

**REGION 11**  
**CHICAGO EMS SYSTEM**

**EMS PROTOCOLS - BLS**



# **REGION 11 CHICAGO EMS SYSTEM EMS PROTOCOLS – BLS**

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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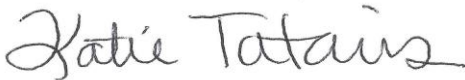
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A handwritten signature in black ink, appearing to read 'Kenneth Pearlman', with the name 'PEARLMAN' printed in a sans-serif font below it.


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A handwritten signature in black ink, appearing to read 'Katie Tataris', with the name 'TATARIS' printed in a sans-serif font below it.

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A handwritten signature in black ink, appearing to read 'Joseph M. Weber', with the name 'WEBER' printed in a sans-serif font below it.

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Joseph Weber, M.D.  
EMS Medical Director  
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# **REGION 11 – CHICAGO EMS SYSTEM**

## **EMS PROTOCOLS – BLS**

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**GENERAL**

Adult Initial Assessment  
Routine Medical Care (RMC)



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Adult Initial Assessment - BLS
	Section: General
	Approved: EMS Medical Directors Consortium
	Effective: October 1, 2018

## **ADULT INITIAL ASSESSMENT – BLS**

### **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), or supraglottic airway device (SGA), as per Airway Management Protocol.
    - d. For airway obstruction, see Airway Obstruction Protocol.



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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 15L 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 Protocol.

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



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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



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3. For patients with a cardiac or respiratory complaint or in those where acute coronary syndrome is suspected, request ALS assistance
4. Blood sugar should be checked on any patients with altered mental status or with known or suspected diabetes
5. Continuous waveform capnography must be monitored on any patient with an advanced airway or bag-mask ventilation.
6. 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

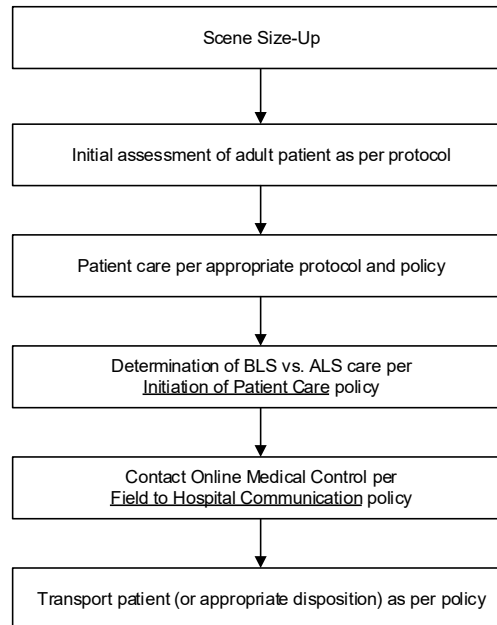
1. At least every 15 minutes in a stable patient
2. At least every 5 minutes in an unstable patient or more often if clinically appropriate



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Title: Routine Medical Care - BLS
Section: General
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**ROUTINE MEDICAL CARE (RMC) - BLS**



## **CARDIOVASCULAR**

Acute Coronary Syndrome / Cardiac Chest Pain

Cardiac Arrest

Cardiac Arrest Management (ICCA)

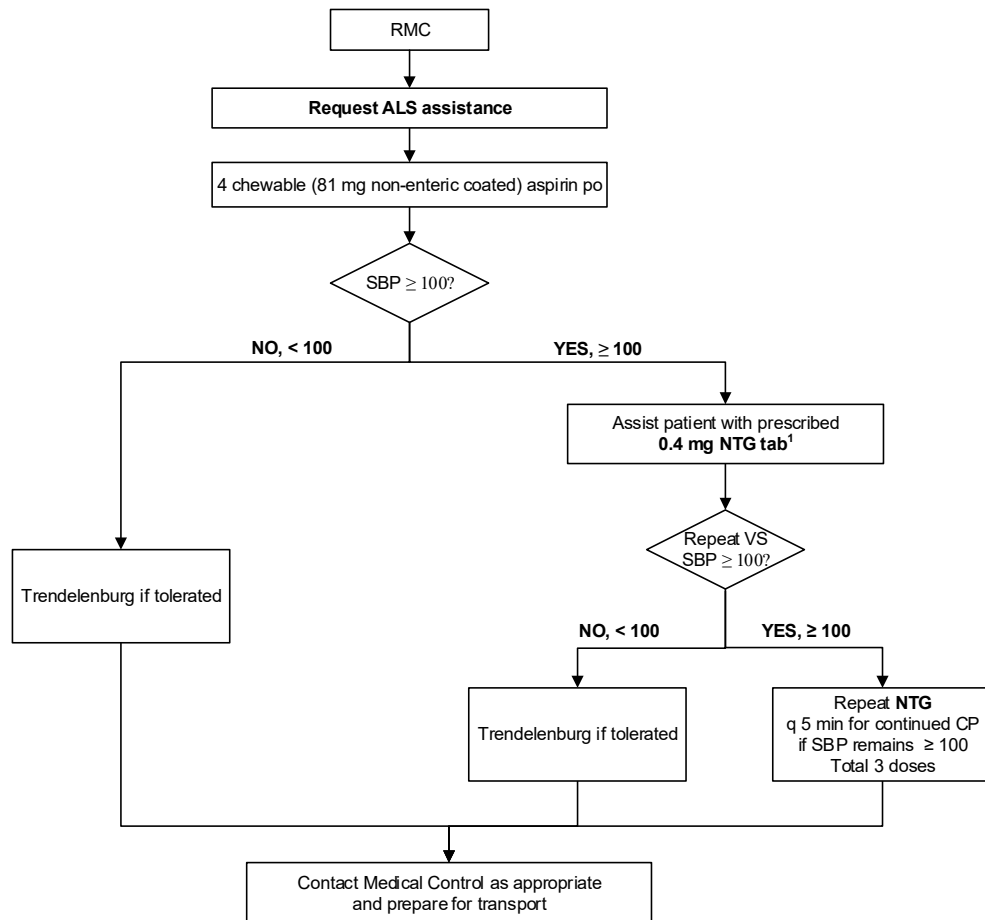
Stroke



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Acute Coronary Syndrome / Cardiac Chest Pain - BLS
Section: Cardiovascular
Approved: EMS Medical Directors Consortium
Effective: January 18, 2019

## **ACUTE CORONARY SYNDROME / CARDIAC CHEST PAIN - BLS**



<sup>1</sup> – Contact Medical Control before administration of nitroglycerin in patients with recent use of erectile dysfunction medications such as sildenafil (Viagra), tadalafil (Cialis), or vardenafil (Levitra)



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PROTOCOL**

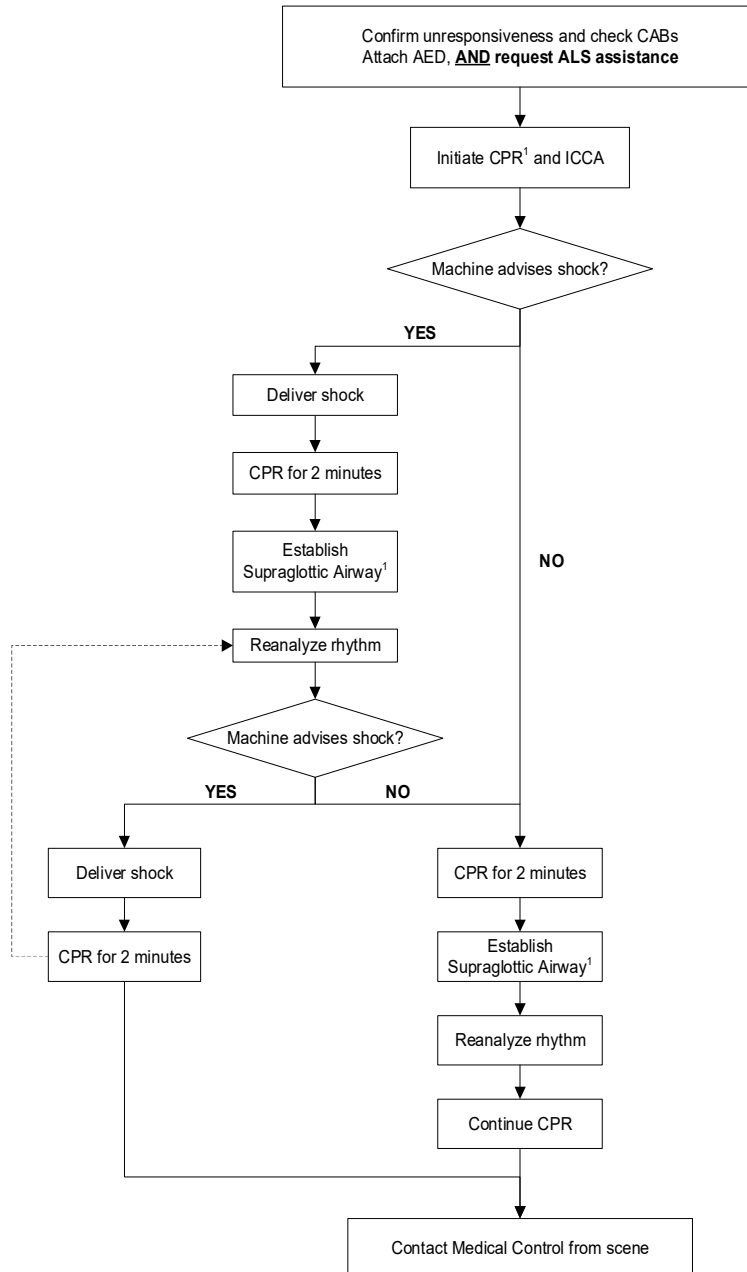
Title: Cardiac Arrest - BLS

Section: Cardiovascular

Approved: EMS Medical Directors Consortium

Effective: December 1, 2022

**CARDIAC ARREST - BLS**



**1 – Ventilation Rate:** 10 breaths per minute (1 breath every 6 seconds)



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Title: Cardiac Arrest Management / ICCA – BLS/ALS

Section: Cardiovascular

Approved: EMS Medical Directors Consortium

Effective: December 1, 2022

## **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 patient in non-traumatic cardiac arrest

### **III. PATIENT MANAGEMENT**

#### CODE TASKS

- Resuscitation must begin and continue where patient is encountered
- Provide high quality, uninterrupted chest compressions
- Provide early defibrillation for shockable rhythms
- Provide controlled ventilatory management
- Obtain IV or IO access and advanced life support drug delivery
- Monitor End Tidal CO<sub>2</sub> for CPR quality and ROSC

#### EQUIPMENT

##### **BLS:**

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

##### **ALS:**

- Manual monitor/defibrillator
- Adult and pediatric defibrillator pads
- End Tidal CO<sub>2</sub> monitoring equipment
- Bag Valve Mask (Adult and Pediatric BVM) with adult, child, infant, and neonatal masks
- Advanced airway (I-gel or endotracheal tube)
- Oxygen
- IV/IO equipment
- Advanced life support drugs



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### 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 providers, thus additional resources should be called (an assist company or as per private EMS provider 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 providers 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 rescuer 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.

#### 3. **Attach cardiac monitor and assess rhythm.**

- a. Defibrillate if ventricular fibrillation or pulseless ventricular tachycardia (or if AED advises shock).
  - i. Adult: Joules per manufacturer recommendations.
    - Stryker: 200-300-360 J
    - Zoll: 120-150-200 J
  - 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 ETCO<sub>2</sub> monitoring capability as soon as possible.
- e. 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.
  - ii. Automated External Defibrillator: For children and infants less than 8 years of age or 25 kg (55lbs) use pediatric attenuator pads.



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### 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 correct rate avoiding hyperventilation.
  - i. Adults: 10 breaths per minute (1 breath every 6 seconds)
  - ii. Children: 15:2 compression to ventilation cycle
  - iii. Infants: 15:2 compression to ventilation cycle
- d. Assess breath sounds and chest wall rise to ensure adequate ventilation.

### 5. Ensure **TWO MINUTE** cycles of CPR.

- a. The code commander **MUST** track 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. The total peri-shock pause (pre shock and post shock) should be less than 10 seconds.

### 6. Obtain IV/IO access and administer ACLS drugs.

- 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. Administer repeat doses of epinephrine every 5 minutes after the first dose.
    - 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: 150mg IV/IO
    - Pediatrics: 5 mg 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).



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### 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 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 CO<sub>2</sub> and monitor waveform and numerical value to assess:

- a. Correct advanced airway position
  - i. Presence of normal capnography waveform.
  - ii. Corresponding ETCO<sub>2</sub> numerical value.
- b. Quality of CPR
  - i. Goal ETCO<sub>2</sub> 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 ETCO<sub>2</sub> 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 - ALS). Pediatric patients with ROSC should be transported to the closest EDAP 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 ACLS drug administration and advanced airway placement with ETCO<sub>2</sub> monitoring.
  - ii. Contact online medical control after code tasks are completed to plan for expedited 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.



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### 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 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 victims.
- 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 provider agencies where multiple transport and non-transport apparatus are on scene, providers 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 record.
- e. For all Chicago Fire Department cardiac arrest cases the full event should be uploaded to CodeSTAT and attached to the PCR.
  - i. Press transmit button
  - ii. Select REPORT = ALL (Do not select code summary, trend summary vital signs or 12 lead)
  - iii. Select SITE = CODESTAT

## IV. NOTES/EDUCATIONAL PEARLS

### 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 highest-ranking EMS provider on scene, so that primary **code tasks** are carried out quickly and efficiently.

#### 1. Code Commander

- Highest ranking EMS provider on scene
- Oversees all operations
- Responsible for timing of CPR cycles and defibrillation
- Requests additional manpower/resources
- Completes and/or delegates **code tasks**
- Communicates with OLMC

#### 2. Compressor-1

- Performs high quality uninterrupted chest compressions
- Assume compressor 2's role when relieved



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### **3. Compressor-2**

- Monitors the effectiveness of compressor 1's compressions (monitors ETCO<sub>2</sub> for compression quality feedback)
- Assists with seal during bag valve mask ventilation
- Relieves compressor 1 after 2 minutes or when compression quality decreases

### **4. Procedures (may include code commander and other paramedic level providers on scene)**

- Apply cardiac monitor/analyze rhythm
- Defibrillate
- 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 CO<sub>2</sub>

### **5. Logistics**

- Oversee distribution of equipment
- Set up IV/IO equipment
- Assemble medications/assist with drug 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/documentation: Patient demographics, medications, medical history, events
- Communicates and assists with family/bystanders



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: Stroke – BLS/ALS

Section: Cardiovascular

Approved: EMS Medical Directors Consortium

Effective: December 6, 2023

# 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 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.



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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.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Stroke – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: December 6, 2023

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
  - b. Comprehensive Stroke Center
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.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>
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Title: Stroke – BLS/ALS
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Section: Cardiovascular
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Approved: EMS Medical Directors Consortium
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Effective: December 6, 2023
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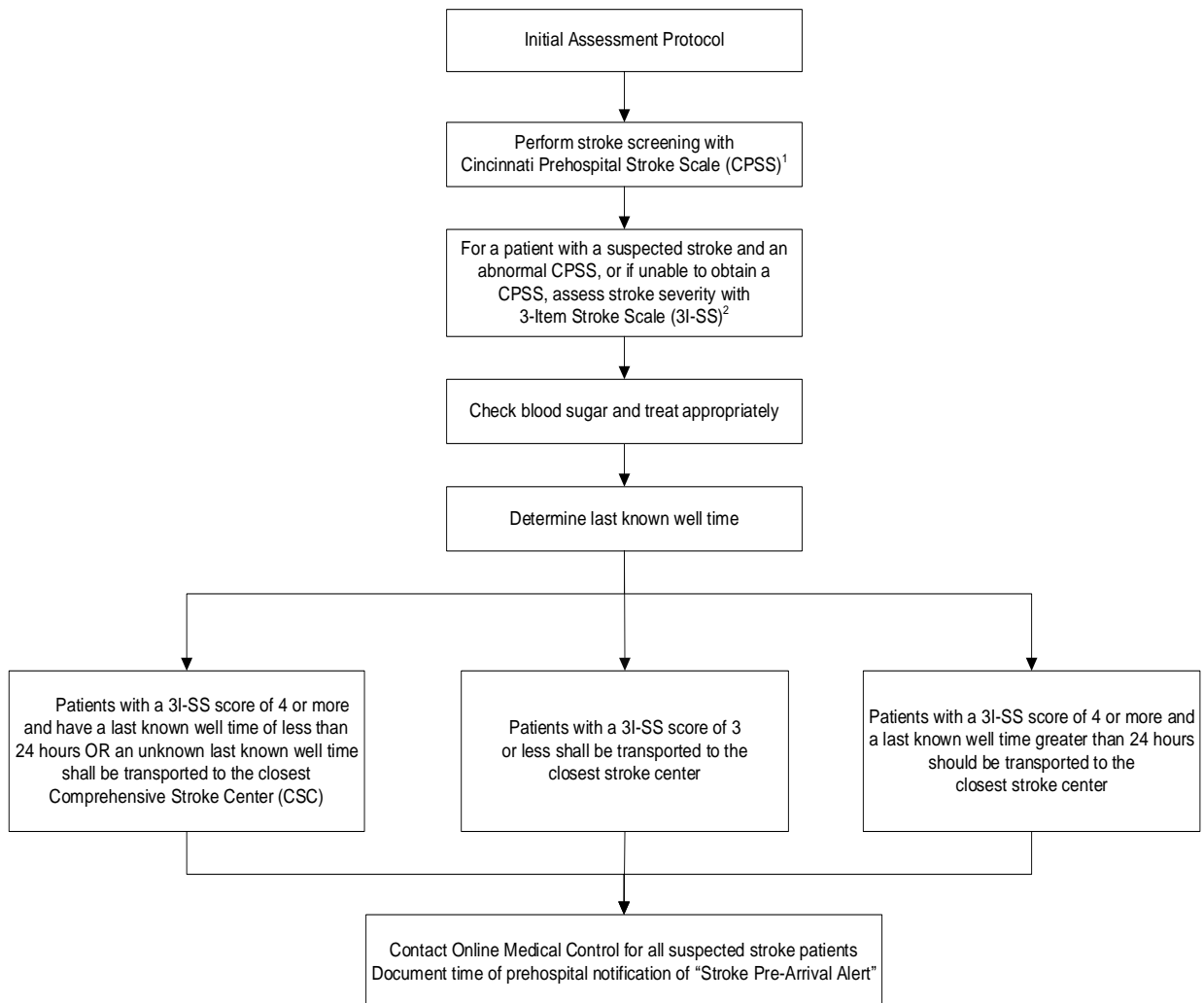
- a. If the patient was last known well prior to bedtime the night before, this is the time to be documented (not time the patient woke up with symptoms present).
2. Blood glucose results.
3. Specific stroke screen and scale used (CPSS and 3I-SS) along with the findings.
4. Time of “Stroke pre-arrival alert” notification to receiving hospital.



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Stroke – BLS/ALS
Section: Cardiovascular
Approved: EMS Medical Directors Consortium
Effective: December 6, 2023

## **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

## **RESPIRATORY**

Airway Management

Airway Obstruction

Bronchospasm



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	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).



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Airway Management
	Section: Respiratory
	Approved: EMS Medical Directors Consortium
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- 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



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: Airway Management

Section: Respiratory

Approved: EMS Medical Directors Consortium

Effective: December 15, 2021

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<sub>2</sub> 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



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

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 CO<sub>2</sub> 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.



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

## 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.



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

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**

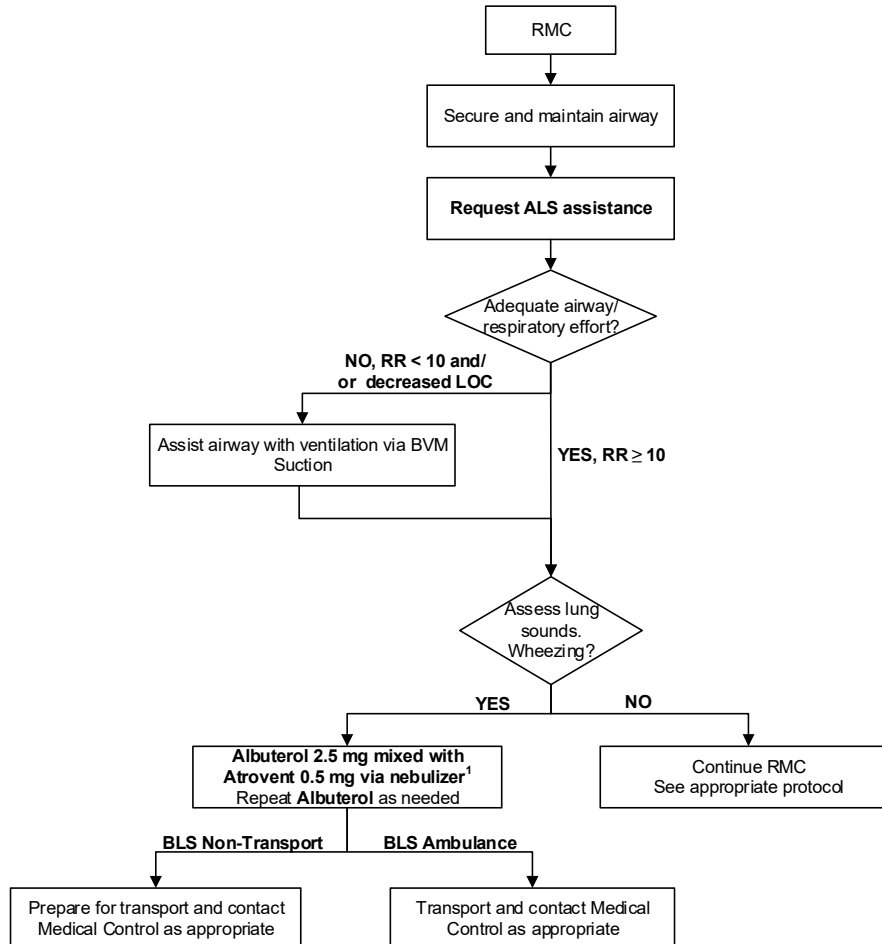
Title: Bronchospasm - BLS

Section: Respiratory

Approved: EMS Medical Directors Consortium

Effective: April 1, 2012

**BRONCHOSPASM - BLS**



1 – If available

**NOTE:** Complete lack of breath sounds may indicate severe bronchoconstriction

**MEDICAL**

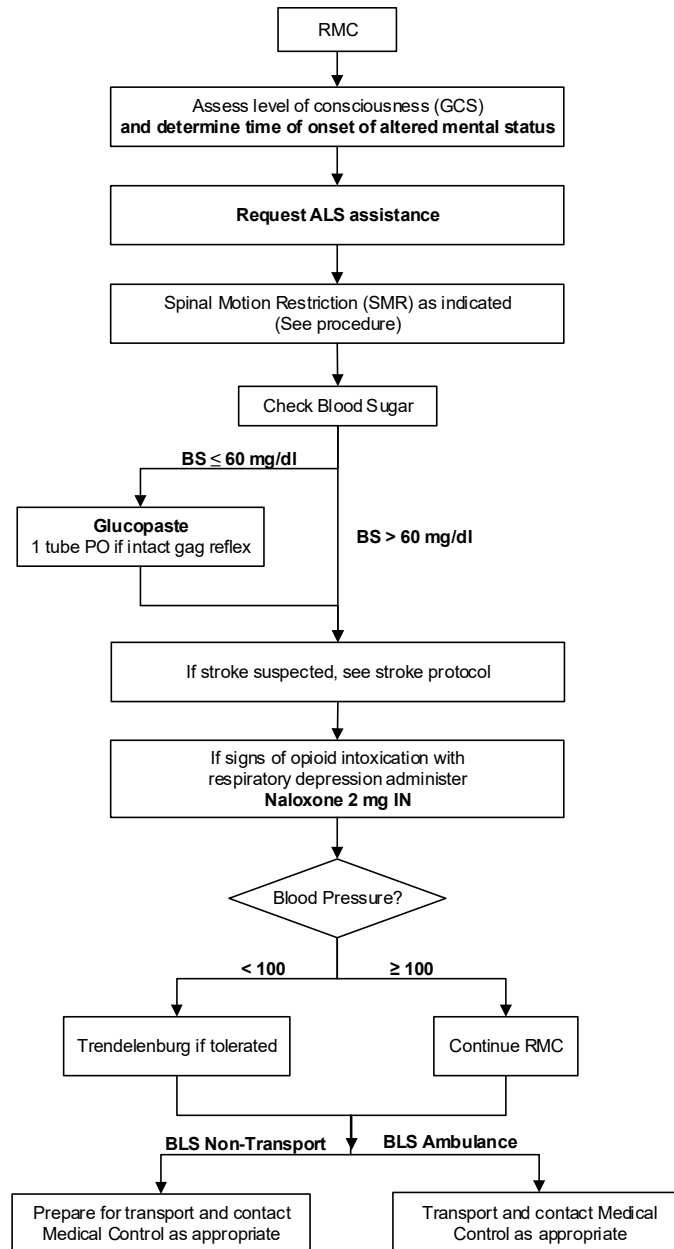
Altered Mental Status  
Anaphylaxis and Allergic Reaction  
Behavioral Emergency  
COVID-19  
Pain Management  
Seizures  
Shock



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Altered Mental Status - BLS
Section: Medical
Approved: EMS Medical Directors Consortium
Effective: October 17, 2016

**ALTERED MENTAL STATUS - BLS**

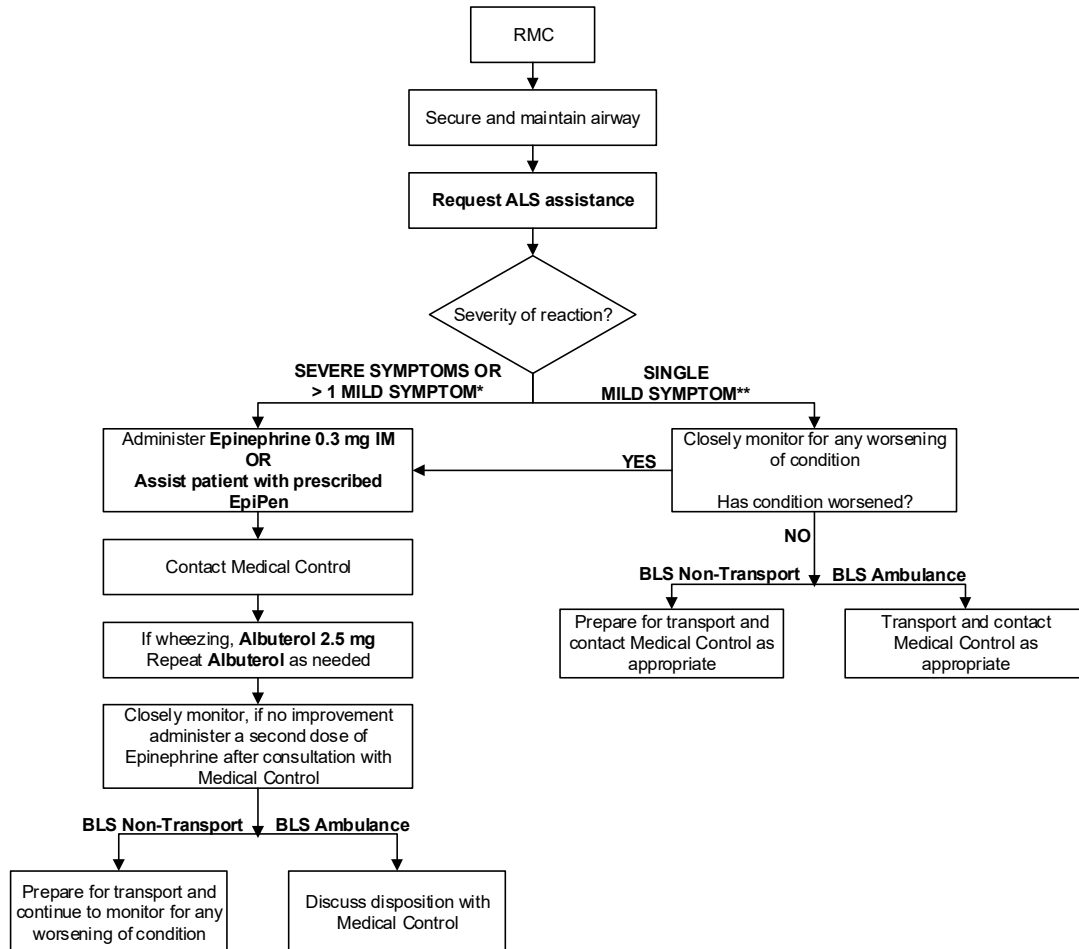




# REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: Anaphylaxis and Allergic Reaction - BLS  
Section: Medical  
Approved: EMS Medical Directors Consortium  
Effective: April 1, 2017

## ANAPHYLAXIS AND ALLERGIC REACTION - BLS



\*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**

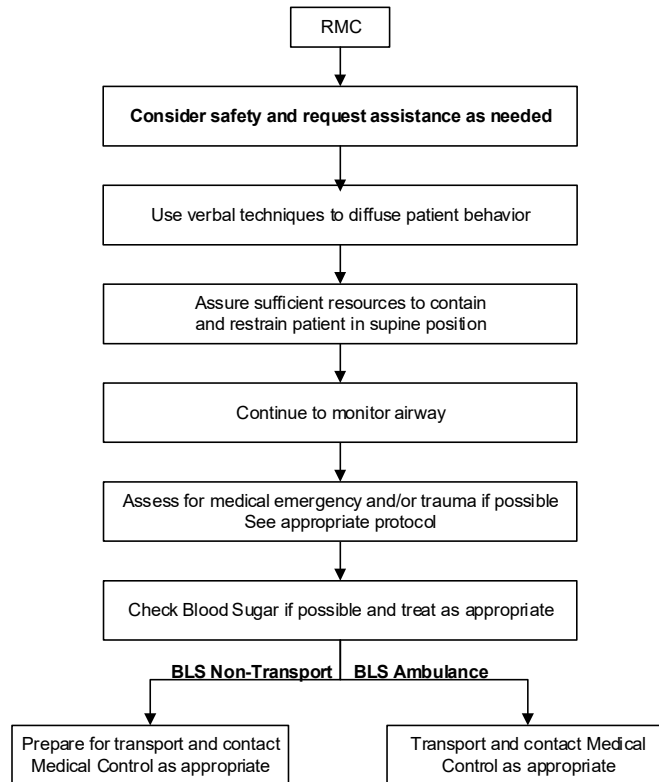
Title: Behavioral Emergency - BLS

Section: Medical

Approved: EMS Medical Directors Consortium

Effective: January 1, 2011

**BEHAVIORAL EMERGENCY - BLS**





## 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).



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Effective: April 3, 2020

- 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



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Title: COVID-19

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Effective: April 3, 2020

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 SpO<sub>2</sub> > 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



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Title: COVID-19

Section: Medical

Approved: EMS Medical Directors Consortium

Effective: April 3, 2020

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



## **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: COVID-19

Section: Medical

Approved: EMS Medical Directors Consortium

Effective: April 3, 2020

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**

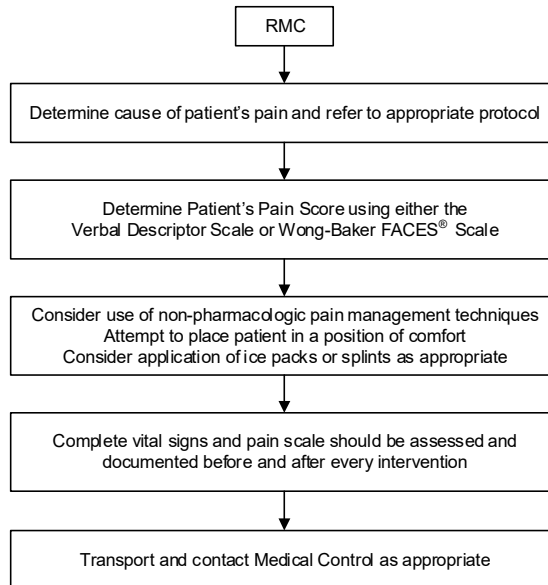
Title: Pain Management - BLS

Section: Medical

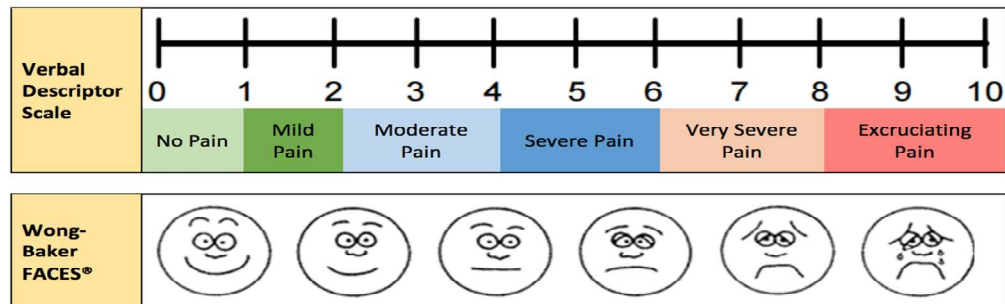
Approved: EMS Medical Directors Consortium

Effective: November 1, 2019

## **PAIN MANAGEMENT - BLS**



### Universal Pain Assessment Tool





**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

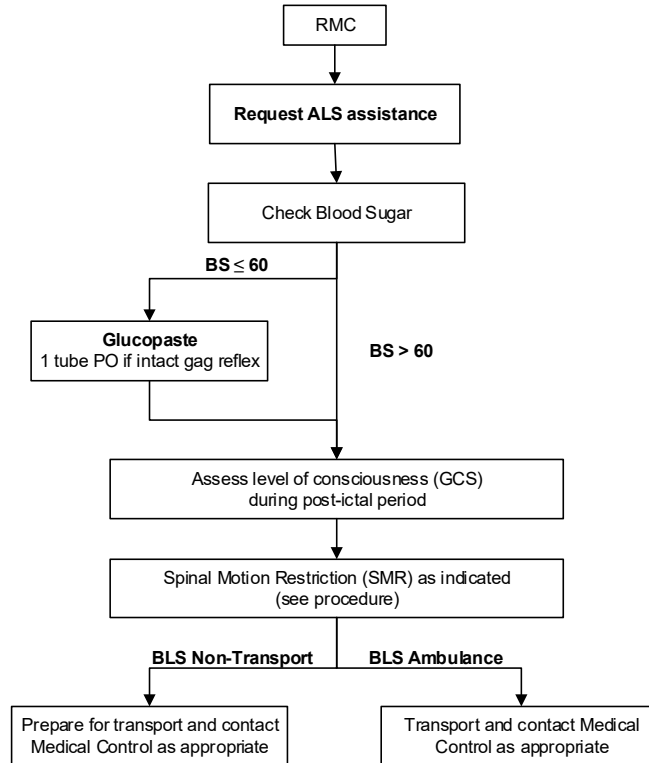
Title: Seizures - BLS

Section: Medical

Approved: EMS Medical Directors Consortium

Effective: January 1, 2011

**SEIZURES - BLS**





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CHICAGO EMS SYSTEM  
PROTOCOL**

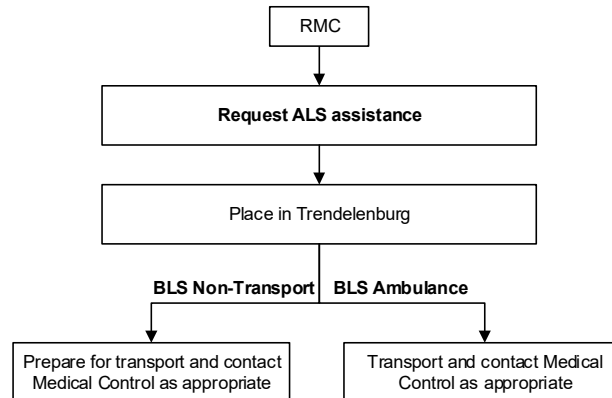
Title: Shock - BLS

Section: Medical

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**SHOCK - BLS**



## **TOXINS AND ENVIRONMENTAL**

Biological Agents

Burns

Carbon Monoxide / Smoke Inhalation

CBRNE / Hazardous Materials

Chemical Agents / Airway Respiratory Irritants

Conducted Electrical Weapon Injury (TASER)

Electrical Injuries

Exertional Heat Stroke

Frostbite

Hyperthermia / Heat Exposure

Hypothermia / Cold Exposure

Topical Chemical Burn



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

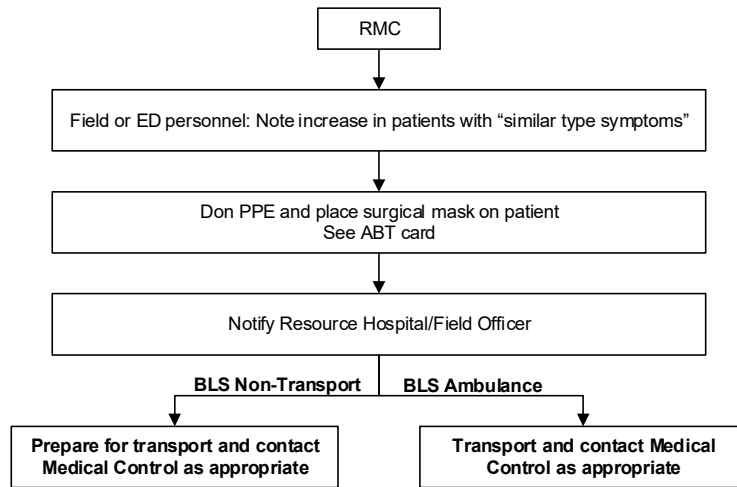
Title: Biological Agents - BLS

Section: Toxins and Environmental

Approved: EMS Medical Directors Consortium

Effective: April 1, 2012

**BIOLOGICAL AGENTS – BLS**



\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

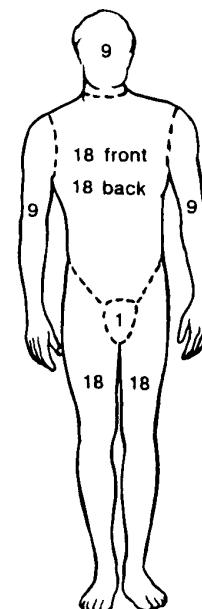
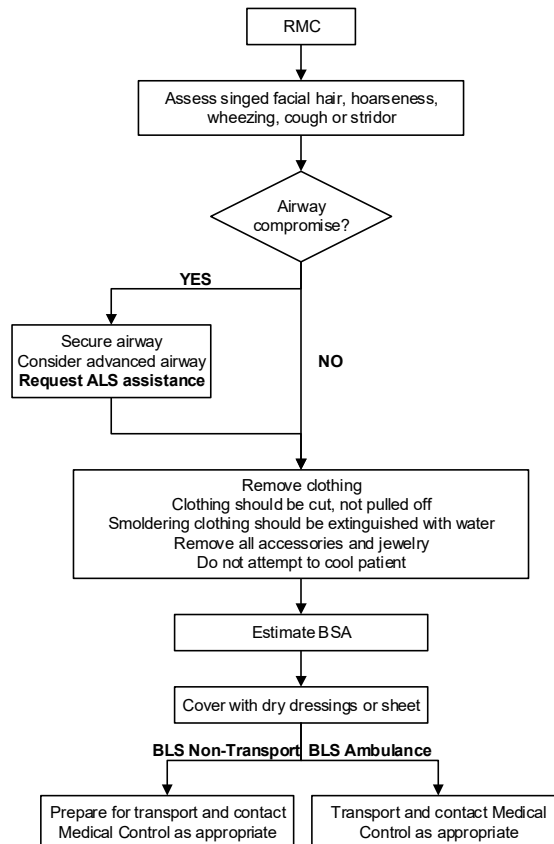
Title: Burns - BLS

Section: Toxins and Environmental

Approved: EMS Medical Directors Consortium

Effective: April 1, 2012

## **BURNS - BLS**





## **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



## **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

### **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 ETCO<sub>2</sub> 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 ETCO<sub>2</sub> 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.



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: Carbon Monoxide/Smoke Inhalation – BLS/ALS
Section: Toxins and Environmental
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### 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.



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

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**

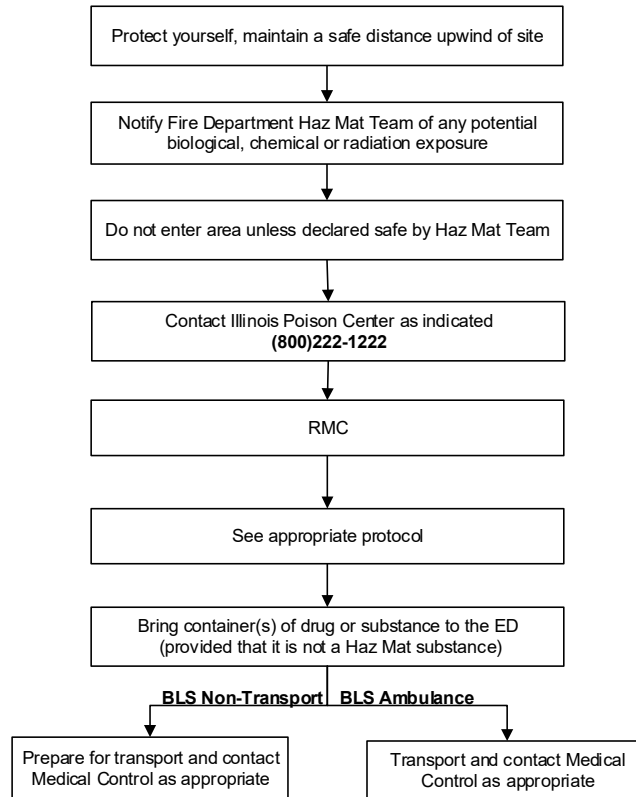
Title: CBRNE / Hazardous Materials - BLS

Section: Toxins and Environmental

Approved: EMS Medical Directors Consortium

Effective: April 1, 2012

**CBRNE / HAZARDOUS MATERIALS - BLS**



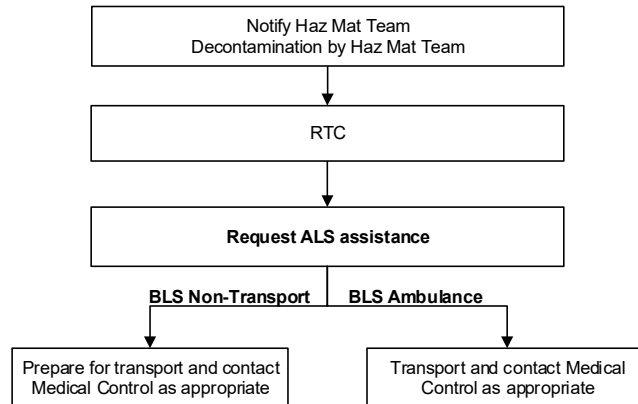
\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Chemical Agents / Airway Respiratory Irritants - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: April 1, 2012

**CHEMICAL AGENTS / AIRWAY RESPIRATORY IRRITANTS - BLS**



\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.

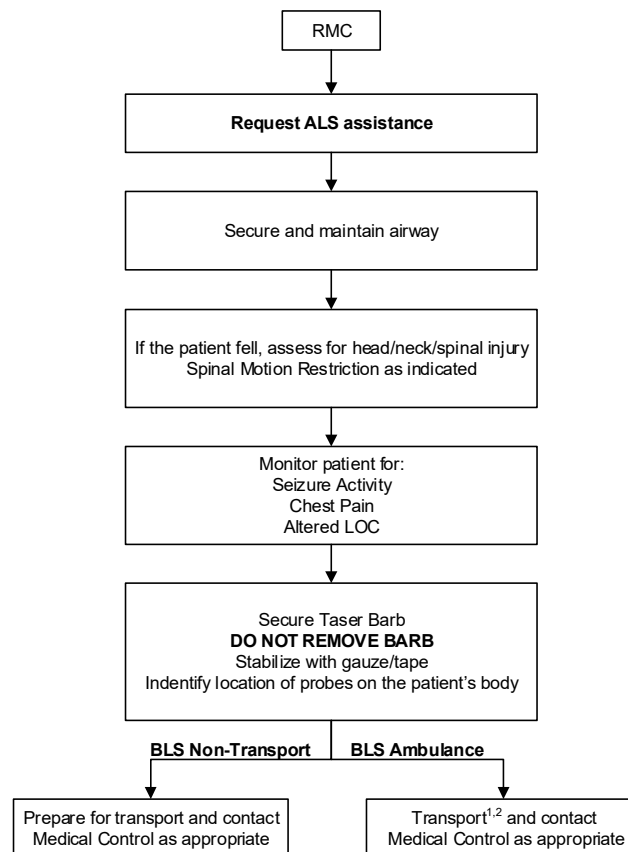


# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Conducted Electrical Weapon Injury (TASER) - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

## **CONDUCTED ELECTRICAL WEAPON INJURY (TASER) – BLS**

**Note:** This protocol is to be used for patients who have been subdued by the use of any conductive electrical weapon device (e.g. TASER)



**1 – Patient will be transported to the closest comprehensive Emergency Department.**

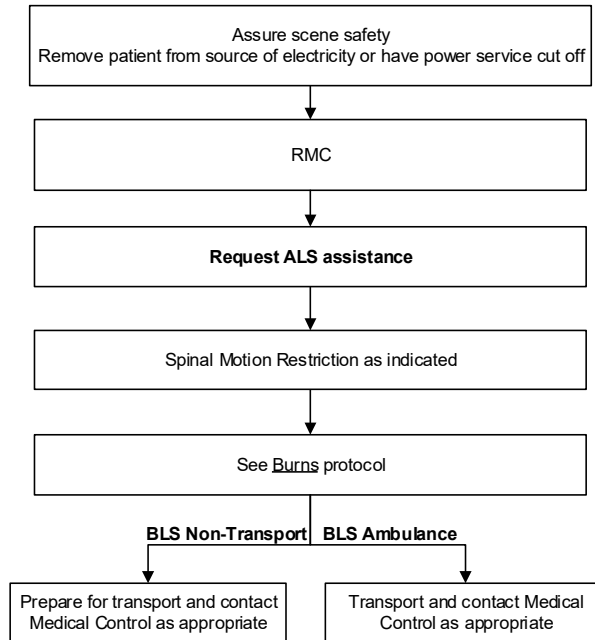
**2 – Patients who are in police custody must be accompanied to the hospital by appropriate law enforcement personnel.**



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Electrical Injuries - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: April 1, 2012

**ELECTRICAL INJURIES - BLS**





## 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

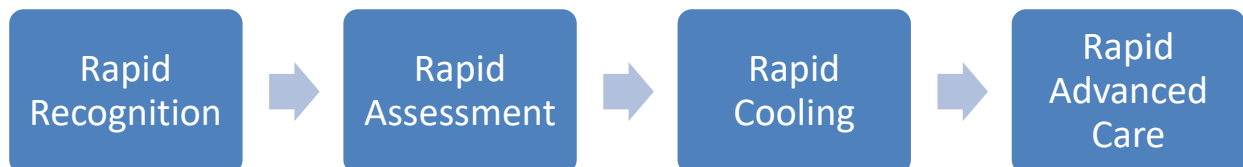
Exertional Heat Stroke (EHS) is an emergent hyperthermic condition that occurs in individuals performing physical activity, typically in warm, humid environments, but can also occur with exertion or impaired heat dissipation in cool environments.

### 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.



## 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

### 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

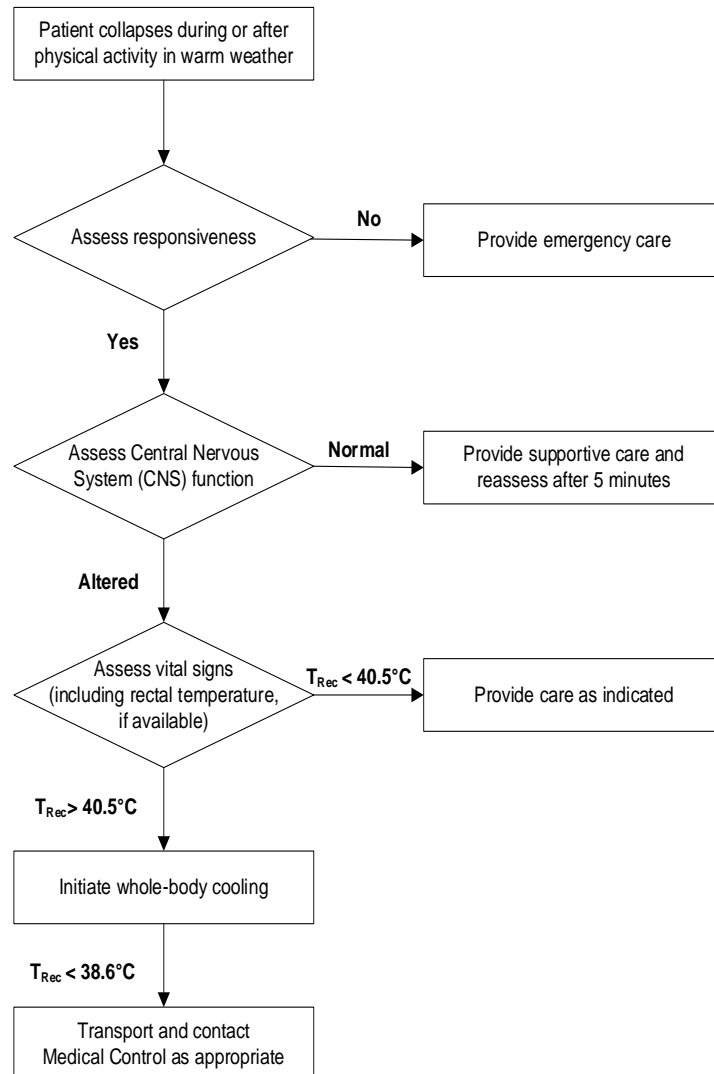
- a. For an EHS patient that is transported to the hospital – core temperature and mental status should be reassessed.
- b. Continued cooling and evaluation for end-organ damage may be needed in the hospital.



**REGION 11  
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PROTOCOL**

Title: Exertional Heat Stroke – BLS/ALS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
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**TREATMENT OF EXERTIONAL HEAT STROKE**





## 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

### 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/hyponatremia), 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

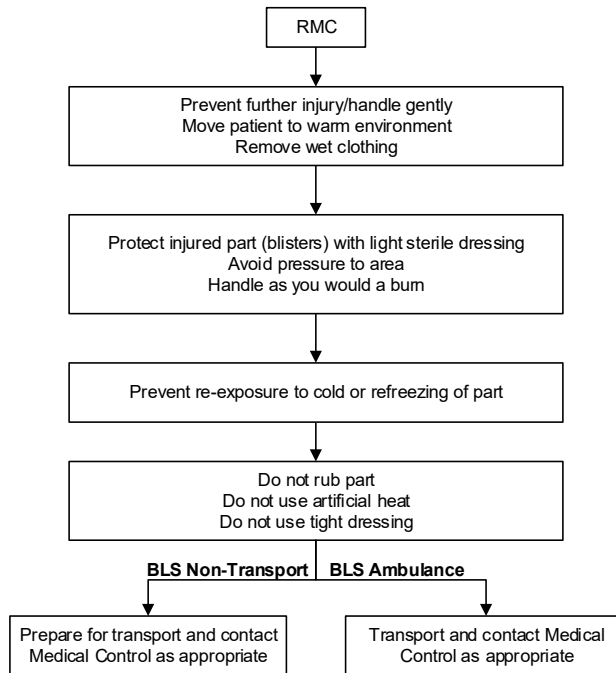
Luke N. Belval, Douglas J. Casa, William M. Adams, George T. Chiampas, Jolie C. Holschen, Yuri Hosokawa, John Jardine, Shawn F. Kane, Michele Labotz, Renée S. Lemieux, Kyle B. McClaine, Nathaniel S. Nye, Francis G. O'Connor, Bryan Prine, Neha P. Raukar, Michael S. Smith & Rebecca L. Stearns (2018). Consensus 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 - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: January 1, 2011

**FROSTBITE - BLS**





**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

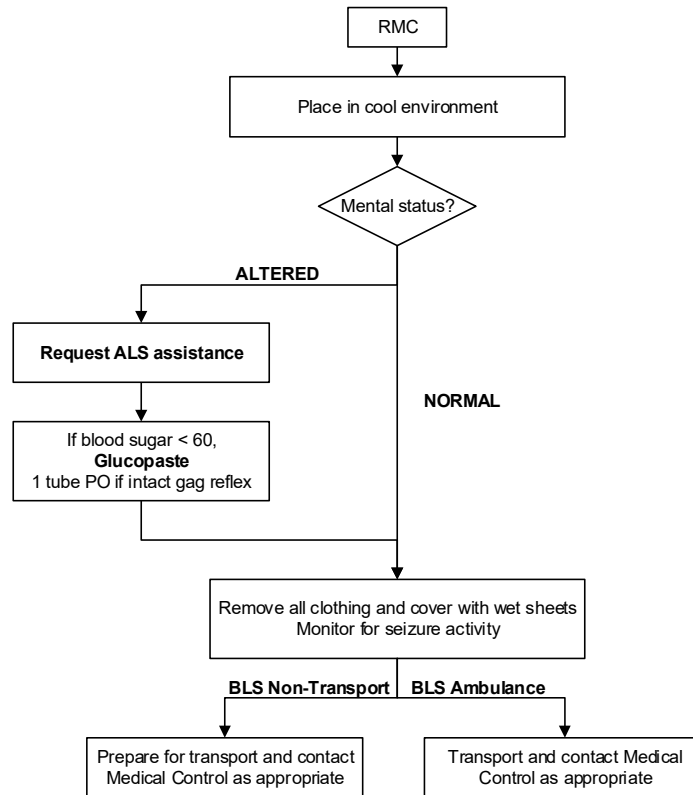
Title: Hyperthermia / Heat Exposure - BLS

Section: Toxins and Environmental

Approved: EMS Medical Directors Consortium

Effective: January 1, 2011

**HYPERTHERMIA / HEAT EXPOSURE - BLS**

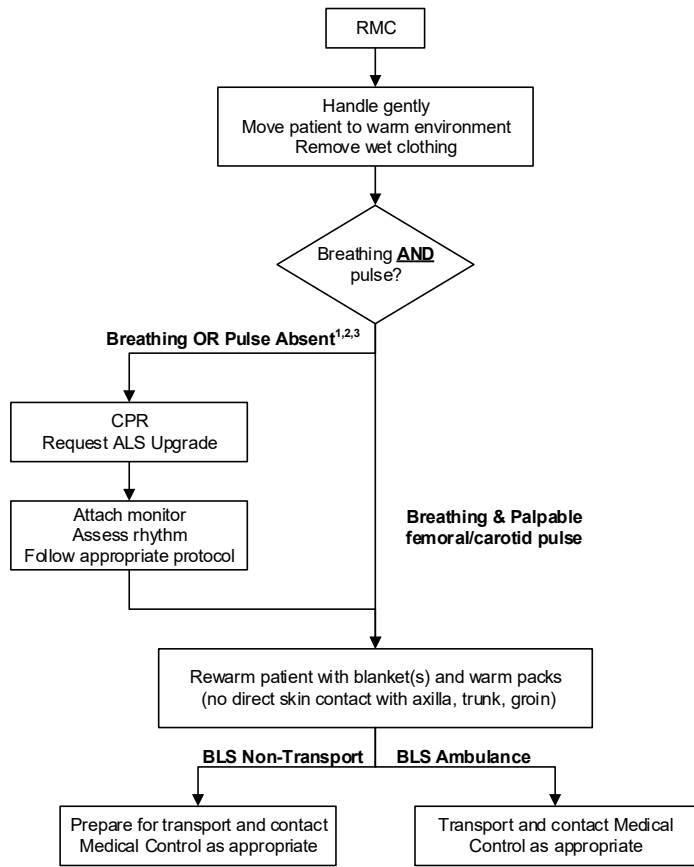




**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Hypothermia / Cold Exposure - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: April 1, 2012

**HYPOTHERMIA / COLD EXPOSURE - BLS**



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.

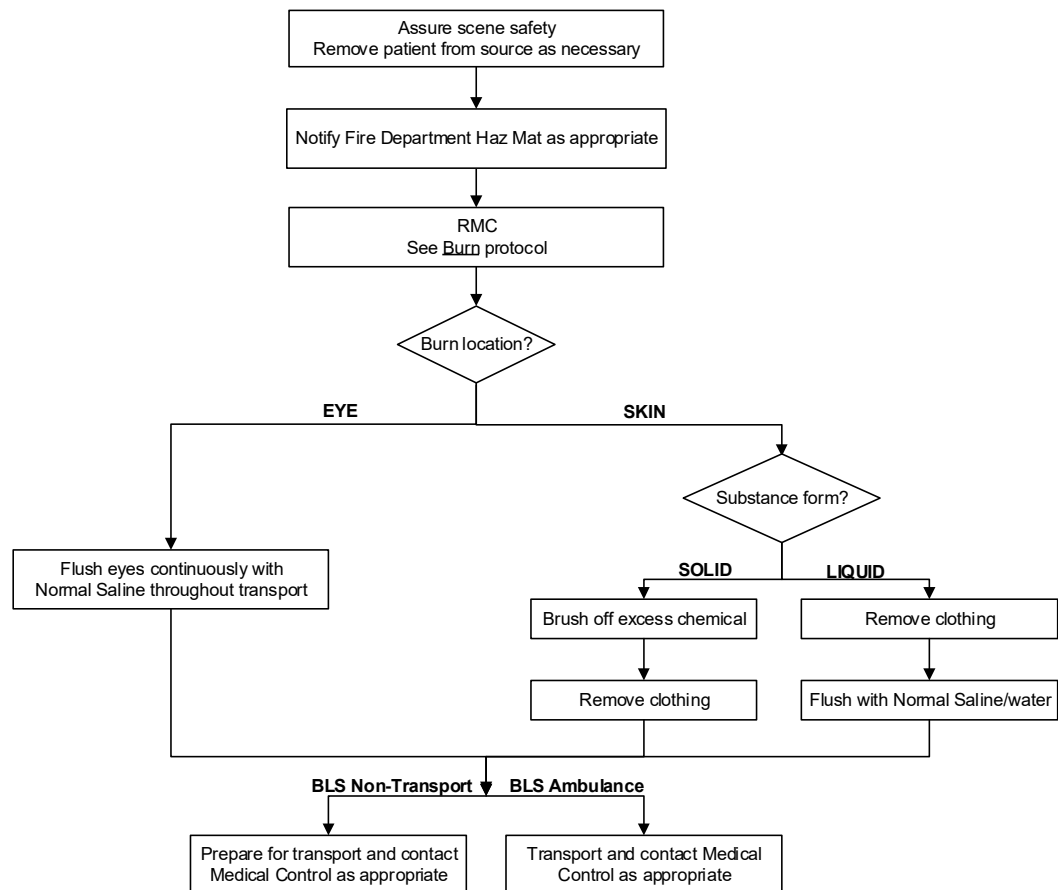
3 - The suspected hypothermic patient shall never be declared dead in the field.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Topical Chemical Burn - BLS
Section: Toxins and Environmental
Approved: EMS Medical Directors Consortium
Effective: April 1, 2012

**TOPICAL CHEMICAL BURN - BLS**



\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.

## **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
Section: Trauma
Approved: EMS Medical Directors Consortium
Effective: December 1, 2020

## **GENERAL TRAUMA MANAGEMENT**

### **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. Assessment and Primary Survey**

1. Hemorrhage Control
  - a. Assess for and stop severe hemorrhage (see Extremity Trauma/External Hemorrhage Management Protocol).
2. Airway
  - a. Assess airway patency by asking the patient to talk to assess stridor and ease of air movement.
  - b. 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.
  - c. Evaluate mental status for ability to protect airway (patients with a GCS less than or equal to 8 are likely to require airway support).
3. Breathing
  - a. Assess respiratory rate and pattern.
  - b. Assess symmetry of chest wall movement.
  - c. Listen bilaterally on lateral chest wall for breath sounds.
4. Circulation
  - a. Assess blood pressure and heart rate.
  - b. Signs of hemorrhagic shock include: tachycardia, hypotension, pale, cool clammy skin, capillary refill greater than 2 seconds.
5. Disability
  - a. Perform neurologic status assessment<sup>1</sup>.
  - b. Assess gross motor movement of extremities.
  - c. Evaluate for clinical signs of traumatic brain injury with herniation including:



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: General Trauma Management

Section: Trauma

Approved: EMS Medical Directors Consortium

Effective: December 1, 2020

- i. Unequal pupils
- ii. Lateralizing motor signs
- iii. Posturing

### 6. Exposure

- a. Rapid evaluation of entire body to identify sites of penetrating wounds or other blunt injuries. Be sure to roll patient and examine the back.
- b. Prevent hypothermia.

## B. Treatment and Interventions

### 1. Hemorrhage Control

- a. Stop severe hemorrhage (see Extremity Trauma/External Hemorrhage Management Protocol).

### 2. Airway

- a. Establish patent airway with cervical spine precautions, per the Airway Management Protocol and Spinal Care Protocol.
- b. If respiratory efforts are inadequate, assist with bag-mask ventilation and consider airway adjuncts. If patient is unable to maintain airway, consider oral airway (nasal airway should not be used with significant facial injury or possible basilar skull fracture).
- c. If impending airway obstruction or altered mental status resulting in inability to maintain airway patency, secure definitive airway.

### 3. Breathing

- a. If absent or diminished breath sounds with chest trauma in a hypotensive patient with respiratory distress, consider tension pneumothorax and perform Needle (Pleural) Decompression Procedure.
- b. For open chest wound, place semi-occlusive dressing or chest seal.
- c. Monitor oxygen saturation and, if indicated, provide supplemental oxygen.

### 4. Circulation

- a. If pelvis is unstable and patient is hypotensive, place pelvic binder or sheet to stabilize pelvis.
- b. Establish IV access.
- c. Fluid resuscitation:
  - i. Adults
    - 1. If SBP greater than 90 mmHg, no IV fluids.
    - 2. If SBP less than 90 mmHg or HR greater than 120, administer IV fluids and reassess.
    - 3. Penetrating trauma: target SBP 90mmHg (or palpable radial pulse).



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4. Head injury: target SBP 110-120 mmHg. Hypotension should be avoided to maintain cerebral perfusion.

ii. Pediatrics

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

5. Disability

- a. If clinical signs of traumatic brain injury, see Head Trauma Protocol.

6. Exposure

- a. Avoid hypothermia:
  - i. Remove wet clothing.
  - ii. Cover patient to prevent further heat loss.

7. **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.

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

- a. Head
  - i. Palpate head, scalp and face and evaluate for soft tissue injury or bony crepitus.
  - ii. Assess pupils.
- b. Neck
  - i. Check for:



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Title: General Trauma Management

Section: Trauma

Approved: EMS Medical Directors Consortium

Effective: December 1, 2020

1. Contusions
  2. Abrasions
  3. Hematomas
  4. Jugular Vein Distension (JVD)
  5. 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.
- 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.
  - ii. Assess peripheral pulses/capillary refill.

### **D. Additional Treatment Considerations**

1. Maintain spine precautions per the Spinal Care Protocol.
2. Splint obvious extremity fractures per the Extremity Trauma/External Hemorrhage Management Protocol.
3. Any intra-abdominal organs visible (evisceration) should be covered with saline soaked dressing and then covered with occlusive dry or plastic dressing.
4. Provide pain medication per the Pain Management Protocol.



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	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: December 1, 2020

5. 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.
6. 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).

#### **E. 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 ABCDE (Airway, Breathing, Circulation, Disability, Exposure).
- 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.



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: General Trauma Management
Section: Trauma
Approved: EMS Medical Directors Consortium
Effective: December 1, 2020

## **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	
	1	No vocalization	No verbal response



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Blast Injury

Section: Trauma

Approved: EMS Medical Directors Consortium

Effective: July 1, 2021

## **BLAST INJURY**

### **I. PATIENT CARE GOALS**

1. Maintain patient and provider 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).
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.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Blast Injury
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 1, 2021

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. Secure 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 control is vital.

3. Breathing:

- a. Administer oxygen as needed to maintain an oxygen saturation of > 94%.
- b. Assist respirations as needed.
- c. Cover any open chest wounds with semi-occlusive dressing or chest seal.
- d. If absent or diminished breath sounds with chest trauma in a hypotensive patient with respiratory distress, consider tension pneumothorax and perform pleural (needle) decompression as per procedure.

4. Circulation:

- a. Establish IV access:
  - i. Administer fluid bolus, 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.



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- a. Consider possibility of subsequent explosions, structural safety, possible toxic chemical contamination, the presence of noxious gasses, and other hazards.
- b. In a possible terrorist event, consider the possibility of secondary explosive devices.

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 airway injury, particularly airway burns, should prompt early airway management.
4. Minimize IV fluid resuscitation in patients without signs of shock.
5. 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.
6. Transport to a Level 1 Trauma Center.

#### B. Pertinent Assessment Findings

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



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## **CRUSH INJURY**

### **I. PATIENT CARE GOALS**

1. Recognizing traumatic crush injury mechanism.
2. Minimize systemic effects of the crush syndrome.

### **II. PATIENT MANAGEMENT**

#### **A. Assessment**

1. Identify any severe 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.

#### **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. Intravenous access should be established with normal saline initial bolus of 20 ml/kg (prior to extrication if possible) up to one liter.
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:



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- 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.

## **III. 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. Hyperkalemia (potassium is released from injured muscle cells);
  - b. 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. Therefore, 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 Twaves become peaked, QRS becomes prolonged (greater than 0.12 seconds), absent P wave, or prolonged QTc.



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4. 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.



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## **EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT**

### **I. PATIENT CARE GOALS**

1. Minimize blood loss from extremity hemorrhage.
2. Avoid hemorrhagic shock as a result of extremity hemorrhage.
3. Minimize pain and further injury as a result of potential fractures or dislocations.

### **II. PATIENT MANAGEMENT**

#### **A. Assessment**

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

#### **B. Treatment and Interventions** (see Prehospital External Hemorrhage Control diagram below)

1. Manage bleeding
  - a. 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)
      1. Tourniquet should be placed 2-3 inches proximal to wound, not over a joint, and tightened until bleeding stops and distal pulse is eliminated.
      2. 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.



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- c. Groin/axillary injury:
  - i. Apply direct pressure to wound.
  - ii. If still bleeding, pack wound tightly with hemostatic gauze and apply direct pressure.
2. Manage pain (see Pain Management protocol)
  - a. Pain management should be strongly considered for patients with suspected fractures.
  - b. If tourniquet is placed, an alert patient will likely require pain medication to manage tourniquet 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.
  - 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.
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.

### **C. Patient Safety Considerations**

1. If tourniquet is used:
  - a. Ensure that it is sufficiently tight to occlude the distal pulse.
  - b. Ensure that it is well marked and visible and that all subsequent providers are aware of the presence of the tourniquet.
  - c. Do not cover with clothing or dressings.
2. Mark time of tourniquet placement prominently on the patient.



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3. If pressure dressing or tourniquet is used, frequently re-check to determine if bleeding has restarted. Check for blood soaking through the dressing or continued bleeding distal to the tourniquet. Do not remove tourniquet or dressing in order to assess bleeding.

### III. NOTES/EDUCATIONAL PEARLS

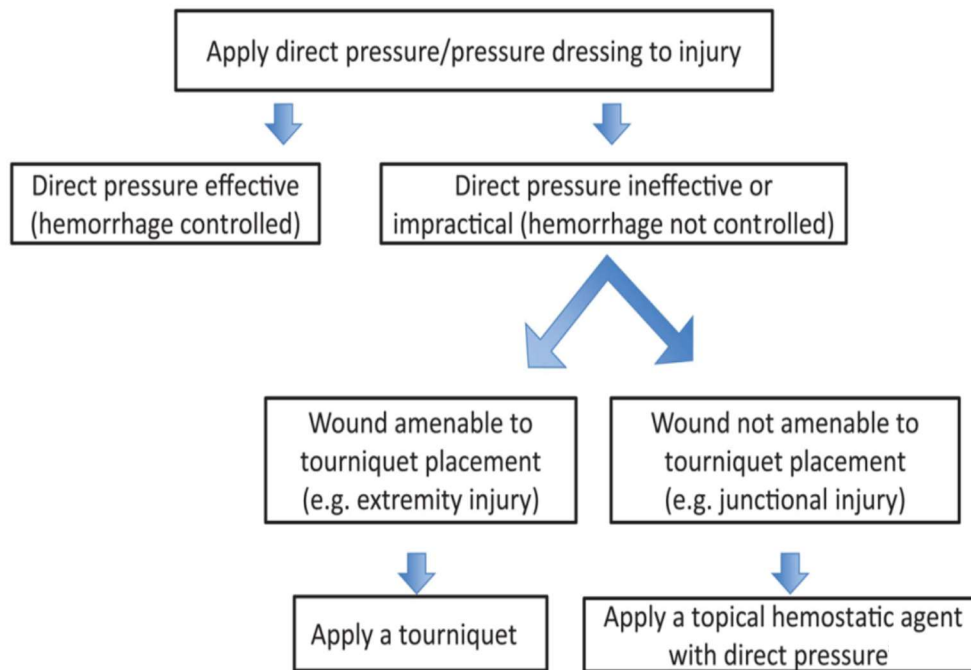
- A. Tourniquet may be placed initially to stop obvious severe hemorrhage, then replaced later with pressure dressing after stabilization of ABCs and packaging of patient. Tourniquet should not be removed if:
  1. Transport time short (less than 30 minutes)
  2. Amputation or near-amputation
  3. Unstable or complex multiple-trauma patient
  4. Unstable clinical or tactical situation
- B. If tourniquet is replaced with pressure dressing, leave loose tourniquet in place so it may be retightened if bleeding resumes.
- C. Survival is markedly improved when a tourniquet is placed *before* shock ensues.
- D. Commercial/properly tested tourniquets are preferred over improvised tourniquets.
- E. If hemostatic gauze is not available, plain gauze tightly packed into a wound has been shown to be effective.
- F. Arterial pressure points are not effective in controlling hemorrhage.



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**Prehospital External Hemorrhage Control Protocol**





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## **FACIAL / DENTAL TRAUMA**

### **I. PATIENT CARE GOALS**

1. Preservation of a patent airway.
2. Preservation of vision.
3. Preservation of dentition.

### **II. PATIENT MANAGEMENT**

#### **A. Assessment**

1. Patient medications with focus on anticoagulants.
2. 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. Cervical spine pain or tenderness (see Spinal Care protocol).
5. Mental status assessment for possible traumatic brain injury (see Head Injury protocol).
6. Gross vision assessment.
7. Dental avulsions.
8. Any tissue or teeth avulsed should be collected.
9. Lost teeth not recovered on scene may be in the airway.
10. Overall trauma assessment.
11. Specific re-examination geared toward airway and ability to ventilate adequately.

#### **B. Treatment and Interventions**

1. Administer oxygen as needed to maintain an oxygen saturation of > 94%.



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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, do not put back into socket. Cover with moist saline dressings and then 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 it does not waste scene time.
  - 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.



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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. Transport avulsed or broken teeth with the patient;
  - b. Use sterile dressing for ear and nose cartilage.

**B. Pertinent Assessment Findings**

1. Unstable facial fractures that can abruptly compromise airway.
2. Loose teeth and retro-pharynx bleeding.



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Title: Head Injury

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## **HEAD INJURY**

### **I. PATIENT CARE GOALS**

1. Limit disability and mortality from head injury by:
  - a. Promoting adequate oxygenation;
  - b. Promoting adequate cerebral perfusion;
  - c. Limiting development of increased intracranial pressure;
  - d. Limiting secondary brain injury.

### **II. 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 ETCO<sub>2</sub>, if advanced airway placed.
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)



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- 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 or possible basilar skull fracture).
- c. Oral endotracheal intubation or supraglottic airway insertion can be used if BVM ventilation ineffective in maintaining oxygenation or if airway is continually compromised.

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. For patients with a severe head injury with signs of herniation: Hyperventilate to a target ETCO<sub>2</sub> of 30-35 mmHg as a short-term option, and **only for severe head injury with signs of herniation** and an advanced airway.
  - i. Signs of herniation:
    1. Decreasing mental status
    2. Abnormal respiratory pattern
    3. Asymmetric/unreactive pupils
    4. Decorticate posturing
    5. Cushing's response (bradycardia and hypertension)
    6. Decerebrate posturing

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: Administer fluid bolus for hypotension
    1. Adult: Target SBP 110-120 mmHg. Hypotension should be avoided to maintain cerebral perfusion
    2. Pediatric: Maintain SBP:
      - 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



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- c. Mild closed head injury:
  - i. Consider administering fluid bolus to maintain blood pressure to above numbers and maintain cerebral perfusion.
- 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:
    - i. Early signs of deterioration:
      - 1. Confusion
      - 2. Agitation
      - 3. Drowsiness
      - 4. Vomiting
      - 5. 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 patient unless signs of herniation.
- 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.

## III. NOTES/EDUCATIONAL PEARLS

### A. Key Considerations

- 1. Hypoxia and hypotension are especially dangerous in severe head injury patients.
- 2. Important that providers be specifically trained in accurate neurologic status assessment.



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3. If endotracheal intubation or supraglottic airways are used, continuous waveform capnography is required to document proper tube placement and assure proper ventilation rate.

**B. Pertinent Assessment Findings**

1. Neurologic status assessment findings
2. Pupils
3. Trauma findings on physical exam



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Title: High Threat Considerations
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## **HIGH THREAT CONSIDERATIONS**

### **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 and urgent medical conditions.
4. Assist evacuation.
5. Accomplish goal with minimal additional injuries.

### **III. PATIENT MANAGEMENT**

#### **A. Assessment, Treatment and Interventions**

1. Hot Zone/Direct Threat Care Considerations:
  - a. Defer in depth medical interventions if engaged in ongoing direct threat (e.g. active shooter, unstable building collapse, improvised explosive device, hazardous material threat).
  - b. Threat mitigation techniques will minimize risk to patients and providers.
  - c. Rapid primary triage as required
  - d. Prioritization for extraction is based on resources available and the situation.
  - e. Minimal interventions are warranted.
  - f. Encourage patients to provide self-first aid or instruct aid from uninjured bystander.
  - 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).



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- 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
- c. Conduct primary survey, per the General Trauma Management Protocol, and initiate appropriate life saving interventions:
  - i. Hemorrhage control:
    - 1. Tourniquet;
    - 2. 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 transport 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, provider safety should be considered in balancing the risks and benefits of patient treatment.

**IV. NOTES/EDUCATIONAL PEARLS**

**A. Key Considerations**

- 1. In high threat situations, risk assessment should be performed and regularly re-evaluated. Provider 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.



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3. During these situations, maintaining communications and incident management concepts may be crucial to maximizing efficiency and mitigating dangers.



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## **SPINAL CARE**

### **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. Minimize patient morbidity from the use of immobilization devices.
4. 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. High risk mechanisms:
    - 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
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 extreme agitation)
  - d. Focal or neurologic deficit
  - e. Any evidence of alcohol or drug intoxication
  - f. Another severe or painful distracting injury is present



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- 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 be immobilized in a position of comfort using towel rolls.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Spinal Care
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: September 15, 2020

### **C. Patient Safety Considerations**

1. Be aware of potential airway compromise or aspiration in immobilized patients with nausea/vomiting or with facial/oral bleeding.
2. Excessively tight immobilization 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, so immobilization straps should go across chest and pelvis and not across the abdomen, when possible.
6. Children have disproportionately larger heads. When securing pediatric patients to a spine board, the board should have a recess for the head, or the body should be elevated approximately 1-2 cm to accommodate the larger head size and avoid neck flexion when immobilized.
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.
  1. Providers 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 immobilized on gurney with cervical collar and straps and will not generally require a spine board.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>
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Title: Spinal Care
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Section: Trauma
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Approved: EMS Medical Directors Consortium
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Effective: September 15, 2020
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- 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.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Traumatic Arrest

Section: Trauma

Approved: EMS Medical Directors Consortium

Effective: July 1, 2021

## **TRAUMATIC ARREST**

### **I. PATIENT CARE GOALS**

- A. Rapid evaluation and treatment of traumatic arrest patients as per the General Trauma Management protocol to improve outcomes.
- B. Assessment 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 cardiac rhythm to determine if resuscitation should be initiated.
- 5. If 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.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Traumatic Arrest
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 1, 2021

- a. The following conditions are excluded and should be resuscitated:
  - i. Drowning or strangulation
  - ii. Lightning strike or electrocution
  - iii. Situations involving hypothermia
  - iv. Patients with visible pregnancy
  - v. 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, Incident Command for Cardiac Arrest (ICCA) should be followed.

## **III. NOTES/EDUCATIONAL PEARLS**

- A. Resuscitative efforts 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.

## **OBSTETRICS**

Childbirth and Post-Delivery Care

Neonatal Resuscitation

Obstetrical Complications / Bleeding in Pregnancy

Obstetrical Complications / Breech Birth

Obstetrical Complications / Nuchal Cord

Obstetrical Complications / Pre-Eclampsia or Eclampsia

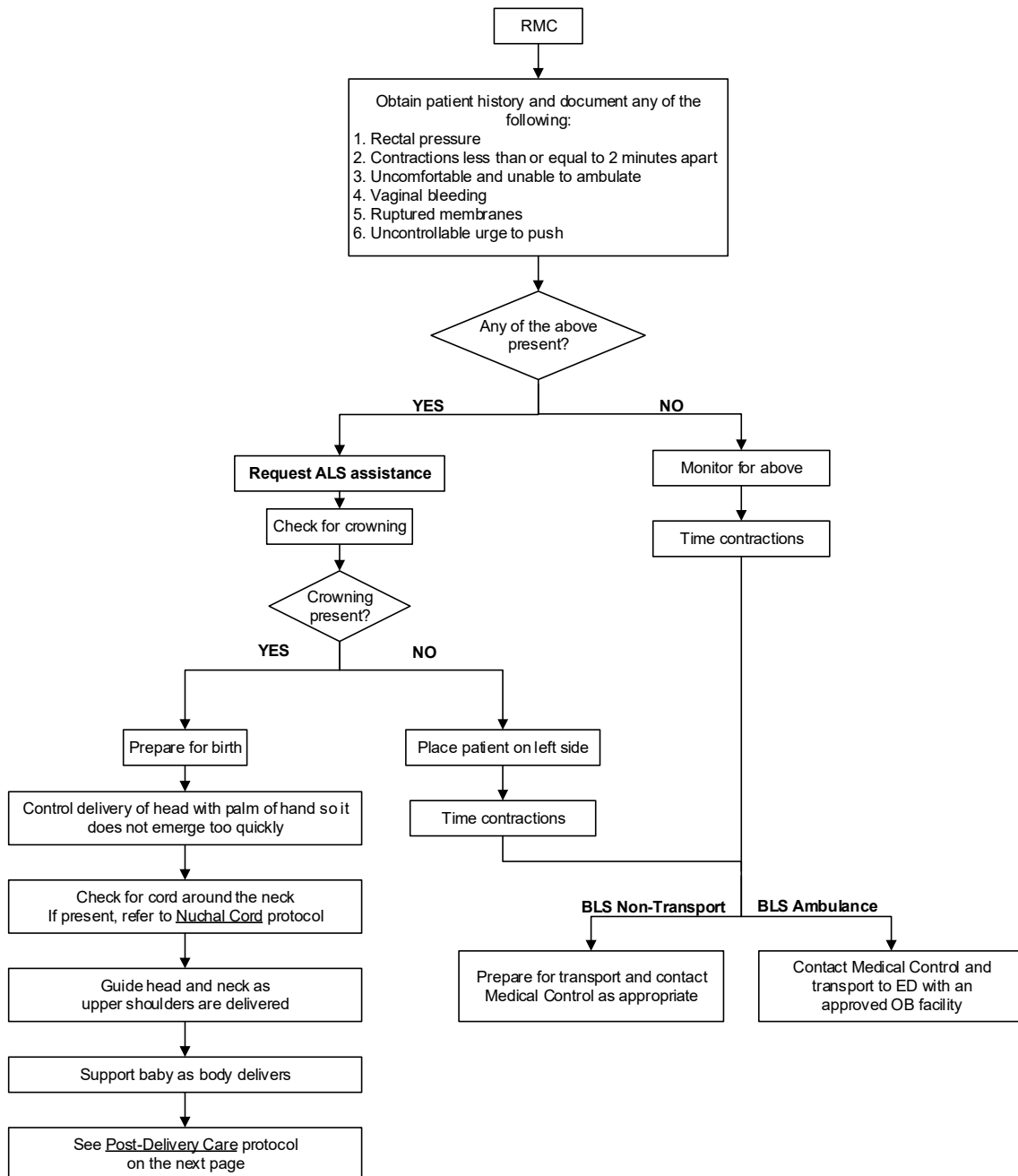
Obstetrical Complications / Prolapsed Cord



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Childbirth and Post-Delivery Care - BLS  
Section: Obstetrics  
Approved: EMS Medical Directors Consortium  
Effective: March 1, 2016

**CHILDBIRTH - BLS**

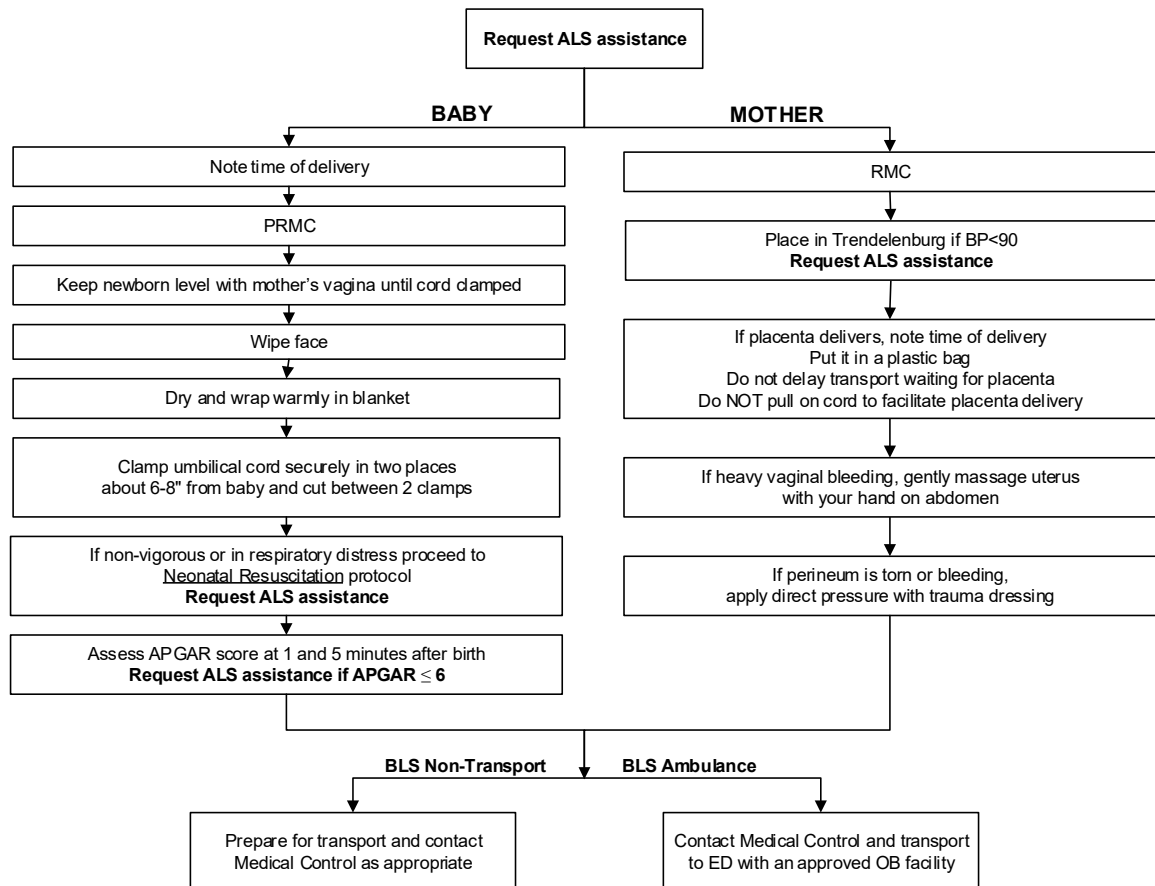




# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Childbirth and Post-Delivery Care - BLS  
 Section: Obstetrics  
 Approved: EMS Medical Directors Consortium  
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## **POST-DELIVERY CARE - BLS**





# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Childbirth and Post-Delivery Care - BLS  
 Section: Obstetrics  
 Approved: EMS Medical Directors Consortium  
 Effective: March 1, 2016

<b><u>APGAR SCORING</u></b>					
	<b>0</b>	<b>1</b>	<b>2</b>	<b>1 Min</b>	<b>5 Min</b>
<b>A</b> =Appearance (color)	Blue, pale	Blue hands and feet	Entirely pink	_____	_____
<b>P</b> =Pulse (heart rate)	Absent	<100/min	≥100/min	_____	_____
<b>G</b> =Grimace (reflex irritability)	No response	Grimace	Cough or sneeze	_____	_____
<b>A</b> =Activity (muscle tone)	Limp	Some flexion of extremities	Active motion	_____	_____
<b>R</b> =Respiratory effort	Absent	Weak cry, hypoventilation	Good, strong cry	_____	_____
<b>TOTALS =</b>					



## **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Neonatal Resuscitation – BLS/ALS

Section: Obstetrics

Approved: EMS Medical Directors Consortium

Effective: June 1, 2023

# **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. If any doubt about accuracy of gestational age, initiate resuscitation and transport.
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



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- 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)
  - i. 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. **Dry, warm, and stimulate**

- a. Wrap infant in dry towel or thermal blanket to keep infant as warm as possible during resuscitation; keep head covered if possible.
- b. If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen.
- 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



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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:
    - i. **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.
    - i. Primary indicator of effective ventilation is improvement in heart rate.
    - ii. Evaluate heart rate every 30 seconds.
    - iii. 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.



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: Neonatal Resuscitation – BLS/ALS

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### 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 to the closest most appropriate hospital after contact with online medical control
  - a. Full term newborns (39 weeks estimated gestation age (EGA) or more) should be transported to a Level II or Level III Perinatal Hospital.
  - b. Preterm newborns (less than 39 weeks) should be transported to a Level III Perinatal Hospital.

### 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.



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

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- 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%

- Both hypoxia and excess oxygen administration can result in harm to the infant. If prolonged oxygen use is required, titrate to maintain an oxygen saturation of 85-95%.
- While not ideal, a larger facemask than indicated for patient size may be used to provide bag-valve-mask ventilation if an appropriately sized mask is not available - avoid pressure over the eyes as this may result in bradycardia.
- Increase in heart rate is the most reliable indicator of effective resuscitative efforts.
- A multiple gestation delivery may require additional resources and/or providers.
- 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
<b>Appearance</b>	Blue, Pale	Body pink, extremities blue	Completely pink
<b>Pulse</b>	Absent	Slow (less than 100)	Rate of 100 or greater
<b>Grimace</b>	No response	Grimace	Cough or Sneeze
<b>Activity</b>	Limp	Some flexion	Active motion of extremities
<b>Respirations</b>	Absent	Slow, irregular	Good, crying

The Apgar score, American College of Obstetricians and Gynecologists, [www.acog.org](http://www.acog.org).

## **B. Pertinent Assessment Findings**

- It is difficult to determine gestational age in the field – if there is any doubt as to viability, resuscitation efforts should be initiated.



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>

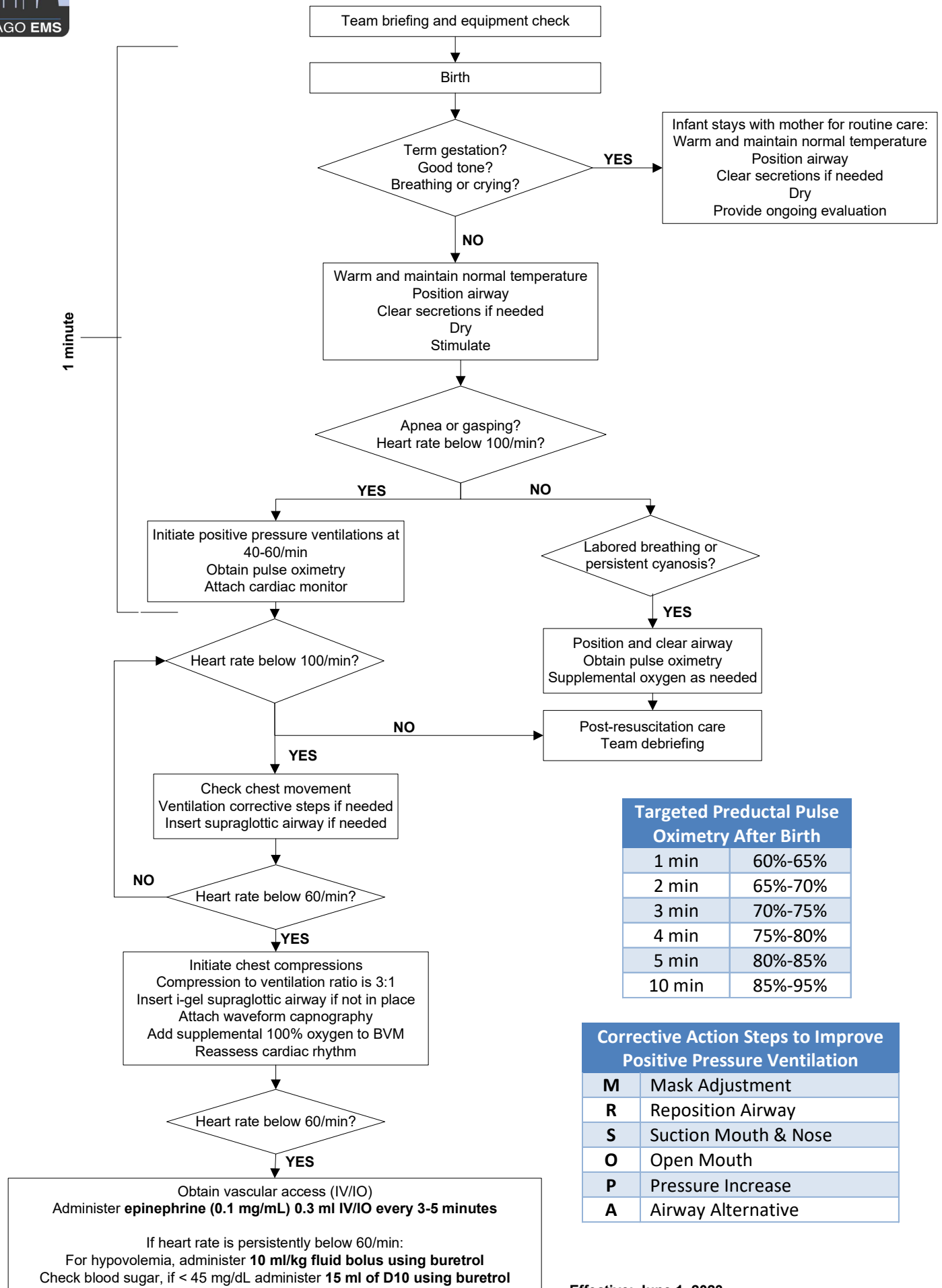
Title: Neonatal Resuscitation – BLS/ALS
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2. Acrocyanosis, a blue discoloration of the distal extremities, is a common finding in the newly born infant transitioning to extrauterine life – this must be differentiated from central cyanosis.

**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%

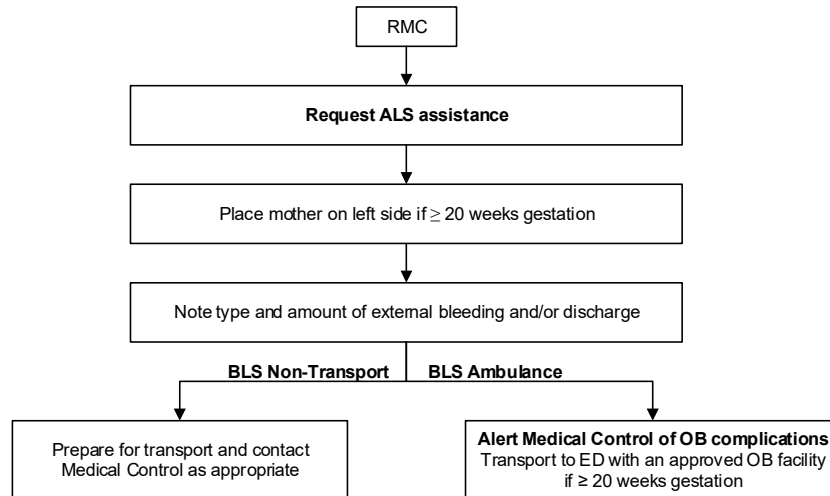
Corrective Action Steps to Improve Positive Pressure Ventilation	
<b>M</b>	Mask Adjustment
<b>R</b>	Reposition Airway
<b>S</b>	Suction Mouth & Nose
<b>O</b>	Open Mouth
<b>P</b>	Pressure Increase
<b>A</b>	Airway Alternative



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Obstetrical Complications / Bleeding in Pregnancy - BLS
Section: Obstetrics
Approved: EMS Medical Directors Consortium
Effective: January 1, 2011

**OBSTETRICAL COMPLICATIONS / BLEEDING IN PREGNANCY - BLS**

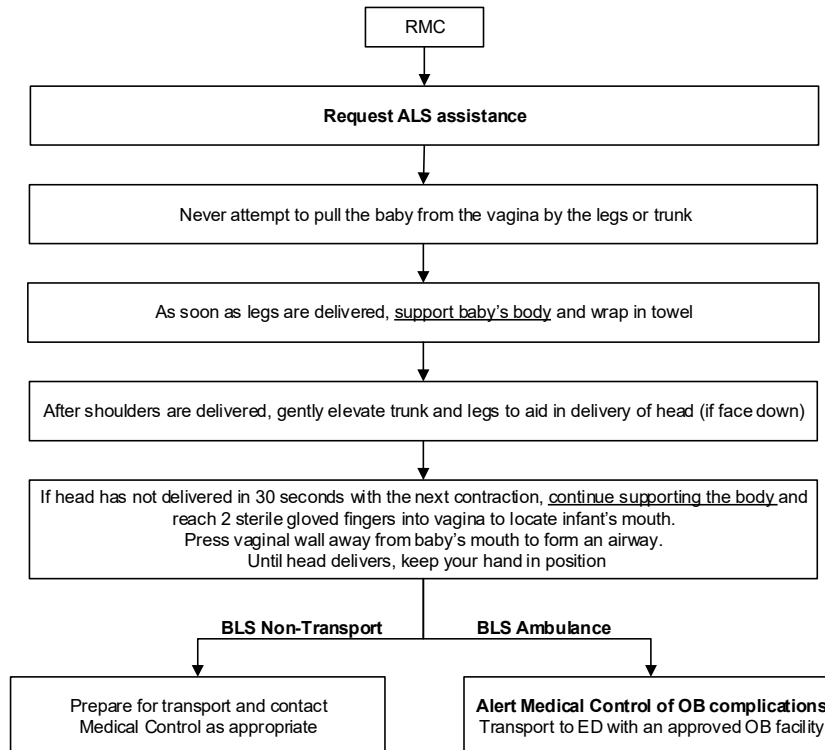




**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Obstetrical Complications / Breech Birth - BLS
Section: Obstetrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**OBSTETRICAL COMPLICATIONS / BREECH BIRTH - BLS**

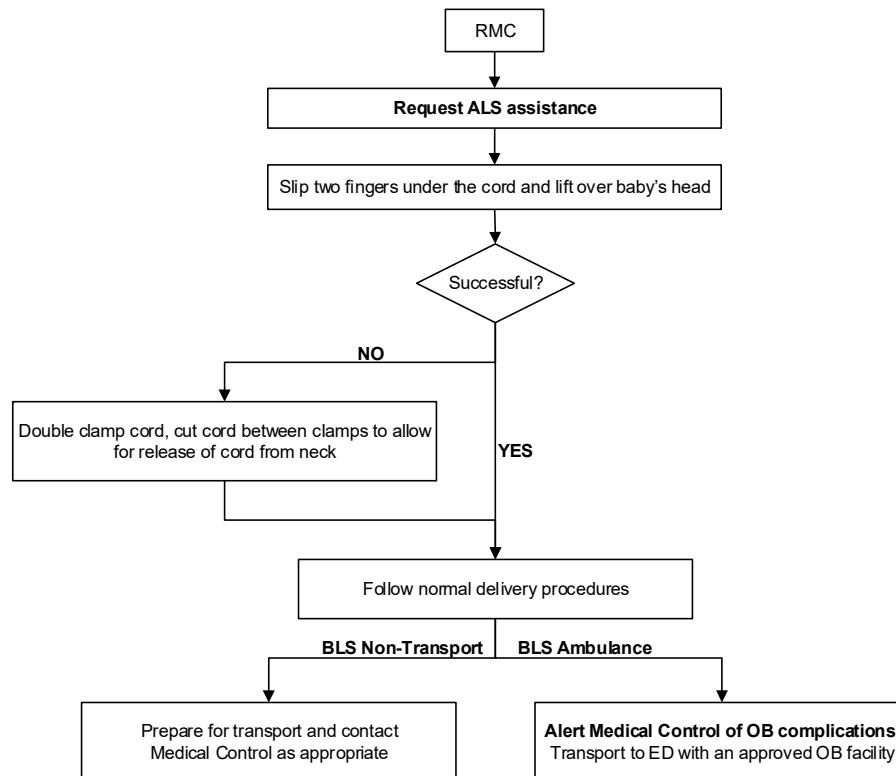




**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Obstetrical Complications / Nuchal Cord - BLS
Section: Obstetrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**OBSTETRICAL COMPLICATIONS / NUCHAL CORD - BLS**

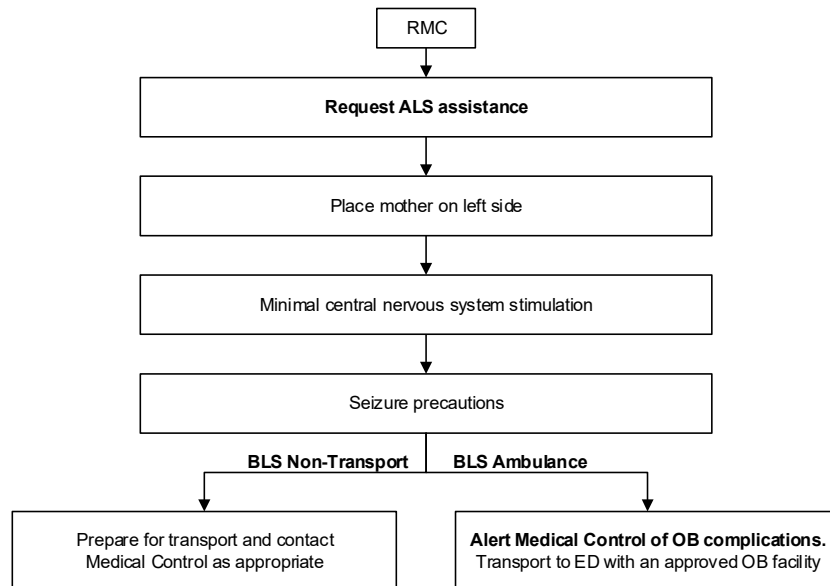




**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Obstetrical Complications / Pre-Eclampsia or Eclampsia - BLS
Section: Obstetrics
Approved: EMS Medical Directors Consortium
Effective: January 1, 2011

**OBSTETRICAL COMPLICATIONS / PRE-ECLAMPSIA or ECLAMPSIA - BLS**

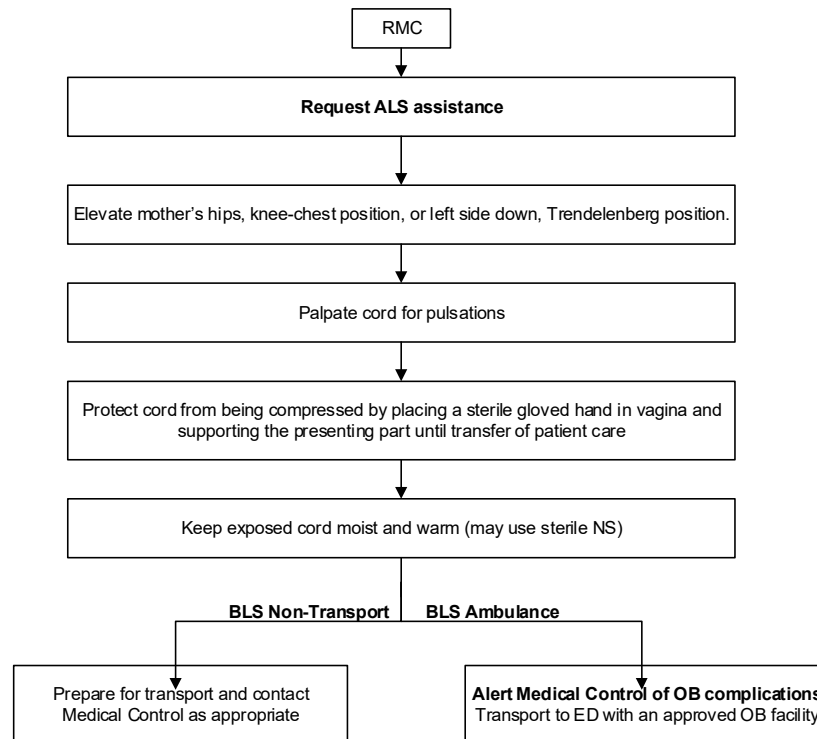




**REGION 11  
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PROTOCOL**

Title: Obstetrical Complications / Prolapsed Cord - BLS
Section: Obstetrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**OBSTETRICAL COMPLICATIONS / PROLAPSED CORD - BLS**



## **PEDIATRICS**

Pediatric Initial Assessment  
Pediatric Routine Medical Care (PRMC)  
Pediatric Routine Trauma Care (PRTC)  
Pediatric Altered Mental Status  
Pediatric Anaphylaxis and Allergic Reaction  
Pediatric Bronchospasm  
Pediatric BRUE (Brief Resolved Unexplained Event) or Apparent Life-Threatening Event (ALTE)  
Pediatric Burns  
Pediatric Cardiac Arrest  
Pediatric Chemical Agents / Airway Respiratory Irritants / Nerve Agents  
Pediatric Croup or Epiglottitis  
Pediatric Drowning  
Pediatric Hyperthermia / Heat Exposure  
Pediatric Hypothermia / Cold Exposure  
Pediatric Pain Management  
Pediatric Seizures  
Pediatric Shock  
Pediatric Topical Chemical Burn  
Pediatric Tracheostomy with Respiratory Distress



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	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.



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PROTOCOL**

Title: Pediatric Initial Assessment
Section: Pediatrics
Approved: EMS Medical Directors Consortium
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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

<u>Age</u>	<u>Pulse</u>	<u>Systolic Blood Pressure</u>	<u>Respiratory Rate</u>
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



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Pediatric Initial Assessment
	Section: Pediatrics
	Approved: EMS Medical Directors Consortium
	Effective: March 1, 2016

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.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Initial Assessment
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

PEDIATRIC GLASGOW COMA SCALE (PGCS)				
	> 1 Year		< 1 Year	Score
<b>EYE OPENING</b>	Spontaneously		Spontaneously	4
	To verbal command		To shout	3
	To pain		To pain	2
	No response		No response	1
<b>MOTOR RESPONSE</b>	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	
<b>VERBAL RESPONSE</b>	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
<b>TOTAL PEDIATRIC GLASGOW COMA SCORE:</b>				<b>(3-15)</b>



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Initial Assessment

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC PAIN SCALE**



0  
No Hurt



1  
Hurts  
Little Bit



2  
Hurts  
Little More



3  
Hurts  
Even More



4  
Hurts  
Whole Lot



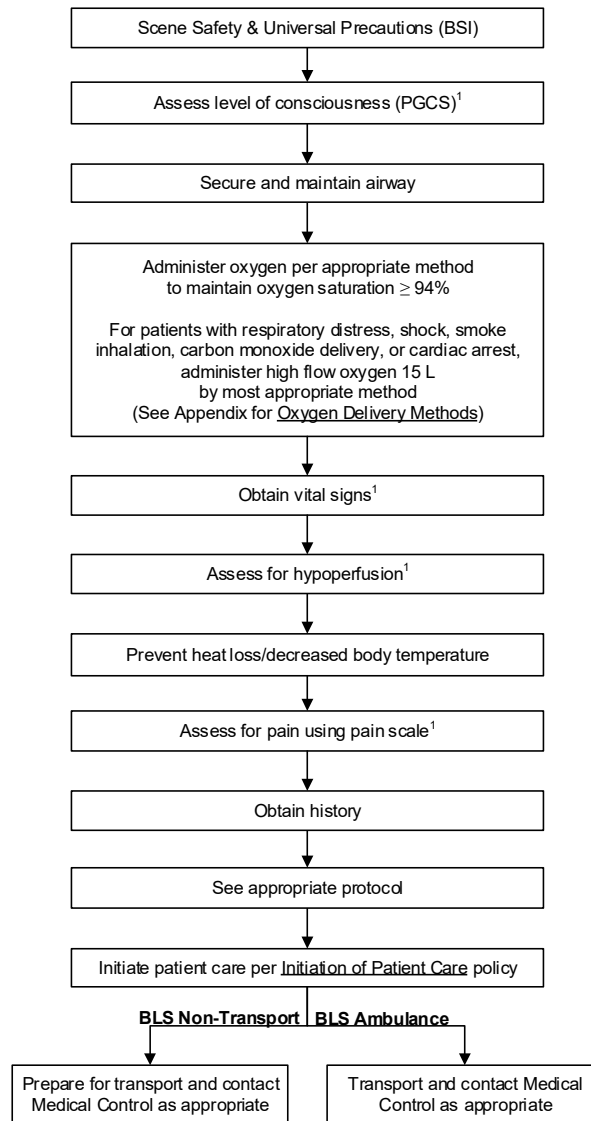
5  
Hurts  
Worst



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Routine Medical Care (PRMC) - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**PEDIATRIC ROUTINE MEDICAL CARE (PRMC) - BLS  
(Age Newborn – 15 yrs.)**



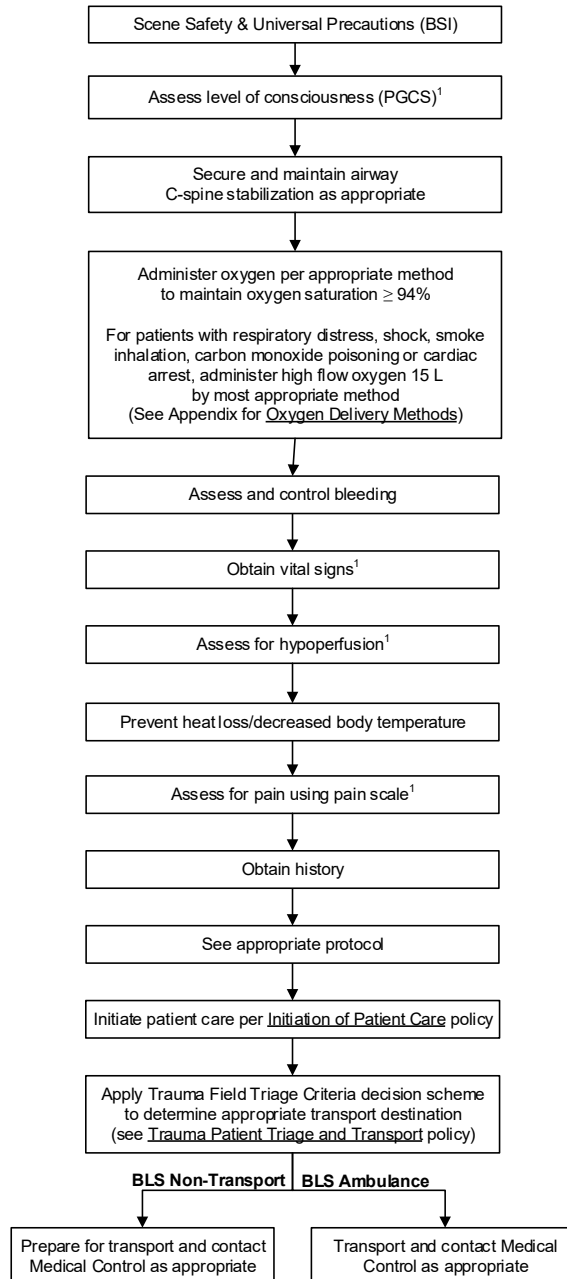
1 – See Pediatric Initial Assessment



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Pediatric Routine Trauma Care (PRTC) - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

## **PEDIATRIC ROUTINE TRAUMA CARE (PRTC) - BLS (Age Newborn – 15 yrs.)**



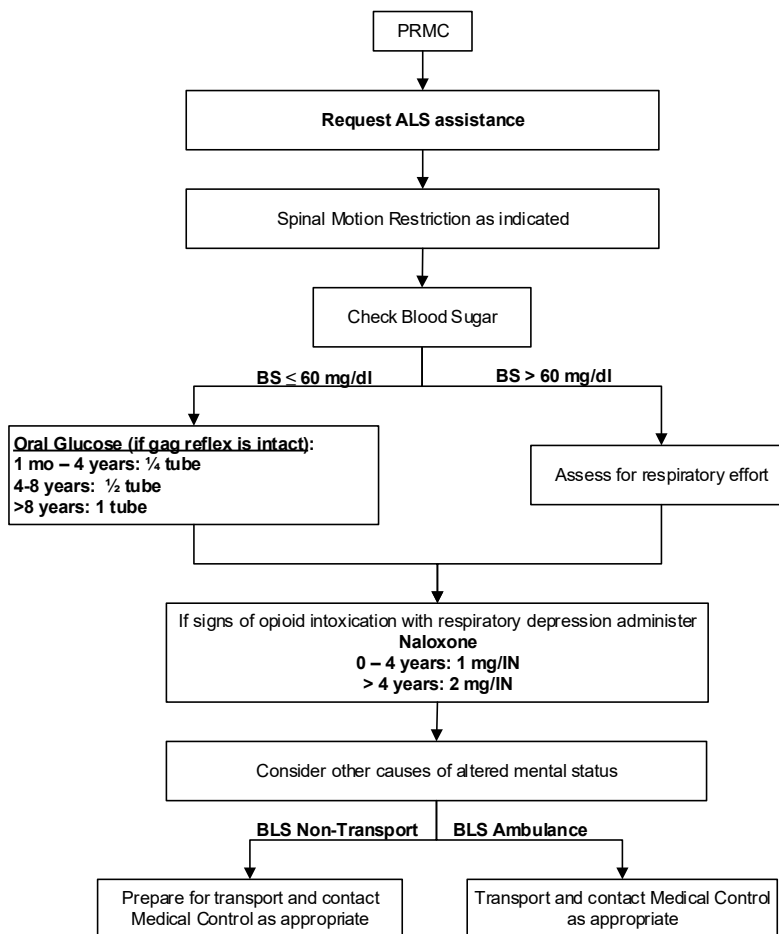
1 – See Pediatric Initial Assessment



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Altered Mental Status - BLS  
Section: Pediatrics  
Approved: EMS Medical Directors Consortium  
Effective: October 17, 2016

**PEDIATRIC ALTERED MENTAL STATUS - BLS**



**Special Considerations:**

Consider causes:

**A** Alcohol, abuse  
**E** Epilepsy, electrolytes, encephalopathy  
**I** Insulin  
**O** Opiates, overdose  
**U** Uremia

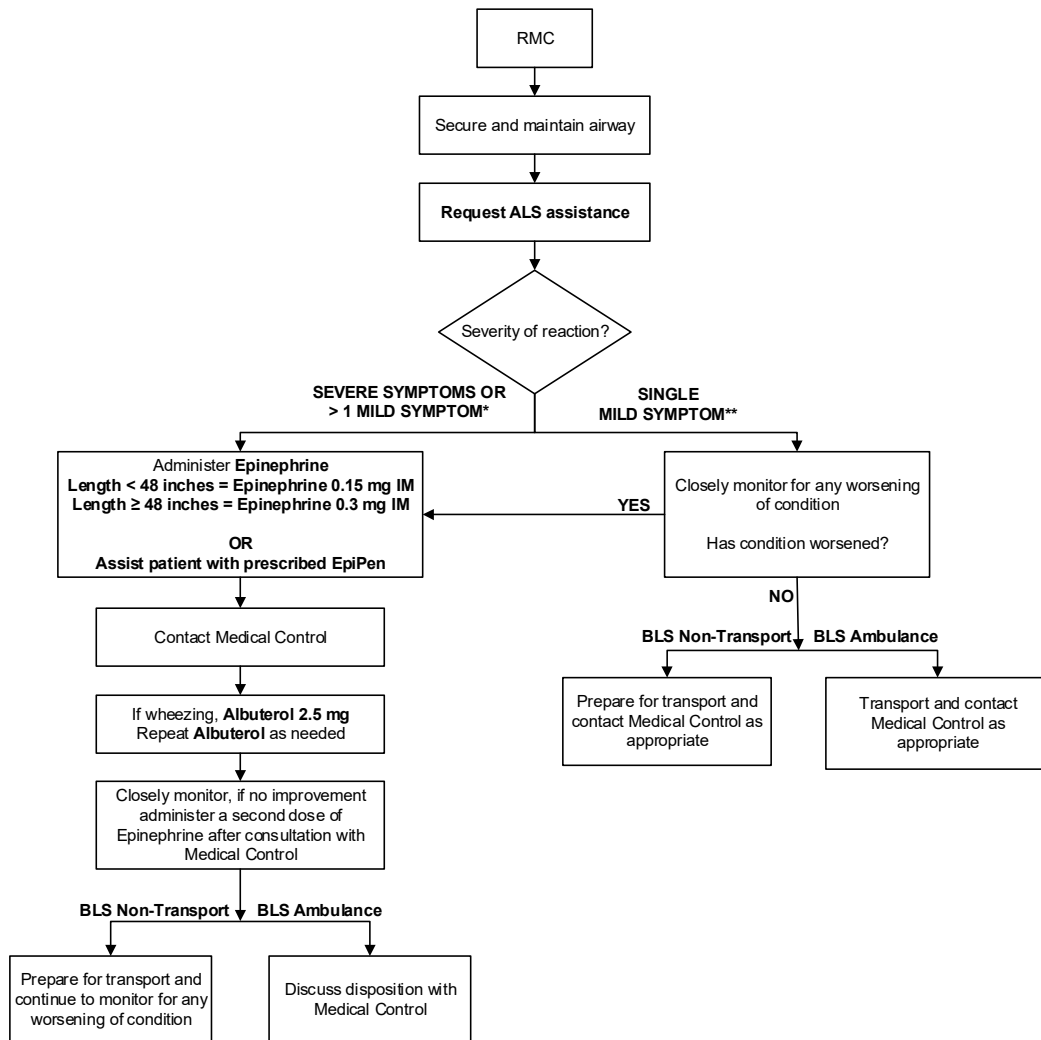
**T** Trauma, temperature  
**I** Infection, intussusception, inborn errors  
**P** Psychogenic  
**P** Poison  
**S** Shock, seizures, stroke, space-occupying lesion, subarachnoid hemorrhage, shunt



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Pediatric Anaphylaxis and Allergic Reaction - BLS  
 Section: Pediatrics  
 Approved: EMS Medical Directors Consortium  
 Effective: April 1, 2017

## **PEDIATRIC ANAPHYLAXIS and ALLERGIC REACTION - BLS**



\*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**

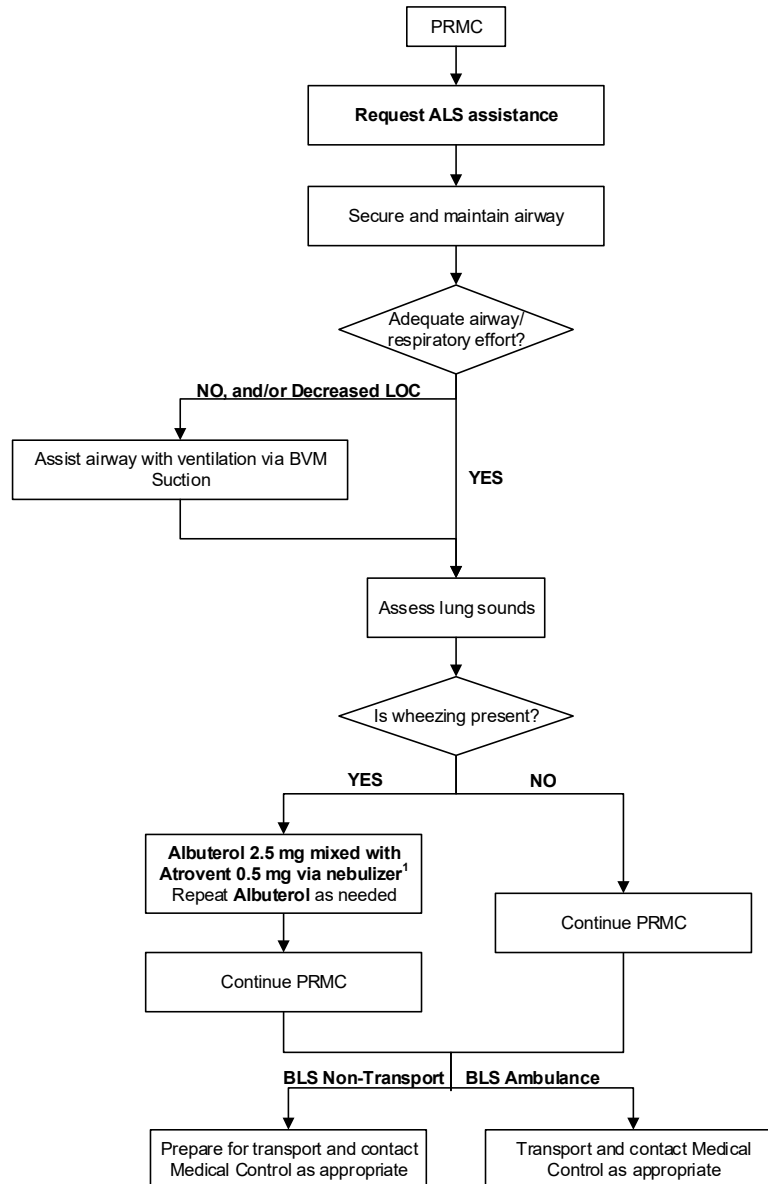
Title: Pediatric Bronchospasm - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC BRONCHOSPASM - BLS**



<sup>1</sup> – If available

NOTE: If patient has an established tracheostomy, see Pediatric Tracheostomy with Respiratory Distress protocol

NOTE: Complete lack of breath sounds may indicate severe bronchoconstriction



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: BRUE (Brief Resolved Unexplained Event) or Apparent Life-Threatening Event (ALTE)

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: June 1, 2023

# BRUE (BRIEF RESOLVED UNEXPLAINED EVENT) or APPARENT LIFE-THREATENING EVENT (ALTE) – 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



## **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: BRUE (Brief Resolved Unexplained Event) or Apparent Life-Threatening Event (ALTE)

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: June 1, 2023

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



## REGION 11 CHICAGO EMS SYSTEM PROTOCOL

Title: BRUE (Brief Resolved Unexplained Event) or Apparent Life-Threatening Event (ALTE)

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: June 1, 2023

- 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.



## **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: BRUE (Brief Resolved Unexplained Event) or Apparent Life-Threatening Event (ALTE)

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: June 1, 2023

- 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”, “ALTE”, “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**

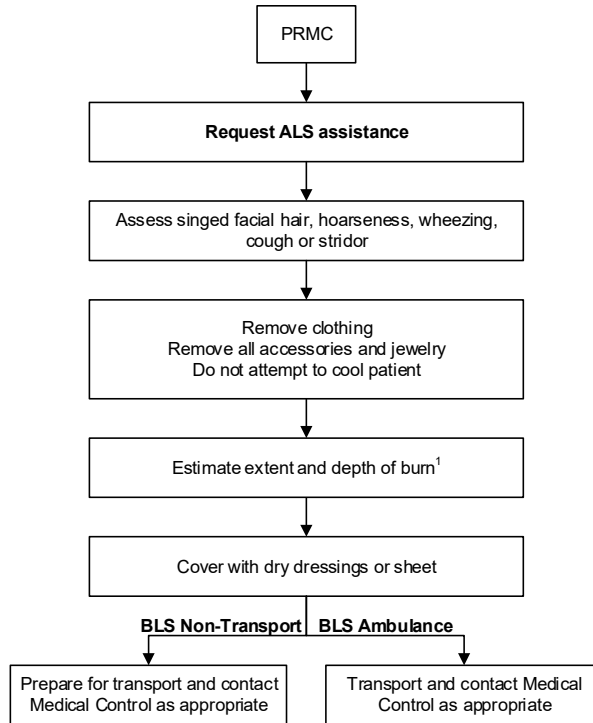
Title: Pediatric Burns - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC BURNS - BLS**



1 – See next page for Pediatric Burns % Body Surface Area



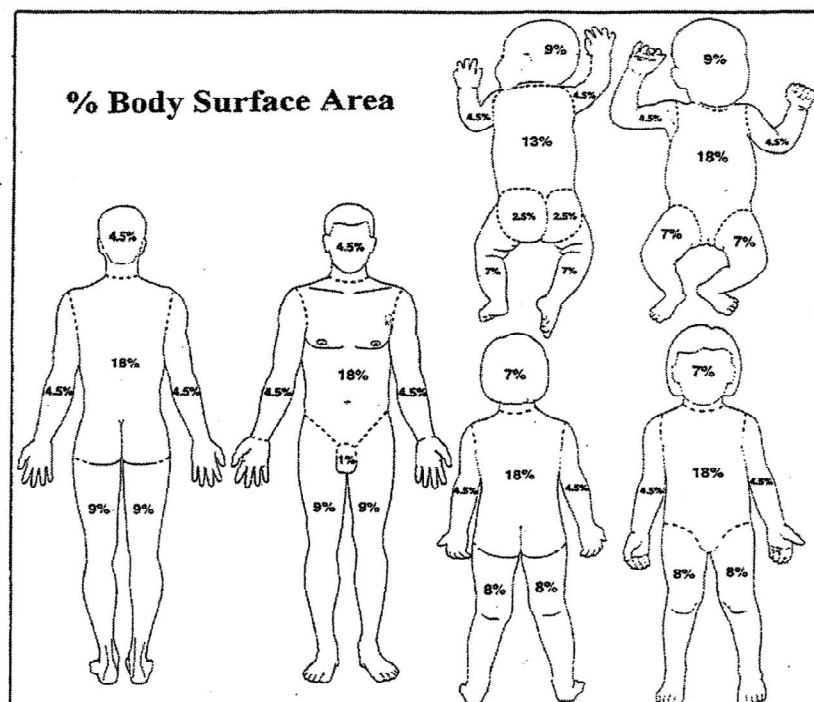
**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Burns - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016



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

Any patient with a life threatening condition should be treated until stable at the nearest appropriate facility before being transferred to a burn center.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

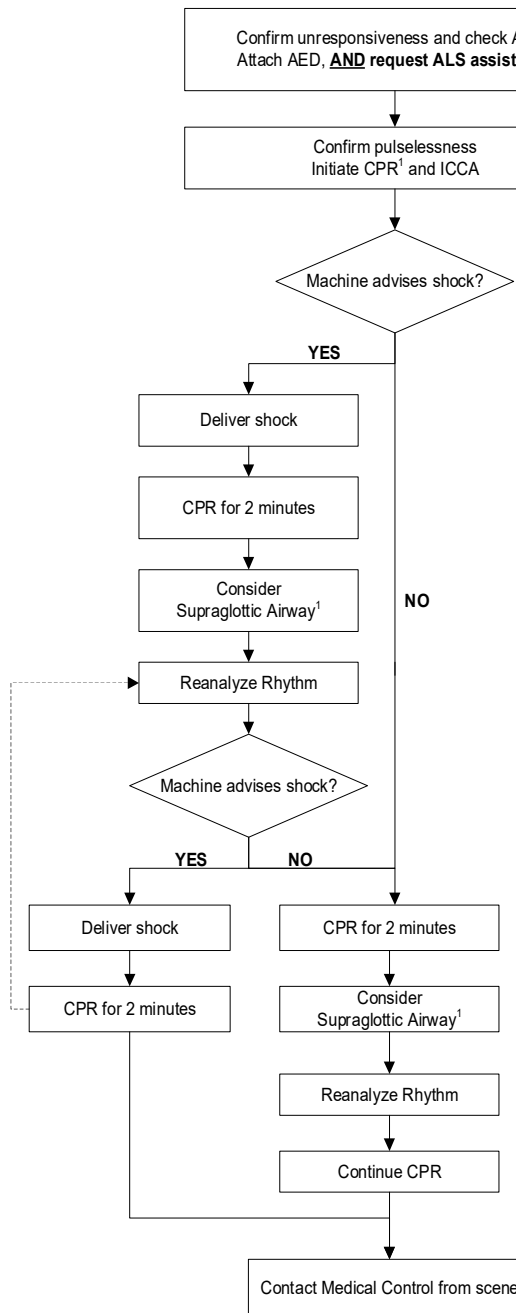
Title: Pediatric Cardiac Arrest - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: December 1, 2022

**PEDIATRIC CARDIAC ARREST - BLS**



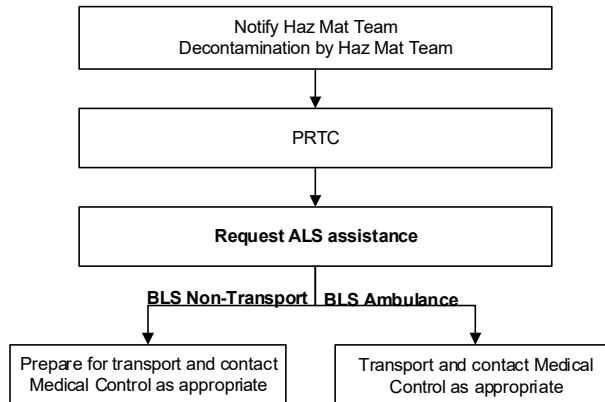
**1 – Pediatric Ventilation Rates:** Basic Airway.....Child = 15:2 compression to ventilation cycle  
Infant = 15:2 compression to ventilation cycle  
Advanced Airway (SGA)...Child = 12 breaths per minute (1 breath every 5 seconds)  
Infant = 20 breaths per minute (1 breath every 3 seconds)



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Chemical Agents / Airway Respiratory Irritants / Nerve Agents - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**PEDIATRIC CHEMICAL AGENTS / AIRWAY RESPIRATORY IRRITANTS / NERVE AGENTS -  
BLS**



\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

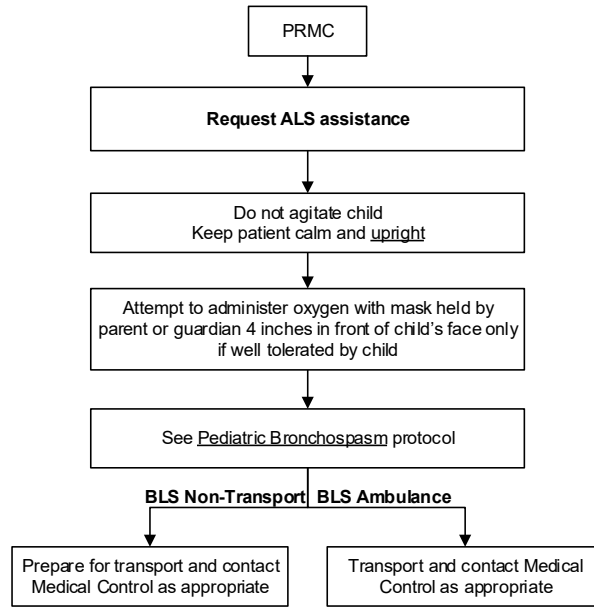
Title: Pediatric Croup or Epiglottitis - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC CROUP OR EPIGLOTTITIS - BLS**





**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

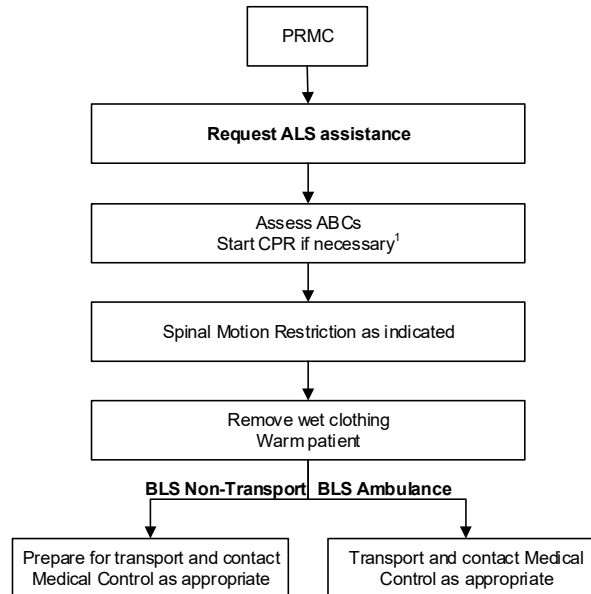
Title: Pediatric Drowning - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC DROWNING - BLS**



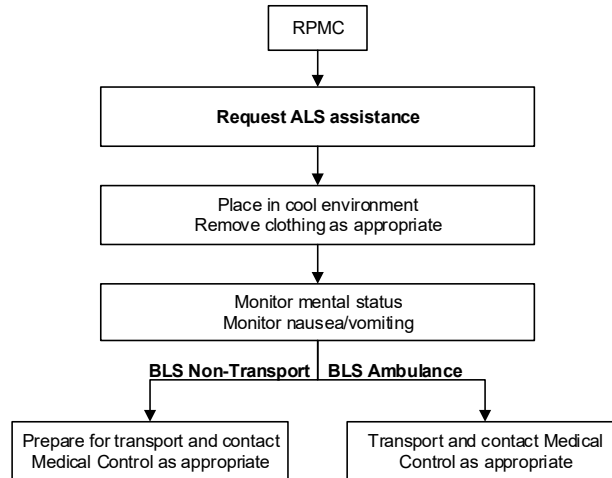
1 – Pediatric CPR rates: 1 rescuer = 30 compressions: 2 ventilations  
2 rescuers = 15 compressions: 2 ventilations



**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Hyperthermia / Heat Exposure - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: January 1, 2011

**PEDIATRIC HYPERTHERMIA / HEAT EXPOSURE - BLS**

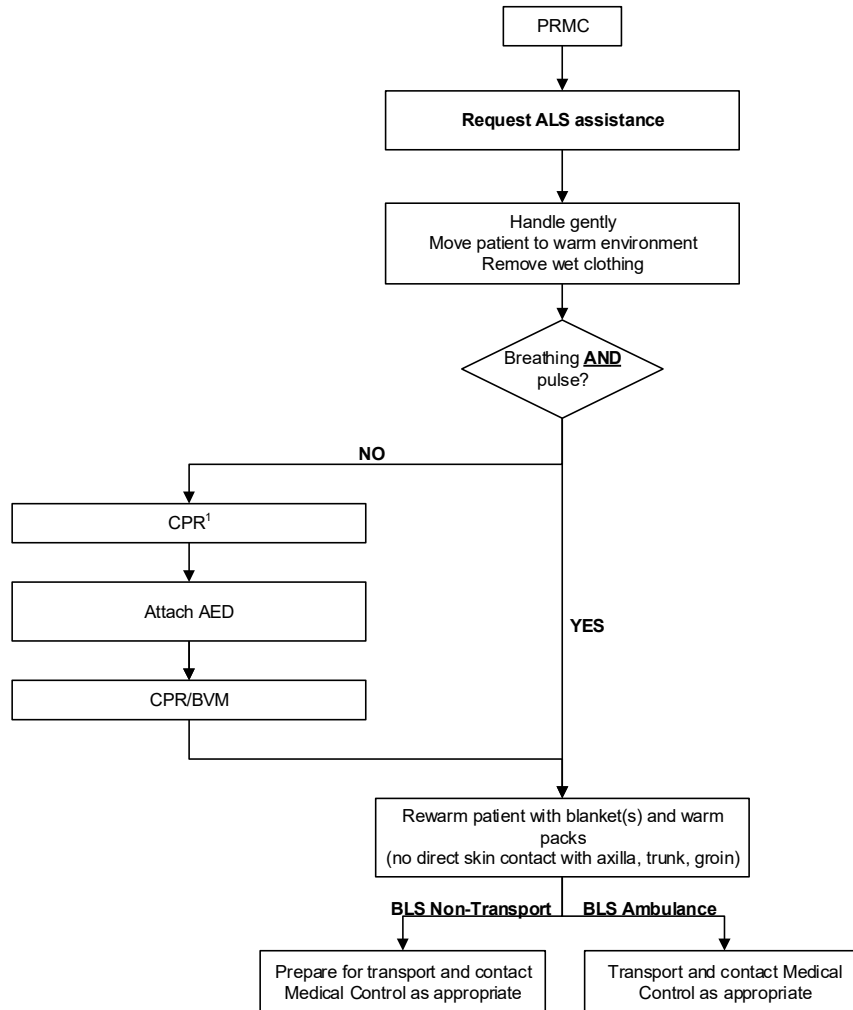




# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Pediatric Hypothermia / Cold Exposure - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

## **PEDIATRIC HYPOTHERMIA / COLD EXPOSURE - BLS**



**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.

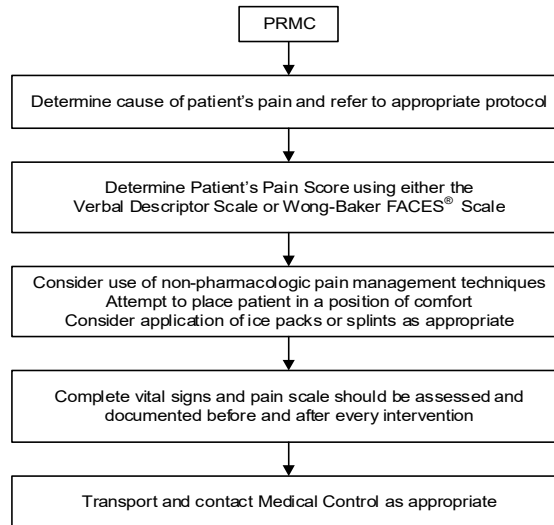
**1 – Pediatric CPR rates:** 1 rescuer = 30 compressions: 2 ventilations  
2 rescuers = 15 compressions: 2 ventilations



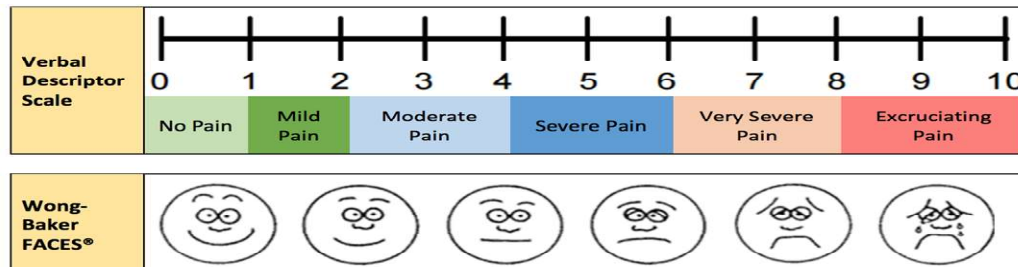
# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Pediatric Pain Management - BLS  
 Section: Pediatrics  
 Approved: EMS Medical Directors Consortium  
 Effective: November 1, 2019

## **PEDIATRIC PAIN MANAGEMENT - BLS**



Universal Pain Assessment Tool





**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

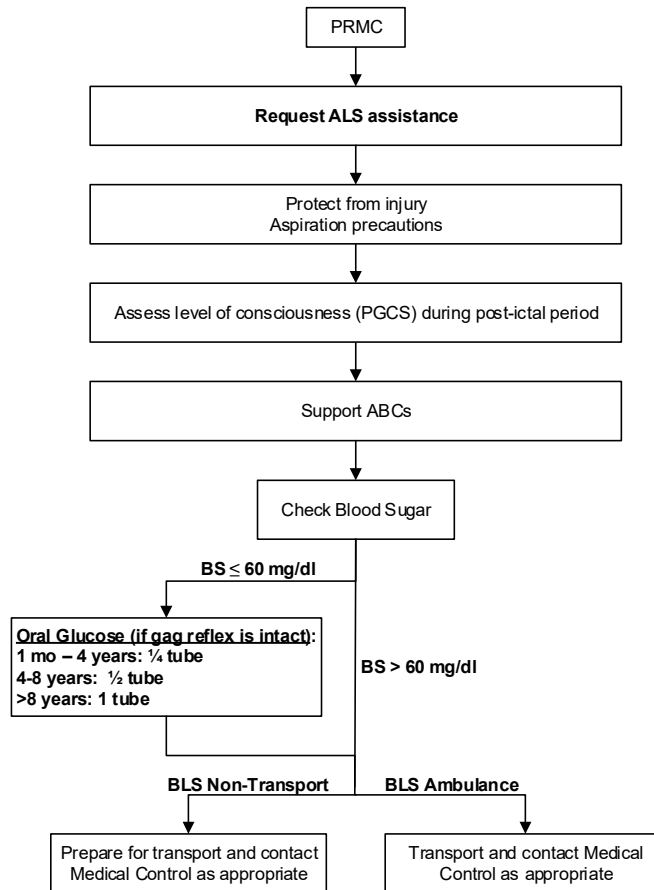
Title: Pediatric Seizures - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: March 1, 2016

**PEDIATRIC SEIZURES - BLS**





**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

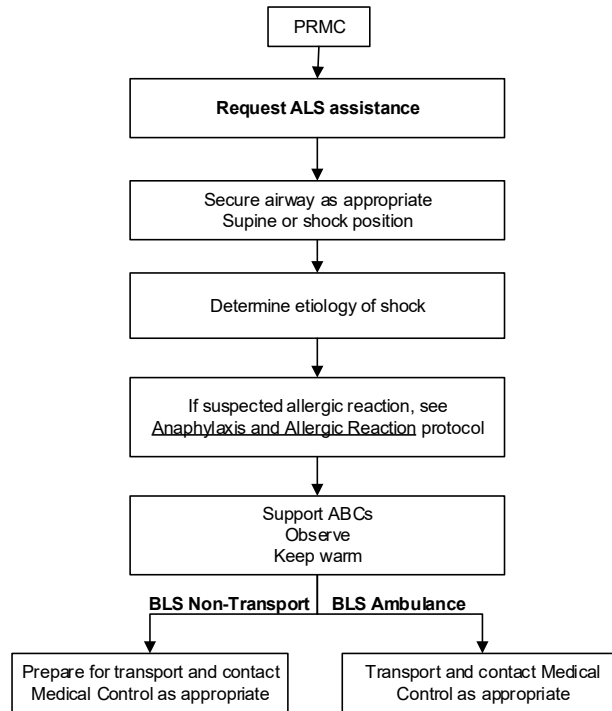
Title: Pediatric Shock - BLS

Section: Pediatrics

Approved: EMS Medical Directors Consortium

Effective: January 1, 2011

**PEDIATRIC SHOCK - BLS**

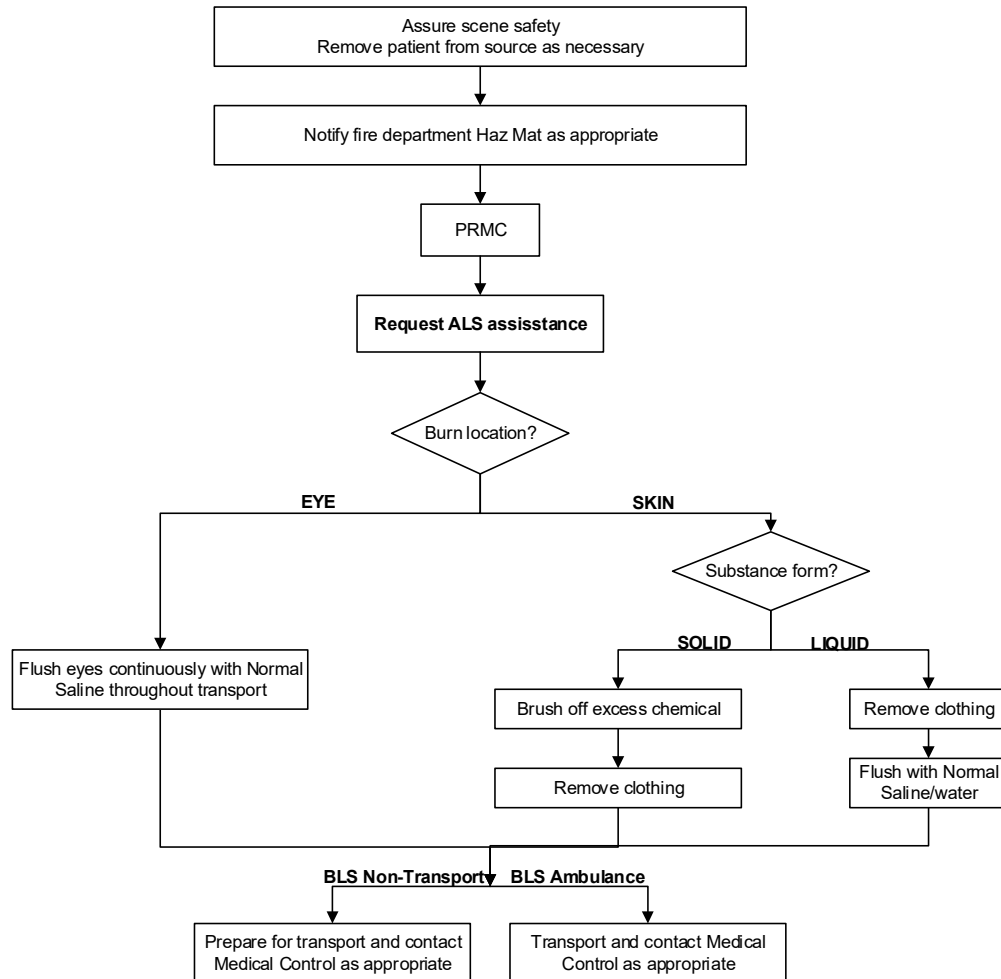




**REGION 11  
CHICAGO EMS SYSTEM  
PROTOCOL**

Title: Pediatric Topical Chemical Burn - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

**PEDIATRIC TOPICAL CHEMICAL BURN - BLS**



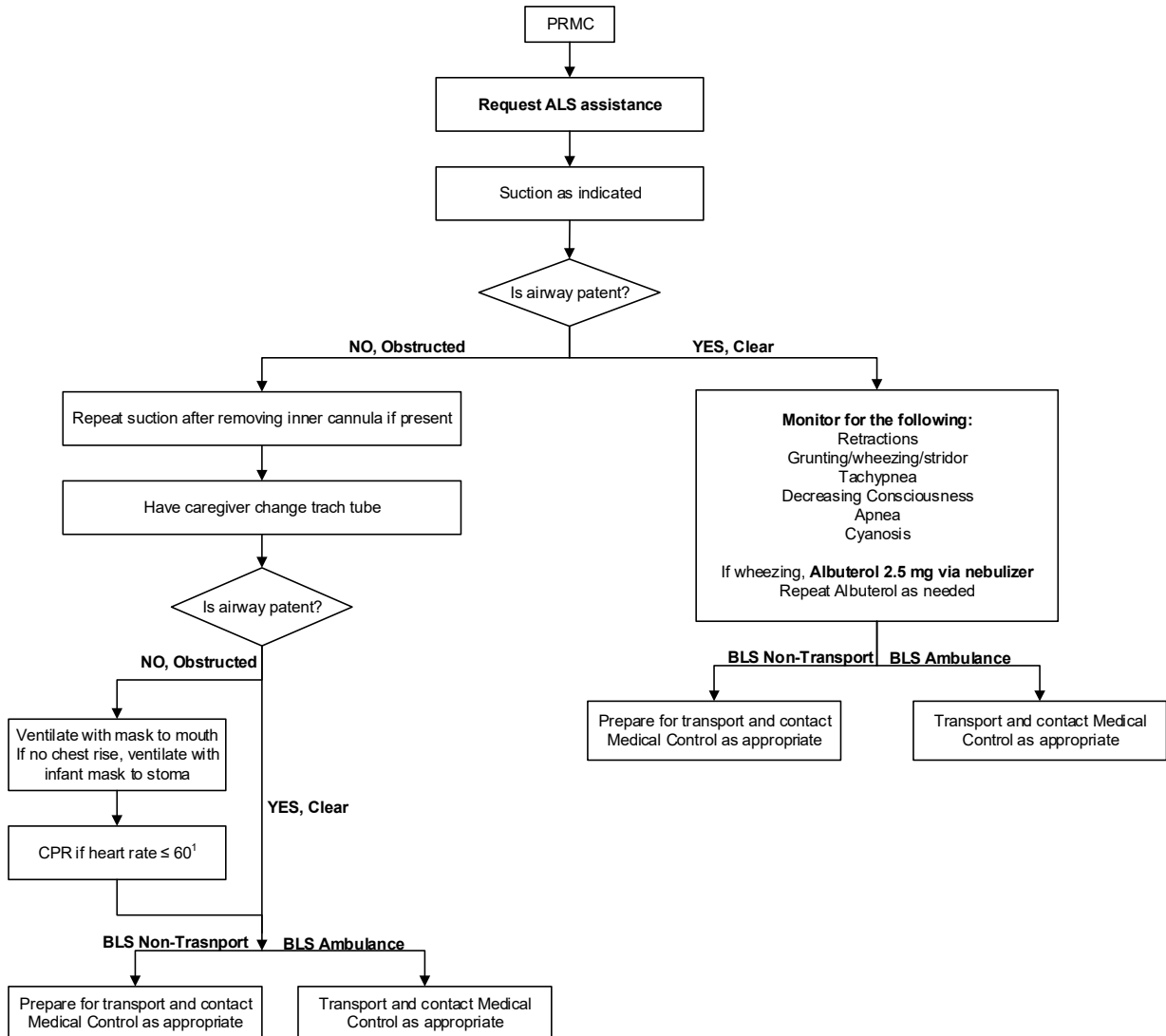
\* All efforts should be made to decontaminate the patient prior to transport, as appropriate per HazMat team.



# **REGION 11 CHICAGO EMS SYSTEM PROTOCOL**

Title: Pediatric Tracheostomy with Respiratory Distress - BLS
Section: Pediatrics
Approved: EMS Medical Directors Consortium
Effective: March 1, 2016

## **PEDIATRIC TRACHEOSTOMY WITH RESPIRATORY DISTRESS - BLS**



1 – Pediatric CPR rates: 1 rescuer = 30 compressions: 2 ventilations  
2 rescuers = 15 compressions: 2 ventilations