administer **ONDANSETRON ODT 4mg PO**.
    a. Contraindicated for suspected or known diagnosis of prolonged QT syndrome.
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Establish IV access.
3. Consider **NORMAL SALINE 500 mL bolus** for signs of dehydration. Repeat fluid bolus as needed; maximum **2 liters**.
4. Administer **ONDANSETRON 4 mg IV or IM** or **ONDANSETRON ODT 4mg PO**. May repeat 4mg dose x1 after 15 minutes (max total dose 8mg).
    a. Contraindicated for suspected or known diagnosis of prolonged QT syndrome.

Nausea / Vomiting

PEARLS

- Nausea and vomiting are symptoms of illness – in addition to treating the patient's nausea and vomiting a thorough history and physical are key to identifying what may be a disease in need of emergent treatment (e.g. bowel obstruction, myocardial infarction, pregnancy).
- Nausea / vomiting is a common finding associated with acute coronary syndrome. Consider obtaining a 12-lead ECG when appropriate.
- While ondansetron has not been adequately studied in pregnancy to determine safety, it remains a treatment option for hyperemesis gravidum in pregnant patient.
- Inhaled isopropyl alcohol has shown promise as an antiemetic and may be superior to oral ondansetron. The mechanism of isopropyl alcohol's antiemetic effect remains unclear.

April MD, Oliver JJ, Davis WT, et al. Aromatherapy versus oral ondansetron for antiemetic therapy among adult emergency department patients: a randomized controlled trial. *Ann Emerg Med*, 2018 Aug; 72(2): 184-93.

KEY DOCUMENTATION ELEMENTS

- Patient age
- Medications given, including time, provider level, dose, dose units, route, response and complications
- Vital signs before and after medication administration
- History and physical with regard to etiology of nausea/vomiting
- ECG performed and interpretation documented if cardiac risk factors are present

PERTINENT ASSESSMENT FINDINGS

- Vital signs
- Risk factors for heart disease / ECG if applicable
- Pregnancy status
- Abdominal exam

QUALITY METRICS

- In patients with nausea and vomiting, appropriate medication(s) was / were administered (including proper dosage) and the patient's response to treatment is documented

Respiratory Distress with a Tracheostomy Tube / Ventilator

History

- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Past medical history (bronchopulmonary dysplasia, muscular dystrophy, post-traumatic brain or spinal cord injury, etc.)
- History of tracheostomy
- Possibility of foreign body
- Concurrent symptoms (fever, cough, rhinorrhea, rash, labored breathing)
- Usual triggers of symptoms (cigarette smoke, change in weather, URI)
- Sick contacts

Signs and Symptoms

- Power or equipment failure at residence
- Wheezing, rhonchi, stridor
- Respiratory distress (hypoxia, retractions, nasal flaring, tripoding, cyanosis, tachypnea, etc)
- Shortness of breath (inability to speak full sentences)
- Copious secretions coming from tracheostomy tube
- Anxious appearing
- Fever, cough, congestion
- Tachycardia

Differential

- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Ventilator failure
- Asthma / Reactive Airway Disease
- Allergic Reaction / Anaphylaxis
- Aspiration
- Foreign body
- Pneumonia
- Congenital heart disease
- Medication or toxin
- Trauma

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Place patient in position of comfort.
3. Administer 100% **OXYGEN** per **tracheostomy collar**.
4. Evaluate for DOPE:
    b. **D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment Failure.
5. If tracheostomy tube is obstructed with secretions, suction tracheostomy tube.
    a. Remove inner catheter of tracheostomy tube and re-suction.
    b. Suction for no more than 10-15 seconds while withdrawing the suction catheter.
    c. 1-3 mL saline may be used to help loosen secretions.
6. If tracheostomy tube still remains obstructed have caregiver / family assist in changing tracheostomy tube if there is a spare tube available.
7. If tracheostomy tube still remains obstructed, ventilate with 100% **OXYGEN** via **Bag Valve Mask (BVM)**.
8. Consider **DuoNeb** by nebulizer. May repeat x2 if needed for continued symptomatic relief.
9. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Reassess patency of tracheostomy tube. If needed, replace tracheostomy tube with spare tracheostomy tube or appropriately sized ET tube into stoma.

Respiratory Distress with a Tracheostomy Tube / Ventilator

PEARLS

- Especially in pediatric tracheostomy patients with significant respiratory distress, plugging or dislodgement of the tracheostomy is the problem until proven otherwise.
- Pulse oximetry and end-tidal CO2 (EtCO2) should be routinely used as an adjunct to other forms of respiratory monitoring.
- Always talk to family / caregivers and use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: ask family / caregiver. No more than 3 to 6 cm typically.
- Do NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal.
- ETT size should be same as tracheostomy tube size. Also have a 0.5 size smaller available.

DOPE:

- **D**islodgement or misplaced tracheostomy (e.g., decannulation)
  - ◊ Assess for subcutaneous air in the neck which may indicate the tracheostomy is not in the trachea
  - ◊ Directly visualize the tracheostomy and the stoma (i.e., remove anything obstructing direct view of stoma including clothing/bandages/sponges etc.) to assure it remains properly seated in the stoma
- **O**bstruction or secretions in tracheostomy
  - ◊ Assure tracheostomy is patent. Especially in pediatric tracheostomy patients with significant respiratory distress, plugging or dislodgement/decannulation of the tracheostomy is the problem until proven otherwise
  - ◊ Auscultate breath sounds, consider potential for plugging of large airways in patients with significant respiratory distress
- **P**neumothorax
- **E**quipment connection problems

Tracheostomy tube components:

- Outer cannula: the tracheostomy size is stamped on the collar
- Inner cannula: not found in all tracheostomies
  - ◊ Not commonly used in pediatric patients
  - ◊ Removed by gently twisting a quarter turn to the left and pulling out
- Balloon cuff: protects lower airway from secretions/blood from above, allows for better mechanical ventilation
- Collar: includes imprint of tube size and attachment for umbilical tape/tracheostomy ties
- Obturator: stiffens and provides shape to tracheostomy tube to facilitate insertion. Must be removed for ventilation

KEY DOCUMENTATION ELEMENTS

- Respiratory assessment
- Tracheostomy tube assessment (obstruction, etc)
- Tracheostomy tube size
- Documentation of replacement trach / ETT size

PERTINENT ASSESSMENT FINDINGS

- Tracheostomy tube assessment
- **DOPE**

QUALITY METRICS

- Utilization of continuous pulse oximetry and EtCO2

Seizure / Status Epilepticus

History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag history
- Seizure medications (recent changes, compliance)
- Medications administered prior to arrival
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

Signs and Symptoms
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

Differential
- CNS (head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
   a. Check blood glucose level.
   b. Ensure patent airway
2. If blood glucose < 60 mg/dL, refer to DIABETIC EMERGENCIES Protocol.
3. Immobilize cervical spine if indicated.
4. Position patient to prevent injury.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. If patient actively seizing, administer **MIDAZOLAM** (IN/IM preferred):

   IN/IM: 0.2 mg/kg (maximum dose 10 mg) (**10mg/2ml concentration**)

   - OR -

   IV/IO: 0.1 mg/kg over 2 minutes (maximum dose 5 mg); may repeat x 1 after 5 minutes if seizure persists.
4. If blood glucose < 60 mg/dL, refer to DIABETIC EMERGENCIES Protocol.
5. For any seizure in a pregnant patient, refer to the ECLAMPSIA/PRE-ECLAMPSIA Protocol.

Medical Control

6. If seizure persists, contact Medical Control for additional **MIDAZOLAM**.

Adult Medical

Seizure / Status Epilepticus

PEARLS

- **Status Epilepticus** is defined as one prolonged seizure lasting more than 5 minutes or two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand Mal Seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal Seizures** affect only a part of the body and are not usually associated with a loss of consciousness, but can propagate to generalized seizures with loss of consciousness.
- Benzodiazepines are effective in terminating seizures; **do not delay IM/IN administration while initiating an IV**.
- Many airway / breathing issues in seizing patients can be managed without intubation or placement of an advanced airway. Reserve these measures for patients that fail less invasive maneuvers as noted above.
- For new onset seizures or seizures that are refractory to treatment, consider other potential causes including, but not limited to, trauma, stroke, electrolyte abnormality, toxic ingestion, pregnancy with eclampsia, hyperthermia.
- For any seizure in a pregnant patient, follow the OBSTRETRIC AND GYNECOLOGICAL CONDITIONS

KEY DOCUMENTATION ELEMENTS

- Actively seizing during transport and time of seizure onset / cessation
- Concurrent symptoms of apnea, cyanosis, vomiting, bowel/bladder incontinence or fever
- Medication amounts/routes given by bystanders or prehospital providers
- Neurologic status (GCS, nystagmus, pupil size, focal neurologic deficit or signs of stroke)
- Blood glucose level

PERTINENT ASSESSMENT FINDINGS

- Acute worsening of respiratory status or evidence of hypoxemia
- Neurologic status
- Blood glucose level
- Be alert for concurrent traumatic injuries in seizure patients

QUALITY METRICS

- Time to administration of anticonvulsant medication
- Blood glucose level obtained

Sepsis

History

- Duration and severity of fever
- Altered mental status
- Past medical history
- Medications / Recent antibiotics
- Immunocompromised (Transplant, HIV, Diabetes, Cancer)
- Recent hospitalization / Healthcare facility
- Prosthetic device / Indwelling device
- Last antipyretic (acetaminophen, ibuprofen)

Signs and Symptoms

- Hyperthermia > 100.4°F (38°C)
- Hypothermia < 96.8°F (36°C)
- Tachycardia (HR > 90)
- Tachypnea (RR > 22)
- Hypotension (SBP < 100)
- Altered mental status
- Hyperglycemia / Hypoglycemia

Differential

- Infections (UTI, pneumonia, skin/soft tissue, etc)
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat Stroke
- Meningitis
- Hypoglycemia / Hypothermia
- MI
- Stroke
- Pulmonary embolism

Criteria

Obvious or suspected source of infection

↓

≥ 2 Criteria

- Temperature > 100.4°F or < 96.8°F
- Heart Rate > 90/min
- Respiratory Rate > 22/min

↓

+1 Criteria

- Hypotension, SBP < 90 mmHg or MAP < 65 mmHg
- Altered Mental Status
- $EtCO_2$ < 25 mmHg

↓

SEPSIS ALERT

Protocol Continues

Sepsis

EMR

1. **UNIVERSAL PATIENT CARE**.
    a. Check blood glucose level. If blood glucose < 60 mg/dL refer to DIABETIC EMERGENCIES protocol for treatment.
2. Reassess patient and vital signs every 5 minutes.
3. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. If temperature is greater than 100.4°F, administer **ACETAMINOPHEN 1000 mg PO**.
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **BLS TREATMENT.**
2. Notify receiving hospital of **"SEPSIS ALERT".**
3. Consider 12-Lead ECG.
4. Establish at least one large bore IV.
    a. Administer **NORMAL SALINE 30 mL/kg** (Ideal Body Weight) fluid bolus **(Document TOTAL amount of IVF given).**
        i. Reassess after each 250 mL increment and STOP fluids if signs of pulmonary edema (increasing shortness of breath or rales / crackles on lung exam).
        ii. May repeat to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg as long as pulmonary edema is not suspected.
        iii. Total amount of IVF should not exceed 2000 mL
5. Continue to reassess patient including vital signs (manual BP), breath sounds, capnography, pulse oximetry, cardiac monitor.

Paramedic

1. Continue **ILS TREATMENT.**
2. For hypotension not responsive to 2,000 mL fluid bolus, consider **NOREPINEPHRINE (Levophed) 2-30 mcg/min** (if available, with IV pump) titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

    Alternative medication**:** **DOPAMINE** at **5mcg/kg/min** titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

    ***While drip is being set up, consider **PUSH DOSE EPINEPHRINE 1 mL (10 mcg) IV/IO** every 2-5 minutes to maintain SBP of 90-100 mmHg or MAP > 65 mmHg.

    a. Mix 1 mL of Epinephrine 1:10,000 with 9 mL of Normal Saline in a 10 mL syringe resulting in a concentration of 10 mcg/mL.

Sepsis

PEARLS

- **Sepsis** is defined as a life-threatening organ dysfunction caused by a dysregulated host response to infection.
  - In lay terms, sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs.
- **Septic Shock** is a subset of sepsis in which underlying circulatory and cellular / metabolic abnormalities resulting in hypotension that require vasopressors to maintain a MAP of ≥ 65 mmHg and having a serum lactate level of ≥ 2 mmol/L despite adequate volume resuscitation, resulting in a higher risk of mortality.
- Early recognition of Sepsis allows for attentive care and early administration of antibiotics.
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic distress in sepsis patients. $EtCO_2$ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Aggressive IV fluid therapy is the most important prehospital treatment for sepsis. Suspected septic patients should receive repeated fluid boluses while being checked frequently for signs of pulmonary edema, especially patients with known history of CHF or ESRD on dialysis. STOP fluid infusion in the setting of pulmonary edema.
- ECG should be obtained with suspected sepsis, but should not delay care in order to obtain.

Ideal Body Weight (kg)

Height	Male	Female		Height	Male	Female
5'	50	46		5'9"	71	66
5'1"	52	49		5'10"	73	69
5'2"	55	50		5'11"	75	71
5'3"	57	52		6'	78	73
5'4"	59	55		6'1"	80	75
5'5"	62	57		6'2"	82	78
5'6"	64	59		6'3"	85	80
5'7"	66	62		6'4"	87	82
5'8"	68	64		6'5"	89	85

KEY DOCUMENTATION ELEMENTS

- Sepsis criteria that patient met
- Full vital signs with reassessment every 15 minutes
- Neurologic status assessment
- Amount of IV fluid given

PERTINENT ASSESSMENT FINDINGS

- Full vital signs
- Criteria for Sepsis
- Findings of hypoperfusion: AMS, hypotension, $EtCO_2$ < 25 mmHg

QUALITY METRICS

- Advance hospital notification for suspected sepsis patients
- Administration of IV fluid to suspected sepsis patients unless contraindicated

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Shock

History
- Blood loss (GI, vaginal, AAA, etc.)
- Fluid loss (vomiting, diarrhea, fever)
- Infection
- Cardiac problems (MI, CHF)
- Medications
- Allergic reaction

Signs and Symptoms
- Altered mental status
- Syncope
- Tachycardia
- Diaphoresis
- Hypotension (SBP < 90 mmHg or MAP < 65 mmHg)
- Pale, cool, clammy skin
- Delayed capillary refill (> 2 sec)

Differential
- Infection / Sepsis
- Dehydration (Vomiting, Diarrhea)
- Medication / Overdose
- Vasovagal
- Physiologic (pregnancy)
- Pulmonary embolus
- Tension pneumothorax

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE** and/or **INITIAL TRAUMA CARE**.
2. Keep patient warm and elevate feet.
3. Control bleeding as necessary. Refer to EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. Consider etiology of shock state:
   a. **DISTRIBUTIVE** (Anaphylaxis, Neurogenic, Sepsis) and **HYPOVOLEMIC** (Dehydration, Bleeding)
      i. Administer **NORMAL SALINE 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
   b. **OBSTRUCTIVE** (Cardiac tamponade, PE, Tension Pneumothorax)
      i. If tension pneumothorax suspected, perform NEEDLE DECOMPRESSION.
   c. **CARDIOGENIC** (CHF, STEMI)
      i. Administer **NORMAL SALINE 250 - 500 mL bolus** if lung sounds clear to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. May repeat as long as lungs remain clear up to **1 liter.**
      ii. Limit fluid boluses if signs of acute CHF and refer to CHF / PULMONARY EDEMA Protocol.
4. Call for intercept per INTERCEPT CRITERIA.

Paramedic

1. Continue **ILS TREATMENT**.
2. If hypotension/shock due to hemorrhage, consider **TRANEXAMIC ACID (TXA) 1 gram IV/IO** over 10 minutes.
   a. Mix **1 gram/10mL vial in 50 mL NS and administer over 10 minutes**.
3. For hypotension not responsive to fluid boluses, consider **NOREPINEPHRINE (Levophed) 2-30 mcg/min** (if available, with IV pump) titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

   Alternative medication: **DOPAMINE** at **5mcg/kg/min** titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

   ***While drip is being set up, consider **PUSH DOSE EPINEPHRINE 1 mL (10 mcg) IV/IO** every 2-5 minutes to maintain SBP of 90-100 mmHg or MAP > 65 mmHg.
   a. Mix 1 mL of Epinephrine 1:10,000 with 9 mL of Normal Saline in a 10 mL syringe resulting in a concentration of 10 mcg/mL.

Shock

PEARLS

- Early, aggressive IV fluid administration is essential in the treatment of suspected shock.
- Patients predisposed to shock:
    a. Immunocompromised (patients undergoing chemotherapy or with a primary or acquired immunodeficiency)
    b. Adrenal insufficiency (Addison's disease, congenital adrenal hyperplasia, chronic or recent steroid use)
    c. History of a solid organ or bone marrow transplant
    d. Infants
    e. Elderly
- In most adults, tachycardia is the first sign of compensated shock, and may persist for hours. Tachycardia can be a late sign of shock in children and a tachycardic child may be close to cardiovascular collapse.
- Hypotension indicates uncompensated shock, which may progress to cardiopulmonary failure within minutes

Hypovolemic Shock: Hemorrhage, Trauma, GI bleeding, Ruptured aortic aneurysm or Pregnancy related bleeding.

- Signs / Symptoms: Tachycardia, Weak thready pulse, Hypotension, Diaphoresis, Cool Skin, Pallor, Flat Neck Veins

Cardiogenic Shock: Heart failure, MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve, toxins.

- Signs / Symptoms: Chest pain, Shortness of breath, Rales, JVD, Hypotension, Tachycardia, Diaphoresis

Distributive Shock: Sepsis, Anaphylactic, Neurogenic (hallmark is warm, dry, pink skin with normal capillary refill time and typically alert), Toxins.

- Signs / Symptoms Neurogenic Shock: Sensory and/or motor loss, Hypotension, Bradycardia vs Normal heart rate, Warm, dry skin

Obstructive Shock: Pericardial tamponade, Pulmonary embolus, Tension pneumothorax. Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.

- Signs / Symptoms Tension Pneumothorax: Asymmetric or absent breath sounds, Respiratory distress or hypoxia, signs of shock including tachycardia and hypotension, JVD, tracheal deviation (late sign)

Acute Adrenal Insufficiency: State where body cannot produce enough steroids (glucocorticoids / mineralocorticoids). May have primary or secondary adrenal disease or more commonly have stopped a steroid like prednisone.

KEY DOCUMENTATION ELEMENTS

- Full vital signs with reassessment every 15 minutes
- Neurologic status assessment
- Amount of IV fluid given
- Medications given

PERTINENT ASSESSMENT FINDINGS

- Full vital signs
- Decreased perfusion manifested by altered mental status, or abnormalities in capillary refill or pulses.

QUALITY METRICS

- Percentage of patients who receive pressors for ongoing hypotension after receiving appropriate IV fluid

Stroke

History
- Previous stroke / TIA's
- "Last Known Well" Time
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma
- Sickle Cell Disease
- Seizure activity

Signs and Symptoms
- Altered mental status
- Neuro deficit (facial droop, localized weakness, gait disturbance, slurred speech)
- Hemiparesis or hemiplegia
- Dysconjugate gaze, force or crossed gaze
- Blindness or other sensory loss
- Vertigo / Dizziness
- Syncope
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / Hypotension
- Vomiting

Differential
- TIA
- Seizure
- Hypoglycemia
- Sepsis
- Migraine
- Tumor
- Trauma
- Intoxication

**see AMS differentials

Stroke Alert Criteria

- Time last known well < 24 hours or unknown
- Blood glucose is or has been corrected to > 60 mg/dL
- Positive Prehospital Stroke Scale

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Perform prehospital stroke scale (BE FAST).
3. Check blood glucose level.
4. If blood glucose < 60 mg/dL, refer to the DIABETIC EMERGENCIES Protocol.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Repeat prehospital stroke scale (BE FAST) with LVO screening tool (VAN).
3. Establish IV access.
4. Continuous monitoring of patient with cardiac monitor, continuous SpO2 and capnography.
    a. Consider 12-lead ECG
5. Notify receiving facility of "Stroke Alert" as soon as possible and/or possibility of LVO if applicable.

Stroke

Prehospital Stroke Scale

****If any of the below are abnormal, it is considered a positive stroke scale.****

Balance

Loss of Balance: Sudden loss of balance or coordination
- **Normal**: Can walk unassisted and upright. No change in ability to walk
- **Abnormal**: Sudden loss of balance, staggering gait, severe vertigo

Eyes

Loss of Vision: Sudden loss of vision in one or both eyes or onset of double vision
- **Normal**: No sudden vision changes
- **Abnormal**: Sudden vision change or loss in one or both eyes

Face

Facial Droop: Have patient smile or show teeth
- **Normal**: Both sides of face move equally
- **Abnormal**: One side of face does not move as well as the other side

Arm

Motor Weakness: Arm drift (close eyes, extend arms, palms up)
- **Normal**: Both arms move the same or both arms do not move at all
- **Abnormal**: One arm drifts down compared with the other or does not move

Speech

Abnormal Speech: Have the patient say "you can't teach an old dog new tricks".
- **Normal**: Patient uses correct words with no slurring
- **Abnormal**: Patient slurs words, uses the wrong words, or is unable to speak

Time

Time of Onset: When was the person last known well?
- Time last seen normal:_____
- Time of symptom onset: _____

If patient has **ARM WEAKNESS** present, continue on to VAN screening tool

VAN Screening Tool

****Patient must have weakness plus one or all of the V, A, or N to be VAN positive.****

Vision

Vision Loss *(display 2 fingers left, 1 finger right) (usually same side as weakness)*
□ Right □ Left
Gaze (*usually away from side of weakness)*
□ Right □ Left

Aphasia

***Usually goes with right sided weakness*
□ Expressive (inability to speak or naming difficulties) **Do not count slurring of words**
(repeat "today is a sunny day" and name 2 objects)
□ Receptive (not understanding or can't follow commands) *(close eyes, make a fist)*

Neglect

***Usually goes with left sided weakness*
□ Patient ignores left side when both sides are touched simultaneously
(With eyes closed, ask patient to say "left, right or both" when arms are touched)

Region 6 Stroke Destination Determination

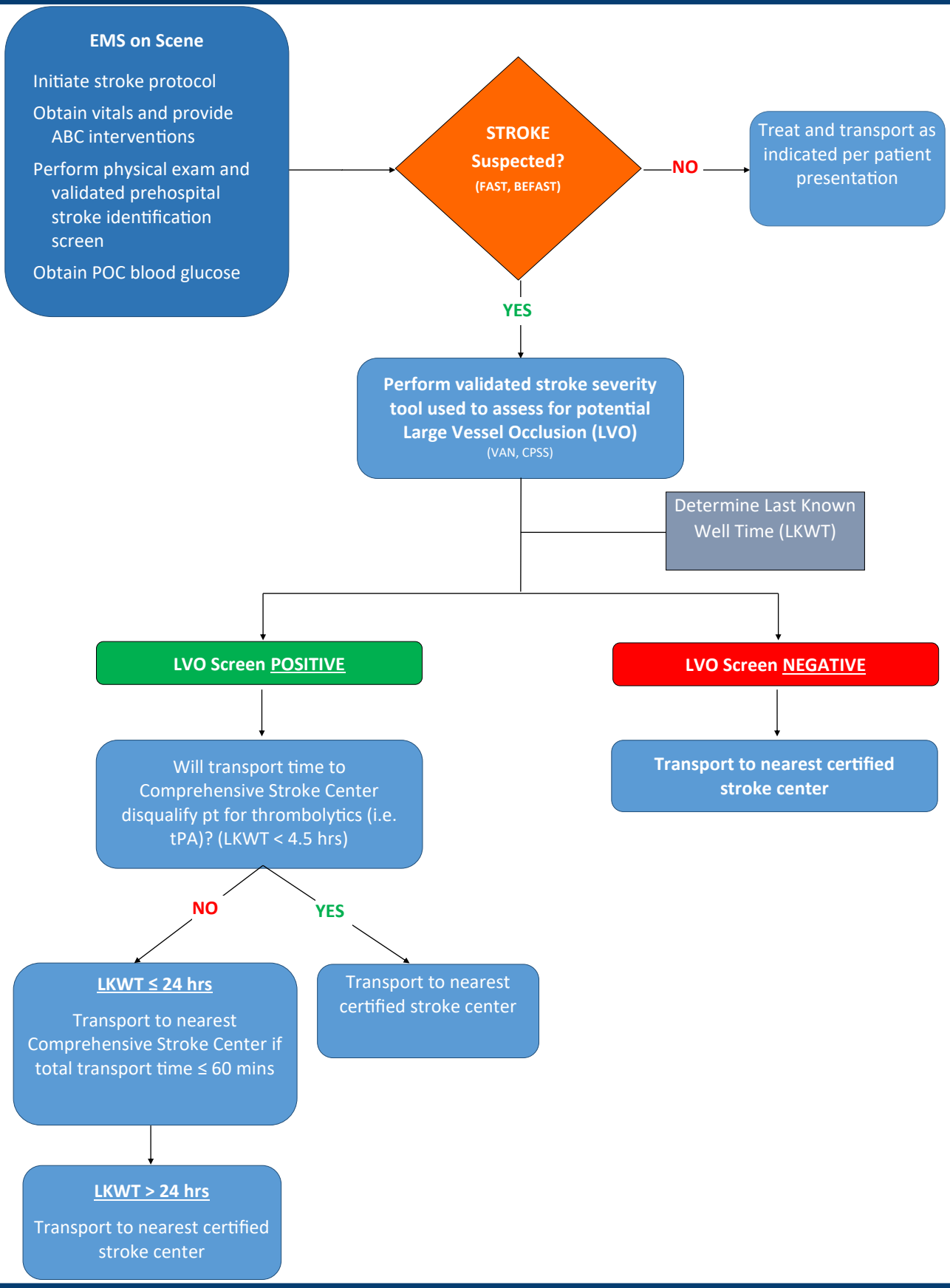
Purpose: To facilitate rapid transport of patients suspected of having a stroke to the appropriate Certified Stroke Center.

Policy: Any patient meeting the criteria below should be transported directly to the facility most capable of meeting their needs as defined by the algorithm. Contact the Resource Hospital for direction as soon as possible if questions exist regarding a specific patient or situation.

Airway compromise or management by a Basic level EMS provider without ALS intercept should be transported to the nearest facility.

Regional Certified Stroke Centers		
Comprehensive Stroke Center		
Carle Foundation Hospital	611 W Park St	Urbana, IL
Springfield Memorial Hospital	701 N 1st St	Springfield, IL
HSHS St. John's Hospital	800 E Carpenter St	Springfield, IL
Primary Stroke Centers		
Decatur Memorial Hospital	2300 N Edward St	Decatur, IL
OSF HealthCare Heart of Mary Medical Center	1400 W Park St	Urbana, IL
OSF HealthCare Sacred Heart Medical Center	812 N Logan Ave	Danville, IL
Union Hospital	1606 N 7th St	Terre Haute, IN
Acute Stroke Ready Hospital		
Carle Hoopeston Regional Health Center	701 E Orange St	Hoopeston, IL
Carle Richland Memorial Hospital	800 E Locust St	Olney, IL
Crawford Memorial Hospital	1000 N Allen St	Robinson, IL
Gibson Community Hospital	1120 N Melvin St	Gibson City, IL
Horizon Health	721 E Court St	Paris, IL
HSHS Good Shepherd Hospital	200 S Cedar St	Shelbyville, IL
HSHS St. Anthony's Memorial Hospital	503 North Maple St	Effingham, IL
HSHS St. Mary's Hospital	1800 East Lake Shore Dr	Decatur, IL
Kirby Medical Center	1000 Medical Center Dr	Monticello, IL
Lawrence County Memorial Hospital	2200 W State St	Lawrenceville, IL
Pana Community Hospital	101 E Ninth St	Pana, IL
Sarah Bush Lincoln Health Center	1000 Health Center Dr	Mattoon, IL

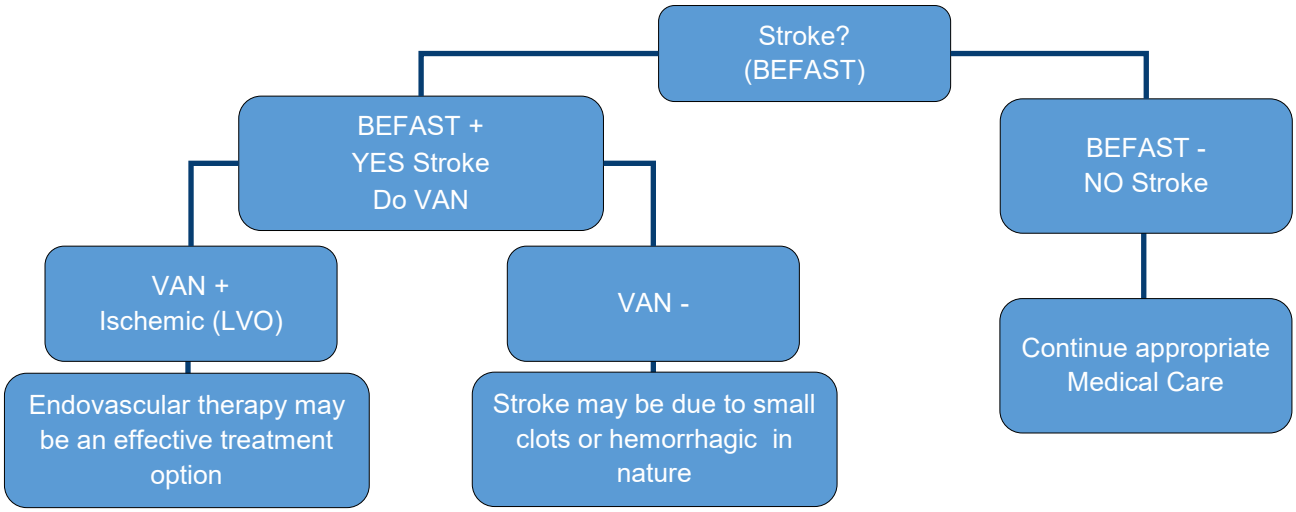
Stroke


EMS on Scene
Initiate stroke protocol
Obtain vitals and provide ABC interventions
Perform physical exam and validated prehospital stroke identification screen
Obtain POC blood glucose
STROKE Suspected?
(FAST, BEFAST)
NO
Treat and transport as indicated per patient presentation
YES
Perform validated stroke severity tool used to assess for potential Large Vessel Occlusion (LVO)
(VAN, CPSS)
Determine Last Known Well Time (LKWT)
LVO Screen POSITIVE
LVO Screen NEGATIVE
Transport to nearest certified stroke center
Will transport time to Comprehensive Stroke Center disqualify pt for thrombolytics (i.e. tPA)? (LKWT < 4.5 hrs)
NO
YES
LKWT ≤ 24 hrs
Transport to nearest Comprehensive Stroke Center if total transport time ≤ 60 mins
Transport to nearest certified stroke center
LKWT > 24 hrs
Transport to nearest certified stroke center

Stroke

PEARLS

- "Last Known Well" Time or Last Seen Normal is one of the most important items that EMS can obtain, of which all treatment decisions are based.
    a. Defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free or last awake)
- Prevent aspiration – elevate head of stretcher 15-30 degrees if systolic BP greater than 100 mm Hg.
    a. Maintain head and neck in neutral alignment, without flexing the neck
- Protect paralyzed limbs from injury.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit.
- Document the Stroke Screen results in the report.
- Consider 12-Lead ECG on suspected stroke patients.



KEY DOCUMENTATION ELEMENTS

- "Last Known Well" Time or Last Seen Normal
- Blood glucose level
- Stroke screen used and findings
- Time of notification to receiving hospital

PERTINENT ASSESSMENT FINDINGS

- Prehospital Stroke Scale
- LVO Screening Tool

QUALITY METRICS

- Suspected stroke patient receiving prehospital screening
- Documentation of "Last Known Well" Time
- Glucose testing for suspected stroke patients
- Advance hospital notification for suspected stroke patients
- Scene time for suspected stroke patients

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Bradycardia

History

- Past medical history
- Medications (Beta-Blockers, Calcium Channel Blockers, Clonidine, Digoxin)
- Pacemaker

Signs and Symptoms

- **HR < 60/min** with:
  - Chest pain
  - Respiratory distress
  - Hypotension or Shock
  - Altered mental status
  - Syncope

Differential

- Acute Myocardial Infarction (MI)
- Hypoxia / Hypothermia
- Pacemaker failure
- Sinus bradycardia
- Athletic
- Head injury (elevated ICP) / Trauma
- Stroke
- Spinal cord lesion
- Sick Sinus Syndrome
- AV blocks (1°, 2° or 3°)
- Overdose

EMR

1. **UNIVERSAL PATIENT CARE**.
2. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. Consider possible underlying causes of bradycardia (*see differentials above*).
4. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **BLS TREATMENT**.
   a. Obtain 12-lead ECG within 10 minutes, if not already obtained, and transmit to receiving facility.
2. Establish IV access.

STABLE Asymptomatic

1. Continue supportive care and monitor for signs and symptoms of symptomatic/unstable bradycardia.

UNSTABLE *Symptomatic (Hypotension, Chest Pain, AMS, acute CHF, syncope, or other signs of hypoperfusion/shock)*

1. Prepare for TRANSCUTANEOUS PACING for unstable patients with signs of hypoperfusion.
2. Consider **ATROPINE 1 mg IV/IO every 3-5 minutes** to a total dose of **3mg,** as long as symptomatic bradycardia persists.
   a. Atropine is **NOT** effective for Mobitz Type II Second-Degree or Third-Degree AV blocks as well as transplanted and total artificial hearts and providers should proceed to transcutaneous pacing.
3. Initiate TRANSCUTANEOUS PACING if patient remains symptomatic.
   a. Consider sedation with **MIDAZOLAM 2.5 mg IV/IO** as able; May repeat in 5 minutes as needed to maintain sedation throughout procedure.
   b. Providers **SHOULD NOT** delay pacing in order to administer Atropine, especially in patients with poor perfusion in the setting of **STEMI, Mobitz Type II Second-Degree or Third-Degree AV blocks**.

Protocol Continues

Bradycardia

Paramedic

1. Continue **ILS TREATMENT**.
2. If persistent bradycardia or hypotension, consider **DOPAMINE** at **5mcg/kg/min** titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg or **PUSH DOSE EPINEPHRINE**.

   ***PUSH DOSE EPINEPHRINE** **1 mL (10 mcg) IV/IO** every 2-5 minutes to maintain SBP of 90-100 mmHg or MAP > 65 mmHg.

   a. Mix 1 mL of Epinephrine 1:10,000 with 9 mL of Normal Saline in a 10 mL syringe resulting in a concentration of 10 mcg/mL.

   Alternative medication: **NOREPINEPHRINE (Levophed)** **2-30 mcg/min** (if available, with IV pump) titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg

Protocol Continues

Bradycardia

PEARLS

- Bradycardia should be managed via the least invasive manner possible. However, in cases of impending hemodynamic collapse, providers should proceed directly to transcutaneous pacing.
- Do not delay transcutaneous pacing in order to administer atropine.
- Mobitz Type II Second-Degree and Third-Degree AV blocks as well as the denervated heart (as in cardiac transplant) likely will not respond to atropine and in these cases, proceed to transcutaneous pacing and/or chronotropic agents (such as epinephrine or dopamine).
- Although dopamine is often recommended for the treatment of symptomatic bradycardia, recent research suggests that patients in cardiogenic or septic shock treated with norepinephrine have a lower mortality rate compared to those treated with dopamine
- The major ECG rhythms classified as bradycardia include:
    a. Sinus bradycardia
    b. Second-degree AV block
        i. Type I - Wenckebach / Mobitz I
        ii. Type II - Mobitz II
    c. Third-degree AV block (Complete Heart Block)
    d. Ventricular escape rhythms (Idioventricular Rhythms)
- Observe for signs of decreased end-organ perfusion: chest pain (CP), shortness of breath (SOB), decreased level of consciousness, syncope or other signs of shock/hypotension.
- Patients who have undergone cardiac transplant will not respond to Atropine.
- Consider potential culprit medications including beta-blockers, calcium channel blockers, sodium channel blockers / anti-depressants, digoxin, and clonidine.
- Consider hyperkalemia in the patient with wide complex bradycardia.
- Hypoxemia is a common cause of bradycardia; be sure to oxygenate the patient.
- Be aware of acute coronary syndrome as a cause of bradycardia in adult patients.

KEY DOCUMENTATION ELEMENTS

- Cardiac rhythm / rate
- Time, dose and response of medications given
- Pacing: Time started or stopped, rate, joules, capture and response
- History of event supporting treatment of underlying causes

PERTINENT ASSESSMENT FINDINGS

- 12-Lead ECG

QUALITY METRICS

- Correct medication and dose given for patient condition
- Correct application and use of cardiac pacing
- Use of sedation with cardiac pacing

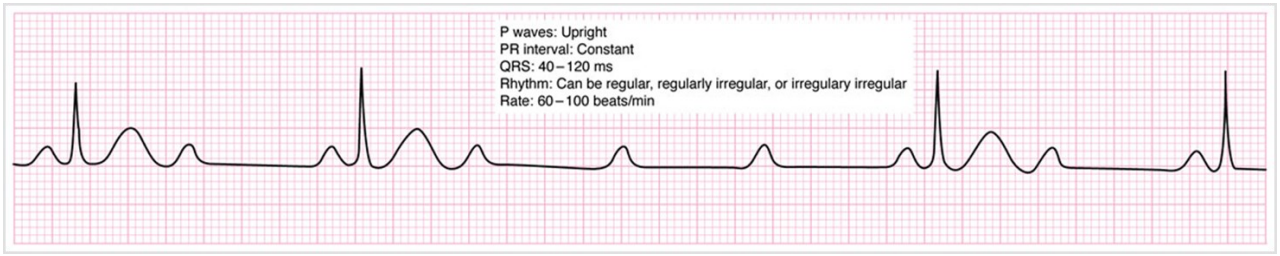
Bradycardia

Rhythms

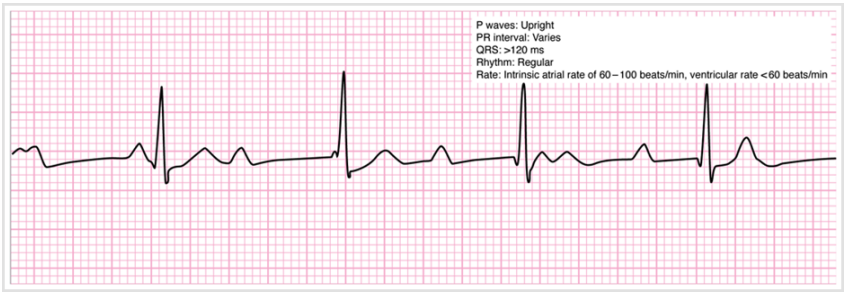
- Sinus Bradycardia

- Second-Degree AV Block— Type I - Wenckebach / Mobitz I

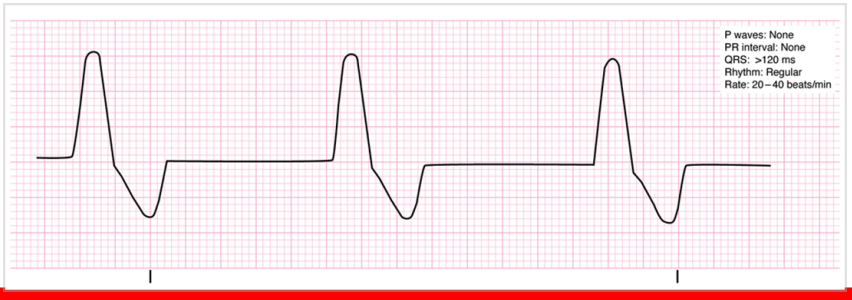
- Second-Degree AV Block—Type II - Mobitz II



- Third-Degree AV Block—Complete Heart Block



- Ventricular escape rhythms (Idioventricular Rhythms)



Cardiac Arrest

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medication
- Existence of terminal illness
- Signs of lividity, rigor mortis
- DNR form

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

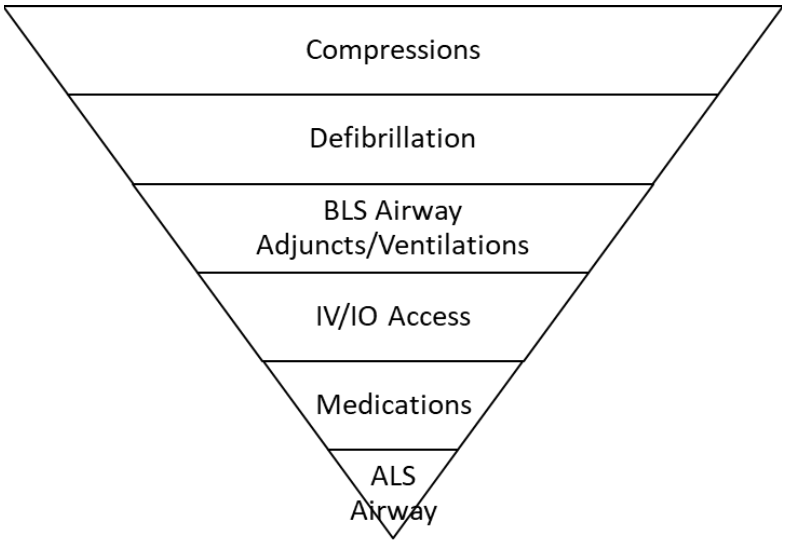
Differential
- Medical vs. Trauma
- V. fib vs Pulseless V. tach
- Asystole
- Pulseless Electrical Activity (PEA)

High Performance CPR

- Chest Compressions at a depth of at least 2 inches
- Rate of compressions between 100-120 per minute
- Allowing for complete chest recoil
- Minimizing interruptions between cycles to less than 10 seconds (Compression fraction >60%)
- Switching providers frequently, about every 2 minutes or sooner if fatigued

Code Resource Management

- Crews should coordinate their duties keeping the call priorities in mind. Intervention priorities are (in order of highest to lowest):



Cardiac Arrest

EMR & EMT-Basic

1. Check airway, breathing and circulation.
2. If pulseless, begin high quality CPR, apply AED and follow the prompts.
    a. If the AED indicates “SHOCK ADVISED”, call out “CLEAR!”, check for the safety of others and follow the prompts on the AED to deliver the defibrillation.
    b. Immediately resume CPR after defibrillation.
3. Ventilate with 100% oxygen.
4. Manage airway with appropriate adjunct. Refer to AIRWAY MANAGEMENT Protocol.
5. Follow current AHA BLS guidelines.
6. Relay information to incoming ambulance and/or initiate transport and call for intercept per INTERCEPT CRITERIA.
7. If return of pulses, refer to RETURN OF SPONTANEUS CIRCULATION Protocol.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Ensure high quality CPR at all times.
3. Refer to appropriate dysrhythmia protocol:
    a. ASYSTOLE / PEA
    b. V-FIB / PULSELESS V-TACH
4. Keep the following in mind:
    a. Rhythm checks, defibrillation and medications are completed at the top of the 2 minute cycle.
    b. Compression fraction should be greater than 60% and $EtCO_2$ greater than 10 mmHg.
5. Consider placement of advanced airway per the AIRWAY MANAGEMENT Protocol.
6. If return of pulses, refer to RETURN OF SPONTANEOUS CIRCULATION Protocol.

Cardiac Arrest
- Asystole / PEA -

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medication
- Existence of terminal illness
- DNR form

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
H's and T's
- Hypovolemia
- Hypoxia
- Massive Myocardial Infarction
- Tension Pneumothorax
- Acidosis / Hyperkalemia
- Toxins - Drug Overdose
- Hypothermia
- Pericardial Tamponade
- Massive Pulmonary Emboloism

H's and T's
- **H**ypovolemia – Volume infusion
- **H**ypoxia – Oxygenation & ventilation, CPR
- **H**ydrogen ion (acidosis) – Ventilation, CPR
- **H**ypo/**H**yperkalemia
- **H**ypothermia - Warming
- **T**ension pneumothorax – Needle decompression
- **T**amponade, cardiac – Volume infusion
- **T**oxins – Agent specific antidote
- **T**hrombosis, pulmonary – Volume infusion, Ventiliation
- **T**hrombosis, coronary – Emergent PCI

EMT-Intermediate
1. Initiate HIGH QUALITY CPR.
2. Establish IV/IO access.
3. **NORMAL SALINE** at **Wide Open** rate.
4. **EPINEPHRINE (1:10,000) 1 mg IV/IO every 3-5 minutes** as long as patient remains pulseless.
5. Consider possible causes and treatments (H's and T's).
6. Call for intercept per INTERCEPT CRITERIA.
7. If return of pulses, refer to the RETURN OF SPONTANEOUS CIRCULATION Protocol.

Paramedic
1. Continue **ILS TREATMENT**.
2. Consider possible causes and treatments (H's and T's).
3. **SODIUM BICARBONATE 50 mEq IV/IO** for:
    a. Known pre-existing hyperkalemia
    b. Known overdose of Quinidine, tricyclic antidepressants, phenothiazines, antihistamines, cocaine
4. If return of pulses, refer to the RETURN OF SPONTANEOUS CIRCULATION Protocol.

Cardiac Arrest
- V-Fib / Pulseless V-Tach -

History
- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR or living will

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Asystole
- Artifact / Device failure
- Cardiac
- Endocrine / Metabolic
- Drugs
- Pulmonary

H's and T's
- **H**ypovolemia – Volume infusion
- **H**ypoxia – Oxygenation & ventilation, CPR
- **H**ydrogen ion (acidosis) – Ventilation, CPR
- **H**ypo/**H**yperkalemia
- **H**ypothermia - Warming
- **T**ension pneumothorax – Needle decompression
- **T**amponade, cardiac – Volume infusion
- **T**oxins – Agent specific antidote
- **T**hrombosis, pulmonary – Volume infusion, Ventilation
- **T**hrombosis, coronary – Emergent PCI

EMT-Intermediate
1. Continue high quality CPR per CARDIAC ARREST Protocol pausing for rhythm checks every 2 minutes for no more than 10 seconds. Consider possible causes and treatments (H's and T's).
2. **DEFIBRILLATE** every 2 minutes as needed at maximum setting or manufacturers recommendations. Resume CPR immediately after defibrillation for 2 minutes.
3. Establish vascular access.
4. **EPINEPHRINE (1:10,000) 1.0 mg IV/IO every 3-5 minutes** as long as patient remains pulseless.
5. After THIRD defibrillation administer **AMIODARONE 300 mg IV/IO** for V-fib/pulseless V-tach refractory to defibrillation ; may repeat at 150 mg IV/IO in 5 minutes if needed (after FIFTH defibrillation).
6. If V-Fib/V-Tach persists or patient is allergic to AMIODARONE, consider **LIDOCAINE 1.5 mg/kg IV/IO**. May **repeat every 3-5 minutes x 2** at **0.75 mg/kg** to maximum total dose of **3 mg/kg**.
    a. If V-fib or V-tach is resolved with LIDOCAINE bolus, administer **LIDOCAINE infusion at 2-4 mg/ min**.
7. If V-Fib/V-Tach persists after THREE defibrillations consider changing vector of pads (AL → AP; AP → AL)
8. Continue cycles of 2 minutes of CPR followed by defibrillation as needed.

Paramedic
1. Continue **ILS TREATMENT.**
2. Consider Double Sequential Defibrillation for persistent V-Fib/V-Tach resistant to THREE defibrillations and ONE vector change.
3. Consider **MAGNESIUM SULFATE 2 grams IV/IO** for Torsades de Pointes.

Cardiac Arrest

PEARLS

- **Early and effective CPR and defibrillation are the most important therapies for cardiac arrest care.**
- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **Consider early IO placement if available and/or difficult IV access anticipated.**

Compressions

- Minimize interruptions in chest compression, as pauses rapidly return the blood pressure to zero and stop perfusion to the heart and brain.
- Chest compressions should be reinitiated immediately after defibrillation as pulses, if present, are often difficult to detect and rhythm and pulse checks interrupt compressions.
- Continue chest compressions between completion of AED analysis and AED charging.
- Effectiveness of chest compressions decreases with any movements and thus patients should be resuscitated as close to the point at which they are first encountered and should only be moved if the conditions on scene are unsafe or do not operationally allow for resuscitation.
- Performing manual chest compressions in a moving vehicle may pose a provider safety concern.

Ventilation

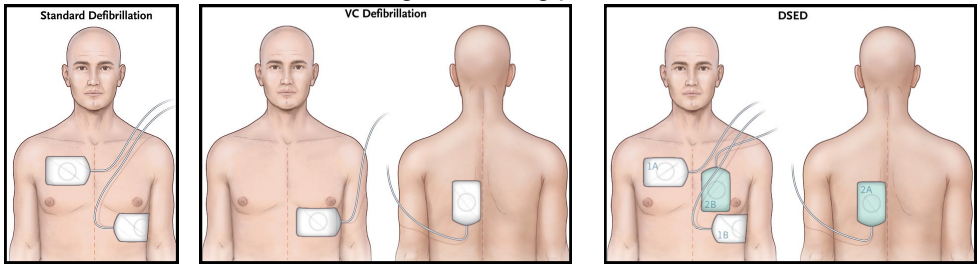
- Avoid excessive ventilation. IF no advanced airway (BIAD or ETT) compression to ventilation ratio is 30:2. If advanced airway is in place, ventilate 10 breaths per minute (1 ventilation every 6 seconds) with continuous, uninterrupted compressions.
- Do not interrupt compression to place endotracheal tube. Consider BIAD first to limit interruptions.
- Reassess and document BIAD and/or endotracheal tube placement and $EtCO_2$ frequently, after every move, and at transfer of care.

$EtCO_2$

- Quantitative end-tidal CO_2 ($EtCO_2$) should be used to monitor effectiveness of chest compressions.
    a. $EtCO_2$ > 10 mmHg is indicative of quality CPR.
    b. Abrupt sustained increase in $EtCO_2$ is indicative of potential ROSC.

Defibrillation

- Follow manufacture's recommendations concerning defibrillation energy. If the manufacturer's recommendation is unknown, use the highest setting possible.



- **Mechanical CPR Devices**
- Mechanical CPR devices should be used in accordance with the devices specific instructions.
- Mechanical CPR should not delay the initiation of high quality manual CPR.
- Interruptions in CPR to apply device should be limited to 10 seconds or less.

Cardiac Arrest

PEARLS

Special Circumstances

- **Maternal Arrest**:
  i. The best hope for fetal survival is maternal survival.
  ii. Position the patient in the supine position with a second rescuer performing manual uterine displacement to the left in an effort to displace the gravid uterus and increase venous return by avoiding aorto-caval compression.
  iii. If manual displacement is unsuccessful, the patient may be placed in the left lateral tilt position at 30°. This position is less desirable than the manual uterine displacement as chest compressions are more difficult to perform in this position.
  iv. Chest compressions should be performed slightly higher on the sternum than in the non-pregnant patient to account for elevation of the diaphragm and abdominal contents in the obviously gravid patient.
  v. Defibrillation should be performed as in non-pregnant patients.
- **Respiratory Arrests** (Drowning / Suffocation / Asphyxiation / Hanging)
  i. Prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Asystole / PEA**
  i. Survival from PEA or Asystole is based on identifying and correcting the CAUSE. Consider a broad differential diagnosis, with early and aggressive treatment of possible causes.

KEY DOCUMENTATION ELEMENTS

- Resuscitation attempted and all interventions performed
- Arrest witnessed
- Location of arrest
- First monitored rhythm
- CPR before EMS arrival
- Outcome
- Any ROSC
- Presumed etiology (Presumed cardiac, Trauma, Submersion, Respiratory, Other non-cardiac, Unknown)

PERTINENT ASSESSMENT FINDINGS

- The patient in cardiac arrest requires a prompt balance of treatment and assessment
- In cases of cardiac arrest, assessments should be focused and limited to obtaining enough information to reveal the patient is pulseless
- Once pulselessness is discovered, treatment should be initiated immediately

QUALITY METRICS

- Time to scene; Time to first CPR; Time to first intervention (shock/epi); Resuscitation Time; Time of ROSC
- Review of CPR Quality (Compression Fraction, Average and longest peri-shock pause, Rate and depth of compressions)
- Waveform capnography used for resuscitation, initial confirmation of advanced airway placement and continuous monitoring during transport

Chest Pain / Acute Coronary Syndrome / STEMI

History
- Age
- Medications (cardiac, erectile dysfunction medications)
- Past medical history (MI, Angina, Diabetes)
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (heaviness, tightness, pressure, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (0-10)
- **T**ime (onset / duration / repetition)

Signs and Symptoms
- Chest Pain (pain, pressure, aching)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea / Vomiting
- Dizziness
- Syncope

Differential
- Trauma vs. Medical
- Angina vs. Myocardial Infarction (MI)
- Pericarditis
- Pulmonary Embolism (PE)
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GERD or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (Cocaine or Methamphetamine

EMR

1. **UNIVERSAL PATIENT CARE**.
2. Administer **ASPIRIN 325 mg PO** or **81 mg x 4 PO**; chewable, non-enteric-coated aspirin preferred.
3. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. For apparent cardiac related chest pain with SBP > 100 mmHg, administer **NITROGLYCERIN 0.4 mg SL**.
4. Repeat **NITROGLYCERIN every 3-5 minutes to maximum of 3 doses** as long as chest pain persists and **SBP > 100 mmHg or MAP > 65 mmHg**.
5. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **BLS TREATMENT.**
2. Establish IV access.
3. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility. If dysrhythmia or ectopy present, proceed to appropriate protocol.
4. If **SBP > 100 mmHg**, apply **NITROGLYCERIN PASTE**, **1 inch**, to patient's chest (*remove if SBP < 100 mmHg*).
5. If chest pain remains, administer **FENTANYL 1 mcg/kg slow IV/IO over 2-3 minutes** (maximum initial dose 100 mcg) .
    a. May consider **MORPHINE SULFATE 2 mg slow IV/IO over 1 minute** as alternative.

Medical Control

6. Medical Control may consider additional **FENTANYL 1 mcg/kg slow IV/IO** or additional **MORPHINE SULFATE 2-4 mg IV/IO every 5 minutes.**

Chest Pain / Acute Coronary Syndrome / STEMI

STEMI Criteria

1. Age > 18 years
2. Chest pain or equivalent symptoms consistent with cardiac ischemia or myocardial infarction.
    a. i.e. “heartburn”/epigastric pain, palpitations, syncope, fatigue, shortness of breath, diaphoresis, ROSC post cardiac arrest.
3. STEMI Criteria (12-lead ECG):
    a. Computer interpretation of the 12-lead is STEMI (i.e. ***ACUTE MI***).
    b. ST segment elevation of ≥ 1 mm in 2 contiguous leads.
    c. Interpretation of ECG transmitted and reviewed by a physician confirmed to be diagnostic of STEMI.

    ***If initial ECG is not diagnostic but suspicion remains high for ACS (acute coronary syndrome) and symptoms persist, obtain serial ECG’s at 5-10 minute intervals*

Goal: First medical contact to ECG ≤ 10 min; Scene time ≤ 15 min.

STEMI Destination Determination

*Transport time estimated to be **≤ 60 minutes***

1. Transport patient to the nearest PCI Capable Receiving Hospital via the most expedient method available.
    a. Consider patient preference in deciding nearest PCI Capable Receiving Hospital.
    b. Consider Air Transport when appropriate.
2. Activate **“STEMI ALERT”** at receiving facility and transmit 12-lead ECG for provider confirmation.
3. If patient demonstrates respiratory or hemodynamic instability that may require immediate ED evaluation and treatment by a physician, proceed to the nearest appropriate hospital.

*Transport time estimated to be **≥ 60 minutes***

1. Notify medical control and consider transport to the closest appropriate non-PCI capable referring hospital and subsequent urgent transfer to a PCI Capable Receiving Facility.
2. Activate “**STEMI ALERT”** at receiving facility and transmit 12-lead ECG for provider confirmation.

Region 6 STEMI Destination Determination

Purpose: To facilitate rapid transport of patients suspected of having a STEMI to the appropriate Percutaneous Coronary Intervention (PCI) capable facility.

Policy: Any patient meeting the STEMI criteria outlined below should be transported directly to a PCI capable facility. Contact the Resource Hospital for direction as soon as possible if questions exist regarding a specific patient or situation.

Airway compromise or management by a Basic level EMS provider without ALS intercept should be transported to the nearest facility.

IDPH Region 6 PCI Capable Facilities		
Decatur Memorial Hospital	2300 N Edward St	Decatur, IL
HSHS St. Mary's Hospital	1800 East Lake Shore Dr	Decatur, IL
Carle Foundation Hospital	611 W Park St	Urbana, IL
OSF HealthCare Heart of Mary Medical Center	1400 W Park St	Urbana, IL

Chest Pain / Acute Coronary Syndrome / STEMI

PEARLS

- Acute coronary syndrome may present with atypical pain, vague or only generalized complaints.
- Ischemic burden time is a risk for morbidity and mortality, EMS can help decrease first medical contact to intervention time/reflow by efficient scripting/training of safely minimizing scene time
- Observe for signs of clinical deterioration: dysrhythmias, CP, SOB, decreased LOC / syncope, or other signs of shock / hypotension.
- Perform serial 12-lead ECGs (especially any time clinical changes noted).
- Consider placing defibrillator pads on high-risk patients.

Nitrates

- The use of nitrates should be avoided in any patient who has used erectile dysfunction medications within the past 48 hours due to possible severe hypotension.
  -Examples: Viagra® / sildenafil, Levitra® / vardenafil, Cialias® / tadalafil
- The location of the infarct does not preclude the use of nitrates; however, administer nitrates with extreme caution, if at all, to patients with inferior-wall STEMI or suspected right ventricular (RV) involvement because these patients require adequate RV preload. Continually monitor the patient's hemodynamic status and be prepared to resuscitate if hypotension occurs
- Care should always be taken when giving nitroglycerin when the patient's blood pressure is marginal. If used in this setting, the clinician should weigh the risk and benefit of nitrate administration over the administration of an opiate analgesic and be ready to respond to hypotension with fluid bolus or pressor.

** Patients with STEMI should be transported to the appropriate destination based on the STEMI—EMS TRIAGE AND DESTINATION Protocol.

KEY DOCUMENTATION ELEMENTS

- The time of symptom onset
- The time of patient contact by EMS to the time of 12-lead ECG acquisition
- The time ASA administered, or reason why not given
- The time of STEMI notification

PERTINENT ASSESSMENT FINDINGS

- A complete medication list should be obtained from each patient. It is especially important for the treating physician to be informed if the patient is taking beta-blockers, calcium channel blockers, clonidine, digoxin, blood thinners (anticoagulants), and medications for the treatment of erectile dysfunction or pulmonary hypertension.

QUALITY METRICS

- 12-Lead ECG in ≤ 10 minutes and transmitted
- Aspirin administration for chest pain / discomfort
- Scene time for STEMI patients
- Advance hospital notification for suspected STEMI
- Direct transport to PCI capable receiving hospital for suspected STEMI patients meeting criteria

CHF / Pulmonary Edema

History

- Congestive Heart Failure (CHF)
  - Use of diuretics and compliance
  - Weight gain
  - Leg swelling
  - Orthopnea
- Past Medical History
- Medications (Digoxin, Lasix)
- Erectile Dysfunction Medication
- Cardiac History (prior MI)

Signs and Symptoms

- Respiratory distress (crackles / rales)
- Lower extremity edema
- Orthopnea
- Jugular Vein Distention (JVD)
- Pink, frothy sputum
- Diaphoresis
- Hypotension, shock
- Chest pain

Differential

- Myocardial Infarction (MI)
- CHF
- Asthma / COPD
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary Embolus (PE)
- Pericardial tamponade
- Toxic exposure

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. **UNIVERSAL PATIENT CARE**.
   a. Apply cardiac monitor and obtain 12-Lead ECG – Transmit to receiving facility.
2. Establish IV access.
3. If SBP > 100 mmHg or MAP > 65 mmHg:
   a. Adminster **NITROGLYCERIN 0.4 mg SL x1**.
   b. Apply CPAP.
   c. Apply **NITROGLYCERIN PASTE**, **1 inch**, to patient's chest (*remove if SBP < 100 mmHg or MAP < 65 mmHg*).
   d. Consider additional **NITROGLYCERIN 0.4 mg SL every 5 minutes x 2 doses**.
      - If CPAP is already applied, do not remove CPAP to administer NITRO.
4. If wheezing is present and if $EtCO_2$ waveform supports concurrent bronchospasm refer to BRONCHOSPASM / ASTHMA / COPD Protocol.

Paramedic

1. Continue **ILS TREATMENT**.
2. If signs of Cardiogenic Shock, consider **NOREPINEPHRINE (Levophed) 2-30 mcg/min** (if available, with IV pump) titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

   Alternative medication: **DOPAMINE** at **5mcg/kg/min** titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

   ***While drip is being set up, consider **PUSH DOSE EPINEPHRINE 1 mL (10 mcg) IV/IO** every 2-5 minutes to maintain SBP of 90-100 mmHg or MAP > 65 mmHg.

   a. Mix 1 mL of Epinephrine 1:10,000 with 9 mL of Normal Saline in a 10 mL syringe resulting in a concentration of 10 mcg/mL.

CHF / Pulmonary Edema

PEARLS

- Consider Myocardial Infarction (MI) in all these patients.
- Allow patient to remain in position of comfort - patients may decompensate if forced to lie down.
- The use of nitrates should be avoided in any patient who has used erectile dysfunction medications within the past 48 hours due to possible severe hypotension.
  -Examples: Viagra® / sildenafil, Levitra® / vardenafil, Cialias® / tadalafil
- Administer nitrates with extreme caution, if at all, to patients with inferior-wall STEMI or suspected right ventricular (RV) involvement because these patients require adequate RV preload.
- Use of Furosemide (Lasix®) is not recommended in the prehospital setting. Pulmonary edema is more commonly a problem of volume distribution than overload, so administration of Furosemide provides no immediate benefit for most patients. Misdiagnosis of CHF and subsequent inducement of inappropriate diuresis can lead to increased morbidity and mortality in patients.
- **Cardiogenic Shock**: Heart failure, MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical/septum/ valve, Toxins.

KEY DOCUMENTATION ELEMENTS

- Vital signs
- Oxygen saturation
- Time of intervention
- Response to interventions

PERTINENT ASSESSMENT FINDINGS

- Full vital signs
- Respiratory distress
- Breath sounds (crackles / rales)
- Edema
- JVD

QUALITY METRICS

- Time to initiation of CPAP
- Assessment / auscultation of lung sounds before and after each intervention

Return of Spontaneous Circulation

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms
- Return of Spontaneous Circulation (ROSC) post cardiac arrest

Differential
- Continue to address rhythm specific differentials

EMR

1. Reassess Airway, Breathing and Circulation.
    a. If ventilation assistance is required, ventilate around 10 breaths per minute.
    b. Do not hyperventilate.
    c. Titrate to maintain oxygen saturation ≥ 94%.
2. Provide **UNIVERSAL PATIENT CARE**.
3. Consider TARGETED TEMPERATURE MANAGEMENT Protocol.
4. Relay information to incoming ambulance.
5. Reassess patient. If patient becomes pulseless, begin CPR and follow CARDIAC ARREST Protocol.

EMT-Basic

1. Continue **EMR TREATMENT.**
2. Obtain 12-Lead ECG and transmit to receiving facility (if available).
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **BLS TREATMENT.**
2. Obtain 12 Lead ECG and transmit to receiving facility.
3. Treat hypotension (SBP < 90 mmHg or MAP < 65 mmHg) according to SHOCK Protocol.
4. Monitor $EtCO_2$. Target 35-40 mmHg.
5. If no advanced airway, consider placement of advanced airway per the AIRWAY MANAGEMENT Protocol.
6. Initiate transport.

Paramedic

1. Continue **ILS TREATMENT**.
2. For hypotension not responsive to fluid boluses, consider **NOREPINEPHRINE (Levophed) 2-30 mcg/min** (if available, with IV pump) titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

    Alternative medication: **DOPAMINE** at **5mcg/kg/min** titrated to a SBP of 90-100 mmHg or MAP > 65 mmHg.

    ***While drip is being set up, consider **PUSH DOSE EPINEPHRINE 1 mL (10 mcg) IV/IO** every 2-5 minutes to maintain SBP of 90-100 mmHg or MAP > 65 mmHg.

    a. Mix 1 mL of Epinephrine 1:10,000 with 9 mL of Normal Saline in a 10 mL syringe resulting in a concentration of 10 mcg/mL.

Return of Spontaneous Circulation / Targeted Temperature Management

History
- Non-traumatic cardiac arrest
- Any presenting ECG rhythm
- Age > 18

Signs and Symptoms
- Cardiac arrest
- Return of Spontaneous Circulation (ROSC) post cardiac arrest

Differential
- Continue to address rhythm specific differentials

Targeted Temperature Management Criteria

1. Age > 18.
2. Return of Spontaneous Circulation (ROSC) not related to trauma, including intracranial hemorrhage.
3. Temperature after ROSC greater than 34°C / 93.2°F.
4. Advanced airway (including BIAD) in place with no purposeful response to verbal or painful stimuli.
5. Not pregnant.

EMR & EMT-Basic

1. Apply ice packs to bilateral neck, groin and axillae. Change ice packs every 15 minutes or more frequently as necessary.
2. Do not allow patient to shiver.
3. Do not hyperventilate.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Do not allow patient to shiver. May use **MIDAZOLAM 2.5 mg IV/IO/**IN, may repeat once in **5 minutes**; or **5 mg IM,** may repeat once in **10 minutes** as needed.
3. Monitor $EtCO_2$; target 35-40 mmHg.

Return of Spontaneous Circulation

PEARLS

- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided. Similarly, hypoventilation (suggested by an EtCO2 greater than 40–45) contributes to worsening acidosis and may precipitate re-arrest.
- Most patients immediately post resuscitation will require ventilatory assistance.
- Many patients experience “stunning” of the cardiac muscle after ROSC. Hypotension is common, and volume resuscitation or vasopressor support is often required.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. A significant percentage of post-ROSC patients will re-arrest.
- A moderate number of post-ROSC patients may have evidence of ST elevation MI on ECG.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, and pneumothorax.

Targeted Temperature Management

- Maintain core temperature between 32°-36°C (89.6°–96.8°F)
- Infusion of cold saline is NOT recommended in the prehospital setting

KEY DOCUMENTATION ELEMENTS

- Immediate post-arrest rhythms
- Vitals Signs
- Neurologic assessment
- Post-ROSC 12-lead ECG

PERTINENT ASSESSMENT FINDINGS

- Asses post-ROSC rhythm, lung sounds and for signs of hypoperfusion

QUALITY METRICS

- Percent of patients receiving Targeted Temperature Management post-ROSC
- Percent of patient receiving a post-ROSC 12-lead ECG

Return of Spontaneous Circulation

Intentionally Left Blank

Syncope / Pre-Syncope

History

- History of prior syncopal episodes
- Cardiac history (CAD, CHF, Dysrhythmias)
- Stroke history
- Seizure history
- Recent trauma
- Occult blood loss (GI/GU)
- Fluid losses (Nausea, Vomiting, Diarrhea)
- Past medical history
- Medications

Signs and Symptoms

- Loss of consciousness with recovery
- Lightheadedness / Dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

Differential

- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypotension)
- AAA
- PE

Definitions

Syncope: Loss of consciousness and postural tone that resolves spontaneously without medical interventions.

Pre-Syncope: Prodromal symptoms of syncope. Usually lasts for seconds to minutes and may be described by the patient as “nearly blacking out” or “nearly fainting”.

EMR

1. **UNIVERSAL PATIENT CARE**.
2. If blood glucose < 60 mg/dL (or suspected), refer to DIABETIC EMERGENCIES Protocol.
3. Evaluate for hemorrhage and treat for shock if indicated. Refer to SHOCK Protocol.
4. Relay information to incoming ambulance.

EMT-Basic

1. Continue **EMR TREATMENT**.
2. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **BLS TREATMENT**.
2. Cardiac Monitor
3. Obtain 12-Lead ECG and transmit to receiving facility.
4. Establish IV access.
5. Monitor for dysrhythmias closely. If dysrhythmia present, follow appropriate dysrhythmia protocol.

Syncope / Pre-Syncope

PEARLS

- Patients suffering syncope due to arrhythmia may suffer recurrent arrhythmia and should therefore be placed on a cardiac monitor.
- Geriatric patients suffering falls from standing may sustain significant injury and should be diligently screened for trauma.
- By being most proximate to the scene and to the patient's presentation, EMS providers are commonly in a unique position to identify the cause of syncope. Consideration of potential causes, ongoing monitoring of vitals and cardiac rhythm as well as detailed exam and history are essential pieces of information to pass onto hospital providers.
- All patients suffering from syncope deserve hospital level evaluation, even if they appear normal with few complaints on scene.
- High risk causes of syncope include the following:
    a. Cardiovascular
        i. Myocardial infarction
        ii. Aortic stenosis
        iii. Hypertrophic cardiomyopathy (young patient with unexplained syncope during exertion)
        iv. Pulmonary embolus
        v. Aortic dissection
        vi. Dysrhythmia
    b. Neurovascular
        i. Intracranial hemorrhage
        ii. Transient ischemic attack or stroke
    c. Hemorrhagic
        i. Ruptured ectopic pregnancy
        ii. GI bleed
        iii. Aortic rupture
- Consider high risk 12-lead ECG features including, but not limited to:
    a. Evidence of QT prolongation (generally over 500ms).
    b. Delta waves.
    c. Brugada syndrome (incomplete RBBB pattern in V1/V2 with ST segment elevation).
    d. Hypertrophic obstructive cardiomyopathy

KEY DOCUMENTATION ELEMENTS

- Presenting cardiac rhythm
- Cardiac rhythm present when patient is symptomatic
- Any cardiac rhythm changes
- Full vital signs, including blood glucose

PERTINENT ASSESSMENT FINDINGS

- Evidence of trauma
- Evidence of cardiac dysfunction (e.g. evidence of CHF, arrhythmia)
- Evidence of hemorrhage
- Evidence of neurologic compromise
- Evidence of alternate etiology, including seizure
- Initial and ongoing cardiac rhythm
- 12-lead ECG findings

QUALITY METRICS

- Acquisition of 12-lead ECG
- Application of cardiac monitor
- Blood glucose obtained

Tachycardia (with a Pulse)

Narrow Complex (< 0.12 sec) - REGULAR Rhythm

History

- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / Near syncope

Signs and Symptoms

- Heart rate > 150
- Dizziness
- Chest pain
- Palpitations
- Shortness of breath
- AMS
- Diaphoresis
- CHF

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Fever, pain, emotional stress
- Hypoxia, Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus
- Sepsis

EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. **UNIVERSAL PATIENT CARE**
    a. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility.
2. Establish IV access - preferably large bore in AC.
3. Consider **NORMAL SALINE 500 mL bolus** to rule out hypovolemia/dehydration as cause of tachycardia. Repeat fluid bolus as needed as long as lungs remain clear; maximum **2 liters**.

STABLE

1. Perform vagal maneuvers.
2. **ADENOSINE 6 mg rapid IV/IO** followed by a 10 mL NS flush.
    a. If underlying rhythm is Atrial Fibrillation or Atrial Flutter refer to TACHYCARDIA, NARROW COMPLEX - IRREGULAR RHYTHM Protocol.
3. If no change in rhythm after 1-2 minutes, **ADENOSINE 12 mg rapid IV/IO** followed by a 10 mL NS flush.
4. If no change in rhythm after 1-2 minutes, repeat **ADENOSINE 12 mg rapid IV/IO** followed by a 10 mL NS flush.

UNSTABLE *(Hypotension, Chest Pain with evidence of ischemia, AMS, signs of shock, acute CHF)*

1. Immediate SYNCHRONIZED CARDIOVERSION at **100J** (or per manufacturer's recommendation).
    a. If normal LOC, consider sedation with **MIDAZOLAM 2.5 mg IV/IO.**
2. If no response to initial energy dose, repeat SYNCHRONIZED CARDIOVERSION in escalating, stepwise fashion (i.e. 200J-300J-360J)
3. If cardioversion is successful, obtain 12-Lead ECG.

Tachycardia (with a Pulse)
Narrow Complex (< 0.12 sec) - IRREGULAR Rhythm

EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

STABLE

1. **UNIVERSAL PATIENT CARE**.
    a. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving.
2. Establish IV access - preferably large bore in AC.
3. Consider **NORMAL SALINE 500 mL bolus** to rule out hypovolemia/dehydration as cause of tachycardia. Repeat fluid bolus as needed as long as lungs remain clear; maximum **2 liters**.

UNSTABLE *(Hypotension, Chest Pain with evidence of ischemia, AMS, signs of shock, acute CHF)*

1. Immediate SYNCHRONIZED CARDIOVERSION at **200J** (or per manufacturer's recommendation).
    a. If normal LOC, consider sedation with **MIDAZOLAM 2.5 mg IV/IO.**
2. If no response to initial energy dose, repeat SYNCHRONIZED CARDIOVERSION in escalating, stepwise fashion (i.e. 200J-300J-360J).
3. If cardioversion is successful, obtain 12-Lead ECG.

Paramedic

STABLE

1. Continue **ILS Treatment.**
2. **DILTIAZEM 0.25 mg/kg slow IV/IO push over 2-5 minutes** if SBP > 100.
    a. ACLS guidelines recommend 15 to 20 mg; **Max dose 20mg**.
    b. For patients older than 65, recommended maximum initial dose of **10mg IV.**
3. If A-fib or A-flutter persists after 15 minutes, consider **DILTIAZEM 0.35 mg/kg slow IV/IO push over 2-5 minutes** if SBP > 100.
    a. ACLS guidelines recommend 20 to 25 mg; Max dose 25mg.
    b. For patients older than 65, recommended maximum second dose of **20mg IV.**
4. If responsive to CARDIZEM bolus, may start **DILTIAZEM maintenance infusion** at **5-15 mg/hr**.
    a. DILTIAZEM infusion: mix DILTIAZEM 100 mg in 100 mL 0.9% Normal Saline to give you 1 mg/mL concentration.
    b. Use 60 drop IV set and 5-15 drops/minute is equivalent to 5-15 mg/hr
5. If patient converts, obtain a repeat 12-Lead ECG
6. If A-fib or A-flutter persists, consider SYNCHRONIZED CARDIOVERSION *(see ILS treatment above).*

UNSTABLE *(Hypotension, Chest Pain with evidence of ischemia, AMS, signs of shock, acute CHF)*

1. Immediate SYNCHRONIZED CARDIOVERSION *(see ILS treatment above).*

Tachycardia (with a Pulse)
Wide Complex (> 0.12 sec)

History
- Past medical history (pacemaker)
- Medications
- Diet
- Drugs
- Syncope / Near syncope
- CHF
- Palpitations

Signs and Symptoms
- Wide complex tachycardia on ECG (QRS > 0.12 sec)
- Conscious, rapid pulse
- Chest pain
- Shortness of breath
- Dizziness
- AMS
- Diaphoresis

Differential
- Artifact / Device failure
- Cardiac
- Endocrine / Metabolic
- Drugs
- Pulmonary

EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Perform 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility (if available).
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **BLS TREATMENT**.
    a. Obtain 12-lead ECG within 10 minutes of patient contact and transmit to receiving facility.
2. Establish IV access - preferably large bore in AC.
3. Consider **NORMAL SALINE 500 mL bolus** to rule out hypovolemia/dehydration as cause of tachycardia. Repeat fluid bolus as needed as long as lungs remain clear; maximum **2 liters**.

STABLE

1. If regular rhythm and monomorphic QRS, consider **ADENOSINE 6 mg rapid IV/IO push** followed by a rapid flush.
    a. If no change in rhythm, may repeat **ADENOSINE 12 mg rapid IV/IO push** followed by a rapid flush.
2. Consider **AMIODARONE 150 mg IV/IO over 10 minutes**. May repeat **AMIODARONE** in **10 minutes**
3. For patients with allergy or no response to AMIODARONE, consider **LIDOCAINE 1.5 mg/kg IV/IO**. May **repeat every 3-5 minutes x 2** at **0.75 mg/kg** to maximum total dose of **3 mg/kg**.
4. If tachycardia resolves with LIDOCAINE bolus, administer **LIDOCAINE** infusion at **2-4 mg/min**.

UNSTABLE

1. If altered LOC, immediate SYNCHRONIZED CARDIOVERSION at **100J** .
    a. If normal LOC, consider sedation with **MIDAZOLAM 2.5 mg IV/IO.**
2. If no response to initial energy dose, repeat SYNCHRONIZED CARDIOVERSION in escalating, stepwise fashion (i.e. 200J-300J-360J) or device recommendation.
3. If cardioversion is successful obtain 12-Lead ECG.
4. If the patient becomes pulseless at any time, refer to the CARDIAC ARREST and/or V-FIB/PULSELESS V-TACH Protocol.

Paramedic

1. Continue **ILS TREATMENT**
2. For Polymorphic V-Tach / Torsades de Pointes, consider **MAGNESIUM SULFATE 2 grams IV/IO** over 10 minutes.

Tachycardia (with a Pulse)

PEARLS

Unstable: Hypotension, Chest Pain with evidence of ischemia, AMS, signs of shock, acute CHF

Regular Narrow Complex Tachycardia - SVT

Irregular Narrow Complex Tachycardia - Atrial fibrillation, atrial flutter, multifocal atrial tachycardia

Regular Wide Complex Tachycardia - Ventricular tachycardia, supraventricular tachycardia, atrial fibrillation/flutter with aberrancy, accelerated idioventricular rhythms, pre-excited tachycardias with accessory pathways

Irregular Wide Complex Tachycardia - atrial fibrillation with aberrancy, pre-excited atrial fibrillation (i.e. atrial fibrillation using an accessory pathway), polymorphic VT / torsades de pointes (treat with Mag Sulfate)

- Consider causes for tachycardia (hypovolemia, hypoxia, hydrogen (acidosis), myocardial infarction, hypokalemia / hyperkalemia, hypoglycemia, hypothermia, toxins / overdose, tamponade, tension, pneumothorax , thrombus – central or peripheral, trauma, hyperthyroidism).
- Atrial fibrillation rarely requires cardioversion in the field. As it is difficult to ascertain onset of rhythm, risk of stroke needs to be considered prior to cardioversion
- A wide-complex irregular rhythm should be considered pre-excited atrial fibrillation; extreme care must be taken in these patients
    a. Characteristic ECG findings include a short PR interval and, in some cases, a delta wave
    b. Avoid AV nodal blocking agents such as Adenosine, calcium channel blockers, Digoxin, and possibly beta-blockers in patients with pre-excitation atrial fibrillation (e.g. Wolff-Parkinson-White Syndrome, Lown-Ganong-Levine Syndrome) because these drugs may cause a paradoxical increase in the ventricular response.
    c. Blocking the AV node in some of these patients may lead to impulses that are transmitted exclusively down the accessory pathway, which can result in ventricular fibrillation.
- Calcium Channel Blocker administered ONLY with narrow complex tachydysrhythmia.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, yet is not harmful.

**MODIFIED VALSALVA MANEUVER

1. Have patient blow through a 10 cc syringe in a semi recumbent position for 15 seconds
2. Lay patient flat and lift their legs to 45 degrees for 15 seconds
3. Return patient to the semi recumbent position for 45 seconds before reassessing cardiac rhythm

KEY DOCUMENTATION ELEMENTS

- Initial rhythm and all rhythm changes
- Time, dose and response to meds given
- Cardioversion times, attempts, joules and response
- Obtain monitor strips after each intervention

PERTINENT ASSESSMENT FINDINGS

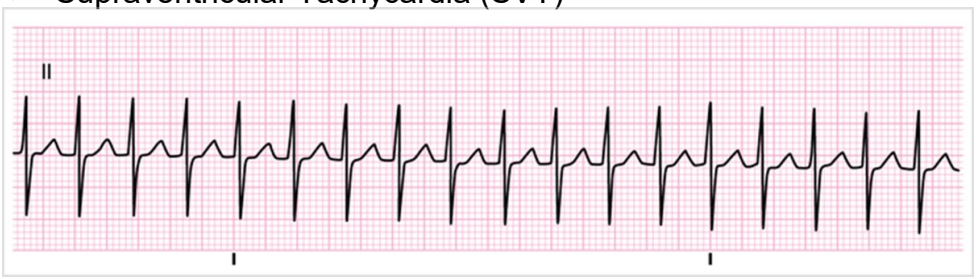
QUALITY METRICS

- Correct medication and dose given
- Correct cardioversion joules delivered

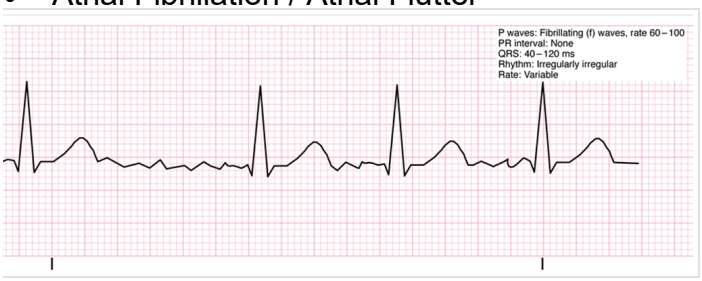
Tachycardia (with a Pulse)

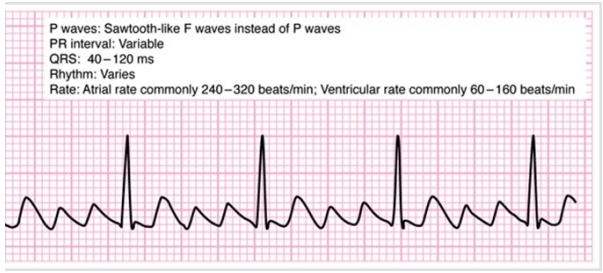
Rhythms

- Supraventricular Tachycardia (SVT)



- Atrial Fibrillation / Atrial Flutter

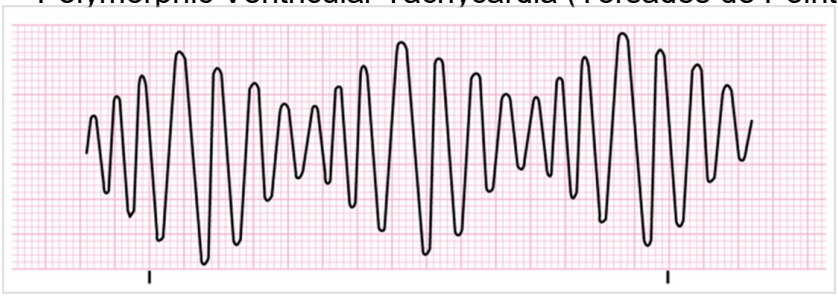




- Multifocal Atrial Tachycardia (MAT)

- Monomorphic Ventricular Tachycardia

- Polymorphic Ventricular Tachycardia (Torsades de Pointes)



Adult Cardiac

Tachycardia (with a Pulse)

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Ventricular Assist Device (VAD)

EMR & EMT-Basic

MyLVAD EMS Guide: https://www.mylvad.com/medical-professionals/resource-library/ems-field-guides

1. **UNIVERSAL PATIENT CARE**.
2. Inspect VAD control for model name and alarms.
3. Asses for possible pump malfunction.
    a. Assess for alarms.
    b. Auscultate for pump sound “hum”.
    c. Signs of hypoperfusion including pallor, diaphoresis, ALTERED MENTAL STATUS.
4. If the VAD pump has malfunctioned:
    a. Utilize available resources to troubleshoot potential VAD malfunctions and to determine appropriate corrective actions to restore normal VAD function.
        i. Contact the patient’s VAD-trained companion, if available.
        ii. Contact the patient’s VAD coordinator, using the phone number on the device.
        iii. Check all the connections to system controller.
        iv. Change VAD batteries, and/or change system controller if indicated
        v. Have patient stop all activity and assess for patient tolerance.
        vi. Follow appropriate cardiovascular condition-specific protocol(s) as indicated.
5. If patient is in full cardiac arrest:
    a. CPR should not be performed if there is any evidence the pump is still functioning, the decision whether to perform CPR should be made based upon best clinical judgment in consultation with the patient’s VAD-trained companion and the VAD coordinator (or direct medical oversight if VAD coordinator unavailable).
    b. CPR may be initiated only where:
        i. You have confirmed the pump has stopped and troubleshooting efforts to restart it have failed, and
        ii. The patient is unresponsive and has no detectable signs of life
6. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.
7. Be sure patient brings back up power sources (batteries, charger, etc.), and hand pump (if applicable).

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Monitor ECG. If there is a pulse, the rhythm may not correlate with it.
3. Obtain 12-lead ECG. Follow appropriate protocol if STEMI or dysrhythmia present.
4. Establish IV access
5. If VAD is functioning and signs of hypoperfusion and lungs are clear, administer **NORMAL SALINE 250 mL fluid bolus** over 10 minutes. May repeat once, up to a total of 500ml or until MAP > 65 mmHg.
    a. Okay to pace, cardiovert, or defibrillate the hypoperfused/unstable patient. Do not disconnect the LVAD

Ventricular Assist Device (VAD)

PEARLS

MyLVAD EMS Guide: https://www.mylvad.com/medical-professionals/resource-library/ems-field-guides

- Deciding when to initiate Chest Compressions is very difficult. Consider that chest compressions **may cause death by exsanguination** if the device becomes dislodged. However, if the pump has stopped the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. IF a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compression. Contact the VAD coordinator and Medical Control.
- You do not need to disconnect the controller or batteries in order to:
    a. Pace, defibrillate or cardiovert
    b. Acquire a 12-lead ECG
- Automatic non-invasive cuff blood pressures may be difficult to obtain due to the narrow pulse pressure created by the continuous flow pump.
- Flow though many VAD devices is not pulsatile and patients may not have a palpable pulse or accurate pulse oximetry.
- The blood pressure, if measurable, may not be an accurate measure of perfusion.
- Ventricular fibrillation, ventricular tachycardia, or asystole/PEA may be the patient's "normal" underlying rhythm. Evaluate clinical condition and provide care in consultation with VAD coordinator
- The patient's travel bag should accompany them at all times with back-up controller and spare batteries
- If feasible, bring the patient's power module, cable, and display module to the hospital
- All patients should carry a spare pump controller with them
- The most common cause for VAD alarms are low batteries or battery failures
- Although automatic non-invasive blood pressure cuffs are often ineffective in measuring systolic and diastolic pressure, if they do obtain a measurement, the MAP is usually accurate
- Other VAD complications:
    a. Infection
    b. Stroke/TIA
    c. Bleeding
    d. Arrhythmias
    e. Cardiac tamponade
    f. CHF
    g. Aortic insufficiency

KEY DOCUMENTATION ELEMENTS

- Information gained from the VAD control box indicating any specific device malfunctions
- Interventions performed to restore a malfunctioning VAD to normal function
- Time of notification to and instructions from VAD-trained companion and/or VAD coordinator

PERTINENT ASSESSMENT FINDINGS

- Asses for possible pump malfunction by assess for alarms, auscultating for pump sound and looking for signs of hypoperfusion

QUALITY METRICS

- Identify and mitigate any correctable VAD malfunctions
- Perform CPR for patients in cardiac arrest when indicated

Direct Obstetric Transport Criteria

Criteria

1. Pregnant patients 20+ weeks gestation who have
    a. Acute onset of abdominal pain
    b. Contractions
    c. Suspected rupture of membranes
2. Exclusions
    a. Imminent delivery (i.e. crowning; feeling the need to push)
    b. Previous precipitous delivery
    c. Patients with symptoms of labor who are less than 20 weeks gestation
    d. Any other situation where the judgement of treating EMS personnel is that the additional transport time might medically endanger the mother.

All Levels

1. **UNIVERSAL PATIENT CARE.**
2. Patients meeting the criteria listed above should bypass community hospital lacking labor and delivery capabilities and be transported to the closest, most appropriate hospital with labor and delivery services.
3. Contact Medical Control if any questions or concerns arise during patient care.

OB Destination Determination

- OSF Heart of Mary and Carle Foundation Hospital are considered equally distant. Patients may choose freely between these facilities as “closest”.
- List of Region 6 (and adjacent) hospitals with labor and delivery capabilities (updated 10/14/2022)
    - OSF Sacred Heart Medical Center (Danville, IL)
    - OSF St Joseph Medical Center (Bloomington, IL)
    - Gibson Area Hospital (Gibson, IL)
    - Carle Foundation Hospital (Urbana, IL)
    - Carle BroMenn Hospital (Normal, IL)
    - Carle Richland Memorial Hospital (Olney, IL)
    - Sarah Bush Lincoln Health Center (Mattoon, IL)
    - Decatur Memorial Hospital (Decatur, IL)
    - HSHS St. Mary’s Hospital (Decatur, IL)

Direct Obstetric Transport Criteria

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Childbirth / Labor

History
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High risk pregnancy

Signs and Symptoms
- Spasmodic pain
- Vaginal discharge or bleeding
- Contractions
- Crowning or urge to push
- Membrane rupture
- Meconium

Differential
- Abnormal presentation
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta

All Levels

1. **UNIVERSAL PATIENT CARE.**
2. If patient in active labor but no signs of imminent delivery:
   a. Prepare for transport. Consider transporting patient in left lateral recumbent position if able.
   b. Frequently reassess for crowning.
4. If patient is in active labor AND signs of imminent delivery, prepare for delivery.
   a. Encourage the patient to perform slow steady pushes with contractions.
   b. Delivery should be controlled in order to allow a slow controlled delivery of infant to prevent injury to mother.
      i. Support the infant's head with gentle counterpressure as it presents to help prevent the head from suddenly popping out.
   c. After delivery of head, suction airway orally then nasally.
   d. Check for nuchal cord and if present attempt to slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
   e. Grasping the head with hand over the ears, gently guide head down to allow delivery of the anterior shoulder.
   f. Gently guide the head up to allow delivery of the posterior shoulder.
   g. Slowly deliver the remainder of the infant.
   h. After 1-3 minutes, clamp cord about 6 inches from the abdomen with 2 clamps; cut the cord between the clamps.
      i. Keep baby positioned level with the mother's heart until cord is cut.
   i. Dry/warm/stimulate infant, wrap in towel & place on mother's chest unless resuscitation needed
5. Record APGAR scores at 1 and 5 minutes.
6. Provide routine neonatal care (dry, warm, position, suction, stimulate). Refer to NEWBORN CARE / NEONATAL RESUSCITATION Protocol
7. The placenta will deliver spontaneously, often within 5-15 minutes of the infant.
   a. Never pull on cord in an attempt to hasten delivery.
9. After delivery, massaging the uterus and allowing the infant to nurse will promote uterine contraction and help control bleeding.
10. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.
11. Transport infant secured to mother with approved neonatal restraint system, in car seat or isolette unless resuscitation is needed. Keep infant warm during transport.

Signs of imminent delivery:
a. Crowning or other presentation in vaginal opening
b. Urge to push
c. Urge to move bowels
d. Mother's sense of imminent delivery

Protocol Continues

Childbirth / Labor

EMR & EMT-Basic

1. If complications of delivery occur, the following are recommended in addition to applying O_2 to mother and expedite transport to closest most appropriate facility:
    a. **Shoulder dystocia** - If delivery fails to progress after head delivers:
        i. Hyperflex mother's hips to severe supine knee-chest position (McRobert's maneuver).
        ii. Apply firm suprapubic pressure to attempt to dislodge shoulder.
        iii. Attempt to angle baby's head as posteriorly as possible but NEVER pull.
    b. **Prolapsed Umbilical Cord**
        i. Place gloved hand into vagina and gently lift head / body off of cord.
            - Do not remove your hand. Maintain until relieved by hospital staff.
        ii. Wrap the prolapsed cord in moist sterile gauze.
        iii. Consider placing mother in prone knee-chest position or extreme Trendelenburg.
    c. **Breech Birth**
        i. Place mother supine, allow the buttocks and trunk to deliver spontaneously, then support the body while the head is delivered.
        ii. If needed, put the mother in a kneeling position which may assist in the delivery.
        iii. If head fails to deliver, place gloved hand into vagina with fingers between infant's face and uterine wall to create an open airway. Place your index and ring fingers on the baby's cheeks forming a "V" taking care not to block the mouth and allowing the chin to be tilted toward the chest flexing the neck
        iv. When delivering breech, you may need to rotate the baby's trunk clockwise; or sweep the legs from the vagina
        v. Once the legs are delivered support the body to avoid hyperextension of the head; keep the fetus elevated off the umbilical cord.
        vi. NEVER pull on the body, especially a preterm or previable baby – just support the baby's body while mother pushes when she feels the urge to.
        vii. The presentation of an arm or leg through the vagina is an indication for immediate transport to hospital.
        viii. Assess for presence of prolapsed cord and treat as above.
    d. Excessive bleeding during active labor may occur with placenta previa.
        i. Obtain history from patient.
        ii. Placenta previa may prevent delivery of infant vaginally.
        iii. C-section needed—transport urgently.
    e. Maternal Cardiac Arrest
        i. Apply manual pressure to displace uterus from right to left.
        ii. Treat per CARDIAC ARREST Protocol.
2. Contact Medical Control for direct medical oversight and make the receiving facility aware of your arrival.
3. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Consider **NORMAL SALINE 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg.

Childbirth / Labor

PEARLS

- Some bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- Supine Hypotension Syndrome:
  a. If mother has hypotension before delivery, place patient in left lateral recumbent position or manually displace gravid uterus to the left is supine position necessary.
  b. Knee-chest position may create safety issues during rapid ambulance transport
- Dry, warm and stimulate all newborns to facilitate respirations and prevent hypothermia.
- Do not pull on the umbilical cord while the placenta is delivering.

APGAR Score			
Sign	**0**	**1**	**2**
Appearance	Blue, Pale	Body pink, Extremities blue	Completely pink
Pulse	Absent	< 100	> 100
Grimace	No response	Grimace	Cough or Sneeze
Activity	Limp	Some flexion	Active motion of extremities
Respirations	Absent	Slow, Irregular	Good, Crying

KEY DOCUMENTATION ELEMENTS

- Document all times (delivery, contraction frequency and length)
- Document any complication with delivery

PERTINENT ASSESSMENT FINDINGS

- Signs of imminent delivery:
  a. Contractions
  b. Crowning
  c. Urge to push
  d. Urge to move bowels
  e. Membrane rupture
  f. Bloody show

QUALITY METRICS

- Documentation of APGAR scores
- Recognition of complications

Childbirth / Labor

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Eclampsia / Pre-Eclampsia

History
- Past medical history
- Hypertension medications
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

Signs and Symptoms
- Hypertension
- Seizures
- Severe headaches
- Visual changes
- Edema of hands and face
- Abdominal pain

Differential
- Pre-eclampsia
- Eclampsia
- Seizures
- Hypertension

Definitions

Female patients > 20 weeks gestation and < 4 weeks post-partum

Pre-Eclampsia: In the setting of pregnancy, hypertension defined as a SBP > 140 or DBP > 90 mmHg in previously normotensive patient. Symptoms of headache, vision changes, confusion, abdominal pain, pulmonary edema.

Eclampsia: Pre-Eclampsia with the development of seizures.

EMR & EMT- Basic

1. **UNIVERSAL PATIENT CARE.**
2. Obtain history and vital signs.
   a. Gestational age or recent post-partum.
   b. Symptoms suggestive of end organ involvement such as headache, confusion, visual disturbances, seizure, epigastric pain, right upper quadrant pain, nausea/vomiting, stroke symptoms, shortness of breath
   c. Previous history of hypertension or known pre-eclampsia.
3. Place patient in left lateral recumbent position.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT.**
2. Establish IV access.
3. If pregnant patient develops seizures refer to SEIZURE / STATUS EPILEPTICUS Protocol and call for intercept per INTERCEPT CRITERIA.

Paramedic

1. Continue **ILS TREATMENT.**

Medical Control

2. Medical Control may consider **MAGNESIUM SULFATE 4 g IV** in 50 mL NS over 10-20 minutes for seizures associated with pregnancy greater than 20-weeks gestation.

Eclampsia / Pre-Eclampsia

PEARLS

- Delivery of the placenta is the only definitive management for pre-eclampsia and eclampsia.
- Early treatment of severe pre-eclampsia with magnesium and anti-hypertensive significantly reduces the rate of eclampsia - use of magnesium encouraged if signs of severe pre-eclampsia present to prevent seizure.
- Magnesium toxicity (progression)
    a. Hypotension followed by
    b. Loss of deep tendon reflexes followed by
    c. Somnolence, slurred speech followed by
    d. Respiratory paralysis followed by
    e. Cardiac arrest
- Treatment of magnesium toxicity
    a. Stop magnesium drip
    b. Support respiratory effort

KEY DOCUMENTATION ELEMENTS

- Document full vital signs and physical findings
- Document neurologic exam

PERTINENT ASSESSMENT FINDINGS

- Vital signs assessment with repeat blood pressure monitoring before and after treatment
- Assessment of deep tendon reflexes after magnesium therapy
- Examination for end organ involvement

QUALITY METRICS

- Patients with signs of hypertension and great than 20-weeks gestation or recent post-partum should be assess for signs of pre-eclampsia
- Recognition and appropriate treatment of eclampsia

Newborn Care / Neonatal Resuscitation

History
- Due date and gestational age
- Multiple gestation (twins, etc.)
- Meconium / Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors such as substance abuse or smoking

Signs and Symptoms
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential
- Airway failure
  - -Secretions
  - -Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia, hypoglycemia, hypothermia
- Congenital heart disease

EMR & EMT-Basic

1. If immediate resuscitation is required and the newborn is still attached to the mother, clamp the cord in two places and cut between the clamps. If no resuscitation is required, warm / dry / stimulate the newborn and then cut / clamp the cord after 60 seconds or the cord stops pulsating.
2. Record APGAR scores at 1 and 5 minutes.
3. Dry, warm and stimulate.
   a. Wrap infant in dry towel or thermal blanket to keep infant as warm as possible during resuscitation; keep head covered if possible.
   b. If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen.
4. If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and clear airway as needed - if thick meconium or secretions present *and* signs of respiratory distress, suction mouth then nose.
5. If heart rate **greater than 100 beats** per minute.
   a. Monitor for central cyanosis - provide blow-by oxygen as needed.
   b. Monitor for signs of respiratory distress. If apneic or in significant respiratory distress:
      i. Initiate BVM ventilation with room air at 40-60 breaths per minute.
         – Positive pressure ventilation (PPV) with bag-mask device may be initiated with room air (21% O_2) in term and late preterm babies; otherwise use 100% O_2
         – Goal: SPO_2 at 10 minutes is 85–95%
6. If heart rate **less than 100 beats** per minute
   a. Initiate BVM ventilation with room air at 40-60 breaths per minute for 90 seconds with room air.
      i. Primary indicator of effective ventilation is improvement in heart rate (check HR q 30s)
      ii. Rates and volumes of ventilation required can be variable, only use the minimum necessary rate and volume to achieve chest rise and a change in heart rate.
   b. If no improvement after 90 seconds, change O_2 delivery to 100% FiO_2 until HR normalizes
7. If heart rate **less than 60 beats** per minute
   a. Ensure effective ventilations with supplementary oxygen and adequate chest rise.
   b. If no improvement after 30 seconds, initiate chest compressions - two-thumb-encircling-hands technique is preferred.
   c. Coordinate chest compressions with positive pressure ventilation (3:1 ratio, 90 compressions and 30 breaths per minute).
8. Relay information to incoming ambulances or call for intercept per INTERCEPT CRITERIA.

Protocol Continues

Newborn Care / Neonatal Resuscitation

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS Treatment**.
2. If heart rate **less than 60 beats** per minute despite ventilations and chest compressions:
   a. Continue ventilations and chest compressions and consider advanced airway.
   b. Administer **EPINEPHRINE (1:10,000) 0.01 mg/kg IV/IO** (preferable if access obtained) or 0.1 mg/kg via the ETT (if unable to obtain access). May repeat every 3-5 min if HR remains less than 60bpm.
3. Administer **NORMAL SALINE 20 mL/kg IV/IO** for signs of shock or post-resuscitative care.
4. Check a blood glucose for ongoing resuscitation, maternal history of diabetes, ill appearing or unable to feed.
   a. If blood glucose < 60 mg/dL, administer **DEXTROSE 10% (D10) 5mL/kg** .

Projected Pulse Oximetry in Infants Over Time	
Time Since Birth	**Projected Increase in Pulse Oximeter Over Time**
1 minute	60-65%
2 minutes	65-70%
3 minutes	70-75%
4 minutes	75-80%
5 minutes	80-85%
10 minutes	85-90%

APGAR Score			
Sign	**0**	**1**	**2**
Appear-ance	Blue, Pale	Body pink, Extremities blue	Completely pink
Pulse	Absent	< 100	> 100
Grimace	No response	Grimace	Cough or Sneeze
Activity	Limp	Some flexion	Active motion of extremities
Respira-tions	Absent	Slow, Irregular	Good, Crying

		Intervention Indicated		
		Blow-by Oxygen	**Bag-Mask-Ventilation (BVM)**	**BVM and Chest Compressions**
Assessment	**Heart Rate (BPM)**	> 100	60-100	< 60
	Respiratory Distress/Apnea	No	Yes	
	Central Cyanosis Present	Yes	Yes/No	

Newborn Care / Neonatal Resuscitation

PEARLS

- Newborn infants are prone to hypothermia which may lead to hypoglycemia, hypoxia and lethargy. Aggressive warming techniques should be initiated including drying, swaddling and warm blankets covering body and head.
- Raise temperature in ambulance patient compartment.
- Approximately 10% of newly born infants require some assistance to begin breathing.
- Deliveries complicated by maternal bleeding (placenta previa, vas previa, or placental abruption) place the infant at risk for hypovolemia secondary to blood loss.
- Low birth weight infants are at high risk for hypothermia due to heat loss.
- Measuring the pulse oximetry on the right hand provides the most accurate oxygen saturation (SpO2) in infants that are transitioning from fetal to normal circulation. At 60 seconds, 60% is the target with an increase of 5% every minute until 5 minutes of life when pulse oximetry is 80–85%.
- Both hypoxia and excess oxygen administration can result in harm to the infant. If prolonged oxygen use is required, titrate to maintain an oxygen saturation of 85-95%.
- While not ideal, a larger facemask than indicated for patient size may be used to provide bag-valve-mask ventilation if an appropriately sized mask is not available - avoid pressure over the eyes as this may result in bradycardia.
- Increase in heart rate is the most reliable indicator of effective resuscitative efforts.
- A multiple gestation delivery may require additional resources and/or providers.
- During transport, neonate should be appropriately secured (e.g., secured to mother with approved neonatal restraint system, car seat or isolette) and mother should be appropriately secured.

KEY DOCUMENTATION ELEMENTS

- Document full vital signs and physical findings
- APGAR score
- Historical elements
  - -Prenatal complications
  - -Delivery complications
  - -Date and time of birth
  - -Estimated gestational age

PERTINENT ASSESSMENT FINDINGS

- If there is any doubt as to viability, resuscitation efforts should be initiated
- Acrocyanosis, a blue discoloration of the distal extremities, is a common finding in the newly born infant transitioning to extrauterine life—this must be differentiated from central cyanosis

QUALITY METRICS

- Time to initiation of interventions
- Use of oxygen during resuscitation
- Number of advanced airway attempts

Newborn Care / Neonatal Resuscitation

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Obstetric and Gynecological Conditions

History
- Past medical history
- Hypertension medications
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

Signs and Symptoms
- Vaginal bleeding
- Abdominal pain
- Nausea / Vomiting
- Syncope
- Lightheadedness / Dizziness

Differential
- Placenta previa
- Abruptio placenta
- Spontaneous abortion
- Ectopic pregnancy

Definitions

Abruptio placenta: Occurs in third trimester of pregnancy; placenta prematurely separates from the uterus causing intrauterine bleeding

a. Lower abdominal pain and uterine rigidity.
b. Lower abdominal pain, uterine rigidity (often not present until abruption is advanced).
c. Vaginal bleeding – this symptom may not occur in cases of concealed abruption.
d. Clinical index of suspicion for abruption (history of trauma, maternal hypertension, maternal drug use especially cocaine).
e. Shock, with minimal or no vaginal bleeding.

Placenta previa: placenta covers part or all of the cervical opening

a. Generally, late second or third trimester.
b. Painless vaginal bleeding, unless in active labor.

Ectopic pregnancy (ruptured)

a. First trimester.
b. Abdominal/pelvic pain with or without minimal bleeding.

Spontaneous abortion (miscarriage)

a. Generally first trimester.
b. Intermittent pelvic pain (uterine contractions) with vaginal bleeding/passage of clots or tissue.

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE.**
2. Exam perineum.
3. Obtain history of pregnancy and pre-natal care.
4. Massage uterus if bleeding is post-delivery.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT.**
2. Establish IV access.
3. If signs of shock, refer to SHOCK Protocol.

Paramedic

1. Continue **ILS TREATMENT.**
2. For hypotension and signs of shock due to significant, uncontrolled hemorrhage following delivery, consider **TRANEXAMIC ACID (TXA) 1 gram in 50 mL of Normal Saline IV/IO** over 10 minutes.

Obstetric and Gynecological Conditions

PEARLS

- Patients in third trimester of pregnancy should be transported on left side or with uterus manually displaced to left if hypotensive.
- Do not place hand/fingers into vagina of bleeding patient except in cases of prolapsed cord or breech birth that is not progressing.
- Syncope can be a presenting symptom of hemorrhage from ectopic pregnancy or causes of vaginal bleeding.
- Save all possible tissue so that the receiving team can assess.

KEY DOCUMENTATION ELEMENTS

- Document full vital signs and physical findings

PERTINENT ASSESSMENT FINDINGS

- Vital signs to assess for signs of shock (e.g. tachycardia, hypotension)
- Abdominal exam (e.g. distension, rigidity, guarding)

QUALITY METRICS

- Recognition and appropriate treatment of shock
- Utilization of Tranexamic Acid

Initial Trauma Care

All Levels

PRIMARY SURVEY:

Scene Size-Up

1. Ensure scene safety – identify any hazards.
2. Determine the number of patients.
3. Identify the mechanism of injury.
4. Call for additional resources if needed.

Initial Assessment (Use "**MARCH**" algorithm)

1. Obtain a general impression of the patient's condition.
2. **M**assive Hemorrhage
   a. Assess for and stop severe hemorrhage. Refer to EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
3. **A**irway
   a. Assess airway patency by asking the patient to talk to assess for stridor and ease of air movement.
   b. Establish patent airway with cervical spine precautions as needed, per the AIRWAY MANAGEMENT and SPINAL MOTION RESTRICTION Protocol.
   c. Look for injuries that may lead to airway obstruction including unstable facial fractures, expanding neck hematoma, blood or vomitus in the airway, facial burns / inhalation injury.
   d. Evaluate mental status for ability to protect airway (patients with GCS ≤ 8 are likely to require airway protection).
4. **R**espiratory/Breathing
   a. Assess respiratory rate and pattern.
   b. Assess for tracheal deviation.
   c. Assess symmetry of chest wall movement.
   d. Listen bilaterally for breath sounds. If absent/diminished breath sounds in hypotensive patient, consider tension pneumothorax and perform NEEDLE DECOMPRESSION **(ILS/ALS ONLY)**
   e. For open chest wound, place occlusive dressing.
   f. Monitor oxygen saturation and $EtCO_2$, if indicated, provide supplemental **Oxygen**.
5. **C**irculation
   a. Assess blood pressure and pulses noting rate, rhythm and quality.
   b. Evaluate skin color, temperature and condition.
   c. Establish IV access and administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**. **(ILS/ALS ONLY)**
   d. In patients with head injury, hypotension should be avoided to maintain cerebral perfusion and target SBP should be 110-120 mmHg. **(ILS/ALS ONLY)**
6. **H**ead Injury/**H**ypothermia (Disability)
   a. Perform initial neurologic status assessment of GCS/AVPU and pupillary size and responsiveness:
      A – Alert; **V** – Responds to verbal; **P** – Responds to pain; **U** – Unresponsive
   b. Assess for gross motor movements of extremities.
   c. Evaluate for clinical signs of traumatic brain injury with herniation including:
      i. Unequal Pupils
      ii. Lateralizing motor signs
      iii. posturing
   d. Prevent hypothermia (remove wet clothing and cover patient to prevent further heat loss).
8. **Critical Transport Decision -** Refer to REGION 6 TRAUMA TRIAGE ALGORITHM
   a. Limit scene time to 10 minutes or less if the patient meets category A or B criteria.

Protocol Continues

All Levels

SECONDARY SURVEY:

SAMPLE History

- Signs and Symptoms
- Allergies
- Medications
- Past medical history, injuries, illnesses
- Last meal / intake
- Events leading up to the injury and/or illness

Head to Toe Physical Exam

(Evaluate for: DCAP-BLS TIC—Deformities, Contusions, Abrasions, Puncture/Penetration/Paradoxical movement - Burns, Laceration, Swelling - Tenderness, Instability, Crepitus)

1. Head
    a. Palpate head, scalp and face and evaluate for soft tissue injury or bony crepitus.
    b. Assess for globe injury and subjective change in vision.
    c. Assess pupils.
2. Neck
    a. Examine for contusions, abrasions, hematomas, lacerations, crepitus, JVD, or tracheal deviation.
    b. Palpate the c-spine for tenderness, deformity and/or crepitus. Refer to SPINAL MOTION RESTRICTION Protocol.
3. Chest
    a. Palpate for instability / crepitus and look for flail segments or paradoxical movements.
    b. Listen to breath sounds.
    c. Inspect for penetrating or soft tissue injuries.
4. Abdomen
    a. Palpate for tenderness.
    b. Inspect for penetrating or soft tissue injuries.
    c. Cover eviscerated abdominal contents with moist dressings.
5. Pelvis
    a. Inspect for penetrating or soft tissue injuries.
    b. Palpate once for instability by applying medial pressure on the iliac crests bilaterally.
6. Back
    a. Maintain spinal alignment and log roll with a minimum of 2 rescuers.
    b. Inspect for penetrating or soft tissue injuries.
    c. Immobilize if applicable per the SPINAL MOTION RESTRICTION Protocol.
7. Neurologic status assessment
    a. Calculate Glasgow Coma Scale (GCS).
    b. Serial assessment of mental status.
    c. Gross exam of motor, strength and sensation in all four extremities.
8. Extremities
    a. Assess for fracture / deformity.
    b. Assess peripheral pulses / capillary refill.

Protocol Continues

All Levels

ONGOING ASSESSMENT:

Monitoring and Reassessment *(seriously ill or injured patients should be reassessed **every 5 min**.)*

1. Reassess mental status (LOC, Pupils, GCS).
2. Reassess ABC's.
3. Reassess identified injuries (change in status, PMS).
4. Reassess and evaluate effectiveness of interventions.

****Monitor patient for deterioration over time with serial vital signs (pulse, blood pressure, respiratory rate, neurologic status assessment) and repeat neurologic status assessment.*

ADDITIONAL TREATMENT CONSIDERATIONS:

1. Maintain spine precautions per the SPINAL MOTION RESTRICTION Protocol.
2. Splint obvious extremity fractures per the EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
3. Provide pain medication per the PAIN MANAGEMENT Protocol.

GLASGOW COMA SCALE (GCS)

Behavior	Response Adult	Response Pediatric	Score
Eye Opening	Spontaneous		4
	To Verbal		3
	To Pain		2
	None		1
Verbal Response	Oriented	Oriented (Smiles, coos, oriented to sounds, interacts)	5
	Confused	Confused (Cries but consolable, Irritable)	4
	Inappropriate Words	Inappropriate Words (Inconsolable, Persistent Crying)	3
	Incomprehensible Sounds	Incomprehensible Sounds (Moans to Pain)	2
	None		1
Best Motor Response	Obeys Commands		6
	Localizes Pain		5
	Withdraws from Pain		4
	Flexion to Pain		3
	Extension to Pain		2
	None		1

Initial Trauma Care

PEARLS

- Optimal trauma care requires a structured approach to the patient emphasizing first control of massive hemorrhage using **MARCH** (**M**assive hemorrhage, **A**irway, **R**espiratory/Breathing, **C**irculation, **H**ead injury/ **H**ypothermia)
- Target scene time less than 10 minutes for unstable patients or those likely to need surgical intervention.
- Transport destination is based on the REGION 6 TRAUMA TRIAGE ALGORITHM Protocol.
- Transport should not be delayed for procedures; ideally procedures should be performed enroute when possible.
- Frequent reassessment of the patient is important. Monitor patient for deterioration over time with serial vital signs and repeat neurologic status assessment.
    a. If patient develops difficulty with ventilation, reassess breath sounds for development of tension pneumothorax.
    b. If extremity hemorrhage is controlled with pressure dressing or tourniquet, reassess for evidence of continued hemorrhage.
    c. If mental status declines, reassess ABCs and repeat neurologic status assessment.
    d. Patients with compensated shock may not manifest hypotension until severe blood loss has occurred.
- Life-threatening injuries identified on primary survey should be managed immediately with rapid transport to a trauma center, while the secondary survey is performed enroute.
- Patients with traumatic brain injury may deteriorate as intracranial swelling and hemorrhage increase.
- Anticipate potential for progressive airway compromise in patients with trauma to head and neck.

KEY DOCUMENTATION ELEMENTS

- Mechanism of injury
- Primary and secondary survey
- Serial vital signs and neurologic assessments
- Scene time
- Procedures performed and patient response

PERTINENT ASSESSMENT FINDINGS

- Primary Survey
- Secondary Survey
- Ongoing Assessment

QUALITY METRICS

- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center

Region 6 Trauma Triage Algorithm

Region 6 Trauma Triage Algorithm

When in doubt, take patient to an appropriate Trauma Center.

Measure signs and level of consciousness and assess for major injury.

For Patients Meeting Category A or B Criteria: Initiate Rapid Transport with Maximum of 10 Minute Scene Time

Airway Compromise or Management by a Basic Level EMS Provider without Mutual Aid Should be Transported to the Nearest Facility

Category A:

___GCS Less than or equal to 10
___Systolic BP less than 90 (Adult), 80 (Peds) with mechanism or exam findings suggesting ongoing blood loss
___Paralysis (spine)
___Uncontrolled Bleeding
___Penetrating injuries to abdomen, back, chest or neck and suspicion of significant injury
___Burns >24% surface area, or involving face/airway not meeting other Category A criteria (Direct to Burn Center)
___Salvageable amputation proximal to wrist or ankle not meeting other Category A criteria (Direct To Reimplant Center)
___Unstable Pelvic Fracture
___Pulseless Extremity
___Cardiac Tamponade or Tension Pneumothorax

YES

STRONGLY RECOMMEND:
Transport to Level I Trauma Center or Specialty Center per Protocol

Alert Trauma Team; Consider Helicopter Transport if Quicker and of Clinical Benefit.

NO:
Assess for other injuries.

Category B:

___LOC greater than 5 minutes and GCS 11-12
___Respiratory rate less than 10 or greater than 29
___Head injury with seizure activity, unilaterally dilated pupil or open/depressed skull fracture
___Full arrest not meeting Field Death Criteria
___Penetrating injuries with capability to work up/correct

___ High Risk Vehicular Crash:
*Rollover with unbelted passengers
*Ejection from crash
*Death in same passenger compartment
*Auto v. pedestrian/bicyclist thrown or run over
*Motorcycle crash with separation of rider and bike.
___Falls greater than 20 ft or 2-3 times patient's height if child
___Flail Chest/Chest wall instability
___Two or more proximal long bone fractures

YES

STRONGLY RECOMMEND:
Transport to center capable of providing definitive care (surgery if needed); alert trauma team; consider helicopter transport if quicker and of clinical benefit.

NO

Transport According to Trauma Protocols

Region 6 Trauma Triage Algorithm

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Abdominal Injuries

History
- Time of injury
- Mechanism (blunt vs penetrating)
- Bleeding
- Evidence for multi-trauma
- Past medical history
- Medications

Signs and Symptoms
- Pain
- Nausea / Vomiting
- Bruising and/or bleeding
- Distention
- Evisceration
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential
- Blunt vs penetrating trauma
- Intra-abdominal bleeding
- Evisceration
- Pelvis / Femur fracture

EMR & EMT-Basic

1. **INITIAL TRAUMA CARE**.
2. Control bleeding.
3. Treat any obvious abdominal injuries as indicated:
    a. **Evisceration:** Cover the organs with a saline-soaked sterile dressing. Do not attempt to put the organs back into the abdomen.
    b. **Impaled Objects:** Stabilize object with a bulky dressing. Do not attempt to remove an impaled object.
    c. **Penetrating Wounds:** Cover with saline-soaked sterile dressing. Look for potential exit wounds.
    d. **Blunt Trauma:** Continue to asses for clinical change (pain, distension, bruising, etc.)
4. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Establish IV access.
3. Administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90 mmHg; maximum 2 liters.
4. Consider management of pain per the PAIN MANAGEMENT Protocol.
5. Consider management of nausea/vomiting per the NAUSEA / VOMITING Protocol.

Abdominal Injuries

PEARLS

- Trauma to the abdomen is either blunt or penetrating.
- Blunt injuries are harder to detect and diagnose and have a higher mortality rate.
- Key signs and symptoms of blunt trauma include a patient in shock with no obvious injuries.
- Distention of the abdomen is an indication of internal hemorrhage. (Pain may not be a significant factor)
- Many abdominal trauma injuries are Load & Go cases.
- Target scene time less than 10 minutes.
- Transport destination is based on the REGION 6 TRAUMA TRIAGE ALGORITHM Protocol.
- Transport should not be delayed for procedures; ideally procedures should be performed enroute when possible.
- Frequent reassessment of the patient is important. Monitor patient for deterioration over time with serial vital signs and repeat abdominal exams.

KEY DOCUMENTATION ELEMENTS

- Mechanism of injury
- Primary and secondary survey
- Serial vital signs and abdominal assessments
- Procedures performed and patient response

PERTINENT ASSESSMENT FINDINGS

- Repeat abdominal exams
- Evaluate for exit wounds with penetrating injuries

QUALITY METRICS

- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center

Blast Injuries

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / Shock
- Airway compromise / Respiratory distress

Differential
- Superficial (1st Degree) red and painful
- Partial Thickness (2nd Degree) blisters
- Full Thickness (3rd Degree) painless/ charred or leathery skin
- Thermal injury
- Chemical injury
- Electrical injury
- Radiation injury

All Levels

1. Hemorrhage control
    a. Assess for and stop severe hemorrhage. Refer to EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
2. Airway
    a. Assess airway patency and consider possible thermal or chemical airway burns.
    b. Establish patent airway with cervical spine precautions per the AIRWAY MANAGEMENT and SPINAL MOTION RESTRICTION Protocol.
    c. If thermal or chemical burns to airway are suspected, early airway control is vital.
3. Breathing
    a. Evaluate adequacy of respiratory effort, oxygenation, quality of lung sounds and chest wall integrity.
    b. Listen bilaterally for breath sounds. Consider possible pneumothorax or tension pneumothorax (as a result of penetrating / blunt trauma or barotrauma).
    c. If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax and perform NEEDLE DECOMPRESSION **(ILS/ALS ONLY)**
    d. For open chest wound, place occlusive dressing.
    e. Monitor oxygen saturation and $EtCO_2$. If indicated, provide supplemental **Oxygen**.
4. Circulation
    a. Assess blood pressure and pulses noting rate, rhythm and quality.
    b. Assess skin color, temperature and condition.
    c. Establish IV access and administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**. **(ILS/ALS ONLY)**
    d. In patients with head injury, hypotension should be avoided to maintain cerebral perfusion and target SBP should be 110-120 mmHg. **(ILS/ALS ONLY)**
5. Disability
    a. Assess level of consciousness (AVPU).
    b. If evidence of head injury, treat per the HEAD INJURY Protocol.
    c. Apply spinal precautions, per the SPINAL MOTION RESTRICTION Protocol.
6. Exposure
    a. Rapid evaluation of entire body to identify sites of penetrating wounds, blunt injuries or burns. Be sure to roll patient and examine the back.
    b. Keep patient warm to prevent hypothermia.
    c. If patient has burns, refer to BURNS Protocol.

Blast Injuries

PEARLS

- Ensuring scene safety is especially important at the scene of an explosion.
    a. Consider possibility of subsequent explosions, structural safety, possible toxic chemical contamination, the presence of noxious gasses, and other hazards.
    b. In a possible terrorist event, consider the possibility of secondary explosive devices
- Remove patient from the scene as soon as is practical and safe.
- Patients sustaining blast injury may sustain complex, multi-system injuries including: blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure.
- Consideration of airway injury, particularly airway burns, should prompt early and aggressive airway management.
- Minimize IV fluid resuscitation in patients without signs of shock.
- Consider injuries due to barotrauma:
    a. Tension pneumothorax
        i. Hypotension or other signs of shock associated with decreased or absent breath sounds, jugular venous distension, and/or tracheal deviation.
    b. Tympanic membrane perforation resulting in deafness which may complicate the evaluation of their mental status and their ability to follow commands.
- **Types of Blast Injury:**
    a. Primary Blast Injury: From pressure wave.
    b. Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel. (Most common cause of death)
    c. Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.

KEY DOCUMENTATION ELEMENTS

- Airway status and intervention
- Breathing status (Oxygenation, respiratory effort)
- Documentation of burns, including TBSA
- Documentation of possible toxic chemical contamination

PERTINENT ASSESSMENT FINDINGS

- Evidence of multi-system trauma, especially:
    a. Airway injury / burn
    b. Barotrauma to lungs
    c. Toxic chemical contamination

QUALITY METRICS

- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center
- Airway assessment and early and aggressive management

Burns
(Thermal, Chemical, Electrical, Inhalation)

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / Shock
- Airway compromise / distress
- Singed facial or nasal hair
- Hoarseness / Wheezing

Differential
- Superficial (1st Degree) red and painful
- Partial Thickness (2nd Degree) blisters
- Full Thickness (3rd Degree) painless/ charred or leathery skin
- Thermal burns
- Chemical burns
- Electrical burns
- Radiation injury

EMR & EMT-Basic

General Treatment:

1. Assure scene and rescuer safety.
2. **INITIAL TRAUMA CARE**.
3. Expose the burned area and remove any rings, bracelets or other constricting items.
4. Estimate Total Body Surface Area (TBSA) and depth of burn.
    a. Use “Rule of 9’s”.
    b. First-degree (superficial) burns (skin erythema only) are not included in TBSA calculations.
5. If evidence of possible airway burn (burns around face, nares or pharynx), consider aggressive airway management per the AIRWAY MANAGEMENT Protocol.
6. Evaluate distal circulation in circumferentially burned extremities.
7. Prevent systemic heat loss and keep the patient warm.
8. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

Thermal Burns:

1. Stop the burning process with sterile water or normal saline.
    a. Remove non-adherent clothing and jewelry.
    b. Leave blisters intact.
2. Minimize burn wound contamination.
    a. Cover burns with dry dressing or clean sheet.
    b. Do not apply gels or ointments.
3. Consider Carbon Monoxide and/or Cyanide poisoning in patients with smoke inhalation. Refer to CARBON MONOXIDE / SMOKE INHALATION and CYANIDE POISONING Protocols.

Chemical Burns:

1. If dry chemical contamination, carefully brush off solid chemical prior to flushing the site.
2. If wet chemical contamination, flush the patient’s skin (and eyes, if involved) with copious amounts of water or normal saline.
3. For eye exposure, administer continuous flushing of Normal Saline fluid to eye.

Electrical Burns:

1. Verify scene safety and ensure that the electrical source is disabled prior to assessment.
2. Assess for visible entrance and exit wounds and treat as thermal burns.
3. Immobilize if associated trauma suspected. Refer to SPINAL MOTION RESTRICTION Protocol.
4. Determine characteristics - AC or DC, voltage, amperage, time of injury.

Protocol Continues

Burns
(Thermal, Chemical, Electrical, Inhalation)

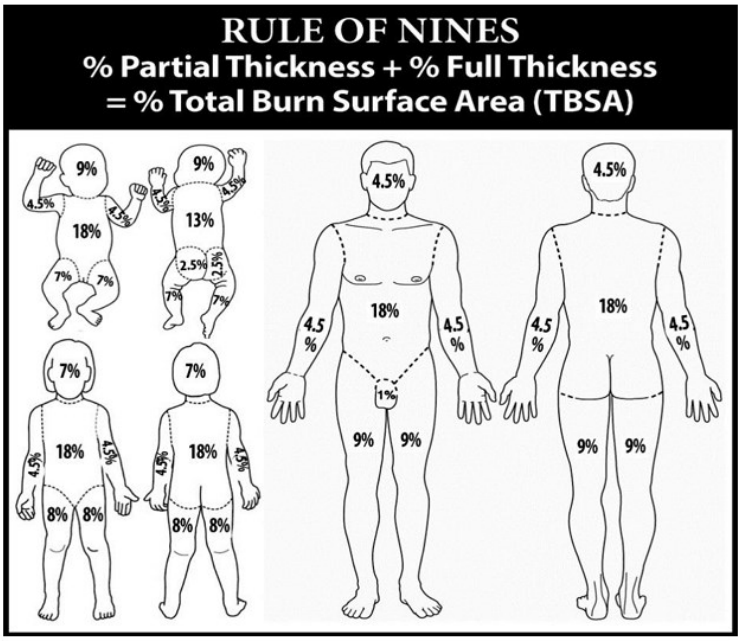
EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Apply cardiac monitor and assess for dysrhythmias, especially in electrical injuries.
3. Establish IV access. Avoid placement through burned skin.
4. Administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
5. Consider the need for an advanced airway if signs of inhalation injury (burns around face, nares or pharynx) are present per the AIRWAY MANAGEMENT Protocol.
6. Consider early management of pain per the PAIN MANAGEMENT Protocol.

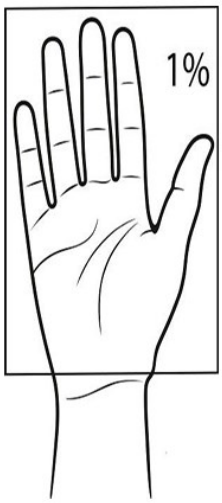
Rule of Nine's

% Partial Thickness + % Full Thickness = % Total Burn Surface Area (TBSA)

%BSA by anatomical area



Palm-and-hand calculation[a]



[a] Palm of hand (including fingers) of infant or child = 1% of the total body surface

Adult Trauma

Burns
(Thermal, Chemical, Electrical, Inhalation)

PEARLS

- Onset of stridor and change in voice are sentinel signs of potentially significant airway burns, which may rapidly lead to airway obstruction or respiratory failure. Early intubation is required in significant inhalation injuries.
- $EtCO_2$ monitoring may be particularly useful to monitor respiratory status in patients receiving significant doses of narcotic pain medication.
- Particularly in enclosed-space fires, carbon monoxide toxicity is a consideration and pulse oximetry may not be accurate.
- Cardiac monitor is important in electrical burns and chemical inhalations.
- Have a high index of suspicion for cyanide poisoning in a patient with depressed GCS, respiratory difficulty and cardiovascular collapse in the setting of an enclosed-space fire. Give the antidote (hydroxocobalamin), if available, in this circumstance.
- Pain management is critical in acute burns.
- TBSA is calculated only based on percent of second (partial thickness) and third degree (full thickness) burns – First degree (superficial) burns are not included in this calculation.
- Burn patients are prone to hypothermia—never apply ice or cool burns that involve > 10% TBSA.
- Burn patients are trauma patients; evaluate for multisystem trauma.
- Anticipate atrial and/or ventricular dysrhythmias as well as cardiac arrest with electrical injuries.
- The mortality related to electrical injuries is impacted by several factors:
    a. Route current takes through the body – current traversing the heart has higher mortality.
    b. Type of current – AC vs. DC
        i. AC is more likely to cause cardiac dysrhythmias while DC is more likely to cause deep tissue burns however either type of current can cause any injury.
        ii. DC typically causes one muscle contraction while AC can cause repeated contractions.
        iii. Both types of current can cause involuntary muscle contractions that do not allow the victim to let go of the electrical source.
        iv. AC is more likely to cause ventricular fibrillation while DC is more likely to cause asystole.
- For chemical burns: Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation and use tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.

KEY DOCUMENTATION ELEMENTS

- Initial airway status
- Total volume of fluid administered
- TBSA of second and third degree burns
- Pulse and capillary refill exam distally on any circumferentially burned extremity
- Pain management

PERTINENT ASSESSMENT FINDINGS

- Consider related trauma in addition to burns
- Consider inhalation exposures such as CO and CN
- If evidence of possible airway burn, consider aggressive airway management
- Estimate TBSA burned and depth of burn

QUALITY METRICS

- Patient transported to most appropriate hospital
- Pain appropriately managed
- Airway assessment and early and aggressive management, especially with burns to face, nares or pharynx

Burns
(Thermal, Chemical, Electrical, Inhalation)

Intentionally Left Blank

Chest Injuries

History
- Time of injury
- Mechanism (blunt vs penetrating)
- Bleeding
- Evidence for multi-trauma
- Past medical history
- Medications

Signs and Symptoms
- Shortness of breath / Dyspnea
- Chest pain
- Cyanosis
- Absent / Diminished breath sounds
- Hypotension / Shock
- Paradoxical chest wall movement
- Bruising over sternum

Differential
- Simple pneumothorax
- Tension pneumothorax
- Flail chest
- Open chest wound
- Hemothorax
- Traumatic asphyxia
- Cardiac tamponade

EMR & EMT-Basic

1. **INITIAL TRAUMA CARE**.
2. Control bleeding.
3. Treat any obvious chest injuries as indicated:
    a. **Open Chest Wound:** Apply semi-occlusive dressing, leaving one side / corner open. Monitor for tension pneumothorax.
    b. **Impaled Objects:** Stabilize object with a bulky dressing. Do not attempt to remove an impaled object.
    c. **Flail Chest:** Stabilize with a bulky dressing.
4. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT.**
2. Establish IV access and administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
3. Treat any obvious chest injuries as indicated (including above):
    a. **Tension Pneumothorax:** Perform NEEDLE DECOMPRESSION.
        i. Signs and symptoms: Hypotension or other signs of shock associated with decreased or absent breath sounds, JVD and/or tracheal deviation.
    b. **Flail Chest:** For massive flail chest with severe respiratory compromise, consider advanced airway per the AIRWAY MANAGEMENT Protocol.
4. Apply cardiac monitor and perform 12-lead ECG.
5. Consider management of pain per the PAIN MANAGEMENT Protocol.

Chest Injuries

PEARLS

- Chest pain due to blunt trauma may be an indication of underlying injury.
- Blunt injuries such as pulmonary contusion and cardiac contusion may cause respiratory insufficiency and/or myocardial infarction. Acquire and transmit 12-lead ECG.
- If tension pneumothorax develops in a patient with a sealed sucking chest wound, attempt to resolve by releasing air from the seal prior to decompressing chest.
- Chest decompression is only indicated for a true tension pneumothorax. It is not appropriate to needle decompress a simple pneumothorax.
- Target scene time less than 10 minutes.
- Transport destination is based on the REGION 6 TRAUMA TRIAGE ALGORITHM Protocol.
- Transport should not be delayed for procedures; ideally procedures should be performed enroute when possible.
- Frequent reassessment of the patient is important. Monitor patient for deterioration over time with serial vital signs and repeat neurologic status assessment.

KEY DOCUMENTATION ELEMENTS

- Mechanism of injury
- Primary and secondary survey
- Serial vital signs and neurologic assessments
- Procedures performed and patient response

PERTINENT ASSESSMENT FINDINGS

- Signs and symptoms of tension pneumothorax
- Airway and respiratory assessment
- Consider underlying cardiac injury and apply cardiac monitor

QUALITY METRICS

- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center
- Airway assessment and management appropriately documented

Conducted Electrical Weapon Injury (Taser®)

History
- Time of injury
- Bleeding
- Evidence for multi-trauma
- Past medical history
- Cardiac history
- Psychiatric history

Signs and Symptoms
- External signs of trauma
- Palpitations
- Intoxication / Substance Abuse

Differential
- Excited Delirium
- Traumatic injury
- Closed head injury
- Cardiac dysrhytmia

All Levels

1. **INITIAL TRAUMA CARE**.
2. Ensure Scene Safety prior to providing patient care.
    a. Make sure patient is appropriately secured with assistance of law enforcement to protect the patient and staff.
    b. Consider psychologic management medications if patient is struggling against physical devices and may harm themselves or other. Refer to BEHAVIORIAL EMERGENCIES Protocol.
3. Confirm device has been turned off and that the barb cartridge has been disconnected from the electrical weapon.
4. Obtain vital signs and cardiac monitoring. Consider 12-lead ECG (if available for BLS).
5. Patients with conducted electrical weapon (Taser®) barb penetration in vulnerable areas of body as mentioned below should be transported to the hospital for further evaluation and probe removal.
    a. Barbs embedded in skin above level of the clavicles, genitalia or female breasts.
    b. Suspicion that probe might be embedded in bone, blood vessel or other sensitive structure.
6. Barb(s) can be removed if NOT in a vulnerable area listed above, by stabilizing the skin surrounding the barb and grasping the barb shaft and pulling straight out with a gentle but quick motion.
    a. Once extracted, visually inspect barb to make sure it is intact and that nothing remains in patient.
7. Document the removal location and time of removal in the patient care report.
8. Apply bandage to the area where the barb was removed.
9. Inform the patient that they will need a tetanus shot if they have not received one in the last five years.
10. Transport patient to the hospital if barbs cannot be safely removed in the field or if in a vulnerable area listed above.

Conducted Electrical Weapon Injury (Taser®)

PEARLS

- Before removal of the barbed dart, make sure the cartridge has been removed from the conducted electrical weapon.
- Patient should NOT be restrained in the prone, face down, or hog-tied position as respiratory compromise is a significant risk.
- The patient may have underlying pathology before being tased (refer to appropriate guidelines for managing the underlying medical/traumatic pathology).
- Perform a comprehensive assessment with special attention looking for signs and symptoms that may indicate excited delirium.
- Transport the patient to the hospital if they have concerning signs or symptoms.
- EMS providers who respond for a conducted electrical weapon patient should not perform a “medical clearance” for law enforcement.
- Conducted electrical weapon can be discharged in three fashions:
    a. Direct contact without the use of the darts
    b. A single dart with additional contact by direct contact of weapon
    c. From a distance up to 35 feet with two darts
- The device delivers 19 pulses per second with an average current per pulse of 2.1 milliamps which in combination with toxins/drugs, patient’s underlying diseases, excessive physical exertion, and trauma may precipitate arrhythmias, thus consider ECG monitoring and 12-lead ECG assessment.
- Drive Stun is a direct two-point contact weapon which is designed to generate pain and not incapacitate the subject. Only local muscle groups are stimulated with the Drive Stun technique.

KEY DOCUMENTATION ELEMENTS

- If darts removed, document the removal location in the patient care report
- Physical exam trauma findings
- Cardiac rhythm and changes
- Neurologic status assessment findings

PERTINENT ASSESSMENT FINDINGS

- Thoroughly assess the patient for trauma as the patient may have fallen
- Ascertain if more than one taser cartridge was used

QUALITY METRICS

- Abnormal findings or vital signs were addressed
- Patient received ECG or 12-lead ECG evaluation

Crush Injuries

History
- Entrapped and crushed under heavy load > 60 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

Signs and Symptoms
- Hypotension / Shock
- Altered mental status
- **Compartment Syndrome**:
  - Pain
  - Paresthesia
  - Paralysis
  - Pallor
  - Pulselessness
  - Poikilothermia (cool to touch)

Differential
- Entrapment without crush syndrome
- Vascular injury with perfusion deficit
- Compartment syndrome
- Altered mental status

EMR & EMT-Basic

1. Ensure scene and rescuer safety.
2. **INITIAL TRAUMA CARE**.
3. Place approved tourniquet on the affected extremity (-ies) just proximal, but as close as possible to the crushed area.
4. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT.**
2. Establish 2 large bore IVs (not in the injured extremity).
3. Treat pain per PAIN MANAGEMENT Protocol.
4. Administer **NORMAL SALINE 1,000 mL** bolus prior to release of crushed extremity. Continue **NORMAL SALINE 500 mL/hr.**
   a. Use with caution in patient with history of CHF. STOP fluids if signs of pulmonary edema (increasing shortness of breath or rales/crackles on lung exam).
5. Call for intercept per INTERCEPT CRITERIA.

Paramedic

1. Continue **ILS TREATMENT.**
2. Initiate cardiac monitoring and assess for hyperkalemia (Wide QRS, Peaked T waved or flattened / absent P waves). Acquire and transmit 12-lead ECG.
3. Consider **SODIUM BICARBONATE** for significant crush injuries or prolonged entrapment of an extremity:
   a. Mix **50 mEq in 1000 mL** of 0.9% Normal Saline. Administer the entire 1000 mL bolus PRIOR to release of crushed extremity.
   b. STOP fluids if signs of pulmonary edema (increasing shortness of breath or rales/crackles on lung exam).
4. Lift object **SLOWLY** off of the patient.
5. Continue **NORMAL SALINE 500 mL/hr.**
6. Transport to appropriate Trauma Facility.

Crush Injuries

PEARLS

- A patient with a crush injury may initially present with very few signs and symptoms. Therefore, maintain a high index of suspicion for any patient with a compressive mechanism of injury.
- A fatal medical complication of crush syndrome is hyperkalemia. Suspect hyperkalemia if T-waves become peaked, QRS becomes prolonged (greater than 0.12 seconds), absent P wave, or prolonged QTc.
- Avoid Lactated Ringer's solution as it contains potassium.
- Continue fluid resuscitation through extrication and transfer to hospital.
- Patient may become hypothermic even in warm environments.
- Causes of mortality in untreated crush syndrome:
    a. Immediate
        i. Severe head injury
        ii. Traumatic asphyxia
        iii. Torso injury with damage to intrathoracic or intra-abdominal organs
    b. Early
        i. Sudden release of a crushed extremity may result in reperfusion syndrome (acute hypovolemia, electrolyte abnormalities, and subsequent lethal arrhythmia)
        ii. Hyperkalemia (potassium is released from injured muscle cells)
        iii. Hypovolemia/shock
    c. Late
        i. Acute kidney injury (from release of toxins from injured muscle cells)
        ii. Coagulopathy and hemorrhage
        iii. Sepsis

KEY DOCUMENTATION ELEMENTS

- Time of tourniquet application, if applied
- Neurovascular status of any crushed extremity
- ECG findings consistent with hyperkalemia
- Amount of IV fluid administered

PERTINENT ASSESSMENT FINDINGS

- Monitor for development of compartment syndrome
- Mental status / GCS
- Evidence of additional trauma, potentially masked by other painful injuries

QUALITY METRICS

- Initiation of fluid resuscitation prior to extrication
- ECG / monitor to monitor for dysrhythmias or changes related to hyperkalemia
- Appropriate transport of trauma patients to Trauma Center

Extremity Trauma / External Hemorrhage Management

History
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history (Tetanus history)
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity
- Altered sensation / Motor function
- Diminished pulse / Capillary refill
- Decreased extremity temperature

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

All Levels

1. **INITIAL TRAUMA CARE**.
2. Manage bleeding.
    a. Expose the wound and apply direct pressure to bleeding site, followed by pressure dressing.
    b. If direct pressure / pressure dressing is ineffective or impractical:
        i. Apply TOURNIQUET to extremity if the bleeding site is amenable to tourniquet placement.
            1. Tourniquet should be placed 2-3 inches proximal to wound, not over a joint or fracture, and tightened until bleeding stops and distal pulse is eliminated.
            2. If bleeding continues, place a second tourniquet proximal to the first.
            3. For thigh wounds, consider placement of two tourniquets, side-by-side, and tighten sequentially to eliminate distal pulse.
            4. Document time of application and location of tourniquet and ensure that receiving facility is aware of time of placement.
        ii. If the bleeding site is not amenable to tourniquet placement (i.e. groin, axillary, trunk, etc.), pack wound tightly and fully with HEMOSTATIC GAUZE to the depth of the wound until bleeding stops and then apply direct pressure.
            1. Consider using a JUNCTIONAL HEMOSTATIC DEVICE for groin or axillary wounds if available.
3. Manage pain.
    a. Refer to PAIN MANAGEMENT Protocol.
    b. Pain management should be strongly considered for patients with suspected fractures.
    c. If tourniquet is placed, an alert patient will likely require pain medication to manage pain. Do not loosen tourniquet to relieve pain
4. Stabilize suspected fractures / dislocations.
    a. Strongly consider pain management before attempting to move a suspected fracture.
    b. If distal vascular function is compromised, gently attempt to restore normal anatomic position.
    c. Use splints as appropriate to limit movement of suspected fracture.
    d. Elevate extremity fractures above heart level whenever possible to limit swelling.
    e. Apply ice packs to limit swelling in suspected fractures or soft tissue injury (DO NOT apply ice directly to skin).
    f. Reassess distal neurovascular status after any manipulation or splinting of fractures / dislocations.
5. Amputations
    a. Rinse amputated part gently with normal saline if gross contamination.
    b. Wrap part in moist sterile gauze and place in water tight plastic bag and seal.
    c. Place sealed bag on ice. **(DO NOT place tissue directly on ice).**

Extremity Trauma / External Hemorrhage Management

PEARLS

- If tourniquet use:
  a. Ensure that it is sufficiently tight to occlude the distal pulse, in order to avoid compartment syndrome.
  b. Ensure that it is well marked and visible and that all subsequent providers are aware of the presence of the tourniquet.
  c. DO NOT cover with clothing or dressings.
  d. Mark time of tourniquet placement prominently on the patient.
- If pressure dressing or tourniquet used, frequently re-check to determine if bleeding has restarted. Check for blood soaking through the dressing or continued bleeding distal to the tourniquet. Do not remove tourniquet or dressing in order to assess bleeding.
- Survival is markedly improved when a tourniquet is placed *before* shock ensues.
- Commercial / properly tested tourniquets are preferred over improvised tourniquets.
- If hemostatic gauze is not available, plain gauze packed into a wound has been shown to be effective.
- DO NOT take time to splint injured extremities in major trauma patients unless it does not delay the scene time or if it prevents you from performing more pertinent patient care.
- Splint the joint above and below for all suspected fractures.
- Splint the bone above and below for all suspected joint injuries.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- DO NOT manipulate pelvis once fracture is suspected. Repeated manipulation can increase internal hemorrhage.

KEY DOCUMENTATION ELEMENTS

- Vital signs and vascular status of extremity after placement of tourniquet, pressure dressing, or splint
- Documentation of elimination of distal pulse after tourniquet placement
- Time of tourniquet placement

PERTINENT ASSESSMENT FINDINGS

- Evaluate for obvious deformity, shortening, rotation, or instability
- Neurologic status of extremity
  a. Sensation to light touch
  b. Distal movement of extremity
- Vascular status of extremity
  a. Pallor
  b. Pulse
  c. Capillary refill
  d. Degree of bleeding / blood loss with assessment of the color of the blood (venous or arterial) and whether it is pulsatile or not

QUALITY METRICS

- Proper placement of tourniquet (location, elimination of distal pulse)
- Proper marking and timing of tourniquet placement and notification of subsequent providers of tourniquet placement
- Appropriate splinting of fractures
- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center

Head Injury

History
- Time of injury
- Mechanism (blunt vs penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma
- Helmet use or damage to helmet

Signs and Symptoms
- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential
- Skull fracture
- Brain injury (concussion, contusion, hemorrhage or laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

EMR & EMT-Basic

1. **INITIAL TRAUMA CARE**.
2. Maintain cervical stabilization per the SPINAL MOTION RESTRICTION Protocol.
3. Airway:
   a. If patient unable to maintain airway, consider oral airway (nasal airway should not be used with significant facial injury or possible basilar skull fracture).
   b. Maintain and support airway per the AIRWAY MANAGEMENT Protocol.
4. Breathing:
   a. Administer **Oxygen** as appropriate with a target of achieving 94-98% saturation.
      i. In cases of severe head trauma administer high-flow oxygen via non-rebreather as a precaution against unanticipated deterioration.
5. Circulation:
   a. Wound care
      i. Control bleeding with direct pressure if no suspected open skull injury.
      ii. Moist sterile dressing to any potential open skull wound.
6. Disability:
   a. Evaluate for other causes of altered mental status—check blood glucose.
   b. Spinal assessment and management per SPINAL MOTION RESTRICTION Protocol.
   c. Perform and trend neurologic status assessment (moderate / severe: GCS 3-13, P or U on AVPU)
      i. Early signs of deterioration: Confusion, Agitation, Drowsiness, Vomiting, Severe Headache.
      ii. Monitor for signs of herniation.
7. Treat specific facial injuries as indicated:
   a. **Unstable Mandible**: Have suction readily available as patient may not be able to spit / swallow effectively. Preferably transport patient sitting upright if no suspected spinal injury.
   b. **Eye Trauma**: Place eye shield for any significant eye trauma (if available). If globe is avulsed, cover with moist saline dressing.
   c. **Avulsed Tooth**: Avoid touching the root of the avulsed tooth. Do not wipe off tooth. Pick up at crown end and rinse off with cold water, if dirty. Place in milk or saline as the storage medium.
   d. **Epistaxis**: Squeeze nose for 10-15 minutes continuously.
8. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

Protocol Continues

Head Injury

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. For patients with moderate / severe head injury:
    a. Continue to maintain adequate oxygenation with high-flow oxygen via NRB or BVM ventilation.
    b. If unable to maintain their airway or adequate oxygenation despite high-flow oxygenation, consider SGA placement or intubation utilizing continuous waveform capnography and $EtCO_2$ measurement, with a target $EtCO_2$ of 35-40 mmHg.
    c. Administer **IV Fluid 500 mL bolus** to maintain SBP ≥ 110 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 110mmHg; maximum **2 liters**. Hypotension should be avoided to maintain cerebral perfusion and target SBP should be 110-120 mmHg.
        i. Do not wait until after the patient is already hypotensive—*prevent* hypotension.
3. For patients with a severe head injury with ***signs of herniation*** that are unconscious or semi-conscious:
    a. Manage airway according to the AIRWAY MANAGEMENT Protocol; hyperventilate to a target $EtCO_2$ of 30-35 mmHg as a *short-term* option.

GLASGOW COMA SCALE (GCS)

Behavior	Response	Score
Eye Opening	Spontaneous	4
	To Verbal	3
	To Pain	2
	None	1
Verbal Response	Oriented	5
	Confused	4
	Inappropriate Words	3
	Incomprehensible Sounds	2
	None	1
Best Motor Response	Obeys Commands	6
	Localizes Pain	5
	Withdraws from Pain	4
	Flexion to Pain	3
	Extension to Pain	2
	None	1

Head Injury

PEARLS

- Head injury severity guideline:
  a. Mild: GCS 14-15 / AVPU = (A)
  b. Moderate: GCS 9-13 / AVPU = (V)
  c. Severe: GCS 3-8 / AVPU = (P) or (U)
- The most important item to monitor and document is a change in the level of consciousness.
- If endotracheal intubation or invasive airways are used, continuous waveform capnography is required to document proper tube placement and assure proper ventilation rate and minute volume)preventing both hyperventilation [too fast] and overventilation [too much]).
- Signs of herniation:
  a. Decreasing mental status
  b. Abnormal respiratory pattern
  c. Asymmetric / unreactive pupils
  d. Decorticate posturing
  e. Cushing's response (bradycardia and hypertension)
  f. Decerebrate posturing
- DO NOT hyperventilate patient unless signs of herniation are present.
- Assume concomitant cervical spine injury in patients with moderate / severe head injury.

KEY DOCUMENTATION ELEMENTS

- Adequate oxygenation
- Airway status and management
- $EtCO_2$ monitored and documented for moderate / severe head injury (avoidance of inappropriate hyperventilation)
- Neurological and mental status assessment

PERTINENT ASSESSMENT FINDINGS

- Neurologic status assessment findings
- Pupils
- Trauma findings on physical exam

QUALITY METRICS

- Scene time for trauma patients
- Appropriate transport of trauma patients to Trauma Center
- No oxygen desaturation less than 90% and no hypotension.

Head Injury

Intentionally Left Blank

Spinal Motion Restriction

- **Spinal Motion Restriction** is defined as application of a cervical collar and maintenance of the spine in neutral alignment (long backboard, a scoop stretcher, a vacuum mattress, or an ambulance cot).
- Determination of spinal motion restriction should be made by the highest level EMS provider.

All Levels

1. **Spinal Motion Restriction** is **required** when ANY of the following conditions apply following blunt trauma: *(When in doubt, apply spinal motion restriction).*
    a. **Age ≥ 65**
    b. **Acutely altered level of consciousness** (e.g., GCS <15, evidence of intoxication)
    c. **Midline neck or back pain and/or tenderness**.
    d. **Focal neurologic signs and/or symptoms** (e.g., numbness or motor weakness).
    e. **Anatomic deformity of the spine**.
    f. **Distracting circumstances or injury** (e.g., long bone fracture, degloving, or crush injuries, large burns, etc.) or any similar injury that impairs the patient's ability to contribute to a reliable examination.
    g. **Torticollis** (patient is unable to move neck from "abnormal position" to "normal position").
    h. **Communication barrier** (emotional / language / cognitive impairment)
    i. **Significant Mechanism of Injury** (Determined by providers clinical judgement)
        – Examples include, but are not limited to, (a) fall >10ft, (b) high speed MVC/rollover/ ejection, (c) bicycle/ATV/motorcycle collision, and (d) axial load injury (ex. diving, helmet -to-helmet contact)
2. When SMR is indicated, apply it to the entire spine due to the risk of noncontiguous injuries
3. Spinal Motion Restriction is NOT utilized in penetrating trauma to the head and/or neck without evidence of spinal injury.
4. Once the backboarded patient is placed on ambulance cot, remove backboard by using a log roll technique, minimizing unnecessary movement during the removal process. Maintain Spinal Motion Restriction by assuring that the patient remains securely positioned on the cot with a cervical collar in place.
5. Helmet removal:
    a. If a football helmet needs to be removed, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet while keeping the neck manually immobilized - occipital and shoulder padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning.

Peter E. Fischer, Debra G. Perina, Theodore R. Delbridge, Mary E. Fallat, Jeffrey P. Salomone, Jimm Dodd, Eileen M. Bulger & Mark L. Gestring (2018): Spinal Motion Restriction in the Trauma Patient – A Joint Position Statement, Prehospital Emergency Care, DOI: 10.1080/10903127.2018.1481476

American College of Surgeons. (2022). Best Practices Guidelines—Spine Injury. https://www.facs.org/media/k45gikqv/spine_injury_guidelines.pdf

Spinal Motion Restriction

PEARLS

- Be aware of potential airway compromise or aspiration in immobilized patient with nausea / vomiting, or with facial / oral bleeding.
- Excessively tight immobilization straps can limit chest excursion and cause hypoventilation.
- Prolonged immobilization on spine board can lead to ischemic pressure injuries to skin.
- Prolonged immobilization on spine board can be very uncomfortable for patient.
- In an uncooperative patient, avoid interventions that may promote increased spinal movement.
- The preferred position for all patients with spine management is flat and supine. There are three circumstances under which raising the head of the bed to 30 degrees should be considered:
    a. Respiratory distress
    b. Suspected severe head trauma
    c. Promotion of patient compliance
- Age alone should not be a factor in decision-making for prehospital spine care, yet the patient's ability to reliably be assessed at the extremes of age should be considered. Communication barriers with infants/ toddlers or elderly patients with dementia may prevent the provider from accurately assessing the patient.
- Spinal precautions should be considered a treatment or preventive therapy.
- Patients who are likely to benefit from immobilization should undergo this treatment.
- Patients who are not likely to benefit from immobilization, who have a low likelihood of spinal injury, should not be immobilized.
- Ambulatory patients may be safely immobilized on cot with cervical collar and straps and will not generally require a spine board.
- Reserve long spine board use for the movement of patients whose injuries limit ambulation and who meet criteria for the use of spinal precautions. Remove from the long board as soon as is practical.

KEY DOCUMENTATION ELEMENTS

- Patient complaint of neck or spine pain
- Spinal tenderness
- Mental status / GCS
- Neurologic examination
- Evidence of intoxication
- Documentation of multiple trauma
- Documentation of mechanism of injury

PERTINENT ASSESSMENT FINDINGS

- Mental status
- Neurologic examination
- Evidence of intoxication
- Evidence of multiple trauma with distracting injuries

QUALITY METRICS

- Percentage of patients with high risk mechanisms of injury and/or signs or symptoms of cervical spine injury who are placed in a cervical collar
- Percentage of trauma patients who are transported on a long backboard

Traumatic Cardiac Arrest

History
- Events leading to arrest
- Estimated downtime
- Mechanism: blunt / penetrating
- Past medical history
- Medication

Signs and Symptoms
- Evidence of penetrating trauma
- Evidence of blunt trauma
- Apnea
- Pulseless

Differential
- Medical cardiac arrest
- Obvious DOA
- Hypovolemia
- Hypoventilation / Hypoxemia
- Tension pneumothorax

- **Traumatic Cardiac Arrest's should be co-managed with Medical Cardiac Arrest Protocols**
- **Limit scene time to 10 minutes or less**

Reversible Pathology (H.O.T.)

Hypovolemia	• Control external hemorrhage • Splint pelvis / fractures • IV/IO fluid bolus
Oxygenation	• Basic / advanced airway management • $EtCO_2$ and SpO_2 monitoring
Tension pneumothorax	• Decompress chest

Lockey DJ, Lyon RM, Davies GE. Development of a simple algorithm to guide the effective management of traumatic cardiac arrest. Resuscitation. 2013 Jun;84(6):738-42.

EMR & EMT-Basic

1. If patient does not meet criteria for DETERMINATION OF DEATH / WITHOLDING RESUSCITATIVE EFFORTS, Initiate HIGH QUALITY CPR and reference CARDIAC ARREST Protocol.
2. Provide early airway management utilizing the AIRWAY MANAGEMENT Protocol.
3. Control external hemorrhage utilizing the EXTERNAL TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT Protocol.
    a. Apply pelvic binder as indicated.
    b. Align long bone fractures, splint as indicated.
4. Attempt to maintain spinal motion restriction. Refer to SPINAL MOTION RESTRICTION Protocol.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access and administer **IV Fluid bolus 20 mL/kg** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed.
3. Continue to co-manage traumatic cardiac arrest utilizing the CARDIAC ARREST Protocol.
4. If concern for tension pneumothorax, perform bilateral NEEDLE DECOMPRESSION.
5. If return of pulses, refer to the RETURN OF SPONTANEOUS CIRCULATION Protocol.
6. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

Protocol Continues

Traumatic Cardiac Arrest

Paramedic

1. Continue **ILS TREATMENT**.
2. If return of pulses, refer to the RETURN OF SPONTANEOUS CIRCULATION Protocol.
3. Continue to co-manage traumatic cardiac arrest utilizing the CARDIAC ARREST Protocol.
4. Consider **TRANEXAMIC ACID**.
5. Transport patient based on the REGION 6 TRAUMA TRIAGE ALGORITHM Protocol. Alert the receiving facility of Trauma Alert

Traumatic Cardiac Arrest

PEARLS

- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
    a. Evidence for the benefit of CPR in traumatic cardiac arrest is limited. Treatment priorities should initially focus on control of massive hemorrhage (including management of pelvis fractures), airway management, and consideration of bilateral needle thoracostomy.
- Consider early IO placement if available and/or difficult IV access anticipated.
- Always remember that a medical cardiac arrest can lead to a traumatic injury (i.e., a cardiac arrest while driving).
- Limit scene time to < 10 minutes in traumatic cardiac arrest patients.
    a. Unless there is an immediate and correctable cause, patients suffering traumatic cardiac arrest have the best chance for survival when arrival time to a hospital is within minutes
- Lightning strike cardiopulmonary arrest patients have a high rate of successful resuscitation, if initiated early, in contrast to general cardiac arrest statistics.
    a. If multiple victims, cardiac arrest patients whose injury was witnessed or thought to be recent should be treated first and aggressively (reverse from traditional triage practices).
        i. Patients suffering cardiac arrest from lightning strike initially suffer a combined cardiac and respiratory arrest.
        ii. Return of spontaneous circulation may precede resolution of respiratory arrest.
        iii. Patients may be successfully resuscitated if provided proper cardiac and respiratory support, highlighting the value of “reverse triage”.

KEY DOCUMENTATION ELEMENTS

- Resuscitation attempted and all interventions performed and patient response
- First monitored rhythm
- Mechanism of injury
- Primary and Secondary survey findings
- Any ROSC

PERTINENT ASSESSMENT FINDINGS

- Evidence of injuries incompatible with life
- Evidence of signs of life
- Assess for reversible causes (i.e. HOT, H’s/T’s)

QUALITY METRICS

- Time to scene; Scene Time
- Appropriateness of procedures, including airway management, hemorrhage control, needle decompression, intravenous access and resuscitation
- Review of CPR Quality (Compression Fraction, Average and longest peri-shock pause, Rate and depth of compressions)
- Waveform capnography used for resuscitation, initial confirmation of advanced airway placement and continuous monitoring during transport

Traumatic Cardiac Arrest

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Acetylcholinesterase Inhibitors (Carbamates, Nerve Agents, Organophosphates) Exposure

History

- Substance
- Time of ingestion or exposure
- Route of exposure
- Quantity of medication or toxin taken
- Alcohol or other intoxicant taken
- Past medical history
- Medications
- Decontamination performed
- Treatment prior to arrival

Signs and Symptoms

SLUDGEM

- **S**alivation
- **L**acrimation
- **U**rination; increase, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain)
- **E**mesis
- **M**uscle Twitching / Miosis

Killer B's

- **B**radycardia, **B**ronchorrhea, **B**ronchospasm
- CNS (headache, confusion, seizures,

Differential

- Nerve agent exposure (e.g. VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g. Mustard Gas, etc.)
- Respiratory irritant exposure (e.g. Hydrogen Sulfide, Ammonia, Chlorine, etc.)

EMR & EMT-Basic

1. Assure scene is safe and the patient has been decontaminated if needed.
2. **UNIVERSAL PATIENT CARE**.
3. Save all bottles, containers or labels for information without exposing rescuers.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

Severity	Signs & Symptoms	Autoinjector Dose *(If Available)* *(DuoDote® or Mark 1® Kit)*
MILD	Salivation; Lacrimation; Miosis	• **1 - Atropine/Pralidoxime Autoinjector**
MODERATE	Localized swelling; Muscle fasciculations; Nausea and vomiting; Weakness; Shortness of breath	• **2 - Atropine/Pralidoxime Autoinjectors**
SEVERE	Unconsciousness; Convulsions; Apnea or severe respiratory distress requiring assisted ventilation; Flaccid paralysis	• **3 - Atropine/Pralidoxime Autoinjectors**

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access. Consider **NORMAL SALINE 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
3. If symptomatic, administer **ATROPINE 2 mg IV or IM**.
4. Repeat **ATROPINE 2-4 mg IV** every 3-5 minutes until symptoms of SLUDGE subside, most importantly secretions.
5. If seizures occur, refer to SEIZURE protocol.

Acetylcholinesterase Inhibitors (Carbamates, Nerve Agents, Organophosphates) Exposure

PEARLS

- Continuous and ongoing patient reassessment is critical.
- Clinical response to treatment is demonstrated by the drying of secretion and the easing of respiratory effort.
- Initiation of and ongoing treatment should not be based upon heart rate or pupillary response.
- Atropine is the primary antidote for organophosphate, carbamate, or nerve agent exposures, and repeated doses should be administered liberally to patients who exhibit signs and symptoms of exposure or toxicity.
- Clinical effects of acetylcholinesterase inhibitor agents
    a. The clinical effects are caused by the inhibition of the enzyme acetylcholinesterase which allows excess acetylcholine to accumulate in the nervous system.
    b. The excess accumulated acetylcholine causes hyperactivity in muscles, glands, and nerves.
- Organophosphates (certain Insecticides)
    a. Can be legally purchased by the general public.
    b. Organophosphates (e.g. pesticides) penetrate tissues and bind to the patient's body fat producing a prolonged period of illness and ongoing toxicity even during aggressive treatment.
- Nerve agents
    a. Traditionally classified as weapons of mass destruction (WMD).
    b. Not readily accessible to the general public.
    c. Extremely toxic and rapidly fatal with any route of exposure.
    d. GA (tabun), GB (sarin), GD (soman), GF, and VX are types of nerve agents and are WMDs.
    e. Nerve agents can persist in the environment and remain chemically toxic for a prolonged period of time.

KEY DOCUMENTATION ELEMENTS

- Time to recognize initial signs and symptoms
- Number of repeated doses of atropine required for the secretions diminish and respirations to improve
- Patient reassessments
- Patient responses to therapeutic interventions
- Measures taken to decontaminate the patient
- Measures taken to protect clean environments from contamination

PERTINENT ASSESSMENT FINDINGS

- Signs and symptoms exhibited with the toxidromes of **SLUDGE** and **Killer B's**

QUALITY METRICS

- Recognition and appropriate treatment of patients

Altitude Illness

History

- Past medical history
- Prior history of altitude illness
- Patient's itinerary
  - Starting altitude
  - Highest altitude gained
  - Rate of ascent
- Presence of prophylaxis against altitude (i.e. acetazolamide, sildenafil)
- Total altitude descended

Signs and Symptoms

- (See definitions below)

Differential

- Carbon monoxide poisoning
- Hypo-/hyperthermia
- Stroke
- Drugs / Alcohol
- Hypoglycemia
- Trauma
- Exhaustion

Definitions

- **Acute mountain sickness**: Headache plus one or more of the following: anorexia, nausea or vomiting, fatigue or weakness, dizziness or lightheadedness or difficulty sleeping. (In infants and young children, symptoms include pallor, fussiness, vomiting, decreased appetite, poor sleep, decreased playfulness.) These symptoms must occur in the setting of recent arrival to high altitude (generally considered greater than 5000 – 7000 feet)
- **High altitude pulmonary edema (HAPE)**: Progressive dyspnea, cough, hypoxia, and weakness in high altitude environments (considered greater than 8000 feet). (In infants and young children, symptoms again include pallor, fussiness, vomiting, decreased appetite, poor sleep, decreased playfulness.) Patients may or may not exhibit new symptoms if acute mountain sickness precedes symptoms of HAPE.
- **High altitude cerebral edema (HACE)**: Heralded by mental status changes in patients with symptoms of acute mountain sickness including altered mentation, ataxia, or stupor and progressing to coma. Typically seen in high altitude environments (greater than 8000 feet).

All Levels

1. Ensure scene and rescuer safety.
2. **UNIVERSAL PATIENT CARE**.
3. Perform ABCs and manage airway as necessary.
4. Administer supplemental oxygen to keep oxygen saturations ≥ 90%.
5. Descend to lower altitude. Descent is the mainstay of therapy and is the definitive therapy for all altitude related illnesses.
   a. Descent should be initiated as soon as scene conditions permit.

Altitude Illness

PEARLS

- Patients suffering from altitude illness have exposed themselves to a dangerous environment. By entering the same environment, providers are exposing themselves to the same altitude exposure. Be vigilant in looking for symptoms of altitude illness amongst rescuers.
- Descent of 500-1000 feet is often enough to see improvements in patient conditions.
- Patients with HAPE are suffering from non-cardiogenic pulmonary edema and may benefit from positive pressure ventilation via either bag assisted ventilation, CPAP, or other means of positive pressure ventilation.
- Patients suffering from altitude illness are commonly dehydrated and require IV fluids.
- HAPE is the most lethal of all altitude illnesses.
- Consider alternate causes of symptoms of AMS - the symptoms of AMS may be caused by alternate etiologies such as carbon monoxide poisoning (in patients cooking within enclosed areas), dehydration, exhaustion, hypoglycemia, hyponatremia.

KEY DOCUMENTATION ELEMENTS

- Patient's itinerary, including starting altitude, highest altitude gained and rate of ascent
- Presence (or absence) of prophylaxis against altitude (including medications such as acetazolamide, sildenafil)
- Total altitude descended

PERTINENT ASSESSMENT FINDINGS

- Consider airway management needs in the patient with severe alteration in mental status
- HAPE will present with increasing respiratory distress and rales on exam
- HACE will present with mental status changes, ataxia and progressing to coma

QUALITY METRICS

Bites and Envenomation

History
- Type of bite / sting
- Description of creature or bring photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

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

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. If signs of allergic reaction refer to ALLERGIC REACTION / ANAPHYLAXIS Protocol.
3. For Insect Bite:
    a. Remove stinger if appropriate.
    b. Remove constricting items.
    c. Apply ice pack.
    d. Minimize movement.
4. For Snake Bite:
    a. Splint limb, bandage and place at level below the heart.
    b. Minimize movement.
    c. Remove constricting items.
    d. Do **NOT** apply ice.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access, as needed.
3. Consider management of pain per the PAIN MANAGEMENT Protocol.

Bites and Envenomation

PEARLS

- **Evidence of infection:** Swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: Diabetes, chemotherapy, transplant patients.
- Patient may still have an imbedded stinger, tooth, nematocyst, or barb which may continue to deliver toxin if left imbedded. Consider safe removal without squeezing the toxin delivery apparatus.
- **Human bites:** Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- **Dog / Cat / Carnivore bites:** Carnivore bites are much more likely to become infected and all have risk of Rabies exposure. Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multicoda).
- **Snake bites:** Coral snake bites are rare: very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack." Amount of envenomation is variable, generally worse with larger snakes and early in spring.
- **Spider bites:** Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly). Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).

KEY DOCUMENTATION ELEMENTS

- Describe the suspect bite or sting source without risking patient or EMS provider
- Repeat evaluation and documentation of signs and symptoms as patient clinical conditions may deteriorate rapidly
- Time of symptoms onset
- Therapy and response to therapy

PERTINENT ASSESSMENT FINDINGS

- Assess for signs and symptoms of local and systematic impact of the suspected toxin
- Patient may still have an imbedded stinger, tooth, nematocysts or barb which may continue to deliver toxin if left imbedded

QUALITY METRICS

- Offending organism was managed appropriately without secondary exposure
- Appropriate pain management

Carbon Monoxide / Smoke Inhalation

History
- Exposure to Carbon Monoxide
- Time / Duration of exposure
- Smoke inhalation
- Reason: Suicide, criminal, accidental
- Past medical history

Signs and Symptoms
- Facial burns
- Singed nasal hairs or facial hair
- Shortness of breath
- Facial edema
- Stridor

Carbon Monoxide
- Mild: Nausea, Fatigue, Headache, Vertigo, Lightheadedness
- Moderate to severe: AMS, Tachypnea, Tachycardia, Convulsion, Cardiopulmonary arrest

Differential
- Diabetes
- Cardiac (ACS / MI)
- Infection
- Anaphylaxis
- Head injury / Trauma
- Co-ingestant or exposure

EMR & EMT-Basic

1. Assure scene is safe and remove patient from toxic environment.
2. **UNIVERSAL PATIENT CARE**.
    a. Check blood glucose level.
    b. Apply **OXYGEN 15 LPM** via **NRB**
3. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access, as needed.
3. Consider the need for early advanced airway if signs of inhalation injury are present. Refer to the AIRWAY MANAGEMENT Protocol.
4. Consider cyanide toxicity in smoke inhalation patients. Refer to the CYANIDE POISONING Protocol.
5. Continue to monitor the patient.

Carbon Monoxide / Smoke Inhalation

PEARLS

- Remove patient and response personnel from potentially hazardous environment as soon as possible.
- Provide instruction to the patient, the patient's family, and other appropriate bystanders to not enter the environment (e.g. building, car) where the carbon monoxide exposure occurred until the source of the poisoning has been eliminated.
- CO oximeter devices may yield inaccurate low / normal results for patients with CO poisoning. All patients with probable or suspected CO poisoning should be transported to the nearest appropriate hospital based on their presenting signs and symptoms.
- Pulse oximetry is inaccurate due to the carbon monoxide binding with hemoglobin.
- Consider cyanide toxicity if carbon monoxide poisoning is from a fire.
- Smoke is a dangerous mixture of toxic gases and suspended chemical resulting from combustion. Smoke inhalation is the result of inhaling these heated components. While it may be impossible to predict exactly what components of combustion are inhaled, cyanide (CN) and carbon monoxide (CO) are common elements found in smoke and should be suspected in all smoke inhalation victims.

KEY DOCUMENTATION ELEMENTS

- If using a carbon monoxide detector, record the level detected
- Evidence of soot or burns around the face, nares or pharynx
- Early and repeat assessment of respiratory status and neuro exam
- Accurate exposure history

PERTINENT ASSESSMENT FINDINGS

- Early and repeat assessment of patient's mental status and motor function are extremely useful in determining response to therapy and the need for hyperbaric therapy
- Identification of possible etiology of poisoning
- Time of symptom onset and time of initiation of exposure-specific treatment
- Response to therapy

QUALITY METRICS

- Appropriate protocol selection and management
- Multiple frequent documented reassessments
- Early airway management in the rapidly deteriorating patient

Cyanide Poisoning

History

- Exposure to Cyanide (inhalation, ingestion or absorption through skin)
- Time / Duration of exposure
- Smoke inhalation
- Industrial exposure
- Reason: Suicide, criminal, accidental
- Past medical history

Signs and Symptoms

- CNS (Headache, Anxiety, Weakness, Vertigo)
- Tachycardia / Tachypnea
- Nausea / Vomiting
- Flushed "cherry red" skin

SEVERE:

- Marked altered LOC
- Seizures
- Respiratory depression or arrest
- Cardiac dysrhythmias

Differential

- Diabetes
- Cardiac (ACS / MI)
- Infection
- Anaphylaxis
- Head injury / trauma
- Co-ingestant or exposure

Note

This protocol assumes a Cyanokit is available.

- There is no widely available, rapid, confirmatory cyanide blood test. Many hospitals will not be able to rapidly assess cyanide levels. Therefore, treatment decisions must be made on the basis of clinical history and signs and symptoms of severe cyanide exposure listed above.

EMR, EMT-Basic & EMT-Intermediate

1. Assure scene is safe and the patient has been decontaminated if needed.
2. **UNIVERSAL PATIENT CARE**.
3. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

Paramedic

1. Continue **EMR / BLS / ILS TREATMENT**.
2. Establish IV access.
3. **HYDROXOCOBALAMIN (Cyanokit) 5 grams** over 15 minutes.
    a. Reconstitute: Place the vial of hydroxocobalamin in an upright position; add 200 mL of 0.9% NaCl to the using the transfer spike. Fill to the line.
    b. Mix: The vial should be repeatedly inverted or rocked, NOT shaken, for at least 60 seconds prior to infusion.
    c. Infuse Vial: Use vented IV tubing, hang and infuse over 15 minutes.

Cyanide Poisoning

PEARLS

- Scene safety is priority!
- Cyanide is a colorless, “bitter almond smell” (genetically only 40% of population can smell) gas or white crystal which binds to the ferric ion in cells, blocking the enzyme cytochrome oxidase, thus preventing the use of oxygen by the cell’s mitochondria, leading to cellular hypoxia.
- Pulse oximetry accurately reflects serum levels of oxygen but does not accurately reflect tissue oxygen levels therefore should not be relied upon in possible cyanide and/or carbon monoxide toxicity.
- After hydroxocobalamin has been administered, pulse oximetry levels are no longer accurate.
- If the patient ingests cyanide, it will react with the acids in the stomach generating hydrogen cyanide gas. Be sure to maximize air circulation in closed spaces (ambulance) as the patient’s gastric contents may contain hydrogen cyanide gases when released with vomiting or belching.
- If smoke inhalation, always consider carbon monoxide poisoning.
- Smoke is a dangerous mixture of toxic gases and suspended chemical resulting from combustion. Smoke inhalation is the result of inhaling these heated components. While it may be impossible to predict exactly what components of combustion are inhaled, cyanide (CN) and carbon monoxide (CO) are common elements found in smoke and should be suspected in all smoke inhalation victims.

KEY DOCUMENTATION ELEMENTS

- Repeat evaluation and documentation of signs and symptoms as the patient’s clinical condition may deteriorate rapidly
- Identification of possible etiology of poisoning
- Time of symptoms onset
- Time of treatment
- Therapy and response to therapy

PERTINENT ASSESSMENT FINDINGS

- Early and repeated assessment is essential

QUALITY METRICS

- Appropriate protocol selection and management
- Multiple frequent documented reassessments
- Early airway management in the rapidly deteriorating patient

Dive (SCUBA) Injury / Accidents

History

- Recent (within 48 hrs) SCUBA diving activity
- Circumstances leading to the dive injury / accident
- Submersion in water regardless of depth
- Duration of submersion / immersion
- Temperature of water (possibility of hypothermia)
- Details of mechanism of injury (c-spine injury?)

Signs and Symptoms

Decompression Sickness:

- Joint pain
- Mental status changes
- Paralysis
- Pulmonary (cough, hemoptysis, SOB)

Nitrogen Narcosis:

- Mental status changes
- Signs of intoxication

Differential

- Trauma
- Pre-existing medical problem
  - Hypoglycemia
  - Cardiac Dysrhythmias
- Pressure injury (SCUBA diving)
  - Barotrauma
  - Decompression sickness

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. If a SCUBA accident includes associated drowning/near-drowning, refer to DROWNING / SUBMERSION INJURY Protocol.
3. If air embolism suspected, place in left lateral recumbent position (patient lying with the left side down, knees drawn upward, and flat)
4. Apply **OXYGEN** as needed with a target oxygen saturation of 94-98%.
   a. Patients with symptoms suspicious for decompression illness should be placed on supplemental oxygen regardless of saturations to enhance washout of inert gas.
5. If patient presents with hypothermia, refer to ENVIRONMENTAL HYPOTHERMIA Protocol.
6. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Consider CPAP to supplement the awake patient's own spontaneous respiratory effort in patients with signs or symptoms of respiratory difficulty.
   a. Do NOT use CPAP in patients for whom pulmonary barotrauma is a consideration.
3. Establish IV access.
4. Advanced airway management as indicated. Refer to the AIRWAY MANAGEMENT Protocol.

Dive (SCUBA) Injury / Accidents

PEARLS

- If the patient is still in the water, seek safest and most rapid means of safe removal (within your scope of training) while minimizing risk of further injury.
- Seek assistance early for special rescue/extrication and transportation needs.
- Check for multiple patients (e.g. group dive, table calculation error(s) or contaminated dive gases).
- Rescue efforts should be coordinated between all responding agencies to ensure that the patient is rapidly accessed and safely removed from the water if diver unable to do so themselves.
- Decompression illness may have a variety of presentations depending on system affected (e.g. skin, joint(s), pulmonary, neurologic).
- SCUBA accidents/incidents can result in a variety of issues, including barotrauma, air embolism and decompression illness.

KEY DOCUMENTATION ELEMENTS

- Water temperature, if available
- Dive history
  - Number of dives in recent days
  - "Bottom time" in dives
  - Maximum depth
  - Rate of ascent
  - Dive gas (e.g. air vs. mixed gases such as Nitrox, Heliox or Trimix)
- Timing of onset of symptoms
- History of altitude exposure after diving (air travel)
- Any associated injuries or exposures

PERTINENT ASSESSMENT FINDINGS

- Vital signs findings
- Neurologic status assessment findings
- Respiratory assessment findings (e.g. oxygen saturation, respiratory rate)
- Subcutaneous emphysema

QUALITY METRICS

- Recognition and appropriate care of pulmonary/respiratory complaints
- Cervical spine management when appropriate

Drowning / Submersion Injury

History
- Circumstances leading to the submersion
- Submersion in water regardless of depth
- Duration of submersion / immersion
- Temperature of water (possibility of hypothermia)
- Details of mechanism of injury (c-spine injury?)

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming / Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem
  - Hypoglycemia
  - Cardiac Dysrhythmias
- Pressure injury (diving)
  - Barotrauma
  - Decompression sickness

EMR & EMT-Basic

1. Approach scene with due caution for rescuer safety.
2. Remove patient from water with spinal motion restriction precautions. Refer to SPINAL MOTION RESTRICTION Protocol.
3. **UNIVERSAL PATIENT CARE**.
4. Apply **OXYGEN** as needed with a target oxygen saturation of 94-98%.
5. If patient becomes pulseless and apneic, refer to CARDIAC ARREST Protocol.
6. If patient presents with hypothermia, refer to ENVIRONMENTAL HYPOTHERMIA Protocol.
7. If patient was involved in SCUBA diving accident, refer to DIVE (SCUBA) INJURY / ACCIDENT Protocol.
8. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Consider CPAP to supplement the awake patient's own spontaneous respiratory effort in patients with signs or symptoms of respiratory difficulty.
3. Establish IV access.
4. Advanced airway management as indicated. Refer to the AIRWAY MANAGEMENT Protocol.

Drowning / Submersion Injury

PEARLS

- The World Health Organization definition of drowning is “the process of experiencing respiratory impairment from submersion / immersion in liquid”.
- Drowning is further defined in the following categories:
    a. Non-fatal drowning – patients rescued from drowning.
    b. Fatal drowning – any death, acutely or subacutely, resultant from drowning.
- Submersion refers to situations in which the patient’s airway is underwater. Immersion refers to situations in which the patient’s body is in water but the patient’s airway remains out of the water.
- Rescue efforts should be coordinated between all responding agencies to ensure patient is rapidly accessed and removed from the water.
- Initiation of in-water ventilations may increase survival – In-water chest compressions are futile.
- Long-standing teaching has suggested that rescuers should always assume c-spine injury in victims of drowning.
    a. The 2010 American Heart Association update on special circumstances in cardiac arrest notes that routine c-spine precautions in all victims of drowning is likely unnecessary unless the mechanism or injury, history, or physical exam suggests a cervical spine injury.
    b. Mechanisms of injury highly suggestive of cervical spine injury include diving, water skiing, surfing or watercraft accidents.
- Patients may develop subacute respiratory difficulty after drowning and therefore all victims of drowning should be transported for observation.
- Consider CPAP early if respiratory distress in awake patients, if adequate mask seal can be established.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.

KEY DOCUMENTATION ELEMENTS

- Mechanism of injury or history suggesting cervical spine injury
- Submersion time
- Water temperature
- Activities leading to drowning

PERTINENT ASSESSMENT FINDINGS

- Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to CPR
- Assess for other associated injuries such as injuries to the head / neck or dive-related emergencies

QUALITY METRICS

- Recognition and appropriate care of pulmonary / respiratory complaints
- Cervical spine management when appropriate

Environmental Hyperthermia

History
- Age
- Oral intake
- Past medial history / Medications
- Alcohol or Illicit drug use
- Ambient temperature and humidity
- Exertion level
- Duration of exposure
- Fatigue and/or muscle cramping

Signs and Symptoms
- Altered mental status / Coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea / Vomiting
- Headache
- Cramps

Differential
- Fever (infection)
- Dehydration
- Medication induced (neuroleptic malignant syndrome, malignant hyperthermia)
- Hyperthyroidism (Thyroid Storm)
- Delirium Tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors

Definitions

Heat Cramps: are minor muscle cramps usually in the legs and abdominal wall. Patient temperature is normal.

Heat Exhaustion: has both salt and water depletion usually of a gradual onset. As it progresses tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur. Heat exhaustion can progress to heat stroke.

Heat Stroke: occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and/or electrolyte imbalances. Patient temperature is usually *greater than* 104°F. When no thermometer is available, it is distinguished from heat exhaustion by altered level of consciousness.

Heat Syncope: Transient loss of consciousness with spontaneous return to normal mentation, attributable to heat exposure.

Heat Cramps

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Remove patient to a cool environment.
3. If nausea and vomiting not present, have patient drink oral fluids, preferably electrolyte solutions.
4. DO NOT massage cramping muscles.
5. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. If no response to electrolyte solution or none is available, establish IV access and administer **NORMAL SALINE 500 mL bolus**.
3. If patient remains symptomatic, repeat fluid bolus as long as lungs remain clear; maximum **2 liters**.

Protocol Continues

Environmental Hyperthermia

Heat Exhaustion / Stroke

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Remove patient to a cool environment.
3. Manage airway as needed per the AIRWAY MANAGEMENT Protocol.
4. Check blood glucose level. If glucose < 60 mg/dL refer to DIABETIC EMERGENCIES Protocol.
5. Initiate active cooling:
    a. Remove patient's clothing; protect privacy.
    b. Cool patient with water and fans.
    c. Apply cold packs to neck, groin and armpits.
    d. Cover patient with cool, wet sheets and fan.
    e. DO NOT induce shivering. Stop cooling if shivering occurs.
6. If core temperature is greater than 104°F (40°C) or if altered mental status is present, begin active cooling by ice bath immersion and remove once patient's temperature is less than 102.2°F (39°C) or if continuous temperature monitoring is not available, until the patient demonstrates improvement in mental status.
    a. Ice bath immersion provides the most rapid cooling mechanism.
    b. If ice bath immersion is not available, consider the following:
        i. Tarp-Assisted Cooling with Oscillation (TACO)
        ii. Rotating ice water-soaked towels or sheets.
        iii. Continually misting the exposed skin with tepid water while fanning the victim.
        iv. Truncal ice packs may be used, but are less effective than evaporation.
7. Avoid fluids by mouth, especially if patient is nauseated.
8. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. If actively cooling patient do not allow patient to shiver. May use **MIDAZOLAM 2.5 mg IV/IO/IN**, may repeat once in **5 minutes**; or **5 mg IM,** may repeat once in **10 minutes** as needed.
4. Administer **NORMAL SALINE 500 mL bolus**.
5. If patient remains symptomatic, repeat fluid bolus as long as lungs remain clear; maximum **2 liters**.
6. Be prepared to treat seizures per SEIZURE Protocol.

Environmental Hyperthermia

PEARLS

- Extremes of age are more prone to heat emergencies (i.e. young and old).
- Heat exposure can occur either due to increased environmental temperatures or prolonged exercise or a combination of both.
    a. Environments with temperature *greater than 90°F* and humidity *greater than 60%* present the most risk.
- Contributory risk factors may come from:
    a. Prescription and over-the-counter herbal supplements
    b. Cold medications
    c. Heart medications
    d. Diuretics
    e. Psychiatric medications
    f. Drug abuse (i.e. cocaine, amphetamines and salicylates)
    g. Accidental or intentional drug overdose
- Heat stroke is associated with cardiac arrhythmias independent of drug ingestion / overdose.
- Sweating *generally* disappears as body temperatures rise over 104°F although sweating (or lack of sweating) can be an unreliable indicator of the severity of heat illness.
- Do not forget to look for other causes of altered mental status such as low blood glucose level, or, in the proper circumstances (e.g. endurance exercise events), consider exercise associated hyponatremia (EAH), especially in the patient with altered mental status, normal blood glucose, and normal temperature.
- Hyperthermia not from environmental factors has a differential that includes the following:
    a. Fever and delirium
    b. Hyperthyroid storm
    c. Delirium tremens (DTs)
    d. CNS lesion or tumor
    e. Adverse drug event: neuroleptic malignant syndrome, malignant hyperthermia
    f. Mental status changes without hyperthermia in the correct circumstances could be exercise associated hyponatremia

KEY DOCUMENTATION ELEMENTS

- Patient assessment includes medication / drug use and detailed past medical history
- Patient temperature and physical exam
- Environmental assessment performed
- Cooling interventions considered and implemented

PERTINENT ASSESSMENT FINDINGS

- Warning signs: fever, altered mental status
- Blood glucose level for altered mental status

QUALITY METRICS

- Blood glucose level obtained
- Fluids given for hypotension
- Attempts to reduce core temperature

Environmental Hyperthermia

Intentionally Left Blank

Environmental Hypothermia / Frostbite

History
- Age
- Ambient temperature
- Exposure to wind / water
- Duration of exposure
- Past medical history / Medications
- Alcohol or illicit drug use

Signs and Symptoms
- Altered mental status / Coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Metabolic disorders (hypoglycemia, hypothyroidism)
- Sepsis
- Environmental exposure
- Shock
- CNS dysfunction (stroke, brain injury, spinal cord injury)

Hypothermia

Classification

	Temperature	Signs & Symptoms
Mild	89.8°-95°F (32°-35°C)	Normal Vitals; Normal mental status; shivering is preserved; body maintains ability to control temperature.
Moderate	82.5°-89.7°F (28°-32°C)	Progressive bradycardia, hypotension, and decreased respirations, alterations in mental status with eventual coma, shivering will be lost in moderate hypothermia (generally between 31-30° C), and general slowing of bodily functions; the body loses ability to thermos-regulate.
Severe	< 82.4°F (< 28°C)	

EMR & EMT-Basic

1. **UNIVERSAL PATIENT CARE**.
2. Cautiously assess pulse for one full minute; unnecessary CPR could precipitate ventricular fibrillation. If patient has a pulse go to step #5.
3. If patient is pulseless & apneic after one full minute, refer to HYPOTHERMIC CARDIAC ARREST section below.
4. Manage airway per the AIRWAY MANAGEMENT Protocol; assist ventilations with BVM but do not hyperventilate as hypocarbia may reduce the threshold for V-Fib in the cold patient.
5. Handle patient gently; DO NOT massage cold extremities.
6. Move patient to a warm environment; remove any wet clothing and replace with dry sheets and blankets.
7. Hot packs may be applied to arm pits, groin and abdominal areas.
8. Assess and treat for other injuries as necessary.
9. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. Administer **NORMAL SALINE 500 mL** fluid bolus and reassess patient. Use warmed (102°-106°F) fluid if available.
4. May repeat fluid bolus as needed as long as lungs remain clear; maximum **2 liters**.

Environmental Hypothermia / Frostbite

Frostbite

Patient Presentation

Patients with frostbite will develop numbness involving the affected body part along with a “clumsy” feeling and areas of blanched skin - later findings include decreased or loss of sensation, bruising or blister formation, white and waxy appearance to affected tissue, or feeling like a block of wood.

All Levels

1. Remove from cold.
2. **UNIVERSAL PATIENT CARE**.
3. Do NOT massage frostbitten extremities.
4. Cover frostbitten nose or ears with a warm hand.
5. Have patient place frostbitten hand in his / her armpit.
6. If ETA is greater than 60 minutes, begin active rewarming:
    a. Immerse extremity in circulating water maintained at a temperature of 100-105 F.
    b. Rewarming should take 30-60 minutes.
    c. Rewarming is complete when frozen area is warm to touch and deep red or bluish in color.
    d. After rewarming, dry gently and cover part with dry sterile dressing and elevate on pillow.
    e. Do NOT allow to refreeze.

Environmental Hypothermia / Frostbite

Hypothermic Cardiac Arrest

EMR & EMT-Basic

1. Cautiously assess pulse for one full minute; unnecessary CPR could precipitate ventricular fibrillation.
2. Begin CPR and apply AED. Follow CARDIAC ARREST Protocol.
3. Manage airway per AIRWAY MANAGEMENT.
4. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Follow appropriate dysrhythmia protocol.
3. Establish IV access.
4. **NORMAL SALINE** at wide open rate; use warm solution (102°-106°F) if available.

PEARLS

Hypothermic Cardiac Arrest

- The following are contraindications for initiation of resuscitation in the hypothermic patient:
    a. Obvious fatal injuries (such as decapitation).
    b. The patient exhibits signs of being frozen (such as ice formation in the airway).
    c. Chest wall rigidity such that compressions are impossible.
    d. Danger to rescuers or rescuer exhaustion
- Fixed and dilated pupils, apparent rigor mortis, and dependent lividity may not be contraindication for resuscitation in the severely hypothermic patient.
- The mainstay of therapy in severe hypothermia and cardiac arrest should be effective chest compressions and attempts at rewarming. Chest compressions should be provided at the same rate as in normothermic patients.
- The temperature at which defibrillation should first be attempted in the severely hypothermic cardiac arrest victim and the number of defibrillation attempts is unclear. There are different approaches regarding resuscitation of the hypothermic arrest patient.
    a. Per the American Heart Association (AHA), if the patient has a shockable rhythm (VF/VT), defibrillation should be attempted – it is reasonable to continue defibrillation attempts per AHA protocols concurrently with rewarming strategies.
- There is little evidence to guide use of medications in severe hypothermia with cardiac arrest, however 2010 AHA updates to advanced cardiac life support recommend use of vasopressors according to standard ACLS guidelines.
- Patients with severe hypothermia and arrest may benefit from resuscitation even after prolonged downtime, and survival with intact neurologic function has been observed even after prolonged resuscitation.

Environmental Hypothermia / Frostbite

PEARLS

- Extremes of age are more susceptible (i.e. young and old).
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Given the additive effects of additional cold stress, the patient should be removed from the cold environment as soon as operationally feasible.
- In patients suffering from moderate to severe hypothermia, it is critical to not allow these patients to stand or exercise as this may cause circulatory collapse.
- Devices that self-generate heat (e.g. heat packs) that are being utilized during the rewarming process should be wrapped in a barrier to avoid direct contact with the skin and to prevent burns. In patients who are unresponsive, or unable to recognize a developing injury, please check the area in which the heating pad is placed regularly to ensure no tissue damage occurs.

KEY DOCUMENTATION ELEMENTS

- Duration of cold exposure
- Ambient temperature
- Rewarming attempts or other therapies performed by EMS and prior to EMS arrival
- Patient use of alcohol and/or drugs

PERTINENT ASSESSMENT FINDINGS

- Identification of associated traumatic injuries (when present)
- Identification of localized freezing injuries
- Patient core temperature (when available)

QUALITY METRICS

- Patient core temperature and means of measurement (when available)
- Presence of cardiac dysrhythmias
- Documentation of associated trauma (when present)
- Blood glucose level obtained

Lightning / Lightning Strike Injury

History
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness

Signs and Symptoms
- Respiratory distress / Apnea
- Dysrhythmias
- Seizures
- Dizziness / Vertigo
- Loss of consciousness
- Paralysis
- Burns, pain, swelling
- Cardiopulmonary arrest

Differential
- Burns—Superficial (1st Degree), Partial Thickness (2nd Degree), Full Thickness (3rd Degree)
- Cardiopulmonary arrest
- Altered mental status
- Seizures
- Dysrhythmias

EMR & EMT-Basic

1. Ensure scene and rescuer safety. Recognize that repeat strike is a risk.
2. **UNIVERSAL PATIENT CARE**.
3. Assure patent airway. Refer to AIRWAY MANAGEMENT Protocol.
4. If in cardiopulmonary arrest, treat per CARDIAC ARREST Protocol.
5. Treat burns per BURNS Protocol.
6. Relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Advanced airway management as indicated. Refer to AIRWAY MANAGEMENT Protocol.
3. Establish IV access.
4. Acquire 12-lead ECG. Monitor ECG for potential arrhythmias.
5. Consider early management of pain per the PAIN MANAGEMENT Protocol.

Lightning / Lightning Strike Injury

PEARLS

- Recognize that repeat strike is a risk. Patient and rescuer safety is paramount.
- Victims do not carry or discharge a current, so the patient is safe to touch and treat.
- Lightning strike cardiopulmonary arrest patients have a high rate of successful resuscitation, if initiated early, in contrast to general cardiac arrest statistics.
- There may be multiple victims.
- If multiple victims, cardiac arrest patients whose injury was witnessed or thought to be recent should be treated first and aggressively (reverse from traditional triage practices).
    a. Patients suffering cardiac arrest from lightning strike initially suffer a combined cardiac and respiratory arrest.
    b. Return of spontaneous circulation may precede resolution of respiratory arrest.
    c. Patients may be successfully resuscitated if provided proper cardiac and respiratory support, highlighting the value of “reverse triage”.
- It may not be immediately apparent that the patient is a lightning strike victim.
- Injury pattern and secondary physical exam findings may be key in identifying patient as a victim of lightning strike.
- Fixed / dilated pupils may be a sign of neurologic insult, rather than a sign of death / impending death – Should not be used as a solitary, independent sign of death for the purpose of discontinuing resuscitation in this patient population.
- Lightning strike is a result of very high voltage, very short duration DC current exposure.

KEY DOCUMENTATION ELEMENTS

- Initial airway status
- Initial cardiac rhythm
- Neurologic exam (initial and repeat)
- Associated / Secondary injuries
- Pain scale documentation / Pain management

PERTINENT ASSESSMENT FINDINGS

- Presence of thermal or non-thermal burns
- Evidence of trauma
- Evidence of focal neurologic deficits

QUALITY METRICS

- Patient transported to most appropriate hospital.
- Pain appropriately managed.
- Airway assessment and early and aggressive management

Poisoning and Overdose

History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Alcohol or other intoxicant ingested
- Time of ingestion
- Reason of ingestion (suicidal, accidental, criminal)
- Available medications at home
- Past medical history
- Medications

Signs and Symptoms
- Mental status changes
- Hypotension / Hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- SLUDGE / DUMBBELS

**See TOXIDROME section*

Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)

Toxidromes

Anticholinergic
- Red as a beet (Flushed skin)
- Dry as a bone (Dry skin)
- Mad as a hatter (Altered mental status)
- Blind as a bat (Mydriasis)
- Hot as a pistol (Hyperthermia)
- Full as a flask (urinary retention)
- "Tachy" like a pink flamingo (tachycardia and hypertension)

Cholinergic

(DUMBELS) DUMBELS is a mnemonic used to describe the signs and symptoms of acetylcholinesterase inhibitor agent poisoning. SLUDGEM is an alternative mnemonic.
- **D**iarrhea
- **U**rination
- **M**iosis/**M**uscle weakness
- **B**ronchospasm/**B**ronchorrhea/**B**radycardia (killer Bs)
- **E**mesis
- **L**acrimation
- **S**alivation/**S**weating

Opioids
- Respiratory depression
- Miosis (pinpoint pupils)
- Altered mental status
- Decreased bowel sounds

Sedative Hypnotic
- Central nervous system depression
- Ataxia (unstable gait or balance)
- Slurred speech
- Normal or depressed vital signs (pulse, respirations, blood pressure)

Stimulants / Hallucinogenics (Sympathomimetic)
- Tachycardia, tachydysrhythmias
- Hypertension
- Diaphoresis
- Delusions/paranoia
- Seizures
- Hyperthermia
- Mydriasis (dilated pupils)

Serotonin Syndrome (presentation with at least three of the following)
- Agitation
- Ataxia
- Diaphoresis
- Diarrhea
- Hyperreflexia
- Mental status changes
- Myoclonus
- Shivering
- Tremor
- Hyperthermia
- Tachycardia

Protocol Continues

Poisoning and Overdose

EMR & EMT-Basic

1. Assure scene is safe and the patient has been decontaminated if needed.
2. **UNIVERSAL PATIENT CARE**.
3. Save all bottles, containers and labels for information. **DO NOT EXPOSE RESCUERS TO POISONOUS SUBSTANCES.**
4. If blood glucose < 60 mg/dL, refer to DIABETIC EMERGENCIES Protocol.
5. If the patient has inadequate respiratory effort from a confirmed or suspected opioid overdose, administer **NALOXONE**
    a. **IN – 2-4 mg**; **1 mg/mL per nostril** via atomizer* (1 mL per nostril maximum). May repeat every 2-3 minutes as needed.
    b. Naloxone has no benefit in the treatment of cardiac arrest. Do not delay other interventions such as CPR and ventilations.

EMT-Intermediate

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. Consider **NORMAL SALINE 500 mL bolus** to maintain SBP ≥ 90 mmHg or MAP ≥ 65 mmHg. Repeat fluid bolus as needed as long as lungs remain clear to maintain SBP ≥ 90mmHg or MAP ≥ 65 mmHg; maximum **2 liters**.
4. Apply cardiac monitor to include pulse oximetry and waveform capnography.
    a. Monitor ECG with special attention to rate, rhythm, QRS and QT duration
5. If patient has inadequate respiratory effort from a confirmed or suspected opioid overdose, administer **NALOXONE**: *(Titrate to adequate ventilation and oxygenation. Not given to restore consciousness.)*

    IV or IM – 0.4-2 mg; may repeat every 2-3 minutes.

    IN – 2-4 mg; 1 **mg/mL per nostril** via atomizer* (1 mL per nostril maximum)
    May repeat every 2-3 minutes as needed.
6. If blood glucose < 60 mg/dL, refer to DIABETIC EMERGENCIES Protocol.
7. Call for intercept per INTERCEPT CRITERIA.

Protocol Continues

Paramedic

1. Continue **ILS TREATMENT**.
2. Apply cardiac monitor to include pulse oximetry and waveform capnography.
   a. Monitor ECG with special attention to rate, rhythm, QRS and QT duration**.**

Overdose Agent	Treatment
Acetylcholinesterase Inhibitors (Carbamates, Nerve Agents, Organophosphates) Exposure	1. Refer to ACETYLCHOLINESTERASE INHIBITORS (CARBAMATES, NERVE AGENTS, ORGANOPHOSPHATES) EXPSOURE Protocol.
Beta Blocker and **Calcium Channel Blocker**	1. For symptomatic bradycardia, refer to BRADYCARDIA Protocol. 2. For symptomatic patients with cardiac effects (i.e. hypotension, bradycardia) administer **GLUCAGON 2mg IV or IM**
Opioid	1. If airway compromise or inadequate respiratory effort present from a confirmed or suspected opioid overdose, administer **NALOXONE:** **IV or IM – 0.4-2 mg**; may repeat every 2-3 minutes as needed. **IN – 2-4 mg**;1 **mg/ml per nostril** via atomizer* (1 mL per nostril maximum) May repeat every 2-3 minutes as needed. **Naloxone has no benefit in the treatment of cardiac arrest. Do not delay other interventions such as CPR and ventilations
Stimulant and **Hallucinogenic** *(Cocaine, Amphetamines, PCP, MDM/Ecstasy, bath salts, spice, K2, Synthetic THC)*	1. Treat chest pain as ACS and follow CHEST PAIN Protocol. 2. Obtain 12-lead ECG. 3. Consider **MIDAZOLAM** to reduce agitation for patient and provider safety. Refer to BEHAVIORAL EMERGENCIES Protocol. 4. If hyperthermia suspected, begin external cooling.
Tricyclic Antidepressant	1. If widened QRS (> 100 msec), administer **SODIUM BICARBONATE 1 mEq/kg IV**.

Poisoning and Overdose

PEARLS

- Each toxin or overdose has unique characteristics which must be considered in individual protocol.
- If possible, bring container / bottles, and/or contents with the patient to the Emergency Department.
- Monitor patient airway, breathing, pulse oximetry, $EtCO_2$ for adequate ventilation as they may change over time. Supportive care.
- Repeat vital signs often.
- Monitor level of consciousness.
- Monitor ECG with special attention to rate, rhythm, QRS and QT duration.
- Maintain or normalize patient temperature.
- Do not rely on patient history of ingestion, especially in suicide attempts.

Specific Signs / Symptoms

- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** Initially asymptomatic or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Aspirin**: Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema can take place later.
- **Depressants:** Bradycardia, hypotension, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants:** Tachycardia, hypertension, increased temperature, dilated pupils, seizures.
- **Anticholinergic:** Tachycardia, increased temperature, dilated pupils, mental status changes.
- **Cardiac Medications:** Dysrhythmias and mental status changes.
- **Solvents:** Nausea, coughing, vomiting, and mental status changes.
- **Insecticides:** Increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.

KEY DOCUMENTATION ELEMENTS

- Repeat evaluation and documentation of signs and symptoms, as patient's clinical condition may deteriorate rapidly
- Identification of possible etiology of poisoning
- Initiating measures on scene to prevent exposure of bystanders when appropriate / indicated
- Time of symptoms onset and time of initiation of exposure-specific treatment

PERTINENT ASSESSMENT FINDINGS

- Frequent reassessment is essential as patient deterioration can be rapid and catastrophic

QUALITY METRICS

- Early airway management in the rapidly deteriorating patient
- Accurate exposure history (Time, Route, Quantity, Alcohol or other intoxicants taken)
- Multiple frequent documented reassessments

Radiation Exposure

History
- Type of exposure
- Inhalation injury
- Time of injury
- Time of GI symptom onset
- Past medical history
- Medications
- Other trauma
- Loss of consciousness

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / Shock
- Airway compromise / distress could be indicated by hoarseness / wheezing

Differential
- Superficial (1st Degree) red and painful
- Partial Thickness (2nd Degree) blisters
- Full Thickness (3rd Degree) painless/ charred or leathery skin
- Thermal burns
- Chemical burns
- Electrical burns
- Blast injury

EMR & EMT-Basic

1. Ensure scene and rescuer safety.
    a. Don standard PPE capable of preventing skin exposure to liquids and solids (gown and gloves), mucous membrane exposure to liquids and particles (face mask and eye protection), and inhalational exposure to particles (N95 face mask or respirator).
2. **UNIVERSAL PATIENT CARE**.
    a. Identification and treatment of life-threatening injuries and medical problems takes priority over decontamination.
3. Treat burns per BURNS Protocol.
4. Treat nausea and vomiting per NAUSEA / VOMITING Protocol.
    a. Document the time of GI symptom onset.
5. Treat seizures per SEIZURE Protocol.
6. Relay information to incoming ambulance and/or call for intercept per INTERCEPT CRITERIA.

EMT-Intermediate & Paramedic

1. Continue **EMR / BLS TREATMENT**.
2. Establish IV access.
3. Treat nausea and vomiting per NAUSEA / VOMITING Protocol.
4. Treat seizures per SEIZURE Protocol.

Pertinent Assessment Findings

- Time to nausea and vomiting is a reliable indicator of the received dose of ionizing radiation. The more rapid the onset of vomiting, the higher the whole-body dose of radiation.
- Tissue burns are a late finding (weeks following exposure) of ionizing radiation injury. If burns are present acutely, they are from a thermal or chemical mechanism.
- Seizures may suggest acute radiation syndrome if accompanied by early vomiting. If other clinical indicators do not suggest a whole-body dose of greater than 20Gy, consider other causes of seizure.

Radiation Exposure

PEARLS

- Contaminated patients pose very little threat to medical providers who use appropriate PPE including N95 masks or respirators, gloves, gowns, and face and eye protection.
- Sources of radiation
    a. Legal
        i. Industrial plants
        ii. Healthcare facilities that provide radiologic services
        iii. Nuclear power plants
        iv. Mobile engineering sources (e.g. construction sites that are installing cement)
    b. Illegal
        i. Weapons of mass destruction
        ii. “Dirty bomb” design to contaminate widespread areas
- Physiology of radiation poisoning
    a. Contamination – Poisoning from direct exposure to a radioactive source, contaminated debris, liquids, or clothing where radiation continues to be emitted from particles on surface.
    b. Exposure – Poisoning from radioactivity, in the form of ionizing rays, penetrating through the bodily tissues of the patient.
- Common types of radioactivity that cause poisoning
    a. Gamma rays
        i. Highest frequency of ionizing rays
        ii. Penetrates the skin deeply
        iii. Causes the most severe radiation toxicity
    b. Beta rays - Can penetrate up to 1 cm of the skin’s thickness
    c. Alpha rays
        i. Lowest frequency of ionizing rays
        ii. Short range of absorption
        iii. Dangerous only if ingested or inhaled
    d. Radioactive daughters
        i. Products of decay of the original radioactive substance
        ii. Can produce gamma and beta rays (e.g. uranium decays into a series of radon daughters)
- In general, trauma patients who have been exposed to or contaminated by radiation should be triaged and treated on the basis of the severity of their conventional injuries.
- A patient who is contaminated with radioactive material (e.g. flecks of radioactive material embedded in their clothing and skin) generally poses a minimal exposure risk to medical personnel.

KEY DOCUMENTATION ELEMENTS

- Duration of exposure to the radioactive source or environment
- Distance (if able to be determined) from the radioactive source (if known)
- Time of onset of vomiting

PERTINENT ASSESSMENT FINDINGS

- Treatment of life-threatening injuries or medical conditions takes priority over assessment for contamination or initiation of decontamination

QUALITY METRICS

- Use of appropriate Personal Protective Equipment (PPE)