REGION 11

CHICAGO EMS SYSTEM

EMS PROTOCOLS - ALS

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These Region 11 Chicago EMS System Protocols, Policies, and Procedures for EMTs and Paramedics are prehospital medical guidelines for patient assessment, treatment, and transportation within the system. They provide a framework for all patient encounters and Online Medical Control should be consulted in situations where there is not clear direction from the written documents.

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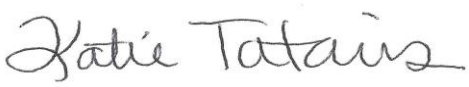

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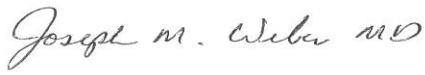

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REGION 11 - CHICAGO EMS SYSTEM
EMS PROTOCOLS - ALS

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REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

GENERAL

Adult Initial Assessment
Routine Medical Care (RMC)

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult Initial Assessment - ALS
	Section: General
	Approved: EMS Medical Directors Consortium
	Effective: December 15, 2021

ADULT INITIAL ASSESSMENT – ALS

I. SCENE SIZE-UP

A. Wear appropriate personal protective equipment (PPE).

B. Assess the scene safety:

1. Evaluate hazards to EMS personnel, patients and bystanders;

2. Determine number of patients;

3. Determine the mechanism of injury/nature of illness;

4. Request additional resources as needed, and weigh the benefits of waiting for additional resources against rapid transport to definitive care;

5. Consider declaration of mass casualty incident if needed.

II. INITIAL ASSESSMENT OF ADULT PATIENT

A. Assess **General Impression** of the patient

1. Evaluate patient responsiveness using the AVPU scale.

B. **Primary Survey** - Should be Airway-Breathing-Circulation (A-B-C), unless specific circumstances such as cardiac arrest or major hemorrhage where Circulation-Airway-Breathing (C-A-B) is indicated.

1. **Airway** - Assess for patency

a. Open the airway as needed using either head-tilt, chin-lift or jaw thrust while maintaining spinal motion restriction as appropriate.

b. Suction airway as needed.

c. Consider use of appropriate airway adjuncts including: oral airway (OPA), nasal airway (NPA), supraglottic airway device (SGA), or endotracheal tube (ETT) as per Airway Management Protocol.

d. For airway obstruction, see Airway Obstruction Protocol.

e. For difficult airway situations in which the patient cannot be effectively oxygenated or ventilated, follow the Airway Management Protocol and transport to the closest appropriate hospital for airway stabilization.

2. **Breathing**

   a. Evaluate for rate, breath sounds, accessory muscle use, retractions, and patient positioning.

   b. Administer oxygen as needed to maintain an oxygen saturation of >94% or at 15 L by most appropriate method for any critically ill patient (respiratory distress, shock, smoke inhalation, carbon monoxide poisoning, or cardiac arrest) per Oxygen Delivery Methods Procedure.

   c. If apneic, see Airway Management Procedure.

3. **Circulation**

   a. Control any major external hemorrhage:
      i. Apply direct pressure to wound;
      ii. For life-threatening bleeding that cannot be controlled by direct pressure, follow the Hemorrhage Control Procedure.

   b. Assess pulse:
      i. Assess rate and quality of carotid and radial pulses;
      ii. If pulseless, follow Cardiac Arrest Management: Incident Command for Cardiac Arrest (ICCA) Procedure.

   c. Assess perfusion status via skin color, temperature and capillary refill.

4. **Disability**

   a. Calculate GCS as indicated.

   b. Evaluate gross motor and sensory exam in all extremities.

   c. Check blood glucose in any patient with altered mental status.

   d. If acute stroke suspected, perform Cincinnati Stroke Scale and see Stroke Protocol.

5. **Expose** patient as appropriate to complaint or mechanism.

   a. Be considerate of patient modesty and environmental conditions.

   b. Apply appropriate intervention to maintain normal body temperature.

C. **Secondary Survey** - A full secondary assessment should be completed and documented on every patient unless a critical airway, breathing or circulation problem

requires stabilization. It should not delay transport in critical patients. A secondary survey should include the following components:

1. Head

    a. Pupils
    b. Naso-oropharynx
    c. Skull and scalp

2. Neck

    a. Jugular venous distention
    b. Tracheal position
    c. Spinal tenderness

3. Chest

    a. Chest wall bruising or deformities
    b. Retractions
    c. Breath sounds

4. Abdomen/Flank/Back/Pelvis

    a. Bruising
    b. Distention
    c. Tenderness

5. Extremities

    a. Bruising or deformities
    b. Pulse
    c. Edema

6. Neurologic

    a. Mental Status/Orientation
    b. Motor and sensory exam

D. Obtain Baseline Vital Signs

1. An initial full set of vital signs is required on every patient including: pulse, blood pressure, respiratory rate, pulse oximetry and neurologic status assessment.

2. A repeat set of vital signs is required at least every 15 minutes on stable patients and at least every 5 minutes on unstable patients.

3. For patients with a cardiac or respiratory complaint or in those where acute coronary syndrome is suspected, a 12-lead ECG should be obtained as early as possible and these patients should receive continuous cardiac and pulse oximetry monitoring.

4. Initiate IV/IO access as indicated for medication or fluid administration.

5. Blood sugar should be checked on any patients with altered mental status or with known or suspected diabetes.

6. Continuous waveform capnography must be monitored on any patient with an advanced airway or bag-valve mask ventilation.

7. Pain scale should be documented on any patient with a pain complaint.

E. Obtain OPQRST History:

1. **O**nset of Symptoms

2. **P**rovocation-location, any factors that worsen or relieve symptoms

3. **Q**uality of symptoms or pain

4. **R**adiation of pain

5. **S**everity of symptoms-pain scale

6. **T**ime of onset and circumstances surrounding onset

F. Obtain SAMPLE History:

1. **S**ymptoms

2. **A**llergies

3. **M**edications

4. **P**ast Medical/Surgical History

5. **L**ast oral intake

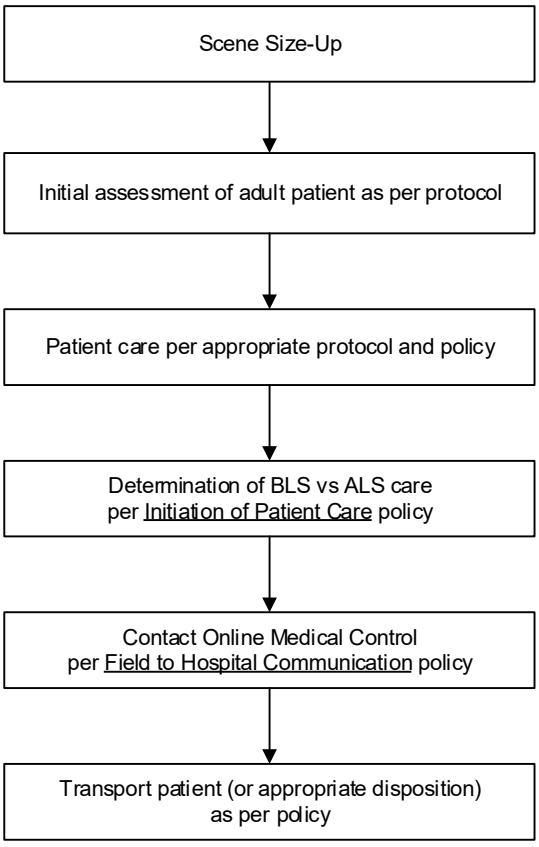
6. **E**vents leading up to emergency call

G. Reassessment

1. At least every 15 minutes in a stable patient.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Routine Medical Care - ALS
	Section: General
	Approved: EMS Medical Directors Consortium
	Effective: October 1, 2018

ROUTINE MEDICAL CARE (RMC) – ALS



REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

CARDIOVASCULAR

Acute Coronary Syndrome / Cardiac Chest Pain / ST Elevation Myocardial Infarction (STEMI)
Adult Bradycardia
Adult and Pediatric Post-ROSC Care
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Ventricular Fibrillation / Pulseless Ventricular Tachycardia

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Acute Coronary Syndrome / Cardiac Chest Pain / ST Elevation Myocardial Infarction (STEMI) – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

ACUTE CORONARY SYNDROME/CARDIAC CHEST PAIN/ST ELEVATION MYOCARDIAL INFARCTION (STEMI) - BLS/ALS

I. PATIENT CARE GOALS

A. Recognize **Acute Coronary Syndrome (ACS)** which includes a heart attack or unstable angina and occurs when the blood supplied to a heart muscle is suddenly blocked.

B. Identify ST-elevation myocardial infarction (STEMI) quickly.

C. Determine the time of symptom onset.

D. Activate hospital-based STEMI system of care.

E. Monitor vital signs and cardiac rhythm and be prepared to provide CPR and defibrillation if needed.

F. Administer appropriate medications.

G. Transport to STEMI Center as per STEMI Patient Destination Policy.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. ACS symptoms include chest pain or discomfort in other areas of the body of suspected cardiac origin (e.g., arm, jaw, epigastrium), shortness of breath, associated or unexplained sweating, nausea, vomiting, or dizziness. Atypical or unusual symptoms which may not include chest pain are more common in women, the elderly, and diabetic patients. May also present with only shortness of breath, syncope, and/or shock.

2. Cardiac chest pain from associated sympathomimetic use (e.g., cocaine, methamphetamine).

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment, Treatment, and Interventions

1. Acute Coronary Syndrome (ACS) signs and symptoms include chest pain or discomfort, shortness of breath, nausea/vomiting, dizziness, diaphoresis, syncope, shock, symptoms similar to a patient's previous myocardial infarction (MI) or atypical symptoms as listed above.

2. Assess the patient's cardiac rhythm and immediately address pulseless rhythms, symptomatic tachycardia, or symptomatic bradycardia (see to appropriate Protocol).

3. If the patient is dyspneic, hypoxic, or has obvious signs of heart failure, EMS clinicians should administer oxygen as appropriate with a target of achieving 94–98% saturation.

4. The 12-lead ECG is the primary diagnostic tool that identifies a STEMI; it is imperative that EMS clinicians routinely acquire a 12-lead ECG within 10 minutes for all patients exhibiting signs and symptoms of ACS.

    a. The ECG may be interpreted by the EMS clinicians, the Base Station, or based on the assistance of computer-interpretation (***STEMI*** or ***ACUTE MI*** reading).
    b. Online Medical Control should be contacted for all patients with a possible STEMI.
    c. The ECG should be transmitted to the receiving hospital. The ECG may also be transmitted to the Base Station hospital as needed for destination decisions.
    d. Performance of serial ECGs is encouraged for symptomatic patients with ECGs initially non-diagnostic for STEMI.

5. Administer four aspirin 81 mg tablets: for a total of 324 mg.

6. Establish IV access.

7. Administer nitroglycerin 0.4 mg sublingual (SL), can repeat every 3–5 minutes if systolic blood pressue (SBP) is greater than 100 mmHg.

    a. Care should always be taken when giving nitroglycerin. The EMS clinician should weigh the risk and benefit of nitrate administration and be ready to respond to hypotension with a fluid bolus.
    b. The use of nitrates should be avoided in any patient who has used a phosphodiesterase inhibitor within the past 48 hours.
    c. Examples include sildenafil (Viagra®, Revatio®), vardenafil (Levitra®, Staxyn®), tadalafil (Cialis®, Adcirca®) which are used for erectile dysfunction and pulmonary hypertension. Also avoid use in patients receiving intravenous epoprostenol (Flolan®) or treporstenil (Remodulin®) which is used for pulmonary hypertension.

8. Inferior myocardial infarction (ST elevation in II, III, AVF) may indicate coexisting right ventricular infarction **but is <u>not a contraindication to nitroglycerin administration</u>**. Patients with Right Ventricular Infarction are particularly preload dependent and may become hypotensive with nitroglycerin administration. Continually monitor the patient's hemodynamic status and be prepared to administer IV fluids if hypotension occurs.

9. For patients with STEMI and pain unresponsive to nitrates or contraindication to nitrates, administer fentanyl 1 mcg/kg IV (maximum dose 50 mcg for patients age over 65; maximum dose 100 mcg for patients 65 years of age and less).

10. Destination decisions should be to a STEMI Center for patients with STEMI or ACUTE MI on the ECG or signs and symptoms of ACS with ECG abnormalities concerning for a STEMI.

11. Early notification to receiving hospital of any changes in patient condition or serial ECGs.

B. Patient Safety Considerations

1. Observe for signs of clinical deterioration: dysrhythmias, chest pain, shortness of breath, decreased level of consciousness/syncope, or other signs of shock/hypotension.

2. Perform serial 12-lead ECGs (especially if clinical changes are noted).

3. Place defibrillator pads on high-risk patients or patients with STEMI.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Acute coronary syndrome may present with atypical pain, vague or only generalized complaints.

2. Ischemic burden time is a risk for morbidity and mortality, EMS can help decrease first medical contact to intervention time/reflow by efficient patient care to safely minimize scene time.

B. Pertinent Assessment Findings

1. A complete medication list should be obtained from each patient.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult Bradycardia – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

ADULT BRADYCARDIA – BLS/ALS

I. PATIENT CARE GOALS

1. Maintain adequate perfusion.

2. Treat underlying cause:

    a. Hypoxia
    b. Shock
    c. Second or third-degree atrioventricular (AV) block
    d. Toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin)
    e. Electrolyte disorder
    f. Hypoglycemia
    g. Increased intracranial pressure (ICP)
    h. Other

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Heart rate less than 50 beats per minute with either symptoms altered mental status chest pain, congestive heart failure, seizure, syncope, shock, pallor, diaphoresis or evidence of hemodynamic instability.

2. The major ECG rhythms classified as bradycardia include:

    a. Sinus bradycardia
    b. Second degree AV block
        - Type I- Wenckebach/Mobitz I
        - Type II- Mobitz II
    c. Third-degree AV block, complete heart block
    d. Ventricular escape rhythms

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Adult Management

1. Manage airway as necessary.

2. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

3. Initiate cardiac monitoring and perform 12-lead ECG.

4. Establish IV access.

5. Check blood glucose and treat hypoglycemia.

6. Consider the following additional therapies if bradycardia and symptoms or hemodynamic instability continue:

   a. Atropine 1 mg IV every 3-5 minutes (maximum total dose of 3 mg)
   b. If atropine is ineffective, initiate Transcutaneous Pacing Procedure and administer analgesia per Pain Management Protocol

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Evaluate for signs of decreased end-organ perfusion: chest pain, shortness of breath, decreased level of consciousness, syncope, or other signs of shock/hypotension.

2. Patients who have undergone cardiac transplant will not respond to atropine.

3. Consider the effect of medications causing bradycardia including beta-blockers, calcium channel blockers, sodium channel blockers/anti-depressants, digoxin, and clonidine.

4. There are many potential causes of bradycardia including: myocardial infarction (MI), hypoxia, pacemaker failure, hypothermia, sinus bradycardia, athletes, head injury with increased intracranial pressure (ICP), stroke, spinal cord lesion, sick sinus syndrome, AV blocks, overdose, and cholinergic nerve agents.

5. Consider hyperkalemia in the patient with wide complex bradycardia.

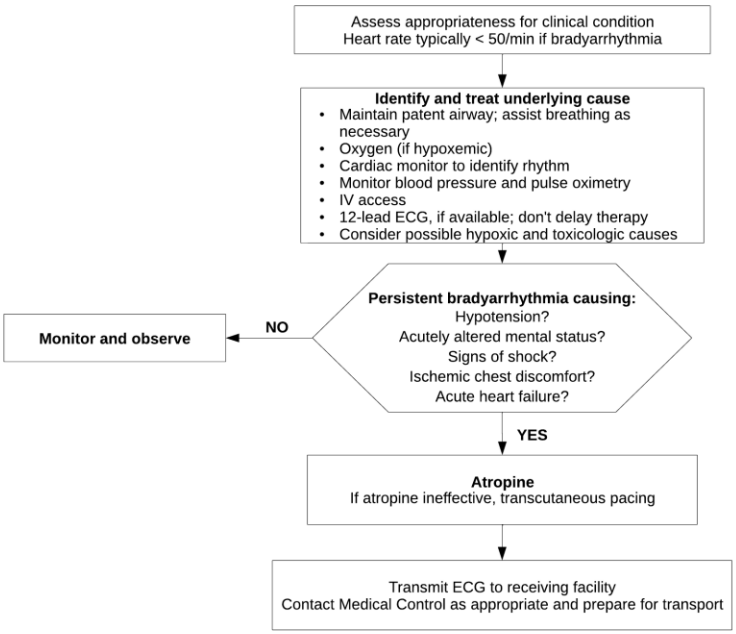
6. Bradycardia should be managed via the least invasive manner possible, escalating care as needed.

   a. Third-degree heart block or the denervated heart (as in cardiac transplant) may not respond to atropine, and in these cases proceed quickly to chronotropic agents (such as epinephrine) or transcutaneous pacing.
   b. In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing.

7. Be aware of acute coronary syndrome as a cause of bradycardia in adult patients.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult Bradycardia – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

ADULT BRADYCARDIA – BLS/ALS



Doses/Details
Atropine IV dose: First dose: 1 mg bolus Repeat every 3-5 minutes Maximum: 3 mg
Causes
• Myocardial ischemia/infarction • Drugs/toxicologic (e.g. calcium-channel blockers, beta blockers, digoxin) • Hypoxia • Electrolyte abnormality (e.g. hyperkalemia)

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult and Pediatric Post-ROSC Care – ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: December 1, 2022

ADULT AND PEDIATRIC POST-ROSC CARE - ALS

I. PATIENT CARE GOALS

The immediate ROSC period is critical in stabilizing patients and preparing for transport. Therefore, the goal is to maximize survival and optimize neurologic and cardiovascular function following a return of spontaneous circulation through the following steps:

1. Manage airway
2. Manage respiratory parameters
3. Manage hemodynamic parameters and maximize blood pressure
4. Obtain 12-lead ECG and identify ST-elevation myocardial infarction (STEMI) or reversible causes of arrest
5. Recognize pending re-arrest
6. Transport to a STEMI Center

II. PATIENT PRESENTATION

Inclusion Criteria: Adult and pediatric patient with return of spontaneous circulation (ROSC) after non-traumatic cardiac arrest

III. PATIENT MANAGEMENT

1. Confirm Return of Spontaneous Circulation (ROSC):
    a. Identify palpable pulse
    b. Document auscultated blood pressure
    c. Perform 12-lead ECG and assess for STEMI
    d. A significant percentage of post-ROSC patients will re-arrest. Continue close monitoring and be prepared for re-arrest during the post-ROSC phase of care.
2. Assess Oxygenation and Ventilation:
    a. Maintain oxygen saturation ≥ 94%, do not hyperoxygenate
    b. Assist spontaneous respirations with BVM as necessary
    c. If no spontaneous respirations, place i-gel or endotracheal tube and attach continuous ETCO2 capnography
    d. Avoid hyperventilation
        i. Adults: Ventilate at a rate of 1 breath every 6 seconds (10 breaths per minute)
        ii. Children: Ventilate at 1 breath every 5 seconds (12 breaths per minute)
        iii. Infants: Ventilate at 1 breath every 3 seconds (20 breaths per minute)
    e. Titrate ventilation to target ETCO2 of 35-45 mmHg

3. Assess Circulation:

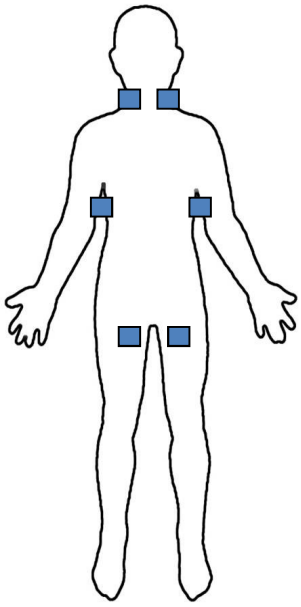
   a. For adults, If SBP is less than 90 mmHg, administer one 300 ml bolus of NS and repeat as indicated to maintain SBP ≥ 90 mmHg.
   b. For pediatric patients, administer 20 ml/kg fluid bolus to maintain blood pressure at or above normal for age as listed on Region 11 Pediatric Resuscitation Card.

4. Assess Mental Status:

   a. Check blood glucose, treat hypoglycemia accordingly.
   b. If adult patient is comatose with GCS ≤ 8, evaluate for Targeted Temperature Management

5. Evaluate for Targeted Temperature Management (TTM):

   a. For adult patients that are comatose (GCS ≤ 8) and sustained ROSC for a minimum of 5 minutes
   b. Apply ice packs to each of the following locations (6 total):
      i. 1 to each carotid artery on neck
      ii. 1 to each axilla
      iii. 1 to each femoral artery on groin



Snap and then apply ice packs as shown. One over each carotid artery (neck), one in each axilla, and one over each femoral artery (groin)

6. Contact Online Medical Control:

   a. Minimize movement of patient during post-arrest phase
   b. In the radio report, notify Online Medical Control if:
      i. Patient has ST Elevation Myocardial Infarction (STEMI) on 12-lead.
      ii. If Targeted Temperature Management (TTM) has been started.

7. Transmit 12-lead ECG and transport ALL adult patients to a Region 11 STEMI Center. Transport all pediatric patients to a Region 11 EDAP hospital.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult Tachycardia with a Pulse – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: June 1, 2026

ADULT TACHYCARDIA WITH A PULSE – BLS/ALS

I. PATIENT CARE GOALS

1. Maintain adequate oxygenation, ventilation, and perfusion.
2. Control ventricular rate.
3. Restore regular sinus rhythm in unstable patient.
4. Evaluate for underlying cause:
    a. Medications (caffeine, diet pills, thyroid, decongestants)
    b. Drugs (cocaine, amphetamines)
    c. History of dysrhythmia
    d. Congestive heart failure (CHF)

II. PATIENT PRESENTATION

Patients will have an elevated heart rate for age and may or may not also present with associated signs or symptoms such as palpitations, dyspnea, chest pain, syncope/near-syncope, hemodynamic compromise, altered mental status, or other signs of end organ decreased perfusion.

Rhythms include:
- *Atrial fibrillation (A-Fib)*
- *Atrial flutter*
- *Multifocal atrial tachycardia (MAT)*
- *Supraventricular tachycardia (SVT)*
- *Torsades de Pointes (TdP)*
- *Ventricular tachycardia (VT)*

A. Inclusion Criteria

Heart rate typically greater than 150 in adults, assess appropriateness for clinical condition.

B. Exclusion Criteria

Sinus tachycardia (heart rate over 100) with hemodynamic stability.

III. PATIENT MANAGEMENT

A. Adult Management

1. Manage airway as necessary.
2. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

3. **ALS:** Initiate monitoring and perform 12-lead ECG.

4. **ALS:** Establish IV access.

5. Check blood glucose and treat if needed.

6. **ALS**: Evaluate the tachycardia and assess for patient stability.

   a. Assess for hemodynamic stability
   b. Assess narrow (QRS < 0.12 second) or wide (QRS ≥ 0.12 second)
   c. Assess regular or irregular rhythm

7. Apply defibrillation pads in the Anterior-Posterior position.

8. Consider the following additional therapies if tachycardia with signs and symptoms or hemodynamic instability continues:

   a. Regular Narrow Complex Tachycardia – Stable (SVT)
   i. Perform vagal maneuvers
   ii. Adenosine 6 mg IV (proximal site) followed by 10 mL fluid bolus using 3-way stopcock
   - If tachycardia continues, give adenosine 12 mg IV
   - A third dose of adenosine, 12 mg IV, can be given

   b. Regular Narrow Complex Tachycardia – Unstable
   i. Deliver synchronized shock of 100J, then 150 J, then 200 J per Synchronized Cardioversion Procedure
   ii. For responsive patients, consider analgesia per Pain Management Protocol

   c. Irregular Narrow Complex Tachycardia – Stable (atrial fibrillation, atrial flutter, multifocal atrial tachycardia)
   i. Monitor hemodynamic status

   d. Irregular Narrow Complex Tachycardia – Unstable
   i. For atrial fibrillation or atrial flutter deliver a synchronized shock at 200 J per Synchronized Cardioversion Procedure
   ii. For responsive patients, consider analgesia per Pain Management Protocol

   e. Regular Wide Complex Tachycardia – Stable (ventricular tachycardia, supraventricular tachycardia, atrial flutter with aberrancy, accelerated idioventricular rhythms, pre-excited tachycardias with accessory pathways)
   i. Monitor and transport

   f. Regular Wide Complex Tachycardia – Unstable
   i. Deliver a synchronized shock of 100 J, 150 J, 200 J per Synchronized Cardioversion Procedure
   iii. For responsive patients, consider analgesia per Pain Management Protocol

g. Irregular Wide Complex Tachycardia – Stable (Atrial fibrillation with aberrancy, pre-excited A-fib (i.e., A-fib using an accessory pathway), multifocal atrial tachycardia (MAT) or polymorphic VT/Torsades de Pointes)

a. Monitor hemodynamic status, often become unstable.
b. For polymorphic ventricular tachycardia with a gradual change in amplitude and twisting of the QRS complexes across the isoelectric line on the ECG (Torsades de Pointes): Administer magnesium 2 grams slow IV push.

f. Irregular Wide Complex Tachycardia – Unstable

i. For polymorphic ventricular tachycardia, deliver an immediate unsynchronized defibrillation at 200 Joules
ii. For polymorphic ventricular tachycardia with a gradual change in amplitude and twisting of the QRS complexes across the isoelectric line on the ECG (Torsades de Pointes): Administer magnesium 2 grams slow IV push after immediate unsynchronized defibrillation at 200J.
iii. For responsive patients, consider analgesia per Pain Management Protocol prior to defibrillation.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Causes:
   a. Hypovolemia
   b. Hypoxia
   c. Hydrogen (acidosis)
   d. Myocardial infarction
   e. Hypokalemia/Hyperkalemia
   f. Hypoglycemia
   g. Hypothermia
   h. Toxins/Overdose
   i. Tamponade
   j. Tension pneumothorax
   k. Thrombus – central or peripheral
   l. Trauma
   m. Hyperthyroidism

2. Atrial fibrillation rarely requires cardioversion in the field. As it is difficult to determine the onset of this rhythm, the risk of stroke needs to be considered prior to cardioversion.

3. 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 in patients with pre-excitation Atrial fibrillation (e.g., Wolff-Parkinson-White Syndrome) because these medications 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.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult Tachycardia with a Pulse – BLS/ALS
	Section: Cardiovascular
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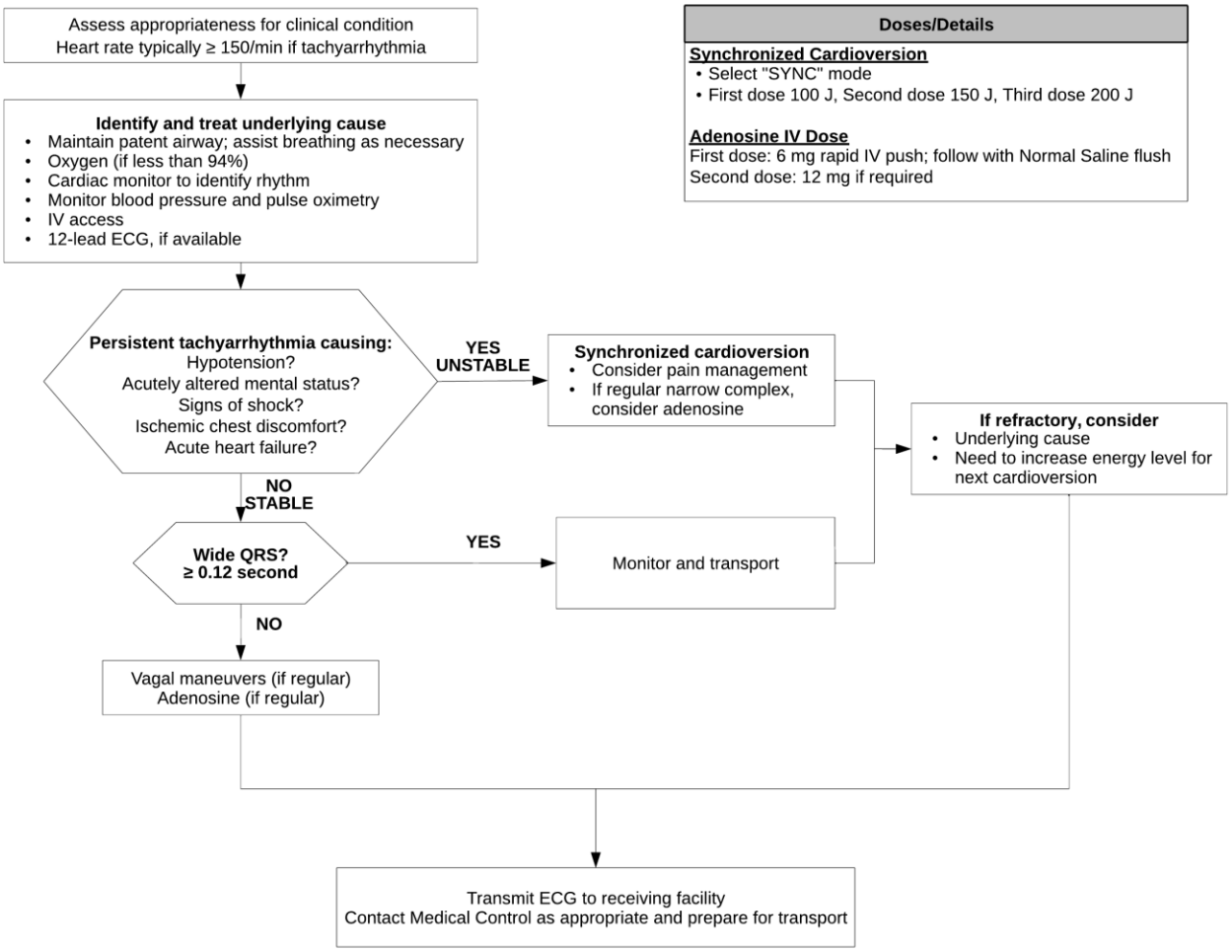
	Effective: June 1, 2026

ADULT TACHYCARDIA WITH A PULSE – BLS/ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Cardiac Arrest Management / ICCA – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

CARDIAC ARREST MANAGEMENT – BLS/ALS
Incident Command for Cardiac Arrest (ICCA)

I. PATIENT CARE GOALS

1. Return of spontaneous circulation (ROSC).
2. Preservation of neurologic function.
3. High-quality chest compressions/CPR with minimal interruption from recognition of cardiac arrest until confirmation of ROSC or field termination of care.

II. PATIENT PRESENTATION

Inclusion Criteria: Adult and pediatric patients in non-traumatic cardiac arrest

III. PATIENT MANAGEMENT

A. Code Tasks

1. Resuscitation must begin and continue where patient is encountered
2. Provide high quality, uninterrupted chest compressions
3. Provide early defibrillation for shockable rhythms
4. Provide controlled ventilatory management
5. Obtain IV or IO access and advanced cardiac medication delivery
6. Monitor End Tidal CO2 for CPR quality and ROSC

B. Equipment

1. BLS:

a. Automated external defibrillator (AED)
b. Adult and pediatric AED pads
c. Bag Valve Mask (Adult and Pediatric BVM) with adult, child, infant, and neonatal masks
d. Supraglottic Airway (I-gel)
e. Oxygen

2. ALS:

a. Manual monitor/defibrillator
b. Adult and pediatric defibrillator pads
c. End Tidal CO2 monitoring equipment
d. Bag Valve Mask (Adult and Pediatric BVM) with adult, child, infant, and neonatal masks

e. Advanced airway (I-gel or endotracheal tube)
f. Oxygen
g. IV/IO equipment
h. Advanced cardiac medications

C. Treatment and Interventions

1. Begin and continue the resuscitation of ADULT and PEDIATRIC patients where they are found.

a. Patients should only be moved for scene safety concerns or to improve CPR quality.
b. High quality resuscitation requires at least three EMS clinicians, thus additional resources should be called (an assist company or as per private EMS protocol).
c. Any delay in the initiation of resuscitation will decrease the patient's chance of survival.
d. The equipment listed above should be brought to the patient.

2. Initiate high-quality uninterrupted chest compressions.

a. The patient should be on a firm surface in the supine position.
b. Compress at a rate of 100-120 compressions per minute.
c. Use metronome set to the above rate when available.
d. Compression depth:
    i. Adults: At least 2 inches
    ii. Children: At least 1/3 the Anterior-Posterior (AP) diameter of the chest (usually 2 inches)
    iii. Infants: At least 1/3 the AP diameter of the chest (usually 1.5 inches)
e. Allow full recoil of the chest wall, avoid leaning on the chest between compressions.
f. Alternate EMS clinicians to avoid fatigue at least every two minutes.
g. Chest compressions should only be interrupted to analyze the cardiac rhythm and to deliver defibrillation. The total peri-shock pause (pre shock and post shock) should be less than 10 seconds.
h. For **pregnant patients** greater than 20 weeks gestation or with a visibly gravid abdomen:
    i. Position the patient in the supine position with a second clinician performing manual uterine displacement to the left to displace the gravid uterus to avoid aorto-caval compression and increase venous return.
    ii. 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.
i. **CPR Dashboard** displays CPR feedback indicators from pads
    i. Depth: chest compression depth
    ii. Rate: compression rate
    iii. Release: compressors ability to fully lift hands off sternum during the upstroke of compression
    iv. PPI (Performance Perfusion Indicator): combined rate and depth of chest compressions

3. Attach cardiac monitor and assess rhythm.

a. Defibrillate if ventricular fibrillation or pulseless ventricular tachycardia (or if AED advises shock).
    i. Adult: Defibrillate per manufacturer recommendations of Joules dosing
    - Zoll: 200 Joules, then 200 Joules, then 200 Joules

- Stryker: 200 Joules, then 300 Joules, then 360 Joules

ii. Pediatric: 2 J/kg then 4 J/kg for all subsequent defibrillations

b. Defibrillation should be carried out as soon as possible, ideally within one minute of monitor application. Early defibrillation is associated with increased survival from cardiac arrest.
c. Immediately resume CPR after each defibrillation.
d. If care is initiated with an AED, transition to a manual defibrillator with ETCO2 monitoring and pediatric feedback capability as soon as possible.
e. Adult patients should have the Zoll Adult CPR Stat Padz in the Anterior-Posterior position applied for both the AED and cardiac monitor.
f. Pediatric defibrillation pad utilization:
    i. Manual defibrillator: Utilize correct pad size as labeled by manufacturer based on patient age/weight. Pads should be positioned without touching. In small children and infants pediatric pads are necessary to achieve this goal. Use the pediatric feedback pads (One Step Pediatric CPR Padz).
    ii. Automated External Defibrillator: For children and infants less than 8 years of age or 25 kg (55 lbs.) use pediatric attenuator pads. (Zoll Pedi-padz)

4. Initiate BASIC AIRWAY management with bag valve mask ventilation.

a. Use appropriately sized BVM:
    i. Adult size bag (1200 ml reservoir): Patients > 40 kg
    ii. Pediatric size bag (600 ml reservoir): Patients < 40 kg
b. Ensure proper seal with appropriately sized adult, child, infant or neonatal mask.
c. Deliver ventilations at the correct rate avoiding hyperventilation.
    i. Adults: 10 breaths per minute (1 breath every 6 seconds)
    ii. Children: 15 to 2 compression to ventilation cycle
    iii. Infants: 15 to 2 compression to ventilation cycle
d. Assess breath sounds and chest wall rise to ensure adequate ventilation.

5. Ensure TWO MINUTE CPR cycles.

a. The code commander is responsible for tracking the timing of CPR cycles.
b. The rhythm should be analyzed, and pulse checked **EVERY TWO MINUTES**.
c. Delays in rhythm analysis and defibrillation decrease the chance of successful defibrillation.
d. The defibrillator should be pre-charged prior to the two-minute rhythm check to allow for a single pause for rhythm analysis and defibrillation.
e. Chest compressors should switch at this two-minute interval while the rhythm is being assessed.
f. <u>The total peri-shock pause (pre shock and post shock) should be less than 10 seconds.</u>

6. Obtain IV/IO access and administer advanced cardiac medications.

a. Attempt IV access. If unable to obtain IV access place an IO.
b. Administer Epinephrine (adult and pediatric) as soon as possible during the resuscitation.
    i. For patients with non-shockable rhythms prioritize early administration of epinephrine within 5 minutes from the start of chest compressions.
    ii. For patients with shockable rhythms administer epinephrine after the second defibrillation (usually within 5 minutes from the start of CPR).
    iii. <u>Administer repeat doses of epinephrine every 5 minutes after the first dose</u>.

- Adults: 1 mg IV/IO
- Pediatrics: 0.01 mg/kg IV/IO

c. Administer antiarrhythmic drugs (adult and pediatric) for patients with refractory shockable rhythms.
   i. Administer **first dose** of Amiodarone after 3rd defibrillation
      - Adults: 300 mg IV/IO
      - Pediatrics: 5 mg/kg IV/IO
   ii. If the patient remains in a shockable rhythm administer **second dose** of Amiodarone after 4th defibrillation.
      - Adults: 150 mg IV/IO
      - Pediatrics: 5 mg/kg IV/IO
   iii. For pediatric patients that remain in a shockable rhythm after two 5 mg/kg doses of Amiodarone, a third 5 mg/kg dose may be administered after the next defibrillation for a total dose of 15 mg/kg (max total dose 450 mg).

7. Place an Advanced Airway.

a. Place a supraglottic airway (I-gel). Supraglottic airways are the preferred advanced airway in cardiac arrest.
b. For Infants and children, bag mask ventilation is an acceptable alternative to the supraglottic airway.
c. Endotracheal intubation may be performed as a backup airway if unable to ventilate/oxygenate with the supraglottic airway or bag mask ventilation.
d. Do not interrupt chest compressions during the placement of an advanced airway.
e. Deliver ventilations with an advanced airway at the correct rate avoiding hyperventilation.
   i. Adults: 10 breaths per minute (1 breath every 6 seconds)
   ii. Children: 12 breaths per minute (1 breath every 5 seconds)
   iii. Infants: 20 breaths per minute (1 breath every 3 seconds)

8. Apply End Tidal CO2 and monitor waveform and numerical value to assess:

a. Correct advanced airway position
   i. Presence of normal capnography waveform.
   ii. Corresponding ETCO2 numerical value.
b. Quality of CPR
   i. Goal ETCO2 greater than 10 mmHg. A lower value indicates poor quality CPR.
   ii. Ideally high-quality chest compression should have a value above 20 mmHg.
c. Return of Spontaneous Circulation (ROSC)
   i. A sudden increase in ETCO2 to near normal values (35-45 mmHg) may indicate ROSC.
   ii. An increase of 10 mmHg above baseline value may also indicate ROSC.

9. Contact online medical control from the scene (BEFORE MOVING THE PATIENT) to discuss the following options:

a. **Transport** of adult patients **with ROSC** to the closest STEMI Center (see Adult and Pediatric Post-ROSC Care Protocol). Pediatric patients with ROSC should be transported to the closest EDAP or PCCC hospital. Our goal is to transport only after ROSC is achieved. Transport of patients without ROSC should only be undertaken after consultation with online medical control.

b. **Continue field resuscitation** for a defined period/task achievement and re-contact medical control.
c. **Transport patient with ongoing resuscitation** to the closest STEMI Center. This may be appropriate for patients with prolonged field resuscitation with refractory shockable rhythms. Transport should only be undertaken after consultation with online medical control.
d. **Termination of resuscitative efforts** (see Termination of Resuscitation Policy).
    i. Field termination of resuscitation does not apply to pediatric patients.
e. For **pregnant patients** greater than 20 weeks gestation or with a visibly gravid abdomen:
    i. Complete the following resuscitation tasks on scene: High quality CPR, defibrillation when indicated, IV or IO access with advanced cardiac medication administration and advanced airway placement with ETCO2 monitoring.
    ii. Contact online medical control after code tasks are completed to plan for hospital transport with ongoing resuscitation.
    iii. These patients should be rapidly transported to the closest STEMI Center that is also a Level III Perinatal hospital.

10. Cardiac Arrest Patient Transport

a. ADULT: If decision is made to transport the destination MUST BE A STEMI CENTER.
b. PEDIATRIC: Must be transported to the closest EDAP or PCCC hospital.
c. OBSTETRIC PATIENT: Greater than 20 weeks gestation should be rapidly transported to a Level III Perinatal Center
d. VAD (ventricular assist device) patients must be transported to a VAD Center.

11. Mandatory Documentation

a. “Cardiac Arrest” should be listed for paramedic impression for all non-traumatic cardiac arrest patients.
b. All information from the beginning of EMS care through the end of the event must be documented in an electronic patient care report (ePCR), including all procedures performed and medications administered. Note: Procedures performed, and medications administered must be documented in the appropriate section of the PCR and not only the narrative section. For EMS agencies where multiple transport and non-transport apparatus are on scene, EMS clinicians on each responding apparatus must document all care they performed.
c. All mandatory cardiac arrest questions in the ePCR must be completed before the record is closed.
d. End-Tidal CO2 number and waveform should be documented in the patient care report.
e. For all Chicago Fire Department cardiac arrest cases the full event should be uploaded to Zoll Online RescueNet and attached to the PCR.
    i. Enter Case Push Menu
    ii. Select close case
    iii. Select case
    iv. Transfer case

IV. NOTES/EDUCATIONAL PEARLS

A. ICCA ROLES AND RESPONSIBILITIES

Cardiac arrest is a shared ALS and BLS response. Successful resuscitation requires a coordinated effort. Upon arrival, resuscitation roles should be clearly delegated by the lead paramedic or most experienced EMS clinician on scene, so that primary **code tasks** are carried out quickly and efficiently.

1. **Code Commander**
   - Lead paramedic or most experienced EMS clinician on scene
   - Oversees all operations
   - Responsible for timing of CPR cycles and defibrillation
   - Requests additional resources
   - Completes and/or delegates **code tasks**
   - Communicates with OLMC

2. **Compressor-1**
   - Performs high quality uninterrupted chest compressions
   - Assumes the role of Compressor 2 role after each cycle

3. **Compressor-2**
   - Monitors the effectiveness of Compressor-1 compressions (by monitoring the ETCO2 for compression quality feedback)
   - Assists with seal during bag valve mask ventilation
   - Relieves Compressor-1 after two minutes or when compression quality decreases

4. **Procedures (may include code commander and other paramedic level clinicians on scene)**
   - Apply cardiac monitor and analyze rhythm
   - Defibrillate every two minutes
   - Obtain IV/IO access
   - Administer medications as per Ventricular Fibrillation / Pulseless Ventricular Tachycardia Protocol - ALS and Pulseless Electrical Activity / Asystole Protocol - ALS.
   - Basic and advanced airway management
   - Apply and monitor End Tidal CO2

5. **Logistics**
   - Oversee distribution of equipment
   - Set up IV/IO equipment
   - Assemble medications/assist with medication delivery
   - Prepares for transport
   - Relief for other tasks

6. **Liaison/Safety**
   - Control the scene and provide for the safety of the resuscitation team
   - Data collection and documentation: patient demographics, medications, medical history, events
   - Communicates and assists with family and bystanders

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pulseless Electrical Activity / Asystole - ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PULSELESS ELECTRICAL ACTIVITY / ASYSTOLE - ALS

Confirm unresponsiveness and check CABs
If pulseless begin CPR and ICCA

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Cardiac monitor

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Identify rhythm
(confirm asystole or PEA)
Reassess rhythm every 2 minutes

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Establish vascular access IV/IO

↓

Epinephrine 1 mg (1 mg/10ml prefilled syringe) IV/IO
Repeat every 5 min

↓

Establish advanced airway
Apply capnography*

↓

Consider cause and initiate specific treatment
(see chart)

↓

Contact Medical Control from scene

For patients with ROSC, see Adult and Pediatric Post-ROSC Care Protocol – ALS

REVERSIBLE CAUSES	SPECIFIC EMS TREATMENT
Hypovolemia	Normal saline bolus
Hypoxia	Check placement of advanced airway, ensure oxygenation and ventilation
Hydrogen ion (acidosis)	None
Hyperkalemia	**Calcium Chloride, 10%, 10 ml (1 gram), IV/IO** **Sodium Bicarbonate, 8.4%, 50 ml (50 mEq), IV/IO**
Hypothermia	None
Tension pneumothorax	Pleural (needle) decompression
Tamponade, cardiac	None
Toxins	For suspected opioid overdose, consider **Naloxone 2 mg IV/IO** For suspected tricyclic antidepressant overdose, consider **Sodium Bicarbonate, 8.4%, 50 ml (50 mEq), IV/IO**
Thrombosis, pulmonary	None
Thrombosis, coronary	None

*** If $ETCO_2$ < 10 mmHg, attempt to improve CPR quality**

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Stroke – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: November 6, 2024

STROKE – BLS/ALS

I. PATIENT CARE GOALS

1. Detect neurological deficits.
2. Determine eligibility for transport to a Stroke Center.
3. Identify patients who have potentially sustained a severe stroke that may involve a large vessel occlusion (LVO) and transport to a Thrombectomy Stroke Center (TSC) or Comprehensive Stroke Center (CSC).

II. PATIENT PRESENTATION

A. Neurologic deficit such as facial droop, localized weakness, gait disturbance, slurred speech, altered mentation, sudden onset of dizziness/vertigo

B. Hemiparesis or hemiplegia

C. Gaze preference

D. Severe headache, neck pain/stiffness, double vision or complete persistent visual loss

III. PATIENT MANAGEMENT

A. Assessment

1. Screen for a stroke using the **Cincinnati Prehospital Stroke Scale (CPSS):**

Facial Droop - Have patient show teeth or smile
- Normal = Both sides of the face move equally
- Abnormal = One side of the face does not move at all

Arm Drift - Have patient close eyes and hold arms out for 10 seconds with palms up
- Normal = Both arms move equally or not at all
- Abnormal = One arm drifts compared to the other

Speech - Have patient say, “You can’t teach an old dog new tricks”
- Normal = Patient uses correct words with no slurring
- Abnormal = Slurred or inappropriate words or mute

For a patient with a suspected stroke and an abnormal CPSS, or if unable to obtain a CPSS, assess stroke severity with 3-Item Stroke Scale.

2. Evaluate stroke severity using the **3-Item Stroke Scale (3I-SS):**

   The 3I-SS is scored 0-6. Assign a score from 0 to 2 for each of the three parts of the assessment. Add each section for the total score.

   Level of Consciousness (AVPU)
   0 = Alert
   1 = Arousable to voice only
   2 = Arousable to noxious stimuli only, or unresponsive

   Gaze Preference
   0 = Normal eye movements
   1 = Prefers to look to one side, but can move eyes to both sides
   2 = Eyes are fixed in one direction

   Motor Function
   0 = Normal strength in arms and legs
   1 = Can lift arm or leg, but cannot hold arm/leg up for 10 seconds
   2 = None or minimal movement of arm or leg

3. Pertinent historical data includes:

   a. History – "last known well" and source of that information
   b. Baseline neurologic status assessment
   c. Assess if the patient is taking warfarin or any anticoagulant medication
   d. History of recent trauma
   e. History of recent seizure
   f. History of recent surgery
   g. History of recent hemorrhage (e.g., GI bleed)

4. Evaluate for the presence of potential stroke mimics including:

   a. Hypoglycemia
   b. Seizure
   c. Sepsis
   d. Migraine
   e. Intoxication

B. Treatment and Interventions

1. Determine "last known well" time.

2. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

3. If seizure activity present, treat per Seizure Protocol.

4. Check blood glucose level and treat hypoglycemia per protocol if glucose less than 60 mg/dL.

5. If ALS, apply cardiac monitor and obtain 12-lead ECG.

6. Contact Online Medical Control and provide notification of stroke patient arrival.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Transport and destination decisions should be based on the Stroke System of Care. Destination hospitals include:

    a. Primary Stroke Center (PSC)
    b. Thrombectomy Stroke Center (TSC)
    c. Comprehensive Stroke Center (CSC)

2. Time of onset of stroke or last known well is critical data for patient treatment and transport decision.

3. Obtain contact information of family or bystander with patient to provide stroke center team information on baseline and last known well time.

4. Do not treat hypertension.

5. Pediatrics

    a. Although rare, pediatric patients can have strokes.
    b. Signs and symptoms of acute stroke in children are similar to those in adults.
    c. The most common symptoms include hemiparesis and facial droop, speech or language disturbance, vision disturbance, and ataxia.
    d. Children may also present with non-localizing symptoms such as headache, altered mental status, or seizure.
    e. Newborn infants have the highest risk and often present with focal motor seizures.
    f. Follow appropriate pediatric treatment protocols.
    g. Stroke scales are not validated for pediatric patients.
    h. Contact Online Medical Control.
    i. Transport suspected Pediatric Stroke patients to a Pediatric Critical Care Center (PCCC) per Pediatric Patient Destination Policy.

B. Key Documentation Elements

1. “Last known well” must be specific.

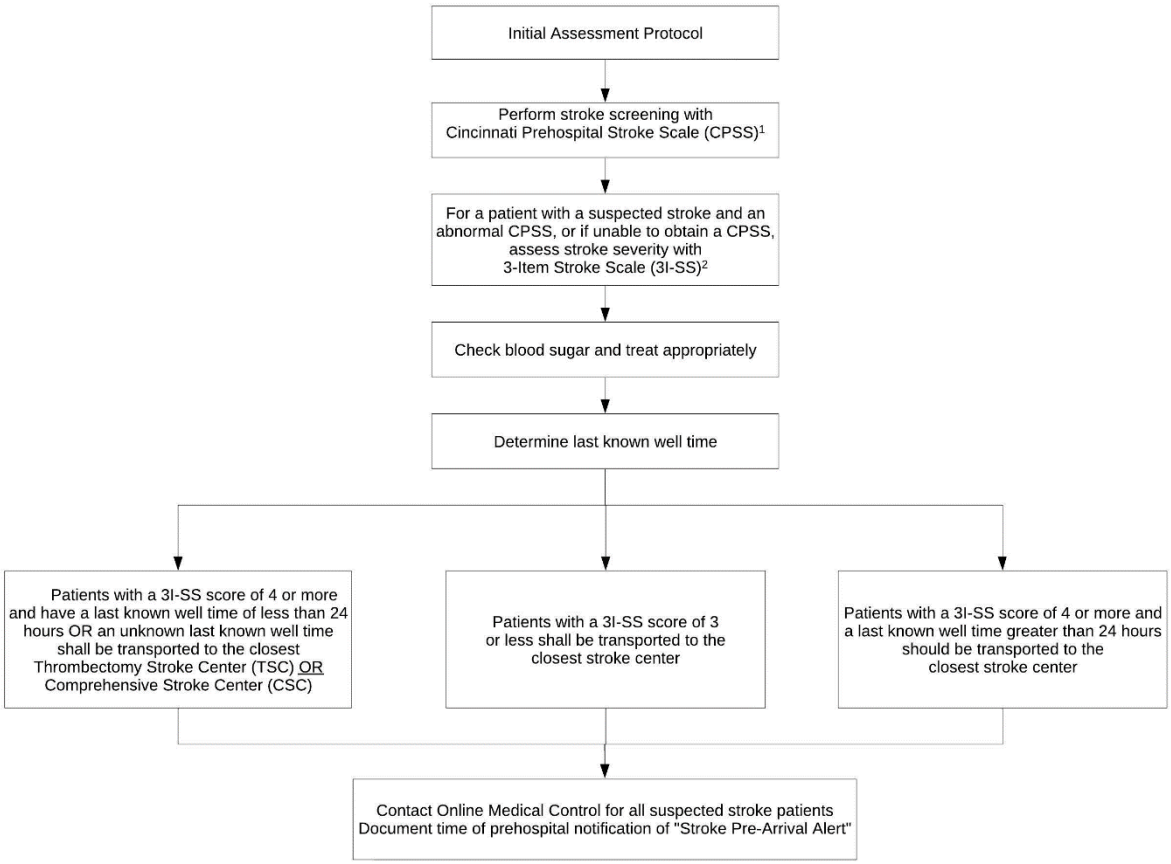
a. If the patient was last known well prior to bedtime the night before, this is the time to be documented (not time the patient woke up with symptoms present).

2. Blood glucose results.

3. Specific stroke screen and scale used (CPSS and 3I-SS) along with the findings.

4. Time of “Stroke pre-arrival alert” notification to receiving hospital.

STROKE – BLS/ALS



1) Cincinnati Prehospital Stroke Scale (CPSS)
Positive CPSS = One or more of the following are abnormal:

1. Facial Droop
- Have patient show teeth or smile
- Abnormal = One side does not move as the other

2. Arm Drift
- Have patient close eyes and hold arms out for 10 seconds with palms up
- Abnormal = One arm does not move or drifts down

3. Abnormal Speech
- Have patient say, "You can't teach an old dog new tricks"
- Abnormal = Patient slurs word, uses wrong words or is unable to speak

2) 3-Item Stroke Scale (3I-SS)
The 3I-SS is scored 0-6. Assign a score from 0 to 2 for each of the three parts of the assessment. Add each section for the total score.

1. Level of Consciousness (AVPU)
0 = Alert
1 = Arousable to voice only
2 = Arousable to noxious stimuli only or unresponsive

2. Gaze Preference
0 = Normal eye movements
1 = Prefers to look to one side, but can move eyes to both sides
2 = Eyes are fixed in one direction

3. Motor Function
0 = Normal strength in arms and legs
1 = Can lift arm or leg, but cannot hold arm/leg up for 10 seconds
2 = None or minimal movement of arm or leg

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Syncope or Near Syncope – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

SYNCOPE OR NEAR SYNCOPE – BLS/ALS

I. PATIENT CARE GOALS

A. Stabilize and resuscitate when necessary.

B. Initiate monitoring and diagnostic procedures.

C. Transport for further evaluation.

II. PATIENT PRESENTATION

A. Syncope: **Both** the loss of consciousness and the loss of postural tone and resolves spontaneously without medical interventions. Syncope typically is abrupt in onset and resolves quickly. EMS clinicians may find the patient awake and alert on initial evaluation.

B. Near syncope: Defined as the prodromal symptoms of syncope. The symptoms that can precede syncope last for seconds to minutes with signs and symptoms that may include pallor, sweating, lightheadedness, visual changes, or weakness. It may be described by the patient as “nearly blacking out” or “nearly fainting”.

C. Rapid intervention during the onset may improve symptoms and prevent syncope.

III. INCLUSION CRITERIA

A. Abrupt loss of consciousness with loss of postural tone.

B. Prodromal symptoms of syncope.

IV. EXCLUSION CRITERIA

Conditions other than the above, including:

A. Patients with alternate and obvious cause of loss of consciousness (including trauma – see Head Injury Protocol).

B. Patients with ongoing mental status changes or coma should be treated per the Altered Mental Status Protocol.

C. Patients with persistent new neurologic deficit (see Stroke Protocol).

V. PATIENT MANAGEMENT

A. Assessment

1. Pertinent History

a. Review the patient's past medical history including a history of:
   i. Cardiovascular disease (e.g., cardiac disease/stroke, valvular disease, hypertrophic cardiomyopathy, mitral valve prolapse)
   ii. Seizure
   iii. Recent trauma
   iv. Active cancer diagnosis
   v. Dysrhythmias including prior electrophysiology studies/pacemaker and/or implantable cardioverter defibrillator (ICD)
   vi. History of syncope
   vii. History of blood clots

b. History of event, including:
   i. Conditions leading to the event: after transition from recumbent/sitting to standing; occurring with strenuous exercise (notably in the young and healthy).
      - Syncope that occurs during exercise often indicates a serious cardiac cause. Patients should be evaluated in the Emergency Department.
   ii. Patient complaints before or after the event including prodromal symptoms.
   iii. History of symptoms described by others on scene, including seizures or shaking, presence of pulse/breathing (if noted), duration of the event, events that lead to the resolution of the event.

c. Additional details:
   i. Current medications (new medications, changes in doses)
   ii. Fluid losses (nausea/vomiting/diarrhea) and fluid intake
   iii. Last menstrual period/pregnant
   iv. Occult blood loss (gastrointestinal (GI)/genitourinary (GU)
   v. Palpitations
   vi. Unilateral leg swelling, history of recent travel, prolonged immobilization, malignancy

d. Pertinent physical exam including:
   i. Attention to vital signs and evaluation for trauma
   ii. Note overall patient appearance, diaphoresis, pallor
   iii. Detailed neurologic exam (including stroke screening and mental status)
   iv. Heart, lung, abdominal, and extremity exam

2. Additional evaluation:
   a. Cardiac monitoring
   b. Oxygen saturation
   c. Ongoing vital signs
   d. 12-lead ECG
   e. Blood glucose level

B. Treatment and Interventions

1. Should be directed at abnormalities discovered in the physical exam or on additional examination and may include management of cardiac dysrhythmias, cardiac ischemia/infarct, hemorrhage, shock, etc.

a. Manage airway as indicated
b. Oxygen as appropriate
c. Evaluate for hemorrhage and treat for shock if indicated
d. Establish IV access
e. Fluid bolus if appropriate
f. Continuous cardiac monitor
g. 12-lead ECG
h. Monitor for and treat arrhythmias (if present, refer to appropriate Protocol)

C. Patient Safety Considerations

1. Patients with syncope due to arrhythmia may experience recurrent arrhythmias and should therefore be placed on a cardiac monitor.

2. Geriatric patients with falls from standing may sustain significant injury and should be diligently screened for trauma (see General Trauma Management Protocol).

VI. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. By being most proximate to the scene and to the patient's presentation, EMS clinicians are commonly in a unique position to identify the cause of syncope. Consideration of potential causes, ongoing monitoring of vitals and cardiac rhythm, and detailed exam and history are essential pieces of information to pass on to hospital teams.

2. High-risk causes of syncope include, but are not limited to, the following:

   a. Cardiovascular
      i. Myocardial infarction
      ii. Aortic stenosis
      iii. Hypertrophic cardiomyopathy (consider in young patient with unexplained syncope during exertion)
      iv. Pulmonary embolus
      v. Aortic dissection
      vi. Dysrhythmia
      vii. Mitral valve prolapse is associated with higher risk for sudden death

   b. Neurovascular
      i. Intracranial hemorrhage
      ii. Transient ischemic attack or stroke
      iii. Vertebral basilar insufficiency

   c. Hemorrhagic
      i. Ruptured ectopic pregnancy
      ii. GI bleed
      iii. Aortic rupture

3. High-risk 12-lead ECG features include, but are not limited to:

    a. Evidence of QT prolongation (generally over 500 msec)
    b. Delta waves
    c. Brugada syndrome (incomplete right bundle branch block (RBBB) pattern in V1/V2 with ST segment elevation)
    d. Hypertrophic obstructive cardiomyopathy

B. Pertinent Assessment Findings

1. 12-lead ECG findings
2. Evidence of alternate etiology, including seizure
3. Evidence of cardiac dysfunction (e.g., evidence of congestive heart failure (CHF), arrhythmia)
4. Evidence of hemorrhage
5. Evidence of neurologic compromise
6. Evidence of trauma
7. Initial and ongoing cardiac rhythm

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Ventricular Assist Device (VAD) - ALS
	Section: Cardiovascular
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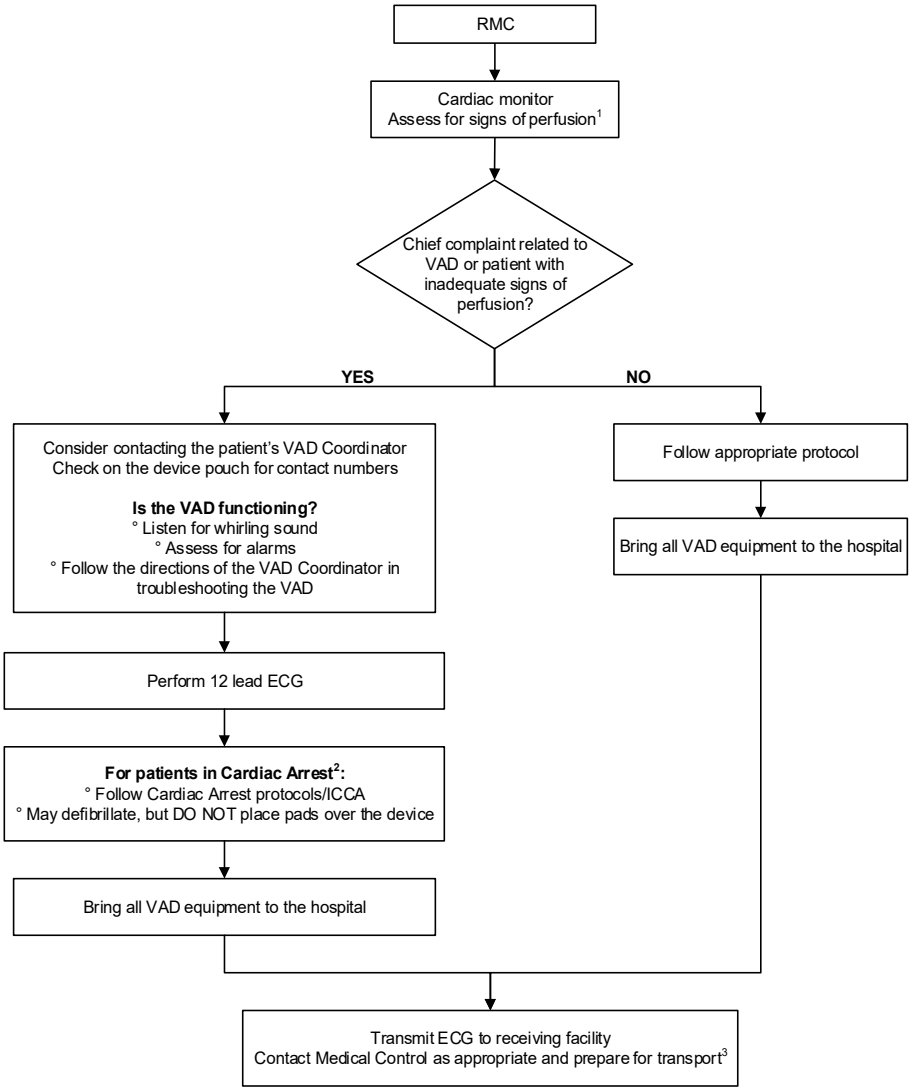
	Effective: January 18, 2019

VENTRICULAR ASSIST DEVICE (VAD) - ALS



1 – Patients with a Ventricular Assist Device (VAD) often do not have a peripheral pulse, O2 saturation, or a palpable blood pressure. Use other indicators of adequate perfusion such as mental status, skin color and condition, and respiratory rate and effort.
2 - Unresponsive and apneic with no signs of life
3 – Refer to Transport of Patients with a Ventricular Assist Device (VAD) policy

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Ventricular Fibrillation / Pulseless Ventricular Tachycardia - ALS
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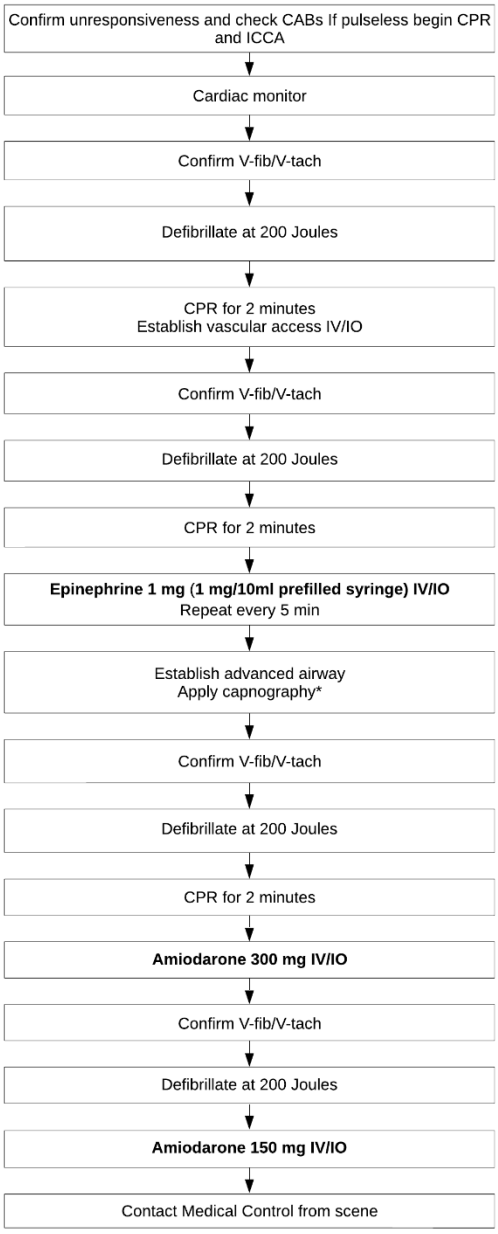
VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA – ALS



For patients with ROSC, see Adult and Pediatric Post-ROSC Care Protocol - ALS

* If $ETCO_2$ < 10 mmHg, attempt to improve CPR quality

REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

RESPIRATORY

Airway Management
Airway Obstruction
Bronchospasm
Pulmonary Edema

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Airway Management
	Section: Respiratory
	Approved: EMS Medical Directors Consortium
	Effective: December 15, 2021

AIRWAY MANAGEMENT

I. PATIENT CARE GOALS

1. Maintain a patent airway.

2. Provide effective oxygenation and ventilation using the least invasive method to achieve those goals.

3. Anticipate, recognize and alleviate respiratory distress.

4. Provide necessary interventions quickly and safely to patients with the need for respiratory support.

5. Identify and plan for a potentially difficult airway.

II. PATIENT MANAGEMENT

A. Assessment

1. History – Assess for:

   a. Time of onset of symptoms.
   b. Associated symptoms.
   c. History of asthma or other breathing disorders.
   d. Choking or other evidence of upper airway obstruction.
   e. History of trauma.
   f. Prior similar episodes, what has helped in the past, home interventions for symptoms.
   g. Severity of shortness of breath.

2. Physical Examination – Assess for:

   a. Abnormal respiratory pattern, rate and/or effort.
   b. Use of accessory muscles.
   c. Ability to speak words or sentences.
   d. Quality of air exchange, including depth of respiration and equality of breath sounds.
   e. Abnormal breath sounds (wheezing, rhonchi, rales, or stridor).
   f. Cough.
   g. Skin color (cyanosis or pallor), presence of diaphoresis.
   h. Mental status, including anxiety.
   i. Hypoxia.
   j. Airway obstruction with foreign body or swelling (angioedema, posterior pharyngeal and laryngeal infections).

k. Signs of a difficult airway (short jaw or limited jaw thrust or mobility, small thyromental space, upper airway obstruction, large tongue, obesity, large tonsils, large neck, craniofacial abnormalities, excessive facial hair, trismus).
l. Signs of fluid overload (jugular vein distention, peripheral edema)
m. Traumatic injuries impairing upper and lower airway physiology:
    i. Facial injuries
    ii. High spine injury (affecting phrenic nerve/intercostal muscles)
    iii. Neck injury (expanding hematoma, tracheal injury)
    iv. Chest wall injury (bruising, paradoxical chest motion, subcutaneous air)

B. Treatment and Interventions

1. The approach to airway management is to implement the interventions below in a stepwise fashion to meet the patient care goals above.

2. Monitoring should include continuous pulse oximetry and waveform capnography for assessment and guiding treatment.

3. Oxygen

    a. Administer oxygen as appropriate with a target of achieving over 94% saturation.
    b. Depending on patient presentation this may be accomplished with nasal cannula, simple face mask, non-rebreather mask, bag-valve mask (BVM), or continuous positive airway pressure (CPAP) (Oxygen Delivery Methods Procedure).

4. Open and maintain patent airway. If needed:

    a. Provide head tilt-chin lift or jaw thrust if concern for potential spinal injury.
    b. Suction airway.

5. Oropharyngeal Airways (OPA) and Nasopharyngeal Airways (NPA)

    a. Consider the addition of an OPA and/or NPA to make BVM ventilation more effective, especially in patients with altered mental status.

6. Bag-Valve Mask (BVM) ventilation

    a. Use bag-valve mask (BVM) ventilation in the setting of respiratory failure with inadequate oxygenation and/or ventilation (Bag-Valve Mask Ventilation Procedure – BLS/ALS).
    b. Two-person, two-thumbs-down BVM ventilation is more effective than one-person technique and should be used when additional providers are available.
    c. Apply continuous waveform capnography for monitoring (Capnography Procedure – ALS).
    d. Ventilation
        i. Tidal volume

1. Ventilate with just enough volume to see chest rise, approximately 6-8 mL/kg ideal body weight.
2. Over-inflation or hyperventilation can have negative effects on patient outcome.

ii. Rate
1. Adult: 10 breaths/minute
2. Child: 20 breaths/minute
3. Infant: 30 breaths/minute

iii. Monitor $ETCO_2$ to maintain goal of 35-45 mmHg.

7. Non-Invasive Ventilation (NIV) - CPAP

a. For severe respiratory distress or impending respiratory failure, consider continuous positive airway pressure (CPAP Procedure - ALS).

8. Supraglottic Airway (SGA) – I-gel

a. Consider the use of an SGA if BVM is not effective in maintaining oxygenation and/or ventilation (I-gel Supraglottic Airway Procedure – BLS/ALS).
b. SGA is the preferred airway in cardiac arrest.

9. Endotracheal Intubation

a. When less-invasive methods (BVM, SGA placement) are ineffective, use endotracheal intubation to maintain oxygenation and/or ventilation (Endotracheal Intubation Procedure - ALS).
b. Other indications may include severe inhalation burns or airway obstruction.

10. Post-advanced airway management

a. Confirm placement of advanced airway (endotracheal tube or SGA) with waveform capnography, absent gastric sounds, and bilateral breath sounds (Capnography Procedure – ALS).
b. Monitor clinical signs, pulse oximetry, cardiac rhythm, blood pressure, and waveform capnography.

11. Gastric decompression may improve oxygenation and ventilation; when there is obvious gastric distention insert a suction catheter through the gastric channel on the SGA.

12. When patients cannot be oxygenated or ventilated effectively using the above interventions, transport to the closest appropriate hospital for airway stabilization.

C. Patient Safety Considerations

1. When less invasive methods do not meet patient care goals, endotracheal intubation can be used. Document all airway management methods and clinical response.

2. Once a successful SGA placement or intubation has been performed, obstruction or displacement of the tube can have negative effects on patient outcome.

    a. Continuously monitor the end-tidal CO2 and adjust tube placement as needed to maintain a good waveform.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Pediatric airway management should include bag-valve mask ventilation or supraglottic airway and only be escalated to endotracheal intubation if those methods are ineffective to maintain oxygenation and ventilation.

2. Bag-valve mask (BVM)

    a. Appropriately sized masks should completely cover the nose and mouth and maintain an effective seal around the cheeks and chin.
    b. Ventilation should be delivered with only sufficient volume to achieve chest rise.

3. Endotracheal intubation

    a. In addition to preoxygenation, apneic oxygenation (high-flow oxygen by nasal cannula) may prolong the period before hypoxia during an intubation attempt.
    b. Adequate preoxygenation can avoid peri-intubation hypoxia and subsequent cardiac arrest.
    c. Positive pressure ventilation after intubation can decrease preload and subsequently lead to hypotension - consider IV fluid bolus for hypotension.

B. Pertinent Assessment Findings

1. Ongoing assessment and monitoring with continuous waveform capnography is critical when an airway device is in place.

2. Acute worsening of respiratory status or evidence of hypoxemia can be secondary to displacement or obstruction of the airway device, pneumothorax or equipment failure.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Airway Obstruction
	Section: Respiratory
	Approved: EMS Medical Directors Consortium
	Effective: December 15, 2021

AIRWAY OBSTRUCTION

I. PATIENT CARE GOALS

1. Provide effective oxygenation and ventilation.
2. Recognize airway obstruction due to a foreign body.
3. Provide necessary interventions to quickly and safely manage the airway obstruction.

II. PATIENT MANAGEMENT

A. Assessment

1. History – Assess for:
   a. Time of onset of symptoms.
   b. Associated symptoms.
   c. Choking or other evidence of upper airway obstruction.
2. Physical Examination – Assess for:
   a. Abnormal respiratory pattern, rate and/or effort.
   b. Use of accessory muscles.
   c. Ability to speak words or sentences.
   d. Quality of air exchange, including depth of respiration and equality of breath sounds.
   e. Abnormal breath sounds (wheezing, rhonchi, rales, or stridor).
   f. Cough.
   g. Skin color (cyanosis or pallor), presence of diaphoresis.
   h. Mental status, including anxiety.
   i. Hypoxia.

B. Treatment and Interventions

1. **Partial Obstruction**
   a. Good Air Exchange: The patient is responsive and can cough forcefully although frequently there is wheezing between coughs. Encourage patient to continue spontaneous coughing and breathing efforts.
   b. Do not interfere with the patient's own attempts to relieve the obstruction.

2. **Complete Obstruction**

   a. Poor or No Air Exchange: The patient may have a weak or ineffective cough, high-pitched noise while inhaling, increased respiratory difficulty, cyanosis, clutching the throat, unable to speak or cry.

   b. Responsive patients
      i. Infants (less than 1 year old) should receive a sequence of 5 back blows and 5 chest thrusts until the object is removed or the patient becomes unresponsive.
      ii. Children and adults should receive abdominal thrusts until the object is removed or the patient becomes unresponsive.
      iii. For pregnant or obese patients, perform chest thrusts to the lower half of the sternum until the object is removed or the patient becomes unresponsive.

   c. Unresponsive patients
      i. Begin CPR starting with chest compressions at a rate of 30 compressions to 2 breaths.
      ii. Before delivering breaths, look in the mouth. If there is an object visualized, remove it if possible.
      iii. Advanced airway obstruction interventions (ALS):
         1. If there is no chest rise during ventilation attempts and no obvious foreign body is seen in the mouth, use the laryngoscope to visualize the upper airway. If a foreign body is visualized above the vocal cords, remove it using the Magill forceps and suction.
         2. If no upper airway foreign body is identified under direct visualization with the laryngoscope and ventilations are ineffective, there may be a tracheal foreign body below the vocal cords.
         3. Perform endotracheal intubation and re-attempt ventilation.

C. Patient Safety Considerations

1. Avoid blind finger sweeps.

2. Avoid abdominal thrusts in infants.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Patients with airway obstruction may initially be responsive when encountered by EMS and then become unresponsive. In this circumstance EMS will know that airway obstruction is the cause of the patient's symptoms.

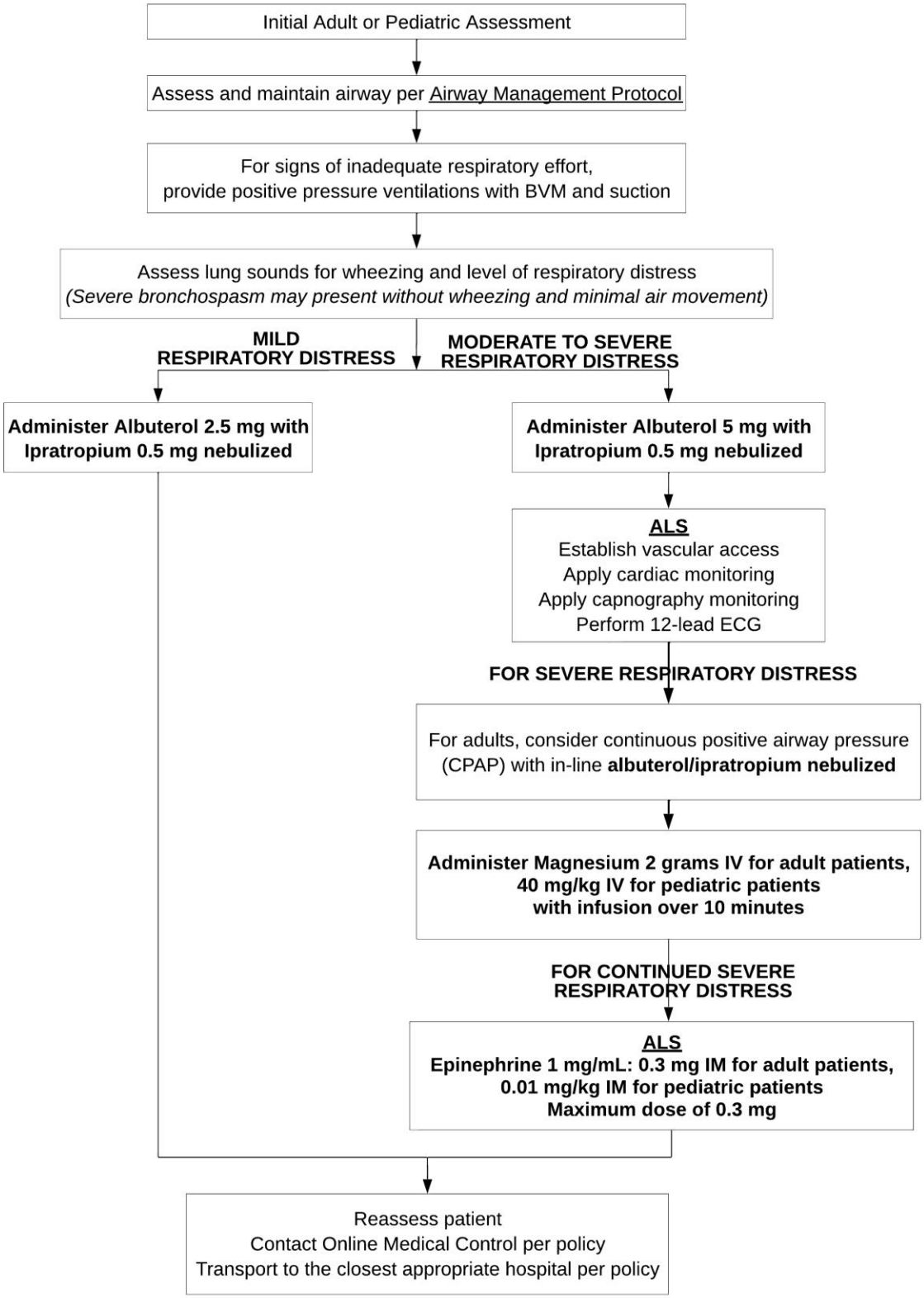
2. Patients with airway obstruction may be unresponsive when initially encountered by EMS. In this circumstance EMS will probably not know that the patient has airway obstruction until repeated attempts at ventilation are unsuccessful.

B. Pertinent Assessment Findings

1. Ongoing assessment of the airway obstruction and if the patient is responsive or unresponsive is critical.

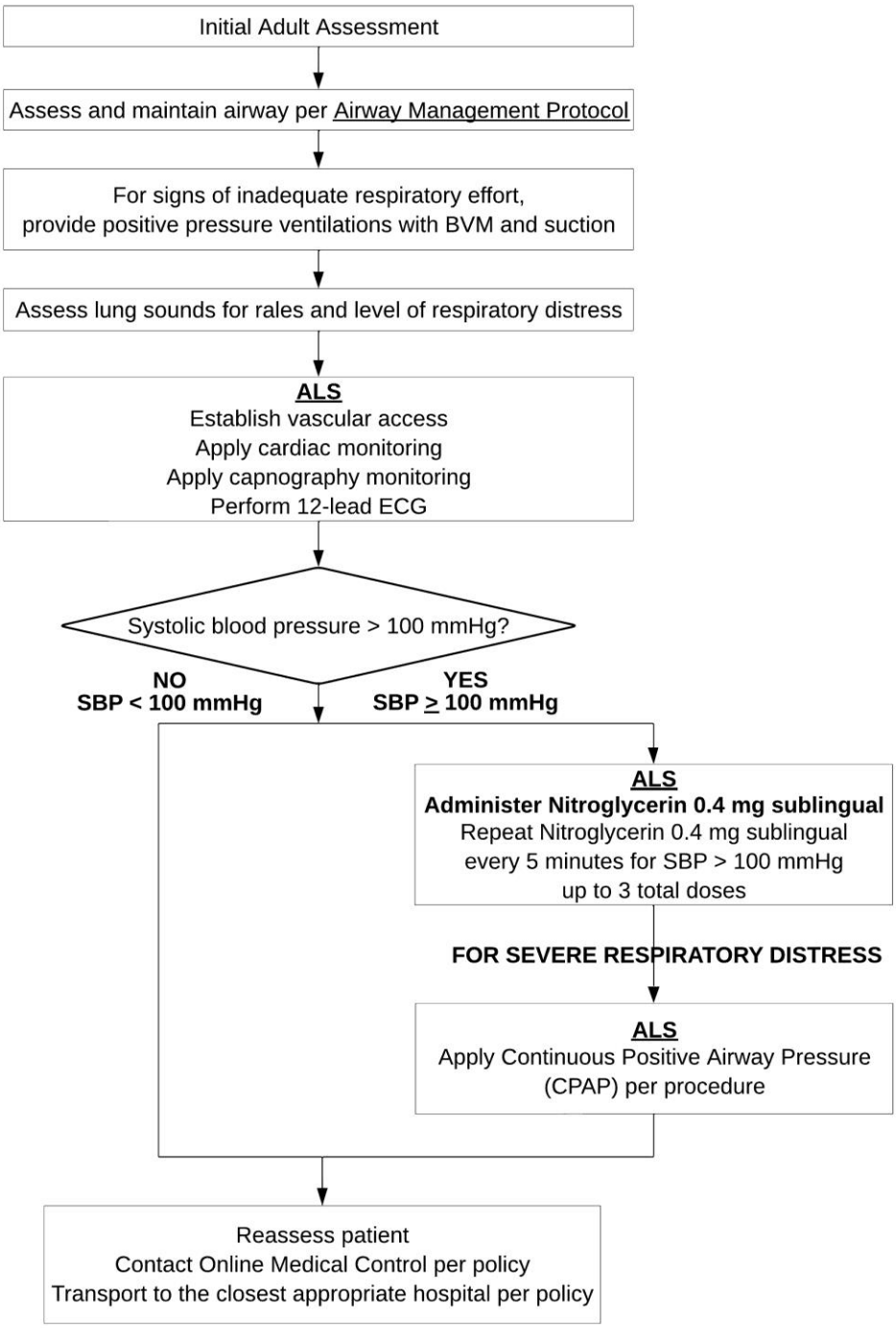
REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Bronchospasm – BLS/ALS
	Section: Respiratory
	Approved: EMS Medical Directors Consortium
	Effective: June 1, 2026

BRONCHOSPASM - BLS/ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pulmonary Edema – BLS/ALS
	Section: Respiratory
	Approved: EMS Medical Directors Consortium
	Effective: June 1, 2026

PULMONARY EDEMA - BLS/ALS



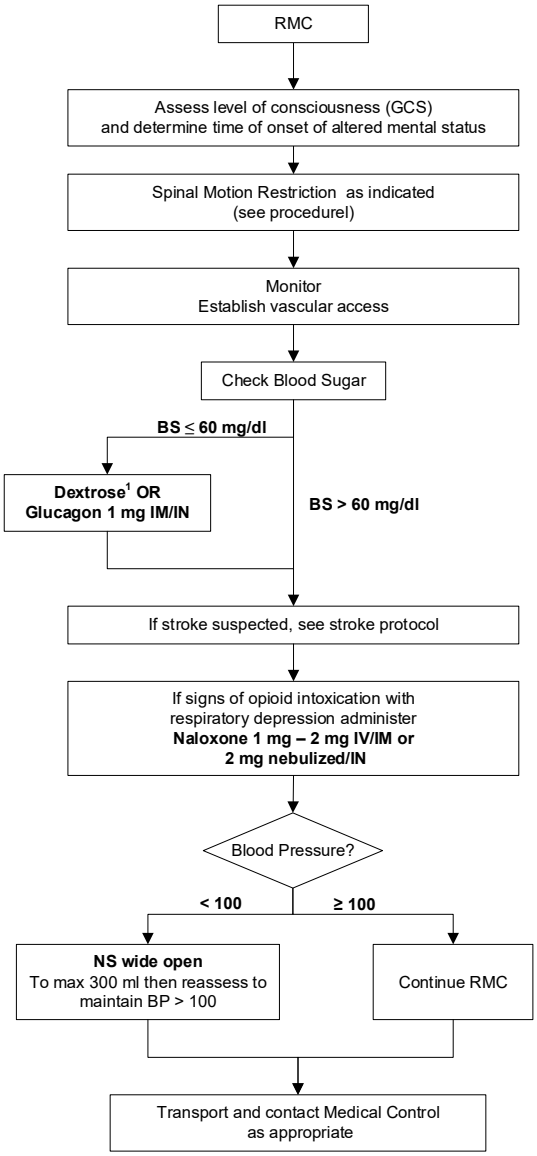
REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

MEDICAL

Altered Mental Status
Anaphylaxis and Allergic Reaction
Behavioral Emergency
COVID-19
Nausea & Vomiting
Pain Management
Renal Failure / Hyperkalemia
Seizures
Shock

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Altered Mental Status - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

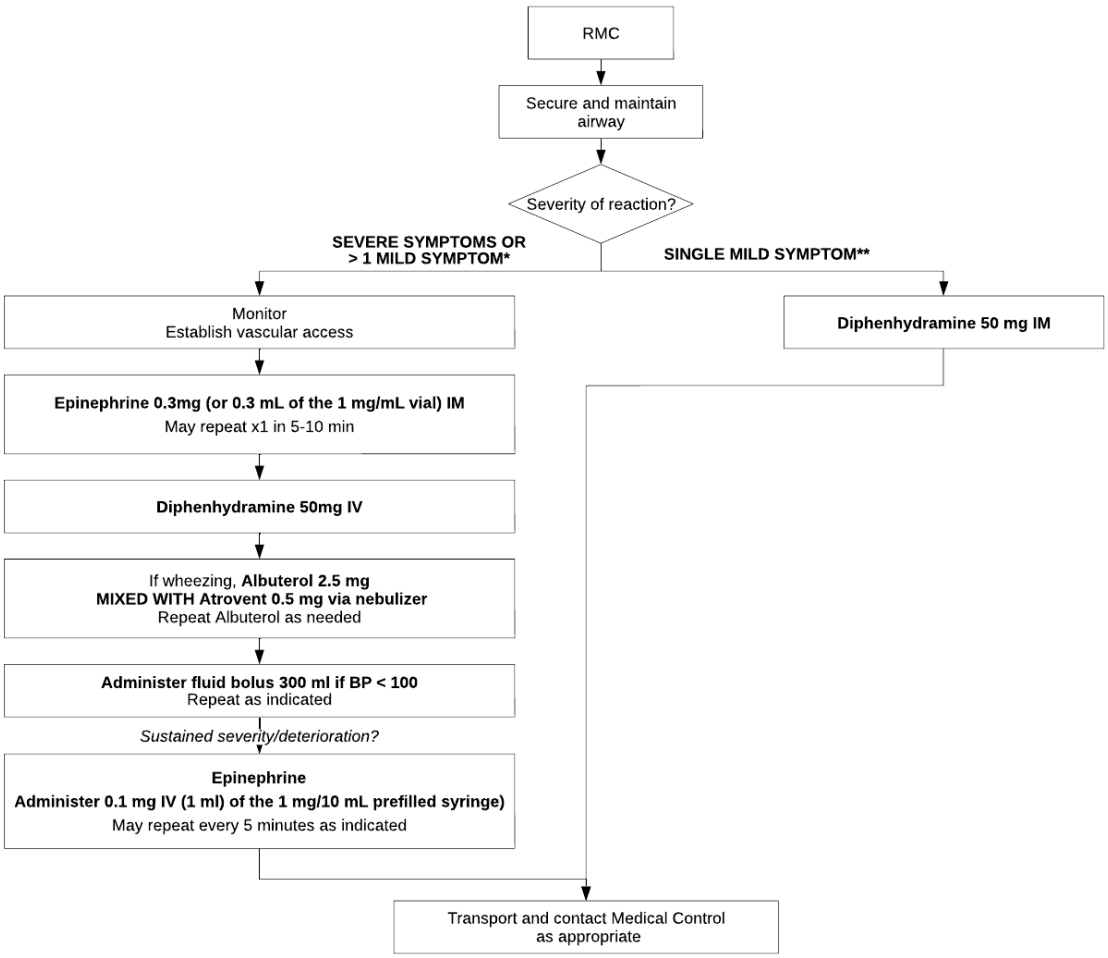
ALTERED MENTAL STATUS - ALS



1 - Dextrose 10% as 100ml boluses until mental status improves or BS > 60 to a maximum of 500ml

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Anaphylaxis and Allergic Reaction - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

ANAPHYLAXIS AND ALLERGIC REACTION - ALS



***Severe symptoms of an allergic reaction may include any combination of the following:**

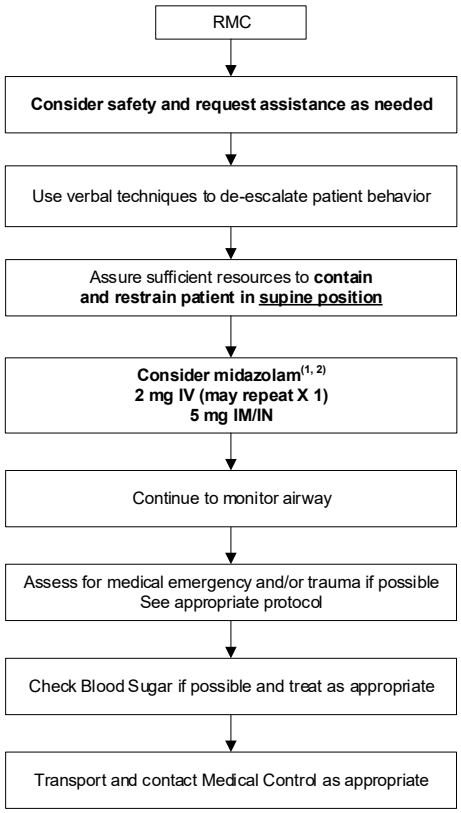
RESPIRATORY – Shortness of breath, wheezing, repetitive coughing
CARDIOVASCULAR – Pale, cyanotic, low blood pressure, dizzy
THROAT – Tightness, hoarse, trouble breathing/swallowing
MOUTH – Swelling of the tongue and/or lips
SKIN- Diffuse hives or redness
GI – Repetitive vomiting, severe diarrhea
NEURO – Anxiety, confusion, sense of doom

****Mild symptoms of an allergic reaction may include any combination of the following:**

NOSE – Itchy/runny nose, sneezing
MOUTH – Itching
SKIN- Few hives, mild itching
GI – Mild nausea/discomfort

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Behavioral Emergency - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

BEHAVIORAL EMERGENCY - ALS



1 – Despite the use of de-escalation techniques and physical restraints in which the patient remains extremely combative and physically dangerous to themselves and others and patient is < 60 years of age.
2 – If patient is > 60 years of age, contact Base Station for approval.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: COVID-19
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: April 3, 2020

COVID-19

I. PATIENT CARE GOALS

A. To identify the proper EMS assessment, treatment, and transport for patients at risk for COVID-19 infection within the Region 11 EMS System.

B. To follow current CDC, IDPH, and CDPH guidelines.

C. To minimize any possible exposure of COVID-19 to EMS providers, Emergency Department staff, or any other patients or family in the healthcare setting.

II. PATIENT MANAGEMENT

A. CASE IDENTIFICATION

1. COVID-19 identification is primarily based on fever and/or symptoms of acute respiratory illness (e.g. cough and difficulty breathing), but patients may also have other viral syndrome symptoms such as chills, myalgias (muscle aches), rhinorrhea (runny nose), sore throat, nausea, vomiting, headache, abdominal pain, and diarrhea. Atypical presentations with any of the above symptoms should be considered.

2. Higher risk patients for COVID-19 includes those with close contact with a COVID-19 positive patient, recent travel to areas with widespread COVID-19, living in close quarters, healthcare workers, chronic medical conditions or immunocompromised state.

3. Emergency Medical Dispatchers (OEMC) should screen calls for suspected COVID-19 and communicate to EMS prior to their arrival on scene to allow for use of proper PPE.

B. PPE GUIDELINES

1. EMS providers should apply proper PPE per CDC guidelines.

   a. **Surgical facemasks** are an acceptable alternative if N-95 or higher level respirators are in short supply.

   b. **Respirators/N-95s** should be prioritized for procedures that are likely to generate respiratory aerosols, which would pose the highest exposure risk to the healthcare provider.

   c. **Eye protection.** (i.e. goggles or disposable face shields that fully covers the front and side of face. Personal eyeglasses are not considered adequate eye protection).

d. **Gloves**. A single pair of disposable patient examination gloves that should be changed if torn or heavily contaminated.

e. **Isolation gown**. If there is a shortage of gowns it should be prioritized for aerosol generating procedures, care activities where splashes and sprays are anticipated and high contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothes of EMS providers (e.g. moving patient onto stretcher).

2. After patient handoff at the hospital, EMS providers should safely remove PPE to prevent contamination. Discard PPE in accordance with routine procedures and perform good hand hygiene.

C. SUSPECTED COVID-19 PATIENT ASSESSMENT

1. Initial Assessment

   a. EMS providers should exercise appropriate precautions when responding to a call with signs or symptoms of a respiratory infection and apply proper PPE before entering the scene.

   b. For patients with suspected COVID-19, EMS providers should avoid exposure of multiple personnel if possible.

   c. Initial assessment should begin at a distance of at least 6 feet from the patient and a facemask should be placed on the patient for source control.

   d. Patient contact should be minimized to the extent possible until a facemask is on the patient.

2. Patient Assessment

   a. Perform Adult or Pediatric Assessment
   b. Travel history
   c. COVID-19 exposure history
   d. Past medical history
   e. Vital signs
   f. Physical examination

3. Procedures

   a. **Aerosol-Generating Procedures should be to minimized to reduce virus transmission unless exhibiting signs of severe respiratory illness.**

   b. EMS providers should exercise caution when an aerosol-generating procedure is necessary, an N-95 or higher level respirator should be used by EMS providers performing aerosol-generating procedures including bag

valve mask (BVM) ventilation, oropharyngeal suctioning, nebulizer treatment, continuous positive airway pressure (CPAP) or resuscitation involving CPR.

c. If possible, Aerosol Generating Procedures should be done with the rear doors of the ambulance open and the HVAC system active or in a negative pressure room away from patient care areas.

d. At the hospital, nebulizers and CPAP should be temporarily discontinued between the ambulance and the patient room to minimize disease transmission.

e. BVMs and other ventilator equipment should be equipped with HEPA or other viral filter to filter expired air if available.

4. Treatment

a. **Oxygenation**

i. Maintain SpO2 > 90%.

ii. Nasal cannula with surgical mask over the cannula is the preferred method of oxygenation. May use higher than normal flow rates (up to 7 liters per minute) if needed to maintain desired oxygen saturation.

iii. If persistently hypoxic despite nasal cannula apply non-rebreather.

b. **Nebulization Therapy**

i. Restrict nebulizer treatments to patients who are exhibiting signs of severe respiratory distress.

ii. Metered dose inhaler (MDI) with a spacer, if available, is the preferred route for medication administration

1. Consider 4-6 puffs per dose of MDI with spacer, if available, may repeat every 5 minutes as needed.

2. Use of patient's MDI with spacer if available is preferred.

c. **Continuous Positive Airway Pressure (CPAP)** should be used with caution in suspected COVID-19 patients due to increased transmission risk.

d. **Endotracheal intubation** should be avoided in suspected COVID-19 patients due to increased transmission risk. Supraglottic airway placement should be performed for advanced airway management during

resuscitation.

e. **Epinephrine**: For patients with severe respiratory distress and wheezing, epinephrine IM can be used for rescue therapy.

5. Transportation of Suspected COVID-19 Patients

a. Transport to the closest appropriate Emergency Department.

b. Close door/window between driver and patient compartment.

c. During transport, vehicle ventilation in both compartments should be on non-circulated mode and rear exhaust fan on.

d. If a vehicle without an isolated patient compartment and ventilation must be used, open the outside air vents in the driver area and turn on the rear exhaust ventilation fans to create a negative patient gradient in the patient area.

e. Online Medical Control should be consulted for any questions regarding patient care and all refusals of transport.

f. Pre-notification to the receiving hospital is mandatory to allow for room and equipment preparation.

g. EMS must coordinate with receiving hospital staff prior to entering the hospital to minimize exposure.

h. Family members and contacts should not ride in the ambulance if possible, but should wear a mask if their presence is critical for patient care.

III. DOCUMENTATION

A. Document any patient with suspected COVID-19 in the narrative.

1. For CFD select “Suspected Case of Corona/COVID-19” on the Special Event/Situation tag under Incident.

B. Document all EMS and public safety providers involved in the care of a suspected COVID-19 patient, level of contact, and level of PPE worn during treatment for follow-up of testing results

C. Positive COVID-19 tests should be reported from the hospital to local health department. The hospital should notify the EMS Agency Designated Infection Control Officer to facilitate appropriate follow-up for agency personnel.

D. EMS Agencies should develop policies for assessing exposure risk and management

of EMS providers that are exposed to and that become infected with COVID-19.

III. CLEANING

A. After patient transport, leave the rear doors of the ambulance open to remove potentially infectious particles. The time to complete patient transfer, cleaning, and documentation should provide sufficient air changes.

B. Routine cleaning and disinfectant procedures are appropriate. When cleaning the vehicle, EMS providers should wear a disposable gown and gloves. A facemask and eye protection should be used if splashes or sprays during cleaning are anticipated.

C. All surfaces that may have come in contact with the patient or materials contaminated during patient care should be thoroughly cleaned and disinfected (e.g. stretcher, rails, control panels, floors, walls, work surfaces).

D. EPA registered disinfectants for emerging viral pathogens should be used.

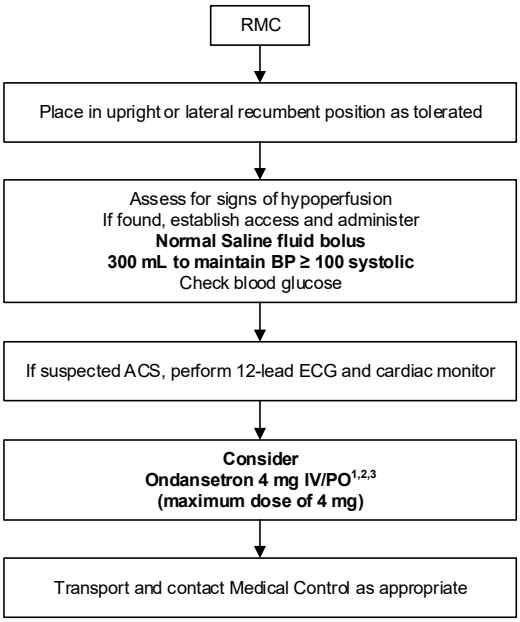
IV. RESTOCKING

A. EMS agencies should maintain a stock of PPE for their EMS providers as the primary means of replacement.

B. Hospitals should replace individual PPE after patient transport if the same level of PPE is available.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Nausea & Vomiting - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: November 1, 2019

NAUSEA & VOMITING - ALS



1 – Avoid in patients with known or suspected prolonged QT, congenital heart disease or surgery, or severe hepatic impairment as these patients are at risk for Torsades de Pointes.
2 – Studies have shown safety in appropriate doses for Ondansetron in pregnancy.
3 – Nausea and vomiting are symptoms of illness. Investigate for underlying causes which are not limited to: gastrointestinal, cardiovascular, gynecologic, hypoglycemia, and hyperglycemia.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pain Management - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

PAIN MANAGEMENT - ALS

RMC

Determine cause of patient's pain and refer to appropriate protocol

Determine Patient's Pain Score using either the Verbal Descriptor Scale or Wong-Baker FACES® Scale

Consider use of non-pharmacologic pain management techniques
Attempt to place patient in a position of comfort
Consider application of ice packs or splints as appropriate

If non-pharmacologic pain management techniques fail and the patient is in severe pain, consider a single dose of analgesia[1,2]

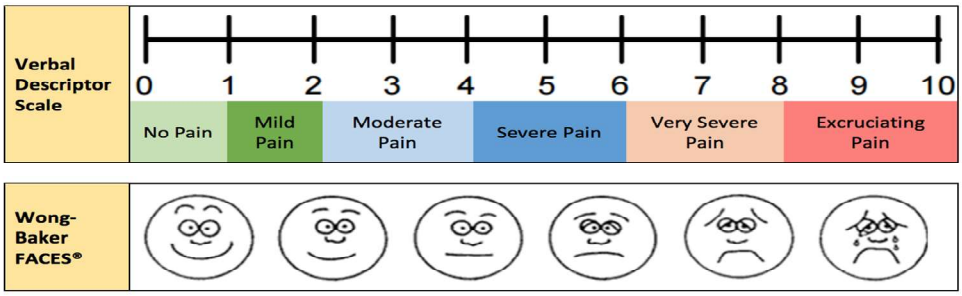
Fentanyl 1 mcg/kg IV/IO/IM/IN
≤ 65 years of age – max dose 100 mcg
> 65 years of age – max dose 50 mcg

Complete vital signs and pain scale should be assessed and documented before and after every intervention

Transport and contact Medical Control as appropriate

1 – Contraindications include known or documented allergy to fentanyl or other opioid analgesic, pregnancy with active labor, dental pain, chronic pain patients who are not part of hospice or palliative care, hypoventilation or respiratory depression.
2 – Use with caution in patients with GCS < 15, hypotension, or hypoxia

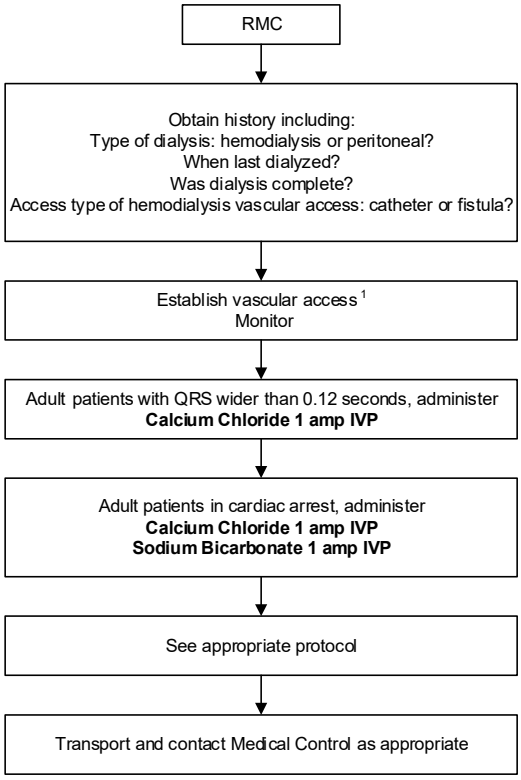
Universal Pain Assessment Tool



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Renal Failure / Hyperkalemia - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

RENAL FAILURE / HYPERKALEMIA - ALS

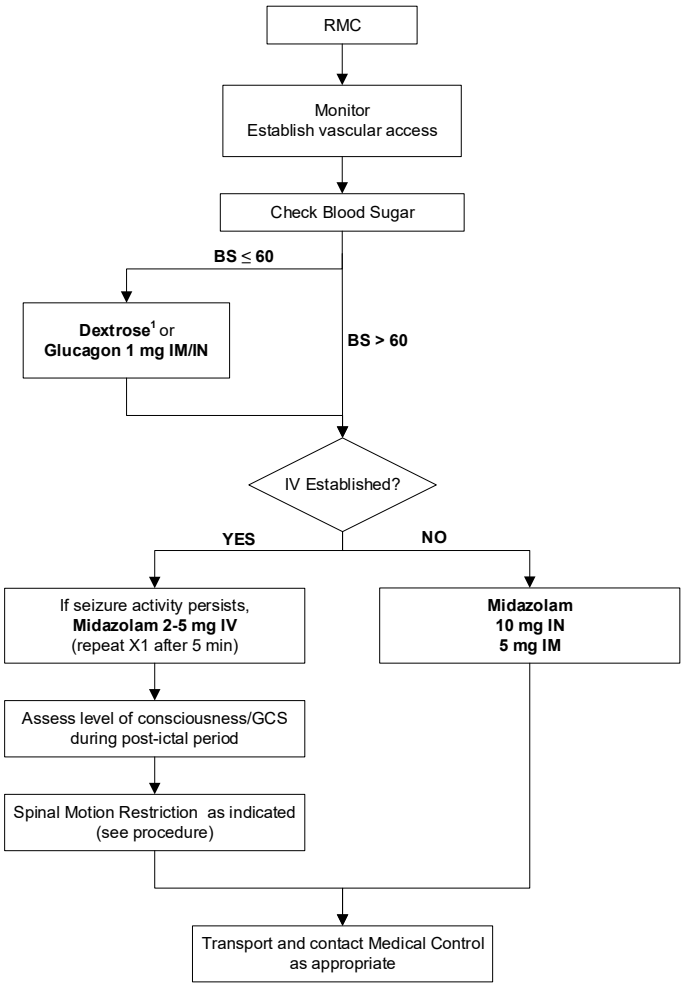
Patients with Chronic Renal Failure and Receiving Hemodialysis or Peritoneal Dialysis



1 - Vascular access should not be attempted in same extremity having a functioning fistula. Fluids should be administered cautiously. If vascular access is needed emergently and a peripheral IV cannot be obtained, a functioning dialysis catheter can be used when in place by attaching IV tubing to the port

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Seizures - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

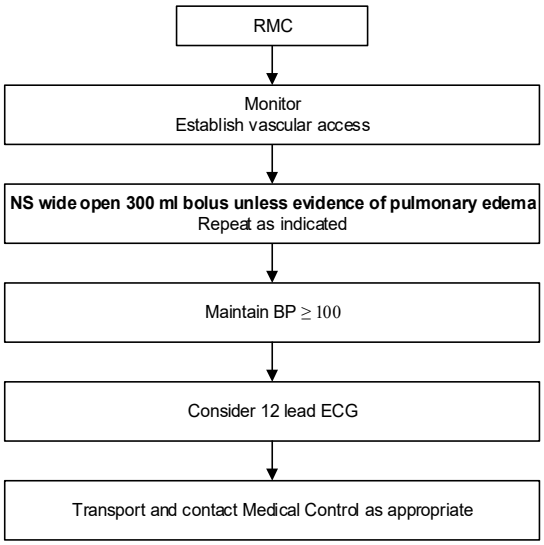
SEIZURES - ALS



1 - Dextrose 10% as 100ml boluses until mental status improves or BS > 60 to a maximum of 500ml

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Shock - ALS
	Section: Medical
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

SHOCK - ALS



1 – At Base Station discretion

REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

TOXINS AND ENVIRONMENTAL

Acetylcholinesterase Inhibitors Exposure (Carbamates, Nerve Agents, Organophosphates)
Burns
Carbon Monoxide / Smoke Inhalation
Chemical Airway Respiratory Irritants
Conducted Electrical Weapon Injury (TASER)
Cyanide Exposure
Electrical Injuries
Exertional Heat Stroke
Frostbite
Hyperthermia / Heat Exposure
Hypothermia / Cold Exposure
Lightning Strike Injuries
Radiation Exposure
Riot Control Agents
Topical Chemical Burn

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Acetylcholinesterase Inhibitors Exposure – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 15, 2024

ACETYLCHOLINESTERASE INHIBITORS EXPOSURE (CARBAMATES, NERVE AGENTS, ORGANOPHOSPHATES) – BLS/ALS

I. PATIENT CARE GOALS

1. Rapid recognition of the signs and symptoms of confirmed or suspected acetylcholinesterase inhibitor (AChEI) agents such as carbamates, nerve agents, or organophosphates exposure followed by expeditious and repeated administration of atropine, the primary antidote.

2. Carbamates and organophosphates are commonly active agents in commercial insecticides.

3. Accidental carbamate exposure rarely requires treatment.

4. Activate HAZMAT response to evaluate any potential chemical exposure.

II. PATIENT PRESENTATION

Acetylcholinesterase Inhibitors may include nerve agents, weapons of mass destruction (WMD), carbamate organophosphate, or insecticide pesticide

A. Inclusion Criteria

1. 'DUMBELS' is a mnemonic tool used to describe the signs and symptoms of acetylcholinesterase inhibitor agent poisoning. All patient age groups are included where the signs and symptoms exhibited are consistent with the toxidrome of 'DUMBELS':

    a. **D**iarrhea
    b. **U**rination
    c. **M**iosis/Muscle weakness
    d. **B**ronchospasm/Bronchorrhea/Bradycardia (the killer Bs)
    e. **E**mesis
    f. **L**acrimation
    g. **S**alivation/Sweating

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Don the appropriate PPE.

2. Remove the patient's clothing and wash the skin with soap and warm water.

    a. Acetylcholinesterase inhibitor agents can be absorbed through the skin.
    b. Contaminated clothing can provide a source of continued exposure to the toxin.

3. Rapidly assess the patient's respiratory status, mental status, and pupillary status.

4. Administer the antidote atropine immediately for confirmed or suspected acetylcholinesterase inhibitor agent exposure.

5. Administer oxygen as appropriate with a target of achieving 94–98% saturation and provide airway management.

6. Establish intravenous access, if possible.

7. Apply a cardiac monitor, if available.

8. The heart rate may be normal, bradycardic, or tachycardic.

9. Clinical improvement should be based upon the drying of secretions and easing of respiratory effort rather than heart rate or pupillary response.

10. Continuous and ongoing patient reassessment is critical.

B. Patient Symptoms

1. Acetylcholinesterase inhibitor agents are highly toxic chemical agents and can be rapidly fatal.

2. Patients with low-dose chronic exposures may have a more delayed presentation of symptoms.

3. Antidotes (atropine and pralidoxime) are effective if administered before circulation fails.

4. The patient may develop:

    a. Miosis (pinpoint pupils)
    b. Bronchospasm
    c. Bradycardia
    d. Vomiting
    e. Excessive secretions in the form of:
        i. Tearing

ii. Salivation
iii. Rhinorrhea
iv. Diarrhea
v. Urination
vi. Bronchorrhea

5. Penetration of an acetylcholinesterase inhibitor agent into the central nervous system (CNS) will cause:

   a. Headache
   b. Confusion
   c. Generalized muscle weakness
   d. Seizures
   e. Lethargy or unresponsiveness

6. Estimated level of exposure based upon signs and symptoms:

   a. Mild
      i. Miosis alone (while this is a primary sign in vapor exposure, it may not be present is all exposures)
      ii. Miosis and severe rhinorrhea
   b. Mild to moderate (in addition to symptoms of mild exposure)
      i. Localized swelling
      ii. Muscle fasciculations
      iii. Nausea and vomiting
      iv. Weakness
      v. Shortness of breath
   c. Severe (in addition to symptoms of mild to moderate exposure)
      i. Unconsciousness
      ii. Convulsions
      iii. Apnea or severe respiratory distress requiring assisted ventilation
      iv. Flaccid paralysis

7. Onset of symptoms can be immediate with an exposure to a large amount of the acetylcholinesterase inhibitor.

   a. There is usually an asymptomatic interval of minutes after liquid exposure before these symptoms occur.
   b. Effects from vapor exposure occur almost immediately.

8. Signs and symptoms with large acetylcholinesterase inhibitor agent exposures (regardless of route):

   a. Sudden loss of consciousness
   b. Seizures

c. Copious secretions
d. Apnea
e. Death

9. Obtain an accurate exposure history (as patient may become unconscious before arrival at the Emergency Department):

   a. Time of ingestion or exposure
   b. Route of exposure
   c. Quantity of medication or toxin taken (safely collect all possible medications or agents).
   d. Alcohol or other substance use or ingestions.
   e. Pertinent cardiovascular history or other prescribed medications for underlying disease.

10. The patient can manifest any of the signs and symptoms of the 'DUMBELS' toxidrome based on the route of exposure, agent involved, and concentration of the agent:

    a. Vapor exposures will have a direct effect on the eyes and pupils causing miosis.
    b. Patients with isolated skin exposures will have normally reactive pupils.
    c. Certain acetylcholinesterase inhibitor agents can place the patient at risk for both a vapor and skin exposure.

C. Treatment and Interventions

1. Medications:

   a. Atropine
      i. Atropine is the primary antidote for organophosphate, carbamate, or nerve agent exposures. Repeated doses should be administered liberally to patients who exhibit signs and symptoms of exposure or toxicity.
      ii. Atropine may be provided in multi-dose vials, pre-filled syringes, or autoinjectors.

   b. Pralidoxime chloride (2-PAM)
      i. Pralidoxime chloride is a secondary treatment and should be given concurrently to reactivate acetylcholinesterase.
      ii. Pralidoxime chloride may be provided in a single dose vial, pre-filled syringes, or auto-injectors.
      iii. Auto-injectors typically contain 600 mg of pralidoxime chloride.
      iv. To be beneficial to the patient, a dose of pralidoxime chloride should be administered shortly after the nerve agent or organophosphate poisoning as it has minimal clinical effect if administration is delayed.

   c. Benzodiazepines

i. Benzodiazepines are administered as an anticonvulsant for those patients who exhibit seizure activity (see Seizures – ALS Protocol for doses and routes of administration).
ii. Benzodiazepines may be provided in multi-dose or single-dose vials, pre-filled syringes, or auto-injectors.
iii. CANA® (Convulsive Antidote Nerve Agent) is a commercially available auto-injector that contains 10 mg of diazepam.

d. Duodote®
   i. A commercially available auto-injector of nerve agent/organophosphate antidote.
   ii. Duodote® is one auto-injector that contains 2.1 mg of atropine and 600 mg of pralidoxime chloride.

e. ATNAA® (Antidote Treatment Nerve Agent Auto-injector)
   a. An auto-injector of nerve agent/organophosphate antidote that is typically in military supplies
   b. ATNAA® is one auto-injector that contains 2.1 mg of atropine and 600 mg of pralidoxime chloride
   c. ATNAA® may be seen in civilian supplies assets when Duodote® is unavailable or in short supply

f. CHEMPACK
   i. Federal cache of nerve agent antidotes that is managed by the Centers for Disease Control and Prevention (CDC) and offered to states that voluntarily agree to maintain custody and security of CHEMPACK assets.
   ii. These are forward-deployed at sites determined by states that are part of the program such as hospitals and EMS centers.
   iii. Deployment of CHEMPACKs is reserved for events where the nerve agent/organophosphate exposure will deplete the local or regional supply of antidotes.
   iv. There are two types of CHEMPACK containers:
      A. EMS Containers: CHEMPACK assets for EMS contain a large portion of autoinjectors for rapid administration of antidotes by EMS clinicians of all levels of licensure/certification. They contain enough antidote to treat roughly 454 patients.
      B. Hospital Containers: CHEMPACK assets contain a large portion of multidose vials and powders for reconstitution — they contain enough antidote to treat roughly 1,000 patients.

2. Medication Administration:

a. Atropine, in large and potentially multiple doses, is the antidote for an acetylcholinesterase inhibitor agent poisoning.
b. Atropine should be administered immediately followed by repeat doses until the patient's secretions resolve.

c. Pralidoxime chloride (2-PAM) is a secondary treatment and, when possible, should be administered concurrently with atropine.
d. The stock of atropine and pralidoxime chloride available to EMS clinicians is usually not sufficient to fully treat a patient with an acetylcholinesterase inhibitor agent exposure; however, EMS clinicians should initiate the administration of atropine and, if available, pralidoxime chloride.
e. Seizures should be treated with benzodiazepines.
f. The patient should be emergently transported to the closest appropriate medical facility as directed by medical direction.

3. Recommended Doses (see dosing tables below). The medication dosing tables that are provided below are based upon the severity of the clinical signs and symptoms exhibited by the patient. There are several imperative factors to note:

   a. For organophosphate or severe acetylcholinesterase inhibitor agent exposure, the required dose of atropine necessary to dry secretions and improve the respiratory status may exceed 20 mg. Atropine should be administered rapidly and repeatedly until the patient's clinical symptoms diminish. Atropine must be given until the acetylcholinesterase inhibitor agent has been metabolized.
   b. Because Duodote® auto-injectors contain pralidoxime chloride, they should not be used for additional dosing of atropine beyond the recommended administered dose of pralidoxime chloride.
   c. All the medications below can be administered intravenously in the same doses cited for the intramuscular route. However, due to the rapidity of onset of signs, symptoms, and potential death from acetylcholinesterase inhibitor agents, intramuscular administration is highly recommended to eliminate the inherent delay associated with establishing intravenous access.
   d. The antidotes can be administered via the intraosseous route. However, due to the rapidity of onset of signs, symptoms, and potential death from acetylcholinesterase inhibitor agents, intramuscular administration remains the preferable due to the inherent delay associated with establishing intraosseous access and the limited use of this route of administration for other medications.

C. Patient Safety Considerations

1. Continuous and ongoing patient reassessment is critical.

2. Clinical response to treatment is demonstrated by the drying of secretion and the easing of respiratory effort.

3. Initiation of and ongoing treatment should not be based upon heart rate or pupillary response.

4. Precautions for pralidoxime chloride administration:

a. Although Duodote® and ATNAA® contain atropine, the primary antidote for an acetylcholinesterase inhibitor agent poisoning, the inclusion of pralidoxime chloride in the auto-injector can present challenges if additional doses of atropine are warranted by patient condition and other formulations of atropine are unavailable:
   i. Pediatrics: An overdose of pralidoxime chloride may cause profound neuromuscular weakness and subsequent respiratory depression.
   ii. Adults: Especially for the geriatric patient, excessive doses of pralidoxime chloride may cause severe systolic and diastolic hypertension, neuromuscular weakness, headache, tachycardia, and visual impairment.
   iii. Geriatrics: Patients may have underlying medical conditions, particularly impaired kidney function or hypertension, the EMS clinician should consider administering the lower recommended adult dose of intravenous pralidoxime chloride.

5. Considerations during the use of auto-injectors:

   a. If an auto-injector is administered, a dose calculation prior to administration is not necessary.
   b. For atropine only auto-injectors, additional auto-injectors should be administered until secretions diminish.
   c. Mark 1 kits, Duodote® and ATNAA® have not been approved for pediatric use by the Food and Drug Administration (FDA), but they can be considered for the initial treatment for children of any age with severe symptoms of an acetylcholinesterase inhibitor agent poisoning especially if other formulations of atropine are unavailable.
   d. Pediatric Atro-Pen® auto-injectors are commercially available in a 0.25 mg autoinjector (yellow) and a 0.5 mg auto-injector (red). Atro-Pen® auto-injectors are commercially available in a 1 mg auto-injector (blue) and a 2 mg auto-injector (green).
   e. A pralidoxime chloride 600 mg auto-injector may be administered to an infant that weighs greater than 12 kg.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. 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.

2. Organophosphates insecticides:

   a. Can be legally purchased by the general public.

b. Organophosphate pesticides penetrate tissues and bind to the patient's body fat producing a prolonged period of illness and ongoing toxicity even during aggressive treatment.

3. 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.

Table 1. Mild Acetylcholinesterase Inhibitor Agent Exposure

Patient	Atropine Dose (Weight) IM or via Auto-injector
Infant: 0–2 years of age	0.05 mg/kg IM or via auto-injector (i.e., *0.25 and/or 0.5 mg auto-injector(s)*)
Child: 3–7 years of age (13–25 kg)	1 mg IM or via auto-injector (i.e., *one 1 mg or two 0.5 mg auto-injectors)*
Child: 8–14 years of age (26–50 kg)	2 mg IM or via auto-injector (i.e., *one 2 mg or two 1 mg auto-injectors)*
Adolescent/Adult	2 mg IM or via auto-injector
Pregnant Women	2 mg IM or via auto-injector
Geriatric/Frail	1 mg IM or via auto-injector
Adapted from: *U.S. Department of Health and Human Services, ASPR, National Library of Medicine, Chemical Hazards Emergency Medical Management: Nerve Agents— Prehospital Management, https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=523&toxid=93*	

Table 2. Mild to Moderate Acetylcholinesterase Inhibitor Agent Exposure

Patient (Weight)	Atropine Dose IM or via Auto-injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0–2 years of age	0.05 mg/kg IM or via auto-injector (i.e., *0.25 mg and/or 0.5 mg auto-injector)*	15 mg/kg IM
Child: 3–7 years of age (13–25 kg)	1 mg IM or via auto-injector (i.e., *one 1 mg auto-injector or two 0.5 mg auto-injectors)*	15 mg/kg IM **OR** One auto-injector (600 mg)
Child: 8–14 years of age (26–50 kg)	2 mg IM or via auto-injector (i.e., *one 2 mg auto-injector or two 1 mg auto-injectors)*	15 mg/kg IM **OR** One auto-injector (600 mg)
Adolescent/ Adult	2–4 mg IM or via auto-injector	600 mg IM **OR** One auto-injector (600 mg)
Pregnant Women	2–4 mg IM or via auto-injector	600 mg IM **OR** One auto-injector (600 mg)
Geriatric/Frail	2 mg IM or via auto-injector	10 mg/kg **IM** **OR** One auto-injector (600 mg)

Adapted from: *U.S. Department of Health and Human Services, ASPR, National Library of Medicine, Chemical Hazards Emergency Medical Management: Nerve Agents— Prehospital Management, https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=523&toxid=93*

Table 3. Severe Acetylcholinesterase Inhibitor Agent Exposure

Patient (Weight)	Atropine Dose IM or via 600 mg Auto-injector	Pralidoxime Chloride Dose IM or via Auto-injector
Infant: 0–2 years of age	0.1 mg/kg IM or via auto-injector (i.e., *0.25 mg and/or 0.5 mg auto-injector)*	45 mg/kg **IM**
Child: 3–7 years of age (13–25 kg)	0.1 mg/kg IM **OR** 2 mg via auto-injector (i.e., one 2 mg auto-injector or four 0.5 mg auto-injectors)	45 mg/kg **IM OR** One auto-injector (600 mg)
Child: 8–14 years of age (26–50 kg)	4 mg IM or via auto-injector (i.e., *two 2 mg auto-injectors or four 1 mg auto-injectors)*	45 mg/kg **IM OR** Two auto-injectors (1200 mg)
Adolescent: 14 years of age or older	6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)*	Three auto-injectors (1800 mg)
Adult	6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)*	Three auto-injectors (1800 mg)
Pregnant Women	6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)*	Three auto-injectors (1800 mg)
Geriatric/Frail	2–4 mg IM or via auto-injector (i.e., *one to two 2 mg auto-injectors)*	25 mg/kg IM **OR** two to three auto-injectors (1200 mg–1800 mg)

Adapted from: *U.S. Department of Health and Human Services, ASPR, National Library of Medicine, Chemical Hazards Emergency Medical Management: Nerve Agents— Prehospital Management, https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=523&toxid=93*

Table 4. Guidance for the Treatment of Seizures Secondary to Acetylcholinesterase Inhibitor Agent Exposure

Patient	Diazepam	Midazolam
Infant (0–2 y/o)	0.2–0.5 mg/kg IM Repeat q 2–5 minutes	0.2 mg/kg IM Repeat prn in 10 minutes
	0.2–0.5 mg/kg IV q 15–30 minutes May repeat twice as needed	May repeat dose once
	Total maximum dose: 5 mg	Total maximum dose: 0.4 mg/kg
Child (3–13 y/o)	0.2–0.5 mg/kg IM Repeat q 2–5 minutes	0.2 mg/kg IM Not to exceed 10 mg Repeat prn in 10 minutes
	0.2–0.5 mg/kg IV q 15–30 minutes May repeat dose twice if needed	May repeat dose once
	Total maximum dose: 5 mg if less than 5 years	Total maximum dose: 0.4 mg/kg Not to exceed 20 mg
	Total maximum dose: 10 mg if age 5 years or older 1 CANA® auto-injector	
Adolescent: 14 y/o or older	2–3 CANA® auto-injectors	0.2 mg/kg IM Total maximum dose of 10 mg Repeat prn in 10 minutes
	5–10 mg IV q 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Adult	2–3 CANA® auto-injectors	10 mg IM Repeat prn in 10 minutes
	5–10 mg IV q 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Pregnant Women	2–3 CANA® auto-injectors	10 mg IM Repeat prn in 10 minutes
	5–10 mg IV q 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Geriatric	2–3 CANA® auto-injectors	10 mg IM Repeat prn in 10 minutes
	5–10 mg IV q 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg

Adapted from: *U.S. Department of Health and Human Services, ASPR, National Library of Medicine, Chemical Hazards Emergency Medical Management: Nerve Agents — Prehospital Management, https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=523&toxid=93*

EMS CHEMPACK Medications

Description	Quantity (in boxes)	Amount per box
ATNAA (Atropine 2.1 mg/Pralidoxime 600mg)	6	200
Atropen (Atropine Autoinjector) 0.5 mg	1	144
Atropen (Atropine Autoinjector) 1mg	1	144
Atropine Sulfate 0.4 mg/mL - 20 mL	1	100
Diazepam 10mg Autoinjector	2	150
Pralidoxime 1g vial - 20mL (once reconstituted)	1	276
Siezalam (Midazolam 5mg/mL vial - 10mL	1	50
Sterile Water for Injection vial - 20mL	1	100

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Burns – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

BURNS – BLS/ALS

I. PATIENT CARE GOALS

Minimize tissue damage and patient morbidity from burns.

II. PATIENT PRESENTATION

A. Patient May Present With:

1. Airway – Stridor, hoarse voice
2. Mouth and Nares – Redness, blisters, soot, singed hairs
3. Breathing – Rapid, shallow, wheezes, rales
4. Skin – Estimate of Percentage Total Body Surface Area (TBSA) burned and depth of burn (partial vs. full thickness)
5. Associated Trauma – Blast, fall, assault

B. Inclusion Criteria

Patients sustaining thermal burns.

C. Exclusion Criteria

Electrical, chemical, and radiation burns (see Toxins and Environmental Section of the Region 11 EMS Protocols).

III. SCENE MANAGEMENT

A. Assure Crew Safety:

1. Power off
2. Electrical lines secure
3. Gas off
4. No secondary devices
5. Assess need for Hazmat response.

6. Proper personal protective equipment (PPE) may be required.

IV. PATIENT MANAGEMENT

A. Assessment

1. Consider circumstances of the event such as:

   a. Related trauma in addition to the burns
   b. Inhalation exposures such as carbon monoxide (CO) and cyanide (CN)
   c. Pediatric or elder abuse or neglect (non-accidental burn trauma)

2. Follow ABCs (Airway, Breathing, Circulation) of resuscitation per the Adult or Pediatric Initial Assessment Protocol.

3. Assess for signs of **Inhalational Injury** of the upper and lower airway **including adequate oxygenation and ventilation or respiratory distress** and treat per the Airway Management Protocol.

   a. Upper airway: stridor and hoarseness from mucosal edema
   b. Lower airway: wheezing and rales from airway inflammation and edema

4. Consider spinal precautions per Spinal Care Protocol.

5. Estimate TBSA and depth of burn.

   a. Use “Rule of Nines” (see Appendix).
   b. ***First-degree/superficial burns (skin erythema only) are not included in TBSA calculations.***

6. Determine burn severity. Burns are classified according to depth of tissue injury and the depth of the burn largely determines the healing potential and need for surgical grafting.

   a. **Superficial Thickness (First Degree Burns)**
      i. Dry, red, easily blanching, sometimes painful
      ii. Injury is superficial and limited to the top layer of the skin (epidermis)
      iii. Example: Sunburn
      iv. NOT counted in calculations of total burn surface area (TBSA)

   b. **Partial Thickness (Second degree burns)**

i. Skin may be red with blisters, wet and weepy, very painful with superficial injury
ii. Skin may be dry and white, darker pink or red, less pain with deep injury
iii. Injury to top layer of the skin (epidermis) and some of the lower layers (dermis)
iv. Counted in calculations of total burn surface area (TBSA)

c. **Full Thickness (Third degree burns)**
   i. Dry, leathery texture
   ii. Variable color (white, brown, black)
   iii. Loss of pain sensation
   iv. Injury to all layers of the skin (epidermis and dermis)
   v. Counted in calculations of total burn surface area (TBSA)

d. **Deep (Fourth degree burns)**
   i. Injury that penetrate below the skin dermal layer and into the underlying soft tissues including fascia, muscle and/or bones
   ii. Counted in calculations of total burn surface area (TBSA)

7. Assess and monitor extremity perfusion for edema and adequate circulation.

8. Document pain scale.

B. Treatment and Interventions

1. Stop the burning.

   a. Remove wet clothing (if not stuck to the patient).
   b. Remove jewelry.
   c. Leave blisters intact.

2. Minimize burn wound contamination.

   a. Cover burns with a burn dressing or clean, dry sheet.
   b. Do not apply gels or ointments.

3. For ALS: Monitor pulse oximetry, ETCO2 and cardiac monitor. Assess co-oximetry for Carbon Monoxide exposure.

4. Administer high flow supplemental oxygen for all burn patients rescued from an enclosed space.

5. For ALS: Establish IV access, avoid placement through burned skin.

6. For ALS: Consider early management of pain and nausea/vomiting.

7. For ALS: Initiate fluid resuscitation.

    a. If the patient is in shock:
        i. Consider other cause such as trauma or cyanide toxicity.
        ii. Administer IV fluid.

    b. If the patient is not in shock, begin initial fluid rates for the prehospital setting:
        i. ≤ 5 years old: 125 ml normal saline per hour
        ii. 6-12 years old: 250 ml normal saline per hour
        iii. ≥ 13 years of age and older: 500 ml normal saline per hour

8. Prevent systemic heat loss and keep the patient warm.

C. Special Treatment Considerations

1. If blast mechanism, treat per Blast Injury Protocol.

2. Patients with significant **Inhalational Injury** may have respiratory distress with symptoms that rapidly progress to upper airway obstruction and respiratory failure. Apply high flow oxygen and follow Airway Management Protocol.

3. 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. In this circumstance, give the antidote (hydroxocobalamin), if available.

4. Particularly in enclosed-space fires, carbon monoxide toxicity is a consideration and pulse oximetry may not be accurate (see Carbon Monoxide/Smoke Inhalation Protocol).

5. For specific chemical exposures (cyanide, hydrofluoric acid, other acids, and alkali) see Topical Chemical Burn Protocol.

6. Consider decontamination and notify the receiving facility of potentially contaminated patient.

7. Burns that involve significant sloughing or loss of skin can result in uncontrolled heat loss. These patients should be monitored closely for the development of hypothermia and appropriate preventative measures should be taken.

D. Special Transport Considerations

A. Patients with the following criteria should preferentially be transported to a Burn Center:

1. Thermal Burns

    a. Full thickness burns
    b. Partial thickness burns with Total Body Surface Area (TBSA) 10% or more
    c. Partial or full thickness burn involving the face, hands, genitalia, feet, perineum, or over any joints
    d. Patients with burns and other comorbidities (including pre-existing medical condition)
    e. Circumferential burns

2. Inhalation injury

3. Pediatric burns (age less than 16 years old)

4. Chemical injuries

5. Electrical injuries

    a. High voltage (≥ 1000 V) electrical injuries
    b. Lightning injury

B. Patients with the following criteria should be transported to most appropriate Level 1 Trauma Center:

    a. Patients with burns and concomitant traumatic injuries

C. For situations where there concern for an impending loss of the airway or worsening clinical condition, transport patient to the closest Emergency Department. Contact Online Medical Control (OLMC) as needed for destination questions.

1. Refer to Burn Patient Destination Policy

V. NOTES/EDUCATIONAL PEARLS

A. **Inhalational Injury**: defined as the aspiration and/or inhalation of superheated gasses, steam, hot liquids or noxious products of incomplete combustion (found in smoke). The

severity of injury is related to the temperature, duration, and composition of the inhaled agent(s). Inhalational injury can occur with or without a cutaneous burn. There are three types of Inhalation Injury:

a. Systemic effects of carbon monoxide or cyanide exposure
b. Thermal inhalation injury of the upper airway
c. Chemical inhalation injury of the lower airway

B. Onset of stridor and change in voice are sentinel signs of potentially significant inhalational injury, which may rapidly lead to airway obstruction or respiratory failure.

C. If the patient is in shock within one hour of burn, it is not from the burn. Evaluate the patient carefully for associated trauma or cyanide toxicity.

D. If the patient is not in shock, the fluid rates recommended above will adequately maintain patient's fluid volume.

E. EMS should administer IV fluids for significant burns at the "initial fluid rate" based on patient age. Definitive calculation of hourly fluid rates (termed "adjusted fluid rates") occurs in the hospital.

F. Pain management is critical in acute burns.

G. End-tidal capnography (ETCO2) monitoring may be particularly useful to monitor respiratory status in patients.

H. TBSA is calculated only based on percent of second- and third-degree burns. First degree/superficial burns are not included in this calculation.

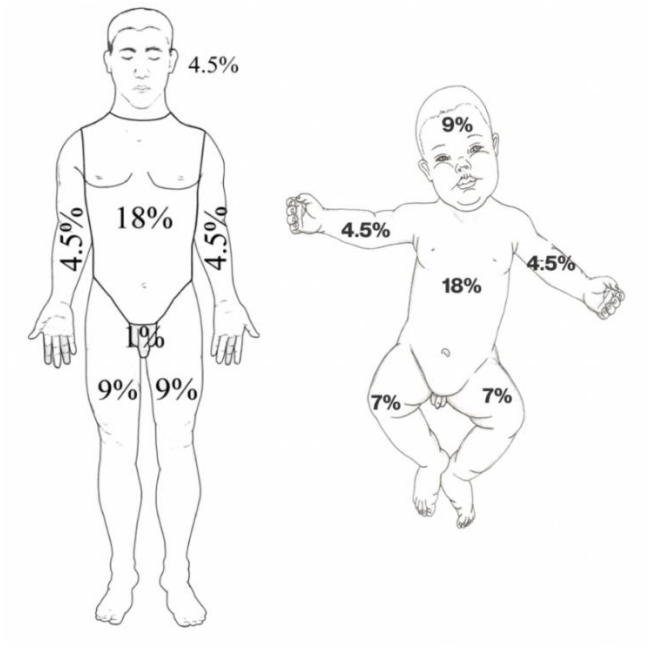
I. It is sometimes difficult to determine the depth of burn injury early as the wound evolves.

J. Burn depth determines the wound care required, the need for grafting, and the functional and cosmetic outcomes.

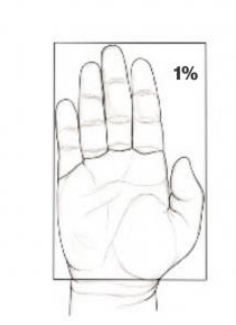
VI. APPENDIX

Percentage Total Body Surface Area (TBSA) – for second degree and deeper burns

"Rule of Nines" - In adults, distinct anatomic regions represent approximately 9%—or a multiple —of the Total Body Surface Area (TBSA). In the infant or child, the "Rule" deviates because of the large surface area of the child's head and the smaller surface area of the lower extremities.



"Palmar Method" - The size of the patient's hand—length of wrist crease to tip of longest finger and width of palm—represents approximately one percent of their total body surface area. Using this method is an easy way to determine the extent of irregularly scattered burns.



Reference: American Burn Association. (2023). *Advanced Burn Life Support.*

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Carbon Monoxide/Smoke Inhalation – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: December 6, 2023

CARBON MONOXIDE/SMOKE INHALATION – BLS/ALS

I. PATIENT CARE GOALS

1. Remove patient from toxic environment.

2. Assure adequate ventilation, oxygenation, and correction of hypoperfusion.

3. Use of environmental carbon monoxide (CO) monitors to assist in detection of CO toxicity.

II. PATIENT PRESENTATION

Carbon monoxide is a colorless, odorless gas which has a high affinity for binding to red cell hemoglobin, thus preventing the binding of oxygen to the hemoglobin, leading to tissue hypoxia (although pulse oximetry may appear to be normal). A significant reduction in oxygen delivery to tissues and organs occurs with carbon monoxide poisoning. Carbon monoxide is also a cellular toxin which can result in delayed or persistent neurologic sequelae in significant exposures. With any form of combustion including fire/smoke (e.g., propane, kerosene, or charcoal stoves or heaters) and combustion engines (e.g., generators, lawn mowers, motor vehicles, home heating systems) carbon monoxide will be generated. People in a fire may also be exposed to cyanide from the combustion of some synthetic materials.

A. Inclusion Criteria

1. Patients exposed to carbon monoxide may present with a spectrum of symptoms:

    a. Mild intoxication:
        i. Nausea
        ii. Fatigue
        iii. Headache
        iv. Vertigo
        v. Lightheadedness

    b. Moderate to severe intoxication:
        i. Altered mental status
        ii. Tachypnea
        iii. Tachycardia
        iv. Seizure
        v. Cardiac arrest

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Remove patient from toxic environment.
2. Assess ABCDs and, if indicated, expose patient and re-cover to assure retention of body heat.
3. Vital signs (pulse, blood pressure, respiratory rate, neurologic status assessment), oxygen saturation, and ETCO2 if available.
4. Apply the CO-oximeter (carbon monoxide measuring device) to the finger and document the reading as SpCO.
5. For ALS providers, apply a cardiac monitor, examine rhythm strip for arrhythmias, and obtain a 12-lead ECG if available.
6. Check blood glucose level.
7. Monitor pulse oximetry and ETCO2 for respiratory decompensation.
8. Patient pertinent history.
9. Patient physical examination.

B. Treatment and Interventions

1. Apply 100% oxygen via non-rebreather mask, bag valve mask, or advanced airway as indicated.
2. If seizure, treat per Seizure Protocol.

C. Patient Safety Considerations

1. Use an environmental carbon monoxide detector to assist with detection of occult CO toxicity. If the detector signals elevated CO levels with an alarm, apply appropriate respiratory protection and exit scene.
2. Remove patient and response personnel from potentially hazardous environment as soon as possible.

3. 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.

4. Cherry red skin coloration is an indication of carbon monoxide poisoning, but is an unusual finding.

5. **CO-oximeter devices may yield inaccurate low/normal results for patients with CO poisoning.** For any patients with smoke exposure, document the reading of the CO-oximeter in the patient care report. All patients with probable or suspected CO poisoning should be transported to the closest, most appropriate hospital based on their presenting signs and symptoms.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Pulse oximetry is inaccurate due to the carbon monoxide binding with hemoglobin.

2. As maternal carboxyhemoglobin levels do not accurately reflect fetal carboxyhemoglobin levels, pregnant patients are more likely to be treated with caution.

3. Consider cyanide toxicity if carbon monoxide poisoning is from a fire.

B. Pertinent Assessment Findings

1. Early and repeat assessment of patient's mental status and motor function are extremely useful in determining response to therapy and the need for additional treatment.

2. Identification of possible etiology of poisoning.

3. Time of symptom onset and time of initiation of exposure-specific treatment.

4. Response to therapy.

C. Key Documentation Elements

1. If using an environmental carbon monoxide detector, record the level detected including units of measurement.

2. Evidence of soot or burns around the face, nares, or pharynx.

3. Early and repeat assessment of patient's mental status and motor function are extremely useful in determining response to therapy and the need for additional treatment.

4. Accurate exposure history

    a. Time of ingestion/exposure
    b. Route of exposure
    c. Quantity of medication or toxin taken
    d. Alcohol or other intoxicant taken

5. Signs and symptoms of other patients encountered at same location, if present.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Chemical Airway Respiratory Irritants – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 15, 2024

CHEMICAL AIRWAY RESPIRATORY IRRITANTS – BLS/ALS

I. PATIENT CARE GOALS

1. Rapid recognition of signs and symptoms of confirmed or suspected airway respiratory irritants.

2. Activate HAZMAT response to evaluate any potential chemical exposure.

II. PATIENT PRESENTATION

Airway respiratory irritants may include airway injuries, chemical respiratory injuries, respiratory injuries, respiratory irritants, and/or toxic inhalation.

A. Inclusion Criteria

1. Inhalation of a variety of gases, mists, fumes, aerosols, or dusts may cause irritation or injury to the airways, pharynx, lung, asphyxiation, or other systemic effects.

2. Inhaled airway respiratory irritants will interact with the mucous membranes and upper and lower airways based on solubility, concentration, particle size, and duration of exposure.

3. The less soluble and smaller the particle size of the inhaled airway respiratory irritant, the deeper it will travel into the airway and respiratory systems before reacting with adjoining tissues, thus causing a greater delay in symptom onset.

B. Exclusion Criteria

None

C. Signs and Symptoms

1. Many airway respiratory irritants have "warning properties" such as an identifiable or unpleasant smell or cause irritation to eyes or airways. Some agents do not have clear warning properties and will often have delayed onset of signs or symptoms.

2. As the type, severity and rapidity of signs and symptom onset depend on the agent, water solubility, concentration, particle size, and duration of exposure, the below signs and symptoms are often overlapping and escalating in severity:

    a. Unusual odor/smell
    b. Tearing or itchy eyes

c. Burning sensation and burns to the nose, pharynx, and respiratory tract
d. Sneezing
e. General excitation
f. Cough
g. Chest tightness
h. Nausea
i. Shortness of breath/dyspnea
j. Wheezing
k. Stridor
l. Dyspnea on exertion
m. Dizziness
n. Change in voice
o. Airway obstructions including laryngospasm and laryngeal edema
p. Pulmonary edema (non-cardiogenic)
q. Seizures
r. Cardiac arrest

3. High water solubility/highly irritating airway respiratory irritants (oral/nasal and pharynx, particle size greater than 10 micrometers) include:

   a. Acrolein
   b. Ammonia
   c. Chloramine
   d. Ethylene oxide
   e. Formaldehyde
   f. Hydrogen chloride
   g. Methyl bromide
   h. Sodium azide
   i. Sulfur dioxide

4. Intermediate water solubility airway respiratory irritants (bronchus and bronchiole, particle size 5–10 micrometers) include:

   a. Chlorine

5. Low water solubility/less irritating airway respiratory irritants (alveolar, particle size less than 5 micrometers) include:

   a. Cadmium fume
   b. Fluorine
   c. Hydrogen sulfide (rotten egg odor; olfactory fatigue)
   d. Mercury fume
   e. Mustard gas (also delayed blistering skin manifestations)
   f. Nickel carbonyl
   g. Ozone

h. Phosgene

6. Asphyxia agents (two categories) include:

   a. Oxygen deprivation below 19.5% oxygen atmosphere ("simple asphyxiants"). Any gas that reduces oxygen fraction or displaces oxygen from the inspired air.
      i. Argon
      ii. Carbon dioxide
      iii. Ethane
      iv. Helium
      v. Methane
      vi. Natural gas (e.g., heptane, propane)
      vii. Nitrogen
      viii. Nitrogen dioxide (delayed symptom onset)

   b. Chemical interfering with oxygen delivery or utilization ("chemical asphyxiants")
      i. Carbon monoxide (see Carbon Monoxide/Smoke Inhalation – BLS/ALS Protocol)
      ii. Cyanide (see Cyanide Exposure – ALS Protocol)
      iii. Hydrogen sulfide

7. Inhalants of abuse include:

   a. These agents or substances are a diverse class of substances that include volatile solvents, aerosols, and gases.
   b. These chemicals are intentionally inhaled to produce a state that resembles alcohol intoxication with initial excitation, drowsiness, lightheadedness, and agitation.
   c. Users of inhalants of abuse are often called huffers, sniffers, baggers, or snorters.
      i. These individuals often present after inhaling an aerosol or gas with a loss of consciousness and the presence of the aerosol can or residue/paint around or in the mouth, nose, and oral pharynx.
   d. Common household products that are used as inhalants of abuse include:
      i. Volatile Solvents: Paint remover, degreasers, dry-cleaning fluids, gasoline, lighter fluid, correction fluid, felt tip markers, or glue.
      ii. Cosmetics/Paints/Sprays: Deodorant spray, vegetable oil spray, fabric protector spray, or spray paint.
      iii. Propellants/Asphyxiants/Nitrous Oxide: Propane gas, balloon tanks (helium), computer keyboard cleaner, ether, halothane, chloroform, butane, propane, or whipped cream dispensers.

8. Riot control agents (see Riot Control Agent – BLS/ALS Protocol)

9. A prototype agent is identified with each region of the affected airway respiratory track for mild to moderate exposures, as severe concentrated exposures of many of these agents overlap in signs and symptoms. The deeper the symptoms are in the respiratory

track and the slower the rate of symptom onset, the less water soluble the airway respiratory irritant.

a. Nasal and oral pharynx irritation: Highly water-soluble agents (ammonia)
b. Bronchial irritation (chlorine)
c. Acute pulmonary edema/deep alveolar injury: Poorly water soluble (phosgene)
d. Direct neurotoxin (hydrogen sulfide)
e. Asphyxia agent with additional symptoms (nitrogen dioxide — Silo Filler's disease)
f. Inhalants of abuse (volatile solvents, cosmetics/paints, propellants/asphyxiants/nitrous oxide)
g. Riot control agents (see Riot Control Agent – BLS/ALS Protocol)
h. Anticholinesterase inhibitors (see Acetylcholinesterase Inhibitors – BLS/ALS Protocol)

10. Ammonia

a. Immediate detection of unique sharp smell
b. Nasal pharyngeal burning/irritation sensation
c. Ocular tearing and irritation
d. Sneezing
e. Altered mental status (sleepy to agitated)
f. Cough
g. Shortness of breath
h. Chest tightness
i. Bronchospasm wheezing
j. Change in voice
k. Upper airway obstruction includes laryngospasm and laryngeal edema
l. Corneal burns or ulcers
m. Skin burns
n. Pharyngeal, tracheal, bronchial burns
o. Dyspnea/tachypnea
p. High concentrations and or protracted exposure may develop non-cardiac pulmonary edema
q. Esophageal burns

11. Chlorine

a. All of the above (see ammonia)
b. Increased likelihood of the following:
    i. Bronchiole burns
    ii. Bronchospasm wheezing
    iii. Non-cardiac pulmonary edema develops within 6–24 hours of higher exposures

12. Phosgene

a. Often have none of the above symptoms for the first half hour to several hours then are much milder until more severe lower respiratory tract symptoms develop.
    i. Only warning is report of "fresh mowed hay" odor
    ii. Mild airway irritation or drying
    iii. Mild eye irritation
    iv. Fatigue
    v. Chest tightness
    vi. Dyspnea/tachypnea
    vii. Significant delay up to 24 hours for:
        A. Exertional dyspnea
        B. Bronchospasm wheezing
        C. Hypoxia
        D. Severe non-cardiac pulmonary edema
        E. Cardiopulmonary arrest

13. Hydrogen sulfide is a direct neurotoxin and is rapidly absorbed through lung generating systemic effects:

    a. Distinctive rotten egg smell which rapidly causes olfactory fatigue/loss of sense of smell
    b. Cough
    c. Shortness of breath
    d. Rapid alternations in cognition or consciousness
    e. Bronchiole and lung hemorrhage/hemoptysis
    f. Non-cardiac pulmonary edema
    g. Hydrogen sulfide is known as the "knock down" gas because of near immediate and sudden loss of consciousness with high concentrations
    h. Asphyxia
    i. Cardiac arrest

14. Nitrogen dioxide (also called Silo Filler's disease)

    a. Heavier than air displacing oxygen from low lying areas and closed spaces causing direct asphyxia
    b. Low concentrations may cause:
        i. Ocular irritation
        ii. Cough
        iii. Dyspnea/tachypnea
        iv. Fatigue
    c. High concentrations may cause:
        i. Altered mental status including agitation
        ii. Cyanosis
        iii. Vomiting
        iv. Dizziness
        v. Loss of consciousness

vi. Cardiopulmonary arrest

15. Inhalants of abuse (i.e., felt tip markers, spray paint)

    a. Physical presences of paint or residue on individual from the inhaled agent
    b. Slurred speech
    c. Altered mental status (excitation, drowsiness, unconsciousness)
    d. Loss of consciousness
    e. Cardiac dysrhythmias
    f. Cardiopulmonary arrest

III. PATIENT MANAGEMENT

A. Assessment

1. Make sure the scene is safe as many gases are heavier than air and will build up in low lying areas. This is especially true of hydrogen sulfide and it's "knock down" effect of the initial unprotected responder and subsequence casualties associated with unprotected rescuers attempting to save the first downed responder.

2. Don appropriate PPE. Respiratory protection is critical.

3. Remove patient from the toxic environment.

4. Remove the patient's clothing, which may retain gases or decontaminate if liquid or solid contamination.

5. Decontaminate.

6. Flush irrigated effected/burned areas.

7. Assess ABCD and, if indicated, expose the patient and then cover the patient to assure retention of body heat.

8. Rapidly assess the patient's respiratory status, mental status, and oxygenation.

9. Assess patient vital signs (pulse, blood pressure, respiratory rate, neurologic status assessment), including temperature.

10. Establish intravenous access, if possible.

11. Place cardiac monitor and examine rhythm strip for arrhythmia potentials (consider 12-lead ECG).

12. Check blood glucose level.

13. Monitor pulse oximetry and ETCO2 for respiratory decompensation.

14. Perform carbon monoxide assessment with co-oximetry, if available.

15. Identify specific suspected agent, if possible.

16. Pertinent cardiovascular history or other prescribed medications for underlying disease.

17. Patient pertinent history.

18. Patient physical examination.
19. Continuous and ongoing patient reassessment is critical.

B. Treatment and Interventions

1. Assure a patent airway.

2. Administer oxygen and support breathing as indicated.

    a. Maintain the airway and assess for airway burns, stridor, or airway edema and, if indicated, perform airway management.
    b. Non-invasive ventilation techniques:
        i. Use CPAP for severe respiratory distress.
        ii. Use bag-valve-mask (BVM) ventilation in the setting of hypoventilation or respiratory failure.

3. Administer albuterol 2.5 mg nebulized for wheezing This can be repeated at this dose with for ongoing symptoms.

4. lpratropium 0.5 mg nebulized should be given in conjunction with albuterol.

5. Initiate IV access for infusion of normal saline and obtain blood glucose.

6. Fluid bolus (20 mL/kg) if evidence of hypoperfusion.

7. If the patient is experiencing significant pain, administer IV/IO analgesics:

    a. Fentanyl 1 mcg/kg IV or IO

8. Eye irrigation early.

9. Treat topical chemical burns (see Topical Chemical Burn Protocol).

10. In cases of severe respiratory irritation, in particular hydrogen sulfide, with altered mental status and no improvement with removal from the toxic environment, administer oxygen as appropriate with a target of achieving 94–98% saturation.

C. Patient Safety Considerations

1. Patients with exposure to highly soluble airway/respiratory irritants will self-extricate due to irritant warning properties such as smell, rapidity of onset of irritation, and other symptoms.

2. Less soluble agents may generate only an odor (e.g., mowed hay smell for Phosgene) and will have delayed serious symptoms such as acute pulmonary edema, hypoxia, and shortness of breath with minimal exertion.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Airway respiratory irritants can exacerbate underlying reactive airway diseases (e.g., asthma, chronic obstructive pulmonary disease (COPD)) and precipitate or exacerbate bronchospasm, respiratory distress, and hypoxia.

2. As patients may be off-gassing (particularly hydrogen sulfide and hydrogen cyanide) in the back of the transport vehicle, it is important to have adequate ventilation of the patient compartment.

3. Removal from the toxic environment, oxygen, general supportive therapy, bronchodilators, respiratory support, and rapid transport are core elements of care as there are no specific antidotes for any of these airway respiratory irritants except for heavy metals, which may be chelated in-hospital after agent identification.

4. Hydrogen sulfide causes the cells responsible for the sense of smell to be stunned into inaction and therefore, with a very short exposure, will shut down and the exposed individual will not perceive the smell, yet the individual continues to absorb the gas as it is still present.

5. Inhaled agents have become popular as a means of committing suicide. If there is some form of suicide signage, hoses, or buckets of substances visible as you arrive at the vehicle or residence, immediately move to a well-ventilated area and don a self-contained breathing apparatus (SCBA) before opening the vehicle or making entry as these gases may be highly concentrated and potentially lethal to EMS responders.

6. Household bathroom, kitchen, and oven cleaners, when mixed, can generate various airway respiratory irritants (ammonia, chloramine, and chlorine gas releases are particularly common). A very common exposure is to chloramine, a gas liberated when bleach (hypochlorite) and ammonia are combined. Chloramine then hydrolyzes in the distal airways and alveoli to ammonia and hypochlorous acid.

7. Sudden sniffing death can result from a single use of inhalant of abuse.

    a. Some inhalants can cause cardiac arrest due to dysrhythmias from irritated myocardium.
    b. This syndrome most often is associated with abuse of butane, propane, and effects of the chemicals in the aerosols.

B. Pertinent Assessment Findings

1. Patient may describe a specific odor (chlorine swimming pool smell, ammonia smell, fresh mowed hay smell [phosgene]) which may be helpful, but should not be relied upon as the human nose is a poor discriminator of scent.

2. Respiratory distress (retractions, wheezing, stridor)

3. Decreased oxygen saturation

4. Skin color

5. Neurologic status assessment

6. Reduction in work of breathing after treatment

7. Improved oxygenation after breathing

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Conducted Electrical Weapon Injury (TASER) – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 15, 2024

CONDUCTED ELECTRICAL WEAPON INJURY (TASER) – BLS/ALS

I. PATIENT CARE GOALS

1. Manage the condition that triggered the application of the conducted electrical weapon with special attention to patients with agitated behavior (see Behavioral Emergency Protocol).

2. Ensure patient is appropriately secured with assistance of law enforcement to protect the patient and EMS clinicians.

3. Perform comprehensive trauma and medical assessment for injuries (e.g., from falls or altercations or concomitant medical issues).

4. If discharged from a distance, up to two single barbed darts (13 mm length) should be located, but not removed.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Patient received either a weapon's direct-contact discharge or struck by the barbed dart of a conducted electrical weapon.

2. Patient may have sustained fall or physical confrontation trauma.

3. Patient may be under the influence of toxic substances and or may have underlying medical or psychiatric disorder.

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Once patient has been appropriately secured with assistance of law enforcement, perform primary and secondary assessment including cardiac monitor, pulse oximeter, and consider 12-lead ECG.

2. Perform a complete patient assessment – identifying the site of barbs if present.

B. Treatment and Interventions

1. Make sure patient is appropriately secured with assistance of law enforcement to protect the patient and responders. Consider medications for agitation if patient may harm themselves or others.

2. Treat all barbed darts as a foreign body and leave them for physician removal in the hospital.

3. Treat medical and traumatic injury.

C. Patient Safety Considerations

1. Make sure the cartridge has been removed from the conducted electrical weapon.

2. Patient should not be restrained in the prone or face down position as respiratory compromise is a significant risk. There should be no compressive force placed on the patient's chest or neck.

3. The patient may have underlying pathology before being tased (refer to appropriate Protocols for managing the underlying medical/traumatic pathology).

4. Perform a comprehensive assessment with special attention looking for signs and symptoms of active medical decompensation.

5. Transport the patient to the hospital.

6. EMS clinicians who respond for a conducted electrical weapon patient should not perform a "medical clearance" for law enforcement to then take the patient to a non-medical facility.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. 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

2. 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 cardiac monitoring and 12-lead ECG assessment.

3. 'Drive Stun' mode on some TASER® devices is a capability that allows for direct weapon two-point contact, which is designed to generate pain and not incapacitate the individual. Only local muscle groups are stimulated with the 'Drive Stun' technique.

B. Pertinent Assessment Findings

1. Thoroughly assess the patient for trauma as the patient may have fallen from standing or higher.

2. Ascertain if more than one TASER® cartridge was used (by one or more officers, in an effort to identify total number of possible darts and contacts).

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Cyanide Exposure - ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: December 6, 2023

CYANIDE EXPOSURE - ALS

I. PATIENT CARE GOALS

1. Remove patient from toxic environment.

2. Assure adequate ventilation, oxygenation, and correction of hypoperfusion.

II. PATIENT PRESENTATION

Cyanide is a colorless 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. While it has a characteristic "bitter almond smell", genetically only 40% of the population can smell it.

A. Inclusion Criteria

1. **Depending on its form, cyanide can enter the body through inhalation, ingestion, or absorption through the skin**. Cyanide should be suspected in occupational or other smoke exposures (e.g., firefighting), industrial accidents, chemical warfare, and terrorism (whenever there are multiple casualties of an unclear etiology).

    a. Early signs of cyanide exposure are non-specific and include: headache, confusion, dyspnea, chest tightness, and nausea.
    b. Other symptoms of cyanide exposure may include: mydriasis (pupil dilation), hypertension, tachypnea, vomiting, and tachycardia.

2. High concentrations of cyanide will produce:

    a. Markedly altered level of consciousness, including rapid collapse
    b. Seizures
    c. Respiratory depression or respiratory arrest
    d. Cardiac dysrhythmias and hypotension

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Remove patient from toxic environment and decontaminate as indicated.

2. Assess ABCDs and, if indicated, expose the patient, and then re-cover the patient to assure retention of body heat.

3. Assess vital signs (pulse, blood pressure, respiratory rate, neurologic status assessment) including pulse oximetry (which may not correlate with tissue oxygenation in cyanide/smoke exposure).

4. Attach a cardiac monitor and examine rhythm strip for arrhythmias.

    a. Perform a 12-lead ECG.

5. Check blood glucose level and treat as appropriate.

6. Monitor pulse oximetry and ETCO2.

7. Monitor patient for signs of hypoxia (pulse oximetry less than 94%) and respiratory decompensation regardless of pulse oximetry reading.

8. Identify the specific agent of exposure, time of ingestion/inhalation, and quantity/timing of exposure.

9. Obtain patient history including cardiovascular history and prescribed medication.

10. Obtain other pertinent patient history.

11. Perform physical exam.

B. Treatment and Interventions

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 cyanide intoxication.**

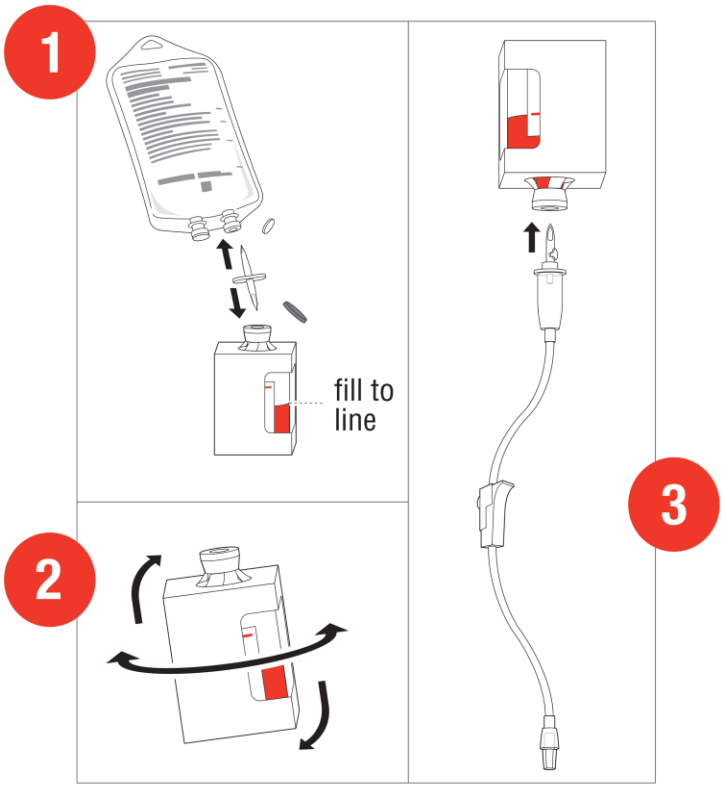
For the patient with an appropriate history and physical findings:

- Including exposure to products of combustion with smoke inhalation from closed-space fires; **AND**
- Manifesting one or more significant cyanide exposure signs or symptoms (markedly altered level of consciousness, seizures, respiratory depression or respiratory arrest, cardiac dysrhythmias and hypotension).

1. Administer 100% oxygen via non-rebreather mask, CPAP, or bag valve mask.

2. Prepare and administer hydroxocobalamin (Cyanokit).

   a. Reconstitute: Place the vial in an upright position. Add 200 ml of 0.9% Sodium Chloride Injection to the vial using the transfer spike. Fill to the line.
   b. Mix: The vial should be repetitively inverted or rocked, not shaken, for at least 60 seconds prior to infusion. Visually inspect the solution for particulate matter and color prior to administration. Discard solution if particulate matter is present or solution is not dark red.
   c. Infuse vial: Using vented intravenous tubing, hang and infuse over 15 minutes.



Reference from CYANOKIT (BTG Pharmaceuticals) - https://cyanokit.com/treatment-with-cyanokit

3. Dosing

    a. Adult: Initial dose is 5 grams administered over 15 minutes slow IV
    b. Pediatric: Hydroxocobalamin 70 mg/kg (reconstitute concentration is 25 mg/mL) with a maximum dose of 5 grams.

4. Use a separate IV line for administration of hydroxocobalamin infusion.

5. If seizure, treat per Seizure Protocol.

C. Patient Safety Considerations

1. In the event of multiple patients, be sure to wear appropriate PPE during rescue evacuation from the toxic environment.

2. Hydroxocobalamin is safe for treatment of cyanide poisoning in pregnant patients.

3. There is a risk of anaphylaxis or other hypersensitivity reactions after administration of hydroxocobalamin (Cyanokit); for new onset chest tightness, edema, urticaria, pruritis, dyspnea, or rash treat per Anaphylaxis and Allergic Reaction Protocol.

4. There is a risk of substantially increased blood pressure after hydroxocobalamin (Cyanokit) administration; monitor blood pressure during therapy.

IV. NOTES/EDUCATIONAL PEARLS

A. 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.

B. After hydroxocobalamin has been administered, pulse oximetry levels are no longer accurate and skin, tears, and urine will all turn red. This flushing should not be interpreted as an allergic reaction.

C. 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.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Electrical Injuries – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

ELECTRICAL INJURIES – BLS/ALS

I. PATIENT CARE GOALS

1. Prevent additional harm to patient.
2. Identify life threatening issues such as dysrhythmias and cardiac arrest.
3. Identify characteristics of electrical source to communicate to receiving facility (voltage, amperage, alternating current [AC] versus direct current [DC]).
4. Understand that deep tissue injury can be far greater than external appearance.
5. Have high index of suspicion for associated trauma due to patient being thrown.
6. Determine most appropriate destination for the patient as many will require Burn Center care and some may require Level 1 Trauma Center care.

II. PATIENT PRESENTATION

A. Inclusion Criteria

Exposure to electrical current (AC or DC).

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Verify scene is secure. The electrical source must be disabled prior to assessment.
2. Perform primary survey with specific focus on dysrhythmias or cardiac arrest. For ALS: Apply a continuous cardiac monitor and obtain 12-lead ECG as soon as feasible.
3. Identify all sites of burn injury. If the patient became part of the circuit, there will be an additional site near the contact with ground. Electrical burns are often full thickness and involve significant deep tissue damage; there may be multiple burn sites.
4. Assess for potential associated trauma and note if the patient was thrown from the contact point. If patient has altered mental status, assume trauma was involved and treat accordingly.

5. Assess for potential compartment syndrome from significant extremity tissue damage.

6. Determine characteristics of source if possible (AC or DC, voltage, amperage, time of injury).

B. Treatment and Interventions

1. Identify dysrhythmias or cardiac arrest; even patients who appear dead (particularly dilated pupils) may have good outcomes with prompt intervention.

2. Apply Spinal Motion Restriction (SMR) if associated trauma is suspected.

3. Apply dry dressing to any wounds.

4. Remove constricting clothing and jewelry since additional swelling is possible.

5. Administer IV fluids. Remember that external appearance will underestimate the degree of tissue injury, but that electrical injuries do not generally require as much fluid as thermal burn injuries. Some acid and alkali agents may manifest systemic effects.

6. Electrical injuries may be associated with significant pain, treat per Pain Management Protocol.

7. Electrical injury patients should be transported to a Burn Center whenever possible since these injuries can involve considerable tissue damage.

C. Patient Safety Considerations

1. Verify there is no additional threat to patient.

2. Shut off electrical power.

3. Move patient to shelter if electrical storm activity still in area.

VI. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Electrical current causes injury through three main mechanisms:

    a. Direct tissue damage, altering cell membrane resting potential and eliciting tetany in skeletal and/or cardiac muscles.
    b. Conversion of electrical energy into thermal energy causing massive tissue destruction and coagulative necrosis.
    c. Mechanical injury with direct trauma resulting from falls or violent muscle contraction.

2. Anticipate atrial and/or ventricular dysrhythmias as well as cardiac arrest.

3. 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 patient to let go of the electrical source.
      iv. AC is more likely to cause ventricular fibrillation while DC is more likely to cause asystole.
   c. The amount of current impacts mortality more than the voltage.

Current level (Milliamperes)	Probable Effect on Human Body of 120 V, 60 Hz AC for 1 second
1mA	Perception level. Slight tingling sensation. Still dangerous if wet conditions.
5mA	Slight shock felt; not painful but disturbing. Average individual can let go. However, strong involuntary reactions to shocks in this range may lead to injuries.
6mA–16mA	Painful shock, begin to lose muscular control. Commonly referred to as the freezing current or "let-go" range.
17mA–99mA	Extreme pain, respiratory arrest, severe muscular contractions. Individual cannot let go. Death is possible.
100mA–2000mA	Ventricular fibrillation (uneven, uncoordinated pumping of the heart). Muscular contraction and nerve damage begins to occur. Death is likely.
> **2,000mA**	Cardiac arrest, internal organ damage, and severe burns. Death is probable.
Source: *https://www.osha.gov/SLTC/etools/construction/electrical_incidents/eleccurrent.html*	

B. Pertinent Assessment Findings

1. Identification of potential trauma concomitant with electrical injury.

2. Presence of cardiac dysrhythmias.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Exertional Heat Stroke – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: December 6, 2023

EXERTIONAL HEAT STROKE (EHS) – BLS/ALS

I. PATIENT CARE GOALS

1. For the patient with Exertional Heat Stroke (EHS) the goals of care include rapid recognition, rapid assessment, rapid cooling, and rapid advanced care.

2. Rapid cessation of and reversal of hyperthermia through whole body cooling.

II. PATIENT PRESENTATION

Exertional Heat Stroke (EHS) is an emergent hyperthermic condition that occurs in individuals performing physical activity, typically in warm, humid environments, but can also occur with exertion or impaired heat dissipation in cool environments.

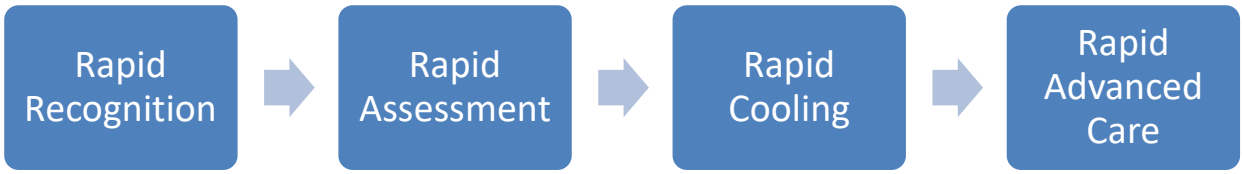
A. Inclusion Criteria

1. Exertional Heat Stroke is characterized by both:

   a. Severe hyperthermia (greater than 40.5 degrees C or 104.9 degrees F) AND
   b. End organ dysfunction, which is typically manifested as central nervous system (CNS) dysfunction.

III. PATIENT MANAGEMENT

A. Approach to the Patient With Exertional Heat Stroke (EHS)



1. Rapid Recognition

   a. Early recognition is critical to optimize treatment.
   b. Dispatcher input may guide triage and treatment of a potential EHS patient.
   c. EHS typically occurs in warm/humid environments in individuals performing strenuous and continuous exercise.
   d. EHS may also occur in cool environments in individuals performing intense exercise.
   e. Patients with EHS may present with CNS disturbances (confusion, irritability, or irrational behavior) which may progress to collapse or loss of consciousness.
   f. Lack of sweating or hot skin are not always present in EHS.

2. Rapid Assessment

    a. Mental status may range from mild disorientation to combative or comatose.
    b. Accurate measurement of internal core body temperature is necessary to determine EHS.
        i. If available, rectal temperature (with insertion depth 15 cm) is the most accurate method.
        ii. Rectal temperature is not within the EMS scope of practice in Region 11, but may be performed by other medical personnel on site.
        iii. Surface temperature readings including oral, tympanic, axillary, and temporal have been shown to be invalid.
    c. If rectal temperature is not available or difficult to obtain, cooling should not be delayed in cases of suspected EHS.

B. Treatment and Interventions

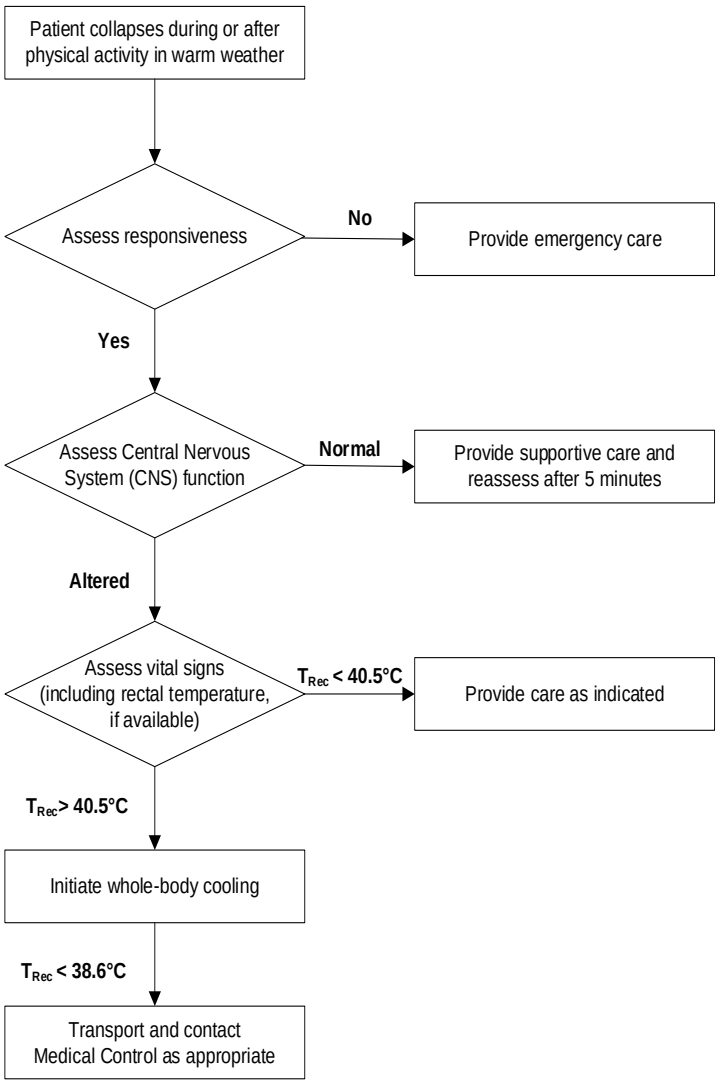
1. Rapid Cooling

    a. Rapid cooling within 30 minutes of collapse is optimal.
    b. External cooling methods should adequately cool when applied to a sufficient body surface area.
    c. If available, cold water immersion (CWI) should be performed.
    d. If CWI is not available, use other cooling methods such as continuously and alternating placing cold wet towels over a patient's body.
    e. If seizure, treat per Seizure Protocol.
    f. If nausea and/or vomiting, treat per Nausea/Vomiting Protocol.

2. Rapid Advanced Care

    a. For an EHS patient that is transported to the hospital – core temperature and mental status should be reassessed.
    b. Continued cooling and evaluation for end-organ damage may be needed in the hospital.

TREATMENT OF EXERTIONAL HEAT STROKE



C. Patient Safety Considerations

1. In situations where EHS is known or expected to occur, such as endurance/running races or sports practices, advanced planning is essential to ensure adequate staffing and access to the necessary supplies for cold water immersion (CWI) in order to allow for on-site cooling.

2. Regardless of the nature and locale of the EHS patient, the goal for treatment is to minimize the amount of time the individual is hyperthermic.

3. This underlies the principle “cool first, transport second”.

4. On site cooling may be in collaboration with other medical personnel at an event or sporting site.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. A collapsed athlete should be assessed for other causes of altered mental status including cardiac arrhythmia, electrolyte abnormalities (hyponatremia/hypernatremia), hypoglycemia, stroke, trauma, or anaphylaxis.

2. Point of care blood testing may be available for electrolyte analysis.

B. Pertinent Assessment Findings

1. Early and repeat assessment of patient's mental status and core temperature are extremely useful in determining response to therapy and the need for additional treatment.

2. Identification of other causes of the collapsed athlete.

3. Time of symptom onset and time of initiation of any treatment.

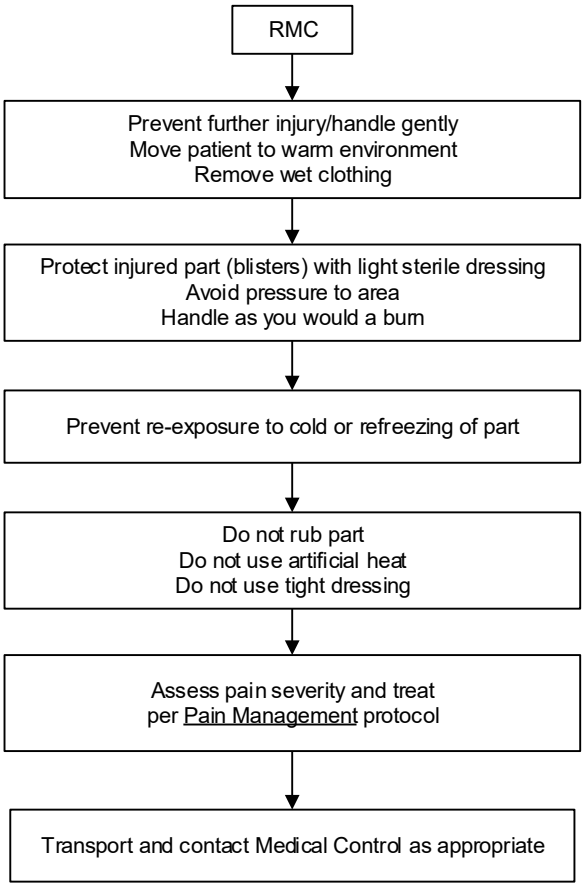
4. Response to therapy.

References

Luke N. Belval, Douglas J. Casa, William M. Adams, George T. Chiampas, Jolie C. Holschen, Yuri Hosokawa, John Jardine, Shawn F. Kane, Michele Labotz, Renée S. Lemieux, Kyle B. McClaine, Nathaniel S. Nye, Francis G. O'Connor, Bryan Prine, Neha P. Raukar, Michael S. Smith & Rebecca L. Stearns (2018). Consensus Statement- Prehospital Care of Exertional Heat Stroke, Prehospital Emergency Care, 22:3, 392-397, DOI: 10.1080/10903127.2017.1392666.

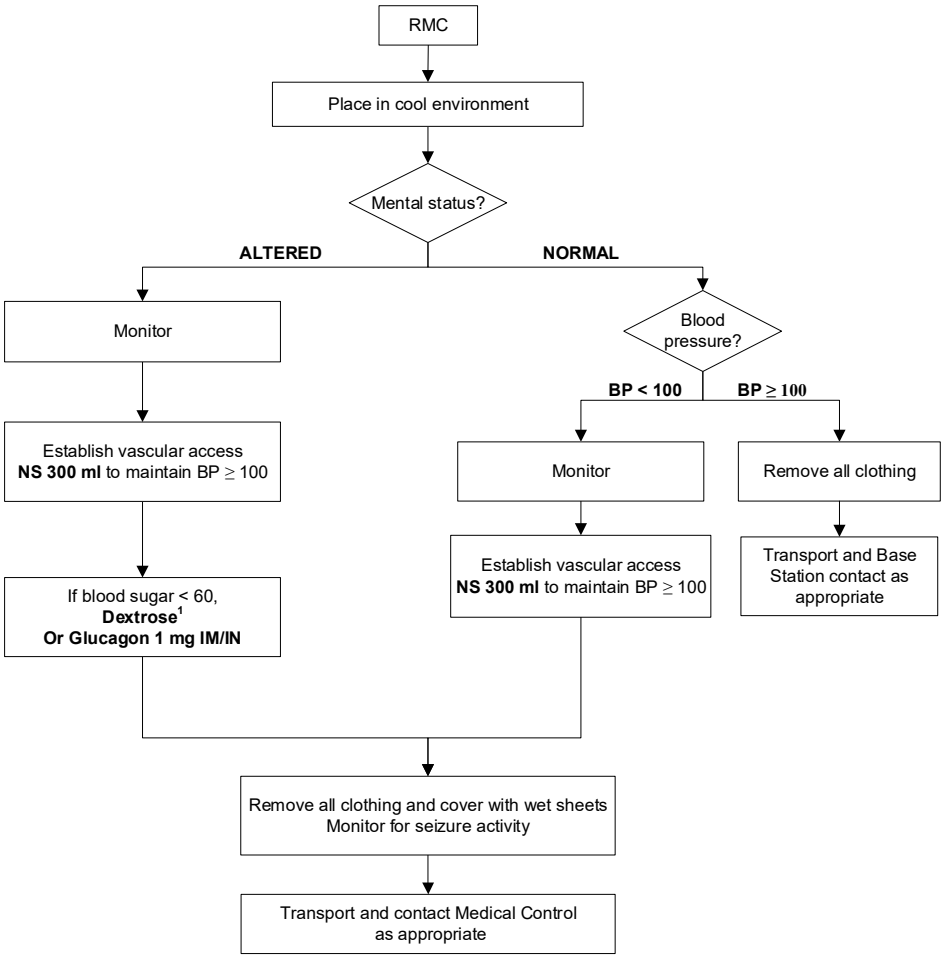
REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Frostbite - ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: November 1, 2019

FROSTBITE - ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Hyperthermia / Heat Exposure - ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

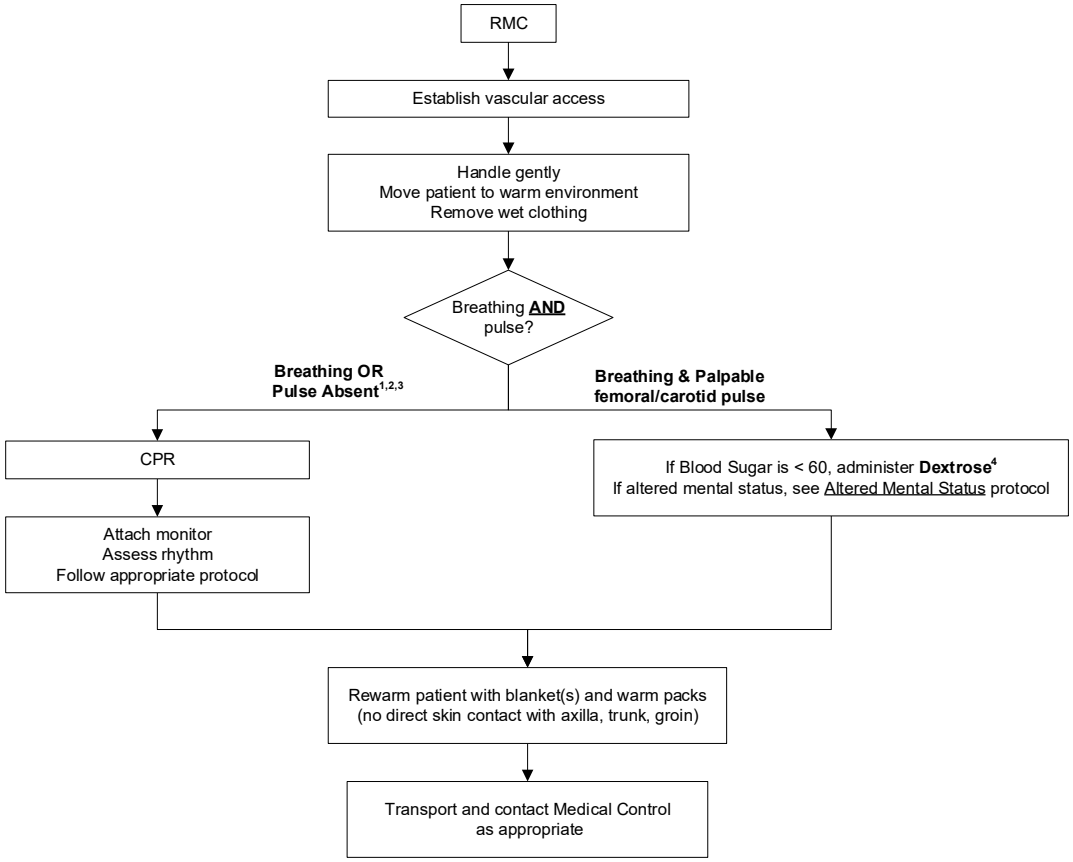
HYPERTHERMIA / HEAT EXPOSURE - ALS



1 - Dextrose 10% as 100ml boluses until mental status improves or BS > 60 to a maximum of 500ml

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Hypothermia / Cold Exposure - ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

HYPOTHERMIA / COLD EXPOSURE - ALS



1 - May present with altered sensorium or unconscious. Heart more susceptible to dysrhythmias. May have apnea, dusky or cyanotic appearance, fixed and dilated pupils; may appear without signs of life.
2 – An individual in a frozen state is not considered salvageable.
3 – The suspected hypothermic patient shall never be declared dead in the field.
4 - Dextrose 10% as 100ml boluses until mental status improves or BS > 60 to a maximum of 500ml

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Lightning Strike Injuries – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

LIGHTNING STRIKE INJURIES – BLS/ALS

I. PATIENT CARE GOALS

1. Identify patient(s) with lightning strike injuries.
2. Move to safe area.
3. Initiate immediate resuscitation of cardiac arrest patient(s), also known as "reverse triage".
4. For ALS: Cardiac monitoring during transport.
5. Treat associated traumatic injuries.

II. PATIENT PRESENTATION

A. Lightning strikes may happen in a variety of environmental conditions. Most commonly they occur in outdoor or wilderness circumstances. However, golf courses, exposed mountains or ledges, and farms/fields all present conditions that increase the risk of a lightning strike when hazardous meteorological conditions exist.

B. Lacking bystander observations or history, it is not always immediately apparent that the patient has been injured by a lightning strike. Subtle findings, such as injury patterns, might suggest a lightning injury.

C. Inclusion Criteria

Patients of all ages who have been injured by a lightning strike.

D. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Respiratory
    a. Apnea
    b. Agonal respirations
    c. Respiratory paralysis
2. Cardiovascular

a. Dysrhythmias
b. Transient hypertension

3. Neurologic

a. Seizures
b. Confusion
c. Paralysis
d. Paraplegia
e. Vertigo/dizziness
f. Paresthesia
g. Amnesia
h. Memory deficits
i. Anxiety
j. Fixed/dilated pupils possible (autonomic dysfunction)

4. Skin

a. Ferning or fern-like superficial skin burn ("Lichtenberg figures")
b. Vascular instability may result in cool, mottled extremities
c. Frequent first and/or second-degree burns
d. Third degree burns less common

5. Patient may be in cardiac arrest or have only respiratory arrest, as injury is a result of DC current.

6. May have stroke-like findings as a result of neurologic system effects.

7. May have secondary traumatic injury as a result of over pressurization, blast, or missile injury.

8. Fixed/dilated pupils may be a sign of neurologic system effects rather than a sign of death or impending death. Apply a cardiac monitor and initiate resuscitation in this patient population.

B. Treatment and Interventions

1. Assure patent airway. If in respiratory arrest, manage airway as appropriate.

2. If in cardiac arrest, treat per Cardiac Arrest Management Protocol.

3. For ALS: Consider IV initiation; avoid initiation through burned skin.

4. For ALS: Monitor ECG. Be alert for potential arrhythmias. Perform 12-lead ECG.

5. For ALS: Consider early pain management for burns or associated traumatic injury.

C. Patient Safety Considerations

1. Recognize that repeat strike is a risk. Patient and rescuer safety is paramount.

2. Patients do not carry or discharge a current, so the patient is safe to touch and treat.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Lightning strike cardiac arrest patients have a high rate of successful resuscitation, if initiated early.

2. There may be multiple patients.

3. If multiple patients, 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 with cardiac arrest from lightning strike initially have 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".
    d. It may not be immediately apparent that the patient has been injured by lightning strike.
    e. Injury pattern and secondary physical exam findings may be key in identifying the patient as injured by lightning strike.
    f. Lightning strike is a result of very high voltage, very short duration DC current exposure.

B. Pertinent Assessment Findings

1. Presence of thermal or non-thermal burns.

2. Evidence of trauma.

3. Evidence of focal neurologic deficits.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Radiation Exposure – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 15, 2024

RADIATION EXPOSURE – BLS/ALS

I. PATIENT CARE GOALS

1. Prioritize identification and treatment of immediately life-threatening medical conditions and traumatic injuries above any radiation-associated injury.

2. Identify and appropriately treat acute radiation injury.

3. Reduce risk for contamination of personnel while caring for patients potentially or known to be contaminated with radioactive material.

4. Activate HAZMAT response to evaluate any potential radiation exposure.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Patients who have been acutely exposed to ionizing radiation from accidental environmental release of a radioactive source.

2. Patients who have been acutely exposed to ionizing radiation from a non-accidental environmental release of a radioactive source.

3. Patients who have been contaminated with material emitting ionizing radiation.

B. Exclusion Criteria

1. Patients exposed to normal doses of ionizing radiation from medical imaging studies.

2. Patients exposed to normal doses of ionizing radiation from therapeutic medical procedures.

III. PATIENT MANAGEMENT

A. Assessment

1. 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. Identification and treatment of life-threatening injuries and medical problems takes priority over decontamination.

3. Do not eat or drink any food or beverages while caring for patients with radiation injuries until screening completed for contamination and appropriate decontamination, if needed.
4. Use caution to avoid dispersing contaminated materials.

5. Provide appropriate condition-specific care for any immediately life-threatening injuries or medical problems.

B. Treatment and Interventions

1. If patient experiences nausea, vomiting, and/or diarrhea:

   a. Provide care, per Nausea and Vomiting Protocol.
   b. Document the time gastrointestinal symptoms started.

2. If seizure occurs:

   a. Consider a primary medical cause or exposure to possible chemical agents unless indicators for a large whole-body radiation dose (greater than 20 Gy (Gray), such as rapid onset of vomiting, are present.
   b. Treat per Seizure – ALS Protocol.

C. Patient Safety Considerations

1. Treat life-threatening medical problems and traumatic injuries prior to assessing for and treating radiation injuries or performing decontamination.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Irradiated patients pose no threat to EMS clinicians.

2. Contaminated patients pose very little threat to EMS clinicians who use appropriate PPE including N95 masks or respirators, gloves, gowns, and face and eye protection.

3. Sources of radiation:

   a. Legal
      i. Industrial plants
      ii. Healthcare facilities that provide radiologic services
      iii. Nuclear power plants
      iv. Mobile engineering sources (i.e., construction sites that are installing cement)
   b. Illegal
      i. Weapons of mass destruction

ii. "Dirty bomb" designed to contaminate widespread areas

4. Physiology of radiation poisoning:
   a. Contamination: Material emitting radiation is present on clothing, body surface, or inside the body.
   b. Exposure: Radiation waves or particles transfer energy to the bodily tissues of the patient, which can result in damage to tissues and organs.

5. Common types of radioactivity that cause poisoning:

   a. Gamma rays, X-rays
      i. Electromagnetic radiation (photons)
      ii. Penetrates the skin deeply
      iii. Can damage internal organs
   b. Beta particles:
      i. Free electrons
      ii. Relatively small and light particles
      iii. Can penetrate 1-2cm of skin
   c. Alpha particles
      i. Relatively large and heavy
      ii. Cannot penetrate intact skin
      iii. Dangerous only if alpha emitter is ingested or inhaled
   d. Neutrons
      i. Uncharged particles
      ii. Very penetrating
      iii. Released only by certain radioactive materials such as uranium and plutonium used in nuclear reactors and nuclear weapons

6. In general, trauma patients who have been exposed to, or contaminated by, radiation should be triaged and treated based on the severity of their conventional injuries.

7. A patient who is contaminated with radioactive material (i.e., flecks of radioactive material embedded in their clothing and skin) generally poses a minimal exposure risk to medical personnel. Radioactive contamination is generally in the form of dust, and can be temporarily controlled by removing contaminated clothing, covering contaminated areas of skin with a dressing, and using a sheet to cover the patient.

8. EMS clinicians may be asked to assist public health agencies in the distribution and administration of potassium iodide in a mass casualty incident involving release of radioactive iodine (nuclear reactor breach or nuclear weapon detonation).

9. Stages of radiation sickness:

   a. Prodromal: Due to acute inflammation. Nausea, vomiting, diarrhea, fatigue, fever, , starting hours up to 4 days after initial exposure.

b. Latent: May last up to four weeks. Acute inflammation subsides, damage or organs may be progressing as damaged cells cannot reproduce.
c. Manifest illness: Patient is at risk for infection and bleeding due to immune compromise, leading to fever, sepsis, weakness. May have bloody diarrhea, fluid losses and infection due to loss of intestinal lining.
d. Recovery: May take weeks to months

B. Pertinent Assessment Findings

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

2. Time to nausea and vomiting is an indicator of the received dose of ionizing radiation. The more rapid the onset of vomiting, the higher the whole-body dose of radiation.

3. Tissue burns are a late finding (weeks following exposure) of ionizing radiation injury. If immediate burns are present, they are from a thermal or chemical mechanism.

4. Loss of consciousness may suggest acute radiation syndrome if accompanied by vomiting within minutes of exposure. If other clinical indicators do not suggest a whole-body dose of greater than 10 Gy, consider other causes of syncope.

5. Delayed symptoms (days to weeks after exposure or contamination):

    a. Skin burns with direct contact with radioactive source
    b. Skin burns or erythema from ionizing radiation
    c. Fever
    d. Bone marrow suppression presenting as:
        i. Immunosuppression
        ii. Petechiae
        iii. Spontaneous internal and external bleeding

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Riot Control Agents – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: August 15, 2024

RIOT CONTROL AGENTS – BLS/ALS

I. PATIENT CARE GOALS

1. Address side effects of exposed individuals.
2. Decontamination of affected individuals.
3. Minimize effect to EMS clinician.

II. PATIENT PRESENTATION

Riot control agents may include chemical crowd control agents, harassing agents, lacrimators, oleoresin capsicum (OC, pepper spray), 2-Chloroacetophenone (CN, Mace®), incapacitating agents, o-chlorobenzylidene, malononitrile (CS), and tear gas.

A. Inclusion Criteria

Exposure to identifiable agents that are not intended to cause significant injury or fatality.

B. Exclusion Criteria

1. Exposure to chlorine, phosgene, ammonia, or other agents that are intended to cause significant injury or fatality (Refer to Chemical Airway Respiratory Irritant Protocol).
2. Exposure to an unknown agent.

III. PATIENT MANAGEMENT

A. Assessment

1. Assess scene safety; evaluate for hazards to EMS personnel, patient, bystanders.
    a. Determine riot control agent being used.
    b. Don appropriate PPE.
    c. Determine number of patients.
2. Note symptoms exhibited by the exposed individual(s).
3. Provide assessment as appropriate to complaints.

B. Treatment and Interventions

1. Move affected individual(s) from contaminated environment into fresh air, if possible.

2. Remove contaminated clothing as able.

3. Have patient remove contact lenses, if appropriate.

4. Irrigation with water or saline may facilitate resolution of symptoms and is recommended for decontamination of dermal and ocular exposure.

5. Chemical irritant spray decontamination wipes (such as Sudecon) can be used on the affected skin and eyes, as available.

6. Irrigation with baby shampoo may be used but studies have shown this provides no better relief of symptoms than irrigation with water alone.

7. If patient is hypoxic, apply oxygen as indicated.

8. If patient is wheezing, see Bronchospasm Protocol.

9. For persistent pain of the eye or skin, see Topical Chemical Burn Protocol.

10. Exposed individuals who are persistently symptomatic warrant further evaluation and treatment.

C. Patient Safety Considerations

1. Toxicity is related to duration of exposure and concentration of agent used (exposure in non- ventilated space).

2. Patients with pre-existing pulmonary conditions (e.g., asthma, COPD) may be prone to more severe respiratory effects.

3. Traumatic injury may result when exposed individuals are in proximity to the device used to disperse the riot control agent (e.g., hose/stream under pressure, riot control agent projectile, grenade).

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. CN (Mace), CS, and OC are the most encountered riot control agents.

2. CN (Mace), CS, and OC have a high safety ratio. All three have a high median lethal concentration (LCt50) and a low median effective concentration (ECt50).

3. Toxicity is related to time of exposure and concentration of agent used (exposure in non-ventilated space).

4. Symptoms that may be experienced after exposure:

    a. Eyes: Tearing, pain, conjunctivitis, blurred vision
    b. Nose/mouth/throat: Rhinorrhea, burning/pain, trouble swallowing, drooling
    c. Lungs: Chest tightness, coughing, choking sensation, wheezing, dyspnea
    d. Skin: Burning, redness, dermatitis
    e. GI: Nausea and vomiting are rare and may be post-tussive

5. Symptoms begin within seconds of exposure, are self-limited, and are best treated by removing patient from ongoing exposure. Symptoms frequently decrease over time (15– 45 minutes) after exposure ends.

B. Pertinent Assessment Findings

1. Riot control agent used

2. Symptoms of exposed

3. Lung sounds

4. Evidence of other traumatic injuries

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Topical Chemical Burn – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

TOPICAL CHEMICAL BURN – BLS/ALS

I. PATIENT CARE GOALS

1. Rapid recognition of a topical chemical burn and initiation of appropriate intervention.
2. Transport of significant topical chemical burn to a Burn Center.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Patients of all ages who have sustained exposure to a chemical that can cause a topical chemical burn which may develop immediate, or in some cases a delayed, clinical presentation.
2. Agents that are known to cause chemical burns include alkalis, acids, organic compounds, or vesicant chemical agents.

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Assessment

1. Apply appropriate personal protective equipment (PPE).
2. Remove the patient's clothing, if necessary. Contaminated clothing should preferably be placed in double bags.
3. Clinical effects and severity of a topical chemical burn is dependent upon:
    a. Class of agent (alkali injury or acid injury)
    b. Concentration of the chemical (higher concentration, greater the risk of injury)
    c. pH of the chemical
        i. Alkali: Increased risk with pH greater than or equal to 11
        ii. Acid: Increased risk with pH less than or equal to 3
    d. Onset of burn
        i. Immediate
        ii. Delayed (e.g., hydrofluoric acid)
4. Calculate the estimated total body surface area that is involved.

5. Prevent further contamination.

6. Assess for ocular or oropharyngeal exposure; evaluate for airway compromise secondary to spasm or direct injury associated with oropharyngeal burns.

7. Some acid and alkali agents may manifest systemic effects.

B. Treatment and Interventions

1. If dry chemical contamination, carefully brush off solid chemical prior to flushing the site as the irrigating solution may activate a chemical reaction.

2. If wet chemical contamination, flush the patient's skin (and eyes, if involved) with copious amounts of water or normal saline.

3. Provide adequate analgesia per the Pain Management Protocol.

4. For eye exposure, administer continuous flushing of irrigation fluid to eye.

5. Assess the need for airway management if there is airway compromise or bronchospasm associated with oropharyngeal burns.

6. Take measures to minimize hypothermia.

7. Initiate intravenous fluid resuscitation if necessary to obtain hemodynamic stability.

C. Special Treatment Considerations

1. Hydrofluoric Acid (HF)

   A highly corrosive substance that is primarily used for automotive cleaning products, rust removal, porcelain cleaners, etching glass, cleaning cement or brick, or as a pickling agent to remove impurities from various forms of steel. Hydrofluoric acid readily penetrates intact skin and there may cause underlying tissue injury. It is unlikely that low concentrations of hydrofluoric acid will cause an immediate acid-like burn, however there may be delayed onset of pain to the exposed area. Higher concentrations of hydrofluoric acid may cause immediate pain as well as more of a burn appearance that can range from mild erythema to an obvious burn. An oral or large dermal exposure can result in significant systemic hypocalcemia with possible QT prolongation and cardiovascular collapse.

   For all patients in whom a hydrofluoric acid exposure is confirmed or suspected:

   a. Vigorously irrigate all affected areas with water or normal saline for a minimum of 15 minutes.
   b. Apply a cardiac monitor for oral or large dermal hydrofluoric acid exposures.

c. Hydrofluoric acid exposure is very painful. Hydrofluoric acid exposure typically causes pain out of proportion to the visible dermal effects. Minimal skin changes may exist with substantial exposures.
d. For patients who have ingested hydrofluoric acid or who have a large dermal exposure consider administration of intravenous calcium chloride, 1 gram of 10% solution, as symptomatic hypocalcemia can precipitate rapidly as manifest by muscle spasms, seizures, hypotension, ventricular arrhythmias, and QT prolongation.

D. Patient Safety Considerations

1. Take measures to prevent the patient from further contamination through decontamination.

2. Take measures to protect EMS personnel and others from contamination.

3. Information regarding the chemical should be gathered while on scene including the Safety Data Sheet (SDS), if available.

4. Communicate all data regarding the chemical to the receiving facility.

5. Do not attempt to neutralize an acid with an alkali or an alkali with an acid as an exothermic reaction will occur and cause serious thermal injury to the patient.

6. Transport to a Burn Center should be considered for chemical burns that involve a significant percentage of total body surface area or burns that involve the eyes, face, hands, feet, or genitals.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. IV fluid resuscitation should be guided by patient age for a significant burn. If the patient is not in shock, begin initial fluid rates for the prehospital setting:

   a. ≤ 5 years old: 125 ml normal saline per hour
   b. 6-12 years old: 250 ml normal saline per hour
   c. ≥ 13 years of age and older: 500 ml normal saline per hour

2. Since the **severity of topical chemical burns is largely dependent upon the type, concentration, and pH of the chemical involved** as well as the body site and surface area involved, it is imperative to obtain as much information as possible while on scene about the chemical substance by which the patient was exposed. The information gathering process will often include:

   a. Transport of a sealed container of the chemical to the receiving facility;

b. Transport of the original or a copy of the Safety Data Sheet (SDS) of the substance to the receiving facility;
c. Contacting the reference agency to identify the chemical agent and assist in management (e.g., CHEMTREC®).

3. Inhalation of hydrofluoric acid should be considered in any dermal exposure involving the face and neck or if clothing is soaked in the product.

4. Decontamination is critical for both acid and alkali agents to reduce injury. Removal of chemicals with a low pH (acids) is more easily accomplished than chemicals with a high pH (alkalis) because alkalis tend to penetrate and bind to deeper tissues.

5. Some chemicals will also manifest local and systemic signs, symptoms, and bodily damage.

B. Pertinent Assessment Findings

1. An estimate of the total body surface area that is involved.

2. Patient response to therapeutic interventions.

3. Patient response to fluid resuscitation.

4. Patient response to analgesia.

REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

TRAUMA

General Trauma Management
Blast Injury
Crush Injury
Extremity Trauma / External Hemorrhage Management
Facial / Dental Trauma
Head Injury
High Threat Considerations
Spinal Care
Traumatic Arrest

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: General Trauma Management – BLS/AS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

GENERAL TRAUMA MANAGEMENT – BLS/ALS

I. PATIENT CARE GOALS

1. Rapid assessment and management of life-threatening injuries.
2. Safe movement of patient to prevent worsening of injury severity.
3. Rapid and safe transport to the appropriate level of trauma care.

II. PATIENT MANAGEMENT

A. Initial Assessment

1. Primary Survey using the “MARCH” algorithm.

    a. Massive Hemorrhage
        i. Initial visual and body sweep to assess for penetrating wounds and severe life-threatening hemorrhage (see Extremity Trauma/External Hemorrhage Management Protocol).

    b. Airway

        i. Assess airway patency by asking the patient basic questions to assess stridor and ease of air movement.
        ii. 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.
        iii. Evaluate mental status for ability to protect airway (patients with a GCS less than or equal to 8 are likely to require airway support).

    c. Respiratory/Breathing

        i. Assess respiratory rate and pattern.
        ii. Assess for tracheal deviation.
        iii. Assess symmetry of chest wall movement.
        iv. Listen bilaterally on lateral chest wall for breath sounds.

    d. Circulation

        i. Assess blood pressure and heart rate.
        ii. Assess for signs of hemorrhagic shock including tachycardia, hypotension, pale, cool clammy skin, or capillary refill greater than 2 seconds.

    e. Head Injury/Hypothermia

i. Perform initial neurologic status assessment of GCS/AVPU (Alert, Verbal, Painful, Unconscious) and pupillary size and responsiveness. See Appendix 1 for Neurologic Status Assessment.
ii. Assess gross motor movement of extremities.
iii. Evaluate for clinical signs of traumatic brain injury with herniation including:
- Unequal pupils
- Lateralizing motor signs
- Posturing

iv. Prevent hypothermia.

B. Immediate Treatment and Interventions

1. Massive or exsanguinating hemorrhage control

a. First stop severe external and extremity hemorrhage with pressure dressing, extremity tourniquets, or appropriate wound packing with hemostatic gauze (see Extremity Trauma/External Hemorrhage Management Protocol).
b. Be sure to roll the patient and examine the back as well.

2. Airway

a. If airway compromise or altered mental status resulting in inability to maintain airway patency, immediately ensure airway patency per the Airway Management Protocol and Spinal Care Protocol.
b. Consider airway adjuncts as appropriate avoiding nasal airway adjuncts in patients with significant facial injury.
c. If impending airway obstruction or altered mental status resulting in inability to maintain airway patency, secure definitive airway.

3. Respiratory/Breathing

a. If absent or diminished breath sounds in a hypotensive patient with chest trauma and respiratory distress and/or tracheal deviation, consider tension pneumothorax and perform Needle (Pleural) Decompression Procedure.
b. For open chest wound, place chest seal.
c. Monitor oxygen saturation and, if indicated, provide supplemental oxygen to maintain saturation above 94% and respiratory support if needed.

4. Circulation

a. If pelvis is unstable and patient is hypotensive, place sheet to stabilize pelvis.
b. Establish IV access.
c. Fluid resuscitation:
   i. Adults
      - If SBP greater than 90 mmHg and the heart rate is less than 120 beats per minute, no IV fluids required.

- If SBP less than 90 mmHg or the heart rate is greater than 120 beats per minute, administer 500 ml bolus of IV fluids and reassess.
- Trauma resuscitation target SBP 90 mmHg (palpable radial pulse or alert mental status).
- Head injury target SBP greater than 110 mmHg. Hypotension should be avoided to maintain cerebral perfusion.
- Reassess SBP after bolus given.

ii. Pediatrics
- If child demonstrates tachycardia for age with signs of poor perfusion (low blood pressure, greater than 2 second capillary refill, altered mental status, hypoxia, weak pulses, pallor, or mottled/cool skin), give 20 ml/kg crystalloid bolus and reassess.
- Target normal BP for age (see Pediatric Initial Assessment Protocol).

d. Tranexamic Acid (TXA) may be considered within three hours of injury and signs of hemorrhagic shock.

5. Disability/Head/Hypothermia

a. If clinical signs of traumatic brain injury, see Head Trauma Protocol.
b. Avoid or treat hypothermia:
   i. Remove wet clothing.
   ii. Cover patient to warm and prevent further heat loss.

6. **NOTE**: Patients with major hemorrhage, hemodynamic instability, penetrating torso trauma, or signs of traumatic brain injury often require rapid surgical intervention. Minimize scene time (goal is under 10 minutes) and initiate rapid transport to a Level 1 Trauma Center or Level 1 Pediatric Trauma Center.

7. Repeat primary assessment or secondary assessment should be conducted enroute to the trauma center.

8. Decisions regarding transport destination should be based on the Region 11 Trauma Field Triage Criteria Policy.

C. Secondary Assessment, Treatment, and Interventions

1. Assessment

a. Obtain medical history from patient or family including:
   i. Allergies
   ii. Medications
   iii. Past medical and surgical history
   iv. Events leading up to the injury

2. Secondary Survey: Head to toe physical exam including re-assessment of interventions from primary survey.

    a. Head/Face
        i. Palpate head, scalp and face and evaluate for soft tissue injury or bony crepitus.
        ii. Assess for globe injury and subjective changes in vision.
        iii. See Facial/Dental Trauma Protocol.

    b. Neck
        i. Check for:
            - Contusions
            - Abrasions
            - Hematomas
            - Jugular Vein Distension (JVD)
            - Tracheal deviation
        ii. Palpate for crepitus.
        iii. Spinal assessment per the Spinal Care Protocol.

    c. Chest
        i. Palpate for instability/crepitus.
        ii. Listen to breath sounds.
        iii. Inspect for penetrating or soft tissue injuries.

    d. Abdomen
        i. Palpate for tenderness.
        ii. Inspect for penetrating or soft tissue injuries.
        iii. Any intra-abdominal organs visible (evisceration) should be covered with saline soaked dressing and then covered with occlusive dry or plastic dressing.

    e. Pelvis
        i. Inspect for penetrating or soft tissue injuries.
        ii. Palpate once for instability by applying medial pressure on the iliac crests bilaterally.

    f. Back
        i. Maintain spinal alignment. Refer to Spinal Care Protocol.
        ii. Inspect for penetrating or soft tissue injuries.

    g. Neurologic Status Assessment
        i. Serial assessment of mental status.
        ii. Gross exam of motor strength and sensation in all four extremities.

    h. Extremities
        i. Assess for fracture/deformity and splint as indicated by the Extremity Trauma/External Hemorrhage Management Protocol.

ii. Assess peripheral pulses/capillary refill.

3. Additional treatment considerations

   a. Maintain spine precautions per the Spinal Care Protocol.
   b. Provide pain medication per the Pain Management Protocol.
   c. Pregnant patients at greater than 20 weeks of estimated gestational age should be placed with their right side elevated 15 degrees (left side down) to relieve pressure on the great vessels, preventing supine hypotension and subsequent significant loss of preload and cardiac output.
   d. Traumatic cardiac arrest patients should be assessed for signs of life including respirations, pulse, and spontaneous movement. If there are no signs of life, the cardiac monitor should be applied. Asystolic patients may have resuscitation withheld. If there is cardiac activity or signs of life, resuscitation should be initiated with transport to the closest Level 1 Trauma Center (see Determination of Death/Withholding of Resuscitative Measures Policy).

D. Patient Safety Considerations

1. 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.

2. Monitor patient for deterioration over time with serial vital signs and repeat neurologic status assessment.

   a. Patients with compensated shock may not manifest hypotension until severe blood loss has occurred.
   b. Patients with traumatic brain injury may deteriorate as intracranial swelling and hemorrhage increase.

3. Anticipate potential for progressive airway compromise in patients with trauma to the head and neck.

III. NOTES/EDUCATIONAL PEARLS

A. Optimal trauma care requires a structured approach to the patient emphasizing first control of massive hemorrhage using MARCH (Massive Hemorrhage, Airway, Respiratory/Breathing, Circulation, Head Injury/Hypothermia).

B. Target scene time less than 10 minutes for unstable patients or those likely to need surgical intervention.

C. Frequent reassessment of the patient is important.

1. If patient develops difficulty with ventilation, reassess breath sounds for development of tension pneumothorax.

2. If extremity hemorrhage is controlled with pressure dressing or tourniquet, reassess for evidence of continued hemorrhage.

3. If mental status declines, reassess ABCs and repeat neurologic status assessment.

APPENDIX 1 - Neurologic Status Assessment

Neurological status assessment involves establishing a baseline and then trending any change in patient neurological status. Glasgow Coma Scale (GCS) or AVPU may be used for this.

Glasgow Coma Score

	Points	Pediatric	Adult
Eyes	1	No eye opening	
	2	Eye opening to pain	
	3	Eye opening to verbal	
	4	Eyes open spontaneously	
Verbal	1	No vocalization	No verbal response
	2	Inconsolable, agitated	Incomprehensible sounds
	3	Inconsistently consolable, moaning	Inappropriate words
	4	Cries but consolable, inappropriate interactions	Confused
	5	Smiles, oriented to sounds, follows objects, interacts	Oriented
Motor	1	No motor response	
	2	Extension to pain	
	3	Flexion to pain	
	4	Withdraws from pain	
	5	Localizes pain	
	6	Obeys commands	

AVPU

A: The patients is alert

V: The patient responds to verbal stimulus

P: The patient responds to painful stimulus

U: The patient is completely unresponsive

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Blast Injury – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

BLAST INJURY – BLS/ALS

I. PATIENT CARE GOALS

1. Maintain patient and clinician safety by identifying ongoing threats at the scene of an explosion.

2. Identify multi-system injuries, which may result from a blast, including possible toxic contamination.

3. Prioritize treatment of multi-system injuries to minimize patient morbidity.

II. PATIENT MANAGEMENT

A. Assessment

1. Hemorrhage Control

    a. Assess for and stop severe hemorrhage (per Extremity Trauma/External Hemorrhage Management Protocol).

2. Airway

    a. Assess airway patency.
    b. Consider possible thermal or chemical burns to airway.

3. Breathing

    a. Evaluate adequacy of respiratory effort, oxygenation, quality of lung sounds, and chest wall integrity.
    b. Consider possible pneumothorax or tension pneumothorax (as a result of penetrating/blunt trauma or barotrauma).
    c. Continually reassess for blast lung injury.

4. Circulation

    a. Look for evidence of external hemorrhage.
    b. Assess blood pressure, pulse, skin color/character, and distal capillary refill for signs of shock.

5. Disability

    a. Assess patient responsiveness (AVPU) and level of consciousness (GCS).
    b. Assess pupils.
    c. Assess gross motor movement and sensation of extremities.

6. Exposure

    a. Rapid evaluation of entire skin surface, including back (log roll), to identify blunt or penetrating injuries.

B. Treatment and Interventions

1. Hemorrhage Control:

    a. Control any severe external hemorrhage (per Extremity Trauma/External Hemorrhage Management Protocol).

2. Airway:

    a. Manage airway, utilizing airway maneuvers, airway adjuncts, supraglottic device, or endotracheal tube (per Airway Management Protocol).
    b. If thermal or chemical burn to airway is suspected, early airway management is vital.

3. Breathing:

    a. Administer oxygen as appropriate with a target of achieving 94-98% saturation.
    b. Assist respirations as needed.
    c. Cover any open chest wounds with chest seal.
    d. If absent or diminished breath sounds in a hypotensive patient with chest trauma and respiratory distress and/or tracheal deviation, consider tension pneumothorax and perform Needle (Pleural) Decompression Procedure.

4. Circulation:

    a. Establish IV access:
        i. Administer resuscitative fluids as needed, per the General Trauma Management Protocol;
        ii. If patient is burned, administer fluid per the Burn Protocol.

5. Disability:

    a. If evidence of head injury, treat per the Head Injury Protocol.
    b. Apply spinal precautions, per the Spinal Care Protocol.
    c. Monitor GCS during transport to assess for changes.

6. Exposure:

    a. Keep patient warm to prevent hypothermia.

C. Patient Safety Considerations

1. Ensuring scene safety is especially important at the scene of an explosion.

    a. Always consider the possibility of subsequent explosion
    b. Structural safety, possible toxic chemical contamination, the presence of noxious gasses, and other hazards might cause a delay in patient extrication.
    c. In a possible terrorist event, consider the possibility of secondary explosive devices.

2. Remove patient from the scene as soon as is practical and safe.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Scene safety is of paramount importance when responding to an explosion or blast injury.

2. Patients sustaining blast injury may sustain complex, multi-system injuries including: blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure.

3. Consideration of inhalational injury should prompt early airway management.

4. 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.
    c. Blast injuries to lung or bowel can take time to manifest, asymptomatic patients can develop symptoms with time.

5. Transport to a Level 1 Trauma Center for combined trauma with burn injuries.

B. Pertinent Assessment Findings

1. Evidence of multi-system trauma, especially:

    a. Airway injury/burn
    b. Barotrauma to lungs
    c. Toxic chemical contamination

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Crush Injury – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

CRUSH INJURY – BLS/ALS

I. PATIENT CARE GOALS

1. Recognizing traumatic crush injury mechanism.

2. Minimize systemic effects of the crush syndrome such as rhabdomyolysis, hyperkalemia, acute kidney injury.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Traumatic crush mechanism of injury

2. Non-traumatic injuries that may cause compartment syndrome include prolonged immobilization, prolonged compression of the torso/limbs, electrical injury, or burns.

III. PATIENT MANAGEMENT

A. Assessment

1. Identify and manage any severe external hemorrhage.

2. Assess airway, breathing, and circulation.

3. Evaluate for additional injury (e.g. fractures, solid organ damage, or spinal injury).

4. Monitor for development of compartment syndrome (pain out of proportion to clinical exam, tense swelling, pain with passive stretch, muscle weakness, absent pulses, parasthesias).

B. Treatment and Interventions

1. The treatment of crushed patients should begin as soon as they are discovered.

2. If severe hemorrhage is present, manage per Extremity Trauma/External Hemorrhage Management Protocol.

3. Administer oxygen as needed to maintain an oxygen saturation of > 94%.

4. Establish IV access. IV fluids should be administered prior to releasing the crushed body part but should not delay extrication. Administer 1000 ml normal saline bolus or 20 ml/kg for pediatric patients. Crush injury without adequate fluid resuscitation develops into crush syndrome.

5. For significant crush injuries or prolonged entrapment of an extremity, administer sodium bicarbonate 1 mEq/kg (maximum dose of 50 mEq) slow IV push.

6. Attach cardiac monitor. Obtain/interpret 12-lead ECG, if available. Carefully monitor for dysrhythmias or signs of hyperkalemia (elevated potassium) before and immediately after release of pressure and during transport (e.g., peaked T waves, wide QRS, lengthening QT interval, loss of P wave).

7. For pain control, consider analgesics per Pain Management Protocol.

8. Consider the following post extrication:

   a. Continued resuscitation with normal saline (500-1000 ml/hr for adults,10 ml/kg/hr for children).
   b. If ECG suggestive of hyperkalemia, administer:
      i. Calcium chloride – 1 gm IV/IO slow IV push.
   c. If not already administered, for significant crush injuries with ECG suggestive of hyperkalemia, administer sodium bicarbonate 1 mEq /kg (max dose of 50 mEq) slow IV push.
   d. If ECG suggestive of hyperkalemia, consider albuterol 5 mg via nebulizer.

C. Patient Safety Considerations

1. Scene safety for both rescuers and patients is of paramount importance.

IV. NOTES/EDUCATIONAL PEARLS

A. Causes of mortality in untreated Crush Syndrome:

1. Immediate

   a. Severe head injury
   b. Traumatic asphyxia
   c. Torso injury with damage to intrathoracic or intra-abdominal organs

2. Early

   a. Sudden release of a crushed extremity may result in reperfusion syndrome (acute hypovolemia, electrolyte abnormalities, and subsequent lethal arrhythmia)
   b. Hyperkalemia (potassium is released from injured muscle cells)
   c. Hypovolemia/shock

3. Late

   a. Renal failure (from release of toxins from injured muscle cells)

b. Coagulopathy and hemorrhage
c. Sepsis

B. Key Considerations

1. Rapid extrication and evacuation to a definitive care facility (Level 1 Trauma Center).

2. A patient with a crush injury may initially present with very few signs and symptoms. Maintain a high index of suspicion for any patient with a compressive mechanism of injury.

3. 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, prolonged QTc, or sine wave. Continue fluid resuscitation through extrication and transfer to hospital.

C. Pertinent Assessment Findings

1. Mental status/GCS.

2. Evaluation for fractures and potential compartment syndrome development (neurovascular status of injured extremity).

3. Examination of spine.

4. Evidence of additional trauma, potentially masked by with other painful injuries.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Extremity Trauma / External Hemorrhage Management – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT – BLS/ALS

I. PATIENT CARE GOALS

1. Minimize blood loss from extremity hemorrhage.
2. Avoid hemorrhagic shock due to extremity hemorrhage.
3. Minimize pain and further injury due to fractures, dislocations, or soft-tissue injuries.

II. PATIENT MANAGEMENT

A. Assessment

1. Assess degree of external bleeding from extremity or blood loss.
2. Vascular status of extremity
    a. Pallor
    b. Pulse
    c. Capillary refill and skin temperature
3. Evaluate for obvious deformity, shortening, rotation, or instability.
4. Neurologic status of extremity
    a. Sensation to touch
    b. Distal movement of extremity

B. Treatment and Interventions (see Prehospital External Hemorrhage Control diagram below)

1. 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. If the bleeding site is amenable to tourniquet placement, apply tourniquet to extremity (see Hemorrhage Control Procedure)
            - Tourniquet should be placed 2-3 inches proximal to wound, not over a joint, and tightened until bleeding stops and distal pulse is eliminated.
            - If bleeding continues, place a second tourniquet proximal to the first.

   ii. If the bleeding site is not amenable to tourniquet placement (i.e. junctional injury), pack wound tightly with a hemostatic gauze and apply direct pressure.
c. Wound packing
   i. Indications: Groin/axillary injury ("junctional") injury or any limb wound with persistent bleeding despite direct pressure and/or application of a tourniquet.
   ii. Materials: Hemostatic gauze, regular gauze, or any available material iii.
   iii. Procedure: Pack tightly and fully to the depth of the wound until bleeding stops (may require significant packing for deep, large wounds), then apply direct pressure and/or pressure dressing; do not remove packing to assess bleeding.
d. Consider tranexamic acid (TXA) for injury associated with hemorrhagic shock if within three hours of injury.

2. Manage pain (see Pain Management Protocol)

   a. Pain management should be strongly considered for patients with tourniquets and suspected fractures.
   b. Do not loosen tourniquet to relieve pain.

3. 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 and reassess perfusion status.
   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/cold 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.
   g. Dress open wounds associated with fractures with saline-moistened gauze.

4. Amputations

   a. Amputated body parts should be transported with patient for possible re-implantation.
   b. Amputated parts should be covered with dry gauze.
   c. Place the amputated part in a plastic bag.
   d. Place the bag with the amputated part on ice in a second bag.
   e. Do not let the amputated part come into direct contact with the ice.
   f. The stump should be covered with saline moistened gauze.

5. Remove wet or blood-soaked clothing and use measures to prevent heat loss.

6. Remove jewelry and potentially constricting clothing from the injured limb.

7. Do not remove impaled foreign bodies.

C. Patient Safety Considerations

1. If tourniquet is placed:

    a. Ensure that the tourniquet is sufficiently tight to occlude the distal pulse.
    b. Ensure that the tourniquet is well marked and visible and that all subsequent clinicians are aware of the presence of the tourniquet.
    c. Do not cover the tourniquet with clothing or dressings.

2. Mark time of tourniquet placement prominently on the patient and in the patient care report.

3. Without removing the tourniquet or dressing, reassess frequently for signs of ongoing or renewed bleeding such as:

    a. Blood soaking through the dressing
    b. Bleeding distal to the tourniquet

III. NOTES/EDUCATIONAL PEARLS

A. Tourniquets should be applied to bare skin, 2–3 inches proximal to the wound.

B. Tourniquet should be reassessed at every stage of patient movement to ensure ongoing hemorrhage control.

C. Survival is markedly improved when a tourniquet is placed *before* shock ensues.

D. Properly-applied tourniquets in conscious patients are painful – treat pain with analgesics, but do not loosen a tourniquet to relieve discomfort.

E. Arterial pressure points are not effective in controlling hemorrhage.

F. Pediatric Considerations:

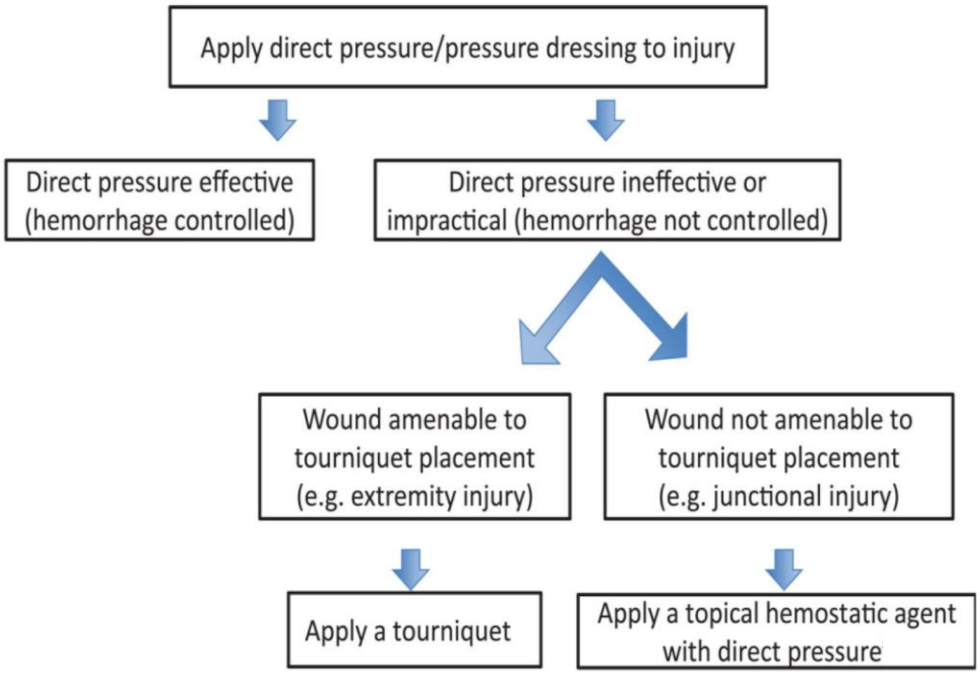
1. External hemorrhage control to prevent shock is critical in infants and young children, due to their relatively small blood volume.

2. Most commercial tourniquets can be used effectively on children over 2 years of age.

3. Stretch-wrap-tuck elastic-type tourniquets can be used on any age patient.

4. Direct pressure and wound packing may be more suitable for infants and young children.

Prehospital External Hemorrhage Control Protocol



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Facial / Dental Trauma – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

FACIAL / DENTAL TRAUMA – BLS/ALS

I. PATIENT CARE GOALS

1. Preservation of a patent airway.
2. Preservation of vision.
3. Preservation of dentition.

II. PATIENT MANAGEMENT

A. Assessment

1. Perform a complete trauma assessment.
2. Assess ABCs with particular focus on ability to keep airway patent:
    a. Stable midface
    b. Stable mandible
    c. Stable dentition (poorly anchored teeth require vigilance for possible aspiration).
3. Bleeding (which may be severe – epistaxis, oral trauma, facial lacerations).
4. Identify if the patient takes blood thinners.

.

5. Cervical spine pain or tenderness (see Spinal Care Protocol).
6. Mental status assessment for possible traumatic brain injury (see Head Injury Protocol).
7. Gross vision assessment.
8. Dental avulsions.
9. Any tissue or teeth avulsed should be collected.
10. Lost teeth not recovered on scene may be in the airway.
11. Overall trauma assessment.
12. Specific re-examination geared toward airway and ability to ventilate adequately.

B. Treatment and Interventions

1. Administer oxygen as appropriate to maintain a target oxygen saturation of >94.

2. IV access, as needed, for fluid or medication administration.

3. Pain medication per the Pain Management Protocol.

4. Avulsed tooth:

    a. Avoid touching the root of the avulsed tooth. Do not wipe off tooth.
    b. Pick up at crown end. If dirty, rinse off under cold water for 10 seconds.
    c. Place in milk or saline as the storage medium.

5. Eye trauma:

    a. Place eye shield if available for any significant eye trauma.
    b. If globe is avulsed or enucleated, do not put back into socket. Cover with moist saline dressings and protect from further injury.

6. Mandible (lower jaw) unstable:

    a. Expect patient cannot spit/swallow effectively and have suction readily available.
    b. Preferentially transport sitting up with emesis basin/suction available (in the absence of a suspected spinal injury, see Spinal Care Protocol).

7. Epistaxis (nosebleed) - Squeeze nose (or have patient do so) for 10-15 minutes continuously.

8. Nose/ear avulsion:

    a. Recover tissue if possible.
    b. Transport with avulsed tissue wrapped in dry sterile gauze in a plastic bag placed on ice.
    c. Severe ear and nose lacerations can be addressed with a protective moist sterile dressing.

C. Patient Safety Considerations

1. Frequent reassessment of airway.

2. Maintenance of a patent airway is the highest priority; therefore, conduct cervical spine assessment (per Spinal Care Protocol) to enable transport sitting up for difficulty with bleeding, swallowing, or handling secretions.

III. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Airway may be compromised because of fractures or bleeding.

2. After nasal fractures, epistaxis may be posterior and may not respond to direct pressure over the nares with bleeding running down posterior pharynx, potentially compromising airway.

3. Protect avulsed tissue and teeth:

   a. Avulsed teeth may be successfully re-implanted if done so in a very short period after injury at the hospital.
   b. Use moist sterile dressing for ear and nose cartilage.

4. For penetrating eye injuries, do not remove foreign bodies. Cover uninjured eye or ask patient to close eye to prevent conjugate movement of injured eye.

5. Consider administration of antiemetics to prevent increases in intraocular pressure due to nausea and vomiting in penetrating and blunt trauma to the eye. See Nausea/Vomiting Protocol.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Head Injury – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

HEAD INJURY – BLS/ALS

I. PATIENT CARE GOALS

1. Limit disability and mortality from head injury by minimizing secondary brain injury through

    a. Promoting adequate oxygenation and pre-oxygenating to protect against unanticipated deterioration
    b. Promoting good cerebral perfusion and avoid hypotension
    c. Preventing hypocapnia (by avoiding hyperventilation and overventilation)

II. PATIENT PRESENTATION

A. INCLUSION CRITERIA

1. Adult or pediatric patient with blunt or penetrating head injury – loss of consciousness or amnesia not required.

III. PATIENT MANAGEMENT

A. Assessment

1. Maintain cervical stabilization (see Spinal Care Protocol).

2. Primary survey per the General Trauma Management Protocol.

3. Monitoring:

    a. Continuous pulse oximetry.
    b. Frequent systolic and diastolic blood pressure measurement.
    c. Initial neurologic status assessment and reassessment with any change in mentation.
    d. Moderate/severe head injury: Apply continuous waveform ETCO2 if available.

4. Secondary survey pertinent to isolated head injury:

    a. Head: Gently palpate skull to evaluate for depressed or open skull fracture.
    b. Eyes:
        i. Evaluate pupil size and reaction to light to establish baseline;
        ii. Reassess pupils if decrease in mentation.
    c. Nose/Mouth/Ears: Evaluate for blood/fluid drainage.
    d. Face: Evaluate for bony stability.
    e. Neck: Palpate for cervical spine tenderness or deformity.
    f. Neurologic:

i. Perform neurologic status assessment (GCS or AVPU)
ii. Evaluate for focal neurologic deficit: motor and sensory.

5. Head injury severity guideline:

   a. Mild: GCS 13-15 / AVPU = (A)
   b. Moderate: GCS 9-12 / AVPU = (V)
   c. Severe: GCS 3-8 / AVPU = (P) or (U)

B. Treatment and Interventions

1. Airway:

   a. Administer oxygen as needed to maintain an oxygen saturation of > 94%.
   b. If patient unable to maintain airway, consider oral airway (nasal airway should not be used with significant facial injury).
   c. BVM (bag-valve-mask) ventilation if oxygen administration or non-rebreather (NRB) is inadequate to maintain oxygenation or ventilation.
   d. Place supraglottic airway or perform endotracheal intubation if BVM ventilation is ineffective in maintaining oxygenation or if airway management is required.

2. Breathing:

   a. For patients with a moderate or/severe head injury who are unable to maintain their airway or are hypoxic despite basic airway interventions, initiate BVM ventilation.
   b. Supraglottic airway placement or endotracheal intubation should only be performed if BVM ventilation is inadequate to maintain adequate oxygenation.
   c. Do not hyperventilate patients: Maintain all patients in ETCO2 range of 35–45 mmHg.

3. 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.
      iii. Cover an injured eye with moist saline dressing and eye shield if available to protect from further injury.
   b. Moderate/severe closed head injury:
      i. Blood pressure: Avoid hypotension and administer fluid bolus as indicated.
         - Adult: Target systolic blood pressure 110-120 mmHg. Hypotension should be avoided to maintain cerebral perfusion
         - Pediatric: Maintain systolic blood pressure:
           a. Less than 1 month: Greater than 60 mmHg
           b. 1-12 months: Greater than 70 mmHg

c. 1-10 y/o: Greater than 70 + 2x age in years

c. Mild closed head injury:
   i. Administer IV fluid boluses to maintain systolic blood pressure above threshold to maintain cerebral perfusion.
   ii. Do not wait until after the patient is already hypotensive—prevent hypotension.

d. Do not delay transport to initiate IV access.

4. Disability:

   a. Evaluate for other causes of altered mental status - check blood glucose.
   b. Spinal assessment and management, per Spinal Care Protocol.
   c. Perform and trend neurologic status assessment (GCS or AVPU scale):
      i. Early signs of deterioration:
         - Confusion
         - Agitation
         - Drowsiness
         - Vomiting
         - Severe headache
      ii. Monitor for signs of herniation
   d. Severe head injury – Elevate head of bed 30 degrees.

5. Transport according to Region 11 Trauma Field Triage Criteria:

   a. Preferential transport to Level 1 Trauma Center:
      i. GCS 3-13, P (pain) or U (unresponsive) on AVPU scale;
      ii. Penetrating head trauma;
      iii. Open or depressed skull fracture.

C. Patient Safety Considerations

1. Do not hyperventilate patients: Maintain all patients in ETCO2 range of 35–45 mmHg.

2. Assume concomitant cervical spine injury in patients with moderate/severe head injury.

3. **Geriatric Consideration**: Elderly patients with ankylosing spondylitis or severe kyphosis should be padded and immobilized in a position of comfort and may not tolerate a cervical collar.

4. **Pediatric Consideration**: Children have disproportionately larger heads. When securing pediatric patients to the stretcher with spinal motion restriction (SMR), the body should be elevated approximately 1–2 cm to accommodate the larger head size and avoid neck flexion when flat.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Hypoxia, hypotension, hyperventilation are especially dangerous in severe head injury patients.

2. Important that providers be specifically trained in accurate neurologic status assessment.

3. If endotracheal intubation or supraglottic airways are used, continuous waveform capnography is required to document proper tube placement and assure proper ventilation rate.

4. Herniation is difficult to diagnose in the prehospital setting. Hyperventilation results in vasoconstriction which further decreases blood flow to the brain and worsens the secondary brain injury.

B. Pertinent Assessment Findings

1. Neurologic status assessment findings

2. Pupils

3. Trauma findings on physical exam

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: High Threat Considerations – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

HIGH THREAT CONSIDERATIONS – BLS/ALS

I. DEFINITIONS

1. Hot Zone/Direct Threat Zone: An area where active threat and active hazards exists.
2. Warm Zone/Indirect Threat Zone: An area where security and safety measures are in place. This zone may have potential hazards, but no active danger exists.
3. Cold Zone/Evacuation Zone: An area where no significant threat is reasonably anticipated.

II. PATIENT CARE GOALS

1. Assess scene for safety and number of patients.
2. Mitigating further harm.
3. Treat immediate medical conditions.
4. Accomplish goal with minimal additional injuries.

III. PATIENT PRESENTATION

A. Inclusion Criteria

1. High threat environment – when greater than normal conditions exist that could cause threat to clinician or patient.

B. Exclusion Criteria

1. No significant threat exists to clinician or patient allowing for the performance of routine care.

IV. PATIENT MANAGEMENT

A. Assessment, Treatment and Interventions

1. Hot Zone/Direct Threat Care Considerations:
    a. Mitigate threat as able to minimize risk to patients and clinicians, move to a safer position and recognize that threats are dynamic and may be ongoing, requiring continuous assessment of threat.

b. Defer in depth medical interventions if engaged in ongoing direct threat (e.g. active shooter, unstable building collapse, improvised explosive device, hazardous material threat).
c. Triage should be deferred to when no longer in a hot zone/direct threat care zone.
d. Prioritization for extraction is based on resources available and the situation encountered.
e. Minimal interventions are warranted.
f. Encourage patients to provide self-first aid or instruct uninjured bystanders to provide aid.
g. Consider hemorrhage control:
    i. Tourniquet application is the primary "medical" intervention to be considered in Hot Zone/Direct Threat.
    ii. Consider instructing patient to apply direct pressure to the wound if no tourniquet available (or application is not feasible).
h. Consider quickly placing or directing patient to be placed in position to protect airway, if not immediately moving patient.

2. Warm Zone/Indirect Threat Care Considerations:

a. Maintain situational awareness.
b. Ensure safety of both responders and patients by rendering environment safe (firearms, vehicle ignition).
c. Conduct primary survey, per the General Trauma Management Protocol, and initiate appropriate lifesaving interventions:
    i. Hemorrhage control
        - Tourniquet
        - Wound packing if feasible.
    ii. Maintain airway and support ventilation per Airway Management Protocol.
d. Do not delay patient extraction and evacuation for non-life-saving interventions.
e. Consider establishing a casualty collection point (CCP) if multiple patients are encountered.
f. Unless in a fixed casualty collection point, triage in this phase of care should be limited to the following categories:
    i. Uninjured and/or capable of self-extraction;
    ii. Deceased/expectant;
    iii. All others.

3. Cold Zone/Evacuation Zone:

a. Reassess all interventions applied in previous phases of care
b. Additional trauma treatment and destination per Region 11 EMS Protocols and Policies.
c. Additional medical or transport resources may be staged in this area.

C. Patient Safety Considerations

1. Anticipate unique threats based on situation.

2. During high threat situations, clinician safety should be considered in balancing the risks and benefits of patient treatment.

V. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. In high threat situations, clinician and patient safety will need to be simultaneously considered.

2. During high threat situations, an integrated response with other public safety entities may be warranted.

3. During these situations, maintaining communications and incident management concepts may be crucial to maximizing efficiency and mitigating dangers.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Spinal Care – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

SPINAL CARE – BLS/ALS

I. PATIENT CARE GOALS

1. Select patients for whom spinal motion restriction (SMR) is indicated.

2. Minimize secondary injury to spine in patients who have, or may have, an unstable spinal injury.

3. **Spinal Motion Restriction (SMR)** is defined as attempting to maintain the head, neck, and torso in anatomic alignment and independent from device use.

II. PATIENT MANAGEMENT

A. Assessment

1. Assess the scene to determine the mechanism of injury.

    a. Mechanism alone should not determine if a patient requires spinal motion restriction – however, mechanisms that have been associated with a higher risk of injury are:
        i. Motor vehicle crashes (including automobiles, all-terrain vehicles, and snowmobiles)
        ii. Axial loading injuries to the spine (large load falls vertically on the head or a patient lands on top of their head)
        iii. Falls greater than 10 feet
        iv. Minor trauma in patients ≥ 65 years old

2. Assess the patient in the position found for findings associated with spine injury:

    a. Altered mental status
    b. Neurologic deficits
    c. Neck or back pain or tenderness
    d. Any evidence of intoxication
    e. Other severe injuries, particularly associated torso injuries

B. Treatment and Interventions

1. Place patient in cervical collar and initiate Spinal Motion Restriction (SMR) if there are any of the following:

    a. Patient complains of midline neck or spine pain
    b. Any midline neck or spine tenderness with palpation
    c. Any abnormal mental status (including severe agitation)
    d. Focal or neurologic deficit
    e. Any evidence of alcohol or drug intoxication

f. Another severe or painful distracting injury is present
g. Torticollis in children
h. A communication barrier that prevents accurate assessment
i. If none of the above apply, patient may be managed without a cervical collar and SMR

2. Patients with penetrating injury to the neck should not be placed in a cervical collar or other spinal precautions regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromise, and has been associated with increased mortality.

3. If extrication is required:

   a. From a vehicle: After placing a cervical collar, if indicated, children in a booster seat and adults should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat.
   b. Other situations requiring extrication: A padded long board may be used for extrication, using the lift and slide (rather than a logroll) technique.

4. 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.
   b. Evidence is lacking to provide guidance about other types of helmet removal.

5. Patients requiring spinal motion restriction should be secured to and transported on ambulance stretcher with cervical collar in place. Do not transport patients on rigid long boards, unless the clinical situation warrants longboard use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these situations, long boards should ideally be padded or have a vacuum mattress applied to minimize secondary injury to the patient.

6. Patients should be transported to the nearest appropriate facility, in accordance with the Region 11 Trauma Field Triage Criteria Policy.

7. Patients with severe kyphosis or ankylosing spondylitis may not tolerate a cervical collar. These patients should have spinal motion restriction (SMR) applied in a position of comfort using towel rolls.

C. Patient Safety Considerations

1. Be aware of potential airway compromise or aspiration in spinal motion restriction (SMR) patients with nausea/vomiting or with facial/oral bleeding.

2. Excessively tight straps can limit chest excursion and cause hypoventilation.

3. Prolonged immobilization on spine board can lead to ischemic pressure injuries to skin.

4. Prolonged immobilization on spine board can be very uncomfortable for the patient.

5. Children are abdominal breathers, therefore straps should go across chest and pelvis and not across the abdomen.

6. **Pediatric Consideration**: Children have disproportionately larger heads. When securing pediatric patients to the stretcher with spinal motion restriction (SMR), the body should be elevated approximately 1–2 cm to accommodate the larger head size and avoid neck flexion when flat.

7. In an uncooperative patient, avoid interventions that may promote increased spinal movement.

8. 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

III. NOTES/EDUCATIONAL PEARLS

A. Evidence is lacking to support or refute the use of manual stabilization prior to spinal assessment in the setting of a possible traumatic injury when the patient is alert with spontaneous head/neck movement. Clinicians should not manually stabilize these alert and spontaneously moving patients, since patients with pain will self-limit movement and forcing immobilization in this scenario may unnecessarily increase discomfort and anxiety.

B. Ambulatory patients may be safely secured on a stretcher with cervical collar and straps and will not generally require a spine board.

C. 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.

D. Communication barriers with infants/toddlers, the elderly, patients with dementia may prevent the clinician from accurately assessing the patient. In these situations, strongly consider SMR.

E. Spinal precautions or spinal motion restriction (SMR) should be considered a treatment or procedure.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Traumatic Arrest – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

TRAUMATIC ARREST – BLS/ALS

I. PATIENT CARE GOALS

A. Rapid evaluation treatment of traumatic arrest patients as per the General Trauma Management Protocol to improve outcomes.

B. Assess for signs of life to determine if resuscitation is indicated.

C. Transport of traumatic arrest patients that meet criteria for resuscitation to the closest appropriate Level 1 Trauma Center.

1. Age 15 years or less: Pediatric Level 1 Trauma Center
2. Age 16 years and older: Level 1 Trauma Center

II. PATIENT MANAGEMENT

A. Assessment

1. Perform a thorough patient assessment and evaluate for signs of life which include:

   a. Respirations
   b. Pulse
   c. Spontaneous movement

2. Patients with traumatic injury and signs of life should have resuscitation initiated with transport to the closest appropriate Level 1 Trauma Center.

3. Resuscitation should be withheld in the following circumstances with no signs of life present (per Determination of Death/Withholding of Resuscitative Measures Policy).

   a. Decapitation
   b. Transection of the torso
   c. Incineration (90% of body surface area with full thickness burns)

4. For adult patients with traumatic injury and no signs of life, assess the cardiac rhythm to determine if resuscitation should be initiated.

5. If the cardiac rhythm is Pulseless Electrical Activity (PEA), resuscitation should be initiated with transport to the closest appropriate Level 1 Trauma Center.

6. If cardiac rhythm is asystole in multiple leads and no signs of life are present, resuscitation may be withheld and Online Medical Control should be contacted.

a. The following conditions are excluded from this protocol and should be resuscitated:
   i. Drowning or strangulation
   ii. Lightning strike or electrocution
   iii. Patients with hypothermia
   iv. Patients with visible pregnancy
   v. Situations where the mechanism of injury does not correlate with the clinical condition suggesting a non-traumatic cardiac arrest

B. Treatment and Interventions

1. Resuscitation includes control of external hemorrhage, airway management, pelvic stabilization if indicated, chest compressions, and rapid transport.

2. Pleural (needle) decompression is indicated for traumatic arrest with thoracic trauma.

3. Epinephrine is not recommended for traumatic arrest.

C. Patient Safety Considerations

1. When the traumatic mechanism does not correlate with the clinical condition, suggesting a non-traumatic cause of cardiac arrest, the Cardiac Arrest Management Protocol and Incident Command for Cardiac Arrest (ICCA) should be followed.

III. NOTES/EDUCATIONAL PEARLS

A. Resuscitative efforts for traumatic arrests should occur in route to a trauma center and should not prolong scene time.

B. When resuscitation is indicated, traumatic arrest patients should be transported to the closest appropriate Level 1 Trauma Center.

C. Situations where resuscitation is withheld should be managed with law enforcement.

D. Patient care is the responsibility of EMS. For scenes managed with law enforcement, a full patient assessment is still required to determine need for resuscitative efforts.

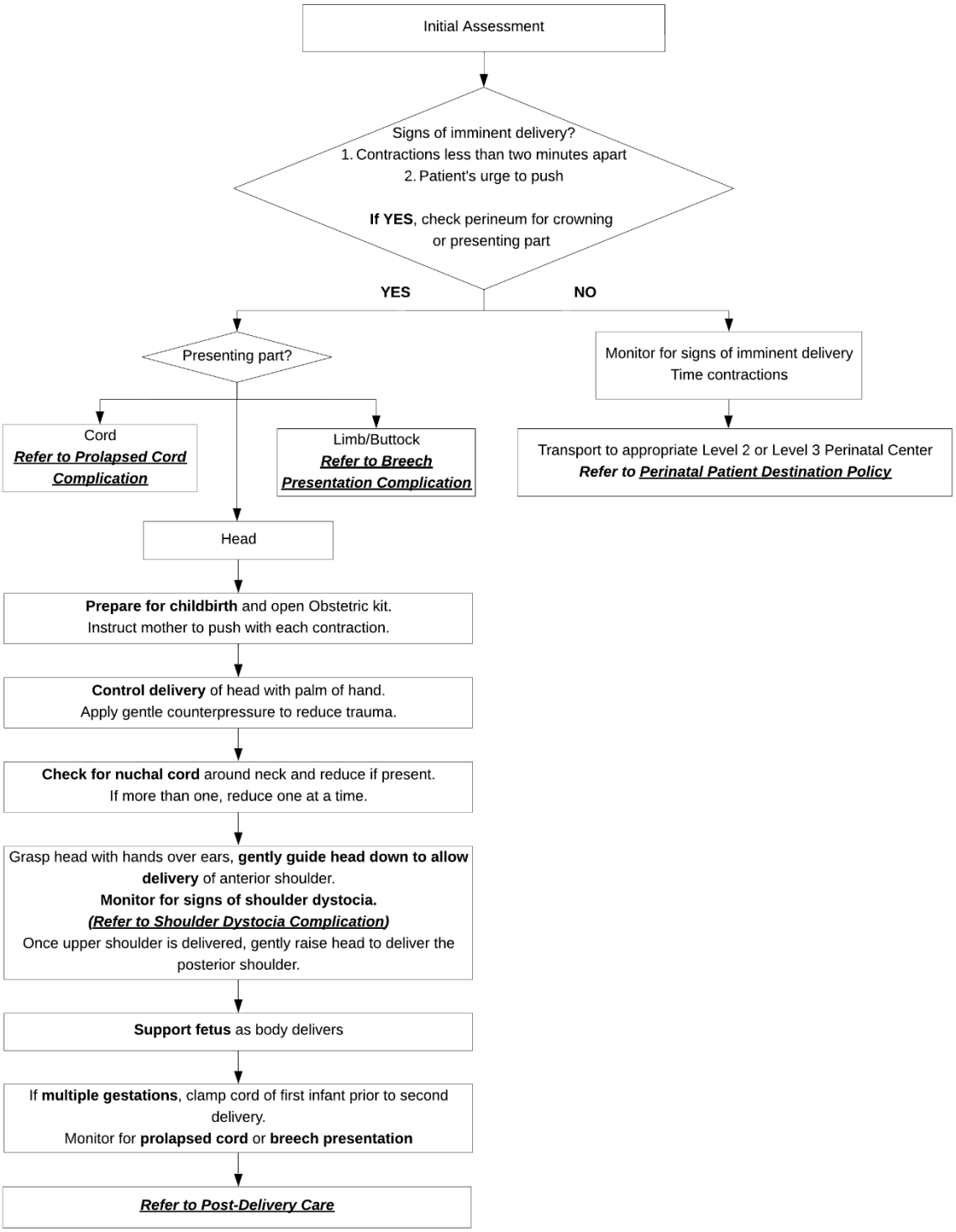
REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

OBSTETRICS

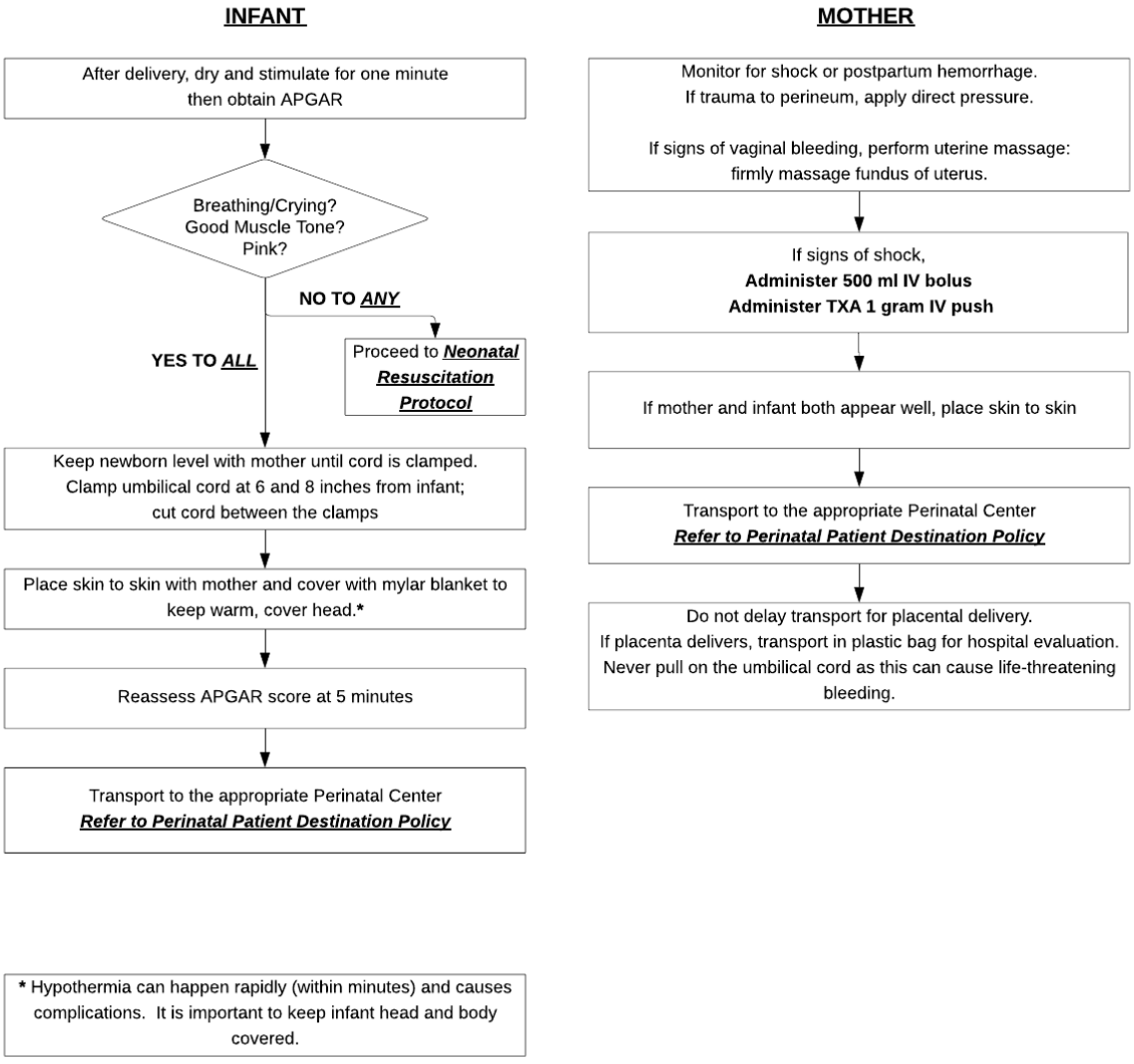
Childbirth
Bleeding in Pregnancy
Eclampsia and Pre-Eclampsia
Neonatal Resuscitation

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Childbirth – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
	Effective: December 17, 2025

CHILDBIRTH - BLS/ALS



POST-DELIVERY CARE



* Hypothermia can happen rapidly (within minutes) and causes complications. It is important to keep infant head and body covered.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Childbirth – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
	Effective: December 17, 2025

CHILDBIRTH – BLS/ALS

I. PATIENT CARE GOALS

1. Obtain necessary history to plan for birth and resuscitation of the newborn.
2. Recognize imminent delivery.
3. Plan for additional resources based on number of patients (mother and child or multiple births).
4. Assist with uncomplicated delivery of newborn.
5. Recognize complicated delivery situations (e.g., prolapsed umbilical cord, breech delivery, shoulder dystocia) and plan for management and appropriate transport to a Level 2 or 3 Perinatal Center.
6. Apply appropriate techniques when an obstetric complication exists.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Imminent delivery with crowning.

B. Exclusion Criteria

1. Vaginal bleeding in any stage of pregnancy outside of active labor or postpartum (refer to Bleeding in Pregnancy Protocol)
2. Emergencies in first or second trimester of pregnancy (refer to Bleeding in Pregnancy Protocol).
3. Seizure in pregnancy (refer to Eclampsia and Pre-Eclampsia Protocol).

III. PATIENT MANAGEMENT

A. Assessment

1. Assess for ***signs of imminent delivery***:
    a. Contractions less than two minutes apart
    b. Patient's urge to push
2. If signs of imminent delivery – check the perineum for crowning or other fetal presentation.

3. Signs of active labor include:

    a. Regular and frequent contractions
    b. Membrane rupture or fluid from vagina

B. Treatment and Interventions

1. If patient is in active labor, but no signs of imminent delivery, transport to the appropriate Perinatal Center (Refer to Perinatal Patient Destination Policy).

2. If there are signs of imminent delivery with crowning, prepare to deliver and call for additional EMS resources.

3. Delivery should optimally allow a slow and controlled delivery of infant to reduce injury to mother.

    a. Support the infant's head as needed and apply gentle counterpressure.
    b. This helps prevent the head from suddenly popping out and reduce trauma to the vaginal canal.

4. Check for nuchal cord (i.e., cord around the infant's neck)

    a. If present, hook finger between nuchal cord and fetal body.
    b. Attempt to reduce by slipping the cord over the head.
    c. If more than one nuchal cord is identified, reduce one at a time.
    d. If unable to reduce, attempt to slip the cord over the shoulders and deliver the fetus with the nuchal cord around shoulders and neck.
    e. If unable to deliver fetus with nuchal cord present, double clamp the cord and cut between the clamps. Cutting of the cord stops placental oxygen administration and delivery must be achieved quickly.

5. Suction infant airway only when airway is contaminated (with meconium), do not routinely suction the infant's airway during delivery.

6. Grasp the head with hands over the ears and gently guide the head down to allow delivery of the anterior shoulder. Do not pull on the head.

7. Gently guide the head up to allow delivery of the posterior shoulder.

8. Support infant head and torso during the remainder of delivery.

9. Dry, warm, stimulate infant for the first minute of life.

    a. At 60 seconds, if resuscitation is indicated, initiate neonatal resuscitation (see Neonatal Resuscitation Protocol)
    b. If APGAR is appropriate after 1 minute of life, wrap in towel and place on maternal chest.

10. After 1 minute, regardless of cord pulsation, clamp cord at 6 and 8 inches from the infant with two clamps; cut the cord between the clamps.

    a. If resuscitation is needed, start resuscitation immediately after birth with drying, warming, and stimulation and clamp and cut the cord immediately.
    b. While cord is attached, take care to ensure the infant is not significantly higher positioned than the mother to prevent blood from flowing backwards from infant to placenta.

11. Once neonate is stabilized, record APGAR scores at 1 and 5 minutes.

12. In the case of multiple gestations (more than one infant during same pregnancy):

    a. Evaluate for prolapsed cord or limb presentation between deliveries.
    b. Repeat steps for each prehospital fetal delivery. The cord should be clamped and cut immediately after delivery in cases of multiple gestations.

13. The placenta will deliver spontaneously, often within 5–30 minutes after the infant is delivered.

    a. Do not force the placenta to deliver; do not pull on the umbilical cord as this can tear the placenta or cord and cause life threatening bleeding.
    b. Transport all tissue in a plastic bag for evaluation by the hospital.
    c. Do not wait for delivery of the placenta to initiate transport.

14. After delivery of the infant, massage the fundus of the uterus (located at the level of the umbilicus) and allow the infant to nurse to promote uterine contraction and help control bleeding.

    a. Monitor for signs of hemorrhagic shock. If signs of shock or heavy vaginal bleeding, establish large bore IV (above the diaphragm preferred), administer TXA 1 gram IV push, and give 500 mL IV bolus.
        - Reassess vital signs and response to fluid resuscitation, repeat bolus as indicated.
    b. If perineum is torn or bleeding, apply direct pressure with gauze.

15. Stable infants may be transported in the same ambulance as the mother with a neonatal safety restraint. Unstable infants or infants requiring medical intervention should be transported in a separate ambulance with proper infant safety restraint systems and to the same hospital destination as the mother.

16. Keep infant warm during transport, including head covering.

17. Most deliveries proceed without complications. If complications in delivery occur, attempt to stabilize and expedite transport to the appropriate Level 2 or 3 Perinatal Center in consultation with Online Medical Control. Maternal resuscitation is critical for best maternal and fetal outcome.

C. Patient Safety Considerations

1. Supine Hypotension Syndrome

    a. If the mother has hypotension before delivery, place patient in left lateral recumbent position or manually displace gravid uterus to the left in supine position to improve venous return.

2. Do not routinely suction the infant's airway (even with a bulb syringe) during delivery.

3. Newborns are very slippery, take care not to drop the infant.

4. Dry, warm and stimulate all newborns to facilitate respirations and prevent hypothermia. Hypothermia can happen rapidly (within minutes) and cause increased complications, it is important to keep the infant's skin covered, especially the head.

    a. Do not pull on the umbilical cord while waiting for placenta to deliver. This can cause the placenta or cord to tear and cause life threatening bleeding.

IV. CHILDBIRTH COMPLICATIONS

A. Shoulder Dystocia – Inability to deliver the anterior shoulder as it can be wedged behind the maternal pubic bone.

Shoulder Dystocia

Shoulder Dystocia identified

↓

Hyperflex mother's hips by firmly pressing knees to chest by EMS clinician (i.e. McRobert's maneuver)

↓

Second EMS clinician applies firm suprapubic (not fundal) pressure with fist directed downwards to dislodge anterior shoulder.

↓

Attempt to angle infant's head as posteriorly as possible toward the ground.
Do not pull the infant's head.

↓

If unable to reduce shoulder dystocia, initiate immediate transport to appropriate Perinatal Center
Refer to Perinatal Patient Destination Policy
Contact Online Medical Control

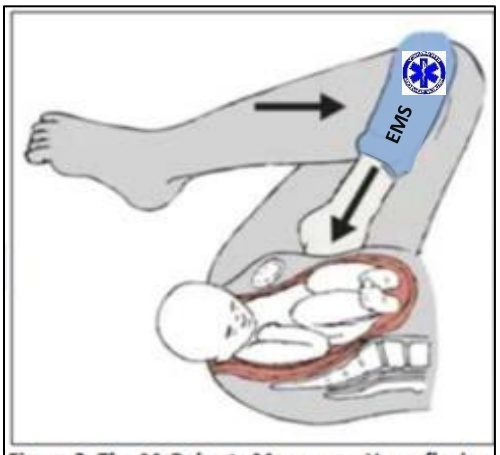


Figure 3. The McRoberts Maneuver: Hyperflexion of Hips & SUPRAPUBIC Pressure
(Adapted from: teachmeobgyn.com)

1. If delivery fails to progress after head delivers, quickly attempt the following:

   a. Hyperflex mother's hips by firmly pressing knees to chest by EMS clinician (i.e. McRoberts' maneuver).
   b. Second EMS clinician applies firm suprapubic, *not fundal,* pressure with fist directed downwards to attempt to dislodge anterior shoulder. This allows for delivery in up to 75% of cases.
   c. Attempt to angle the infant's head as posteriorly as possible toward the ground. Do not pull the infant's head.
   d. Continue with delivery as normal once the anterior shoulder is delivered. If unable to reduce shoulder dystocia, initiate immediate transport.

B. Prolapsed Umbilical Cord

Prolapsed Cord

Prolapsed Cord identified

↓

Insert gloved hand into vagina and use two fingers to lift the presenting part (head, limb, buttock) off cord to achieve pulsatile cord blood flow

↓

If still no pulse in cord, place mother in Trendelenburg position: head of bed down, legs up, with hips elevated with blankets

↓

Wrap exposed prolapsed cord in saline soaked gauze

↓

Transport immediately
Hand displacing presenting part must stay in place until relieved by hospital staff

↓

Transport to the appropriate Perinatal Center
Refer to Perinatal Patient Destination Policy

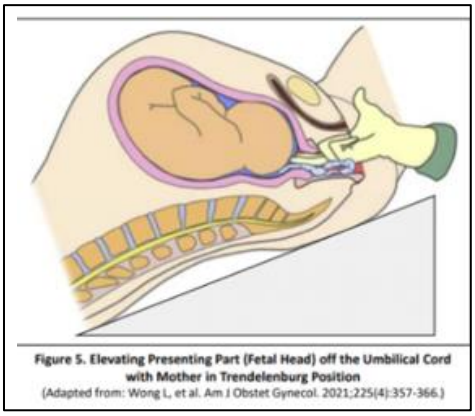
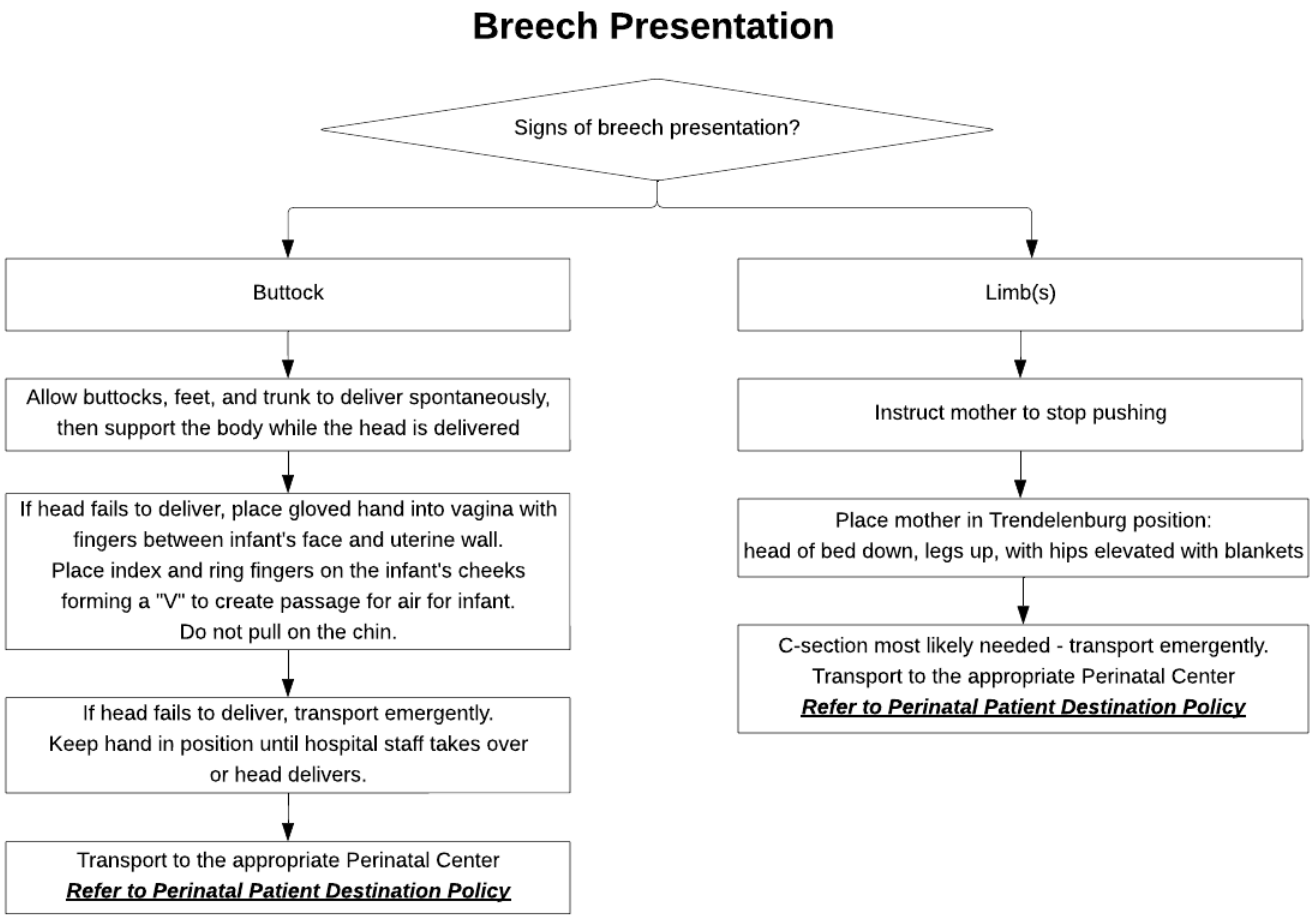


Figure 5. Elevating Presenting Part (Fetal Head) off the Umbilical Cord with Mother in Trendelenburg Position
(Adapted from: Wong L, et al. Am J Obstet Gynecol. 2021;225(4):357-366.)

1. Identify umbilical cord as presenting part.
2. Assess for pulsations in cord, place gloved hand into vagina and gently lift the presenting part off the cord.
3. Wrap exposed prolapsed cord in saline soaked gauze and initiate transport emergently, C-Section most likely needed.
4. Maintain positioning until relieved by hospital staff.
5. If previous techniques are not successful to achieve pulse in cord, mother should be placed in extreme Trendelenburg position with hips elevated.

C. Breech Birth



1. Breech Birth - Buttock Presentation

a. Place mother supine, allow the buttocks, feet, and trunk to deliver spontaneously, then support the body while the head is delivered.
b. If needed, put the mother in a kneeling position which may assist in the delivery.
c. 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 infant'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. Do not pull on the chin.
d. When delivering breech, you may need to rotate the infant's trunk clockwise.
e. Once the legs are delivered, support the body to avoid hyperextension of the head; keep the fetus elevated off the umbilical cord.
f. NEVER pull on the body– just support the infant's body while mother pushes.

2. **Breech Birth - Limb Presentation**

   a. Instruct patient to stop pushing.
   b. Place mother in Trendelenburg position: head of bed down, legs up with hips elevated with blankets.
   c. The presentation of an arm or leg through the vagina is an indication for immediate transport to hospital. C-Section most likely needed.

E. Excessive Bleeding During Labor - May occur with placenta previa or placental abruption.

1. Obtain history from patient – evaluate for known placenta previa, recent pre-eclampsia symptoms, hypertension history, recent trauma, drug use especially cocaine.

2. Placenta previa will most likely prevent delivery of infant vaginally.

3. Place large bore vascular access and evaluate for hypotension or signs of hemorrhagic shock. In cases of excessive bleeding during labor and signs of hemorrhagic shock, administer 500 ml IV fluids and TXA 1 gram IV/IO.

4. C-Section most likely needed – transport emergently.

F. Postpartum Hemorrhage (bleeding after delivery)

1. Obtain history from patient – evaluate for history of prenatal or delivery complications, recent trauma, prescription anticoagulants, substance use (cocaine).

2. Perform fundal massage. This is often uncomfortable/painful as the uterine contracts and clamps down.

3. Place large bore IVs and initiate 500 ml IV fluid bolus.

4. Administer TXA 1 gram IV/IO push for signs of hypotension or hemorrhagic shock.

V. NOTES/EDUCATIONAL PEARLS

A. In cases of reported severe pain by pregnant patient, fentanyl 1 mcg/kg can be administered.

B. Obstetric Patient Assessment

1. Length of pregnancy and due date (calculate gestational age in weeks)

   a. If the gestational age is unknown, a palpable fundal height above the umbilicus indicates a gestation of more than 20 weeks.
   b. Ask for estimated last menstrual period (first day of last period) if patient has not had prenatal care or an ultrasound and does not know their due date.

2. Number of pregnancies

3. Prenatal care
4. Number of expected babies (multiple gestations)
5. Maternal medications and substance use
6. Report by patient of being deemed “high risk” obstetrical patient or any known pregnancy complications – hypertension, gestational diabetes, placenta previa, premature labor, history of fetal demise, fetal anomalies/birth defects, etc.
7. Signs of imminent delivery (crowning, frequent contractions, urge to push).
8. Location where the patient receives prenatal care (preferred destination if time delay is acceptable).

C. Obstetric patients are Systems of Care and Online Medical Control should be contacted.

D. APGAR should be performed at one and five minutes after birth (See APGAR Table).

Sign	0	1	2
Appearance:	Blue, Pale	Body pink, Extremities blue	Completely pink
Pulse:	Absent	Slow (less than l00)	≥ 100
Grimace:	No response	Grimace	Cough or Sneeze
Activity:	Limp	Some flexion	Active motion of extremities
Respirations:	Absent	Slow, Irregular	Good, Crying

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Bleeding in Pregnancy – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
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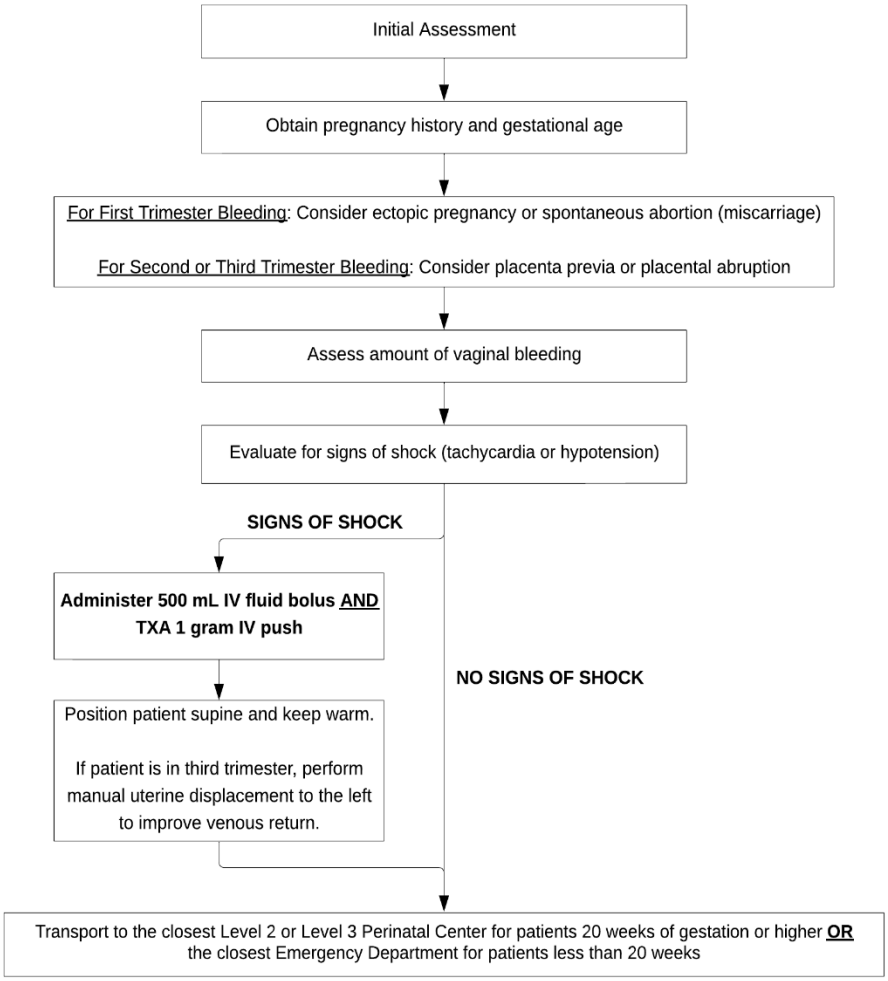
BLEEDING IN PREGNANCY - BLS/ALS



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BLEEDING IN PREGNANCY – BLS/ALS

I. PATIENT CARE GOALS

1. Recognize serious conditions associated with hemorrhage during pregnancy even when hemorrhage or pregnancy is not apparent (e.g., ectopic pregnancy, placenta previa, placental abruption).

2. Provide adequate resuscitation for hypovolemia.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Pregnant patient with vaginal bleeding in any trimester.

2. Patient with pelvic pain or possible ectopic pregnancy.

3. Consider pregnancy in any female between the ages of 10–60 years of age.

B. Exclusion Criteria

1. Childbirth and active labor (refer to Childbirth Protocol)

2. Postpartum hemorrhage (refer to Childbirth Protocol)

C. Differential Diagnosis

1. Ectopic Pregnancy: Pregnancy located outside the uterus

    a. First trimester
    b. Abdominal or pelvic pain with or without vaginal bleeding.
    c. Shock is possible even with minimal or no vaginal bleeding.

2. Spontaneous Abortion (miscarriage): Loss of pregnancy

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

3. Placenta Previa: Placenta covers part or all of the cervical opening.

    a. Identified in second or third trimester.
    b. Painless vaginal bleeding, unless in active labor.
    c. For management during active labor see Childbirth Protocol.

4. Placental Abruption: Most frequently occurs in third trimester of pregnancy; placenta prematurely separates from the uterus causing intrauterine bleeding.

a. Can be difficult to assess for in the prehospital setting. Symptoms may include:
   - Lower abdominal pain, uterine rigidity (often not present until abruption is advanced)
   - Vaginal bleeding (may or may not be present, depending on location and characteristics of abruption)
   - Shock, even with minimal or no vaginal bleeding

b. Clinical index of suspicion for abruption (history of trauma or intimate partner violence, elevated blood pressure concerning for pre-eclampsia, maternal drug use especially cocaine).

III. PATIENT MANAGEMENT

A. Assessment

1. Obtain history

   a. Obstetrical history
   b. Abdominal pain – onset, duration, quality, radiation, provoking or relieving factors
   c. Vaginal bleeding – onset, duration, quantity (pads saturated), passage of fetal tissue
   d. Syncope or lightheadedness
   e. Nausea or vomiting
   f. Fever or history of recent fever

2. Monitoring

   a. ECG and cardiac monitoring if history of syncope or lightheadedness
   b. Pulse oximetry

B. Treatment and Interventions

1. If signs of shock (including tachycardia, hypotension or elevated shock index):

   a. Position patient supine and keep patient warm. If patient is in third trimester, perform manual uterine displacement to the left to improve venous return.
   b. Place large bore IV, above the diaphragm preferred, in third trimester patients.
   c. Volume resuscitation: Administer 500 mL IV fluid bolus.
   d. Reassess vital signs and response to fluid resuscitation, repeat bolus as indicated.
   e. TXA is safe in pregnancy and 1 gram IV push should be given if concern for obstetric hemorrhage causing shock.

2. For patients with moderate or severe pain, fentanyl 1 mcg/kg IV/IM/IN can be administered (maximum dose 100 mcg).

3. Transport to the closest appropriate hospital based on estimated or known gestational age. Contact Online Medical Control as appropriate and provide a pre-notification call.

   a. Patients with bleeding in pregnancy less than 20 weeks may be transported to the closest Emergency Department.

b. Patients with bleeding in pregnancy more than 20 weeks should be transported to the closest Perinatal Center (Refer to Perinatal Patient Destination Policy).

C. Patient Safety Considerations

1. Patients in third trimester of pregnancy with signs of shock should be transported on left side or with uterus manually displaced to left to improve maternal perfusion and venous return.

2. Recognition of hemorrhage in obstetric patients is complicated by the normal physiologic changes that occur during pregnancy.

IV. NOTES/EDUCATIONAL PEARLS

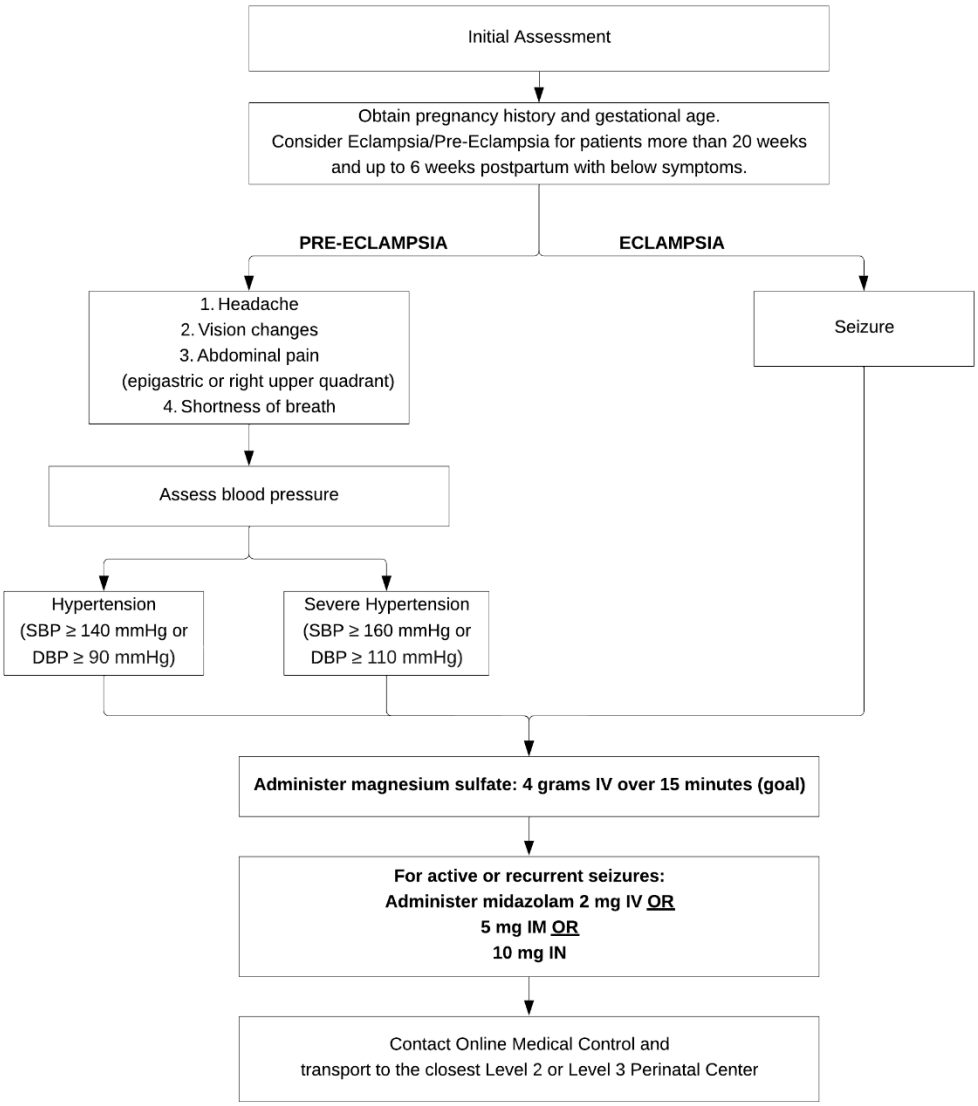
A. Key Considerations

1. Syncope can be a presenting symptom of intraabdominal hemorrhage from ectopic pregnancy or antepartum hemorrhage from spontaneous abortion, placental abruption, or placenta previa.

2. Pregnancy is a high-risk period for intimate partner violence (IPV). IPV can increase risk of hemorrhagic obstetric complications such as placental abruption.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Eclampsia and Pre-Eclampsia – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
	Effective: December 17, 2025

ECLAMPSIA AND PRE-ECLAMPSIA - BLS/ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Eclampsia and Pre-Eclampsia – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
	Effective: December 17, 2025

ECLAMPSIA AND PRE-ECLAMPSIA – BLS/ALS

I. PATIENT CARE GOALS

1. Recognize serious conditions associated with pregnancy and elevated blood pressure.
2. Prevention of eclampsia-related seizures and complications.
3. Provide adequate treatment for eclampsia-related seizures.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Pre-Eclampsia: Pregnant patient more than 20 weeks gestation or up to 6 weeks postpartum WITH symptoms and elevated blood pressure:

   a. **Symptoms of Pre-Eclampsia**
   - Headache
   - Vision changes including blurred vision or spots/floaters
   - Epigastric or right upper quadrant (RUQ) pain
   - Shortness of breath

   b. **Elevated blood pressure**
   - **Hypertension**: Systolic blood pressure (SBP) ≥ 140 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg
   - **Severe hypertension**: SBP ≥ 160 mmHg or DBP ≥110

2. Eclampsia

   a. Seizure in any pregnant patient more than 20 weeks gestation and up to 6 weeks or postpartum.
   b. Any pregnant patient who is seizing should be assumed to have eclampsia.
   c. History of pre-eclampsia is not required.

B. Exclusion Criteria - None

III. PATIENT MANAGEMENT

A. Assessment

1. Obtain history

   a. Gestational age in weeks or recent delivery (post-partum).
   b. Symptoms of pre-eclampsia such as headache, confusion, vision changes, epigastric pain, right upper quadrant pain, shortness of breath.

c. Symptoms of pregnancy complication such as vaginal bleeding or absence of fetal movement.
d. Previous pregnancy complications including hypertension or known pre-eclampsia.

2. Monitor vital signs including repeat blood pressures every 10 minutes.

B. Treatment and Interventions

1. Pre-Eclampsia

a. Monitor for seizures
b. Administer **magnesium sulfate:** 4 grams IV over 15 minutes (goal)

2. Eclampsia: Seizure whether active or complete, regardless of seizure history

a. Administer one time dose of **magnesium sulfate:** 4 grams IV over 15 minutes (goal)
b. For active or recurrent seizure, administer **midazolam**: 2 mg IV OR 5 mg IM OR 10 mg IN.

3. Monitor for respiratory depression and airway compromise.

4. Reassess vital signs every 10 minutes or more frequently as indicated.

5. IV fluids only if signs of dehydration or hypotension (patients with pre-eclampsia are at risk of pulmonary edema).

6. Administer oxygen as indicated with goal pulse oximetry saturation of 94-98%.

7. Contact Online Medical Control for all obstetric patients.

8. Transport to closest Level 2 or 3 Perinatal Center as per Perinatal Patient Destination Policy.

C. Patient Safety Considerations

1. Magnesium side effects may include facial flushing and hypotension with rapid administration.

IV. NOTES/EDUCATIONAL PEARLS

A. Delivery is the only definitive management for pre-eclampsia and eclampsia.

B. Early treatment of severe pre-eclampsia with magnesium for seizure prophylaxis significantly reduces the rate of eclampsia.

C. If the gestational age is unknown, a palpable fundal height above the umbilicus indicates a gestation of more than 20 weeks.

D. Consider other causes of seizures including epilepsy, hypoglycemia, and traumatic head injury.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Neonatal Resuscitation – BLS/ALS
	Section: Obstetrics
	Approved: EMS Medical Directors Consortium
	Effective: December 17, 2025

NEONATAL RESUSCITATION – BLS/ALS

I. PATIENT CARE GOALS

1. Plan for resources based on number of anticipated patients (e.g., mother and newborn or multiple births).
2. Provide care to the newly born infant.
3. Perform a neonatal assessment.
4. Rapidly identify newly born infants requiring resuscitative efforts.
5. Provide appropriate interventions to minimize distress in the newly born infant.
6. Recognize the need for additional resources based on patient condition and/or environmental factors.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Newly born infants.
2. Concepts may be extended to newborns in the neonatal period (birth – 28 days).

B. Other Considerations

1. Regardless of gestational age, all newborns should be assessed for signs of life including responsiveness, breathing, and pulse with a cardiac monitor. Newborns with signs of life should be resuscitated and transported.
2. In situations where the estimated gestational age is less than 20 weeks (usually calculated by date of last menstrual period), the newborn is typically not viable. The newborn should have the cardiac monitor applied and resuscitation withheld if asystole.
    a. <u>If any doubt about accuracy of gestational age, initiate resuscitation and transport.</u>
3. In situations where the estimated gestational age is more than 20 weeks (usually calculated by date of last menstrual period), the newborn should be resuscitated and transported.
4. Physical examination findings that indicate less than 20 weeks gestation may include:
    a. Fused eyelids
    b. Transparent skin

c. Underdeveloped anatomy
d. No lanugo: fine soft hair covering the body and limbs

III. PATIENT MANAGEMENT

A. Assessment

1. History

a. Date and time of birth
b. Onset of any symptoms
c. Prenatal history including prenatal care, mother's pregnancy status (gravida, para) substance abuse, multiple gestation, maternal illness
d. Birth history including maternal fever, presence of meconium, maternal bleeding, difficult delivery (e.g., shoulder dystocia, prolapsed or nuchal cord, breech)
e. Estimated gestational age (may be based on last menstrual period)

2. Exam

a. Respiratory rate and effort (strong, weak, or absent; regular or irregular)
b. Signs of respiratory distress (grunting, nasal flaring, retractions, gasping, apnea)
c. Heart rate (fast, slow, or absent)
   - Precordium, umbilical stump, or brachial pulse may be used (auscultation of chest is preferred since palpation of umbilical stump is less accurate)
d. Muscle tone (poor or strong)
e. Color/appearance (central cyanosis, acrocyanosis, pallor, normal)
f. APGAR score (Appearance, Pulse, Grimace, Activity, Respiratory effort) – may be calculated for documentation, but not necessary to guide resuscitative efforts
g. Estimated gestational age
h. Pulse oximetry should be considered if resuscitative efforts are initiated or if supplemental oxygen is administered

B. Treatment and Interventions

1. Assess the newborn.

2. **<u>Dry, warm, and stimulate</u>**

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.

c. If no resuscitation is required, warm/dry/stimulate the newborn, and then cut/clamp the cord after 60 seconds or the cord stops pulsating. 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.

3. If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and clear airway as needed - if signs of respiratory distress with airway obstruction, suction mouth then nose; routine suctioning is not recommended.

4. If heart rate greater than 100 beats per minute:

   a. Monitor for central cyanosis.
   b. Monitor for signs of respiratory distress. If apneic or in significant respiratory distress:
      - **Ventilate**: Bag-valve-mask ventilation with room air at 40-60 breaths per minute.
        1. Positive pressure ventilation (PPV) with bag-mask device may be initiated with room air (21% oxygen).
        2. Goal: Oxygen saturation at 10 minutes is 85-95%.

5. **Evaluate**: If heart rate less than 100 beats per minute:

   a. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute for 90 seconds with room air.
      - Primary indicator of effective ventilation is improvement in heart rate.
      - Evaluate heart rate every 30 seconds.
      - 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; can control rate and volume by saying “squeeze, release” – squeeze the bag just until chest rise is visualized then release to allow for exhalation.
   b. If no improvement after 90 seconds, add supplemental 100% oxygen to BVM until heart rate normalizes.
   c. Insert i-gel supraglottic airway if BVM ineffective.

6. **Resuscitate**: If heart rate less than 60 beats per minute:

   a. Ensure effective ventilations with supplementary oxygen and adequate chest rise.
   b. 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).
   d. Insert i-gel supraglottic airway if not already in place and attach waveform capnography.
   e. Administer epinephrine (0.1 mg/mL) 0.3 ml IV/IO every 3 to 5 min if heart rate remains less than 60 beats per minute.

7. Consider checking a blood glucose for ongoing resuscitation, maternal history of diabetes, ill appearing or unable to feed. If blood sugar < 45 mg/dL administer D10 using buretrol.

8. Administer 10 mL/kg normal saline IV/IO for signs of shock or post-resuscitative care.

C. Patient Safety Considerations

1. Hypothermia is common in newborns and worsens outcomes of nearly all post-natal complications

    a. Ensure heat retention by drying the infant thoroughly, covering the head, and wrapping the baby in dry cloth.
    b. When it does not interfere with the necessary assessment or required interventions, “kangaroo care” (i.e., placing the infant skin-to-skin directly against mother’s chest and wrapping them together) is an effective warming technique.
    c. 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 or mylar blankets covering body and head.** When available, radiant warmers or other warming adjuncts are suggested for babies who require resuscitation, especially for preterm babies. Check blood glucose and treat as appropriate.

2. During transport, neonate should be appropriately secured (with approved child restraint system) and mother should be appropriately secured.

3. Transport all prehospital deliveries to the closest Level 3 Perinatal Center after contact with online medical control

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Approximately 10% of newly born infants require some assistance to begin breathing at birth and 1% require resuscitation to support perfusion.

2. Most newborns require only drying, warming, and stimulating to help them transition from fetal respiration to newborn respiration. ***The resuscitation sequence can be remembered as Dry, Warm, and Stimulate – Ventilate – Evaluate – and Resuscitate.***

3. Deliveries complicated by maternal bleeding (placenta previa or placental abruption) place the infant at risk for hypovolemia secondary to blood loss.

4. Low birth weight infants are at high risk for hypothermia due to heat loss.

5. Measuring the pulse oximetry on the right hand provides the most accurate oxygen saturation 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%.

Targeted 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	85-95%

6. 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%.

7. 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.

8. Increase in heart rate is the most reliable indicator of effective resuscitative efforts.

9. A multiple gestation delivery may require additional resources and/or providers.

10. APGAR scoring is not critical during the resuscitation, but can be assessed at 1 minutes and 5 minutes after birth

APGAR Score

	0	1	2
Appearance	Blue, Pale	Body pink, extremities blue	Completely pink
Pulse	Absent	Slow (less than 100)	Rate of 100 or greater
Grimace	No response	Grimace	Cough or Sneeze
Activity	Limp	Some flexion	Active motion of extremities
Respirations	Absent	Slow, irregular	Good, crying

The Apgar score, American College of Obstetricians and Gynecologists, www.acog.org.

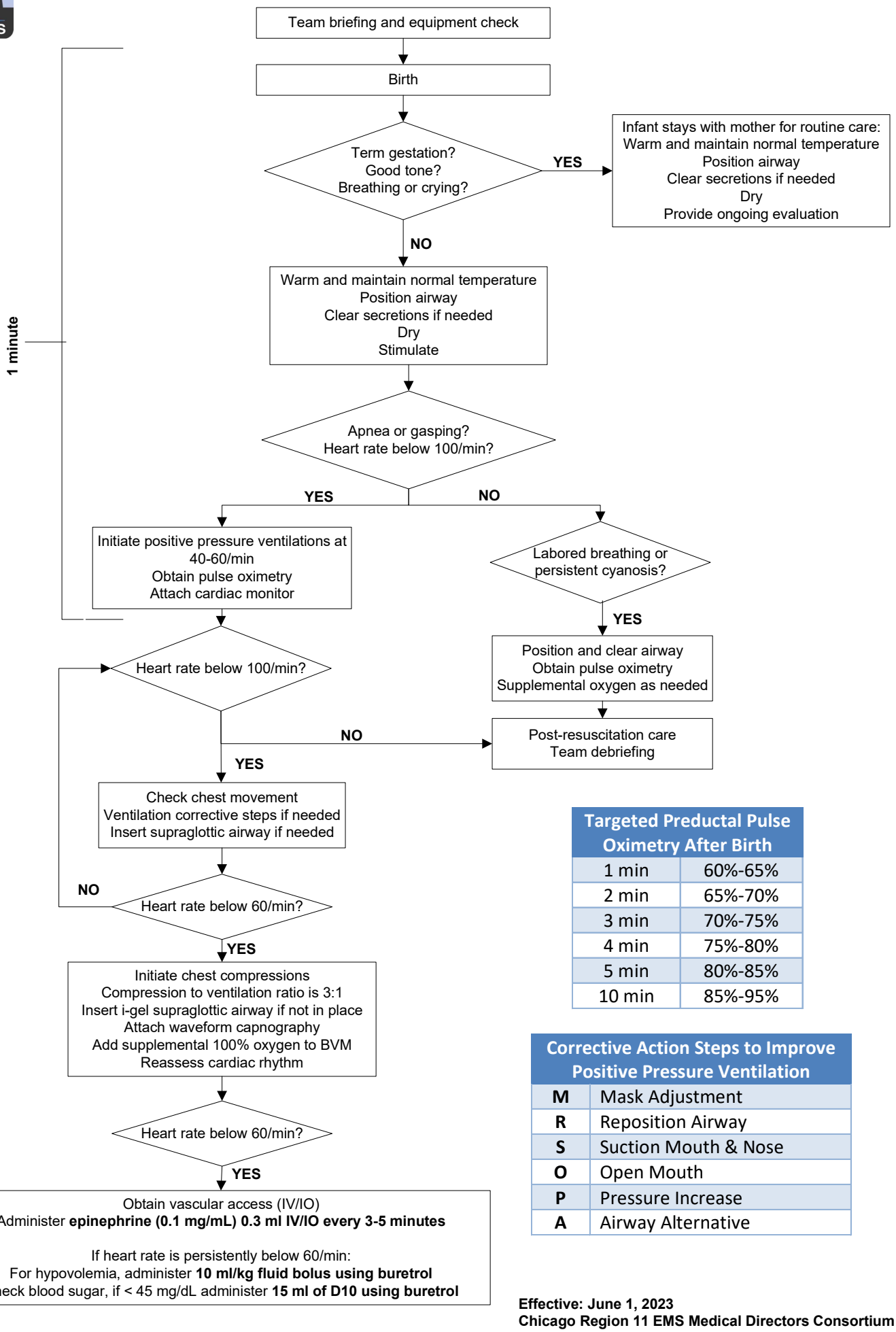
B. Pertinent Assessment Findings

1. It is difficult to determine gestational age in the field – if there is any doubt as to viability, resuscitation efforts should be initiated.

2. 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.

V. NEONATAL RESUSCITATION ALGORITHM (SEE NEXT PAGE)

NEONATAL RESUSCITATION ALGORITHM



Targeted Preductal Pulse Oximetry After Birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

Corrective Action Steps to Improve Positive Pressure Ventilation	
M	Mask Adjustment
R	Reposition Airway
S	Suction Mouth & Nose
O	Open Mouth
P	Pressure Increase
A	Airway Alternative

Effective: June 1, 2023
Chicago Region 11 EMS Medical Directors Consortium

REGION 11
CHICAGO EMS SYSTEM
PROTOCOLS

PEDIATRICS

Pediatric Initial Assessment
Pediatric Routine Medical Care (PRMC)
Altered Mental Status
Anaphylaxis and Allergic Reaction
Bradycardia
BRUE (Brief Resolved Unexplained Event)
Croup or Epiglottitis
Drowning
Hyperthermia / Heat Exposure
Hypothermia / Cold Exposure
Nausea & Vomiting
Pain Management
Post-ROSC Care
Pulseless Electrical Activity / Asystole
Seizures
Shock
Tachycardia with a Pulse
Tracheostomy with Respiratory Distress
Ventricular Fibrillation / Pulseless Ventricular Tachycardia
Region 11 EMS Pediatric Resuscitation Card

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Initial Assessment
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

PEDIATRIC INITIAL ASSESSMENT

I. SCENE SIZE-UP

A. Protect from body substance through isolation (glasses, gloves, gown and mask).

B. Assess the scene for safety and take appropriate steps.

C. Determine the mechanism of injury/nature of illness.

1. Note the number of patients.

2. Initiate Mass Casualty Plan, if necessary.
    a. Call for additional personnel and equipment.
    b. Begin triage.

3. Assess for any indication of abuse or neglect of the patient (see Reporting Abused and/or Neglected Patients policy).

II. INITIAL ASSESSMENT OF PEDIATRIC PATIENT

A. Assess general impression of child and environment with initial assessment of wellness and general appearance (conduct from a distance). Complete assessment while protecting the cervical spine, if necessary.

1. Determine nature of illness or mechanism of injury.

2. Is child in a life threatening condition? Treat immediately. Refer to Broselow tape if needed.

3. Obtain SAMPLE history and identify any caregivers at scene.

B. Assess child's mental status.

1. Identify yourself and your purpose using age appropriate terms.

2. Initially approach child in non-threatening manner, on their level when appropriate. Initiate touch in a non-threatening manner before examining child, when appropriate.

3. Evaluate child's mental status utilizing Pediatric Coma Scale.

C. Assess airway

1. Responsive Child
   a. If child is talking or crying, then assess for adequacy of breathing.
   b. If child is not talking or crying, open airway using modified jaw thrust maneuver.

2. Unresponsive Child
   a. Open the airway using modified jaw thrust maneuver.
   b. Consider use of oral airway.

D. Assess Breathing

1. Non-breathing child
   a. Maintain open airway and assist breathing utilizing ventilatory adjuncts and oxygen at the appropriate rate.
   b. Suction if necessary.
   c. Pulse oximeter

2. Breathing child
   a. Look for rise and fall of chest and feel for rate and depth of breathing.
   b. Look for use of accessory muscles, nasal flaring, grunting and retractions.
   c. Determine adequacy of breathing for age (either too fast or too slow).
   d. If breathing is inadequate, assist breathing utilizing ventilatory adjuncts and oxygen at the appropriate rate.
   e. Suction if necessary.
   f. Pulse oximeter (if indicated)

PEDIATRIC VITAL SIGNS

Weight in kg = (2 x age in years) + 10

Age	Pulse	Systolic Blood Pressure	Respiratory Rate
Neonate (0-30 days)	100-180	> 60	30-60
Infant (31 days - < 1yr)	100-160	> 60	30-60
Toddler (1 yr - < 3 yrs)	90-150	> 70	24-40
Pre-School (3 yrs - < 5 yrs)	80-140	> 75	22-34
School Age (5 yrs – 12 yrs)	70-120	> 80	18-30
Adolescent (> 12 yrs)	60-100	> 90	12-16

E. Assess Circulation

INDICATORS OF HYPOPERFUSION IN CHILDREN

- Cyanosis despite administration of oxygen
- Truncal pallor/cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- Weak, thready, or absent peripheral pulses
- No palpable blood pressure
- Decreasing level of consciousness

1. Check brachial or femoral pulse for rate and quality.

2. If none found, check for carotid pulse. If pulseless, start CPR and see appropriate protocol.

3. Assess for central capillary refill.

4. Assess skin condition.

5. Assess and control severe bleeding.

F. Identify priority pediatric patients for immediate transport and initiate interventions as per protocols.

G. Repeat initial assessment.

1. Every 15 minutes in a stable child.

2. Every 5 minutes in an unstable child.

3. Repeat before beginning detailed physical examination.

H. Initiate measures to prevent heat loss to keep the child from becoming hypothermic.

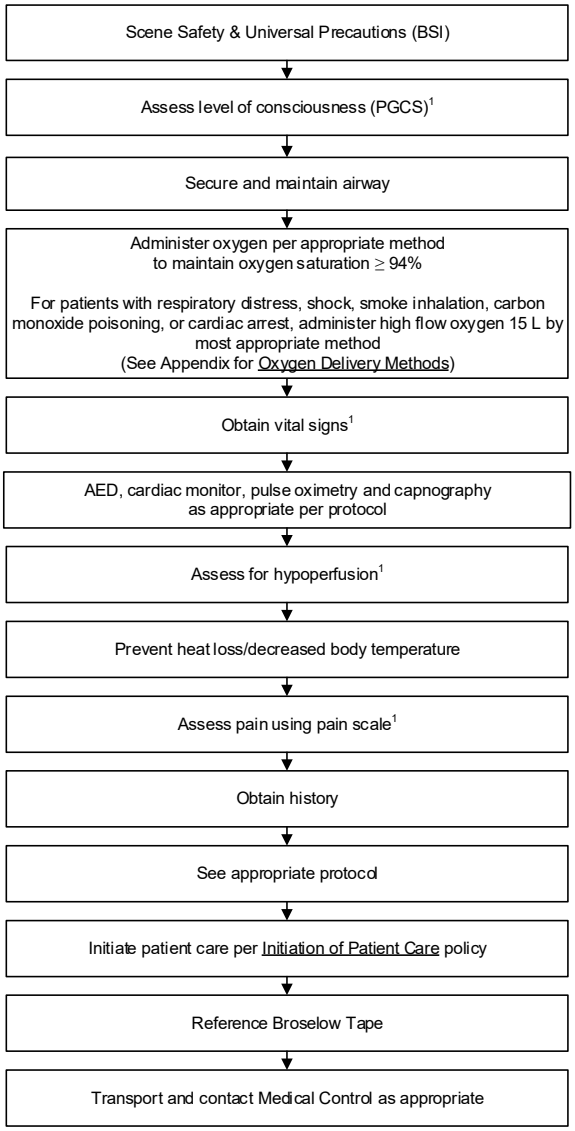
I. For children with special healthcare needs (CSHN), refer as needed to child's emergency care plan. Understanding the child's baseline will assist in determining the significance of altered physical findings.

PEDIATRIC GLASGOW COMA SCALE (PGCS)				
	> 1 Year		**< 1 Year**	**Score**
EYE OPENING	Spontaneously		Spontaneously	4
	To verbal command		To shout	3
	To pain		To pain	2
	No response		No response	1
MOTOR RESPONSE	Obeys		Spontaneous	6
	Localizes pain		Localizes pain	5
	Flexion-withdrawal		Flexion-withdrawal	4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)	3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)	2
	No response		No response	1
	> 5 years	**2-5 Years**	**0-23 Months**	
VERBAL RESPONSE	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused	Inappropriate words	Cries and is consolable	4
	Inappropriate words	Persistent cries and screams	Persistent inappropriate crying and/or screaming	3
	Incomprehensible sounds	Grunts	Grunts, agitated, and restless	2
	No response	No response	No response	1
TOTAL PEDIATRIC GLASGOW COMA SCORE:				**(3-15)**

PEDIATRIC PAIN SCALE

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Routine Medical Care (PRMC) - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

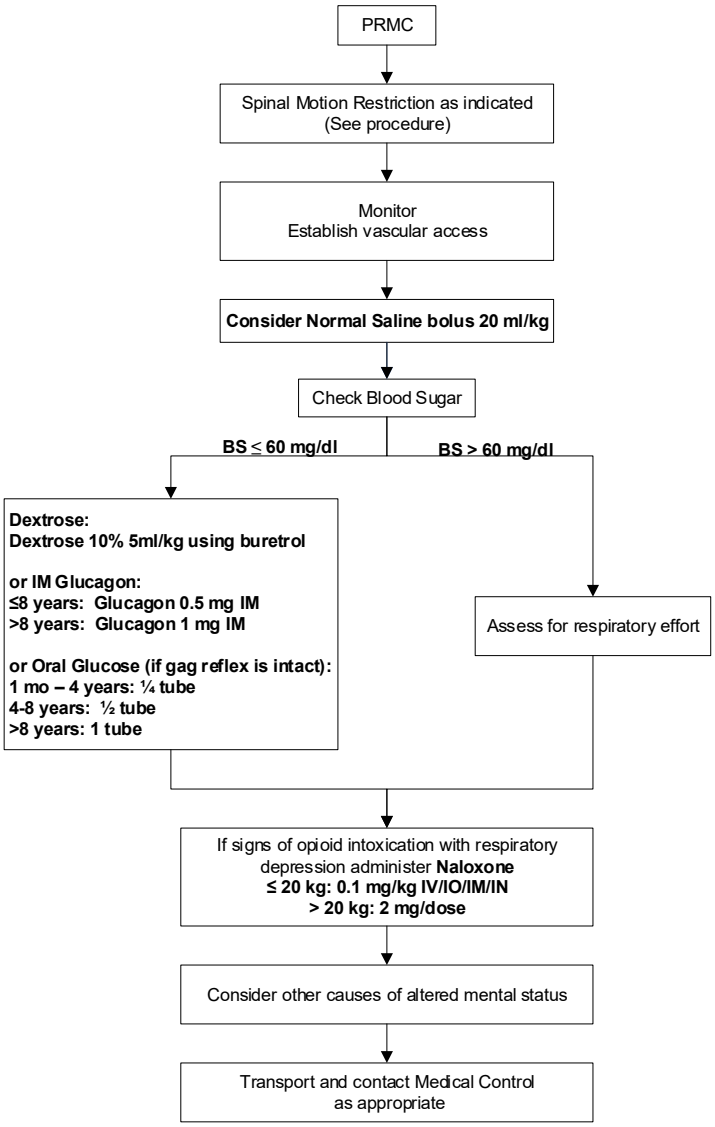
PEDIATRIC ROUTINE MEDICAL CARE (PRMC) - ALS
(Age Newborn – 15 yrs.)



1 – See Pediatric Initial Assessment

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Altered Mental Status - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: October 17, 2016

PEDIATRIC ALTERED MENTAL STATUS - ALS

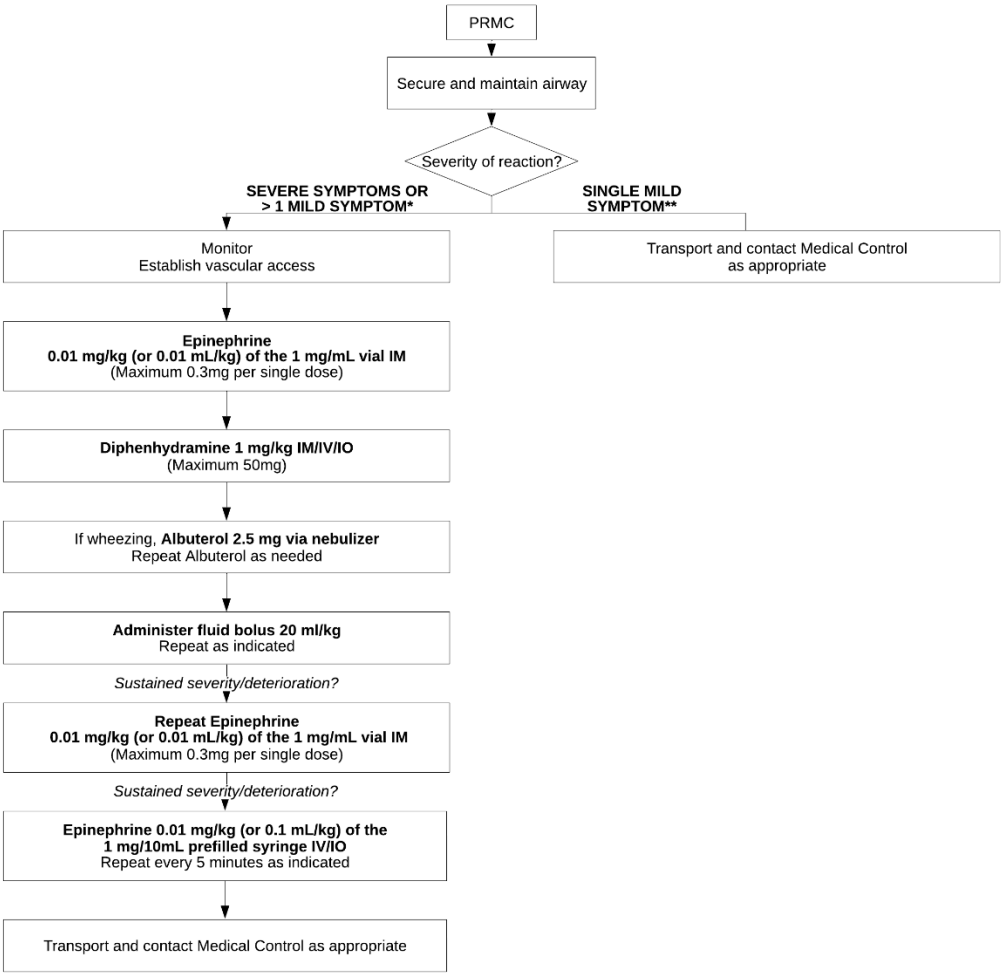


Consider causes:

A Alcohol, abuse	**T** Trauma, temperature
E Epilepsy, electrolytes, encephalopathy	**I** Infection, intussusception, inborn errors
I Insulin	**P** Psychogenic
O Opiates, overdose	**P** Poison
U Uremia	**S** Shock, seizures, stroke, space-occupying lesion, subarachnoid hemorrhage, shunt

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Anaphylaxis and Allergic Reaction - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC ANAPHYLAXIS AND ALLERGIC REACTION - ALS



***Severe symptoms of an allergic reaction may include any combination of the following:**

RESPIRATORY – Shortness of breath, wheezing, repetitive coughing
CARDIOVASCULAR – Pale, cyanotic, low blood pressure, dizzy
THROAT – Tightness, hoarse, trouble breathing/swallowing
MOUTH – Swelling of the tongue and/or lips
SKIN- Diffuse hives or redness
GI – Repetitive vomiting, severe diarrhea
NEURO – Anxiety, confusion, sense of doom

****Mild symptoms of an allergic reaction may include any combination of the following:**

NOSE – Itchy/runny nose, sneezing
MOUTH – Itching
SKIN- Few hives, mild itching
GI – Mild nausea/discomfort

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Bradycardia – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC BRADYCARDIA – BLS/ALS

I. PATIENT CARE GOALS

1. Maintain adequate perfusion.

2. Treat underlying cause:

   a. Hypoxia
   b. Shock
   c. Second or third-degree atrioventricular (AV) block
   d. Toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin)
   e. Electrolyte disorder
   f. Hypoglycemia
   g. Increased intracranial pressure (ICP)
   h. Other

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Pediatric patient with bradycardia and either symptoms of altered mental status chest pain, congestive heart failure, syncope, shock, pallor, diaphoresis or evidence of hemodynamic instability.

2. The major ECG rhythms classified as bradycardia include:

   a. Sinus bradycardia
   b. Second degree AV block
      - Type I- Wenckebach/Mobitz I
      - Type II- Mobitz II
   c. Third-degree AV block, complete heart block
   d. Ventricular escape rhythms

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Pediatric Management

Treatment is only indicated for patients who are symptomatic (pale/cyanotic, diaphoretic, altered mental status, hypoxic).

1. For infants and newborns, initiate chest compressions for heart rate less than 60 beats per minute and signs of poor perfusion (altered mental status, hypoxia, hypotension, weak pulse, delayed capillary refill, cyanosis).

2. Manage airway and assist ventilations as necessary with minimally interrupted chest compressions using a compression-to-ventilation ratio 15:2 (30:2 if single clinician is present).

3. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

4. Initiate monitoring and perform 12-lead ECG.

5. Establish IV access.

6. Check blood glucose and treat hypoglycemia.

7. Consider the following additional therapies if bradycardia and symptoms or hemodynamic instability continue:

    a. Administer atropine 0.02 mg/kg IV with minimum dose of 0.1 mg to maximum initial dose of 0.5 mg (maximum total dose of 3 mg).
    b. If atropine is ineffective, initiate Transcutaneous Pacing Procedure with analgesia per Pain Management Protocol
    c. Epinephrine may be used for bradycardia and poor perfusion unresponsive to ventilation and oxygenation, the dose is 0.01 mg/kg (or 0.1 mL/kg) of the 1 mg/10 mL prefilled syringe, IV/IO (Max 1 mg).

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Evaluate for signs of decreased end-organ perfusion: chest pain, shortness of breath, decreased level of consciousness, syncope, or other signs of shock/hypotension.

2. Consider the effect of medications causing bradycardia including beta-blockers, calcium channel blockers, sodium channel blockers/anti-depressants, digoxin, and clonidine.

3. There are many potential causes of bradycardia including: myocardial infarction (MI), hypoxia, hypothermia, sinus bradycardia, athletes, head injury with increased intracranial pressure (ICP), stroke, spinal cord lesion, AV blocks, overdose, and cholinergic nerve agents.

4. Consider hyperkalemia in the patient with wide complex bradycardia.

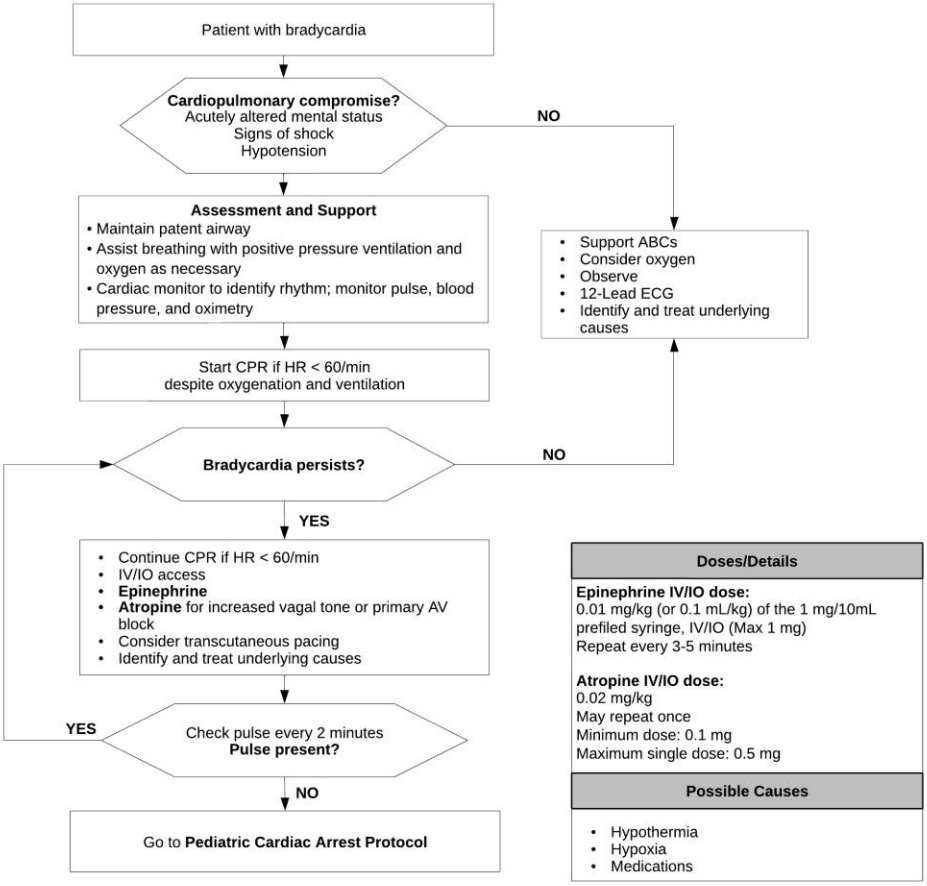
5. Bradycardia should be managed via the least invasive manner possible, escalating care as needed.

    a. Third-degree heart block may not respond to atropine, and in these cases proceed quickly to chronotropic agents (such as epinephrine) or transcutaneous pacing.
    b. In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing.

6. Be aware of acute coronary syndrome as a cause of bradycardia in adult patients.

7. When dosing medications for pediatric patients, dose should be weight-based for non-obese patients and based on ideal body weight for obese patients.

PEDIATRIC BRADYCARDIA WITH A PULSE – BLS/ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: BRUE (Brief Resolved Unexplained Event)
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: June 1, 2023

BRUE (BRIEF RESOLVED UNEXPLAINED EVENT) – BLS/ALS

I. PATIENT CARE GOALS

1. Recognize patient characteristics and symptoms consistent with a BRUE.

2. Promptly identify and intervene for patients who require escalation of care.

3. Transport suspected BRUE cases to hospitals with EDAP (Emergency Department Approved for Pediatrics) designation.

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Suspected BRUE: An event in an infant less than 1-year-old reported by a bystander as sudden, brief (less than 1 minute), unexplained, and completely resolved upon EMS arrival that includes one or more of the following:

    a. Breathing change (absent, decreased, or irregular)
    b. Color change (central cyanosis or pallor)
    c. Marked change in muscle tone (increase or decrease in muscle tone)
    d. Altered level of responsiveness (including irritability)

2. Patients with **high-risk criteria include:**

    a. Less than 2 months of age
    b. History of prematurity (less than or equal to 32 weeks gestation)
    c. More than one BRUE, now or in the past
    d. Event duration greater than 1 minute
    e. CPR or resuscitation by caregivers or trained rescuers

B. Exclusion Criteria

1. Any signs or symptoms suggestive of underlying or acute illness or injury present upon EMS evaluation, such as:

    a. Abnormal vital signs for age (including fever)
    b. Vomiting
    c. Signs of trauma
    d. Noisy or labored breathing

2. Identifiable cause for the event which may be determined at the hospital, include:

    a. Gastric reflux (spitting up)

b. Swallowing dysfunction
c. Nasal congestion or excessive secretions from the nose and/or mouth
d. Periodic breathing of the newborn
e. Breath-holding spell
f. Change in tone associated with choking, gagging, crying, feeding
g. Seizure (e.g. eye deviation, nystagmus, tonic-clonic activity)
h. Hypoglycemia
i. Episode with significant past medical history (e.g., congenital heart disease, pulmonary disease, VP shunt, or seizure disorder)

3. History or exam concerning for child abuse or neglect.

4. Color change that involved only redness (i.e., in the face) or isolated hands/feet cyanosis.

III. PATIENT MANAGEMENT

A. Assessment

1. History

a. History of circumstances and symptoms before, during, and after the event, including duration, interventions done, as well as patient color, tone, breathing, feeding, position, location, activity, and level of consciousness.
b. Other concurrent symptoms (e.g., fever, congestion, cough, rhinorrhea, vomiting, diarrhea, rash, labored breathing, fussy, less active, poor sleep, poor feeding).
c. Prior history of BRUE (ever, including past 24 hours).
d. Past medical history (e.g., prematurity, prenatal/birth complications, gastric reflux, congenital heart disease, developmental delay, airway abnormalities, breathing problems, prior hospitalizations, surgeries, or injuries).
e. Family history of sudden unexplained death or cardiac arrhythmia in other children or young adults.
f. Social history: those living at home, recent household stressors, exposures to toxins/drugs, sick contacts.
g. Considerations for possible child abuse (i.e., multiple/changing versions of the story or reported mechanism of injury does not seem plausible, especially for child's developmental stage).

2. Exam

a. Full set of vital signs (pulse, blood pressure, respiratory rate, pulse oximetry, neurologic status assessment).
b. General assessment:

i. Signs of respiratory distress or increased work of breathing (e.g., tachypnea, grunting or other abnormal breath sounds, nasal flaring, retracting, or head bobbing).
ii. Color, both central and peripheral (pallor, cyanosis, redness, or normal), capillary refill.
iii. Mental status (alert, tired, lethargic, unresponsive, or irritable).

c. Head to toe exam, including:
i. Physical exam for signs of trauma or neglect.
ii. Pupillary response and anterior fontanelle.

B. Treatment and Interventions

1. Monitoring (all patients with possible BRUE):

a. Continuous cardiac monitor
b. Continuous pulse oximetry
c. Serial observations during transport for change in condition
d. Check blood glucose and treat hypoglycemia (glucose < 60 mg/dL)

2. Airway

a. Give supplemental oxygen for signs of respiratory distress or hypoxemia - escalate from a nasal cannula to a simple face mask to a non-rebreather mask as needed (Airway Management Protocol).
b. Suction excessive secretions from the nose and/or mouth (using bulb syringe or suction catheter).

3. Utility of IV placement and fluids

a. Routine IVs are not necessary on all suspected BRUE patients.
b. IVs should be placed only for clinical concerns of shock or to administer IV medications.

4. Transport the patient to the closest, appropriate hospital with EDAP (Emergency Department Approved for Pediatrics) designation even if they appear well or have returned to their baseline.

C. Patient Safety Considerations

1. Regardless of the patient's well appearance, all infants with a history of signs or symptoms suggestive of BRUE should be transported for further evaluation.

a. By definition, infants who are not completely well-appearing at EMS evaluation do not meet the definition of possible BRUE and should be treated and transported as appropriate.

2. Destination considerations:

    a. All patients should be transported to the closest, appropriate hospital with EDAP (Emergency Department Approved for Pediatrics) designation after contacting Online Medical Control.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. BRUE is a group of symptoms, not a disease process.

2. If the infant is not completely well upon EMS arrival, this excludes possible BRUE event:

    a. Treat and transport as per Region 11 EMS Protocols.

3. Avoid using “BRUE”, “SIDS”, or “near-miss SIDS” terminology with parent/guardian.

4. EMS providers play a unique and important role in obtaining an accurate history soon after the event and in observing, documenting, and reporting environmental, scene and social indicators that may point to an alternate diagnosis.

5. High-risk patients with a possible BRUE have worse outcomes and require emergency department (ED) or inpatient testing, intervention, and/or follow-up.

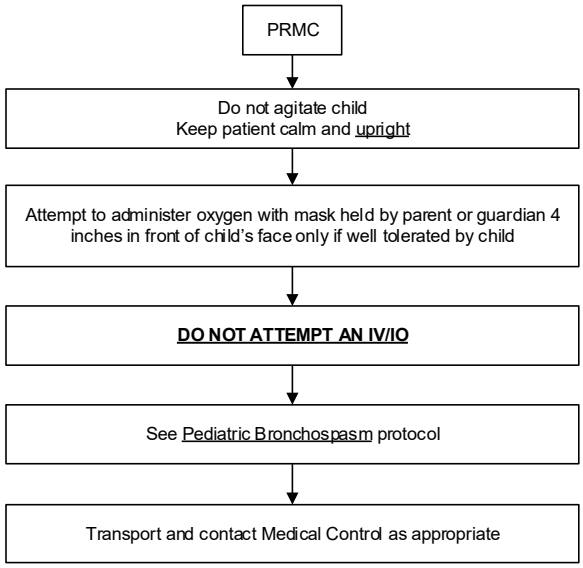
6. The determination of a BRUE is made only after hospital evaluation, not in the field.

7. All patients with suspected BRUE should be transported to an ED.

8. Contact online medical control if parent/guardian is refusing medical care and/or transport, especially if any high-risk criteria are present.

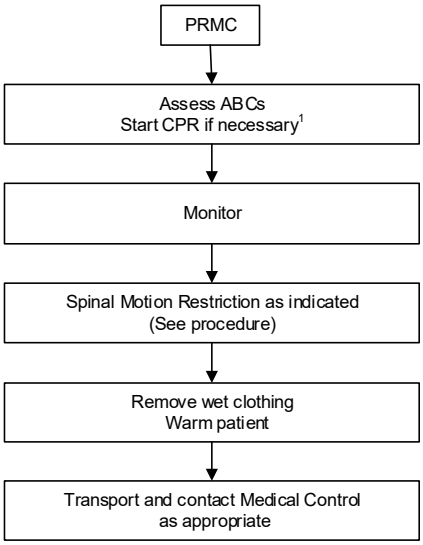
REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Croup or Epiglottitis - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

PEDIATRIC CROUP OR EPIGLOTTITIS - ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Drowning - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: January 1, 2010

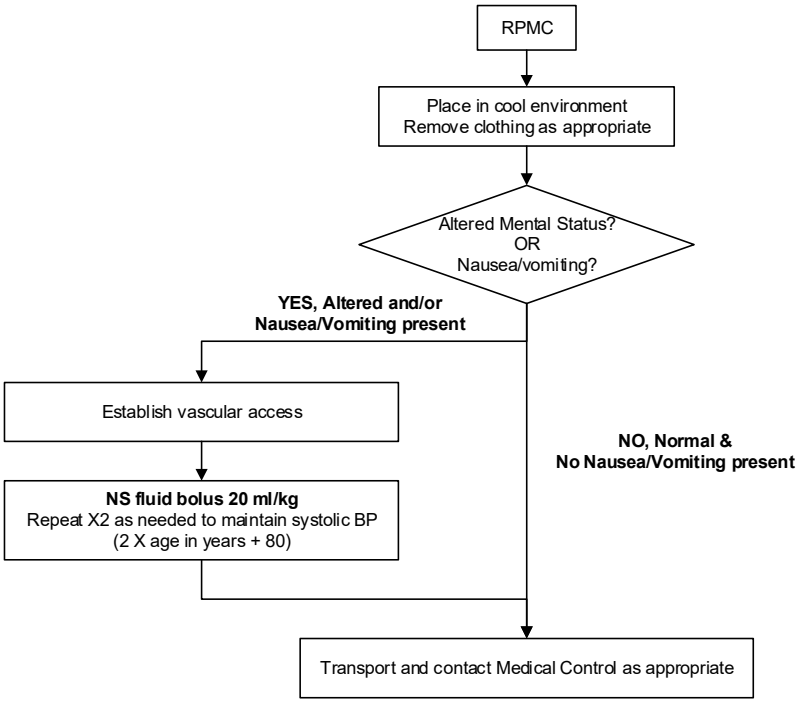
PEDIATRIC DROWNING - ALS



1 – Pediatric CPR rates: 1 rescuer = 30 compressions: 2 ventilations
2 rescuers = 15 compressions: 2 ventilations

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Hyperthermia / Heat Exposure - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: January 1, 2010

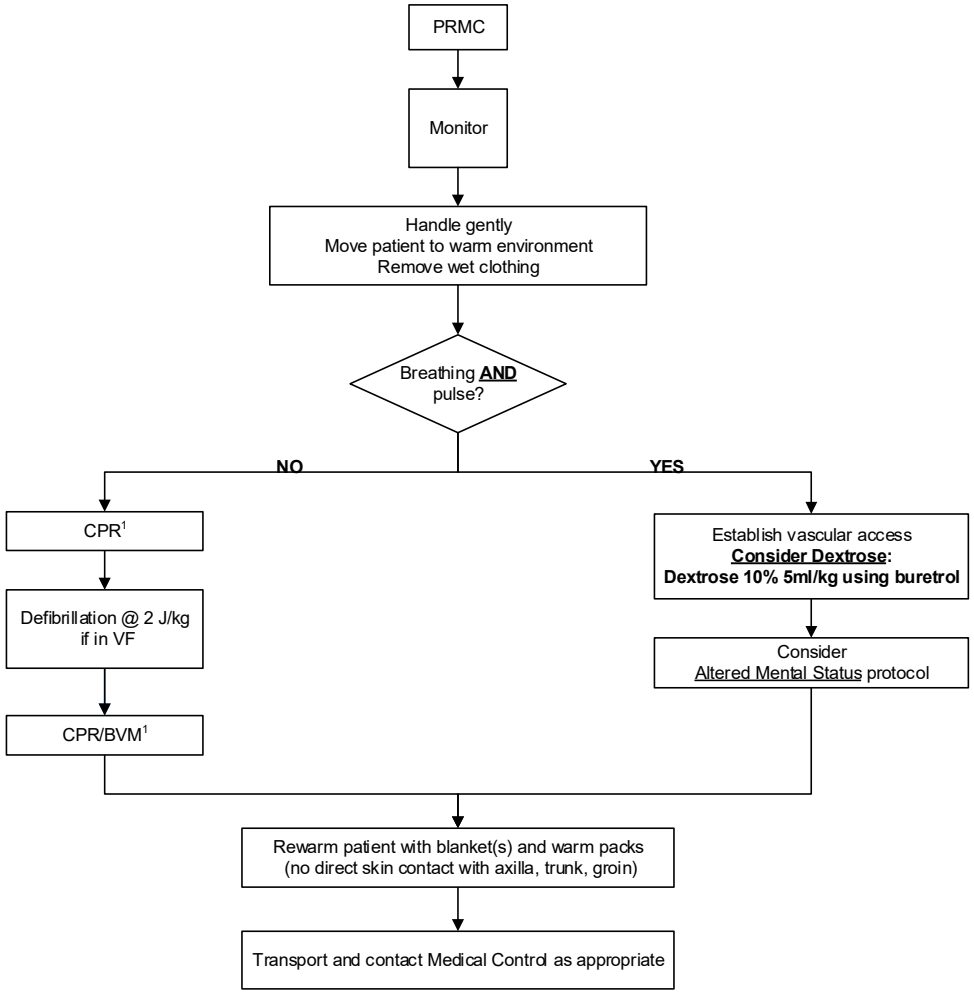
PEDIATRIC HYPERTHERMIA / HEAT EXPOSURE - ALS



NOTE: Capillary refill may NOT be a reliable indicator when the patient's temperature is > 104 degrees

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Hypothermia / Cold Exposure - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

PEDIATRIC HYPOTHERMIA / COLD EXPOSURE - ALS

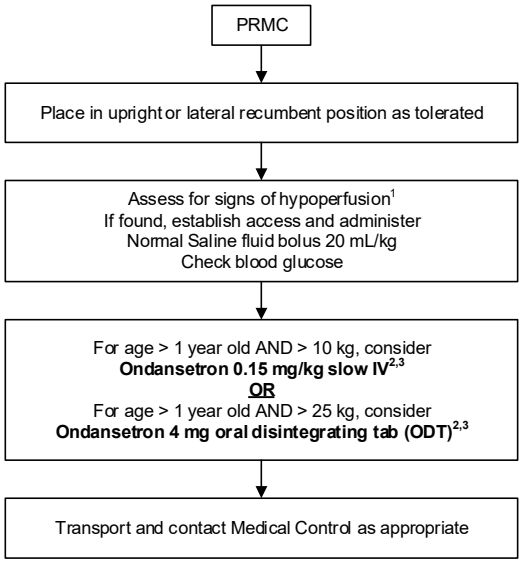


NOTES: **- May present with altered sensorium or as unconscious. Heart more susceptible to dysrhythmias. May have apnea, dusky or cyanotic appearance, fixed and dilated pupils; may appear without signs of life.**
- An individual in a frozen state is not considered salvageable.
- The suspected hypothermic patient shall never be declared dead in the field.

1 – Pediatric CPR rates: 1 rescuer = 30 compressions: 2 ventilations
2 rescuers = 15 compressions: 2 ventilations

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Nausea & Vomiting - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: November 1, 2019

PEDIATRIC NAUSEA & VOMITING - ALS



1 - See indicators of hypoperfusion in Pediatric Initial Assessment protocol.
2 – Avoid in patients with known or suspected prolonged QT, congenital heart disease or surgery, or severe hepatic impairment as these patients are at risk for Torsades de Pointes.
3 – Nausea and vomiting are symptoms of illness. Investigate for underlying causes which are not limited to: gastrointestinal, cardiovascular, gynecologic, hypoglycemia, and hyperglycemia.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Pain Management - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

PEDIATRIC PAIN MANAGEMENT – ALS

PRMC

Determine cause of patient's pain and refer to appropriate protocol

Determine Patient's Pain Score using either the Verbal Descriptor Scale or Wong-Baker FACES® Scale

Consider use of non-pharmacologic pain management techniques
Attempt to place patient in a position of comfort
Consider application of ice packs or splints as appropriate

If non-pharmacologic pain management techniques fail and the patient is in severe pain and > 1 year old, consider single dose of analgesia[1, 2]

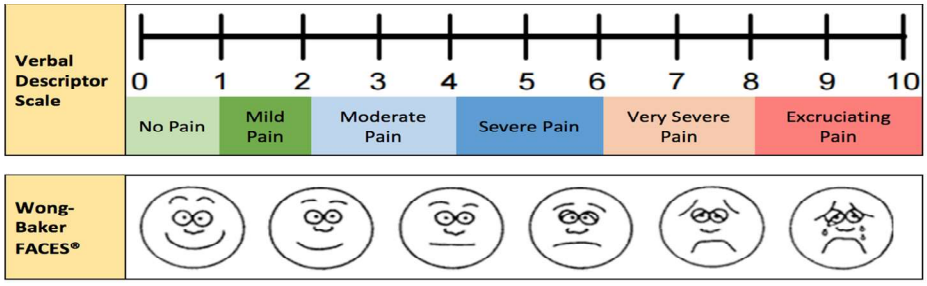
Fentanyl 1 mcg/kg IV/IO/IM/IN
max dose 100 mcg

Complete vital signs and pain scale should be assessed and documented before and after every intervention

Transport and contact Medical Control as appropriate

1 – Contraindications include known or documented allergy to fentanyl or other opioid analgesic, pregnancy with active labor, dental pain, chronic pain patients who are not part of hospice or palliative care, hypoventilation or respiratory depression.
2 – Use with caution in patients with GCS < 15, hypotension, or hypoxia

Universal Pain Assessment Tool



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Adult and Pediatric Post-ROSC Care – ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: December 1, 2022

ADULT AND PEDIATRIC POST-ROSC CARE - ALS

I. PATIENT CARE GOALS

The immediate ROSC period is critical in stabilizing patients and preparing for transport. Therefore, the goal is to maximize survival and optimize neurologic and cardiovascular function following a return of spontaneous circulation through the following steps:

1. Manage airway
2. Manage respiratory parameters
3. Manage hemodynamic parameters and maximize blood pressure
4. Obtain 12-lead ECG and identify ST-elevation myocardial infarction (STEMI) or reversible causes of arrest
5. Recognize pending re-arrest
6. Transport to a STEMI Center

II. PATIENT PRESENTATION

Inclusion Criteria: Adult and pediatric patient with return of spontaneous circulation (ROSC) after non-traumatic cardiac arrest

III. PATIENT MANAGEMENT

1. Confirm Return of Spontaneous Circulation (ROSC):
    a. Identify palpable pulse
    b. Document auscultated blood pressure
    c. Perform 12-lead ECG and assess for STEMI
    d. A significant percentage of post-ROSC patients will re-arrest. Continue close monitoring and be prepared for re-arrest during the post-ROSC phase of care.
2. Assess Oxygenation and Ventilation:
    a. Maintain oxygen saturation ≥ 94%, do not hyperoxygenate
    b. Assist spontaneous respirations with BVM as necessary
    c. If no spontaneous respirations, place i-gel or endotracheal tube and attach continuous ETCO2 capnography
    d. Avoid hyperventilation
        i. Adults: Ventilate at a rate of 1 breath every 6 seconds (10 breaths per minute)
        ii. Children: Ventilate at 1 breath every 5 seconds (12 breaths per minute)
        iii. Infants: Ventilate at 1 breath every 3 seconds (20 breaths per minute)
    e. Titrate ventilation to target ETCO2 of 35-45 mmHg

3. Assess Circulation:

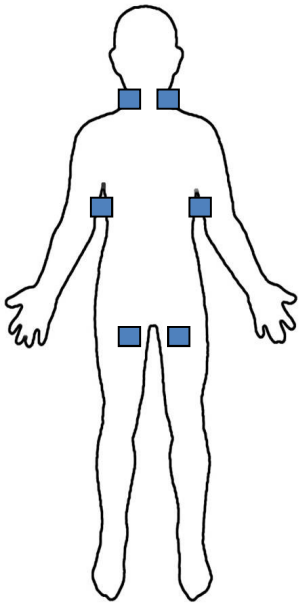
   a. For adults, If SBP is less than 90 mmHg, administer one 300 ml bolus of NS and repeat as indicated to maintain SBP ≥ 90 mmHg.
   b. For pediatric patients, administer 20 ml/kg fluid bolus to maintain blood pressure at or above normal for age as listed on Region 11 Pediatric Resuscitation Card.

4. Assess Mental Status:

   a. Check blood glucose, treat hypoglycemia accordingly.
   b. If adult patient is comatose with GCS ≤ 8, evaluate for Targeted Temperature Management

5. Evaluate for Targeted Temperature Management (TTM):

   a. For adult patients that are comatose (GCS ≤ 8) and sustained ROSC for a minimum of 5 minutes
   b. Apply ice packs to each of the following locations (6 total):
      i. 1 to each carotid artery on neck
      ii. 1 to each axilla
      iii. 1 to each femoral artery on groin



Snap and then apply ice packs as shown. One over each carotid artery (neck), one in each axilla, and one over each femoral artery (groin)

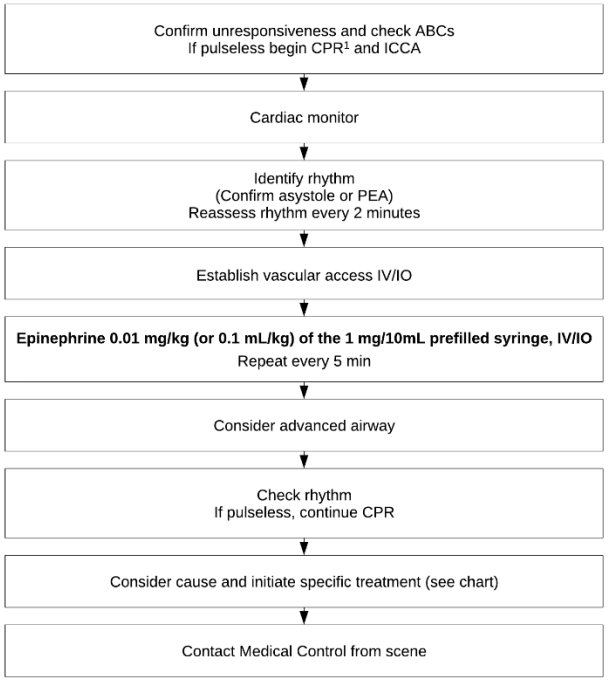
6. Contact Online Medical Control:

   a. Minimize movement of patient during post-arrest phase
   b. In the radio report, notify Online Medical Control if:
      i. Patient has ST Elevation Myocardial Infarction (STEMI) on 12-lead.
      ii. If Targeted Temperature Management (TTM) has been started.

7. Transmit 12-lead ECG and transport ALL adult patients to a Region 11 STEMI Center. Transport all pediatric patients to a Region 11 EDAP hospital.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Pulseless Ventricular Electrical Activity / Asystole - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC PULSELESS ELECTRICAL ACTIVITY / ASYSTOLE - ALS



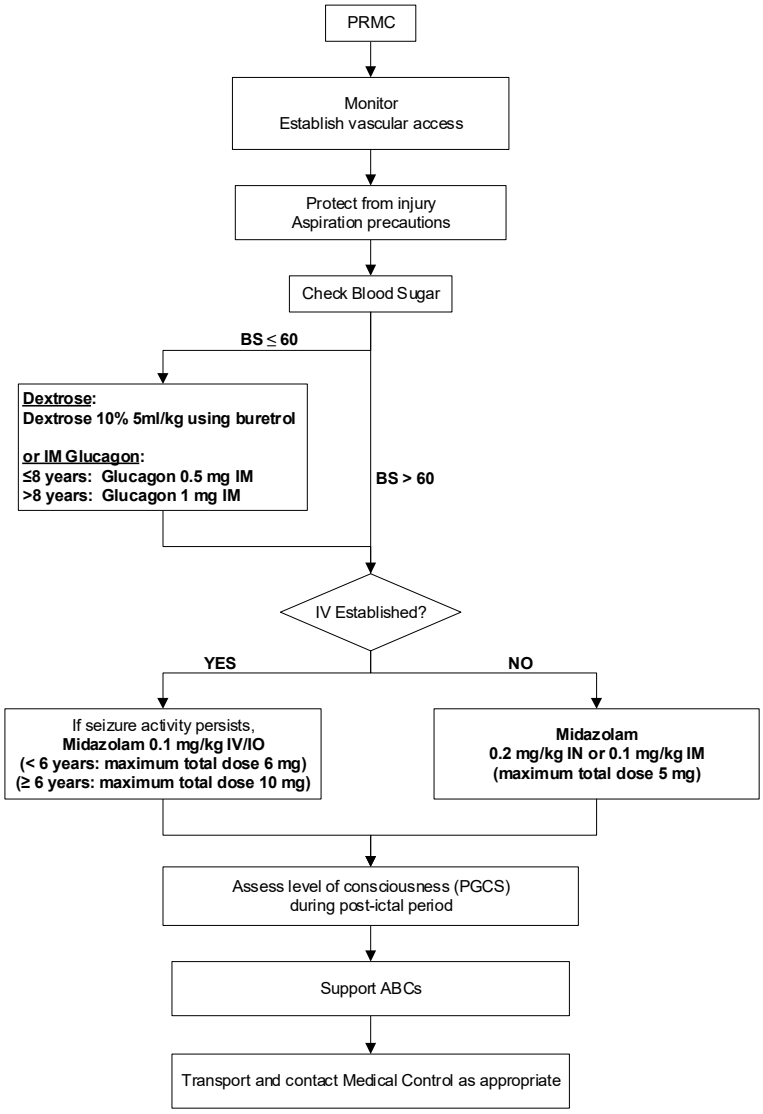
1 – Ventilation Rates: Basic Airway……1 rescuer = 30 compressions: 2 ventilations
2 rescuers = 15 compressions: 2 ventilations

Advanced Airway…..Child = 12 breaths per minute (1 breath every 5 seconds)
Infant = 20 breaths per minute (1 breath every 3 seconds)

REVERSIBLE CAUSES	SPECIFIC EMS TREATMENT
Hypovolemia	Normal saline bolus, 20 ml/kg
Hypoxia	Check placement of advanced airway, ensure oxygenation and ventilation
Hydrogen ion (acidosis)	None
Hyperkalemia	For children older than 6 months of age: **Calcium Chloride, 10%, 0.2 ml/kg, IV/IO, max single dose 10 ml** **Sodium Bicarbonate, 8.4%, 1 mEq/kg, IV/IO, max single dose 50 ml**
Hypothermia	None
Tension pneumothorax	Pleural (needle) decompression
Tamponade, cardiac	None
Toxins	For suspected opioid overdose, consider **Naloxone: ≤ 20 kg: 0.1 mg/kg, IV/IO** **> 20 kg: 2.0 mg/dose, IV/IO** For suspected tricyclic antidepressant overdose, consider **Sodium Bicarbonate, 8.4%, 1 mEq/kg, IV/IO, max single dose 50 ml**
Thrombosis, pulmonary	None
Thrombosis, coronary	None

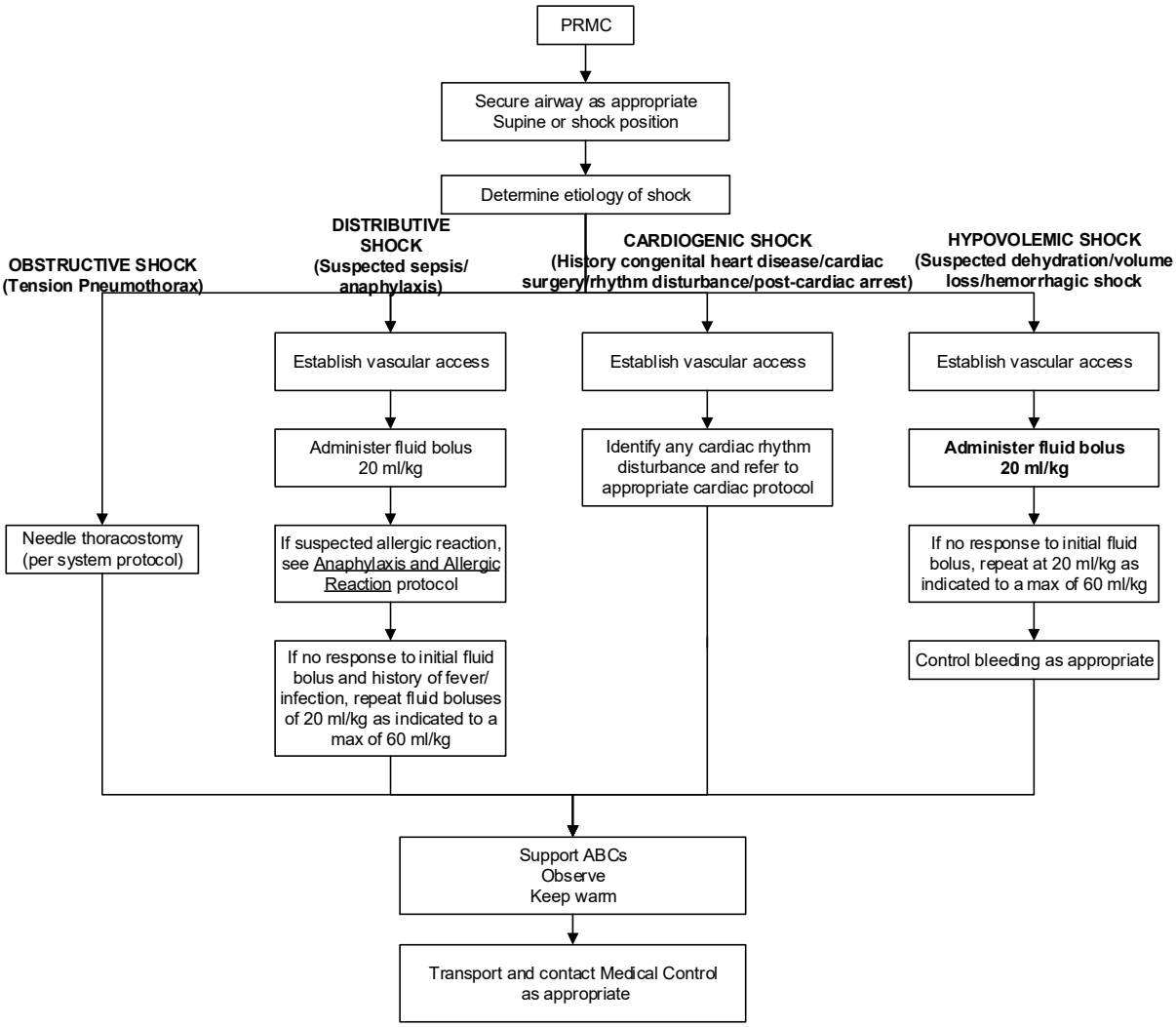
REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Seizures - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: August 1, 2022

PEDIATRIC SEIZURES - ALS



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Shock - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: November 1, 2010

PEDIATRIC SHOCK - ALS



Special Considerations:
Caution – fluids may need to be restricted in Cardiogenic shock.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Tachycardia with a Pulse – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC TACHYCARDIA WITH A PULSE – BLS/ALS

I. PATIENT CARE GOALS

1. Maintain adequate oxygenation, ventilation, and perfusion.
2. Control ventricular rate.
3. Restore regular sinus rhythm in unstable patient.
4. Search for underlying cause:
    a. Medications (caffeine, diet pills, thyroid, decongestants)
    b. Drugs (cocaine, amphetamines)
    c. History of dysrhythmia
    d. Congestive heart failure (CHF)

II. PATIENT PRESENTATION

Patients will manifest elevated heart rate for age and may or may not also present with associated signs or symptoms such as palpitations, dyspnea, chest pain, syncope/near-syncope, hemodynamic compromise, altered mental status, or other signs of end organ decreased perfusion.

Rhythms include:
- *Atrial fibrillation (A-fib)*
- *Atrial flutter*
- *Multifocal atrial tachycardia (MAT)*
- *Supraventricular tachycardia (SVT)*
- *Torsades de pointes*
- *Ventricular tachycardia (VT)*

A. Inclusion Criteria

Heart rate with relative tachycardia in pediatric patients – assess per clinical condition and hemodynamic instability.

B. Exclusion Criteria

Sinus tachycardia with hemodynamic stability.

III. PATIENT MANAGEMENT

A. Pediatric Management

1. Manage airway as necessary.

2. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

3. Initiate monitoring and perform 12-lead ECG.

4. Establish IV access.

5. Check blood glucose and treat if needed.

6. For ALS clinicians, evaluate the tachycardia and assess for patient stability.

    a. Assess for hemodynamic stability
    b. Assess narrow (QRS ≤ 0.09 second) or wide (QRS > 0.09 second)
    c. Assess regular or irregular rhythm.

7. Apply defibrillation pads in the Anterior-Posterior position.

8. Consider the following additional therapies if tachycardia with signs and symptoms or hemodynamic instability continues:

    a. Regular Narrow Complex Tachycardia – Stable (SVT)
        i. Perform vagal maneuvers
        ii. Adenosine 0.1 mg/kg (maximum of 6 mg)
        iii. If unsuccessful, may repeat with 0.2 mg/kg (maximum of 12 mg)

    b. Regular Narrow Complex Tachycardia – Unstable
        i. Deliver a synchronized shock: 1 J/kg for the first dose per Synchronized Cardioversion Procedure
        ii. Repeat doses should be 2 J/kg

    c. Regular Wide Complex Tachycardia — Stable
        i. Monitor hemodynamic status and transport

    d. Regular, Wide Complex Tachycardia – Unstable
        i. Synchronized cardioversion 1.0 J/kg per Synchronized Cardioversion Procedure
        ii. Repeat doses should be 2 J/kg

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Causes:

    a. Hypovolemia
    b. Hypoxia
    c. Hydrogen (acidosis)
    d. Myocardial infarction

e. Hypokalemia/Hyperkalemia
f. Hypoglycemia
g. Hypothermia
h. Toxins/Overdose
i. Tamponade
j. Tension pneumothorax
k. Thrombus – central or peripheral
l. Trauma
m. Hyperthyroidism

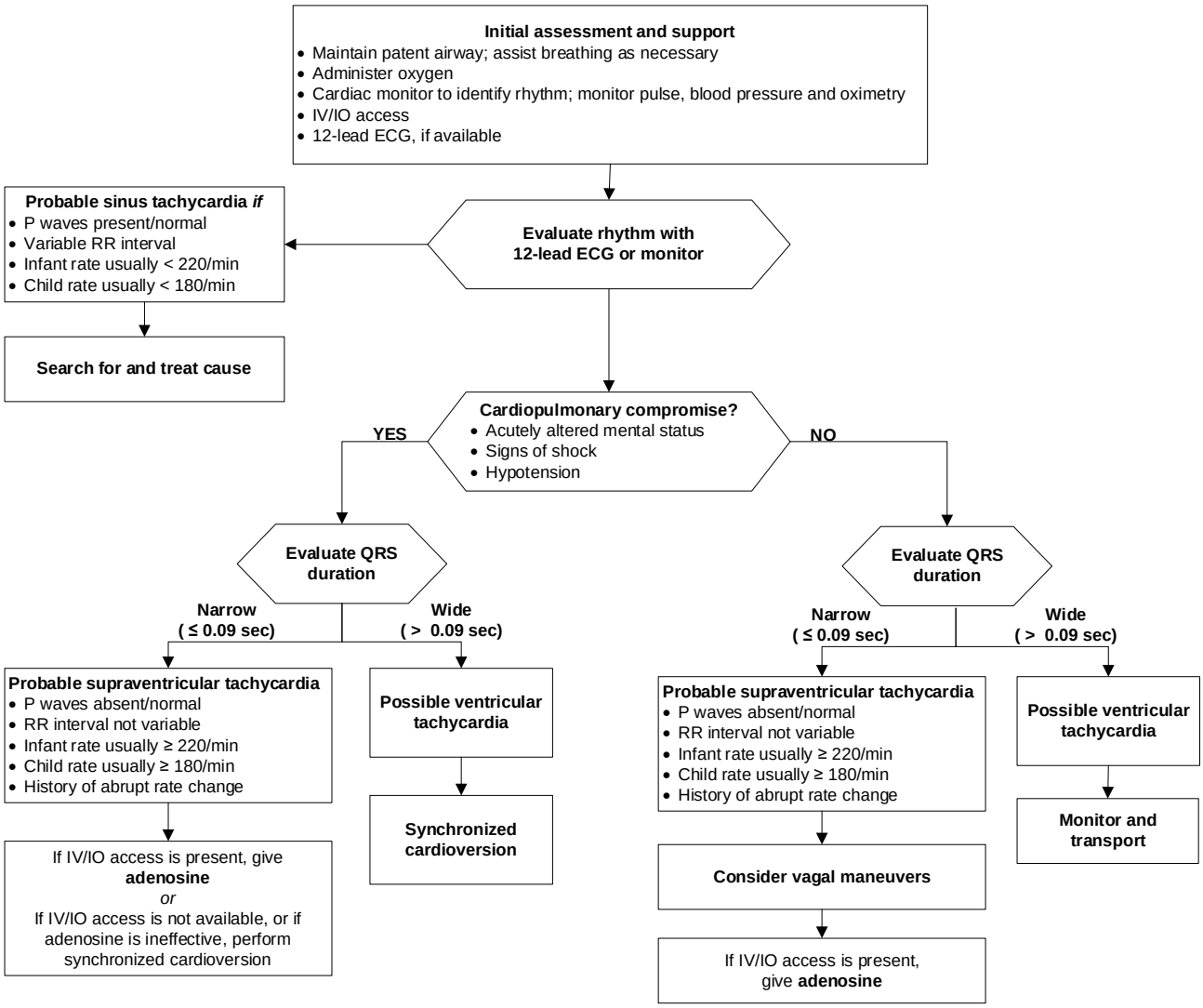
2. Atrial fibrillation rarely requires cardioversion in the field. As it is difficult to ascertain the onset of this rhythm, the risk of stroke needs to be considered prior to cardioversion.

3. 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 in patients with pre-excitation atrial fibrillation (e.g., Wolff-Parkinson-White 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.

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Tachycardia with a Pulse – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

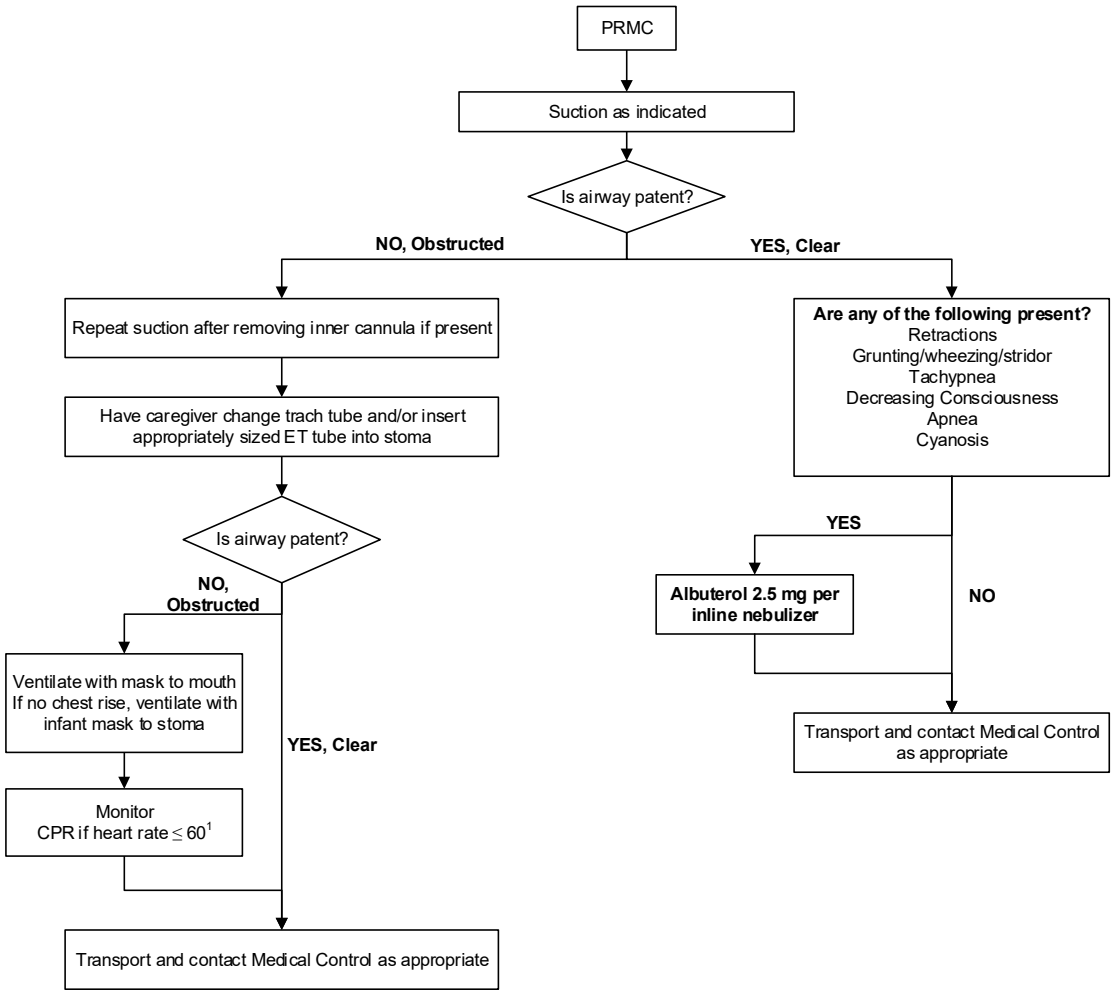
PEDIATRIC TACHYCARDIA WITH A PULSE – BLS/ALS



Doses/Details
Synchronized Cardioversion Begin with 1 J/kg; if not effective, increase to 2 J/kg Administer analgesia if needed, but don't delay cardioversion
Drug Therapy
Adenosine IV/IO dose First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg) Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg)

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Tracheostomy with Respiratory Distress - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

PEDIATRIC TRACHEOSTOMY WITH RESPIRATORY DISTRESS - ALS

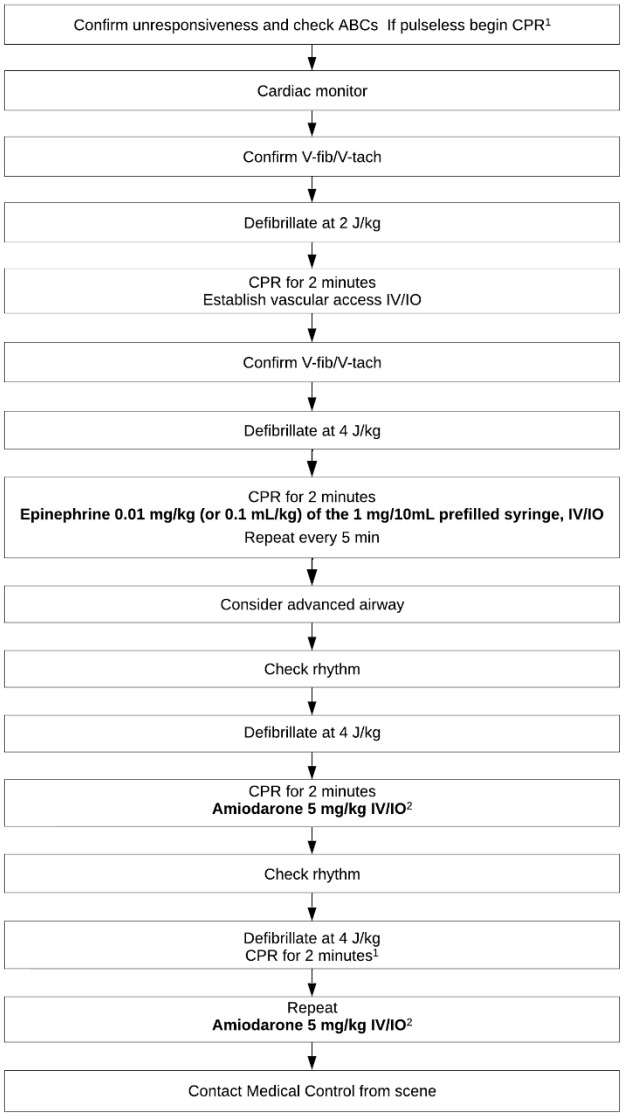


NOTE: If chest raise inadequate using mask to stoma, consider depressing pop-off valve or switching to an adult bag to increase volume and pressure.

1 – Pediatric CPR rates: 1 rescuer = 30 compressions: 2 ventilations
2 rescuers = 15 compressions: 2 ventilations

REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Ventricular Fibrillation / Pulseless Ventricular Tachycardia - ALS
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA - ALS



1 – Ventilation Rates: Basic Airway……1 rescuer = 30 compressions: 2 ventilations
2 rescuers = 15 compressions: 2 ventilations

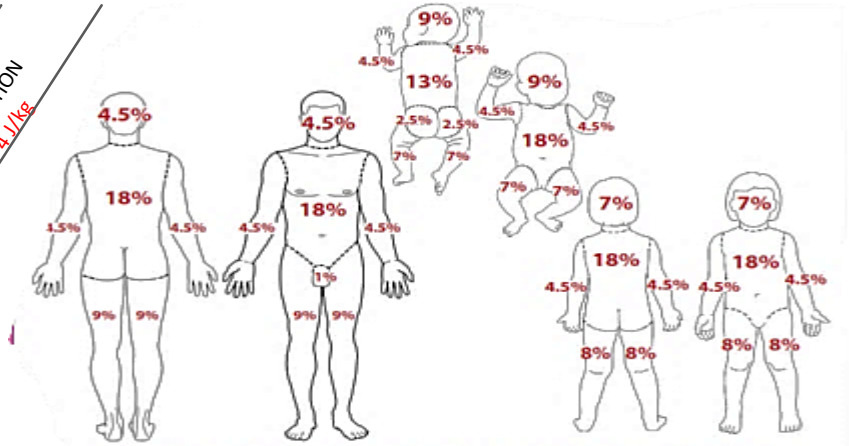
Advanced Airway…..Child = 12 breaths per minute (1 breath every 5 seconds)
Infant = 20 breaths per minute (1 breath every 3 seconds)

2 – Maximum single dose 300 mg
Maximum total dose 450 mg

Region 11 EMS Pediatric Resuscitation Card

AGE	WEIGHT IN KG	HEART RATE PER MINUTE	SYSTOLIC BLOOD PRESSURE	RESPIRATORY RATE	NPA SIZE (French)	OPA SIZE (mm)	BVM SIZE	SUCTION CATHETER SIZE (French)	I-GEL SIZE	BLADE SIZE	ETT SIZE (cuffed)	IO SIZE	1st CARDIOVERSION 1 J/kg	2nd CARDIOVERSION 2 J/kg	1st DEFIBRILLATION 2 J/kg	2nd & Subsequent DEFIBRILLATION 4 J/kg
NB	3	100-160	> 60	30-60	14	50	Infant	6	1	1	3	Pink	3 J	6 J	6 J	12 J
2 mo	4	100-160	> 65	30-60	14	50	Infant	6	1	1	3	Pink	4 J	8 J	8 J	16 J
4 mo	5	100-160	> 65	30-60	14	50	Infant	6	1.5	1	3	Pink	5 J	10 J	10 J	20 J
6 mo	6	100-160	> 65	30-60	14	50	Infant	8	1.5	1	3.5	Pink	7 J	13 J	13 J	26 J
	7	100-160	> 65	30-60	14	50	Infant	8	1.5	1	3.5	Pink	7 J	13 J	13 J	26 J
9 mo	8	100-160	> 65	30-60	16	50	Infant	8	1.5	1	4	Pink	9 J	17 J	17 J	34 J
	9	100-160	> 65	30-60	16	50	Infant	8	1.5	1	4	Pink	9 J	17 J	17 J	34 J
1 yr	10	90-150	> 70	24-40	18	60	Pediatric	10	1.5	1	4	Blue	11 J	21 J	21 J	42 J
	11	90-150	>70	24-40	18	60	Pediatric	10	1.5	1	4	Blue	11 J	21 J	21 J	42 J
2 yr	12	90-150	> 70	24-40	20	60	Pediatric	10	2	2	4.5	Blue	13 J	26 J	26 J	52 J
	13	90-150	> 70	24-40	20	60	Pediatric	10	2	2	4.5	Blue	13 J	26 J	26 J	52 J
	14	80-140	> 75	22-34	20	60	Pediatric	10	2	2	4.5	Blue	13 J	26 J	26 J	52 J
4 yr	16	80-140	> 75	22-34	22	60	Pediatric	10	2	2	5	Blue	17 J	33 J	33 J	66 J
	18	80-140	> 75	22-34	22	60	Pediatric	10	2	2	5	Blue	17 J	33 J	33 J	66 J
6 yr	20	70-120	> 80	18-30	24	70	Pediatric	10	2	2	5.5	Blue	21 J	42 J	42 J	84 J
	22	70-120	> 80	18-30	24	70	Pediatric	10	2	2	5.5	Blue	21 J	42 J	42 J	84 J
8 yr	24	70-120	> 80	18-30	26	80	Pediatric	10	2.5	2	6	Blue	27 J	53 J	53 J	106 J
	26	70-120	> 80	18-30	26	80	Pediatric	10	2.5	3	6	Blue	27 J	53 J	53 J	106 J
	28	70-120	> 80	18-30	26	80	Pediatric	10	2.5	3	6	Blue	27 J	53 J	53 J	106 J
9 yr	30	70-120	> 80	18-30	28	80	Pediatric	12	3	3	6	Blue	33 J	66 J	66 J	132 J
	32	70-120	> 80	18-30	28	80	Pediatric	12	3	3	6.5	Blue	33 J	66 J	66 J	132 J
10 yr	34	70-120	> 80	18-30	28	80	Pediatric	12	3	3	6.5	Blue	33 J	66 J	66 J	132 J
	36	70-120	> 80	18-30	28	80	Pediatric	12	3	3	6.5	Blue	33 J	66 J	66 J	132 J
	38	70-120	> 80	18-30	28	80	Pediatric	12	3	3	6.5	Blue	38 J	40 J	76 J	152 J
12 yr	40	70-120	> 80	12-16	30	90	Adult	14	3	3	7	Blue	40 J	80 J	80 J	160 J
	42	70-120	> 80	12-16	30	90	Adult	14	3	3	7	Blue	42 J	82 J	82 J	164 J
	44	70-120	> 80	12-16	30	90	Adult	14	3	3	7	Blue	44 J	88 J	88 J	176 J
13 yr	46	60-100	> 90	12-16	30	90	Adult	14	3	3	7	Blue	46 J	92 J	92 J	184 J
	48	60-100	> 90	12-16	30	90	Adult	14	3	3	7	Blue	48 J	96 J	96 J	192 J
adol	50	60-100	> 90	12-16	30	90	Adult	14	4	3	7	Blue	50 J	100 J	100 J	200 J

% Body Surface Area



PALM OF HAND (INCLUDING FINGERS) OF INFANTS OR CHILD = 1% OF TOTAL BODY SURFACE

PEDIATRIC GLASCOW COMA SCALE (PGCS)

		> 1 Year		< 1 Year	SCORE
EYE OPENING		Spontaneously		Spontaneously	4
		To Verbal Command		To Shout	3
		To Pain		To Pain	2
		No Response		No Response	1
MOTOR RESPONSE		Obeys		Spontaneous	6
		Localizes Pain		Localizes Pain	5
		Flexion - Withdrawal		Flexion - Withdrawal	4
		Flexion - Abnormal (decorticate rigidity)		Flexion - Abnormal (decorticate rigidity)	3
		Extension (decerebrate rigidity)		Extension (decerebrate rigidity)	2
		No Response		No Response	1
VERBAL RESPONSE		> 5 Years	2-5 Years	0-23 Months	
		Oriented	Appropriate Words/Phrases	Smiles/Coos Approriately	5
		Disoriented/Confused	Inappropriate Words	Cries and is consolable	4
		Inappropriate Words	Persistent Cries & Screams	Persistent inappropriate crying and/or screaming	3
		Incomprehensible Sounds	Grunts	Grunts, agitated and restless	2
		No Response	No Response	No Response	1
TOTAL PEDIATRIC GLASCOW COMA SCORE:					(3-15)

APGAR SCORING

	0	1	2	1 MIN	5 MIN
A = Appearance (color)	Blue, Pale	Blue Hands	Entirely Pink		
P = Pulse (heart rate)	Absent	<100/min	≥100/min	____	____
G = Grimace (reflex irritability)	No Response	Grimace	Cough or Sneeze	____	____
A = Activity (muscle tone)	Limp	Some Flexion of Extremities	Active Motion	____	____
R = Respiratory Effort	Absent	Weak Cry, Hypoventilation	Good, Strong Cry	____	____
			TOTALS =	____	____

Use pediatric measuring tape to measure child and determine weight estimate (Broselow Tape or Dose by Growth)

Region 11 (Chicago) EMS Medical Directors Consortium
Effective: June 1, 2023

Region 11 EMS Pediatric Resuscitation Card

AGE	WEIGHT IN KG	FLUID BOLUS 0.9 NS 20mL/kg (NB 10mL/kg)	1st DOSE ADENOSINE 6mg/2mL 0.1mg/kg IV/IO	2nd DOSE ADENOSINE 6mg/2mL 0.2mg/kg IV/IO	AMIODARONE 150mg/3mL 5mg/kg IV/IO	ATROPINE 1mg/10mL 0.02mg/kg IV/IO	CALCIUM CHLORIDE 10% 1g/10mL 20 mg/kg IV/IO	DEXTROSE 10% 25g/250mL 5mL/kg (0.5g/kg) IV/IO	DIPHENHYDRAMINE HCL 50mg/mL 1mg/kg IV/IO	EPINEPHRINE 1mg/mL 0.01mg/kg IM	EPINEPHRINE 0.1mg/mL 0.01mg/kg IV/IO	FENTANYL 100mcg/2mL 1mcg/kg IV/IO/IM/IN	GLUCAGON 1mg/1mL ≤ 8 = 0.5 mg/> 8 = 1 mg IM	GLUCOSE GEL 37.5g tube 1/4 tube - 1 tube based on age, Oral	MIDAZOLAM 10mg/2mL 0.2mg/kg IN	MIDAZOLAM 10mg/2mL 0.1mg/kg IV/IO/IM	NALOXONE 2mg/2mL 0.1 mg/kg IV/IO/IM/IN	ONDANSETRON 4mg/2ml 0.15mg/kg IV	ONDANSETRON 4mg ODT 4mg, Oral	SODIUM BICARB 8.4% 50mEq/50ml 1mEq/kg IV/IO
NB	3	30 ml	0.1 ml	0.2 ml	0.3 ml	1 ml	0.6 ml	15 ml	X	X	0.3 ml	X	0.5 mg	X	0.1 ml	X	0.3 ml	x	X	3 ml
2 mo	4	80 ml	0.1 ml	0.3 ml	0.4 ml	1 ml	0.8 ml	20 ml	X	X	0.4 ml	X	0.5 mg	1/4 tube	0.2 ml	X	0.4 ml	x	X	4 ml
4 mo	5	100 ml	0.2 ml	0.3 ml	0.5 ml	1 ml	1 ml	25 ml	0.1 ml	0.05 ml	0.5 ml	0.1 ml	0.5 mg	1/4 tube	0.2 ml	x	0.5 ml	x	X	5 ml
6 mo	6	130 ml	0.2 ml	0.4 ml	0.7 ml	1.3 ml	1.3 ml	30 ml	0.15 ml	0.05 ml	0.7 ml	0.15 ml	0.5 mg	1/4 tube	0.3 ml	0.15 ml	0.7 ml	x	X	7 ml
	7	130 ml	0.2 ml	0.4 ml	0.7 ml	1.3 ml	1.3 ml	30 ml	0.15 ml	0.05 ml	0.7 ml	0.15 ml	0.5 mg	1/4 tube	0.3 ml	0.15 ml	0.7 ml	x	X	7 ml
9 mo	8	170 ml	0.3 ml	0.6 ml	0.9 ml	1.7 ml	1.7 ml	40 ml	0.15 ml	0.1 ml	0.9 ml	0.15 ml	0.5 mg	1/4 tube	0.3 ml	0.15 ml	0.9 ml	x	X	9 ml
	9	170 ml	0.3 ml	0.6 ml	0.9 ml	1.7 ml	1.7 ml	40 ml	0.15 ml	0.1 ml	0.9 ml	0.15 ml	0.5 mg	1/4 tube	0.3 ml	0.15 ml	0.9 ml	x	X	9 ml
1 yr	10	210 ml	0.4 ml	0.7 ml	1.1 ml	2.1 ml	2.1 ml	50 ml	0.2 ml	0.1 ml	1.1 ml	0.2ml	0.5 mg	1/4 tube	0.4 ml	0.2 ml	1.1 ml	0.8 ml	X	11 ml
	11	210 ml	0.4 ml	0.7 ml	1.1 ml	2.1 ml	2.1 ml	50 ml	0.2 ml	0.1 ml	1.1 ml	0.2 ml	0.5 mg	1/4 tube	0.4 ml	0.2 ml	1.1 ml	0.8 ml	x	11 ml
2 yr	12	260 ml	0.4 ml	0.9 ml	1.3 ml	2.6 ml	2.6 ml	65 ml	0.25 ml	0.15 ml	1.3 ml	0.25 ml	0.5 mg	1/4 tube	0.5 ml	0.25 ml	1.3 ml	1 ml	X	13 ml
	13	260 ml	0.4 ml	0.9 ml	1.3 ml	2.6 ml	2.6 ml	65 ml	0.25 ml	0.15 ml	1.3 ml	0.25 ml	0.5 mg	1/4 tube	0.5 ml	0.25 ml	1.3 ml	1 ml	x	13 ml
	14	260 ml	0.4 ml	0.9 ml	1.3 ml	2.6 ml	2.6 ml	65 ml	0.25 ml	0.15 ml	1.3 ml	0.25 ml	0.5 mg	1/4 tube	0.5 ml	0.25 ml	1.3 ml	1 ml	X	13 ml
4 yr	16	330 ml	0.6 ml	1.1 ml	1.7 ml	3.3 ml	3.3 ml	80 ml	0.35 ml	0.15 ml	1.7 ml	0.35 ml	0.5 mg	1/2 tube	0.7 ml	0.35 ml	1.7 ml	1.2 ml	X	17 ml
	18	330 ml	0.6 ml	1.1 ml	1.7 ml	3.3 ml	3.3 ml	80 ml	0.35 ml	0.15 ml	1.7 ml	0.35 ml	0.5 mg	1/2 tube	0.7 ml	0.45 ml	1.7 ml	1.2 ml	X	17 ml
6 yr	20	420 ml	0.7 ml	1.4 ml	2.1 ml	4.2 ml	4.2 ml	100 ml	0.4 ml	0.2 ml	2.1 ml	0.4 ml	0.5 mg	1/2 tube	0.8 ml	0.4 ml	2 ml	1.6 ml	X	21 ml
	22	420 ml	0.7 ml	1.4 ml	2.1 ml	4.2 ml	4.2 ml	100 ml	0.4 ml	0.2 ml	2.1 ml	0.4 ml	0.5 mg	1/2 tube	0.8 ml	0.4 ml	2 ml	1.6 ml	X	21 ml
8 yr	24	530 ml	0.9 ml	1.8 ml	2.7 ml	5 ml	5.3 ml	130 ml	0.55 ml	0.25 ml	2.7 ml	0.55 ml	0.5 mg	1/2 tube	1.1 ml	0.55 ml	2 ml	2 ml	X	27 ml
	26	530 ml	0.9 ml	1.8 ml	2.7. ml	5 ml	5.3 ml	130 ml	0.55 ml	0.25 ml	2.7 ml	0.55 ml	0.5 mg	1/2 tube	1.1 ml	0.55 ml	2 ml	2 ml	1 tablet	27 ml
	28	530 ml	0.9 ml	1.8 ml	2.7 ml	5 ml	5.3 ml	130 ml	0.55 ml	0.25 ml	2.7 ml	0.55 ml	0.5 mg	1/2 tube	1.1 ml	0.55 ml	2 ml	2 ml	1 tablet	27 ml
9 yr	30	660 ml	1.1 ml	2.1 ml	3.3 ml	5 ml	6.6 ml	170 ml	0.65 ml	0.3 ml	3.3 ml	0.65 ml	1 mg	1 tube	1.3 ml	0.65 ml	2 ml	2 ml	1 tablet	33 ml
	32	660 ml	1.1 ml	2.1 ml	3.3 ml	5 ml	6.6 ml	170 ml	0.65 ml	0.3 ml	3.3 ml	0.65 ml	1 mg	1 tube	1.3 ml	0.65 ml	2 ml	2 ml	1 tablet	33 ml
10 yr	34	660 ml	1.1 ml	2.1 ml	3.3 ml	5 ml	6.6 ml	170 ml	0.65 ml	0.3 ml	3.3 ml	0.65 ml	1 mg	1 tube	1.3 ml	0.65 ml	2 ml	2 ml	1 tablet	33 ml
	36	660 ml	1.1 ml	2.1 ml	3.3 ml	5 ml	6.6 ml	170 ml	0.65 ml	0.3 ml	3.3 ml	0.65 ml	1 mg	1 tube	1.3 ml	0.65 ml	2 ml	2 ml	1 tablet	33 ml
	38	760 ml	1.3 ml	2.5 ml	3.8 ml	5 ml	7.6 ml	190 ml	0.8 ml	0.3 ml	3.8 ml	0.7 ml	1 mg	1 tube	1.6 ml	0.8 ml	2 ml	2 ml	1 tablet	38 ml
12 yr	40	800 ml	1.3 ml	2.7 ml	4 ml	5 ml	8 ml	200 ml	0.8 ml	0.3 ml	4 ml	0.8 ml	1 mg	1 tube	1.6 ml	0.8 ml	2 ml	2 ml	1 tablet	40 ml
	42	840 ml	1.4 ml	2.8 ml	4.2 ml	5 ml	8.4 ml	210 ml	0.8 ml	0.3 ml	4.2 ml	0.8 ml	1 mg	1 tube	1.6 ml	0.8 ml	2 ml	2 ml	1 tablet	42 ml
	44	880 ml	1.5 ml	2.9 ml	4.4 ml	5 ml	8.8 ml	220 ml	0.9 ml	0.3 ml	4.4 ml	0.9 ml	1 mg	1 tube	1.8 ml	0.9 ml	2 ml	2 ml	1 tablet	44 ml
13 yr	46	920 ml	1.5 ml	3.1 ml	4.6 ml	5 ml	9.2 ml	230 ml	0.9 ml	0.3 ml	4.6 ml	0.9 ml	1 mg	1 tube	1.8 ml	0.9 ml	2 ml	2 ml	1 tablet	46 ml
	48	960 ml	1.6 ml	3.2 ml	4.8 ml	5 ml	9.6 ml	240 ml	1 ml	0.3 ml	4.8 ml	1 ml	1 mg	1 tube	2 ml	1 ml	2 ml	2 ml	1 tablet	48 ml
adol	50	1000 ml	1.7 ml	3.3 ml	5 ml	5 ml	10 ml	250 ml	1 ml	0.3 ml	5 ml	1 ml	1 mg	1 tube	2 ml	1 ml	2 ml	2 ml	1 tablet	50 ml

Use pediatric measuring tape to measure child and determine weight estimate (Broselow Tape or Dose by Growth)

Region 11 (Chicago) EMS Medical Directors Consortium
Effective: June 1, 2023