



# Out-of-Hospital & Mobile Integrated Healthcare Protocols

November 14, 2022

The Uniform EMS Ordinance, and related Interlocal Agreements, establishes the Metropolitan Area EMS Authority, dba MedStar Mobile Healthcare. In conjunction with each member city’s fire or police EMS first-response, the MAEMSA System provides service to more than 1,100,000 residents over 438-square-miles, and responds to approximately 155,000 emergency calls a year. The mission is to provide high quality patient care in an efficient, accountable, and cost effective fashion. To ensure a high standard of clinical care for the System, the Ordinance also establishes the Office of the Medical Director & the Emergency Physicians Advisory Board (EPAB), to provide medical direction and clinical oversight to the entire system.

These protocol’s jurisdictional authority pertains to the following members of the MAEMSA System:

**Metropolitan Area EMS Authority**

- |                              |                                       |
|------------------------------|---------------------------------------|
| MedStar Mobile Healthcare    | Bell Helicopter Fire Department       |
| Fort Worth Fire Department   | Edgecliff Village Fire Department     |
| Fort Worth Police Department | River Oaks Fire Department            |
| Burleson Fire Department     | Saginaw Fire Department               |
| Forest Hill Fire Department  | Sansom Park Fire Department           |
| Haltom City Fire Department  | Westover Hills Police Department      |
| Haslet Fire Department       | Westworth Village Police Department   |
| Lake Worth Fire Department   | White Settlement Fire Department      |
| Blue Mound Fire Department   | *Lockheed Martin (FW) Fire Department |

*\* EPAB does not provide direct medical oversight for these agencies*

These protocols apply only during official responses within the member jurisdictions, to personnel who are considered to be “On-Duty” by their respective agencies. Agencies responding to mutual aid requests are expected to operate under them as well.

In the case of a regional disaster, providers who normally operate under these protocols will continue to do so, regardless of the location of the disaster, until other instructions can be provided.

Questions regarding the applicability of this document within any specific jurisdiction or for a particular event should be directed to the OMD by calling 817-923-1500 or in writing to the following address:

Office of the Medical Director  
2900 Alta Mere Drive  
Fort Worth, Texas 76116



EFFECTIVE:  
November 14, 2022

Jeffery L. Jarvis, MD, MS, EMT-P, FACEP, FAEMS  
System Medical Director





Medical Direction and Oversight of the system includes the following components:

### ***Emergency Physicians Advisory Board***

The Restated and Amended Interlocal Cooperative Agreement provides for a multi-jurisdictional Emergency Physicians Advisory Board (EPAB), to provide professional oversight of the clinical performance of the prehospital emergency medical services, mobile integrated healthcare, and medial transportation system. The EPAB is empowered to provide independent medical advice and oversight for clinical matters. The EPAB is composed of the System area hospital Emergency Department Medical Directors and additional licensed physicians appointed by the Tarrant County Medical Society.

### ***Medical Director***

The Medical Director is responsible for all aspects of clinical care for the System, including establishing clinical care requirements, credentialing standards, training & education, quality improvement processes, and research. The EPAB collaboratively reviews changes for medical appropriateness and consistency with sound medical practice. The Medical Director must approve all medical protocols. The Medical Director's power and duties are defined in the Texas Medical Board Rules in the Texas Administrative Code, Title 22, Part 9, Chapter 197-Emergency Medical Service, in the Restated and Amended Interlocal Cooperative Agreement, and in an Employment Agreement and Job Description. The Medical Director is also the Chief Medical Officer of the Authority, reports to the Board of the Authority, and has all powers and duties afforded and required of EMS medical directors under state law. The Medical Director provides all independent medical direction and is the exclusive source of medical direction and oversight for the System.

### ***Office of the Medical Director***

The Medical Director may appoint members of staff to aid in the provision of medical direction and oversight, which may include physician (Associate/Assistant Medical Directors), and non-physician staff. The Medical Director may delegate certain tasks and responsibilities to this staff. The selection, hiring, separation, and day-to-day direction of members of this staff solely resides with the Medical Director.

### ***Medical Directives***

Medical Directives are issued by the Medical Director and describe specific clinical changes or updates in the System. Medical Directives are distributed to all affected System stakeholders. Medical Directives are preferably distributed electronically but may be physically distributed to Agency contact persons. Each System Agency is responsible for disseminating Medical Directives to their stakeholders and credentialed EMS staff.



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## Organization of the Protocol Document



This document was designed for efficient navigation, including hyperlinks of the protocols to individual drugs in the Pharmacopeia, and to skills in the Procedure section. All hyperlinks are underlined and in red.

The major sections are color coded to allow for rapid identification and are organized as follows:

The adult and pediatric master sections are identified by the top-most heading within each protocol, with individual subsections, e.g. cardiac, medical, trauma, environmental, distinguished by their color-coding. The definition of pediatric patients is outlined in the Age Specific Transport Guidelines section of the Patient Destination Policy.

### General

Spans multiple protocols due to their relevance to all facets of patient care, including Drug Assisted Airway, Shock/Hypotension, Acute Pain Management, Release at Scene, Against Medical Advice

### Cardiac

Cardiac Arrest, Ischemic Chest Pain, and treatment of dysrhythmias

### Medical

General medical emergencies, including Abdominal Pain, Respiratory Distress, Stroke/CVA/TIA

### Environmental

Bites/Envenomation, Hypothermia, Hyperthermia, Near Drowning

### Trauma

Treatment protocols for the injured patient

### OB/GYN

Emergency Childbirth and Newly Born

## Protocol Conventions

- All 911 protocols are listed in their entirety on a single page.
- Interventions, including the use of skills or medications, are preceded by individual bullets or lists of bullets.

### Suspected Hyperkalemia

- Calcium Chloride - 1 g IV
- Sodium Bicarbonate – 1 mEq/kg IV/IO

- Simple *If* statements provide specific indications for the interventions that follow.

*If time permits and if adequate respirations, consider sedation prior to/during pacing*

- Ketamine - 0.5 mg/kg IV/IO, IIRR × 2

- While bullets are generally listed in the order of importance, numbers are avoided for the purpose of deemphasizing a rote, *cookbook*, approach to patient management
- The following pages provide a visual guide to the key elements of each protocol page, including:
  - Master and Subsection identification
  - Provider Tabs for individual credentialing levels, i.e. Basic, Assist, Advanced
  - Pearls & Pitfalls
  - QA Points

## Procedures

Detailed Procedures are provided in either the Procedure section or, in some cases, are located directly within the individual protocols (Respiratory Insufficiency/Failure & Drug-Assisted Airway) to standardize the approach to high-risk low-frequency

# Master & Subsection Identification



Master Section  
(Adult)

Subsection  
(Trauma)

ADULT

General Trauma

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Spinal Motion Restriction, as appropriate
- Pelvic binder, as appropriate
- Keep patient warm

BASIC

---

- Advanced airway management, as appropriate
- Needle Thoracostomy for presumed tension pneumothorax
- Cardiac monitoring, as appropriate
- IV access, as appropriate;

*If SBP < 90*

- NS - 250 cc IV bolus, INRR 250 cc increments titrate to SBP = 90 (permissive hypotension), except if suspected

ASSIST

---

- Acute Pain Management, as appropriate

*If traumatic arrest*

- Consider Needle Thoracostomy(s) prior to following procedures for:  
Termination of Resuscitation or Withholding Resuscitative Efforts, as appropriate

ADVANCED

Eye Injury

*If isolated eye injury*

- Irrigate with NS if result of chemical burn (if appropriate to agent)
- Cover unaffected eye/stabilize impaled object

*If suspected ocular compartment syndrome*

- Do not delay transport

*If outside socket:*

- Cover with NS soaked gauze

Head/Neck Injuries

- Spinal Motion Restriction

Chest Injuries

- Bleeding control
- Stabilize impaled objects
- Stabilize flail segments
- Occlusive dressing— open wounds

Chest Injuries

- Tension Pneumothorax— Needle thoracostomy

Abdominal/Pelvic Injuries

- Control bleeding
- Pelvic binder
- Stabilize impaled objects
- Evisceration— cover with saline moistened gauze

Pregnancy Considerations:

- Left lateral recumbent (LLR) position

*If signs of poor cardiac output*

- Manual fundus displacement (to left)

Extremity/Amputation Injuries

- Bleeding control (direct pressure, tourniquet)
- Splinting, as appropriate
- Sterile dressing— open fractures
- Care for amputated body part

ASSIST & ADVANCED

Bulleted Actions

*If* statement

# Provider Tabs



Interventions for each provider credentialing level are listed within their individual tabs on the right of the page:

- Basic
- Assist
- Advanced

Each successive credentialing level includes interventions for that specific tab, as well as those interventions in the tabs preceding it. Assist level providers perform all interventions in both the Basic and Assist tabs, while Advanced level providers are responsible for all interventions in the Basic, Assist, and Advanced tabs.

PEDI

### Diabetic Emergencies

<ul style="list-style-type: none"> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Assess blood glucose concentration</li> </ul> <p><i>If &lt; 60 mg/dl:</i></p> <ul style="list-style-type: none"> <li>• Oral Glucose 7.5 g buccal (<i>If conscious/able to tolerate</i>)</li> </ul>	BASIC
<ul style="list-style-type: none"> <li>• Cardiac monitoring, as appropriate</li> <li>• <b>IV access</b>, as appropriate</li> </ul> <p><i>Hypoglycemia: If blood glucose &lt; 60 mg/dl</i></p> <ul style="list-style-type: none"> <li>• Dextrose 10% (25g/250ml) - 5 ml/kg IV/IO bolus, INRR up to 25 g (250 ml)</li> </ul> <p><i>Hyperglycemia: If blood glucose &gt; 300 mg/dl and altered mental status and/or signs of hypovolemia</i></p> <ul style="list-style-type: none"> <li>• IV access, as appropriate; consider 15cc/kg NS IV/IO rapid bolus for hypotension, INRR up to 30cc/kg or 2L to-</li> </ul>	ASSIST
<p><i>If blood glucose concentration &lt; 60mg/dl and If IV access cannot be obtained:</i></p> <ul style="list-style-type: none"> <li>• Glucagon 0.1mg/kg IM/IN (max dose 1 mg)</li> </ul>	ADVANCED

Consider differential diagnosis for hyperglycemia

- Diabetic Ketoacidosis (DKA)
- Hyperosmolar hyperglycemic state (*non-ketotic*)



# Pearls & Pitfalls



Additional guidance may be listed below the tabs in a white, un-tabbed “Pearls & Pitfalls” box. This may include additional diagnostic and treatment considerations, recommendations, and links to other relevant protocols.

PEDI		
Diabetic Emergencies		
<ul style="list-style-type: none"><li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li><li>• Assess blood glucose concentration</li></ul> <i>If &lt; 60 mg/dl:</i> <ul style="list-style-type: none"><li>• Oral Glucose 7.5 g buccal (If conscious/able to tolerate)</li></ul>	BASIC	
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<p>Consider differential diagnosis for hyperglycemia</p> <ul style="list-style-type: none"><li>• Diabetic Ketoacidosis (DKA)</li><li>• Hyperosmolar hyperglycemic state (non-ketotic)</li></ul>		

# Quality Assurance (QA) Points

Protocols include a blue-gray Quality Assurance button, linking to a document containing patient care metrics and documentation standards for performance measurement of quality of care.

QA

Contents

## ADULT

### Cardiac Arrest

OFFICE OF THE  
MEDICAL DIRECTOR

<ul style="list-style-type: none"> <li>Begin 2 minute cycles of <b>Pit Crew CPR</b> with continuous chest compressions @ 100-120 bpm</li> <li>Open airway/passive oxygenation for first 6 minutes unless etiology is respiratory</li> <li>Apply AED: optimal pad placement in anterior-posterior (A-P) configuration               <ul style="list-style-type: none"> <li>If arrest witnessed by EMS/FIRE—apply AED immediately</li> <li>If arrest unwitnessed—perform 2 minutes of CPR before applying AED</li> </ul> </li> </ul> <p><i>After 6 minutes or 3 cycles of CPR</i></p> <ul style="list-style-type: none"> <li>BVM or SGA (waveform EtCO<sub>2</sub> required for SGA)</li> <li>Perform CPR to goal of EtCO<sub>2</sub> ≥ 20 mmHg</li> </ul> <p><i>If patient has gravel stress</i></p> <ul style="list-style-type: none"> <li>Manually displace fundus to the patient's left</li> </ul>	BASIC														
<ul style="list-style-type: none"> <li>Apply cardiac monitor               <ul style="list-style-type: none"> <li>Only after completion of last 2 minute cycle of CPR</li> <li>Optimal pad placement in anterior-posterior (A-P) configuration</li> </ul> </li> <li><b>IV/IO access</b></li> <li>Advanced airway management (waveform EtCO<sub>2</sub> required) only after ≥ 6 minutes or 3 cycles of CPR</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="text-align: center; padding: 2px;">VF/VT</td> <td style="text-align: center; padding: 2px;">Asystole/PEA</td> </tr> <tr> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Defibrillator</b> at highest energy setting q 2 minutes</li> <li><b>Epinephrine</b> 1:10,000 - 1 mg IV/IO q 5-min, 3-dose-max</li> <li><b>Amiodarone</b> 300 mg IV/IO after second defibrillation</li> </ul> <p><i>If persistent or recurrent VF/VT (≥ 3 defibrillations)</i></p> <ul style="list-style-type: none"> <li><b>Amiodarone</b> 150 mg IV/IO × 1 and change pad placement</li> </ul> </td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Epinephrine</b> 1:10,000 - 1 mg IV/IO immediately, then q 5-min, 3-dose-max</li> </ul> </td> </tr> </table>	VF/VT	Asystole/PEA	<ul style="list-style-type: none"> <li><b>Defibrillator</b> at highest energy setting q 2 minutes</li> <li><b>Epinephrine</b> 1:10,000 - 1 mg IV/IO q 5-min, 3-dose-max</li> <li><b>Amiodarone</b> 300 mg IV/IO after second defibrillation</li> </ul> <p><i>If persistent or recurrent VF/VT (≥ 3 defibrillations)</i></p> <ul style="list-style-type: none"> <li><b>Amiodarone</b> 150 mg IV/IO × 1 and change pad placement</li> </ul>	<ul style="list-style-type: none"> <li><b>Epinephrine</b> 1:10,000 - 1 mg IV/IO immediately, then q 5-min, 3-dose-max</li> </ul>	ASSIST										
VF/VT	Asystole/PEA														
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<p><i>If Signs/Symptoms of CPR-Induced Convulsions:</i></p> <ul style="list-style-type: none"> <li><b>Ketamine</b> - 1 mg/kg IV/IO (max single dose 200 mg)</li> <li>Do not perform Termination of Resuscitation</li> </ul> <p>For any of the following give early in the course of cardiac arrest management.</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="padding: 2px;">Metabolic acidosis etiology (e.g., DKA)</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO</li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Hyperkalemia:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 1 g IV/IO, slow push</li> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO (q<sub>10</sub>-C<sub>6</sub>Cl<sub>16</sub>)</li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Torsades de Pointes:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Magnesium Sulfate</b> - 2 g IV/IO, slow push</li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Tension Pneumothorax:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Needle Thoracostomy Procedure</b></li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Tricyclic Antidepressant Overdose:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO</li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Calcium Channel Blockers:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 1 g IV/IO, slow push</li> </ul> </td> </tr> <tr> <td style="padding: 2px;">Beta Blocker Overdose:</td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li><b>Glucagon</b> - 1 mg IV/IO slow push over 1 minute, IRR 1 mg IV/IO × 1</li> <li><b>Epinephrine infusion</b> - infuse at 2-30 mcg/min, start at 5 mcg/min</li> <li>Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</li> </ul> </td> </tr> </table>	Metabolic acidosis etiology (e.g., DKA)	<ul style="list-style-type: none"> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO</li> </ul>	Hyperkalemia:	<ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 1 g IV/IO, slow push</li> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO (q<sub>10</sub>-C<sub>6</sub>Cl<sub>16</sub>)</li> </ul>	Torsades de Pointes:	<ul style="list-style-type: none"> <li><b>Magnesium Sulfate</b> - 2 g IV/IO, slow push</li> </ul>	Tension Pneumothorax:	<ul style="list-style-type: none"> <li><b>Needle Thoracostomy Procedure</b></li> </ul>	Tricyclic Antidepressant Overdose:	<ul style="list-style-type: none"> <li><b>Sodium Bicarbonate</b> - 1 g/eq/kg IV/IO</li> </ul>	Calcium Channel Blockers:	<ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 1 g IV/IO, slow push</li> </ul>	Beta Blocker Overdose:	<ul style="list-style-type: none"> <li><b>Glucagon</b> - 1 mg IV/IO slow push over 1 minute, IRR 1 mg IV/IO × 1</li> <li><b>Epinephrine infusion</b> - infuse at 2-30 mcg/min, start at 5 mcg/min</li> <li>Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</li> </ul>	ADVANCED
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<ul style="list-style-type: none"> <li>For initiation of resuscitation, see <b>Withholding Resuscitative Efforts Protocol</b></li> <li>Resuscitate in the location found unless scene is unmanageable</li> <li>Limit chest compression pauses and individual pause length to &lt; 10 seconds</li> <li>Do not interrupt CPR for airway management</li> <li>Open airway: If choking suspected, remove FBAO as early as possible</li> <li>Passive Oxygenation = NRB and NC at ≥ 15 g<sub>100</sub> (as available) with OPA and/or NPA, and jaw thrust</li> <li>ETT or SGA insertion only with waveform EtCO<sub>2</sub> (if no waveform, replace device or use BVM)</li> <li>Confirm waveform CO<sub>2</sub> ≥ 5 mmHg for every breath</li> <li>Switch AED to monitor/defibrillator only after completion of the current CPR cycle</li> <li>Do not interrupt CPR or defibrillation for ACLS drug administration</li> <li>If ROSC, optimize patient hemodynamics, oxygenation, and ventilation prior to initiating transport</li> <li>If no response to treatment, follow <b>Termination of Resuscitation Protocol</b></li> <li>Sodium bicarbonate is not indicated for prolonged down time</li> <li>* CPR-induced consciousness may be identified by: combative/ras/ agitation, purposeful movements, pulling at lines/airway devices, withdrawing from compressions, speaking; without concurrent return of spontaneous circulation</li> </ul>															

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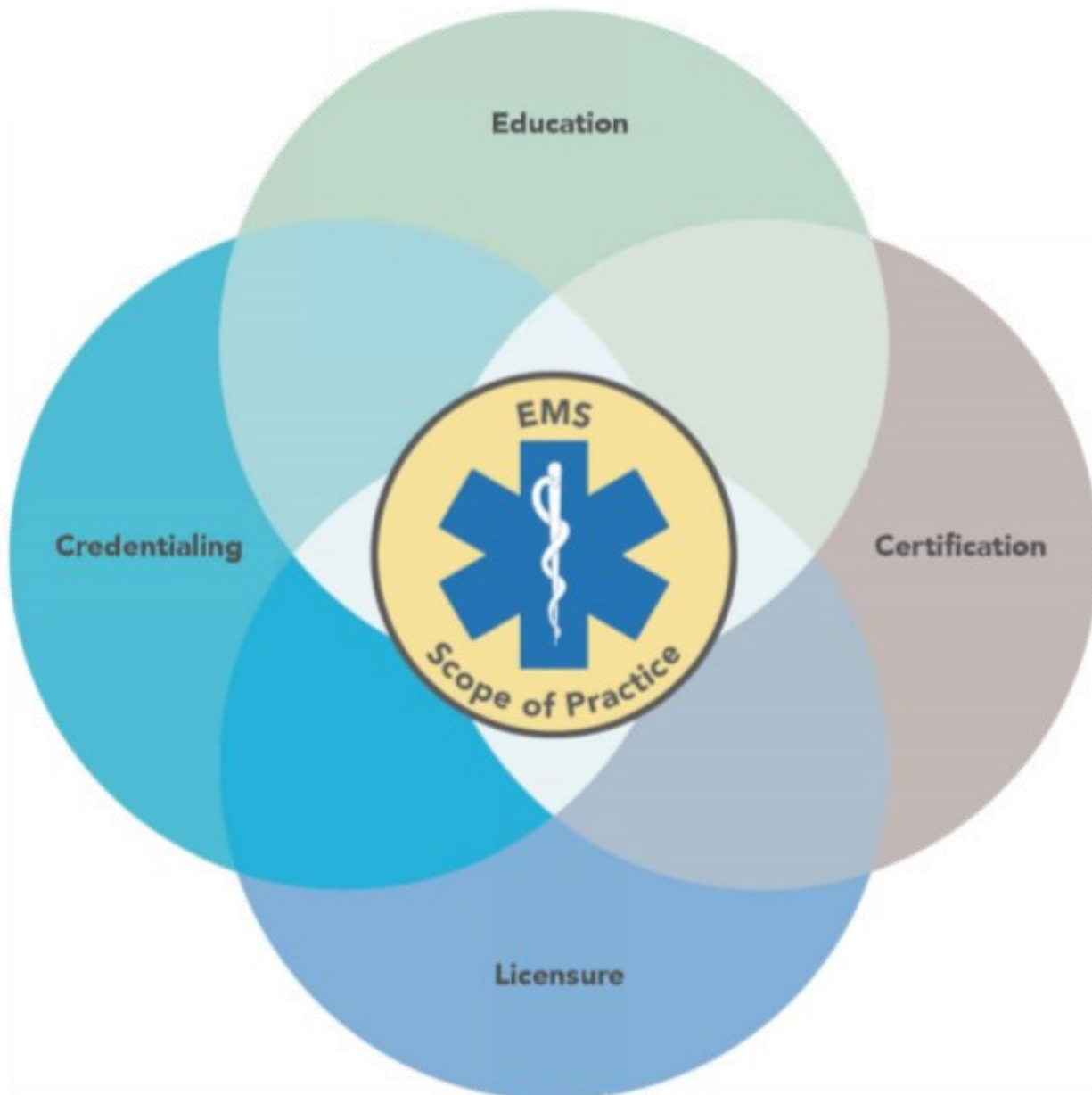
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# Scope of Practice



It is the responsibility of each individual clinician to operate within their credentialed scope of practice. Credential level and scope of practice can only be changed by successful completion of the OMD credentialing process. Except when specifically detailed, such as in an OMD-approved training program, no provider may authorize or delegate clinical care to another provider, which is outside of either's scope of practice.

Intermediate credentialed providers may perform Assist/Advanced level skills only after being specifically directed by an Assist or Advanced credentialed provider and shall not make decisions independently on when to perform these skills. Intermediate providers may only administer medications within the basic scope of practice.



State Certification	ECA	EMT-B	EMT-I	EMT-P			
Credential Level	ECA	Basic	Intermediate	Assist	Advanced	MIH	CCP
<b>Airway</b>							
Pulse Oximetry		X	X	X	X	X	X
Waveform Capnography		X	X	X	X	X	X
Oxygen therapy (Nasal Cannula or Non-Rebreather Mask)	X	X	X	X	X	X	X
Airway Maneuvers (Head tilt-chin lift, Jaw-thrust)	X	X	X	X	X	X	X
Airway Adjuncts (OPA & NPA)		X	X	X	X	X	X
CPAP/BPAP (BiLevel)		X	X	X	X	X	X
Bag-valve-mask	X	X	X	X	X	X	X
Supraglottic Insertion		X	X	X	X	X	X
Endotracheal Intubation			X	X	X	X	X
Surgical Airway			X	X	X	X	X
Transtracheal Ventilation			X	X	X	X	X
Emergency Tracheostomy Exchange			X	X	X	X	X
Airway Obstruction (manual dislodgement techniques)	X	X	X	X	X	X	X
Airway Obstruction (dislodgement via Magills forceps)			X	X	X	X	X
Gastric tube insertion via SGA port		X	X	X	X	X	X
Orogastric tube placement			X	X	X	X	X
Nasogastric tube placement			X	X	X	X	X
Suctioning - Upper Airway	X	X	X	X	X	X	X
Suctioning - Tracheobronchial via Tracheostomy		X	X	X	X	X	X
Suctioning - Tracheobronchial via Endotracheal Tube			X	X	X	X	X
Needle Decompression			X	X	X	X	X
Drug-Assisted Airway (DAA)					X	X	X
Rapid Sequence Intubation (RSI)							X
High flow nasal cannula via device							X
BiPAP via portable ventilator							X
<b>Cardiovascular</b>							
Cardiopulmonary resuscitation (CPR)	X	X	X	X	X	X	X
Mechanical Compression Device Placement		X	X	X	X	X	X
Blood pressure manual	X	X	X	X	X	X	X
Blood pressure automated		X	X	X	X	X	X
Cardiac monitoring - 12 lead ECG acquisition & transmission		X	X	X	X	X	X
Cardiac monitoring - 12 lead ECG interpretation				X	X	X	X
Automated External Defibrillator (AED) Placement & Use	X	X	X	X	X	X	X
Manual Defibrillation			X	X	X	X	X
Electrical Cardioversion			X	X	X	X	X
Transcutaneous pacing			X	X	X	X	X
<b>Skills - Trauma/Restraint</b>							
Hemorrhage Control (direct pressure, tourniquet, wound packing)	X	X	X	X	X	X	X
Manual Cervical Stabilization & Cervical Collar	X	X	X	X	X	X	X
Spinal Motion Restriction (LSB, Scoop Stretcher, KED)		X	X	X	X	X	X
Extremity stabilization & splinting	X	X	X	X	X	X	X
Traction Splinting		X	X	X	X	X	X
Manual Patient Restraint	X	X	X	X	X	X	X
<b>Skills - Access/Maintenance</b>							
Peripheral intravenous access (extremity, truncal, external jugular)			X	X	X	X	X
Intraosseous initiation (adult, pediatric, tibial, humeral)			X	X	X	X	X
Peripherally Inserted Central Catheter Access (PICC)					X	X	X
Central Catheter Access (Browiac, Central Line) for Emergency					X	X	X
Central Line Catheter Monitoring Only					X	X	X
<b>Skill - Miscellaneous</b>							
Blood glucose monitoring	X	X	X	X	X	X	X
Eye irrigation		X	X	X	X	X	X
Venous blood sampling					X	X	X
Telehealth Consultation Facilitation		X	X	X	X	X	X
Emergency Childbirth	X	X	X	X	X	X	X
<b>Medications</b>							
Aspirin	X	X	X	X	X	X	X
Adenosine				X	X	X	X
Albuterol		X	X	X	X	X	X
Amiodarone				X	X	X	X
Atropine							
<i>Symptomatic bradycardia</i>				X	X	X	X
<i>All other Indications</i>					X	X	X
Calcium Chloride							
<i>Entrapment/Crush/Traumatic Rhabdomyolysis</i>				X	X	X	X
<i>All other Indications</i>					X	X	X
Dexamethasone					X	X	X
Dextrose 10%				X	X	X	X
Diltiazem					X	X	X
Diphenhydramine				X	X	X	X



State Certification	ECA	EMT-B	EMT-I	EMT-P			
Credential Level	ECA	Basic	Intermediate	Assist	Advanced	MIH	CCP
<b>Epinephrine</b>							
Auto-injector Epinephrine (patient or EMS supplied)	X	X	X	X	X	X	X
Intramuscular (anaphylaxis)		X	X	X	X	X	X
Cardiac Arrest				X	X	X	X
Intravenous Push-Dose Pressor				X	X	X	X
Intramuscular (asthma)					X	X	X
Infusion					X	X	X
Fentanyl				X	X	X	X
Glucagon					X	X	X
Oral Glucose	X	X	X	X	X	X	X
Haloperidol					X	X	X
Hydralazine							X
Hydroxocobalamin				X	X	X	X
Ipratropium		X	X	X	X	X	X
Isopropyl Alcohol	X	X	X	X	X	X	X
<b>Ketamine</b>							
For facilitation of pacing/cardioversion				X	X	X	X
Behavioral Emergencies/Excited Delirium					X	X	X
Respiratory Insufficiency/Failure and Airway					X	X	X
Ketorolac				X	X	X	X
Furosemide							X
Lidocaine				X	X	X	X
Magnesium					X	X	X
Methylprednisolone					X	X	X
<b>Midazolam</b>							
Pacing if Ketamine insufficient					X	X	X
Sedation after advanced airway obtained					X	X	X
All Other Indications				X	X	X	X
<b>Naloxone</b>							
Auto-injector	X	X	X	X	X	X	X
Intranasal	X	X	X	X	X	X	X
Intravenous				X	X	X	X
Nicardipine							X
Nitroglycerin		X	X	X	X	X	X
Assist with self-administration of already prescribed NTG & on scene	X						
EMS Supplied Nitroglycerin		X	X	X	X	X	X
Norepinephrine					X	X	X
Normal Saline (0.9%)				X	X	X	X
<b>Ondansetron</b>							
ODT for non-actively vomiting patients		X	X	X	X	X	X
Intravenous				X	X	X	X
Propofol							X
Paralytics (Succinylcholine, Rocuronium)							X
Racemic Epinephrine				X	X	X	X
<b>Sodium Bicarbonate</b>							
Entrapment/Crush/Traumatic Rhabdomyolysis				X	X	X	X
All other Indications					X	X	X
Tranexamic Acid (TXA)					X	X	X
Immunizations		X	X	X	X	X	X
<b>Mobile Integrated Healthcare</b>							
Consultation for Medical Director Refusal						X	X
Point of Care (iSTAT) Laboratory Analysis						X	X
CHF In-Home Diuresis						X	X
Foley Insertion						X	X
<b>Critical Care</b>							
Blood or Blood Products (excluding Albumin)							X
Invasive Line Monitoring (Arterial Line, Swan-Ganz)							X
All Chest Tubes (suction or gravity)							X
Mechanical Ventilation							X
Home Ventilator (with Home care or Facility RN accompanying)					X	X	X
Intra-Aortic Balloon Pump (IABP)							X
Impella							X
Ventricular Assist Device (VAD) NON-VAD therapy complaint					X	X	X
Ventricular Assist Device (VAD) with complaint related to VAD therapy							X
Extracorporeal Membrane Oxygenation (ECMO)							X



# Glossary (Abbreviations and Terms)



Abbreviations	
ETSN	Ear-to-sternal notch (airway position, previously known as “sniffing position”), performed by elevating the patient’s head, and confirmed from the patient’s side by visualizing that the auditory canal is level with sternum and parallel to the ground.
ELM	External Laryngeal Manipulation, also know as “Bimanual Laryngoscopy”, similar to BURP
IIRR	“If incomplete response, repeat”, applies to transient or incomplete responses to initial doses of medications, e.g. repeat doses of nebulized albuterol in the face of continued wheezing and difficulty breathing
MAP	Mean Arterial Pressure
MIH	Mobile Integrated Healthcare services that are designed to enhance, coordinate, effectively manage, and integrate out-of-hospital care
OLMC	On Line Medical Control
OLPG	On Line Protocol Guidance
PIE	Progressive Insertion Epiglottoscopy, or epiglottis identification laryngoscopy, prior to exposing vocal folds during intubation
PCMH	Patient Centered Medical Home refers to the function and/or group of providers through which individuals receive comprehensive, patient-centered, and coordinated care
SBP/DBP	Systolic Blood Pressure/Diastolic Blood pressure - all units of measurement are in mmHg, e.g. SBP $\geq$ 90 means Systolic Blood Pressure $\geq$ 90 mmHg
Terms	
Atropinization	Drying of mucus membranes and airway secretions resulting from appropriate dosing of atropine in organophosphate poisoning
Drug-Assisted Airway	Pharmacologic and procedural induction of sedation or unconsciousness to facilitate advanced airway management
Hyperactive Delirium with Severe Agitation	A combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent or bizarre behavior, insensitivity to pain, elevated body temperature and abnormal strength, often associated with stimulant use, and which may be linked to sudden cardiac arrest, often in custody of law enforcement.
Hemodynamic Instability	Abnormal or unstable low blood pressure. Signs and symptoms include diminished organ function (e.g. AMS, pallor/diaphoresis) due to a low perfusion (blood flow) state; may be manifested as absolute hypotension (e.g. SBP $\leq$ 90 in adults) or relative hypotension in patients with signs of poor perfusion.
Inframammary Line	The anatomic location used to guide needle thoracostomy insertion site selection, especially in patient’s with difficult to visualize anatomic landmarks. Defined as the line where the breast meets the torso.
Kit Dump	Organized approach to advanced airway management for the purpose of minimizing error and, therefore, adverse patient outcomes (e.g. oxygen desaturation, bradycardia, hypotension, aspiration, cardiac arrest). All equipment necessary for appropriate airway management is placed out of the packing, in 2 sizes, within the airway manager’s field of view.

<b>Max BVM</b>	BVM with 2 NPA (Nasopharyngeal Airway) + OPA (Oropharyngeal Airway)+ HFNC (High flow Nasal Cannula)+ HFBVMO2 ( High flow bag valve mask oxygen)
<b>Needle Thoracostomy</b>	Insertion of a large-bore catheter into the chest for the purpose of relieving a tension pneumothorax
<b>Spinal Motion Restriction</b>	Means to mitigate potential or further trauma in patients with suspected spinal injury
<b>Serial EKGs</b>	Repeat EKGs, at minimum 2-tracings prior to arrival at the destination
<b>Waveform Capnography</b>	The visual representation of the measured exhaled carbon dioxide in graphic form as opposed to a numeric value. Visualized as a 4-phase generally square shaped waveform with each breath. Monitoring is required for all patient's receiving advanced airway intervention, including endotracheal intubation or blind insertion supraglottic airway
<b>Withholding of Resuscitative Efforts</b>	Formerly 'Dead on Scene', as differentiated from a worked cardiac arrest or 'Termination of Resuscitation'

## Patient Assessment

- Assure scene safety
- Perform initial assessment, including evaluation for hemodynamic life threats of the patient’s airway, breathing, and circulation.
- Assess mental status (e.g., AVPU) and disability (e.g., GCS).
- Perform a focused history and physical based on patient’s chief complaint.

*If valid DNR, regardless if pulse present or absent*

- Do not perform at any time throughout the encounter
  - BVM
  - Advanced Airway Management (SGA, ETI)
  - CPR
  - Pacing/Cardioversion/Defibrillation



BASIC

ASSIST

*If provider impression of extremis, including new-onset altered mental status, airway issues, severe respiratory distress/failure, signs and symptoms of shock/poor perfusion, or imminent cardiac or respiratory arrest:*

- Do not move patient to ambulance or transport from scene until best attempts at correcting hemodynamic instability have been completed (e.g. critical hypoxia, bradycardia, hypotension, etc.).
- Refer to:
  - Crashing Patient: Medical
  - Crashing Patient Trauma

ADVANCED

- Complete interventions and perform a complete secondary exam to include a baseline set of vital signs
- Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.





## Crashing Patient: Medical

*If general impression of patient in extremis*  
**DO NOT INITIATE MOVEMENT OF THE PATIENT**

- Consider requesting additional resources
- Obtain full set of vital signs (BP, HR, SpO<sub>2</sub>, ECG, Temp, BGL)
  - Initiate waveform capnography
  - Attempt to gain 360° access

- Assess Airway and Breathing Status

### If Respiratory Distress

- Increased work of breathing
- Inability to speak in full sentences
- Accessory muscle use/retractions
- SpO<sub>2</sub> ≤ 90% on room air

### If Respiratory Failure

- Poor respiratory effort
- Unable to speak (severe dyspnea)
- Loss of muscle tone/control of posture
- Altered mental status
- SpO<sub>2</sub> ≤ 90% with O<sub>2</sub>
- Hypoventilation/Increasing EtCO<sub>2</sub>/Hypopnea

- High flow O<sub>2</sub> via NRB
- NIPPV
- If Asthma/COPD/Wheezing;  
Or Acute Pulmonary Edema;  
Or Severe Anaphylaxis:*
- Treat underlying cause per protocol

- Immediately start MAX BVM ventilation  
(2 person, ETSN, elevate HOB, 100% O<sub>2</sub>, PEEP, 2 NPA ± OPA)

- If persistent hypoxia or no longer improving*
- Quick SGA

- If Can't Oxygenate;  
Can't Ventilate (COCV)*
- Consider Quick SGA
  - Surgical airway

**RESPIRATORY GOAL: SpO<sub>2</sub> ≥ 94%; or persistent hypoxia despite SGA/surgical airway**

- Assess Circulatory Status

*If SBP < 90 mmHg and signs of shock*

Unstable Bradycardia

Cardiogenic

General Medical

Unstable Tachycardia

External Cardiac Pacing

Fluids per protocol

Sync Cardioversion

Push-dose Epinephrine

OK to initiate patient movement (not transport)

Vasopressor infusions, as indicated

Titrate interventions to maximize effect

**CIRCULATORY GOAL: SBP ≥ 90 mmHg or initiation of vasopressors**

- Consider DAA
- OK to transport
- Maximize therapy en-route (\*call OLPG if needed)

- Movement of the patient should be minimal until goals are met or treatment has been optimized
- Trending of vital signs is critically important, a single set does not verify stability
- Fluid responsiveness is variable depending on underlying conditions and physiology
- Optimize hemodynamics prior to intubation/DAA
- Patient movement increases risk of poor BVM, consider timing of advanced airway management
- For pacing, adjust output first to achieve capture, then adjust rate to maximize effect



## Crashing Patient: Trauma

*If general impression is critically injured trauma patient*  
**DO NOT INITIATE MOVEMENT OF THE PATIENT**

- Perform scene size up; consider requesting additional resources
- Obtain full set of vital signs (BP, HR, SpO<sub>2</sub>, EtCO<sub>2</sub>/waveform capnography)
  - Fully expose injuries; ensure 360° access to patient
    - Pre-hospital trauma alert ASAP
    - SMR as indicated

- Assess for Catastrophic Hemorrhage

- Hemorrhage control per protocol

**HEMORRHAGE GOAL:** Control catastrophic hemorrhage or maximal therapy per protocol

- Assess Airway and Breathing Status

### *If Respiratory Distress*

- Increased work of breathing
- Inability to speak in full sentences
- Accessory muscle use/retractions
- SpO<sub>2</sub> ≤ 90% on room air

### *If Respiratory Failure*

- Poor respiratory effort
- Unable to speak (severe dyspnea)
- Loss of muscle tone/control of posture
- Altered mental status
- SpO<sub>2</sub> ≤ 90% with O<sub>2</sub>
- Hypoventilation/Increasing EtCO<sub>2</sub>/Hypopnea

- High flow O<sub>2</sub> via NRB

- Immediately start MAX BVM ventilation (2 person, jaw thrust, 100% O<sub>2</sub>, PEEP, 2 NPA ± OPA, elevate HOB maintaining SMR)

- If persistent hypoxia or no longer improving*
- Quick SGA

- If Can't Oxygenate; Can't Ventilate (COCV)*
- Consider Quick SGA
  - Surgical airway

- If suspected open pneumothorax*
- Partial occlusive dressing

- If suspected tension pneumothorax*
- Needle decompression

**RESPIRATORY GOAL:** SpO<sub>2</sub> ≥ 94%; or persistent hypoxia despite SGA/surgical airway

OK to initiate patient movement (not transport)

- Assess Circulatory Status

- Consider pelvic binder; further bleeding control

- Consider DAA, if indicated and circulatory goal met

- OK to Initiate Transport
- IV/IO access
- Fluid bolus per protocol (permissive hypotension unless TBI)
- Administer TXA if indicated
- Advanced airway management, as appropriate
- Trauma alert
- Splinting and wound bandaging

→ Unless otherwise indicated, interventions should be performed en route

**CIRCULATORY GOAL:** SBP ≥ 90 mmHg (120 if TBI); or hypo-perfusion despite maximal therapy

- Achieve catastrophic hemorrhage control and respiratory goals then prioritize transport
- Patient may be moved for scene conditions or safety
- Prevent Hypothermia (blankets, increase patient compartment heat)
- TBI - Prevent Hypoxia, Hypotension, Hyperventilation
- Do not delay transport for non-essential procedures/testing (i.e. 12-lead, POC glucose in conscious/awake patient, minor splinting or wound bandaging, IV/IO access or fluid bolus)

# Shock/Hypotension

<ul style="list-style-type: none"> <li>• Assist airway, as appropriate</li> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Position patient in supine position with legs elevated, as appropriate and tolerated (no Trendelenburg)</li> </ul> <p><i>If suspected sepsis</i></p> <ul style="list-style-type: none"> <li>• Consider <b>Fever Protocol</b></li> </ul> <p><i>If suspected traumatic etiology</i></p> <ul style="list-style-type: none"> <li>• Control external bleeding</li> <li>• Pelvic binder, as appropriate</li> </ul> <p><i>If gravid uterus</i></p> <ul style="list-style-type: none"> <li>• Manually displace fundus to the patient's left (may be accomplished by left lateral decubitus positioning, if tolerated)</li> </ul>	BASIC
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<ul style="list-style-type: none"> <li>• Advanced airway management as appropriate</li> </ul> <p><i>If suspected tension pneumothorax</i></p> <ul style="list-style-type: none"> <li>• <b>Needle Thoracostomy Procedure</b></li> <li>• <b>IV/IO access</b></li> <li>• Cardiac monitoring; treat dysrhythmias and <b>12-lead EKG</b>, as appropriate</li> </ul>	ASSIST
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<b>- Least</b>	<b>Volume Replacement</b>	<b>Most +</b>
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<p><b>Trauma</b></p> <p><i>If SBP ≤ 90 or HR ≥ 120 with signs of hypoperfusion</i></p> <ul style="list-style-type: none"> <li>• NS - 250 ml IV bolus</li> <li>• IIRR 250 ml increments</li> <li>• Titrate to SBP=90 (permissive hypotension)</li> </ul> <p><b>Except if suspected intracranial injury/TBI</b></p> <ul style="list-style-type: none"> <li>• Titrate to SBP=120</li> </ul>	<p><b>Cardiogenic Shock</b></p> <p><i>If SBP ≤ 90 and/or signs of hypoperfusion/end organ dysfunction</i></p> <ul style="list-style-type: none"> <li>• NS - 500 ml IV bolus</li> <li>• Titrate to SBP 90 and/or signs of improved perfusion</li> </ul> <p>Use caution if suspected acute pulmonary edema</p> <p>Consider relative hypotension, especially if inferior wall ACS changes</p>	<p><b>General Medical (e.g. Sepsis, medical bleeding)</b></p> <p><i>If SBP ≤ 90 and/or suspected/high risk for infection with 2 or more of following: RR ≥ 20, HR ≥ 90, temp ≥ 100.4 F</i></p> <ul style="list-style-type: none"> <li>• NS - 20 ml/kg IV bolus</li> <li>• IIRR to improved SBP and clinical signs, max 2L total</li> </ul> <p><i>If goals not met</i></p> <ul style="list-style-type: none"> <li>• Contact <b>OLMC</b></li> </ul>
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<p><i>If persistent hypotension despite adequate fluid administration, to temporarily stabilize blood pressure until vasopressor infusion can be initiated</i></p> <ul style="list-style-type: none"> <li>• <b>Epinephrine</b>- 0.1 mg in 10ml NS IV/IO, 10 mcg (1 ml) IIRR q 5-minutes, max total dose 50 mcg (5 ml)</li> </ul>
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<p><i>If trauma with significant hemorrhage and SBP ≤ 90 or HR ≥ 110 with poor perfusion or TBI with inability to follow verbal instructions (Motor GCS &lt; 5)</i></p> <ul style="list-style-type: none"> <li>• <b>Tranexamic Acid</b> - 2 g IV/IO, slow push over 1-minute</li> <li>→ Do not give if injury occurred ≥ 3 hours before</li> </ul> <p><i>If suspected anaphylaxis/anaphylactic shock or symptomatic bradycardia</i></p> <ul style="list-style-type: none"> <li>• <b>Epinephrine infusion</b> - 1 mg (10ml) of 1:10,000 in 250 ml NS, infuse at 2-30 mcg/min, start at 5 mcg/min</li> </ul> <p><i>If any other suspected etiology of shock unresponsive to initial fluid resuscitation</i></p> <ul style="list-style-type: none"> <li>• <b>Norepinephrine</b> - 4 mg in 250 ml NS, infuse @ 2-30 mcg/min, start at 5 mcg/min, titrate to SBP ≥ 90 and signs of improved perfusion</li> </ul> <p><i>If sepsis criteria as above and ETCO<sub>2</sub> ≤ 25</i></p> <ul style="list-style-type: none"> <li>• Notify receiving facility of sepsis alert</li> </ul> <p><i>If documented history of Addison's disease/adrenal insufficiency,</i></p> <ul style="list-style-type: none"> <li>• <b>Dexamethasone</b> - 4 mg IV/IO/IM</li> </ul>	ADVANCED
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Cardiogenic shock is most frequently caused by sudden myocardial infarction or severe heart failure decompensation. Classic symptoms are hypotension and signs of left-sided heart failure, e.g. rales, JVD)



# Respiratory Insufficiency/Failure and Drug-Assisted Airway (DAA)

<ul style="list-style-type: none"> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> </ul> <p><i>If signs of upper airway obstruction</i></p> <ul style="list-style-type: none"> <li>• Attempt to clear the airway by             <ul style="list-style-type: none"> <li>◦ Jaw thrust/head-tilt-chin-lift</li> <li>◦ Nasopharyngeal and/or oropharyngeal airway placement (NPA/OPA)</li> </ul> </li> <li>• Position the patient (ETSN)</li> <li>• Remove foreign body airway obstruction (FBAO), as appropriate (Heimlich maneuver, chest compressions)</li> </ul> <p><i>If severe respiratory insufficiency/impending respiratory failure</i></p> <ul style="list-style-type: none"> <li>• <b>Assist ventilation with bag-valve-mask (BVM)</b></li> </ul> <p><i>If equipped</i></p> <ul style="list-style-type: none"> <li>• Confirm ventilation with EtCO<sub>2</sub> (waveform with each breath, with goal of 35-45 mmHg)             <ul style="list-style-type: none"> <li>◦ If unable to confirm ventilation utilize up to two-NPAs in combination with an OPA, along with head elevation and two-rescuer mask seal technique</li> </ul> </li> </ul> <p><i>If EtCO<sub>2</sub> available, and no Assist/Advanced providers on scene</i></p> <ul style="list-style-type: none"> <li>• Supraglottic Airway (see box, on right)</li> </ul>	<p style="text-align: center;"><b>Supraglottic Airway (King LT)</b></p> <ul style="list-style-type: none"> <li>• Suction before attempting insertion</li> <li>• Maintain HFNC throughout the procedure</li> <li>• Position patient's head in neutral or head elevated position</li> <li>• Confirm EtCO<sub>2</sub> with <i>every breath</i></li> <li>• Promptly remove device and ventilate by other means if EtCO<sub>2</sub> waveform is lost</li> </ul> <p><i>If gastric contents in SGA</i></p> <ul style="list-style-type: none"> <li>• Promptly remove and aggressively suction if copious secretions present in the tube</li> <li>• If detector remains clogged (indicated by dashed EtCO<sub>2</sub> line) replace detector and confirm waveform CO<sub>2</sub></li> </ul>	BASIC
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<ul style="list-style-type: none"> <li>• IV/IO access as appropriate</li> </ul> <p><i>For suspected tension pneumothorax</i></p> <ul style="list-style-type: none"> <li>• <b>Needle Thoracostomy Procedure</b></li> </ul> <p><i>If progression to severe respiratory insufficiency/respiratory failure, or unable to manage the airway</i></p> <ul style="list-style-type: none"> <li>• Advanced airway management (EtCO<sub>2</sub> required)</li> </ul> <p>Preoxygenate with 100% O<sub>2</sub> - non-rebreather mask (NRB) ± High flow nasal cannula (HFNC), as available</p> <p>Initiate laryngoscopy/endotracheal intubation (ETI) or supraglottic airway (SGA/KING LT)</p> <p><i>If primary ETI fails, then initiate SGA rescue</i></p>	<p style="text-align: center;"><b>Laryngoscopy/Endotracheal Intubation</b></p> <ul style="list-style-type: none"> <li>• Utilize <b>Intubation Checklist</b></li> <li>• Perform <b>Advanced Airway Preparation</b></li> <li>• Maintain HFNC throughout the procedure</li> <li>• Position patient's head in neutral or head elevated position to obtain best view (ETSN)</li> <li>• Use assisted External Laryngeal Manipulation (ELM) as needed to obtain view</li> <li>• Use Bougie to deliver tube</li> <li>• Maintain visualization until tube is seen passing the cords and bougie removed</li> <li>• Confirm EtCO<sub>2</sub> with <i>every breath</i></li> <li>• Promptly remove device and ventilate by other means if EtCO<sub>2</sub> waveform is lost</li> </ul>	ASSIST
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<p><i>If unable to place or maintain advanced airway, and if unable to adequately oxygenate or ventilate (no EtCO<sub>2</sub> waveform and persistent hypoxia)</i></p> <ul style="list-style-type: none"> <li>• <b>Surgical Airway Procedure (Cricothyrotomy)</b></li> </ul>	
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<p><i>If unable to intubate or achieve sufficient patient relaxation prior to intubation, consider drug assisted airway</i></p> <ul style="list-style-type: none"> <li>• <b>Ketamine</b> - 2 mg/kg IV/IO (max single dose 200 mg), or 4 mg/kg IM (max single dose 500 mg), IIRR 2 mg/kg IV/IO (max single dose 200 mg)</li> </ul> <p><i>If further sedation or pain control is required once advanced airway obtained</i></p>		ADVANCED
<p><i>If hemodynamically stable</i></p>	<p><i>If hypotensive</i></p>	
<p>Fentanyl – 1 mcg/kg IV/IO (max single dose 100 mcg), IIRR q 5-min to max total dose of 500 mcg</p>	<p>OR</p>	<p>Midazolam – 0.1 mg/kg slow IV/IO, IIRR q 5-min to max total dose of 10 mg</p>
<p style="text-align: center;">Ketamine – 2 mg/kg IV/IO (max single dose 200 mg)</p>		
<p style="text-align: center;">Do not administer simultaneously, either agent may be given q 5-min; Reassess sedation level and vital signs between administrations</p>		

→ If SGA in place and ventilations are adequate, do not replace with endotracheal tube

→ NIPPV should not be utilized for severe respiratory insufficiency/impending respiratory failure

→ Patients with COPD may have chronic low baseline SpO<sub>2</sub>, so do not indiscriminately place on high flow O<sub>2</sub>

Start 2-3 lpm O<sub>2</sub> via NC, or double baseline flow rate, if known

Titrate to patient's baseline SpO<sub>2</sub> (88-92%) and work of breathing

# Traumatic Cardiac Arrest

<ul style="list-style-type: none"> <li>DO NOT INITIATE MOVEMENT OF THE PATIENT</li> </ul> <p><i>If non-traumatic cause probable</i></p> <ul style="list-style-type: none"> <li>Proceed with medical cardiac arrest management</li> </ul> <p><i>If traumatic <u>Withholding Resuscitative Efforts met</u>,</i></p> <ul style="list-style-type: none"> <li>Consider withholding efforts</li> <li>Initiate CPR and place pads</li> <li>Rapidly &amp; Simultaneously Address Reversal Pathology (H.O.T.)</li> </ul>			BASIC	
<div style="display: flex; justify-content: space-around;"> <div style="width: 30%; text-align: center;"><b>Hypovolemia</b></div> <div style="width: 30%; text-align: center;"><b>Oxygenation</b></div> <div style="width: 30%; text-align: center;"><b>Tension</b></div> </div>			BASIC	
<ul style="list-style-type: none"> <li>Expose patient promptly</li> </ul> <p><i>If catastrophic hemorrhage suspected</i></p> <ul style="list-style-type: none"> <li>Bleeding control interventions per General Trauma Protocol</li> </ul> <p><i>If major fractures present</i></p> <ul style="list-style-type: none"> <li>Pelvic binder, as appropriate</li> <li>Refer to General Trauma Protocol</li> </ul>	<ul style="list-style-type: none"> <li>1-2 IV attempts or IO (humeral preferred)</li> <li>Rapid 1 L NS bolus via manual pressure or pressure bag</li> </ul>	<ul style="list-style-type: none"> <li>BVM</li> <li>SGA (place promptly)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Advanced Airway Management, as appropriate</li> </ul>	<p><i>If blunt or penetrating injury to torso</i></p> <ul style="list-style-type: none"> <li>Needle Thoracostomy</li> </ul>	BASIC
<b>GOAL: Catastrophic hemorrhage intervention, oxygenation and confirmed ventilation via EtCO<sub>2</sub>, and evaluation +/- treatment for tension pneumothorax</b>			ASSIST	
<ul style="list-style-type: none"> <li>Epinephrine IV/IO per protocol (do not delay above for administration)</li> <li>Advanced airway management (if not previously performed)</li> </ul>			ASSIST	
ROSC?			ASSIST	
Yes	No		ASSIST	
<ul style="list-style-type: none"> <li>Optimize patient hemodynamics, oxygenation, and ventilation, however prioritize rapid transport</li> <li>Hospital pre-notification ASAP</li> </ul>	<ul style="list-style-type: none"> <li>After 15 minutes of resuscitative efforts consider <u>Traumatic Termination of Resuscitation Protocol</u></li> </ul>		ASSIST	
<ul style="list-style-type: none"> <li><u>Tranexamic Acid</u>—2 g IV/IO, slow push over 1 min</li> </ul>			ADV	

**Pearls:**

- Patient may be moved for scene conditions or safety.
- Minimize pauses in chest compressions, however rapid addressing of reversal pathology is priority.
- There is limited evidence for epinephrine in TCA, focus should be on addressing reversible pathology.

## Acute Pain Management

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Place in position of comfort and splint extremity injuries, as appropriate
- Utilize pain scale (see below)

If pain scale ≤ 6, consider

- **Acetaminophen** - 1 g PO

If not actively vomiting

- **Ondansetron** - 4 mg ODT, IIRR x 1 in 10-min

BASIC

- Advanced airway management, as appropriate
- Monitoring, as appropriate
- **IV access**, as appropriate
- **EtCO<sub>2</sub> monitoring**

If pain scale > 6, in the presence of

- Burns
- Trauma
- Other syndromes
  - Abdominal pain
  - Sickle cell crisis

- **Ketorolac** - 15 mg IV or 30 mg IM
- **Fentanyl** - 1 mcg/kg IV/IN/IM (max single dose 100 mcg), IIRR × 3, titrate to pain relief and respiratory/hemodynamic status (Max total dose of 400 mcg)
- Monitor and document vital signs and pain scale following each dose; document body weight

For active nausea/vomiting (routine administration of antiemetic with fentanyl not required)

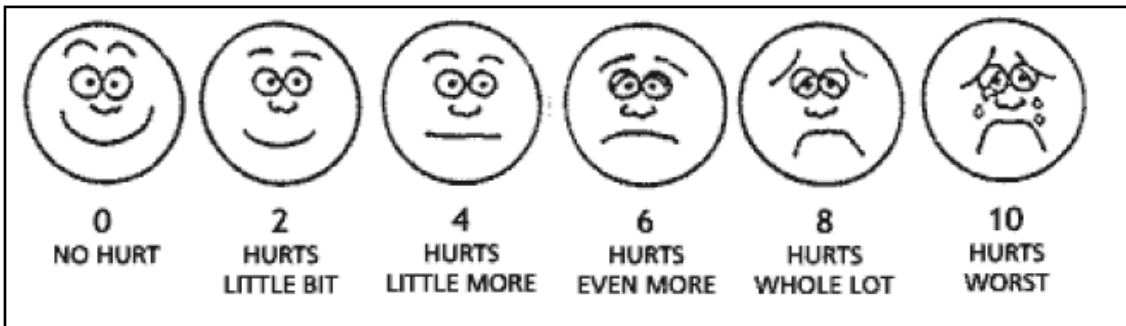
- **Ondansetron** - 4 mg IV, IIRR x 1 in 10-min

- Relative contraindications to IV pain management
- Inadequate respiratory/hemodynamic status
  - AMS
  - Obstetric emergency/anticipated delivery

ASSIST

ADVANCED

- IV opiates are not indicated for Ischemic Chest Pain/ACS/STEMI
- Benzodiazepines are not indicated for muscular spasm, and should not be co-administered with opiates





## Release at Scene (RAS)

A Release at Scene (RAS) may **only** be performed if the reason for the 911 call is trauma-related (non-medical), and if “no” is answered to all of the following questions:

- Did the person activate 911 for EMS?
- Is the person disoriented, confused, or otherwise impaired (e.g. alcohol or drugs, language barrier, MHMR)?
- Was there any loss of consciousness?
- Is there any complaint of illness, pain, or injury?
- Was there a significant mechanism of injury (e.g. MCC, ejection, auto vs. pedestrian)?
- Were any patients on-scene dead?
- Does anyone object to the patient being released (e.g. family member, first-responder)?
- Has the patient had contact with EMS in the last 72-hours?

The following information will be documented in the ePCR:

- The answers to the above questions
- Incident number, unit number, and crew
- Contact phone number and home address of the person
- Signature of the person
- Signature of a witness

BASIC

ASSIST

ASSIST

# Consent for Treatment and Transport

Before treating an individual, you must first obtain consent either from the individual or from a legal surrogate. Consent to treatment may be implied when an individual is:

- **unable to communicate** because of an injury, accident, or illness; or
- **unconscious** and suffering from a life-threatening injury or illness; or
- a minor who is suffering from an immediate life-threatening injury or illness and whose parents, healthcare surrogate, or legal guardian is not present.

Otherwise, you cannot treat a person without their consent.

The right to refuse treatment includes the right to refuse assessment and the right to refuse all or specific treatments or assessments.

A person in law enforcement custody has the right to refuse treatment but not to refuse transport.

*If a patient refuses all contact or assessment*

- Record disposition of call as “refused all contact”

*If a patient communicates a refusal of assessment, treatment, or transport*

- Follow [Against Medical Advice \(AMA\)](#) protocol

*If a patient communicates a refusal of assessment, treatment, or transport but appears to lack decision making capacity*

- Follow [Refusal Without Demonstration of Capacity](#) protocol

BASIC

ASSIST

ADVANCED



## Refusal Against Medical Advice (AMA)

All AMAs must be patient-initiated.

Anytime a patient or their parent/guardian communicates a refusal of treatment, or transport:

- Perform a thorough history & physical
- Develop a differential diagnosis specific to the patient presentation
- Offer appropriate treatment and transport to the patient, parent, and guardian
- Explain the risks and consequences of refusing treatment and/or transport at the patient or parent/guardian's level of understanding, based on the differential diagnosis

*If a patient or their parent/guardian refuses an assessment or continues to refuse treatment or transport after the risks of refusal have been explained*

- Attempt to speak with whomever called 911, as well as any family, friends, bystanders, patient surrogates, or guardians and/or medical personnel on scene.
- Explain the risks and consequences of refusing treatment and/or transport at the parent or guardian's level of understanding
- Assess the patient or parent/guardian's understanding of the risks and consequences of refusing treatment and/or transport, and document this in their own words
- Perform capacity assessment (evaluation of patient's understanding of risk of refusal)
- Document all of the above in the PCR

*If the patient is suffering from a life-threatening injury or illness*

- Enlist the help of supervisors and [OLMC](#)

*If patient appears to lack decisional capacity, and refuses treatment or transport*

- Refer to [Refusal Without Demonstration of Capacity](#)

BASIC

ASSIST

ADVANCED

A patient's decisional capacity may be impaired as a result of, but not limited to, the following:

- ⇒ Use and/or abuse of alcohol, illegal or prescription drugs, or toxic substances
- ⇒ Head trauma, dementia, encephalopathy, and/or mental retardation
- ⇒ Acute or chronic psychiatric illness
- ⇒ Medical illness including, but not limited to, the following: hypoxia, hypotension, hyperglycemia, hypoglycemia, dehydration, and sepsis

# Refusal Without Demonstration of Capacity

*If patient refusing consent for medical treatment and/or transport but is unable to demonstrate decision making capacity*

- Ensure provider safety first and foremost
- Request Police in cases of mental illness or concern of behavioral emergencies, including self-harm or harm to others
- Contact [OLMC](#)
- Document:
  - Capacity assessment as it was performed
  - All personnel on scene – including any law enforcement name and badge number
  - If any family members present/spoken to, including content of discussions
- Record disposition of call as “refusal without demonstration of capacity”

BASIC

ASSIST

ADVANCED

Making a decision against medical advice does not alone demonstrate a lack of capacity.

Lack of capacity does not imply consent if the patient is able to communicate.

# Lift Assist

*If dispatched for “lift assist”*

- Make scene and evaluate patient
  - Assess for signs of trauma, infection or altered mental status (AMS)
- Assess vital signs
- Evaluate cause of patient fall

*If patient meets any below criteria*

- Medical cause of fall
- Signs of new trauma (e.g. pain or injury)
- Altered mental status
- Any loss of consciousness
- Currently on blood thinners (not including ASA)
- HR > 100
- SBP < 100 or > 200
- DBP > 140
- RR > 20
- SpO<sub>2</sub> < 90%
- Blood Glucose < 70 or > 300 (check if diabetic or otherwise indicated)
- Recommend further evaluation and transport to hospital

*If patient refuses transport*

- Follow [AMA Protocol](#)

*If patient meets none of the above criteria*

- Assist patient with request
- Disposition call per agency policy regarding lift assistance

BASIC

ASSIST

ADVANCED

Agencies may have alternative dispositions for “lift assist”, e.g. assist citizen, assist invalid, etc.

## Non-Traumatic Termination of Resuscitation

### Indications for use of protocol

Unsuccessful resuscitative efforts following:

**CONFIRMED EFFECTIVE VENTILATION + HIGH QUALITY CPR + ACLS DRUGS**

### Contraindications for use of protocol

Any of the following are present,

- EMS witnessed arrest
  - Return of Spontaneous Circulation (ROSC) or presumed ROSC at any point in care
  - CPR induced consciousness at any point in care
  - Abrupt  $\uparrow$  EtCO<sub>2</sub>  $\geq$  10 mmHg  $\pm$  “pulses”
  - Hypothermic patients
  - Family request for continued efforts
  - Resuscitation attempted in public view
  - Pregnancy
- Observe waveform EtCO<sub>2</sub> for every breath
    - Follow trend of capnometry values throughout resuscitation

*If persistent VF/VT (2 or more defibrillations)*

- Do not perform Termination of Resuscitation
- Transport with mechanical chest compression device (request if not already on-scene)

*If asystole or PEA*

*If EtCO<sub>2</sub>  $\leq$  10 mmHg*

- Consider termination of resuscitation after 20-minutes

*If EtCO<sub>2</sub>  $>$  10 mmHg*

- Consider termination of resuscitation after 30-minutes

- Times referenced above begin when chest compressions started by credentialed provider (ie. FRO or EMS)
- Consider differential diagnosis (e.g. toxic ingestion, metabolic processes) and possible benefits of ED intervention, especially in patients with no typical risk factors/comorbidities (e.g. HTN, smoking, diabetes)
- Notification of law enforcement is required.
- Remain with the deceased until relieved by law enforcement
  - Unless unsafe to do so
- Document objective findings including (each responding agency):
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings *as appropriate*
  - Suspicious/inconsistent scene or physical findings

## Traumatic Termination of Resuscitation

Patients for whom any resuscitation was attempted by any provider

*If blunt or penetrating traumatic cardiac arrest and if, after 15 minutes of resuscitative efforts including CPR, confirmed effective ventilation, and/or needle thoracostomy (as appropriate), and if none of the following:*

- EMS-witnessed arrest
- ROSC or presumed ROSC at any point in care
  - abrupt  $\uparrow$  EtCO<sub>2</sub>  $\geq$  10mmHg  $\pm$  “pulses”
- Hypothermia
- Family request for continued efforts
- Pregnancy

Notification of law enforcement is required.

- Consider termination of resuscitation
  - Remain with the deceased until relieved by law enforcement (unless unsafe to do so)
  - Document objective findings including (each responding agency):
    - Position/location found
    - Any movement of the patient/surroundings
    - Access limitations
    - Assessment findings as appropriate
    - Suspicious/inconsistent scene or physical findings

ADVANCED

- Traumatic arrest in a public place is not a contraindication for termination of resuscitation
- This protocol applies to scenes with  $\leq$  9 patients
- Times referenced above begin when chest compressions started by credentialed provider (i.e., FRO or EMS)



# Withholding Resuscitative Efforts

*If any of the following clinical signs of irreversible death or criteria*

- Rigor mortis/dependent lividity
- Fetal death after preterm delivery ( $\leq 20$  weeks gestation by best determination)
- Decapitation, decomposition or incineration
- Head-under submersion (excluding vehicular submersions) for greater than:
  - 90-minutes if water temperature  $\leq 6^{\circ} \text{C}$  ( $43^{\circ} \text{F}$ )
  - 30-minutes if water temperature  $> 6^{\circ} \text{C}$  ( $43^{\circ} \text{F}$ )

*AND if all of the following*

- Pulseless & no heart tones
- Apnea
- No pupillary response
- Consider withholding resuscitative efforts
- Remain with the deceased until relieved by law enforcement (Unless unsafe to do so)
- Document objective findings including (each responding agency):
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings as appropriate
  - Suspicious/inconsistent scene or physical findings

Notification of law enforcement is required.

For all other patients, or if at any point resuscitation was deemed appropriate, e.g. pulse/respiration witnessed by any provider

- Initiate resuscitative efforts, as per [Cardiac Arrest](#) Protocol

*If patient has Out-of-Hospital Do Not Resuscitate order*

- See DNR Policy

*If verifiable medical Power of Attorney (POA) on-scene and requesting withholding of resuscitation*

- Consider withholding resuscitative efforts (contact [OLMC](#) if questionable circumstances)

*If patient has executed Medical Orders on Scope of Treatment (MOST) or Physician's Orders for Life-Sustaining Treatment (POLST)*

- Limit resuscitation as directed by MOST/POLST form

BASIC

*If NO clinical signs of irreversible death in the setting of blunt or penetrating trauma present, and if all of the following:*

- Pulseless & no heart tones
- Apnea
- No pupillary response
- Asystole on cardiac monitor
- Consider withholding resuscitative efforts
- Remain with the deceased until relieved by law enforcement (unless unsafe to do so)
- Document objective findings including (each responding agency):
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings as appropriate
  - Suspicious/inconsistent scene or physical findings

ASSIST

ADVANCED

- If any patient has any clinical signs of irreversible death, and they are apneic and pulseless with no pupillary response, then resuscitation may be withheld
- If there are no signs of irreversible death, then all patients (without DNR) must be worked, unless they have a trauma mechanism, in which case they must also have confirmed asystole, as well as be apneic and pulseless with no pupillary response, in order to withhold resuscitative efforts
- For the purpose withholding of resuscitation, electrical/lightning strikes are not considered trauma

# BLS Transport Criteria

## BLS UNIT CANNOT TRANSPORT PATIENTS WITH ANY OF THE FOLLOWING:

<p><b>Crashing Patient</b></p> <ul style="list-style-type: none"> <li>→ Provider impression of extremis, including new-onset altered mental status, airway issues, severe respiratory distress/failure, signs and symptoms of shock/poor perfusion, or imminent cardiac or respiratory arrest</li> </ul> <p><b>Airway</b></p> <ul style="list-style-type: none"> <li>→ Current or anticipated need for airway management</li> </ul> <p><b>Breathing</b></p> <ul style="list-style-type: none"> <li>→ Respiratory failure or distress (RR &lt; 8 or &gt; 20)</li> <li>→ Hypoxia (SpO<sub>2</sub> &lt; 94%) despite NRB or PPV (including BPAP and CPAP)</li> </ul> <p><b>Circulation</b></p> <ul style="list-style-type: none"> <li>→ Cardiac chest pain or anginal equivalent</li> <li>→ EKG with ischemia or infarct</li> <li>→ EKG with new or concerning dysrhythmia</li> <li>→ Current or anticipated need for IV fluids, vasopressors, or other IV medication</li> <li>→ Unstable bradycardia/tachycardia</li> <li>→ Hypotension (SBP &lt; 90)</li> </ul>	<p><b>Disability</b></p> <ul style="list-style-type: none"> <li>→ Acute change in mental status (GCS &lt; 13)</li> <li>→ Positive stroke screen (or new neurologic deficit)</li> <li>→ Seizure not returned to baseline or multiple seizures</li> <li>→ Syncope</li> <li>→ Acute Agitation</li> <li>→ Severe intoxication/overdose</li> </ul> <p><b>Everything Else</b></p> <ul style="list-style-type: none"> <li>→ Significant injuries or high mechanism trauma</li> <li>→ Hypoglycemia with AMS</li> <li>→ Hyperglycemia with AMS</li> <li>→ Basic Provider Clinical Concern</li> <li>→ ALS Procedure Performed (not including IV placement or 12-lead EKG interpretation)</li> <li>→ ALS Medication Administered</li> </ul>
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BASIC

ASSIST

ADVANCED

### BLS only resource(s) on scene:

*If transport is required*

- Review BLS Transport Criteria and complete ePCR criteria documentation and appropriate crew signatures

*If no criteria met*

- Transport by BLS ambulance

*If any criteria met*

- Request an ALS resource and include priority of response requested based on patient condition
  - Provide handoff to ALS resource
  - ALS clinicians should not attempt to hand off care to the BLS resource

*If ALS resources are not available within a reasonable timeframe*

- If time-sensitive/emergent condition, consider transport to the closest appropriate facility
- Consider OLPG for additional assistance in decision making

### BLS with ALS resource on scene:

*If transport required*

- Review BLS Transport Criteria and complete ePCR criteria documentation and appropriate crew signatures

*If no criteria met*

- Transport by BLS ambulance

*If any criteria met*

- QRV Advanced-credentialed clinician should attend to patient during transport, or
- Transfer care to ALS ambulance

*If ALS QRV/Ambulance is not available within a reasonable timeframe, and patient experiencing a time-sensitive/emergent condition*

- Consider transport to the closest appropriate facility, or
- A FRO Assist-credentialed clinician may elect to attend to patient during transport

- Default to ALS clinician for any concerns or disputes
- If a patient meets BLS transport criteria and an Assist/Advanced credentialed clinician has interpreted an EKG (no ischemia or dysrhythmia), they should sign the appropriate field in the ePCR before transferring care back to the BLS unit.
- If an Assist/Advanced credentialed clinician is unavailable and an EKG acquisition/interpretation is required to determine BLS Transport Criteria, a BLS clinician may acquire the EKG and facilitate a remote interpretation of the EKG image by an appropriately credentialed clinician.



## Cardiac Arrest

- Begin 2-minute cycles of **Pit Crew CPR** with continuous chest compressions @ 100-120 bpm
  - Open airway/passive oxygenation for first 6-minutes unless etiology is respiratory
  - Apply AED; optimal pad placement in anterior-posterior (A-P) configuration
    - If arrest witnessed by EMS/FIRE—apply AED immediately
    - If arrest unwitnessed—perform 2-minutes of CPR before applying AED
- After 6-minutes or 3 cycles of CPR*
- **BVM**, or **SGA** (waveform EtCO<sub>2</sub> required for SGA)
    - Perform CPR to goal of EtCO<sub>2</sub> ≥ 20 mmHg
- If patient has gravid uterus*
- Manually displace fundus to the patient's left

BASIC

- Apply cardiac monitor
    - Only after completion of last 2-minute cycle of CPR
    - Optimal pad placement in anterior-posterior (A-P) configuration
  - **IV/IO access**
  - Advanced airway management (waveform EtCO<sub>2</sub> required) only after ≥ 6-minutes or 3-cycles of CPR
- | VF/VT  | Asystole/PEA   |
|--|--|
| <ul style="list-style-type: none"> <li>• <b>Defibrillate</b> at highest energy setting q 2-minutes</li> <li>• <b>Epinephrine</b> 1:10,000 - 1 mg IV/IO q 5-min. 3-dose-max</li> <li>• <b>Amiodarone</b> - 300 mg IV/IO after second defibrillation</li> </ul> <p><i>If persistent or recurrent VF/VT (≥ 3 defibrillations)</i></p> <ul style="list-style-type: none"> <li>• <b>Amiodarone</b> 150 mg IV/IO × 1 and change pad placement</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Epinephrine</b> 1:10,000 - 1 mg IV/IO immediately, then q 5-min. 3-dose-max</li> </ul> |

ASSIST

- If Signs/Symptoms of CPR-Induced Consciousness,*
- **Ketamine** - 1 mg/kg IV/IO (max single dose 200 mg)
  - Do not perform Termination of Resuscitation

For any of the following give early in the course of cardiac arrest management.

Metabolic acidosis etiology (e.g. DKA)	• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO
Hyperkalemia:	• <b>Calcium Chloride</b> - 1 g IV/IO, slow push • <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO (give CaCl first)
Torsades de Pointes:	• <b>Magnesium Sulfate</b> - 2 g IV/IO, slow push
Tension Pneumothorax:	• <b>Needle Thoracostomy Procedure</b>
Tricyclic Antidepressant Overdose:	• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO
Calcium Channel Blockers:	• <b>Calcium Chloride</b> - 1 g IV/IO, slow push
Beta Blocker Overdose:	• <b>Glucagon</b> - 1 mg IV/IO slow push over 1-minute, IIRR 1 mg IV/IO × 1 • <b>Epinephrine infusion</b> - infuse at 2-30 mcg/min, start at 5 mcg/min Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS

ADVANCED

- For initiation of resuscitation, see **Withholding Resuscitative Efforts Protocol**
- Resuscitate in the location found unless scene is unmanageable
- Limit chest compression pauses and individual pause length to < 10-seconds
- Do not interrupt CPR for airway management
- Open airway; If choking suspected, remove FBAO as early as possible
- Passive Oxygenation = NRB and NC at ≥ 15 lpm (as available) with OPA and/or NPA, and jaw thrust
- ETT or SGA insertion only with waveform EtCO<sub>2</sub> (if no waveform, replace device or use BVM)
- Confirm waveform CO<sub>2</sub> ≥ 5 mmHg for every breath
- Switch AED to monitor/defibrillator only after completion of the current CPR cycle
- Do not interrupt CPR or defibrillation for ACLS drug administration
- If ROSC, optimize patient following **Crashing Patient Medical Protocol**. Norepinephrine is vasopressor of choice; acquire 12-lead and transmit to receiving facility.
- If no response to treatment, follow **Termination of Resuscitation Protocol**
- Sodium bicarbonate is not indicated for prolonged down time
- CPR-induced consciousness may be identified by: combativeness/agitation, purposeful movements, pulling at lines/airway devices, withdrawing from compressions, speaking; without concurrent return of spontaneous circulation



# Ischemic Chest Pain/Acute Coronary Syndrome/STEMI

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- **Aspirin** - 324 mg PO chewed
- **Nitroglycerin** - 0.4 mg SL every 5-minutes
  - Titrate to SBP ≥ 100 and signs/symptoms (recheck BP before each dose)
  - Do not administer if patient has recently taken medication for erectile dysfunction (see pharmacopeia)
- Acquire and transmit 12-lead EKG

BASIC

*If severe nausea and/or vomiting*

- Refer to **Nausea and Vomiting protocol**

- Advanced airway management
- Cardiac monitoring, acquire and transmit **12-lead EKG**
  - Treat arrhythmias as identified
  - RV-leads if inferior wall MI changes, especially if hypotension or relative hypotension
- **Nitroglycerin** - 0.4 mg SL every 5 minutes
  - Titrate to SBP ≥ 100 and signs/symptoms (recheck BP before each dose)
  - Do not delay administration of NTG unless borderline or relative hypotension
  - Do not administer if patient has recently taken medication for erectile dysfunction (see pharmacopeia)
  - Use with caution if borderline/relative hypotension or suspected RV involvement
- **IV access**; consider 500 ml NS IV/IO rapid bolus for hypotension, especially if suspected RV infarct
- Perform serial EKGs, as appropriate

ASSIST

*If ST-elevation MI (STEMI)*

- Place pad defibrillation pads
- Notify facility of STEMI alert, as early as possible

ADVANCED

- See Hospital Capabilities List most appropriate transport destination
- IV opiates are, in general not indicated for ACS; If necessary, contact **OLMC**
- Maintain a high index of suspicion for any of the following

Female or atypical presentations	Anginal equivalent symptoms	Risk factors
Females	Dyspnea (exertional included)	Smoking (and other forms of tobacco)
Diabetics	Lightheadedness/presyncope/syncope	Hypertension
Elderly	Palpitations	Diabetes
	Diaphoresis	Hypercholesterolemia
	Nausea/vomiting	Obesity
	Decreased exercise capacity	Family history or coronary artery disease

# Symptomatic Bradycardia

<ul style="list-style-type: none"> <li>Assist airway, as appropriate</li> <li>Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> </ul> <p><i>If chest pain or anginal equivalent symptoms</i></p> <ul style="list-style-type: none"> <li>Follow protocol for <a href="#">Ischemic Chest Pain/Acute Coronary Syndromes/STEMI</a></li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>Advanced airway management</li> <li>Cardiac monitoring and 12-lead EKG</li> <li><a href="#">IV/IO access</a>; consider 500 ml NS IV/IO rapid bolus for hypotension</li> <li>Ensure adequate oxygenation prior to initiating pacing</li> </ul> <p><i>Do not delay pacing for IV placement or ACLS drugs in the presence of</i></p> <ul style="list-style-type: none"> <li>Severe hemodynamic instability</li> <li>Acute MI/ACS with hypotension/relative hypotension</li> <li>High degree AV-block (Mobitz II 2<sup>nd</sup>-degree or 3<sup>rd</sup>-degree)</li> <li>Acute pulmonary edema (with hypotension/relative hypotension)</li> </ul> <ul style="list-style-type: none"> <li><a href="#">External Cardiac Pacing</a> <ul style="list-style-type: none"> <li>Begin at 30 mA and increase energy in 10 mA increments until capture achieved</li> <li>Begin at 70 ppm and increase pacing rate in 10 ppm increments until hemodynamic response/improved perfusion</li> </ul> </li> </ul> <p><i>While preparing for pacing</i></p> <ul style="list-style-type: none"> <li><a href="#">Atropine</a> - 0.5 mg IV/IO, IIRR to max dose of 3 mg</li> </ul> <p><i>If time permits, consider sedation prior to/during pacing</i></p> <ul style="list-style-type: none"> <li><a href="#">Ketamine</a> - 0.5 mg/kg IV/IO, IIRR × 2</li> </ul>	<b>ASSIST</b>
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<p><i>If insufficient sedation and if adequate respiration</i></p> <ul style="list-style-type: none"> <li><a href="#">Midazolam</a> - 2.5 mg IV/IO, IIRR × 1</li> </ul>	<b>ADVANCED</b>						
<table border="1"> <tr> <td style="background-color: #d4edda;">Shock/hypotension</td> <td style="background-color: #d4edda;"> <ul style="list-style-type: none"> <li><a href="#">Epinephrine Infusion</a> - 2-30 mcg/min, start at 5 mcg/min Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</li> </ul> </td> </tr> <tr> <td style="background-color: #d4edda;">Hyperkalemia</td> <td style="background-color: #d4edda;">                     WIDE COMPLEX RHYTHM, 12-LEAD EKG FINDINGS, DIALYSIS HX                     <ul style="list-style-type: none"> <li><a href="#">Calcium Chloride</a> - 1 g IV slow push</li> <li><a href="#">Sodium Bicarbonate</a> - 1 mEq/kg IV/IO (if suspected acidosis)</li> </ul> </td> </tr> <tr> <td style="background-color: #d4edda;">Acidosis</td> <td style="background-color: #d4edda;"> <ul style="list-style-type: none"> <li><a href="#">Sodium Bicarbonate</a> - 1 mEq/kg IV/IO</li> </ul> </td> </tr> </table>		Shock/hypotension	<ul style="list-style-type: none"> <li><a href="#">Epinephrine Infusion</a> - 2-30 mcg/min, start at 5 mcg/min Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</li> </ul>	Hyperkalemia	WIDE COMPLEX RHYTHM, 12-LEAD EKG FINDINGS, DIALYSIS HX <ul style="list-style-type: none"> <li><a href="#">Calcium Chloride</a> - 1 g IV slow push</li> <li><a href="#">Sodium Bicarbonate</a> - 1 mEq/kg IV/IO (if suspected acidosis)</li> </ul>	Acidosis	<ul style="list-style-type: none"> <li><a href="#">Sodium Bicarbonate</a> - 1 mEq/kg IV/IO</li> </ul>
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<p>If any of the below causes are suspected, contact <a href="#">OLMC</a> following initial dosing</p>							
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<p>→ Symptomatic Bradycardia (symptoms/signs do not generally occur unless rate &lt; 50 bpm)</p> <p>→ Signs of poor perfusion or end organ dysfunction</p> <ul style="list-style-type: none"> <li>Hypotension (or relative hypotension)</li> <li>ACS/Acute MI (with hypotension/relative hypotension)</li> <li>Acute pulmonary edema (with hypotension/relative hypotension)</li> </ul> <p>→ Atropine may worsen ischemia/ACS</p>
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## Tachycardias

<ul style="list-style-type: none"> <li>• Assist airway, as appropriate</li> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>• Advanced airway management</li> <li>• Cardiac monitoring and <u>12-lead EKG</u></li> <li>• Assess rhythm for rate, width and regularity             <ul style="list-style-type: none"> <li>Do not delay cardioversion for IV placement or ACLS drugs in the presence of severe hemodynamic instability</li> </ul> </li> <li>• <u>IV access</u>; consider 500 ml NS IV/IO rapid bolus for hypotension</li> </ul>	<b>ASSIST</b>
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	Unstable	Stable		
	<p style="text-align: center;"><b>Unstable</b></p> <ul style="list-style-type: none"> <li>• <u>Synchronized Cardioversion</u> - At highest energy setting IIRR at highest energy setting, as needed</li> <li><i>If time permits, consider sedation prior to/during Cardioversion</i></li> <li>• <u>Ketamine</u> - 0.5 mg/kg IV/IO, IIRR × 2</li> </ul> <p style="text-align: center;">Narrow complex (<i>QRS</i> ≤ 0.12) SVT: PAT</p> <p><i>If time allows, while preparing</i></p> <ul style="list-style-type: none"> <li>• <u>Adenosine</u> - 12 mg rapid IV/IO</li> </ul>	<p style="text-align: center;"><b>Narrow complex</b> (<i>QRS</i> ≤ 0.12)</p> <p style="text-align: center;"><b>Regular</b> (SVT: PAT or A-flutter)</p> <ul style="list-style-type: none"> <li>• Vagal maneuver</li> <li>• <u>Adenosine</u> - 12 mg IV IIRR × 1</li> </ul> <p><i>If sympathomimetic associated</i></p> <ul style="list-style-type: none"> <li>• <u>Midazolam</u> - 2.5 mg IV IIRR as needed (max total dose 10 mg)</li> </ul>	<p style="text-align: center;"><b>Wide complex</b> (<i>QRS</i> &gt; 0.12)</p> <p style="text-align: center;"><b>Regular</b> (Ventricular Tachycardia or SVT w/ BBB or accessory pathway)</p> <ul style="list-style-type: none"> <li>• <u>Adenosine</u> - 12 mg IV, IIRR × 1 (unless known VT)</li> </ul> <p style="text-align: center;"><b>Irregular</b> (A-fib)</p> <ul style="list-style-type: none"> <li>• Treat underlying cause (no adenosine or diltiazem)</li> </ul>	<b>ADVANCED</b>
	<p style="text-align: center;"><b>Regular</b> (SVT: PAT or A-flutter)</p> <p><i>If no response to adenosine</i></p> <ul style="list-style-type: none"> <li>• Treat as below</li> </ul> <p style="text-align: center;"><b>Irregular (A-fib)</b></p> <p><i>If IFT and stable on infusion</i></p> <ul style="list-style-type: none"> <li>• <u>Diltiazem</u> - Maintain 5-15 mg/hr IV/IO (titrate to HR parameters from the sending facility)</li> </ul>	<p style="text-align: center;"><b>Regular</b> (Ventricular Tachycardia or SVT w/ BBB or accessory pathway)</p> <ul style="list-style-type: none"> <li>• <u>Amiodarone</u> - 150 mg IV (over 10 min) IIRR × 1</li> </ul> <p style="text-align: center;"><b>Suspected Hyperkalemia</b></p> <ul style="list-style-type: none"> <li>• <u>Calcium Chloride</u> - 1 g IV</li> <li>• <u>Sodium Bicarbonate</u> – 1 mEq/kg IV/IO <i>If suspected acidosis</i> IIRR 0.5 mEq/kg</li> </ul> <p style="text-align: center;"><b>Torsades de Pointes</b></p> <ul style="list-style-type: none"> <li>• <u>Magnesium Sulfate</u> - 2 g IV slow push</li> </ul>		

**Unstable Tachycardia** (symptoms/signs do not generally occur unless rate ≥ 150)

- Hypotension (or relative hypotension with signs of poor perfusion or end-organ dysfunction)
- ACS/Acute MI
- Acute pulmonary edema

*If suspected sinus tachycardia or MAT*

- Treat the underlying condition

Upper limit of sinus tachycardia is approx. 220 - patient age

## Abdominal Pain

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock

BASIC

- Cardiac monitoring and 12-lead EKG, as appropriate
- IV/IO access, as appropriate

For severe nausea/vomiting

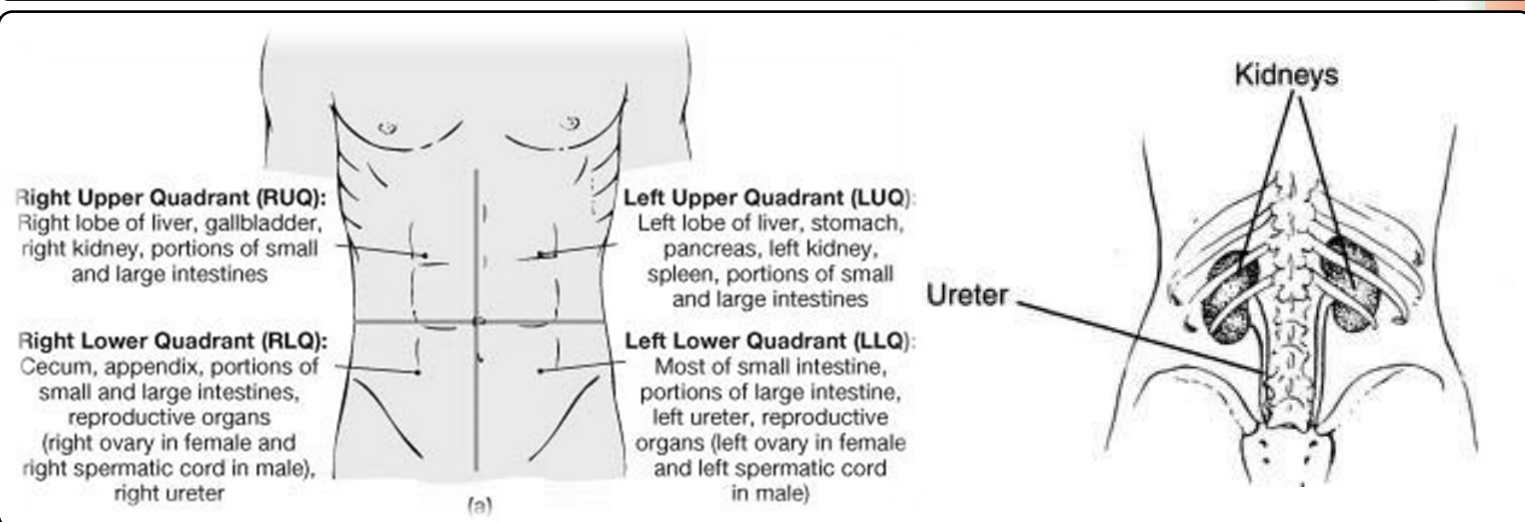
- Nausea and Vomiting Protocol

ASSIST

For moderate-to-severe acute pain (> 6/10) on the Pain Scale and/or grimacing/guarding/moaning

- Acute Pain Management Protocol
- Treat associated causes (ACS, Overdose/Poisoning, Diabetic Emergencies, Emergency Childbirth)

ADVANCED



## Allergic Reaction/Anaphylaxis

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- For suspected respiratory failure see Respiratory Insufficiency/Respiratory Failure & Drug Assisted Airway (DAA)
- Remove inciting agent (e.g. stinger), if possible

<p><b>LOCAL REACTION/RASH/HIVES</b></p> <ul style="list-style-type: none"> <li>• Observe for respiratory distress and hypotension</li> </ul>	<p><b>WHEEZING/BRONCHOSPASM</b></p> <ul style="list-style-type: none"> <li>• <u>Albuterol</u> - 2.5 mg/<u>ipratropium</u> -0.5 mg in 3 ml NS nebulized IIRR x 2</li> </ul>	<p><b>SEVERE SIGNS/SYMPTOMS</b></p> <ul style="list-style-type: none"> <li>→ Stridor</li> <li>→ Oropharyngeal swelling/difficulty swallowing/throat tightening</li> <li>→ Severe dyspnea</li> <li>→ Wheezing with accessory muscle use</li> <li>→ Poor air-movement to auscultation</li> <li>→ Difficulty speaking in full sentences</li> <li>→ Hypotension ± signs of shock</li> </ul> <ul style="list-style-type: none"> <li>• <u>Epinephrine</u> 1:1,000 - 0.3 mg IM IIRR × 2 q 5 min (max total dose 0.9 mg)</li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>• Advanced airway management, as appropriate</li> <li>• Cardiac monitoring</li> <li>• <u>IV access</u>, as appropriate; consider 20 ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 2 L total</li> <li>• <u>Diphenhydramine</u> - 50 mg IV/IM/IO</li> </ul> <p><i>If respiratory distress</i></p> <ul style="list-style-type: none"> <li>• Initiate <u>EtCO<sub>2</sub> monitoring</u></li> </ul> <p><i>In presence of signs of anaphylaxis/anaphylactic shock (stridor and or hypotension/end-organ dysfunction), DO NOT DELAY</i></p> <ul style="list-style-type: none"> <li>• <u>Epinephrine</u>- 0.1 mg in 10ml NS IV/IO, 10 mcg (1 ml) IIRR q 5-minutes, max total dose 50 mcg (5 ml)</li> </ul>	<b>ASSIST</b>
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<ul style="list-style-type: none"> <li>• <u>Epinephrine infusion</u> - 2-30 mcg/min, start at 5 mcg/min</li> </ul> <p>Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</p> <p><i>Consider</i></p> <ul style="list-style-type: none"> <li>• <u>Methylprednisolone</u> - 125 mg IV/IM</li> </ul>	<b>ADVANCED</b>
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→ If history of ACE inhibitor use, or if personal/family history of non-allergic angioedema, above interventions may provide no benefit

→ Use extreme caution if patient wishes to refuse transport following treatment (several hours of monitoring may be necessary)

# Altered Mental Status/CNS Depression

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Assess blood glucose concentration

If ≤ 60 mg/dl:

- **Glucose (Oral)** - 15 g buccal (If conscious/able to tolerate)

If known or suspected **opiate intoxication** with miosis, respiratory depression, and CNS depression (all 3)

- **Naloxone** - 2 mg IN (1 mg in each nostril), IIRR × 1 in 5 min

BASIC

- **EtCO<sub>2</sub> monitoring**
- Advanced airway management, as appropriate
- Cardiac monitoring, acquire and transmit **12-lead EKG**
- IV access, as appropriate

If blood glucose ≤ 60 mg/dl:

- **Dextrose 10%** (25 g/250 ml) - 100 ml IV/IO bolus, IIRR up to 50g (500 ml)

If known or suspected **opiate intoxication** with miosis, respiratory depression, and CNS depression (all 3)

- **Naloxone** - 0.5 mg IV, IIRR in 0.5 mg increments q 5 min. to 4 mg max total dose

ASSIST

If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained:

- **Glucagon** - 1 mg IM/IN

If shock/hypotension

- See **Shock/Hypotension Protocol**

Consider other causes of AMS and treat as follows, Contact **OLMC** after initial dose If **beta-blocker overdose**

- **Glucagon** - 1 mg IV/IO, IIRR 1 mg IV/IO x 1
- **Epinephrine infusion** - 2-30 mcg/min, start at 5 mcg/min Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS

If **calcium channel blocker overdose**

- **Calcium Chloride** - 1 g IV/IO slow push

If **organophosphate poisoning**

- **Atropine** - 2 mg IV/IM/IO (IIRR see **Overdose/Poisoning**)

If **tricyclic antidepressant intoxication**

- **Sodium Bicarbonate** - 1 mEq/kg IV/IO (IIRR see **Overdose/Poisoning**)

ADVANCED



## Behavioral Emergencies/Agitation

- Protect yourself and other crew (await law enforcement, as appropriate)
- Approach patient calmly and with caution
- Verbally de-escalate if possible
- Use “take-down”/manual restraint if other methods have failed
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Physically restrain, if necessary
  - Supine position (avoid positional asphyxia)
  - Lateral decubitus (if risk of aspiration)
- Passive/active cooling, as appropriate (see [Hyperthermia Protocol](#))
- Blood glucose assessment and treatment (see [Diabetic Emergencies Protocol](#))

Appropriate Supine Restraint:



BASIC

- [EtCO<sub>2</sub> monitoring](#)
- Advanced airway management, as appropriate
- [IV access](#), as appropriate; consider 500 ml NS IV/IO bolus for severe dehydration or hypotension, IIRR to 2 L total
- Cardiac monitoring, acquire and transmit [12-lead EKG](#) as appropriate
- [Midazolam](#) - 2.5 mg slow IV/IO, IIRR x 1 q 5-min; or 5 mg IM/IN, IIRR × 1

ASSIST

*If unable to achieve optimal sedation despite midazolam*

- Assess underlying cause of agitation
  - *If Hyperactive Delirium with Severe Agitation (only as defined below)*
    - [Ketamine](#) - 2 mg/kg IV or 4 mg/kg IM
  - *If known psychiatric disease or ETOH intoxication*
    - [Haloperidol](#) - 5 mg IM, IIRR x 1 after 15 min. to total 10 mg. (caution; QT prolongation) *If other cause of agitation or cause unclear (in addition to above midazolam dosing, as needed)*
    - [Midazolam](#), 2.5 mg IV/IO IIRR x 1 q 5-minutes; or 5 mg IM/IN, IIRR x 1
- Contact [OLMC](#) for additional dosing, if necessary

*For provider-witnessed sudden cardiac arrest, associated with prolonged agitation/Hyperactive Delirium with Severe Agitation*

- [Sodium Bicarbonate](#) - 1 mEq/kg IV/IO; IIRR 0.5 mEq/kg × 1 q 10 minutes

ADVANCED

- Hyperactive Delirium with Severe Agitation is triggered by drug use of stimulants/hallucinogens or psychiatric illness
- Identifying Hyperactive Delirium with Severe Agitation
  - Exceptional/abnormal pain tolerance
  - Tachypnea
  - Tactile hyperthermia
  - Unusual strength
  - Extreme noncompliance
  - Lack of tiring against restraint
  - Inappropriate clothing for environmental temperature
  - Violent and paranoid behavior
  - Rapid development of symptoms
  - Rapidly fluctuating periods of calm and then delirium



## Diabetic Emergencies

<ul style="list-style-type: none"> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Assess blood glucose concentration</li> </ul> <p><i>If ≤ 60 mg/dl:</i></p> <ul style="list-style-type: none"> <li>• <b>Glucose (Oral)</b> - 15 g buccal (<i>If conscious/able to tolerate</i>)</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>• Cardiac monitoring, acquire and transmit <b>12-lead EKG</b></li> <li>• <b>IV access</b>, as appropriate</li> </ul> <p><i>Hypoglycemia: If blood glucose ≤ 60 mg/dl</i></p> <ul style="list-style-type: none"> <li>• <b>Dextrose 10%</b> (25 g/250 ml) - 100 ml IV/IO bolus, IIRR to 50 g (500 ml)</li> </ul> <p><i>Hyperglycemia: If blood glucose ≥ 300 mg/dl and altered mental status and/or signs of hypovolemia</i></p> <ul style="list-style-type: none"> <li>• NS - 250-500 ml IV bolus, IIRR to 2 L</li> </ul>	<b>ASSIST</b>
<p><i>If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained</i></p> <ul style="list-style-type: none"> <li>• <b>Glucagon</b> - 1 mg IM/IN</li> </ul>	<b>ADVANCED</b>
<p>Consider differential diagnosis for hyperglycemia</p> <ul style="list-style-type: none"> <li>→ Diabetic Ketoacidosis (DKA)</li> <li>→ Hyperosmolar hyperglycemic state (non-ketotic hyperosmolar coma)</li> <li>→ Infection/sepsis</li> <li>→ ACS/MI</li> </ul>	

## Fever

- Assist airway as appropriate
- Remove excess blankets/clothing if present
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock
- [Acetaminophen](#) - 1 g PO

BASIC

- [IV access](#), as appropriate

ASSIST

ADVANCED

### Contraindications

- Received Tylenol within last 4 hours
- Active and severe hepatic disease
- Severe hepatic impairment
- Hypersensitivity to acetaminophen

### PEARLS

- Fever is temperature  $\geq 100.4$  F
- Assure upon arrival at receiving facility to inform Acetaminophen administered

Consider other protocols as appropriate

- [Sepsis \(shock/hypotension\)](#)
- [Seizure](#)

## Nausea and Vomiting

<ul style="list-style-type: none"> <li>• Position patient to avoid aspiration <i>Consider recovery position</i></li> <li>• <u>Suction</u>, as appropriate</li> <li>• <u>Isopropyl Alcohol</u> – 3-pads. Instruct patient to hold pads 1-2 cm from nose and inhale deeply as frequently as required to achieve nausea relief. IIRR x 1</li> <li>• <u>Ondansetron</u> - 4 mg ODT (only for <u>non-actively</u> vomiting patients), IIRR x 1 in 10-min <i>Contraindicated if suspected or reported 1st-trimester pregnancy</i></li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>• <u>IV access</u>, as appropriate; NS - 250-500 ml for signs of dehydration, IIRR to 2 L total</li> <li>• <u>Ondansetron</u> - 4 mg IV, IIRR x 1 in 10-min</li> </ul>	<b>ASSIST</b>
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<p><i>If vomiting persists despite ondansetron, or for patients with suspected gastroparesis or cyclical vomiting syndrome</i></p> <ul style="list-style-type: none"> <li>• <u>Haloperidol</u> - 2.5 mg IV, IIRR x 1 in 15-minutes</li> </ul>	<b>ADVANCED</b>
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→ IV opiates (fentanyl) do not require co-administration of antiemetics; therefore, only administer ondansetron following treatment with opiates in the presence of active nausea/vomiting

→ Consider other conditions/protocols which may present with nausea/vomiting (myocardial ischemia)

## Overdose/Poisoning/Adverse Drug Reaction

<p><i>If suspected exposure to toxic agent</i></p> <ul style="list-style-type: none"> <li>Remove patient from environment if safe/trained/equipped (PPE) to do so</li> <li>Ensure full decontamination prior to initiating care</li> <li>Assist airway as appropriate</li> <li>Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>Determine blood glucose concentration, treat as appropriate</li> </ul> <p><i>If known or suspected <b>opiate intoxication</b> with miosis, respiratory depression, and CNS depression (all 3)</i></p> <ul style="list-style-type: none"> <li><b>Naloxone</b> - 2 mg IN (1 mg in each nostril), IIRR × 1 in 5 min</li> </ul> <p><i>If suspected <b>carbon monoxide (CO)</b></i></p> <ul style="list-style-type: none"> <li>High flow O<sub>2</sub> by NRB + HFNC (as available) 15 lpm each</li> </ul> <p><i>If caustic ingestion</i></p> <ul style="list-style-type: none"> <li>Do not induce vomiting or allow the patient to eat or drink</li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>Advanced airway management as appropriate</li> <li><b>IV/IO access</b>; follow <b>Shock/Hypotension Protocol</b>, as appropriate</li> </ul> <p><i>If known or suspected <b>opiate intoxication</b> with miosis, respiratory depression, and CNS depression (all 3)</i></p> <ul style="list-style-type: none"> <li><b>Naloxone</b> - 0.5 mg IV, IIRR in 0.5 mg increments q 5 min to 4 mg max total dose</li> </ul> <p><i>If <b>cocaine/amphetamine/stimulant/sympathomimetic intoxication</b></i></p> <ul style="list-style-type: none"> <li><b>Midazolam</b> - 2.5 mg slow IV/IO or 5 mg IM/IN, IIRR x 1 q 5-min (max total dose 10 mg)</li> </ul> <p><i>If <b>dystonic reaction</b></i></p> <ul style="list-style-type: none"> <li><b>Diphenhydramine</b> - 50 mg IV/IM/IO</li> </ul> <p><i>In the setting suspected <b>cyanide poisoning</b> (inhalation (smoke), dermal or ingestion exposure) AND if altered mental status, hemodynamic instability, or cardiac arrest</i></p> <ul style="list-style-type: none"> <li><b>Hydroxocobalamin</b> (if available) through a dedicated IV/IO - 5 g IV/IO over 15 minutes, IIRR x 1; contact <b>OLMC</b> following initial dose</li> </ul>	<b>ASSIST</b>
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**Hydroxocobalamin**  
1 bottle = 5 g

<p><i>Consider the following toxidromes/treatments; following initial dose, contact <b>OLMC</b></i></p> <p><b>Tricyclic Antidepressant (TCA)</b></p> <ul style="list-style-type: none"> <li><b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg x 1</li> </ul> <p><b>Beta-blocker</b></p> <ul style="list-style-type: none"> <li><b>Glucagon</b> - 1 mg IV/IO slow push over 1-min, IIRR 1 mg x 1</li> <li><b>Epinephrine infusion</b> - 2-30 mcg/min, start at 5 mcg/min Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS</li> </ul> <p><b>Calcium Channel Blocker</b></p> <ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 1 g slow IV/IO</li> </ul> <p><b>Organophosphate</b></p> <ul style="list-style-type: none"> <li><b>Atropine</b> - 2 mg IV/IO, IIRR 4 mg q 3-minutes until signs of sufficient atropinization (drying of secretions)</li> </ul>	<b>ADVANCED</b>
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→ SpO<sub>2</sub> may be a poor indicator of severity in CO poisoning; therefore, regardless of SpO<sub>2</sub>, always treat the patient

→ Toxidromes secondary to toxic substances or to toxic doses of common medications may result from exposure in the form of

Ingestion, inhalation, injection, skin absorption

→ Dystonias may result from a number of psychiatric and GI medications, including

Haloperidol, fluphenazine, fluoxetine, duloxetine, sertraline, metoclopramide

**Hydroxocobalamin Reconstitution Procedure:**

→ Add 200 ml 0.9% sodium chloride injection from vial #1 to vial #2

→ Fill the vial to the line (keep vial #2 in an upright position)

→ Rock or rotate the vial for 30-seconds to mix the solution, **Do not shake**

→ Administer through vented IV tubing

→ If administering IO, use “push-pull” syringe method

# Respiratory Distress

- Assist airway, as appropriate; respiratory monitoring required (EtCO<sub>2</sub> and SpO<sub>2</sub>) if equipped
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Seat patient (semi-) upright for SBP ≥ 100 and/or signs of adequate perfusion
- For suspected respiratory failure; [Respiratory Insufficiency/Failure & Drug Assisted Airway \(DAA\) Protocol](#)

## Pulmonary Edema/CHF

- [Aspirin](#) - 324 mg PO
- [Nitroglycerin](#) - 0.4 mg SL q 5-min. (only if history of CHF)  
Titrate to SBP ≥ 100 and signs/symptoms  
Do not administer if patient has recently (see pharmacopeia) taken medication for erectile dysfunction

*For moderate to severe respiratory distress*

- Initiate NIPPV (waveform EtCO<sub>2</sub> required, if equipped)  
Discontinue if SBP ≤ 90

*For wheezing/bronchospasm, consider*

- [Albuterol](#) - 2.5 mg/[ipratropium](#) - 0.5 mg in 3 ml NS nebulized IRR x 2

## Asthma/COPD/Wheezing

- [Albuterol](#) - 2.5 mg/[ipratropium](#) - 0.5 mg in 3 ml NS nebulized IRR x 2

*For moderate to severe respiratory distress*

- Initiate NIPPV (waveform EtCO<sub>2</sub> required, if equipped)

Discontinue if hypotensive

## Pneumonia (aspiration or other)

- Suction as appropriate (oral/nasal)

*For moderate to severe respiratory distress*

- Initiate NIPPV (waveform EtCO<sub>2</sub> required, if equipped)  
Discontinue if hypotensive

*For wheezing/bronchospasm*

- [Albuterol](#) - 2.5 mg/[ipratropium](#) - 0.5 mg in 3 ml NS nebulized IRR x 2

*For respiratory distress associated with near drowning*

- NIPPV may be utilized

BASIC

Advanced airway management, as appropriate (EtCO<sub>2</sub> required)

[IV access](#)

[Nitroglycerin](#) - as above

(Does not require prior history of CHF)

Cardiac monitoring, acquire and transmit [12-lead EKG](#)

Treat arrhythmias as identified

Advanced airway management, as appropriate (EtCO<sub>2</sub> required)

• IV access

• Cardiac monitoring, acquire and transmit 12-lead EKG

*If persistent wheezing/respiratory distress*

- [Albuterol](#) - continuous nebulized (max 7.5 mg in 9 ml NS)

Advanced airway management, as appropriate (EtCO<sub>2</sub> required)

• IV access

• Cardiac monitoring, acquire and transmit 12-lead EKG

ASSIST

*Consider, especially if subacute presentation (≥ 1-2 days)*

- [Methylprednisolone](#) - 125 mg IV/IM

*If severe (e.g. accessory muscle use)*

- [Magnesium Sulfate](#) - 2 g in 250 ml NS over 15 min

*For asthma only, and if impending respiratory failure or unable to tolerate nebulizer*

- [Epinephrine](#) 1:1000 - 0.3 mg IM IRR q 5 min. x 1

ADVANCED

- Moderate to severe respiratory distress may be characterized by some combination of the following:  
Inability to speak in full sentences  
Increased *work* of breathing  
Accessory muscle use/retractions
- Patients with COPD may have chronic low baseline O<sub>2</sub> saturations, so do not indiscriminately place on high flow O<sub>2</sub>  
Start 2-3 lpm O<sub>2</sub> via NC or double patient's home O<sub>2</sub> flow rate, if known  
Titrate to patient's baseline SpO<sub>2</sub> (88-92%) and work of breathing

## Seizure/Status Epilepticus

<ul style="list-style-type: none"> <li>• Assist airway, as appropriate</li> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Position patient to avoid injury and aspiration <i>Consider recovery position</i></li> <li>• Assess blood glucose concentration</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>• <u>EtCO<sub>2</sub> monitoring</u></li> <li>• Advanced airway management, as appropriate</li> <li>• <u>IV access</u>, as appropriate</li> </ul> <p><i>If blood glucose ≤ 60 mg/dl</i></p> <ul style="list-style-type: none"> <li>• <u>Dextrose 10%</u> (25 g/250 ml) - 100 ml IV/IO bolus, IIRR up to 50 g (500 ml)</li> <li>• Cardiac monitoring, acquire and transmit <u>12-lead EKG</u></li> </ul> <p><i>If actively seizing, or in status epilepticus ( ≥ 2-seizures and without intervening lucid period)</i></p> <ul style="list-style-type: none"> <li>• <u>Midazolam</u> - 10 mg IM/IN; or 5 mg slow IV/IO, IIRR q 5-min x 2 <b>IM midazolam is the preferred route of administration if an IV not already established</b> Monitor for respiratory depression and need for assisted ventilation (see <u>Respiratory Insufficiency/Failure &amp; Drug Assisted Airway Protocol</u>)</li> </ul> <p><i>If post-ictal and not actively seizing or in status epilepticus, pharmacologic therapy with midazolam is <b>not indicated</b></i></p>	<b>ASSIST</b>
<p><i>If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained</i></p> <ul style="list-style-type: none"> <li>• <u>Glucagon</u> 1mg IM/IN</li> </ul> <p><i>If suspected eclampsia/peripartum seizure (administered even if seizure stops)</i></p> <ul style="list-style-type: none"> <li>• <u>Magnesium Sulfate</u> - 4 g IV/IO over 15 min (preferred) or IM; followed by 2 g/hr infusion</li> </ul>	<b>ADVANCED</b>
<p>→ Consider toxicologic causes of seizure</p> <ul style="list-style-type: none"> <li>• Organophosphate/nerve gas (see chemical warfare policy)</li> <li>• Sympathomimetic toxidrome (stuffers/packers, methamphetamine)</li> </ul> <p>→ Anticipate that dispatch or initial clinical picture of seizure may be initial presentation cardiac arrest</p> <p>→ Always consider eclampsia and treatment with magnesium with Seizures in 3<sup>rd</sup> trimester pregnancy, peri-partum, or post-partum (90% in 1st week)</p>	

## Stroke/CVA/TIA

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Assess blood glucose, treat as per Diabetic Emergencies Protocol
- Complete **Initial** Stroke Screen (Modified Cincinnati Prehospital Stroke Scale)
  - Facial Droop
  - Arm-Pronator Drift
  - Speech/language (dysarthria or aphasia)
  - Time patient was last seen prior to onset of symptoms required

*If initial stroke screen is positive (any of 3-criteria):*

- Complete **LAMS** evaluation
- Bedside Stroke Alert, as appropriate

BASIC

- Advanced airway management, as appropriate
- IV access, as appropriate
- Cardiac monitoring, as appropriate

*If symptom onset within 24-hours, and*

LAMS 4+

- Transport to closest Comprehensive Stroke Center (CSC)

LAMS 0-3

- Transport to closest Stroke Center (Primary or CSC)

*If symptom onset greater than 24-hours*

- Transport to closest Stroke Center (Primary or CSC)

Los Angeles Motor Score (LAMS)		
Facial Droop	Arm Drift	Grip Strength
Absent 0	Absent 0	Normal 0
Present 1	Drifts down 1	Weak grip 1
	Falls rapidly 2	No grip 2

ASSIST

ADVANCED



## Syncope/Fainting

<ul style="list-style-type: none"> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Measure blood glucose, treat as appropriate</li> <li>• Complete <b>Initial Stroke Screen</b> <i>see</i> <a href="#">Stroke/CVA/TIA</a></li> <li>• Assess orthostatic pulse and blood pressure, as tolerated</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>• Cardiac monitoring; acquire and transmit <a href="#">12-lead EKG</a>, treat dysrhythmias</li> <li>• <a href="#">IV access</a>; NS - 250-500 ml as appropriate for signs of hypovolemia</li> </ul>	<b>ASSIST</b>
	<b>ADVANCED</b>

Consider the following conditions/protocols

- [Ischemic Chest Pain/Acute Coronary Syndrome/STEMI Shock/Hypotension](#)
- [Symptomatic Bradycardia](#)
- [Tachycardias](#)
- [Diabetic Emergencies](#)
- [Seizure/Status Epilepticus](#)
- [Stroke/CVA/TIA](#)
- Vasovagal (pain management)

Consider causes of presyncope/impending arrest spectrum:

1. Acute Coronary Syndromes (ACS): *look for evidence of ischemia*
2. Tachydysrhythmias
3. Bradydysrhythmias and Blocks
4. Wolff-Parkinson-White (WPW): *look for short PR, prolonged QRS, and a delta wave*
5. Brugada Syndrome: *look for RSR' similar to a right bundle block and ST elevation in the anterior leads*
6. Hypertrophic Cardiomyopathy (HCM): *look for high voltage and narrow ("needle-like", <20 milliseconds/one small box) q waves in the lateral (V5-aVL) and possibly inferior leads; may also have left atrial enlargement, ischemic-appearing EKG, tall R wave in V1*
7. Long or Short QT interval: *look for a QTc <300 (autosomal dominant inheritance) or >500*
8. Arrhythmogenic Right Ventricular Dysplasia (ARVD): *look for epsilon waves ± T-wave inversions in leads V1-V3*
9. Miscellaneous: (PE, right-sided heart strain; electrolytes, ICH, etc.)

# Tracheostomy Emergencies

- Look, listen, and feel at the mouth and tracheostomy for air movement
- Place non-rebreather mask to tracheostomy, and to mouth (unless history of laryngectomy)
  - Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Reposition airway in slight extension (unconscious), or upright (conscious)
- Respiratory monitoring required (in-line EtCO<sub>2</sub> and SpO<sub>2</sub>) if equipped
- Obtain tracheostomy history (e.g., age of tracheostomy, laryngectomy)
  - If unable to determine if laryngectomy, assume upper airway patent

## Tracheostomy Respiratory Distress/Failure

- Assume all acute distress or respiratory failure to be dislodgement or obstruction until proven otherwise
- Remove all accessory items (valves/caps) and stoma padding (if present)
- Perform 3 C's, reassess patient condition and SpO<sub>2</sub>/EtCO<sub>2</sub> after each step

### Cannula

- Remove inner cannula and inspect for obstruction (do not discard)

*If obstructed with secretions*

- Consider rinsing with saline or tap water, may use 3 ml syringe/suction catheter to “pressure wash”

### Catheter

- Attempt to pass suction catheter down tracheostomy

*If suction passes and tracheostomy patent*

- Perform suctioning and consider partial obstruction

### Cuff

*If unable to pass suction*

- Deflate tracheostomy cuff (if present)

*If no improvement after 3 C's*

- Remove tracheostomy tube and reassess

*If respiratory distress: [Respiratory Distress Protocol](#)*

*If Acute Respiratory Insufficiency/Failure or chronic mechanical ventilation, and patent airway*

- Assist ventilation with bag-valve-mask (BVM) to face; cover stoma with gloved hand or gauze *laryngectomy or unable to ventilate via face*
- Assist ventilation with pediatric BVM mask to stoma; if no laryngectomy, may need to close mouth/nose

## Tracheostomy Hemorrhage

- Obtain history to determine likely source of bleeding (skin, pulmonary, GI, potential trachea)
- Strongly advocate for transport for even small volume tracheostomy bleeding

*If rapid and massive hemorrhage from tracheostomy (suspected tracheo-innominate artery fistula)*

- Apply oxygen or BVM to face
- Apply external digital compression with index finger at sternal notch (do not delay cuff inflation below)
- Immediately inflate trach cuff to 50 ml

## Tracheostomy Respiratory Distress/Failure

*If no distress/failure and tracheostomy exchange or replacement required, [Tracheostomy Replacement/Exchange](#)*

**Procedure** *If no improvement*

*If tracheostomy ≥ 7-days since initial placement*

- [Tracheostomy Replacement/Exchange Procedure](#)
- If unable or replacement/backup unavailable, consider intubation of stoma with 6.0 ETT

*If tracheostomy less than 7-days since initial placement*

- Do not attempt tracheostomy replacement or stoma intubation, manage with BVM

*If unable ventilate or exchange trach or place stoma*

- Consider orotracheal intubation (unless laryngectomy)

## Tracheostomy Hemorrhage

*If uncuffed tracheostomy*

- Consider exchange for 6.0 ETT using bougie

*If continued severe bleeding*

- Consider orotracheal intubation OR remove tracheostomy and intubate stoma
- Once ETT in place (oral or stoma), consider insertion of finger in stoma to apply direct compression of vessel into sternum

*If significant hemorrhage and SBP ≤ 90 or HR ≥ 110 with poor perfusion*

- [Tranexamic Acid](#) - 2 g IV/IO, slow push over 1 min

BASIC

ASSIST

ADVANCED

## Bites/Envenomation

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

*If bite involves extremity*

- Immobilize affected limb below the level of the heart
- Do not tightly wrap the affected limb
- Remove all jewelry

*If stinger is present*

- Attempt to brush away with edge of card  
Do not disturb the wound site

BASIC

- Advanced airway management, as appropriate
- Cardiac monitoring, and treat dysrhythmias
- IV access, as appropriate

ASSIST

ADVANCED

Consider other protocols as appropriate:

- [Allergic Reaction/Anaphylaxis](#)
- [Shock/Hypotension](#)

## Hyperthermia/Heat Stroke

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Remove patient from high temperature environment

If **Mild** symptoms: *heat cramps or heat exhaustion; no signs of altered mental status (AMS); temperature ≤ 104° F*

- Passive cooling (loosen clothing, fanning)

If available

- PO fluids (use caution if nausea/vomiting)

If **Severe** symptoms: *heat stroke (AMS, neurologic deficit, temperature ≥ 104° F, sweating may or may not be present)*

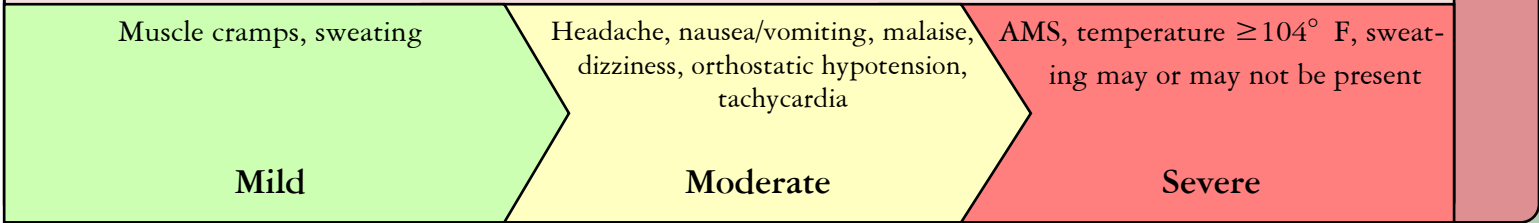
- Begin active cooling
  - Use sheets/towels dipped in ice water directly on skin
  - Ice packs to core (trunk/abdomen)

If shivering begins, mental status improves, or temperature ≤ 102° F

- Cease active cooling measures

If ice water submersion is in progress, do not remove patient until temperature ≤ 102° F

BASIC



- Advanced airway management, as appropriate
- Cardiac monitoring, as appropriate
- **IV access**, as appropriate; consider 500ml NS IV/IO rapid bolus for hypotension, IIRR up to 2 L total

If chilled fluids available

- 500 ml NS IV/IO rapid bolus

If uncontrolled shivering occurs during cooling

- **Midazolam** - 2.5 mg IV/IO/IN

ASSIST

ADVANCED

Maintain high index of suspicion for heat-related illness if the any of following risk factors are present:

- Elderly
- Psychiatric medication
- Cardiovascular medications
  - Diuretics
  - Antihypertensives

Consider other protocols, as appropriate:

- Seizures/Status Epilepticus
- Overdose/Poisoning
- Shock/Hypotension
- Altered Mental Status/CNS
- Depression Diabetic Emergencies

# Hypothermia

- Assist airway, as appropriate
  - Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
  - Remove patient from cold environment, dry and insulate
    - Handle the patient gently, consider scoop stretcher (excessive movement may induce ventricular fibrillation)
    - Cut off all wet clothing
  - Assist passive warming:
    - Cover with blankets, heat packs for comfort
- If severe symptoms/signs: AMS, unstable, dysrhythmia, and/or temperature ≤ 90° F*
- Actively warm patient:
    - Heat packs to neck, groin, and axillae
  - Carefully assess vital signs, as they may be diminished but adequate
- If patient is in cardiac arrest, and AED advises shockable rhythm*
- Administer one defibrillatory shock (no further defibrillation until temperature ≥ 90° F)
- If due to water submersion (head-under)*
- See [Withholding of Resuscitation Protocol](#) for exclusion criteria for beginning cardiopulmonary resuscitation

BASIC

- [IV access](#), as appropriate; warm IV fluids if possible, consider 500 ml NS IV/IO rapid bolus for hypotension, IIR up to 2 L total
  - Cardiac monitoring and [12-lead EKG](#)
- If patient is in pulseless ventricular tachycardia/ventricular fibrillation and not previously defibrillated (AED)*
- Administer one defibrillatory shock only, at highest energy setting
  - Do not terminate resuscitation
- If symptomatic bradycardia (carefully assess vital signs, as they may be diminished but adequate)*
- Initiate pacing only for temperature ≥ 90° F

ASSIST

ADVANCED



## Near Drowning

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

*If suspected cervical spinal trauma*

- Spinal Motion Restriction
- Remove wet clothing and dry patient, and follow Hypothermia Protocol
- NIPPV, as appropriate

*If prolonged water submersion (head-under)*

- See Withholding of Resuscitation Protocol for criteria for beginning cardiopulmonary resuscitation

BASIC

- Advanced airway management, as appropriate
- Initiate EtCO<sub>2</sub> monitoring
- Cardiac monitoring, and treat dysrhythmias
- IV access, as appropriate

ASSIST

ADVANCED

## General Trauma

<ul style="list-style-type: none"> <li>Assist airway, as appropriate</li> <li>Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li><b>Spinal Motion Restriction</b>, as appropriate</li> <li><b>Pelvic binder</b>, as appropriate</li> <li>Keep patient warm</li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>Advanced airway management, as appropriate</li> <li><b>Needle Thoracostomy</b> for presumed tension pneumothorax</li> <li>Cardiac monitoring, as appropriate</li> <li><b>IV access</b>, as appropriate;</li> <li><i>If SBP ≤ 90</i></li> <li>NS - 250 ml IV bolus, IIRR 250 ml increments (<b>Shock/Hypotension</b>)-permissive hypotension, unless TBI</li> </ul>	<b>ASSIST</b>
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<ul style="list-style-type: none"> <li>See <b>Trauma Transport Guidelines</b></li> <li><b>Acute Pain Management</b>, as appropriate</li> <li><i>If traumatic arrest</i></li> <li>Consider <b>Needle Thoracostomy</b> prior to following procedures for:             <ul style="list-style-type: none"> <li><b>Termination of Resuscitation</b> or <b>Withholding Resuscitative Efforts</b>, as appropriate</li> </ul> </li> </ul>	<b>ADVANCED</b>
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<b>BASIC</b>	<b>Eye Injury</b> <i>If isolated eye injury</i> <ul style="list-style-type: none"> <li>Irrigate with NS if result of chemical burn (if appropriate to agent)</li> <li>Cover unaffected eye/stabilize impaled object</li> </ul> <i>If suspected ocular injury</i> <ul style="list-style-type: none"> <li>Do not delay transport</li> </ul> <i>If outside socket</i> <ul style="list-style-type: none"> <li>Cover with NS soaked gauze</li> </ul>		<i>If trauma with significant hemorrhage and SBP ≤ 90 or HR ≥ 110 with poor perfusion or; or TBI with inability to follow verbal instructions (Motor GCS ≤ 5)</i> <ul style="list-style-type: none"> <li><b>Tranexamic Acid</b> - 2 g IV/IO, slow push over 1 min             <ul style="list-style-type: none"> <li>→ Do not give if injury occurred ≥ 3 hours before</li> </ul> </li> </ul>	<b>ASSIST &amp; ADVANCED</b>
	<b>Head/Neck Injuries</b> <ul style="list-style-type: none"> <li>Spinal Motion Restriction</li> <li>Maintain ≥ 94% SpO<sub>2</sub> at all times</li> <li><i>If respiratory failure</i></li> <li>Ventilate at a rate of 10 bpm, or to maintain EtCO<sub>2</sub> 35-45 mmHg</li> </ul>		<b>Head/Neck Injuries</b> <ul style="list-style-type: none"> <li>Maintain SBP &gt; 120</li> <li>EtCO<sub>2</sub> between 35-45 mmHg</li> </ul>	<b>ASSIST &amp; ADVANCED</b>
	<b>Chest Injuries</b> <ul style="list-style-type: none"> <li>Bleeding control</li> <li>Stabilize impaled objects</li> <li>Stabilize flail segments</li> <li><i>If suspected open pneumothorax</i></li> <li>Partial occlusive dressing</li> </ul>		<b>Chest Injuries</b> <ul style="list-style-type: none"> <li>Tension Pneumothorax– Needle thoracostomy</li> </ul>	<b>ASSIST &amp; ADVANCED</b>
	<b>Abdominal/Pelvic Injuries</b> <ul style="list-style-type: none"> <li>Control bleeding</li> <li><b>Pelvic binder</b></li> <li>Stabilize impaled objects</li> <li>Evisceration– cover with saline moistened gauze</li> </ul>		<b>Pregnancy Considerations</b> <ul style="list-style-type: none"> <li>Left lateral recumbent (LLR) position</li> <li><i>If signs of poor cardiac output</i></li> <li>Manual fundus displacement (to left)</li> </ul>	<b>BASIC</b>
	<b>Junctional/Extremity Injuries</b> <ul style="list-style-type: none"> <li>Bleeding control (direct pressure, tourniquet)</li> <li><i>If bleeding uncontrolled by tourniquet</i></li> <li>Pack wound tightly with hemostatic gauze and kerlix gauze</li> <li>Splinting, as appropriate</li> <li>Sterile dressing– open fractures</li> <li>Care for <b>Amputated Body Part</b></li> </ul>			



## Trauma Transport Guidelines

Major trauma patients may need to be transported to a designated trauma center in a timely manner. It is in the best interest of the patient to be transported to a designated trauma center if the patient meets certain criteria.

*If any of the following criteria are present,*

- Transport to the closest Trauma Center (Level 1 or 2):

Injury Pattern	Mental Status & Vital Signs
→ Penetrating injury (e.g. GSW, stabbing) to head, neck, torso, upper arm, thigh	→ Unable to follow commands (motor GCS <6)
→ Skull deformity, suspected skull fracture	→ SBP < 90 (or relative hypotension)
→ Suspected spinal injury with new motor or sensory loss	→ Age ≥ 65 AND SBP ≤ 110
→ Chest wall instability, deformity, or suspected flail chest	→ HR > SBP (shock index of ≥ 1)
→ Suspected pelvic fracture	→ RR < 10 or > 29
→ Suspected two or more proximal long-bone fractures	→ Respiratory distress or need for assisted ventilation (e.g. BVM, SGA, ETT)
→ Crushed, degloved, mangled, or pulseless extremity	→ Room air pulse oximetry ≤ 90%
→ Amputation proximal to wrist or ankle	
→ Active bleeding requiring a tourniquet or wound packing with continuous pressure	

*If any of the following criteria are present,*

- Transport to the closest Trauma Center (Level 1, 2, 3, or 4):

Mechanism of Injury	Risk Factors
→ Fall from height > 10 feet	→ Low-level falls in older adults (age ≥ 65 years) with significant head impact
→ MVC with:	→ Anticoagulant use
Partial or complete ejection	→ Special, high-resource healthcare needs (chronic ventilator dependency, ventricular assist device)
Significant intrusion (including roof), with any:	→ Pregnancy > 20 weeks
> 12 inches occupant side	→ Burns in conjunction with trauma
> 18 inches any site	
Need for extrication of an entrapped patient	
Death in same passenger compartment	
Vehicle telemetry data consistent with severe injury	
→ Rider separated from transport vehicle with significant impact (e.g. motorcycle, ATV, horse, etc.)	
→ Pedestrian or bicycle rider thrown, run over, or with significant impact	

Traumatic mechanism not meeting above criteria may be transported to any approved receiving facility.

Pearls & Pitfalls:

- Amputations distal to wrist/ankle may be evaluated at closest Trauma Center with Orthopedic specialty coverage

BASIC

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## Burns

Assist airway, as appropriate

- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

*If suspected carbon monoxide (CO)*

- Ensure scene safety, and remove patient from toxic environment
- High flow O<sub>2</sub> by NRB + NC (15 lpm)

*If potential for ongoing burning*

- Brush dry chemicals then flush with water  
    Initiate decontamination, as appropriate
- Remove clothing/jewelry (affected area and distal to burn)
- Flush eyes with copious amounts of water, as appropriate
- Apply dressings to burns
  - ⇒ If ≤ 10% BSA, use moist dressings
  - ⇒ If ≥ 10% BSA, use dry burn sheet or dry sterile dressing and insulate to prevent hypothermia

BASIC

- Advanced airway management, as appropriate  
    Maintain high index of suspicion for inhalation injury  
    Stridor, muffled voice, singed facial/nasal hair, carbonaceous sputum
- Cardiac monitoring, and 12-lead EKG for electrical burns

- IV access, as appropriate; consider 500 ml NS IV/IO rapid bolus for hypotension, IIRR up to 2 L total

*If ≥ Partial thickness burn (≥10% BSA)*

- Administer IV fluids as per Advanced Burn Life Support (ABLS) guidelines, 500 ml/hr NS IV/IO

- Acute Pain Management, as appropriate

*If severe symptoms/signs (≥ 10% BSA partial thickness, full-thickness, circumferential, involvement of face/hands/feet/genitals, significant chemical or electrical burns, or airway involvement)*

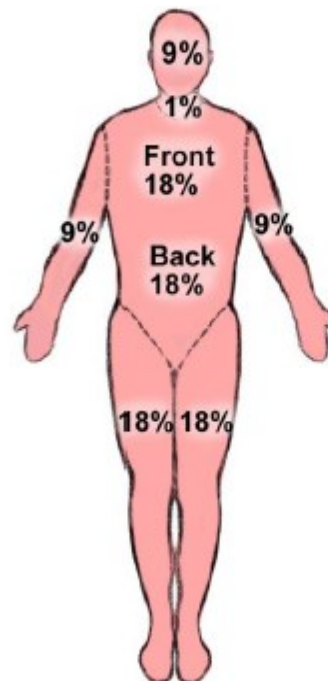
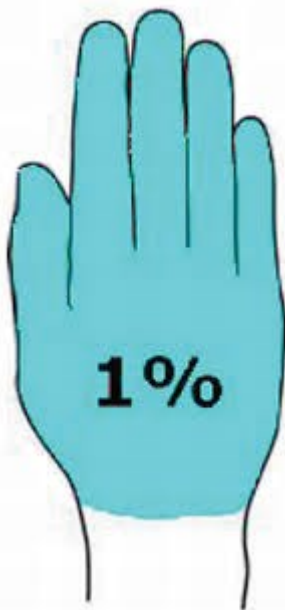
- Provide notification and transport to nearest burn center

*If unsecured airway*

- Transport to the closest full-service hospital

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Adult body Part	% of total BSA
Head	9%
Neck	1%
Leg	18%
Anterior trunk	18%
Posterior trunk	18%
Arm	9%

## Amputated Body Part

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Bleeding control (direct pressure, tourniquet)
- Cover the stump with saline-soaked sterile dressing and wrap with dry dressing
- Wrap severed part in saline-moistened sterile dressing
  - Place in watertight plastic bag
  - Place bag in cooler with ice, if possible
  - Do not freeze
  - Do not macerate/soak in water
  - Transport with patient to the Emergency Department

BASIC

- Advanced Airway management, as appropriate
- Monitoring, as appropriate
- **IV access**, as appropriate;
- If SBP ≤ 90*
  - NS - 250 ml IV bolus, IIRR 250 ml
    - If isolated extremity trauma*  
To 2 L total
    - If multi-trauma*  
Titrate to SBP = 90, (permissive hypotension)

ASSIST

- **Acute Pain management**, as appropriate

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## Entrapment/Crush/Traumatic Rhabdomyolysis

<ul style="list-style-type: none"> <li>• Assist airway, as appropriate</li> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Bleeding control (direct pressure, tourniquet)</li> <li>• Remove constricting clothing, jewelry</li> </ul>	<p style="text-align: center;"><b>Field amputation</b></p> <p>If anticipated prolonged entrapment/extrication, and if potential for worsening of patient condition in the absence of extrication, call <b>OLMC</b> to activate field amputation process</p>	<b>BASIC</b>	
<ul style="list-style-type: none"> <li>• Advanced airway management, as appropriate</li> <li>• Cardiac monitoring, <u>12-lead EKG</u></li> <li>• <u>IV access</u>, 20 ml/kg/hr NS Infusion IV/IO, to 2 L total; if prolonged extrication decrease to 500 ml/hr (<b>OLMC</b>)</li> </ul> <p><i>If EKG findings of hyperkalemia (peaked T-waves, wide QRS), contact <b>OLMC</b> following initial dose</i></p> <ul style="list-style-type: none"> <li>• <u>Calcium Chloride</u> - 1 g IV/IO, slow push</li> <li>• <u>Sodium Bicarbonate</u> - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg x 1</li> <li>• <u>Acute Pain Management</u> Protocol, as appropriate</li> </ul>		<b>ASSIST</b>	<b>ADVANCED</b>

## Spinal Motion Restriction

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*If penetrating trauma (including to the neck and/or spine with or without neurological deficit)*

- Do not initiate Spinal Motion Restriction Procedure

*If any of the following findings are present*

*History (five questions), midline tenderness, pain or paresthesias on external rotation*

- Initiate **Spinal Motion Restriction Procedure**

*Spinal motion restriction may be deferred **ONLY IF ALL OF THESE FINDINGS ARE ABSENT***

*History*

- Age  $\geq$  65
- Limited ability to sense or communicate pain  
*AMS, LOC, intoxicated, head trauma, language barrier, mental retardation*
- Distracting injury  
*Long bone fracture, visceral trauma (abdomen, pelvis), large laceration, crush injury, large burn*
- Neurologic deficit  
*Motor/sensory loss or paresthesia*
- Dangerous mechanism of injury  
*Fall  $\geq$  3-feet or 5-stairs*  
*Axial loading injury to the head (diving accident/sports injury)*  
 *Vehicular accident*  
*High speed motor vehicle accident  $\geq$  60 mph*  
*Motorized recreational vehicle accident*  
*Ejection*  
*Bicycle collision with immobile object (tree, parked car)*  
*Struck by large vehicle*  
*Roll-over*

*Palpation*

- Midline cervical tenderness

*Active Range of Motion Test*

- Patient is able to actively rotate neck 45 ° both to left and right with no pain, paresthesia or motor deficit

**If any pain or paresthesia upon rotation, IMMEDIATELY TERMINATE RANGE OF MOTION TEST**

*If patient unable to tolerate spinal motion restriction*

- Attempt less restrictive means (c-collar only ) or use position of comfort and/or allow patient to self-splint

## Emergency Childbirth

- Administer O<sub>2</sub> and titrate to SpO<sub>2</sub> ≥ 94% or work of breathing
- Check for presentation (crowning, limb, breach, cord) and follow procedures, as below

### *If crowning*

- [Emergency Childbirth Procedure](#)

#### *If nuchal cord,*

- If cord is loose around the neck: Attempt to gently slip cord over infant's head
- If cord is tight around the neck: Clamp cord × 2 (2-inches apart), cut between clamps  
This may result in high morbidity/mortality for both mother and child

### *If cord presentation*

- Position mother in Trendelenburg or in the knee-to-chest position
- Instruct the mother to pant with each contraction
- Palpate cord for pulse
  - No pulse
    - Gently push presenting fetal part upward off and into the birth canal
    - Maintain hand position so as to maintain cord pulse
    - Do not attempt to reposition if the cord retracts
  - Pulse
    - Apply moist sterile dressing to cord

### *If breech presentation*

- [Emergency Childbirth Procedure: breech presentation](#)

### *If single limb, rapid transport*

### *If premature birth*

- [Emergency Childbirth Procedure](#)
- Dry and cover newborn (start with head, then body)
  - Cover head and wrap body use dry liner and foil
- Administer blow-by oxygen (humidified, if available) avoid direct O<sub>2</sub> flow into neonate's face
- Minimize family member contact with neonate
- Once delivery complete, follow [Newly Born Protocol](#)

### *If uterine inversion*

- DO NOT ATTEMPT TO REMOVE PLACENTA
- Apply pressure to fundus upward through cervix, use fingertips and palm of gloved hand
- Cover with sterile moist dressing if unsuccessful

### *If suspected pre-eclampsia that meets all the following criteria*

- ≥ 20 weeks gestation through 6 weeks postpartum
- SBP ≥ 160 or DBP ≥ 110
- Headache, AMS, vision changes or pulmonary edema
- [Magnesium Sulfate](#) - 4 g IV over 15 min. followed by 2 g/hr IV infusion
- Contact [OLMC](#) after first dose

### *If suspected eclamptic seizure*

- [Seizure/Status Epilepticus Protocol](#)

### *If postpartum hemorrhage*

- [Tranexamic Acid](#) - 1 g IV/IO, slow push over 1 min

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# Newly Born

- Follow [Emergency Childbirth Protocol](#)
- Assess and document APGAR score at 1-minute and 5-minutes after birth

Warm, dry, and stimulate infant.

- Clear secretions as needed
- Assess breathing pattern and palpate pulse rate

*If apneic, gasping, or HR < 100 bpm*

- Begin assisted ventilation with a BVM without supplemental oxygen at rate 40-60 breaths per minute

*If HR < 60 despite 30-seconds of confirmed BVM ventilation*

- Begin CPR, 3:1 compressions-ventilation, 120 bpm

*If labored breathing or persistent cyanosis*

- Position and clear airway
- Supplemental oxygen as needed
- Begin SpO<sub>2</sub> monitoring (place on right hand)

→ Goal timeframe ~1 minute

BASIC

*If HR < 100 despite BVM*

- Ensure effective ventilation with BVM (chest rise and fall, waveform capnography)
- Advanced airway management, if necessary

*If HR < 60 despite 30-seconds of confirmed ventilation*

- Begin CPR, 3:1 compressions-ventilation, 120 bpm (if not already begun)
- Advanced airway management
- Ventilation with high-flow oxygen

*If HR < 60 despite 60-seconds of CPR*

- IV/IO access
- Epinephrine 1:10,000 - 0.01 mg/kg IV q 5-min
- If failure to respond to epinephrine and suspected hypovolemia*
  - NS - 10 ml/kg slow IV/IO push (max dose 50 ml), push over 10 minutes

*If blood glucose < 50*

- [Dextrose](#) 10% (25 g/250 ml) - 2 ml/kg IV/IO bolus
- Initiate transport

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→ SpO<sub>2</sub> slowly increases within the first 10 minute post-birth (see chart)

Targeted Procedural SpO <sub>2</sub>	
1 min	60-65%
2 min	65-70%
3 min	70-75%
4 min	75-80%
5 min	80-85%
10 min	85-95%

APGAR	0	1	2
Appearance	Blue/pale	Blue extremities	Good color
Pulse	Absent	≤100	≥100
Grimace	No response	Weak cry	Strong cry
Activity	None	Some	Flexed arms/legs
Respiratory Effort	Absent	Weak/gasps	Strong (with strong cry)

- Routine suctioning for meconium including endotracheal suctioning is generally not indicated
- Intraosseous access is only suitable for term infants > 3kg, and requires a slightly more distal approach than in older children
- Prevent hypothermia



## Patient Assessment

A pediatric patient is defined as:

- Patients 14-years of age or younger AND
  - Fit on a length-based-resuscitation tape (e.g. Broselow) OR
  - Estimated or known weight <36 kg (~80 lbs)
- For destination decisions follow patient destination policy

- Assure scene safety
- Perform initial assessment, including evaluation for hemodynamic life threats of the patient's airway, breathing, and circulation
- Assess mental status (e.g., AVPU) and disability (e.g., GCS)
- Perform a focused history and physical based on patient's chief complaint
- Utilize reference guide (Broselow/pre-calculated dosing reference) for medication dosing and equipment sizing

*If provider impression of extremis, including new-onset altered mental status, poor appearance, airway issues, severe respiratory distress/failure, signs and symptoms of shock/poor perfusion, or imminent cardiac or respiratory arrest:*

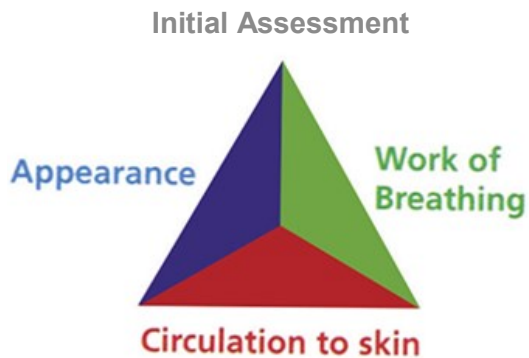
- Do not move patient to ambulance or transport from scene until best attempts at correcting hemodynamic instability have been completed (e.g. critical hypoxia, bradycardia, hypotension, etc.)
- Refer to:
  - Pediatric Crashing Patient: Medical
  - Pediatric Crashing Patient Trauma

- Complete interventions and perform a complete secondary exam to include a baseline set of vital signs
- Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR

BASIC

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### General Vital Signs and Guidelines

Age	Heart Rate (beats/min)	Blood Pressure (mmHg)	Respiratory Rate (breaths/min)
Premature	110-170	SBP 55-75 DBP 35-45	40-70
0-3 months	110-160	SBP 65-85 DBP 45-55	35-55
3-6 months	110-160	SBP 70-90 DBP 50-65	30-45
6-12 months	90-160	SBP 80-100 DBP 55-65	22-38
1-3 years	80-150	SBP 90-105 DBP 55-70	22-30
3-6 years	70-120	SBP 95-110 DBP 60-75	20-24
6-12 years	60-110	SBP 100-120 DBP 60-75	16-22
> 12 years	60-100	SBP 110-135 DBP 65-85	12-20

### Pediatric GCS

Eye Opening (4)	
Spontaneous	4
To Speech	3
To Pressure	2
None	1
Verbal Response (5)	
Coos, Babbles (infant)/Talks normally	5
Irritable cry (infant)/Words	4
Cries to pressure (infant)/Sounds	3
Moans to pressure	2
None	1
Best Motor Response (6)	
Spontaneous Movement	6
Withdraws to touch	5
Withdraws from pressure	4
Abnormal flexion	3
Abnormal extension	2
None	1



## Crashing Patient: Medical

*If general impression of patient in extremis*  
**DO NOT INITIATE MOVEMENT OF THE PATIENT**

- Consider requesting additional resources
- Obtain full set of vital signs (BP, HR, SpO<sub>2</sub>, ECG, Temp, BGL)
  - Initiate waveform capnography
  - Attempt to gain 360° access

• Assess Airway and Breathing Status

*If Respiratory Distress*

- Increased work of breathing
- Difficulty speaking in full sentences or crying
- Accessory muscle use/retractions
- Nasal flaring/pursed lips
- SpO<sub>2</sub> ≤ 90% on room air

*If Respiratory Failure*

- Poor respiratory effort/gasping
- Unable to speak (severe dyspnea)/cry
- Head bobbing/see-saw breathing
- Loss of muscle tone/control of posture
- Altered mental status/loss of interactivity
- SpO<sub>2</sub> ≤ 90% with O<sub>2</sub>
- Hypoventilation/Increasing EtCO<sub>2</sub>/Hypopnea

- High flow O<sub>2</sub> via NRB
- NIPPV
- If Asthma/Wheezing;*
- Or Suspected Choking;*
- Or Severe Anaphylaxis;*
- Or Stridor:*
- Treat underlying cause per protocol

- Immediately start MAX BVM (2 person, ETSN, elevate HOB, 100% O<sub>2</sub>, PEEP, 2 NPA ± OPA)

*If persistent hypoxia or no longer improving*

- Quick SGA

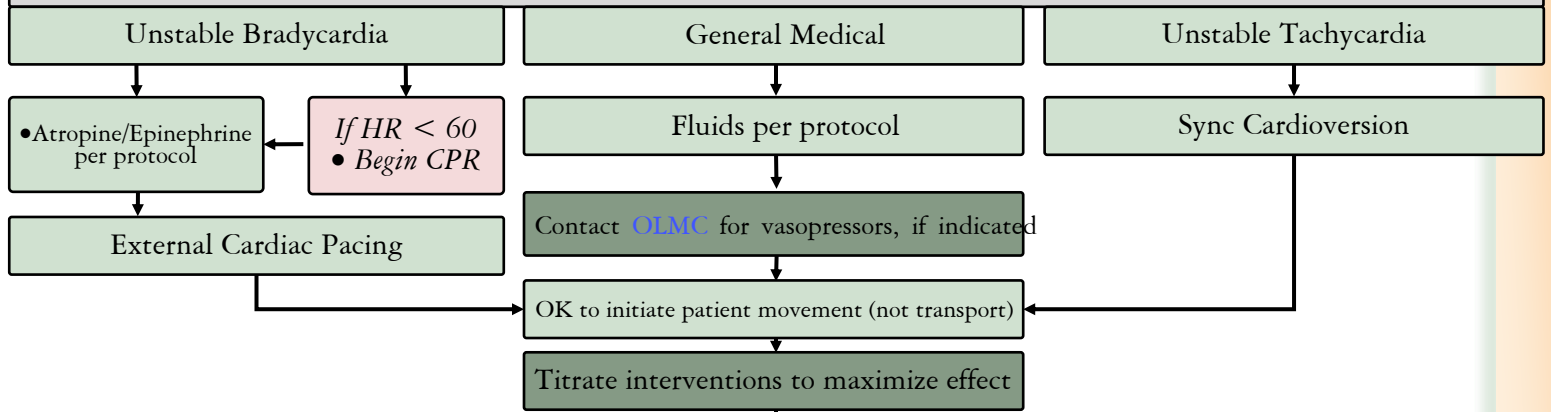
*If Can't Oxygenate; Can't Ventilate (COCV)*

- Consider Quick SGA
- Surgical airway/Transtacheal ventilation

**RESPIRATORY GOAL: SpO<sub>2</sub> ≥ 94%; or persistent hypoxia despite SGA/surgical airway/transtacheal ventilation**

• Assess Circulatory Status

*If hypotensive and signs of shock*



**CIRCULATORY GOAL: Resolution of hypotension/shock or initiation of vasopressors**

- Consider DAA
- OK to transport
- Maximize therapy en route (\*call OLPG if needed)

- Movement of the patient should be minimal until goals are met or treatment has been optimized
- Trending of vital signs is critically important, a single set does not verify stability
- Patients with known or suspected congenital heart disease may not achieve normal oxygen saturations
- Fluid responsiveness is variable depending on underlying conditions and physiology
- Optimize hemodynamics prior to intubation/DAA
- Patient movement increases risk of poor BVM, consider timing of advanced airway management
- For pacing, adjust output first to achieve capture, then adjust rate to maximize effect



## Crashing Patient: Trauma

*If general impression is critically injured trauma patient*  
**DO NOT INITIATE MOVEMENT OF THE PATIENT**

- Perform scene size up; consider requesting additional resources
- Obtain full set of vital signs (BP, HR, SpO<sub>2</sub>, EtCO<sub>2</sub>/waveform capnography)
  - Fully expose injuries; ensure 360° access to patient
    - Pre-hospital trauma alert ASAP
    - SMR as indicated

- Assess for Catastrophic Hemorrhage

- Hemorrhage control per protocol

**HEMORRHAGE GOAL:** Control catastrophic hemorrhage or maximal therapy per protocol

- Assess Airway and Breathing Status

### *If Respiratory Distress*

- Increased work of breathing
- Difficulty speaking in full sentences or crying
- Accessory muscle use/retractions
- Nasal flaring/pursed lips
- SpO<sub>2</sub> ≤ 90% on room air

### *If Respiratory Failure*

- Poor respiratory effort/gasping
- Unable to speak (severe dyspnea)/cry
- Head bobbing/see-saw breathing
- Loss of muscle tone/control of posture
- Altered mental status/loss of interactivity
- SpO<sub>2</sub> ≤ 90% with O<sub>2</sub>
- Hypoventilation/Increasing EtCO<sub>2</sub>/Hypopnea

- High flow O<sub>2</sub> via NRB

- Immediately start MAX BVM ventilation (2 person, jaw thrust, 100% O<sub>2</sub>, PEEP, 2 NPA ± OPA, elevate HOB maintaining SMR)

- If persistent hypoxia or no longer improving*
  - Quick SGA

- If Can't Oxygenate; Can't Ventilate (COCV)*
  - Consider Quick SGA
  - Surgical airway/Transtracheal ventilation

- If suspected open pneumothorax*
  - Partial occlusive dressing

- If suspected tension pneumothorax*
  - Needle decompression

**RESPIRATORY GOAL:** SpO<sub>2</sub> ≥ 94%; or persistent hypoxia despite SGA/surgical airway/transtracheal ventilation

OK to initiate patient movement (not transport)

- Assess Circulatory Status

- Consider pelvic binder; further bleeding control

- Consider DAA, if indicated and circulatory goal met

- OK to Initiate Transport
- IV/IO access
- Fluid bolus per protocol
- Advanced airway management, as appropriate
- Trauma alert
- Splinting and wound bandaging

→ Unless otherwise indicated, interventions should be performed en route

**CIRCULATORY GOAL:** Resolution of hypotension/shock (normotension if TBI); or hypoperfusion despite maximal therapy

- Achieve catastrophic hemorrhage control and respiratory goals then prioritize transport
- Patient may be moved for scene conditions or safety
- Prevent Hypothermia (blankets, increase patient compartment heat)
- TBI - Prevent Hypoxia, Hypotension, Hyperventilation
- Do not delay transport for non-essential procedures/testing (i.e. 12-lead, POC glucose in conscious/awake patient, minor splinting or wound bandaging, IV/IO access or fluid bolus)

## Shock/Hypotension

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Position patient in supine position with legs elevated, as appropriate and tolerated (no Trendelenburg)

*If suspected traumatic etiology*

- Control external bleeding
- Pelvic binder, as appropriate

**BASIC**

- Advanced airway management, as appropriate

*If suspected tension pneumothorax*

- [Needle Thoracostomy Procedure](#)
- [IV/IO access](#)
- Cardiac monitoring; treat dysrhythmias and transmit [12-lead EKG](#), as appropriate



**ASSIST**

### Trauma

*If SBP ≤ 70 + (age in years x 2) OR 90 (≥ 10 years)*

- NS - 20 ml/kg (max dose 250 ml) IV, IIRR to goal SBP

### General Medical

*If SBP ≤ 70 + (age in years x 2) OR 90 (≥ 10 years)*

- Treat underlying condition
- NS - 20 ml/kg IV bolus, IIRR to improved SBP and clinical signs of improved perfusion (mucosa, turgor, capillary refill, fontanel) to max 2 L total

*If goals not met*

- Contact [OLMC](#)

*If suspected anaphylaxis/anaphylactic shock or symptomatic bradycardia*

- [Epinephrine](#) infusion 0.1 mcg/kg/min  
Add Epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS, titrate by 0.1 mcg/kg/min q 2 min

*If documented history of Addison's disease/adrenal insufficiency, and with explicit parental consent*

- [Dexamethasone](#) - 0.6 mg/kg (max 4 mg)

**ADVANCED**



## Respiratory Insufficiency/Failure and Drug-Assisted Airway (DAA)

- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

*If signs of upper airway obstruction, attempt to clear the airway by*

- Attempt to clear the airway by
  - Jaw thrust/head-tilt-chin-lift
  - Nasopharyngeal and/or Oropharyngeal airway placement (NPA/OPA)
- Positioning (ear-to-sternal notch); place padding under infant's shoulders, up to 5 y/o lay flat, and head elevation for ≥ 5 y/o (same as adult)
- Remove foreign body airway obstruction (FBAO), as appropriate (Heimlich maneuver, chest compressions)

*If severe respiratory insufficiency/impending respiratory failure*

- **Assist ventilation with bag-valve-mask (BVM)**

*If equipped*

- **Confirm ventilation with EtCO<sub>2</sub>** (waveform with each breath, with goal of 35-45 mmHg)

If unable to confirm ventilation utilize up to two-NPAs in combination with an OPA, along with head elevation and two-rescuer mask seal technique

*If EtCO<sub>2</sub> available, and no Assist/Advanced providers on scene*

- Supraglottic Airway (see box, on right)

### Supraglottic Airway (King LT)

- Suction before attempting insertion
- Maintain HFNC throughout the procedure
- Position patient head in neutral or head elevated position for insertion
- Confirm EtCO<sub>2</sub> every breath
- Promptly remove device and ventilate by other means if EtCO<sub>2</sub> waveform is lost

*If gastric contents in SGA*

- Promptly remove and aggressively suction if copious secretions present in the tube
- If detector remains clogged (indicated by dashed EtCO<sub>2</sub> line) replace detector and confirm EtCO<sub>2</sub>

BASIC

*IV/IO access as appropriate*

*For suspected tension pneumothorax*

- **Needle Thoracostomy Procedure**

*If progression to severe respiratory insufficiency/respiratory failure, or unable to manage the airway*

- Advanced airway management (EtCO<sub>2</sub> required)
  - Preoxygenate with 100% oxygen (NRB ± HFNC)
  - Initiate laryngoscopy/endotracheal intubation (ETI) or supraglottic airway (SGA/KING LT)

*If primary ETI fails and able to ventilate, confirmed with EtCO<sub>2</sub>*

- Initiate SGA rescue (if size available); or BVM, optimize positioning/seal (ETSN, 2 rescuer seal)

### Laryngoscopy/Endotracheal Intubation

- Utilize **Intubation Checklist**
- Perform **Advanced Airway Preparation**
- Maintain HFNC throughout the procedure
- Position patient head in neutral or head elevated position to obtain best view
- Use assisted External Laryngeal Manipulation (ELM) as needed to obtain view
- Deliver bougie/tube
  - *If ETT 4.0 mm or greater*
    - Utilize bougie to deliver tube
  - *If ETT smaller than 4.0 mm*
    - Use styletted tube
- Maintain visualization until tube is seen passing the cords
- Confirm EtCO<sub>2</sub> every breath
- Promptly remove device and ventilate by other means if EtCO<sub>2</sub> waveform is lost

*If ≥ 35 kg and unable to place or maintain advanced airway, and if unable to adequately oxygenate or ventilate (no EtCO<sub>2</sub> waveform and persistent hypoxia)*

- **Surgical Airway & Transtracheal Ventilation Procedure**

ASSIST

*If unable to intubate or achieve sufficient patient relaxation prior to intubation, consider drug-assisted airway*

- **Ketamine** - 1 mg/kg IV/IO (max single dose 200 mg), IIRR x 1

*If further sedation or pain control is required once advanced airway obtained*

<i>If hemodynamically stable</i>		<i>If hypotensive</i>
Fentanyl – 1 mcg/kg IV/IO (max single dose 100 mg), IIRR q 5-min to max total dose of 500 mcg	OR	Midazolam – 0.1 mg/kg slow IV/IO (max single dose 2.5 mg), IIRR q 5-min to max total dose of 10 mg
Do not administer simultaneously, either agent may be given q 5-min; Reassess sedation level and vital signs between administrations		Ketamine – 2 mg/kg IV/IO (max single dose 200 mg)

ADVANCED

→ If SGA in place and ventilations are adequate, do not replace with endotracheal tube

## Traumatic Cardiac Arrest

<ul style="list-style-type: none"> <li>• DO NOT INITIATE MOVEMENT OF THE PATIENT</li> </ul> <p><i>If non-traumatic cause probable</i></p> <ul style="list-style-type: none"> <li>• Proceed with medical cardiac arrest management</li> </ul> <p><i>If traumatic <u>Withholding Resuscitative Efforts</u> met,</i></p> <ul style="list-style-type: none"> <li>• Consider withholding efforts</li> <li>• Initiate CPR and place pads</li> <li>• Rapidly &amp; Simultaneously Address Reversal Pathology (H.O.T.)</li> </ul>			BASIC
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Hypovolemia		Oxygenation	Tension	BASIC
<ul style="list-style-type: none"> <li>• Expose patient promptly</li> </ul> <p><i>If catastrophic hemorrhage suspected</i></p> <ul style="list-style-type: none"> <li>• Bleeding control interventions per General Trauma Protocol</li> </ul> <p><i>If major fractures present</i></p> <ul style="list-style-type: none"> <li>• Pelvic binder, as appropriate</li> <li>• Refer to General Trauma Protocol</li> </ul>	<ul style="list-style-type: none"> <li>• 1-2 IV attempts or IO</li> <li>• Rapid 20 ml/kg NS bolus via manual pressure or pressure bag</li> </ul>	<ul style="list-style-type: none"> <li>• BVM</li> <li>• SGA (place promptly)</li> </ul>	<p><i>If blunt or penetrating injury to torso</i></p> <ul style="list-style-type: none"> <li>• Needle Thoracostomy</li> </ul>	

<p><b>GOAL:</b> Catastrophic hemorrhage intervention, oxygenation and confirmed ventilation via EtCO<sub>2</sub>, and evaluation +/- treatment for tension pneumothorax</p>	ASSIST
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<ul style="list-style-type: none"> <li>• Epinephrine IV/IO per protocol (do not delay above for administration)</li> <li>• Advanced airway management (if not previously performed)</li> </ul> <p><i>If ROSC</i></p> <ul style="list-style-type: none"> <li>• Optimize patient hemodynamics, oxygenation, and ventilation, however prioritize rapid transport</li> <li>• Hospital pre-notification ASAP</li> </ul>	ASSIST
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Pearls:

- Patient may be moved for scene conditions or safety.
- Minimize pauses in chest compressions, however rapid addressing of reversal pathology is priority.
- There is limited evidence for epinephrine in TCA, focus should be on addressing reversible pathology.



## Acute Pain Management

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Position of comfort and splint extremity injuries, as appropriate
- Utilize pain scale (see below)

If pain ≤ 6, consider

- **Acetaminophen** - 15 mg/kg PO (max dose 1 g)

If severely nauseous and not vomiting

- **Ondansetron** - 8-15 kg- 2 mg ODT, IIRR x 1 in 10-min  
16-30 kg - 4 mg ODT, IIRR x 1 in 10-min

BASIC

- Advanced Airway management, as appropriate
- Monitoring, as appropriate
- **IV access**, as appropriate
- EtCO<sub>2</sub> monitoring

If pain > 6, in the presence of

- Burns
- Trauma
- Other syndromes
  - Abdominal pain
  - Sickle cell crisis

### Relative contraindications to IV pain management

- Inadequate respiratory/hemodynamic status
- AMS

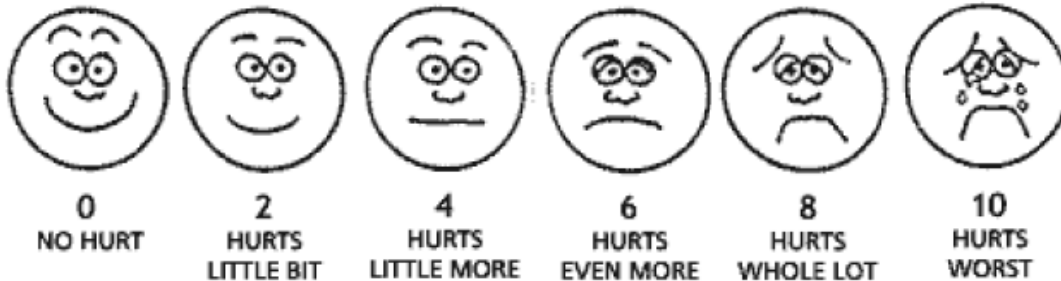
ASSIST

- **Fentanyl** - 1 mcg/kg IV/IN/IM (max single dose 100 mcg), IIRR × 1 (max total dose 200 mcg), titrate to pain relief and respiratory/hemodynamic status
- Monitor and document vital signs and pain scale following each dose; document body weight
- **Ketorolac** - 0.5 mg/kg IV/IM max single dose 15 mg

For active nausea/vomiting (routine administration of antiemetic with fentanyl not required)

- **Ondansetron** - 0.15 mg/kg IV (max dose 4 mg)

ADVANCED





## Release at Scene (RAS)

A Release at Scene (RAS) may **only** be performed if the reason for the 911 call is trauma-related (non-medical), and if “no” is answered to all of the following questions:

- Did the person activate 911 for EMS?
- Is the person disoriented, confused, or otherwise impaired (e.g. alcohol or drugs, language barrier, MHMR)?
- Was there any loss of consciousness?
- Is there any complaint of illness, pain, or injury?
- Was there a significant mechanism of injury (e.g. MCC, ejection, auto vs. pedestrian)?
- Were any patients on-scene dead?
- Does anyone object to the patient being released (e.g. family member, first-responder)?
- Has the patient had contact with EMS in the last 72-hours?

The following information will be documented in the ePCR:

- The answers to the above questions
- Incident number, unit number, and crew
- Contact phone number and home address of the person
- Signature of the parent or legal guardian
- Signature of a witness

BASIC

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## Consent for Treatment and Transport

Before treating an individual, you must first obtain consent either from the individual or from a legal surrogate. Consent to treatment may be implied when an individual is:

- **unable to communicate** because of an injury, accident, or illness; or
- **unconscious** and suffering from a life-threatening injury or illness; or
- a minor who is suffering from an immediate life-threatening injury or illness and whose parents, healthcare surrogate, or legal guardian is not present.

Otherwise, you cannot treat a person without their consent.

The right to refuse treatment includes the right to refuse assessment and the right to refuse all or specific treatments or assessments.

A person in law enforcement custody has the right to refuse treatment but not to refuse transport.

*If a patient refuses all contact or assessment*

- Record disposition of call as “refused all contact”

*If a patient communicates a refusal of assessment, treatment, or transport*

- Follow [Against Medical Advice \(AMA\)](#) protocol

*If a patient communicates a refusal of assessment, treatment, or transport but appears to lack decision making capacity*

- Follow [Refusal Without Demonstration of Capacity](#) protocol

BASIC

ASSIST

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## Against Medical Advice (AMA)

All AMAs must be patient-initiated.

Anytime a patient or their parent/guardian communicates a refusal of treatment, or transport:

- Perform a thorough history & physical
- Develop a differential diagnosis specific to the patient presentation
- Offer appropriate treatment and transport to the patient, parent, and guardian
- Explain the risks and consequences of refusing treatment and/or transport at the patient or parent/guardian's level of understanding, based on the differential diagnosis

*If a patient or their parent/guardian refuses an assessment or continues to refuse treatment or transport after the risks of refusal have been explained*

- Attempt to speak with whomever called 911, as well as any family, friends, bystanders, patient surrogates, or guardians and/or medical personnel on scene.
- Explain the risks and consequences of refusing treatment and/or transport at the parent or guardian's level of understanding
- Assess the patient or parent/guardian's understanding of the risks and consequences of refusing treatment and/or transport, and document this in their own words
- Perform capacity assessment (evaluation of patient's understanding of risk of refusal)
- Document all of the above in the PCR

*If the patient is suffering from a life-threatening injury or illness*

- Enlist the help of supervisors and [OLMC](#)

*If patient appears to lack decisional capacity, and refuses treatment or transport*

- Refer to [Refusal Without Demonstration of Capacity](#)

BASIC

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A patient's decisional capacity may be impaired as a result of, but not limited to, the following:

- ⇒ Use and/or abuse of alcohol, illegal or prescription drugs, or toxic substances
- ⇒ Head trauma, dementia, encephalopathy, and/or mental retardation
- ⇒ Acute or chronic psychiatric illness
- ⇒ Medical illness including, but not limited to, the following: hypoxia, hypotension, hyperglycemia, hypoglycemia, dehydration, and sepsis

## Refusal Without Demonstration of Capacity

*If patient refusing consent for medical treatment and/or transport but is unable to demonstrate decision making capacity*

- Ensure provider safety first and foremost
- Request Police in cases of mental illness or concern of behavioral emergencies, including self-harm or harm to others
- Contact [OLMC](#)
- Document:
  - Capacity assessment as it was performed
  - All personnel on scene – including any law enforcement name and badge number
  - If any family members present/spoken to, including content of discussions
- Record disposition of call as “refusal without demonstration of capacity”

BASIC

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Making a decision against medical advice does not alone demonstrate a lack of capacity.

Lack of capacity does not imply consent if the patient is able to communicate.

## Withholding Resuscitative Efforts

*If any of the following clinical signs of irreversible death or criteria*

- Rigor mortis/dependent lividity
- Fetal death after preterm delivery ( $\leq 20$  weeks gestation by best determination)
- Decapitation, decomposition or incineration
- Head-under submersion (excluding vehicular submersions) for greater than:
  - 90-minutes if water temperature  $\leq 6^{\circ}$  C ( $43^{\circ}$  F)
  - 30-minutes if water temperature  $>6^{\circ}$  C ( $43^{\circ}$  F)

*AND if all of the following*

- Pulseless & no heart tones
- Apnea
- No pupillary response
- Consider withholding resuscitative efforts
- Remain with the deceased until relieved by law enforcement (Unless unsafe to do so)
- Document objective findings including (each responding agency):
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings as appropriate
  - Suspicious/inconsistent scene or physical findings

For all other patients, or if at any point resuscitation was deemed appropriate, e.g. pulse/respiration witnessed by any provider

- Initiate resuscitative efforts, as per Cardiac Arrest Protocol

Notification of law enforcement is required.

*If patient has Out-of-Hospital Do Not Resuscitate order*

- See DNR Policy

*If patient has executed Medical Orders on Scope of Treatment (MOST) or Physician's Orders for Life-Sustaining Treatment (POLST)*

- Limit resuscitation as directed by MOST/POLST form

BASIC

*If NO clinical signs of irreversible death in the setting of blunt or penetrating trauma present, and if all of the following:*

- Pulseless & no heart tones
- Apnea
- No pupillary response
- Asystole on cardiac monitor
- Consider withholding resuscitative efforts
- Remain with the deceased until relieved by law enforcement (unless unsafe to do so)
- Document objective findings including (each responding agency):
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings as appropriate
  - Suspicious/inconsistent scene or physical findings

ASSIST

ADVANCED

- If any patient has any clinical signs of irreversible death, and they are apneic and pulseless with no pupillary response, then resuscitation may be withheld
- If there are no signs of irreversible death, then all patients (without DNR) must be worked, unless they have a trauma mechanism, in which case they must also have confirmed asystole, as well as be apneic and pulseless with no pupillary response, in order to withhold resuscitative efforts
- For the purpose withholding of resuscitation, electrical/lightning strikes are not considered trauma

## BLS Transport Criteria

### BLS UNIT CANNOT TRANSPORT PATIENTS WITH ANY OF THE FOLLOWING:

#### Crashing Patient

- Provider impression of extremis, including new-onset altered mental status, poor appearance, airway issues, severe respiratory distress/failure, signs and symptoms of shock/poor perfusion, or imminent cardiac or respiratory arrest

#### Airway

- Current or anticipated need for airway management

#### Breathing

- Respiratory failure or distress
- Hypoxia (SpO<sub>2</sub> < 94%) despite NRB or PPV (including BPAP and CPAP)

#### Circulation

- Cardiac chest pain or anginal equivalent
- EKG with ischemia or infarct
- EKG with new or concerning dysrhythmia
- Current or anticipated need for IV fluids, vasopressors, or other IV medication
- Unstable bradycardia/tachycardia
- Hypotension

#### Disability

- Acute change in mental status (GCS < 13)
- Positive stroke screen (or new neurologic deficit)
- Seizure not returned to baseline or multiple seizures
- Syncope
- Acute Agitation
- Severe intoxication/overdose

#### Everything Else

- Significant injuries or high mechanism trauma
- Hypoglycemia with AMS
- Hyperglycemia with AMS
- Pediatric patients with a high-risk complaint (e.g., BRUE) or complex medical history
- Basic Provider Clinical Concern
- ALS Procedure Performed (not including IV placement or 12-lead EKG interpretation)
- ALS Medication Administered

BASIC

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### BLS only resource(s) on scene:

*If transport is required*

- Review BLS Transport Criteria and complete ePCR criteria documentation and appropriate crew signatures

*If no criteria met*

- Transport by BLS ambulance

*If any criteria met*

- Request an ALS resource and include priority of response requested based on patient condition
  - Provide handoff to ALS resource
  - ALS clinicians should not attempt to hand off care to the BLS resource

*If ALS resources are not available within a reasonable timeframe*

- If time-sensitive/emergent condition, consider transport to the closest appropriate facility
- Consider OLPG for additional assistance in decision making

### BLS with ALS resource on scene:

*If transport required*

- Review BLS Transport Criteria and complete ePCR criteria documentation and appropriate crew signatures

*If no criteria met*

- Transport by BLS ambulance

*If any criteria met*

- QRV Advanced-credentialed clinician should attend to patient during transport, or
- Transfer care to ALS ambulance

*If ALS QRV/Ambulance is not available within a reasonable timeframe, and patient experiencing a time-sensitive/emergent condition*

- Consider transport to the closest appropriate facility, or
- A FRO Assist-credentialed clinician may elect to attend to patient during transport

→ Default to ALS clinician for any concerns or disputes

→ If a patient meets BLS transport criteria and an Assist/Advanced credentialed clinician has interpreted an EKG (no ischemia or dysrhythmia), they should sign the appropriate field in the ePCR before transferring care back to the BLS unit.

→ If an Assist/Advanced credentialed clinician is unavailable and an EKG acquisition/interpretation is required to determine BLS Transport Criteria, a BLS clinician may acquire the EKG and facilitate a remote interpretation of the EKG image by an appropriately credentialed clinician.

## Cardiac Arrest

- Begin 2-minute cycles of **Pit Crew CPR** CPR; 15:2 compressions-ventilation, 100-120 bpm, no pauses > 10 seconds
- **BVM ventilation** for first 6-minutes (waveform EtCO<sub>2</sub> required, if available)
- Apply AED
  - If arrest witnessed by EMS/FIRE—apply AED immediately
  - If arrest unwitnessed—perform 2-minutes of CPR before applying AED
- Perform CPR to goal of EtCO<sub>2</sub> ≥ 20 mmHg
- Utilize Broselow tape

BASIC

- Apply cardiac monitor only after completion of last 2-minute cycle of CPR
- IV/IO access
- Advanced airway management (waveform EtCO<sub>2</sub> required) only after > 6-minutes or 3-cycles of CPR

- VF/VT**
- **Defibrillate** at 2 J/kg; IIRR q 2 min, increase by 2 J/kg (max 10J/kg or max energy setting)
  - **Epinephrine** 1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO q 5-min. 3-dose-max
  - **Amiodarone** - 5 mg/kg IV/IO (max 300 mg) after second defibrillation, IIRR x 2 every other cycle or 4 min, if persistent or recurrent VF/VT

- Asystole/PEA**
- **Epinephrine** 1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO immediately, then q 5 min 3-dose-max

ASSIST

For any of the following give early in the course of cardiac arrest management.

Metabolic acidosis etiology (e.g. DKA)	• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO
Hyperkalemia:	• <b>Calcium Chloride</b> - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g) • <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO
Torsades de Pointes:	• <b>Magnesium Sulfate</b> - 25-50 mg/kg (max 2 g) IV/IO, slow
Tension Pneumothorax:	• <b>Needle Thoracostomy Procedure</b>
If any of the below causes are suspected, contact <b>OLMC</b> following initial dosing	
Tricyclic Antidepressant Overdose:	• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO
Calcium Channel Blockers:	• <b>Calcium Chloride</b> - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)
Beta Blocker Overdose:	• <b>Glucagon</b> - 0.1 mg/kg IV/IO slow push over 1-minute (max single dose 1 mg), IIRR 0.2 mg/kg IV/IO × 1 (max single dose 1 mg)

ADVANCED

- If signs of obvious death see Withholding Resuscitative Efforts
- Resuscitate in the location found unless scene is unmanageable
- Limit chest compression pauses and individual pause length to < 10-seconds
- Do not interrupt CPR for airway management
- Open airway; If choking suspected, remove FBAO as early as possible
- Waveform EtCO<sub>2</sub> required for all advanced airways
  - Confirm waveform EtCO<sub>2</sub> ≥ 5 mmHg for every breath
  - Remove airway if EtCO<sub>2</sub> ≤ 5 mmHg
- Switch AED to monitor/defibrillator only after completion of the current CPR cycle
- Do not interrupt CPR or defibrillation for ACLS drug administration
- If ROSC, optimize patient hemodynamics, oxygenation, and ventilation prior to initiating transport
- Sodium bicarbonate is not indicated for prolonged down time



## Symptomatic Bradycardia

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

*If heart rate ≤ 60 with signs of hypoperfusion or end-organ dysfunction*

- CPR; 15:2 compressions-ventilation, 100-120 bpm, no pauses > 10 seconds

BASIC

- Advanced airway management, as appropriate
- Cardiac monitoring and 12-lead EKG
- **IV access**

*If persistent symptomatic bradycardia with adequate oxygenation and ventilation*

- **Epinephrine** 1:10,000 - 0.01 mg/kg IV/IO (max single dose 0.1 mg)

*If persistent symptomatic bradycardia, and primary AV-block or increased vagal tone*

- **Atropine** - 0.02 mg/kg IV/IO (minimum dose 0.1 mg and maximum single dose 0.5 mg), IIRR × 1

*If persistent symptomatic bradycardia with adequate oxygenation and ventilation*

- Consider **External Cardiac Pacing**
  - Place pediatric pads in anterior/posterior position
  - Begin at 30 mA and increase energy in 10 mA increments until capture achieved
  - Begin at the appropriate rate for the patient's age, and increase pacing rate in 10 ppm increments until hemodynamic response/improved perfusion

Pediatric Pacing Guide			
Age	0-36 months	36 months-12 years	> 12 years
Rate	120 ppm	100 ppm	70 ppm

*If time permits and if adequate respirations, consider sedation prior to/during pacing*

- **Ketamine** - 0.5 mg/kg IV/IO, IIRR × 2

ASSIST

*If insufficient sedation*

- **Midazolam** - 0.05 - 0.1 mg/kg IV/IO/IN, max single dose 2.5 mg (EtCO<sub>2</sub>)

Consider underlying causes of bradycardia, and treat as below

Shock/hypotension	<ul style="list-style-type: none"> <li>• NS - 20 ml/kg IV/IO rapid bolus for hypotension; IIRR up to 2 L total</li> <li>• <b>Epinephrine infusion</b> Add Epinephrine 1:10,000 -1 mg (10 ml) to 250ml NS, Infuse at 0.1 mcg/kg/min, titrate by 0.1 mcg/kg/min q 2 min</li> </ul>
Hyperkalemia	<p>WIDE COMPLEX RHYTHM, 12-LEAD EKG FINDINGS, DIALYSIS HX</p> <ul style="list-style-type: none"> <li>• <b>Calcium Chloride</b> - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)</li> <li>• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO</li> </ul>
Acidosis	<ul style="list-style-type: none"> <li>• <b>Sodium Bicarbonate</b> - 1 mEq/kg IV/IO</li> </ul>

If any of the below causes are suspected, contact **OLMC** following initial dosing

Beta Blocker Toxicity	<ul style="list-style-type: none"> <li>• <b>Glucagon</b> - 0.1 mg/kg IV/IO slow push over 1-minute (max single dose 1 mg), IIRR 0.2 mg/kg IV/IO × 1 (max single dose 1 mg)</li> </ul>
Calcium Channel Blocker Toxicity	<ul style="list-style-type: none"> <li>• <b>Calcium Chloride</b> - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)</li> </ul>

ADVANCED

→ **Symptomatic Bradycardia** = Heart Rate ≤ 60 (very young) or relative bradycardia with:  
 Signs of poor perfusion or end organ dysfunction  
 Hypotension (or relative hypotension)  
 Acute pulmonary edema

→ Failure to capture may reflect underlying cause of bradycardia

→ Capture thresholds are similar in pediatrics as to adults

→ Monitor pads for burns, pediatrics have more sensitive skin

## Tachycardias

<ul style="list-style-type: none"> <li>Assist airway, as appropriate</li> <li>Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> </ul>	<b>BASIC</b>
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<ul style="list-style-type: none"> <li>Advanced airway management</li> <li>Cardiac monitoring and <b>12-lead EKG</b></li> <li>Assess rhythm for rate, width and regularity                     <ul style="list-style-type: none"> <li>Do not delay cardioversion for IV placement or ACLS drugs in the presence of severe hemodynamic instability</li> </ul> </li> <li><b>IV access</b>; NS 15ml/kg IV/IO rapid bolus for hypotension, IIRR up to 30 ml/kg or 2 L total</li> </ul>	<b>ASSIST</b>
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Unstable	Stable		<b>ASSIST</b>
<ul style="list-style-type: none"> <li><b>Synchronized Cardioversion</b>- 0.5-1.0 J/kg, then 2 J/kg</li> </ul> <p><i>If time permits, consider sedation prior to/during pacing</i></p> <ul style="list-style-type: none"> <li><b>Ketamine</b> - 0.5 mg/kg IV/IO, IIRR × 2</li> </ul> <p><b>Narrow complex (QRS &lt; 0.12)</b> (SVT: PAT)</p> <p><i>While preparing/ if time allows</i></p> <ul style="list-style-type: none"> <li><b>Adenosine</b> - 0.1 mg/kg rapid IV/IO (max 6 mg)</li> </ul>	<p><b>Narrow complex (QRS &lt; 0.12)</b></p> <p style="text-align: center;"><b>Regular</b> (SVT: PAT or A-Flutter)</p> <ul style="list-style-type: none"> <li>Vagal maneuver</li> <li><b>Adenosine</b> - 0.1 mg/kg rapid IV/IO (max 6 mg)</li> <li>IIRR 0.2 mg/kg IV/IO (max 12 mg)</li> </ul>	<p><b>Wide complex (QRS &gt; 0.12)</b></p> <p style="text-align: center;"><b>Irregular</b> (A-fib)</p> <ul style="list-style-type: none"> <li>Treat underlying cause (no adenosine)</li> </ul> <p style="text-align: center;"><b>Regular</b> (Ventricular Tachycardia or SVT with BBB or accessory pathway)</p> <ul style="list-style-type: none"> <li><b>Adenosine</b> - 0.1 mg/kg rapid IV/IO (max 6 mg), unless known VT</li> </ul>	
	<p style="text-align: center;"><b>Irregular</b> (A-fib)</p> <ul style="list-style-type: none"> <li>Treat underlying cause, contact <b>OLMC</b> as necessary</li> </ul>	<p style="text-align: center;"><b>Regular</b> (Ventricular Tachycardia or SVT with BBB or accessory pathway)</p> <ul style="list-style-type: none"> <li><b>Amiodarone</b> - 5 mg/kg IV, max 150 mg (over 10 min)</li> </ul> <p style="text-align: center;"><b>Suspected Hyperkalemia</b></p> <ul style="list-style-type: none"> <li><b>Calcium Chloride</b> - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)</li> <li><b>Sodium Bicarbonate</b> - 1 mEq/kg IV <i>If suspected acidosis</i> IIRR 0.5 mEq/kg</li> </ul> <p style="text-align: center;"><b>Torsades de Pointes</b></p> <ul style="list-style-type: none"> <li><b>Magnesium Sulfate</b> - 25-50 mg/kg (max 2 g) IV/IO, slow push</li> </ul>	<b>ADVANCED</b>

<ul style="list-style-type: none"> <li>→ <b>Unstable Tachycardia</b> (symptoms/signs do not generally occur unless rate ≥ 150)                     <ul style="list-style-type: none"> <li>Hypotension (or relative hypotension with signs of poor perfusion or end organ dysfunction)</li> <li>Acute pulmonary edema</li> </ul> </li> <li>→ If suspected sinus tachycardia or MAT,                     <ul style="list-style-type: none"> <li>Treat the underlying condition</li> </ul> </li> <li>→ Upper limit of sinus tachycardia is approx. 220 - patient age</li> </ul>
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## Abdominal Pain

- Assist airway appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> of  $\geq 94\%$  or work of breathing
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock

BASIC

- Cardiac monitoring, as appropriate
- IV/IO access, as appropriate

For severe nausea/vomiting

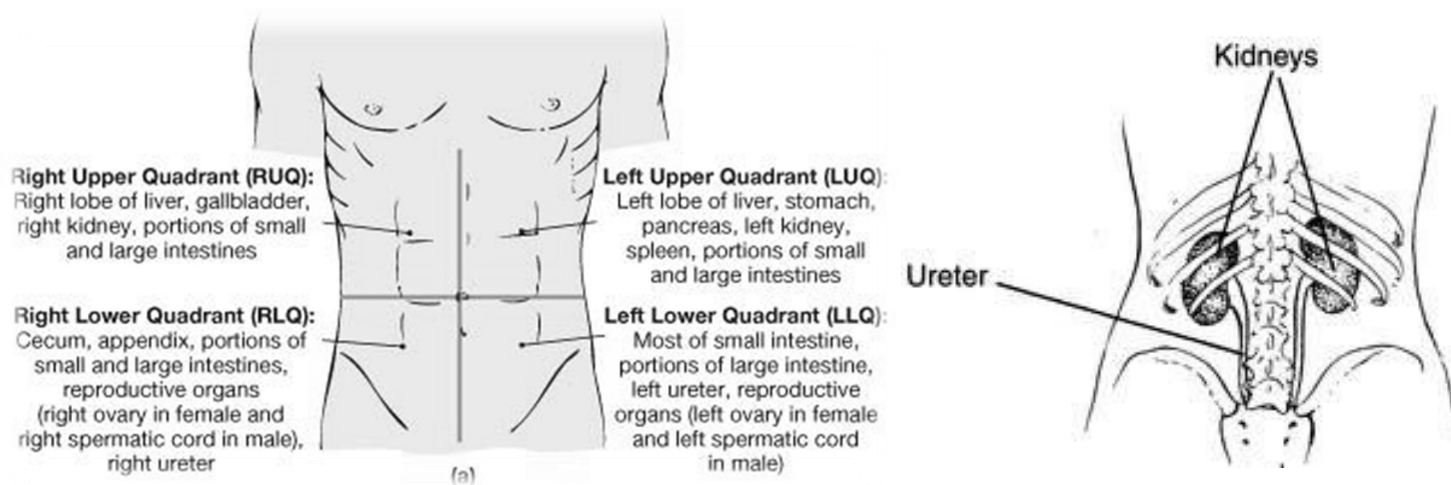
- [Nausea and Vomiting Protocol](#)

ASSIST

For moderate-to-severe acute pain ( $> 6/10$ ) on the Pain Scale and/or grimacing/guarding/moaning

- [Acute Pain Management Protocol](#)
- Treat associated causes ([Overdose/Poisoning](#), [Diabetic Emergencies](#))

ADVANCED



## Allergic Reaction/Anaphylaxis

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- For suspected respiratory failure see [Respiratory Insufficiency/Failure & Airway](#)
- Remove inciting agent (e.g. stinger), if possible

### LOCAL REACTION/RASH/HIVES

- Observe for respiratory distress and hypotension

### WHEEZING/BRONCHOSPASM

- [Albuterol](#) - 2.5 mg/[ipratropium](#) -0.5 mg in 3 ml NS nebulized IIRR x 2

### SEVERE SIGNS/SYMPTOMS

- Stridor
- Oropharyngeal swelling/difficulty swallowing/throat tightening
- Severe dyspnea
- Wheezing with accessory muscle use
- Poor air-movement to auscultation
- Difficulty speaking in full sentences
- Hypotension ± signs of shock
- [Epinephrine](#) 1:1,000 - 0.01 mg/kg IM (max 0.3 mg), IIRR x 2 q 5-10 min.

BASIC

- Advanced airway management, as appropriate
- Cardiac monitoring
- [IV access](#), as appropriate; consider 20ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 2L total
- [Diphenhydramine](#) - 1mg/kg IM/IV/IO (50 mg max total dose)

*If respiratory distress*

- Initiate EtCO<sub>2</sub> monitoring

ASSIST

*In presence of signs of anaphylaxis/anaphylactic shock (stridor and or hypotension/ end organ dysfunction), DO NOT DELAY*

- [Epinephrine](#) infusion  
Add Epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS,  
Infuse at 0.1 mcg/kg/min, titrate by 0.1 mcg/kg/min q 2 min

*Consider*

- [Dexamethasone](#) - 0.6 mg/kg PO/IM/IV (max 12 mg)

ADVANCED

- If personal/family history of non-allergic angioedema, above interventions may provide no benefit
- Use extreme caution if patient wishes to refuse transport following treatment (several hours of monitoring may be necessary)

## Altered Mental Status/CNS Depression

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Assess blood glucose concentration

If ≤ 60 mg/dl:

- Oral Glucose 7.5 g buccal (If conscious/able to tolerate)

If known or suspected **opiate intoxication** with miosis, respiratory depression, and CNS depression (all 3)

- **Naloxone** - 0.5 mg IN, IIRR q 5 min. to 2 mg max total dose

If Brief Resolved Unexplained Event (BRUE) identified

- Record and report the history and quality and duration of the symptoms before, during, and after the event (color, tone, breathing, feeding, position, activity, and LOC), caregiver resuscitation efforts, history of prematurity
- Strongly encourage transport to pediatric hospital

BASIC

- EtCO<sub>2</sub> monitoring
- Advanced airway management, as appropriate
- Cardiac monitoring, acquire and transmit 12-lead EKG
- IV access, as appropriate

If blood glucose ≤ 60 mg/dl:

- **Dextrose 10%** (25 g/250 ml) - 5 ml/kg IV/IO bolus, IIRR up to 25g (250 ml)

If known or suspected **opiate intoxication** with miosis, respiratory depression, and CNS depression (all 3)

- **Naloxone** - 0.5 mg IV/IN, IIRR q 5 min. to 2 mg max total dose

ASSIST

If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained:

- **Glucagon** 0.1 - mg/kg IM/IN (max dose 1 mg)

If shock/hypotension

- See **Shock/Hypotension**

Consider other causes of AMS and treat as follows, Contact **OLMC** following initial dosing

If **beta-blocker overdose**

- **Glucagon** - 0.1 mg/kg IV/IO (max dose 1 mg), IIRR 0.2 mg IV/IO x 1 (max dose 1 mg)

If **calcium channel blocker overdose**

- **Calcium Chloride** - 20 mg/kg (0.2 ml/kg) IV/IO slow push

If **organophosphate poisoning**

- **Atropine** - 0.02 mg/kg IV/IM/IO, IIRR until signs of atropinization (see **Overdose/Poisoning**)

If **tricyclic antidepressant intoxication**

- **Sodium Bicarbonate** - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg (see **Overdose/Poisoning**)

ADVANCED

Consider trauma/abuse in patients ≤ 5 years old unexplained by other causes regardless of physical findings

→ General trauma

→ SMR

BRUE (Brief Resolved Unexplained Event) is an event in an infant less than 1-year reported by a bystander as sudden, brief, and completely resolved upon EMS arrival that includes one or more of the following:

- a. Absent, decreased, or irregular breathing
- b. Color change (central cyanosis or pallor)
- c. Marked change in muscle tone (hyper- or hypotonia)
- d. Altered level of responsiveness

Highest risk BRUE: Age < 60 days, prematurity, CPR by trained medical provider, event lasting > 1 min, multiple BRUE events

## Behavioral Emergencies/Agitation

- Protect yourself and other crew (await law enforcement, as appropriate)
- Approach patient calmly and with caution
- Verbally de-escalate if possible
- Use “take-down”/manual restraint if other methods have failed
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Restrain, if necessary
  - Supine position (avoid positional asphyxia)
  - Lateral decubitus (if risk of aspiration)
- Passive/active cooling, as appropriate (see [hyperthermia](#))
- Blood glucose assessment and treatment (see [Diabetic Emergencies Protocol](#))

Appropriate Supine Restraint:



BASIC

- [EtCO<sub>2</sub> monitoring](#)
- Advanced airway management, as appropriate
- [IV access](#), as appropriate; consider 20 ml/kg NS IV/IO rapid bolus for hypotension (max 20 ml/kg or 2 L),
- Cardiac monitoring, acquire and transmit [12-lead EKG](#) as appropriate
- [Midazolam](#) - 0.05 mg/kg slow IV/IO, IIRR x 1 q 5-min (max 0.5 mg/kg total)
  - or
  - 0.1 mg/kg IM/IN, IIRR × 1 (max 0.5 mg/kg total)

ASSIST

*If suspected Hyperactive Delirium with Severe Agitation, and if unable to achieve optimal behavioral control*

- [Ketamine](#) - 1 mg/kg IV (max single dose 100 mg) or 2 mg/kg IM (max single dose 200 mg)

Monitor respiratory and hemodynamic status

Must wait 5 min after last dose of Midazolam

*Following initial dose, contact [OLMC](#)*

ADVANCED



## Diabetic Emergencies

<ul style="list-style-type: none"> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Assess blood glucose concentration</li> </ul> <p><i>If ≤ 60 mg/dl:</i></p> <ul style="list-style-type: none"> <li>• <b>Oral Glucose</b> 7.5 g buccal (<i>If conscious/able to tolerate</i>)</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>• Cardiac monitoring, as appropriate</li> <li>• <b>IV access</b>, as appropriate</li> </ul> <p><i>Hypoglycemia: If blood glucose ≤ 60 mg/dl</i></p> <ul style="list-style-type: none"> <li>• <b>Dextrose 10%</b> (25 g/250 ml) - 5 ml/kg IV/IO bolus, IIR up to 25 g (250 ml)</li> </ul> <p><i>Hyperglycemia: If blood glucose ≥ 300 mg/dl and altered mental status and/or signs of hypovolemia</i></p> <ul style="list-style-type: none"> <li>• IV access as appropriate; consider NS 20 ml/kg IV/IO up to 2 L total</li> </ul>	<b>ASSIST</b>
<p><i>If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained:</i></p> <ul style="list-style-type: none"> <li>• <b>Glucagon</b> 0.1 mg/kg IM/IN (max dose 1 mg)</li> </ul>	<b>ADVANCED</b>
<p>Consider differential diagnosis for hyperglycemia</p> <ul style="list-style-type: none"> <li>→ Diabetic Ketoacidosis (DKA)</li> <li>→ Hyperosmolar hyperglycemic state (non-ketotic)</li> <li>→ Infection/sepsis</li> </ul>	



## Fever

- Assist airway as appropriate
- Remove excess blankets/clothing if present
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock
- [Acetaminophen](#) - 15 mg/kg (max dose 1 g) PO

BASIC

- [IV access](#), as appropriate

ASSIST

ADVANCED

- Contraindications
  - Received Tylenol within last 4 hours
  - Active and severe hepatic disease
  - Severe hepatic impairment
  - Hypersensitivity to acetaminophen
- PEARLS
  - Fever is temperature  $\geq 100.4^{\circ}$  F
  - Assure upon arrival at receiving facility to inform acetaminophen administered
  - Only administer s/p febrile seizure if pt has returned to baseline mentation
- Consider other protocols as appropriate
  - [Sepsis \(shock/hypotension\)](#)
  - [Seizure](#)

## Nausea and Vomiting

- Position patient to avoid aspiration

*Consider recovery position*

- Suction, as appropriate

*If pediatric patient is able to follow instructions, then*

- Isopropyl Alcohol – 3-pads. Instruct patient to hold pads 1-2 cm from nose and inhale deeply as frequently as required to achieve nausea relief. IIRR x 1

*If not actively vomiting*

- Ondansetron - 8-15 kg: - 2 mg ODT, IIRR x 1 in 10-min  
16-30 kg:- 4 mg ODT, IIRR x 1 in 10-min

BASIC

IV access, as appropriate; NS - 20 ml/kg for signs of dehydration

Ondansetron - 0.15 mg/kg IV (max dose 4 mg)

ASSIST

ADVANCED

→ IV opiates (fentanyl) do not require co-administration of antiemetics; therefore, only administer ondansetron following treatment with opiates in the presence of active nausea/vomiting



## Overdose/Poisoning/Adverse Drug Reaction

*If suspected toxic exposure*

- Remove patient from environment if safe/trained/equipped (PPE) to do so
- Ensure full decontamination prior to initiating care
- Assist airway as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> of ≥ 94% and work of breathing
- Determine blood glucose concentration, treat as appropriate

*If known or suspected opiate intoxication with miosis, respiratory depression, and CNS depression (all 3)*

- **Naloxone** - 0.5 mg IN IRR q 5 min. to 2 mg max total dose

*If suspected carbon monoxide (CO)*

- High flow O<sub>2</sub> by NRB + HFNC (as available) 15 lpm each.

*If caustic ingestion*

- Do not induce vomiting or allow the patient to eat or drink

BASIC

- Advanced airway management as appropriate
- **IV/IO** access; follow **Shock/Hypotension Protocol**, as appropriate

*If known or suspected opiate intoxication with miosis, respiratory depression, and CNS depression (all 3)*

- **Naloxone** - 0.5 mg IV/IN, IRR q 5 min. to 2 mg max total dose

*If cocaine/amphetamine/stimulant/sympathomimetic intoxication*

- **Midazolam** - 0.05 mg/kg (max dose 2.5 mg) IV, IRR x1

*If dystonic reaction*

- **Diphenhydramine** - 1 mg/kg (max dose 50 mg)

*In the setting suspected cyanide poisoning (inhalation (smoke), dermal or ingestion exposure) AND if altered mental status, hemodynamic instability, or cardiac arrest*

- **Hydroxocobalamin** (if available) through a dedicated IV/IO, IRR x 1; contact **OLMC** following initial dose
  - 1-2 years: 0.625 g IV/IO over 15 minutes
  - 3-5 years: 1.25 g IV/IO over 15 minutes
  - 6-13 years: 2.5 g IV/IO over 15 minutes

ASSIST

*Consider the following toxidromes/treatments; following initial dose, contact OLMC*

**Tricyclic Antidepressant (TCA)**

- **Sodium Bicarbonate** - 1 mEq/kg IV, IRR 0.5 mEq/kg x 1

**Beta-blocker**

- **Glucagon** - 0.1 mg/kg IV/IO (max dose 1 mg), IRR 0.2 mg/kg IV/IO x 1 (max dose 1 mg)

**Calcium Channel Blocker**

- **Calcium Chloride** - 20 mg/kg (0.2 ml/kg) IV/IO slow push

**Organophosphate**

- **Atropine** - 0.02 mg/kg IV/IM/IO, IRR until signs of atropinization

ADVANCED

- SpO<sub>2</sub> may be a poor indicator of severity in CO poisoning; therefore, regardless of SpO<sub>2</sub>, always treat the patient
- Toxidromes secondary to substances or to toxic doses of common medications may result from exposure in the form of Ingestion, inhalation, injection, skin absorption
- Dystonias may result from a number of psychiatric (antipsychotic) and GI medications

**Hydroxocobalamin**

**Reconstitution Procedure:**

- Add 200 ml 0.9% sodium chloride injection from vial #1 to vial #2
- Fill the vial to the line (keep vial #2 in an upright position)
- Rock or rotate the vial for 30-seconds to mix the solution, **Do not shake**
- Administer through vented IV tubing
- If administering IO, use “push-pull” syringe method

Hydroxocobalamin

1 bottle = 5 g

- 0-2 years - 1/8 bottle
- 3-5 years - 1/4 bottle
- 6-13 years - 1/2 bottle

## Respiratory Distress

<ul style="list-style-type: none"> <li>• Assist airway, as appropriate; respiratory monitoring required (EtCO<sub>2</sub> and SpO<sub>2</sub>) if equipped</li> <li>• Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li>• Seat patient (semi-) upright for SBP ≥ 70 + (age in years × 2) and/or signs of adequate perfusion</li> <li>• For suspected respiratory failure <i>see</i> <a href="#">Respiratory Insufficiency/Failure &amp; Airway Protocol</a></li> </ul> <p><i>If wheezing/bronchospasm</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Albuterol</a> - 2.5 mg/<a href="#">ipratropium</a> - 0.5 mg in 3 ml NS nebulized IIRR × 2</li> </ul>	<p><i>If barking cough/stridor at rest or on exertion (croup)</i></p> <ul style="list-style-type: none"> <li>• Sit patient upright</li> <li>• Keep patient calm</li> </ul>	<p><b>BASIC</b></p>
<p>Advanced airway management, as appropriate <a href="#">IV access</a> Cardiac monitoring <a href="#">Albuterol</a> - continuous nebulized (max 7.5 mg in 9 ml NS)</p>	<ul style="list-style-type: none"> <li>• Advanced airway management, as appropriate</li> <li>• <a href="#">IV access</a></li> <li>• Cardiac monitoring</li> <li>• <a href="#">Racemic Epinephrine</a>  <ul style="list-style-type: none"> <li>&gt; 10 kg - 0.5 ml (1-ampule) mixed with 3 ml NS nebulized, IIRR x 1</li> <li>≤ 10 kg - 0.25 ml (1/2-ampule) mixed with 3 ml NS nebulized, IIRR x 1</li> </ul> </li> </ul>	<p><b>ASSIST</b></p>
<p>Consider, especially if subacute presentation (&gt; 1-2 days)</p> <ul style="list-style-type: none"> <li>• <a href="#">Dexamethasone</a> - 0.6 mg/kg PO/IM /IV (max 12 mg) <ul style="list-style-type: none"> <li>• Ensure notification to ED staff of any dexamethasone administration</li> </ul> </li> </ul> <p><i>If severe presentation</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Magnesium Sulfate</a> - 40 mg/kg IV/IO over 15 min, max dose 2 g</li> </ul> <p><i>For asthma only, and if impending respiratory failure or unable to tolerate nebulizer</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Epinephrine</a> 1:1,000 - 0.01 mg/kg IM IIRR q 5 min. x 1 max dose 0.3 mg</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Dexamethasone</a> - 0.6 mg/kg PO/IM/IV (max 12 mg) <ul style="list-style-type: none"> <li>• Ensure notification to ED staff of any dexamethasone administration</li> </ul> </li> </ul>	<p><b>ADVANCED</b></p>
<p>→ Moderate to severe respiratory distress may be characterized by some combination of the following:  Inability to speak in full sentences  Increased <i>work</i> of breathing  Accessory muscle use/retractions</p> <p>→ Bronchiolitis is a disease in infants and children &lt; 2 years of age characterized by rhonchi, or undifferentiated illness with rhinorrhea, tachypnea, and/or fever.  It does not traditionally respond to albuterol/ipratropium or steroids.</p>		

## Seizure/Status Epilepticus

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Position patient to avoid injury and aspiration  
*Consider recovery position*
- Assess blood glucose concentration

BASIC

- EtCO<sub>2</sub> monitoring
- Advanced airway management, as appropriate
- IV access, as appropriate

*If blood glucose ≤ 60 mg/dl:*

- Dextrose 10% (25 g/250 ml) - 5 ml/kg IV/IO bolus, IIRR up to 25 g (250 ml)
- Cardiac monitoring, as appropriate

*If actively seizing or in status epilepticus ( ≥ 2-seizures and without intervening lucid period)*

- Midazolam - 0.15 mg/kg slow IV/IM/IN (max dose 2.5 mg), IIRR x 1 in 5-min
- IM midazolam is the preferred route of administration if an IV not already established

Monitor for respiratory depression and need for assisted ventilation (see Respiratory Insufficiency/Failure & Drug Assisted Airway Protocol)

Treatment with midazolam is NOT indicated in the absence of active seizures or status epilepticus

ASSIST

*If blood glucose concentration ≤ 60 mg/dl and If IV access cannot be obtained:*

- Glucagon - 0.1 mg/kg IM/IN (max dose 1 mg)

ADVANCED

- Consider toxicologic causes of seizure
  - Organophosphate/nerve gas (see chemical warfare)
  - Sympathomimetic toxidrome (stuffers/packers, methamphetamine)
- Consider febrile seizure if ≤ 5 y/o
  - If baseline mentation consider Fever Protocol

## Syncope/Fainting

- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Measure blood glucose, treat as appropriate
- Assess orthostatic pulse and blood pressure, as tolerated

BASIC

- Cardiac monitoring; acquire and transmit 12-lead EKG, treat dysrhythmias
- IV access; for hypotension, follow Shock/Hypotension

ASSIST

ADVANCED

### *Differential Diagnoses for Presyncope-Arrest Spectrum:*

1. Acute Coronary Syndromes (ACS): *look for evidence of ischemia*
2. Tachydysrhythmias
3. Bradydysrhythmias and Blocks
4. Wolff-Parkinson-White (WPW): *look for short PR, prolonged QRS, and a delta wave*
5. Brugada Syndrome: *look for RSR' similar to a right bundle block and ST elevation in the anterior leads*
6. Hypertrophic Cardiomyopathy (HCM): *look for high voltage and narrow ("needle-like", <20 milliseconds/one small box) q waves in the lateral (V5-aVL) and possibly inferior leads; may also have left atrial enlargement, ischemic-appearing EKG, tall R wave in V1*
7. Long or Short QT interval: *look for a QTc <300 (autosomal dominant inheritance) or >500*
8. Arrhythmogenic Right Ventricular Dysplasia (ARVD): *look for epsilon waves ± T-wave inversions in leads V1-V3*
9. Miscellaneous: *(PE, right-sided heart strain; electrolytes, ICH, etc.)*

## Tracheostomy Emergencies

- Look, listen, and feel at the mouth and tracheostomy for air movement
- Place non-rebreather mask to tracheostomy, and to mouth
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Reposition airway in slight extension (unconscious), or upright (conscious)
- Respiratory monitoring required (in-line EtCO<sub>2</sub> and SpO<sub>2</sub>) if equipped
- Obtain tracheostomy history (e.g., age of tracheostomy, indications)

### Tracheostomy Respiratory Distress/Failure

- Assume all acute distress or respiratory failure to be dislodgement or obstruction until proven otherwise
- Remove all accessory items (valves/caps) and stoma padding (if present)
- Perform 3 C's, reassess patient condition and SpO<sub>2</sub>/EtCO<sub>2</sub> after each step

#### Cannula

- Remove inner cannula and inspect for obstruction (do not discard)

*If obstructed with secretions*

- Consider rinsing with saline or tap water, may use 3 ml syringe/suction catheter to “pressure wash”

#### Catheter

- Attempt to pass suction catheter down tracheostomy

*If suction passes and tracheostomy patent*

- Perform suctioning and consider partial obstruction

#### Cuff

*If unable to pass suction*

- Deflate tracheostomy cuff (if present)

*If no improvement after 3 C's*

- Remove tracheostomy tube and reassess

*If respiratory distress: [Respiratory Distress Protocol](#)*

*If Acute Respiratory Insufficiency/Failure or chronic mechanical ventilation, and patent airway*

- Assist ventilation with bag-valve-mask (BVM) to face; cover stoma with gloved hand or gauze

*If unable to ventilate via face*

- Assist ventilation with pediatric BVM mask to stoma; may need to close mouth/nose

BASIC

### Tracheostomy Respiratory Distress/Failure

*If no distress/failure and tracheostomy exchange or replacement required, [Tracheostomy Replacement/Exchange Procedure](#)*

*If no improvement*

*If tracheostomy ≥ 7-days since initial placement*

- [Tracheostomy Replacement/Exchange Procedure](#)
- If unable or replacement/backup unavailable, consider intubation of stoma appropriate sized ETT

*If tracheostomy less than 7-days since initial placement*

- Do not attempt tracheostomy replacement or stoma intubation, manage with BVM

*If unable ventilate or exchange trach or place stoma*

- Consider orotracheal intubation

ASSIST

ADVANCED

- Most pediatric tracheostomies are single lumen (i.e., no inner cannula present) and cuffless due to small diameter of trach and airway
- Caregivers are often very knowledgeable of a child's tracheostomy care; engage and utilize them for assistance when possible
- Laryngectomy and tracheo-innominate fistula hemorrhage are rare in pediatric patients, refer to [Adult Tracheostomy Protocol](#) for these circumstances. Note: Cuff inflation volumes may differ.



## Bites/Envenomation

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> of ≥ 94% and work of breathing, follow [Respiratory Distress Protocol](#)

*If bite involves an extremity*

- Immobilize affected limb below the level of the heart
- Do not tightly wrap the affected limb
- Remove all jewelry

*If stinger is present*

- Attempt to brush away with edge of card  
Do not disturb the wound site

BASIC

- Advanced airway management, as appropriate
- Cardiac monitoring, and treat dysrhythmias
- [IV access](#), as appropriate

*If suspected hymenoptera sting*

- Follow [Allergic Reaction/Anaphylaxis](#)

ASSIST

ADVANCED

→ Consider other protocols as appropriate:

[Allergic Reaction/Anaphylaxis](#)

[Shock/Hypotension](#)

## Hyperthermia/Heat Stroke

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> of ≥ 94% and work of breathing, follow [Respiratory Distress Protocol](#)
- Remove patient from high temperature environment

*If Mild symptoms: heat cramps or heat exhaustion; no signs of altered mental status (AMS); temperature ≤ 104° F*

- Passive cooling (loosen clothing, fanning)
- If available, give PO fluids (use caution for nausea/vomiting)

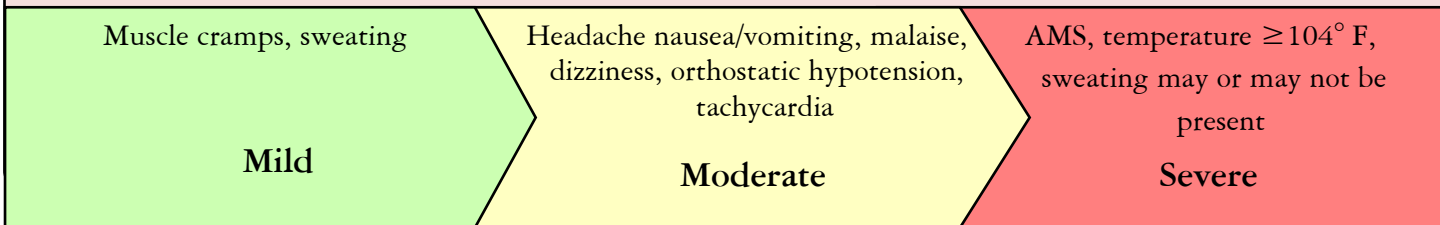
*If Severe Symptoms: heat stroke (signs of AMS, temperature ≥ 104° F, sweating may or may not be present)*

- Begin active cooling
  - Use sheets/towels dipped in ice water directly on skin
  - Ice packs to neck, groin, and axillae

*If shivering begins, mental status improves, or temperature ≤ 102° F*

- Cease active cooling measures

*If ice water submersion is in progress, do not remove patient until temperature ≤ 102° F*



BASIC

- Advanced airway management, as appropriate
- Cardiac monitoring, as appropriate
- [IV access](#), as appropriate; consider 20 ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 2 L maximum

*If chilled fluids available*

- 20 ml/kg NS IV/IO rapid bolus, up to max 500 ml

*If uncontrolled shivering occurs during cooling:*

- [Midazolam](#) - 0.05 mg/kg slow IV/IO, IIRR x 1 q 5-min (max 2.5 mg total)  
or  
0.1 mg/kg IM/IN, IIRR × 1 (max 2.5 mg total)

ASSIST

ADVANCED

→ Maintain high index of suspicion for heat-related illness if the any of following risk factors are present:  
Behavioral/psychiatric medication

## Hypothermia

- Assist airway, as appropriate
  - Titrate O<sub>2</sub> to SpO<sub>2</sub> of ≥ 94% or work of breathing
  - Remove patient from cold environment, dry and insulate
    - Handle the patient gently, consider scoop stretcher (excessive movement may induce ventricular fibrillation)
    - Cut off all wet clothing
  - Assist passive warming:
    - Cover with blankets, heat packs for comfort
- If severe symptoms/signs: AMS, unstable/dysrhythmia, and/or temperature ≤ 90° F*
- Actively warm patient:
    - Heat packs to neck, groin, and axillae
  - Carefully assess vital signs, as they may be diminished but adequate
- If patient is in cardiac arrest, and AED advises shockable rhythm*
- Administer one defibrillatory shock (no further defibrillation until temperature ≥ 90° F)

BASIC

- **IV access**, as appropriate; warm IV fluids if possible, consider 20 ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 2 L total
  - Cardiac monitoring and 12-lead EKG
- If patient is in pulseless ventricular tachycardia/ventricular fibrillation and not previously defibrillated (AED)*
- **Defibrillate** - 4 J/kg × 1 **ONLY**
- If symptomatic bradycardia (carefully assess vital signs, as they may be diminished but adequate)*
- Initiate pacing only for temperature ≥ 90° F

ASSIST

ADVANCED

## Near Drowning

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> of ≥ 94% or work of breathing, follow [Respiratory Distress Protocol](#)

*If suspected cervical spinal trauma*

- [Spinal Motion Restriction Procedure](#)
- Remove wet clothing and dry patient, and follow [Hypothermia Protocol](#)
- NIPPV, as appropriate (must be able to wear adult size mask)

BASIC

- Advanced airway management, as appropriate
- [Initial EtCO<sub>2</sub> Monitoring](#)
- Cardiac Monitoring and treat dysrhythmias
- [IV access](#), as appropriate

ASSIST

ADVANCED

## General Trauma

<ul style="list-style-type: none"> <li>Assist airway, as appropriate</li> <li>Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing</li> <li><b>Spinal Motion Restriction</b>, as appropriate</li> <li>Emergency pelvic stabilization, as appropriate</li> <li>Keep patient warm</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>Advanced Airway management, as appropriate</li> <li><b>Needle Thoracostomy</b> for presumed tension pneumothorax</li> <li>Monitoring, as appropriate</li> <li><b>IV access</b>, as appropriate;</li> </ul> <p><i>If SBP ≤ 70 + (age in years × 2) OR 90 mmHg (10 y/o or greater):</i></p> <ul style="list-style-type: none"> <li>NS - 20 ml/kg IV, IIRR to goal SBP</li> </ul>	<b>ASSIST</b>
<ul style="list-style-type: none"> <li>See <b>Trauma Transport Guidelines</b></li> <li><b>Acute Pain Management</b>, as appropriate</li> </ul> <p><i>If traumatic arrest</i></p> <ul style="list-style-type: none"> <li>Consider <b>Needle Thoracostomy Procedure</b></li> </ul>	<b>ADVANCED</b>

<p style="text-align: center;"><b>Eye Injury</b></p> <p><i>If isolated eye injury</i></p> <ul style="list-style-type: none"> <li>Irrigate with NS if result of chemical burn (if appropriate to agent)</li> <li>Cover unaffected eye/stabilize impaled object</li> </ul> <p><i>If suspected ocular injury</i></p> <ul style="list-style-type: none"> <li>Do not delay transport</li> </ul> <p><i>If outside socket:</i></p> <ul style="list-style-type: none"> <li>Cover in NS soaked gauze</li> </ul>		<p style="text-align: center;"><b>Head/Neck Injuries</b></p> <ul style="list-style-type: none"> <li>Maintain age-appropriate SBP goal</li> </ul>	<b>ASSIST &amp; ADVANCED</b>
<p style="text-align: center;"><b>Head/Neck Injuries</b></p> <ul style="list-style-type: none"> <li>Spinal Motion Restriction</li> <li>Maintain ≥ 94% SpO<sub>2</sub> at all times</li> </ul> <p><i>If respiratory failure</i></p> <ul style="list-style-type: none"> <li>Ventilate at age-appropriate rate (see pearls) or to maintain EtCO<sub>2</sub> 35-45 mmHg</li> </ul>		<p style="text-align: center;"><b>Chest Injuries/Tension Pneumothorax</b></p> <ul style="list-style-type: none"> <li>Needle thoracostomy</li> </ul>	
<p style="text-align: center;"><b>Chest Injuries</b></p> <ul style="list-style-type: none"> <li>Bleeding control</li> <li>Stabilize impaled objects</li> <li>Stabilize flail segments</li> </ul> <p><i>If suspected open pneumothorax</i></p> <ul style="list-style-type: none"> <li>Partial occlusive dressing</li> </ul>		<p style="text-align: center;"><b>Ventilation Rates for Pediatric Head Injuries</b></p> <ul style="list-style-type: none"> <li>→ Infants (0-24 months) 25 breaths per minute</li> <li>→ Children (2-14 years) 20 breaths per minute</li> <li>→ Adolescents (15-17 years) 10 breaths per minute (same as adult)</li> </ul> <p style="text-align: center;"><b>Blood Pressure Goals for Pediatric Head Injuries</b></p> <ul style="list-style-type: none"> <li>→ 0-2 years of age SBP of 70</li> <li>→ 2-10-years of age SBP = 70 +(age in years x 2)</li> <li>→ 10 years of age or greater SBP of 90</li> </ul>	
<p style="text-align: center;"><b>Abdominal/Pelvic Injuries</b></p> <ul style="list-style-type: none"> <li>Control bleeding</li> <li>Stabilize impaled objects</li> <li><b>Pelvic binder</b></li> <li>Evisceration– cover with saline moistened gauze</li> </ul>			
<p style="text-align: center;"><b>Junctional/Extremity Injuries</b></p> <ul style="list-style-type: none"> <li>Bleeding control (direct pressure, tourniquet)</li> </ul> <p><i>If bleeding uncontrolled with tourniquet</i></p> <ul style="list-style-type: none"> <li>Pack wound tightly with hemostatic gauze and kerlix gauze</li> </ul> <ul style="list-style-type: none"> <li>Splinting, as appropriate</li> <li>Sterile dressing– open fractures</li> <li>Care for <b>Amputated Body Part</b></li> </ul>			

# Trauma Transport Guidelines

BASIC

ASSIST

Major trauma patients may need to be transported to a designated trauma center in a timely manner. It is in the best interest of the patient to be transported to a designated trauma center if the patient meets certain criteria.

*If any of the following criteria are present,*

- Transport to the closest Pediatric Trauma Center (Level 1 or 2):

Injury Pattern	Mental Status & Vital Signs
<ul style="list-style-type: none"> <li>→ Penetrating injury (e.g. GSW, stabbing) to head, neck, torso, upper arm, thigh</li> <li>→ Skull deformity, suspected skull fracture</li> <li>→ Suspected spinal injury with new motor or sensory loss</li> <li>→ Chest wall instability, deformity, or suspected flail chest</li> <li>→ Suspected pelvic fracture</li> <li>→ Suspected two or more proximal long-bone fractures</li> <li>→ Crushed, degloved, mangled, or pulseless extremity</li> <li>→ Amputation proximal to wrist or ankle</li> <li>→ Active bleeding requiring a tourniquet or wound packing with continuous pressure</li> </ul>	<ul style="list-style-type: none"> <li>→ Unable to follow commands (motor GCS &lt; 6), or no spontaneous or purposeful movement</li> <li>→ Age 0-9: SBP &lt; 70 + (2 x age years)</li> <li>→ Age 10-14 SBP &lt; 90 <u>or</u> HR &gt; SBP (shock index of ≥1)</li> <li>→ RR &lt; 10 or &gt; 29</li> <li>→ Respiratory distress or need for assisted ventilation (e.g. BVM, SGA, ETT)</li> <li>→ Room air pulse oximetry ≤ 90%</li> </ul>

*If any of the following criteria are present,*

- Transport to the closest Pediatric Trauma Center (Level 1, 2, 3, or 4):

Mechanism of Injury	Risk Factors
<ul style="list-style-type: none"> <li>→ Fall from height &gt; 10 feet</li> <li>→ MVC with:                             <ul style="list-style-type: none"> <li>Partial or complete ejection</li> <li>Significant intrusion (including roof), with any:                                     <ul style="list-style-type: none"> <li>&gt; 12 inches occupant side</li> <li>&gt; 18 inches any site</li> </ul> </li> <li>Need for extrication of an entrapped patient</li> <li>Child (0-9) unrestrained or in a unrestrained child safety seat</li> <li>Death in same passenger compartment</li> <li>Vehicle telemetry data consistent with severe injury</li> </ul> </li> <li>→ Rider separated from transport vehicle with significant impact (e.g. motorcycle, ATV, horse, etc.)</li> <li>→ Pedestrian or bicycle rider thrown, run over, or with significant impact</li> </ul>	<ul style="list-style-type: none"> <li>→ Low-level falls in younger children (age ≤ 5 years) with significant head impact</li> <li>→ Anticoagulant use</li> <li>→ Suspicion for child abuse</li> <li>→ Special, high-resource healthcare needs (chronic ventilator dependency, ventricular assist device)</li> <li>→ Pregnancy &gt; 20 weeks</li> <li>→ Burns in conjunction with trauma</li> </ul>

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Traumatic mechanism not meeting above criteria may be transported to any approved receiving facility.

## Amputated Body Part

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Bleeding control (direct pressure, tourniquet)
- Cover the stump with saline-soaked sterile dressing and wrap with dry dressing
- Wrap severed part in saline-moistened sterile dressing
  - Place in watertight plastic bag
  - Place bag in cooler with ice, if possible
  - Do not freeze
  - Do not macerate/soak in water
  - Transport with patient to the Emergency Department

BASIC

- Advanced Airway management, as appropriate
- Monitoring, as appropriate
- IV access, as appropriate;
- If SBP ≤ goal of 70 + (age in years x 2) OR 90 (≥ 10 years)*
- NS - 20 ml/kg IV, IIRR to goal SBP

ASSIST

- Acute Pain Management, as appropriate

ADVANCED



## Burns

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing

If suspected **carbon monoxide (CO)**

- Ensure scene safety, and remove patient from toxic environment
- High flow O<sub>2</sub> by NRB + NC 15 lpm ea.

If potential for ongoing burning

- Brush dry chemicals then flush with water  
Initiate decontamination, as appropriate
- Remove clothing/jewelry (affected area and distal to burn)
- Flush eyes with copious amounts of water, as appropriate
- Apply dressings to burns
  - ⇒ If ≤ 10% BSA, use moist dressings
  - ⇒ If ≥ 10% BSA, use dry burn sheet or dry sterile dressing and insulate to prevent hypothermia

BASIC

- Advanced airway management, as appropriate  
Maintain high index of suspicion for inhalation injury  
Stridor, muffled voice, singed facial/nasal hair, carbonaceous sputum
- Cardiac monitoring, and 12-lead EKG for electrical burns
- **IV access**, as appropriate; consider 20 ml/kg NS IV/IO rapid bolus for hypotension, IIRR × 2
  - If ≥ partial thickness burns (≥ 10% BSA)
    - ⇒ Administer IV fluids as per ABLIS guidelines
    - 0-3 years 125 ml/hr NS
    - 3-14 years 250 ml/hr NS

If severe symptoms/signs (≥ 10% BSA partial thickness, full-thickness, circumferential, involvement of face/hands/feet/genitals, significant chemical or electrical burns or airway involvement)

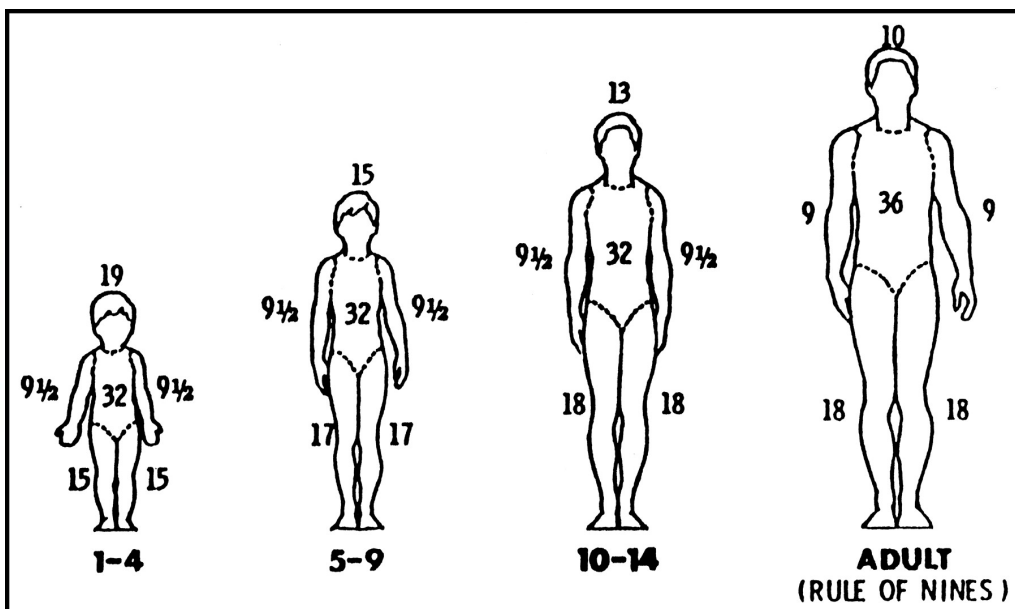
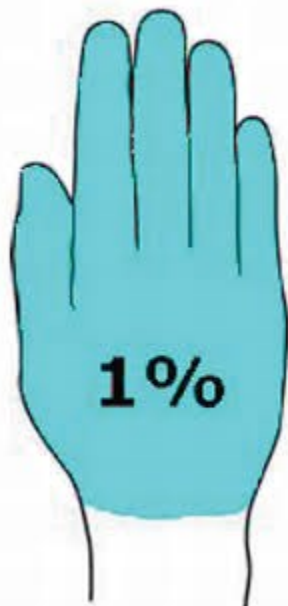
- Provide notification and transport to nearest burn center

If unsecured airway

- Transport to the closest full service hospital
- **Acute Pain Management Protocol**, as appropriate

ASSIST

ADVANCED



## Entrapment/Crush/Traumatic Rhabdomyolysis

- Assist airway, as appropriate
- Titrate O<sub>2</sub> to SpO<sub>2</sub> ≥ 94% or work of breathing
- Bleeding control (direct pressure, tourniquet)
- Remove constricting clothing, jewelry

**Field amputation**  
 If anticipated prolonged entrapment/extrication, and if potential for worsening of patient condition in the absence of extrication, call **OLMC** to activate field amputation process

**BASIC**

- Advanced airway management, as appropriate
- Cardiac monitoring, 12-lead EKG
- IV access, 20 ml/kg/hr NS infusion IV/IO, to 2 L total; if prolonged extrication decrease to 5-10 ml/kg/hr (**OLMC**)

*If EKG findings of hyperkalemia (peaked T-waves, wide QRS), contact **OLMC** following initial dose*

- **Calcium Chloride** - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)
- **Sodium Bicarbonate** - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg in x 1
- **Acute Pain Management** Protocol, as appropriate

**ASSIST**

**ADVANCED**

## Spinal Motion Restriction

*If penetrating trauma (including to the neck and/or spine with or without neurological deficit)*

- Do not initiate Spinal Motion Restriction Procedure

*If any of the following findings are present*

*History (five questions), midline tenderness, pain or paresthesias on external rotation*

- Initiate Spinal Motion Restriction Procedure

*Spinal motion restriction may be deferred ONLY IF ALL OF THESE FINDINGS ARE ABSENT*

*History*

- Age  $\leq$  12
- Limited ability to sense or communicate pain  
*AMS, LOC, intoxicated, head trauma, language barrier, mental retardation*
- Distracting injury  
*Long bone fracture, visceral trauma (abdomen, pelvis), large laceration, crush injury, large burn*
- Neurologic deficit  
*Motor/sensory loss or paresthesia*
- Dangerous mechanism of injury  
*Fall  $\geq$  3-feet or 5-stairs*  
*Axial loading injury to the head (diving accident/sports injury)*  
*Vehicular accident*  
*High speed motor vehicle accident  $\geq$  60 mph*  
*Motorized recreational vehicle accident*  
*Ejection*  
*Bicycle collision with immobile object (tree, parked car)*  
*Struck by large vehicle*  
*Roll-over*

*Palpation*

- Midline cervical tenderness

*Active Range of Motion Test*

- Patient is able to actively rotate neck  $45^\circ$  both to left and right with no pain, paresthesia or motor deficit

If any pain or paresthesia upon rotation, IMMEDIATELY TERMINATE RANGE OF MOTION TEST

*If patient unable to tolerate spinal motion restriction*

- Attempt less restrictive means (c-collar only ) or use position of comfort and/or allow patient to self-splint

BASIC

ASSIST

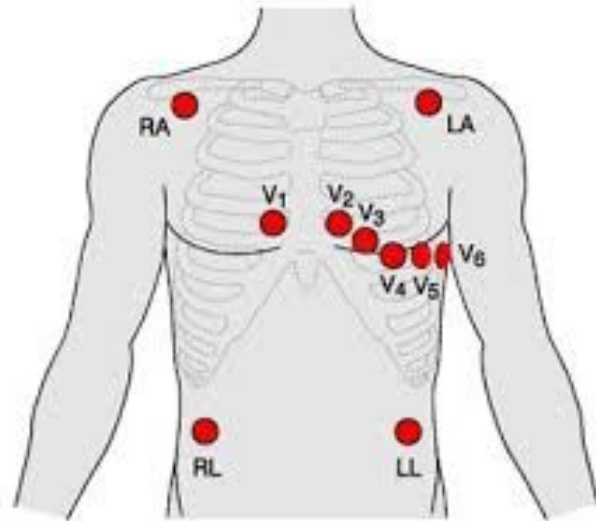
ADVANCED

## 12-Lead EKG

### Indications:

- Complaints of chest pain or atypical symptoms suggestive of ACS (nausea, palpitations, SOB, dizziness, syncope, weakness)
- Electrical Injuries
- Suspected cardiotoxic overdose
- Suspected severe electrolyte derangement
- Cardiac arrhythmia

- Attach patient to monitor
  - Shave chest (as necessary)
  - Apply electrodes
- Enter demographic information (age, first/last name, DOB)
- Transmit EKG to the receiving ED
- Download/Attach EKG to the PCR



BASIC

### Lead Placement Reference

- RA – Right Arm
- LA – Left Arm
- RL – Right Leg
- LL – Left Leg

- V1 – 4th intercostal space at right sternal border
- V2 – 4th intercostal space at left sternal border
- V3 – Directly between V2 and V4
- V4 – 5th intercostal space at mid-clavicular line
- V4R – Right 5th intercostal space at mid-clavicular line
- V5 – Level with V4 at left anterior axillary line
- V6 – Level with V5 at left mid-axillary line

- Obtain serial 12-lead EKGs
  - Continuously monitor EKG
- If meets ST segment elevation MI (STEMI) criteria*
- Transmit to STEMI facility
  - STEMI Alert (*patient is believed to need emergent PCI*)
    - 2 or more continuous leads with:
      - STE  $\geq$  1 mm limb leads with reciprocal depression and/or
      - STE  $\geq$  2 mm precordial leads with reciprocal depression and/or
      - Relative STE  $\leq$  1 mm with reciprocal changes with QRS voltage  $\leq$  5 mm

ASSIST

- If STEMI criteria met*
- Transport to STEMI facility or call for advanced intercept
- If any other interpretation*
- Transport per Patient Destination Policy

ADVANCED

## Advanced Airway Preparation

<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>→ Insertion of any invasive airway device</li> <li>→ Respiratory failure</li> <li>→ Severe - critical hypoxia (<math>SpO_2 \leq 90</math>)</li> </ul> <p><b>Procedure:</b></p>	<p><b>Pearls and pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Failure to prepare for intubation puts patients at unnecessary risk for cardiac arrest</li> <li>→ Ensure all needed equipment is out in the airway manager/assistants field of view to avoid unnecessary delays in retrieving critical equipment</li> </ul>
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**Do not attempt intubation with  $SpO_2 \leq 94\%$ , consider Quick SGA/King:**

<p><b>PREOXYGENATE (60 sec minimum):</b></p> <ul style="list-style-type: none"> <li>• Suction, as appropriate</li> <li>• Up to NPA <math>\times</math> 2 and OPA AND</li> <li>• Head tilt/Chin Lift or jaw thrust AND</li> <li>• Ear-to-sternal notch (head elevated) position AND</li> <li>• NRB + HFNC OR</li> <li>• BVM + HFNC</li> <li>• Utilize PEEP as appropriate</li> </ul>	<p><b>Assemble KIT DUMP (SEE PICTURE)</b></p> <ul style="list-style-type: none"> <li>• Biohazard bag spread near HOB (place the following items, within the field of view)             <ul style="list-style-type: none"> <li>• Suction (Yankauer) powered, tested, tucked under patient shoulder or mattress</li> <li>• 2 sizes endotracheal tubes (out of packaging, ready to be used)</li> <li>• 2 sizes laryngoscope blade (estimated size and next largest)</li> <li>• Bougie                 <ul style="list-style-type: none"> <li>• Adult—6.0 ETT or greater</li> <li>• Pediatric 4.0 to 6.0 ETT (use ETT &amp; stylet for 3.5 or smaller)</li> </ul> </li> <li>• 2 size syringes—10 &amp; 60 cc syringes</li> <li>• Backup airway device (SGA/King Tube)</li> <li>• Tube tamer</li> <li>• BVM (if not already in use)</li> <li>• PEEP Valve</li> <li>• Cricothyrotomy kit or TTV kit (unopened but in view)</li> </ul> </li> </ul>
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BASIC

Age	Size mm I.D.	Suggested Depth
	$\frac{\text{age in years}}{4} + 3.5$	$\frac{\text{age in years}}{2} + 12$
Premature	2.5	8
Newborn	3.0	9-10
3-12 Months	3.0	10.5-12
1 year	3.5	12.5-13.5
2 years	4.0	13.5
4	4.5	14
6	5	15
8	6	16
10	6.5	17
12	6.5-7.0	18
Adolescent	6.5-7.0	21

<p><i>If not in cardiac arrest, ensure patient has met requisite goals per Crashing Patient Protocols</i></p> <ul style="list-style-type: none"> <li>• Endotracheal Intubation/Laryngoscopy</li> <li>• Follow <a href="#">Respiratory Insufficiency/Failure &amp; Drug Assisted Airway</a> (adult or <a href="#">pediatric</a>)</li> </ul> <p><i>If “Can’t Ventilate/Can’t Oxygenate” situation (EtCO<sub>2</sub> 0 and falling/absent SpO<sub>2</sub>)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Surgical Airway Procedure</a> (do not delay for critical hypoxia)</li> </ul>	ASSIST
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<p><i>If induction required, during preoxygenation</i></p> <ul style="list-style-type: none"> <li>• Prepare and separate medications</li> </ul>	ADVANCED
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## Assisted Ventilation/Bag Mask Ventilation

**Indications:**

- Hypoxia uncorrected by passive high FiO<sub>2</sub>
- Ineffective minute ventilation
- Respiratory insufficiency/failure
- BVM ventilation

**Contraindications:**

Mask– inability to obtain a mask seal

- Oral/Facial/mandibular disfigurement
- Edentulousness with/without emaciation

**Pearls & Pitfalls:**

*If mask ventilating*

- Ensure EtCO<sub>2</sub> waveform for every breath
- Reposition patient head if no waveform
- Do not utilize BURP/Sellick’s maneuver to prevent gastric filling
- Position ETSN with 2-hand mask seal to prevent gastric filling

*If advanced airway*

- Ensure EtCO<sub>2</sub> waveform for every breath
- After initial placement confirmation, avoid excessive ventilation rates/pressures
- Be vigilant for tube migration/dislodgment the duration of placement and for all patient moves
- Disconnect BVM for loading/unloading into the ambulance

BASIC

ASSIST

### Ventilation Rates:

**Adult:**

**Cardiac Arrest:**

- ≤ 12 Breaths per minute (every 5 seconds)

**Perfusing:**

- Titrate to SpO<sub>2</sub> ≥ 94% and eucapnia (as appropriate)

**Pediatric:**

**Cardiac Arrest:**

- 15 compressions to 2 breaths
- Pause for breath until intubated

**Perfusing:**

- 20 breaths per minute

**Neonates:**

**Cardiac Arrest:**

- 3 compressions to 1 breath
- Pause for breath until intubated

**Perfusing:**

- 30-60 breaths per minute

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**Procedure**

- Position for patency
  - Ear-to-sternal notch (ETSN)
  - Up to 2 NPAs ± OPA (as appropriate)
- Obtain **strong** face-Mask seal (preferred 2 rescuer technique)
  - Thenar grip or
  - E-C “Clamp”
- Squeeze bag  
(confirm 4 phase EtCO<sub>2</sub> waveform every breath)

Thenar Grip



EC “Clamp”

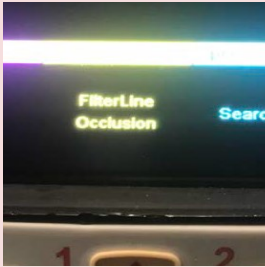

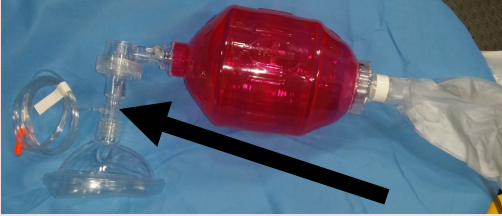


*If wheezes present*

- Continue Albuterol/Ipratropium where applicable in protocol



## Capnography

<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>→ Respiratory distress (<i>diff. breathing, or requiring <math>\geq 2</math> lpm O<sub>2</sub></i>)</li> <li>→ Decreased LOC/somnolence</li> <li>→ Trending: Perfusion/respiration</li> <li>→ Advanced airway use (ETT and SGA)</li> <li>→ Narcotic/benzodiazepine/sedative administration</li> </ul> <p><b>Contraindications:</b> None</p>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Clogging of the detector should prompt appropriately aggressive airway clearance by use of suction (strongly consider removing any inserted device)</li> <li>→ An advanced airway or BLS airway adjunct should be removed and reattempted if CO<sub>2</sub> waveform absent</li> <li>→ EtCO<sub>2</sub> alone cannot detect right main stem intubation, confirm lung sounds after 4-phase waveform every ETT placement</li> <li>→ Be vigilant for tube migration/dislodgment the duration of placement and for all patient moves</li> </ul>	<p><b>BASIC</b></p>
<p><b>Airway in place <i>or</i> During mask ventilation:</b></p>		
<p><b>Clogged Detector</b></p>	<p><b>Malpositioned tube/no ventilation</b></p>	<p><b>ASSIST</b></p>
		<p><b>ADVANCED</b></p>
<ul style="list-style-type: none"> <li>• Suction airway immediately</li> <li>• Replace detector</li> </ul> <p><i>If no noted 4-phase waveform after 1 detector swap</i></p> <ul style="list-style-type: none"> <li>• Remove airway device</li> <li>• Ventilate by different device/method</li> </ul>	<p><i>If SGA LT, ETT, OPA, BVM</i></p> <ul style="list-style-type: none"> <li>• Remove device</li> <li>• Reposition airway</li> <li>• Ventilate by different device/method</li> </ul> <p>Causes: 0 mmHg EtCO<sub>2</sub></p> <ol style="list-style-type: none"> <li>1 Loss of airway <i>e.g. apnea, failed tube, dislodged tube</i></li> <li>2 Loss of circulation <i>e.g. witnessed cardiac arrest, massive PE, exsanguination, RV rupture</i></li> </ol>	<p><b>ADVANCED</b></p>
<p><b>Side Stream Nasal Cannula</b></p>		
<ul style="list-style-type: none"> <li>• Connect EtCO<sub>2</sub> detector line to machine</li> <li>• Apply nasal cannula</li> </ul>		
<p><b>Bag Mask Ventilation</b></p>		
<ul style="list-style-type: none"> <li>• Connect EtCO<sub>2</sub> detector line to machine</li> <li>• Insert “in-line” detector between the Bag-Valve and Mask</li> <li>• Ventilate per Bag Mask Ventilation/Assisted Ventilation Procedure</li> <li>• Appreciate 4-phase EtCO<sub>2</sub> waveform for every breath</li> </ul>		<p><b>ADVANCED</b></p>
<p><b>“In-Line” EtCO<sub>2</sub> with Advanced Airway</b></p>		
<ul style="list-style-type: none"> <li>• Connect EtCO<sub>2</sub> detector line to machine</li> <li>• Insert “in-line” detector between the Bag-Valve and advanced airway</li> <li>• Ventilate per Bag Mask Ventilation/Assisted Ventilation Procedure</li> <li>• Appreciate 4-phase EtCO<sub>2</sub> waveform for every breath</li> </ul>		



## Contact Precautions/Personal Protective Equipment (PPE)

### Procedure:

- Explain the reason for use of isolation equipment
- Wear gloves, gown, and eye protection
- Wash hands after leaving the care area
- Splash precautions (goggles/face shield) for suction, intubation, nebulizer updrafts etc.

### *If standard precautions*

- Don the following PPE
  - Disposable exam gloves
  - Goggles/face shield for any airway procedures or patient with active cough
  - Impermeable gown for any situation likely to generate splash/liquid exposures
  - Place surgical mask on patients who are coughing

### *If contact precautions indicated*

- Don the following PPE
  - Disposable exam gloves
  - Goggles/face shield for any airway procedures or patient with active cough
  - Impermeable gown

### *If droplet precautions indicated*

- Don the following PPE
  - 2 Sets of Disposable Exam Gloves
  - Disposable surgical mask
  - Goggles/Face Shield
  - Impermeable gown

### *If airborne precautions indicated*

- Don the following PPE
  - 2 Sets of Disposable Exam Gloves
  - N95 Respirator
  - Goggles/Face Shield
  - Impermeable gown
  - Utilize viral filter, if available, when performing basic or advanced airway management

### *If special respiratory precautions indicated*

- Don the following PPE
  - 2 Sets of Disposable Exam Gloves
  - N95 Respirator
  - Goggles/Face Shield
  - Impermeable gown
  - Boot/Shoe covers

### *If ebola/viral hemorrhagic fever precautions indicated*


- Don the following PPE
  - *Gloves*
  - *PAPR* (Powered Air-Purifying Respirator)
  - *Coverall*

BASIC

ASSIST


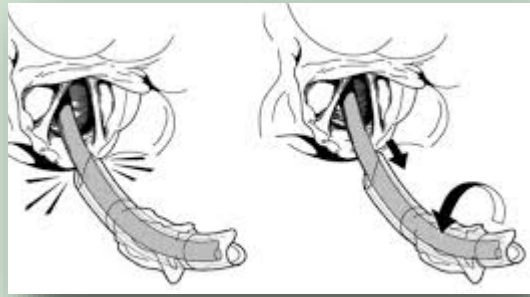
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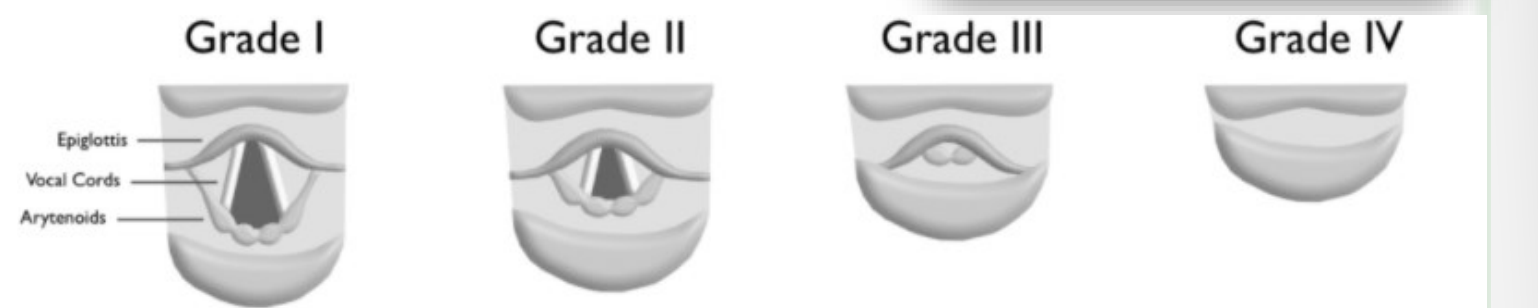
## Emergency Childbirth

<p><b>Indications:</b> Childbirth/labor</p> <p><b>Contraindications:</b> None</p>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Inspect perineum for crowning on all pregnant females reporting symptoms of labor</li> <li>→ Prepare for splashing fluids; sterile gloves, gown, mask/glasses</li> </ul>	<p><b>BASIC</b></p>
<p><b>Childbirth:</b></p>		<p><b>ASSIST</b></p>
<ul style="list-style-type: none"> <li>• Administer oxygen as appropriate</li> <li>• Place patient in tilted Left Lateral Position if not crowning</li> <li>• Visually inspect perineum for crowning</li> <li>• If delivery imminent or in process, do not initiate or continue transport</li> <li>• Prepare OB kit and area for delivery and position mother (lithotomy)</li> </ul> <p><b>As the head delivers:</b></p> <ul style="list-style-type: none"> <li>• Use a gloved hand to control speed of head delivery</li> <li>• Suction the <u>mouth then nose</u> with suction bulb if:             <ul style="list-style-type: none"> <li>Amniotic fluid is not clear</li> <li>Obvious obstruction to spontaneous breathing or if positive pressure ventilation required</li> </ul> </li> <li>• Address umbilical cord around newborn neck if present:             <ul style="list-style-type: none"> <li><i>If cord loose around neck:</i> Attempt to pull cord over infant's neck</li> <li><i>If cord tight around neck:</i> Clamp cord × 2 (2-inches apart), cut between clamps, and continue</li> </ul> </li> <li>• Apply gentle downward traction for the top shoulder to deliver with head <i>sandwiched</i> between both palms</li> <li>• Apply gentle upward traction for the bottom shoulder to deliver with head sandwiched between both palms</li> </ul> <p><i>If delivery fails to progress after head delivers (suspected shoulder dystocia)</i></p> <ul style="list-style-type: none"> <li>• Hyperflex maternal hips via supine knee-chest position (McRobert's maneuver)</li> <li>• Apply firm suprapubic (not fundal) pressure to attempt to dislodge shoulder</li> <li>• After complete delivery place the newborn on maternal abdomen or level with the mother's uterus</li> <li>• Address umbilical cord             <ul style="list-style-type: none"> <li><i>If infant is vigorous and mother is stable:</i> delay cord cutting 30-60 seconds</li> <li>Clamp and cut the umbilical cord (minimum 6-inches from the neonate 2-inches apart) <i>unless already done</i></li> </ul> </li> <li>• Dry and cover newborn — start with head, then body             <ul style="list-style-type: none"> <li><i>If term birth, strong cry, regular respiratory effort, and good tone:</i> Place infant on mother's chest skin-to-skin</li> </ul> </li> <li>• Assess for maternal bleeding, and, assess for signs of placental separation (<i>Lengthening cord, pelvic pain, etc.</i>)             <ul style="list-style-type: none"> <li><i>If not already done,</i> encourage the mother to attempt breastfeeding to aid in bleeding control</li> <li><i>If bleeding present or placenta delivers</i> perform fundal massage (<i>vigorous massage of fundus watching for uterine tone/decreased bleeding</i>)</li> </ul> </li> <li>• Direct pressure for excessive bleeding from birth canal tears</li> </ul>	<p>Lithotomy Position</p> 	<p><b>ADVANCED</b></p>
<p><b>Breech:</b></p>		<p><b>ADVANCED</b></p>
<p><b>Delivering the legs, abdomen, and umbilical cord:</b></p> <ul style="list-style-type: none"> <li>• Allow fetus to deliver to level of umbilicus             <ul style="list-style-type: none"> <li>After umbilicus is visualized extract 4-6 inch loop of umbilical cord</li> </ul> </li> <li>• Gently extract legs downward after buttocks are delivered</li> </ul> <p><b>Delivering the shoulders:</b></p> <ul style="list-style-type: none"> <li>• Gently align the fetus' shoulders anterior-posterior to the mother with the infant's face pointing laterally</li> <li>• Gently guide fetus upward to deliver the posterior shoulder</li> <li>• Gently guide fetus downward to deliver the anterior shoulder</li> </ul> <p><b>Delivering the head/neck:</b></p> <ul style="list-style-type: none"> <li>• Rotate the fetal face or abdomen AWAY from the maternal pubis after the shoulders are delivered</li> </ul> <p><b>Upon delivery of the neck:</b></p> <ul style="list-style-type: none"> <li>• Place gloved finger up into infant's mouth to keep head flexed AND</li> <li>• Apply gentle pressure to the occiput with the other hand to aid in neck flexion AND</li> <li>• Apply gentle upward traction on the body to aide in delivery of the head</li> </ul>		<p><b>ADVANCED</b></p>

# Endotracheal Intubation/Direct Laryngoscopy

<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>→ Respiratory failure</li> <li>→ Cardiac arrest</li> <li>→ Suspected airway obstruction</li> </ul> <p><b>Contraindications:</b></p> <p>None (in presence of hypoxia, complete FBAO, or inability to ventilate)</p> <p><b>Definition of an Intubation Attempt:</b></p> <ul style="list-style-type: none"> <li>• Direct/Video Laryngoscopy: Insertion of a laryngoscope blade into the mouth with the intent of performing endotracheal intubation (regardless of whether a tube/bougie is placed in the mouth).</li> <li>→ Does not include laryngoscopy for foreign body removal</li> </ul>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Unless clearing the airway, withhold laryngoscopy until the best attempt at preoxygenating to a SpO<sub>2</sub> ≥ 94% (minimum 60 seconds high FiO<sub>2</sub> and open airway)</li> <li>→ Do not interrupt CPR to obtain a view</li> <li>→ Avoid soft tissue damage associated with excessively aggressive/violent blade technique</li> <li>→ Avoid damage to the patient's teeth</li> <li>→ Maintain manual cervical spine precautions if suspected cervical spine injury</li> <li>→ See <a href="#">Advanced Airway Preparation Procedure</a> for equipment, including pediatric ET tube sizing/depth</li> </ul>	BASIC
<ul style="list-style-type: none"> <li>• Assist in preparation             <ul style="list-style-type: none"> <li>Oxygenate/Preoxygenate</li> <li>Establish Kit Dump</li> </ul> </li> <li>• Utilize <a href="#">Intubation Checklist</a></li> <li>• External Laryngeal Manipulation (under guidance from laryngoscopist)</li> </ul>		

<ul style="list-style-type: none"> <li>• Position for patency             <ul style="list-style-type: none"> <li>Ear-to-Sternal-Notch (with ramp shoulders for patients ≥70 kg)</li> <li>Neutral position (if suspected trauma)</li> </ul> </li> <li>• Open patient's mouth             <ul style="list-style-type: none"> <li>Use scissor technique (index/thumb)</li> </ul> </li> <li>• <b>Identify the epiglottis</b> (do not deliver tube if unable to visualize <i>epiglottis</i>)             <ul style="list-style-type: none"> <li>Position blade tip:                 <ul style="list-style-type: none"> <li>Curved blade (inside vallecula, or directly lift epiglottis)</li> <li>Straight blade (lift epiglottis)</li> </ul> </li> </ul> </li> <li>• Guide assistant's hand (External Laryngeal Manipulation)             <ul style="list-style-type: none"> <li>Obtain the best view possible before attempting tube delivery</li> </ul> </li> <li>• Deliver ETT via bougie (preferred), or via styletted ETT             <ul style="list-style-type: none"> <li>Maintain visualization until tube is inside trachea</li> <li>If resistance to passage rotate ETT on bougie counterclockwise</li> </ul> </li> <li>• Check insertion depth and inflate ETT cuff</li> <li>• Primary confirmation: WAVEFORM EtCO<sub>2</sub> every breath within 5-breaths</li> <li>• Secondary confirmation:             <ul style="list-style-type: none"> <li>Bougie "hold-up"</li> <li>Positive chest sounds</li> <li>Absent/diminished epigastric sounds</li> <li>"Misting" in tube</li> </ul> </li> </ul>		ASSIST  ADVANCED
		



# Endotracheal Intubation/Video Laryngoscopy (UEScope)

**Indications:**

- Respiratory failure
- Cardiac arrest
- Suspected airway obstruction

**Contraindications:**

None (in presence of hypoxia, complete FBAO, or inability to ventilate)

**Definition of an Intubation Attempt:**

- Direct/Video Laryngoscopy: Insertion of a laryngoscope blade into the mouth with the intent of performing endotracheal intubation (regardless of whether a tube/bougie is placed in the mouth).
- Does not include laryngoscopy for foreign body removal

**Pearls & Pitfalls:**

- Unless clearing the airway, withhold laryngoscopy until the best attempt at preoxygenating to a SpO<sub>2</sub> ≥ 94 % (minimum 60-seconds of high-flow FiO<sub>2</sub> with a patent airway)
- Do not interrupt CPR to obtain a view
- Avoid soft tissue damage associated with excessively aggressive/violent blade technique
- Avoid damage to the patient’s teeth
- Maintain manual cervical spine precautions if suspected cervical spine injury
- See [Advanced Airway Preparation Procedure](#) for equipment, including pediatric ET tube sizing/depth

BASIC

- Assist in preparation
  - Oxygenate/Preoxygenate
  - Establish Kit Dump
- Utilize [Intubation Checklist](#)
- External Laryngeal Manipulation (ELM) under guidance from laryngoscopist

- Position for patency
  - Ear-to-Sternal-Notch (with ramp shoulders for patients ≥70 kg)
  - Neutral position (if suspected trauma)
- Select appropriate UEScope blade for patient size and attach to monitor
- Assure monitor is on and recording
- Open patient’s mouth
  - Use scissor technique (index/thumb)
- Suction airway as required
- **Insert blade midline along the tongue and identify the epiglottis** (do not deliver tube if unable to visualize *epiglottis*)
- **Insert blade into vallecula and lift to view vocal cords**
  - Perform head-lift or ELM to maximize view if necessary
- Deliver bougie and *railroad* ETT over bougie
  - If resistance to passage, rotate ETT clockwise or counterclockwise
- Check insertion depth and inflate ETT cuff
- Remove bougie first and then VL device
- **Confirm placement: WAVEFORM EtCO<sub>2</sub> every breath within 5-breaths**
  - Secondary Confirmation:
    - Bougie “hold-up”
    - Positive chest sounds
    - Absent/diminished epigastric sounds
    - “Misting” in tube
- Secure ETT and continue to monitor placement with EtCO<sub>2</sub> waveform



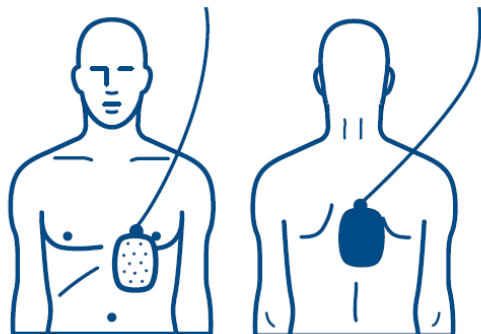
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# External Cardiac Pacing

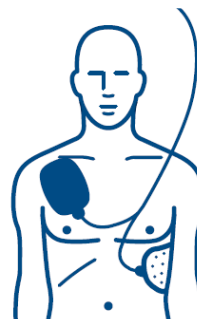
<p><b>Indications:</b>                  Bradycardia associated with:                  → Hemodynamic instability                  → End organ dysfunction                  → Hypotension                  Adult: SBP ≤ 90 or relative ↓BP                  Pedi: SBP ≤ 70 + (age in years × 2), or 90 if ≥ 10 years</p> <p><b>Contraindications:</b>                  → Severe hypothermia (core temp ≤ 86° F)</p>	<p><b>Pearls &amp; Pitfalls:</b>                  → Do not allow removal of EKG electrodes until prepared with a replacement external cardiac pacer                  → Consider underlying profound electrolyte disturbance if unable to achieve capture or if high energy settings required (seek <a href="#">OLMC</a> for guidance)                  As time allows:                  → Administer sedative agent  <i>(use caution until hypotension is corrected)</i></p>	ASSIST		
<ul style="list-style-type: none"> <li>• Sedative agent, as appropriate per protocol</li> <li>• Attach EKG monitoring electrodes (required for demand pacing)                      Secure electrodes to wire connector/patient with sturdy tape/kling</li> <li>• Adjust view to lead with most upright QRS</li> <li>• Apply pads to patient's chest                      +++Do not place pads over implanted devices+++</li> <li>• Select "PACER" function as per device manufacturer recommendations</li> <li>• Set pacer rate, as follows:</li> </ul>				
ADVANCED				
<b>PEDIATRIC</b>			<b>Adult</b>	
<b>Age</b>	0-36 Months	36 months—12 years	≥ 12 years	12 years and older
<b>Rate</b>	120 ppm	100 ppm	70 ppm	70 ppm
<ul style="list-style-type: none"> <li>• Press/select "START" or depress the "PACER" button</li> <li>• Increase output 10 mA increments till capture is noted or maximum output is reached</li> <li>• Verify both markers of capture present:                             <ul style="list-style-type: none"> <li>• Electrical – pacer spike immediately followed by wide QRS complex with tall broad T-wave</li> <li>• Mechanical capture – palpable carotid and/or femoral pulse; variable presence - pulsatile SpO2 matching pacing rate and increase in EtCO2</li> </ul> </li> <li>• Increase rate in 10 bpm increments if low cardiac output</li> <li>• Observe for signs of improved hemodynamics</li> <li>• Treat other causes for poor hemodynamics</li> </ul>				

Anterior/Posterior Pad Placement\*



\* variations do exist, use as appropriate for situation

Anterior Pad Placement





# Gastric Tube

<p><b>Indications:</b> Gastric distention impeding effective ventilation</p> <p><b>Contraindications:</b> History of esophageal tears Ingestion of caustic substances</p>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Do not let gastric tube insertion interrupt airway confirmation</li> <li>→ Do not hesitate to remove a SGA if EtCO<sub>2</sub> waveform is lost</li> </ul>	<p><b>BASIC</b></p>	
<p><b>Use with SGA designed to allow gastric tube placement</b></p>			
<p><i>If suspected gastric inflation</i></p> <ul style="list-style-type: none"> <li>• Remove the gastric tube from the packaging, then, using the tube, measure the distance from: nare-to-ear and ear-to– xiphoid process, noting the length at which to insert the tube to</li> <li>• Prior to insertion, thoroughly lubricate gastric tube and insert through the gastric lumen until at the level of the esophageal bulb on the King LTS-D</li> <li>• Follow Supraglottic Airway (King LTS-D) procedure, ensuring waveform confirmation of placement</li> <li>• Advance the gastric tube through the gastric lumen to the depth noted by the earlier measurement</li> <li>• Using a 60 cc ‘cath-tip’ syringe, inject air through the gastric tube while verifying the presence of “bubble” sounds over the epigastrium</li> <li>• Following confirmation of sounds over epigastrium, aspirate with the syringe, looking for gastric contents</li> </ul> <p><i>If insertion was successful</i></p> <ul style="list-style-type: none"> <li>• Secure with tape to the King LTS-D</li> <li>• Attach gastric tube to suction intermittently at 30-40 mmHg</li> </ul>			<p><b>ASSIST</b></p>
<p><b>Use with Endotracheal Tube</b></p>			
<p><i>If suspected gastric inflation</i></p> <ul style="list-style-type: none"> <li>• Remove the gastric tube from the packaging, then, using the tube, measure the distance from: nare-to-ear and ear-to– xiphoid process, noting the length at which to insert the tube to</li> <li>• Advance the gastric tube at a downward angle into the oropharynx to the depth noted by the earlier measurement</li> <li>• Using a 60 cc cath-tip syringe, inject air through the gastric tube while verifying the presence of “bubble” sounds over the epigastrium</li> <li>• Following confirmation of sounds over epigastrium, aspirate with the syringe, looking for gastric contents</li> </ul> <p><i>If insertion was successful</i></p> <ul style="list-style-type: none"> <li>• Secure with tape</li> <li>• Attach gastric tube to suction intermittently at 30-40 mmHg</li> </ul>			<p><b>ADVANCED</b></p>

## Highly Contagious Infectious Disease

- Upon notification of a response to or awareness of a patient with HCID
- Don personal protective equipment before entering scene (do not remove until after patient contact ends)
- Minimize potential exposure
  - Only **one** EMS provider should approach the patient and perform the initial screening from at least 6 feet away from the patient.
  - Keep other emergency responders further away, while assuring they are still able to support the provider with primary assessment duties.
  - Confirm screening criteria:
    1. Does the patient have any of the following symptoms?
      - a. Fever or chills
      - b. Headache, joint pain, or muscle aches
      - c. Weakness or fatigue
      - d. Stomach pain, diarrhea, or vomiting
      - e. Abnormal bleeding
    - AND
    2. Recent exposure to an individual with a confirmed HCID and/or travel to a region with a known outbreak of an HCID, or if known public health emergency (e.g., COVID, Ebola, Monkeypox).

### *If patient remains a person under investigation*

- Follow agency HCID notification process
- Remove and keep nonessential equipment away from the patient, so as to minimize contamination, on the scene and in the ambulance.
  - Medical equipment used on patients should be disposable whenever possible  
Including manual BP cuff and manual suctioning (if necessary).
  - Transfer cardiac monitor and other equipment to supervisor before transporting.
- Follow disease specific Medical Directives regarding the performance of invasive procedures that may be required for patient stabilization.
  - Minimize aerosolizing procedures to what is necessary while wearing appropriate PPE for airborne precautions
  - If patient is in cardiac arrest contact OLPG immediately for guidance on possible WOR.
- Notify receiving hospital as soon as possible
- Outfit ambulance as per HCID procedure.
- Notify PD to secure scene and keep any exposed persons in same household sequestered until Public Health assesses
- Documentation of patient care should be done after EMS providers have completed their personal cleaning and decontamination of equipment and vehicle.
- EMS documentation should include a listing of public safety providers involved in the response and level of contact with the patient (for example, no contact with patient, provided direct patient care). This documentation may need to be shared with local public health authorities.
- Stay with the patient in the ambulance until the hospital staff is prepared to receive the patient.
- EMS Personnel will doff PPE at the hospital, using the hospital protocol and monitor.

BASIC

ASSIST

ADVANCED



# Influenza Vaccination

<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>→ Adults: One dose if vaccinated for the seasonal influenza in any previous year</li> <li>→ Children 6 mo - 9 yr: Two doses separated by at least 28 days if they have never received a seasonal influenza vaccination in the past, or if their first seasonal influenza vaccine was last year and they only received one dose</li> </ul> <p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>→ Age less than 6 months</li> <li>→ Any acute illness more severe than a common cold</li> <li>→ Oral (or equivalent) temperature elevation <math>\geq 101.5F</math></li> <li>→ History of Guillian-Barre</li> <li>→ Serious allergic reaction to previous dose of influenza vaccine</li> <li>→ Serious allergic reaction to egg or egg products</li> </ul>	<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>→ Prepare vaccines in a clean, designated medication area away from where the patient is being vaccinated and away from any potentially contaminated items. This is to prevent inadvertent contamination of the vial through direct or indirect contact with potentially contaminated surfaces or equipment.</li> <li>→ Different manufacturers have additional allergy contraindications which may include gentamicin, neomycin, polymyxin, thimersol, gelatin, and latex. It is <b>ESSENTIAL</b> that anyone utilizing this protocol understands the packaging insert(s) and contraindications for the specific manufacturers' product(s) being used</li> </ul>	<p><b>BASIC</b></p>
<p><b>Procedure:</b></p> <ol style="list-style-type: none"> <li>1. Provide vaccinee appropriate CDC Vaccination Information Statement (VIS)</li> <li>2. Vaccinee to complete the top section of the Vaccine Administration Record (VAR)</li> <li>3. Review completed VAR             <ol style="list-style-type: none"> <li>a. VAR serves as written consent for the vaccination</li> <li>b. If a potential vaccinee answers "yes" to any of the questions, the potential vaccinee should not receive the vaccination until cleared by a physician</li> </ol> </li> <li>4. Prepare and verify appropriate dose             <ol style="list-style-type: none"> <li>a. For persons 3 years of age and older:                 <ol style="list-style-type: none"> <li>i. 0.5 mL for all inactivated influenza vaccine products</li> </ol> </li> <li>b. For children 6–35 months of age:                 <ol style="list-style-type: none"> <li>i. 0.25 mL for Fluzone Quadrivalent</li> <li>ii. 0.5 mL for FluLaval Quadrivalent</li> </ol> </li> </ol> </li> <li>5. The injection site (L or R deltoid or L or R anterolateral aspect of thigh) should be identified and cleansed with alcohol pad</li> <li>6. A 21-25 gauge needle 1 inch long should be used for adults             <ol style="list-style-type: none"> <li>a. In patients less than 60 kg, a 5/8 to 3/4 inch needle is preferred</li> </ol> </li> <li>7. Insert the needle at a 90-degree angle and stretch the skin flat between thumb and forefinger</li> <li>8. The appropriate dose of vaccine should be delivered in the muscle in a quick, steady manner</li> </ol>		<p><b>ASSIST</b></p>
		<p><b>ADVANCED</b></p>

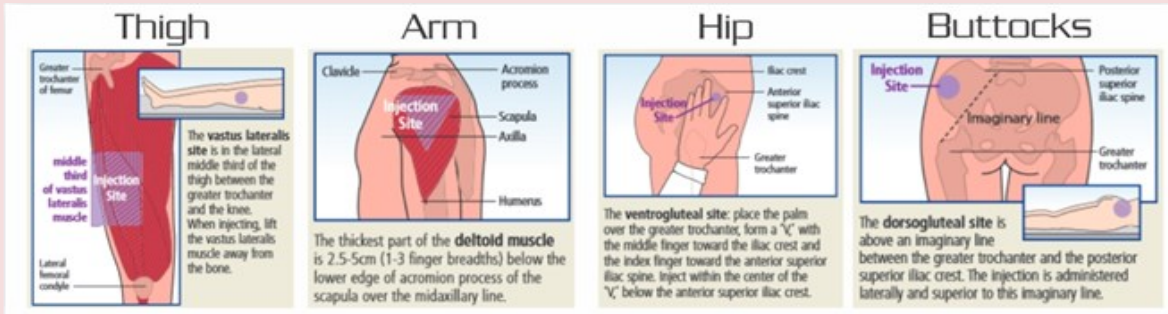
## Intramuscular (IM) Injection

**Indications (Basic providers):**  
Severe allergic reaction

**Indications (Assist/Advanced):**  
Medication administration where applicable in protocol

BASIC

- Select the appropriate administration site:



ASSIST

- Prepare appropriate equipment:

Deltoid Muscle	Dorsogluteal Muscle	Ventrogluteal Muscle	Vastus Lateralis Muscle
Type: IM	Type: IM	Type: IM	Type: IM
Size: 23 to 25 G, 5/8" to 1"	Size: 20 to 23 G, 1 1/2" to 3"	Size: 20 to 23 G, 1 1/2" to 3"	Size: 23 to 25 G, 5/8" to 1 1/2"

ADVANCED

- Stretch skin and hold tight. Hold the syringe at a 90 degree angle to the skin and insert the needle into the muscle tissue with a steady sharp and controlled motion
- Releases the tension on the skin
- Administer correct dose of medication at the proper push rate

## Intraosseous (IO) Access

ASSIST

**Indications:**

- Cardiac Arrest
- Severe illness/injury and at risk for cardiac arrest

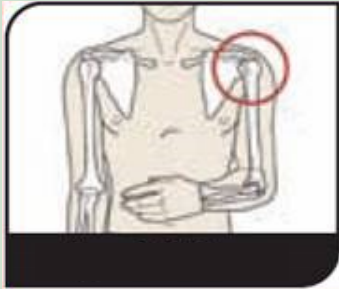
**Contraindications:**

- Available peripheral access
- Hemodynamic stability
- Fractured extremity (consider alternate site)
- Excess tissue/swelling/edema at insertion site
- Infection at insertion site (consider alternate site)
- Known bleeding disorder

**Pearls & Pitfalls:**

- Humeral head is the preferred access site for adults
- Syringe bolus as needed (Adult 20 ml/Pedi 10 ml)
- If conscious explain the need for the procedure

- Locate appropriate insertion site
  1. Humeral Head (Adults)
  2. Proximal Tibia
- Prepare insertion site  
Aseptic technique
- Prepare needle/driver assembly  
*See picture/chart (below)*



ADVANCED

### Humeral Insertion:

- Aim the needle tip laterally into the deltoid at a 45° angle toward the patient's feet
- Gradually drill the needle into the arm until the hub is flat against the skin (adjust depth as needed for flow)

### Tibial Insertion:



- Aim the needle 90° into the medial (flat) surface of the tibia
- Gradually drill the needle into the tibia until the hub is flat against the skin (adjust depth as needed for flow)

- Verify patency:  
Syringe bolus 10-20 ml (aspiration of marrow is not recommended)  
Use pressure infuser/IV pump to maintain flow
- Dress the site  
Protect from trauma/dislodgment
- Apply wristband
- Administer **2% Lidocaine** prior to infusion  
40 mg slow IO bolus (Adult)  
0.5 mg/kg slow IO bolus (Pedi)

Needle size Guide		
Pink	Blue	Yellow
15 mm	25 mm	45mm
7-90 lbs	≥ 90 lbs	≥ 90 lbs with excess tissue; all adult humeral insertions

# Intravenous & Central Line Access

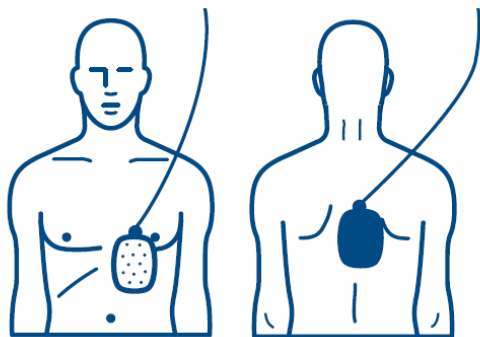
<p><b>Indications:</b>                  Need or potential need for                  → Fluids                  → Medications</p> <p><b>Invasive line Access</b>                  → Cardiac arrest                  → Hemodynamic instability                  → Currently accessed</p>	<p><b>Pearls &amp; Pitfalls:</b>                  → Utilize other methods after 2 peripheral attempts if hemodynamically unstable                  External Jugular Access                  EZ-IO device                  Invasive line access</p>	<p><b>ASSIST</b></p>
<p><b>Peripheral access (extremity or truncal)</b></p> <ul style="list-style-type: none"> <li>Apply band tourniquet to extremity</li> <li>Identify suitable venipuncture site                      Straight vein segment                      Intact, healthy skin</li> <li>Select an appropriate size angiocatheter  <u>Adult:</u>                      Hemodynamic instability, continuous infusions                      18 g or larger                      Medication administration only                      20 g max preferred  <u>Pediatric:</u>                      Hemodynamic instability, continuous infusions                      18 g max                      Medication administration only                      22 g max preferred</li> <li>Use aseptic technique to clean site</li> <li>Apply traction to skin above intended puncture site</li> <li>Insert angiocatheter into the vessel                      Decrease angle of insertion on noting “flash” of blood                      Advance needle/angiocatheter slightly</li> <li>Retract/lock the needle</li> <li>Attach line/lock                      Flush line/administer fluids</li> </ul>	<p><b>External Jugular Vein Access</b></p> <ul style="list-style-type: none"> <li>Lay patient with head dependent if possible  <i>(raise legs if unable to make head lower than torso)</i></li> <li>Identify the external jugular vein                      Examine both sides of the neck                      Use flat, straight vein segment</li> <li>Select venipuncture site highest point above clavicle possible</li> <li>Select appropriate size angiocatheter  <u>Adult:</u>                      18 g or larger  <u>Pediatric:</u>                      20 max preferred</li> <li>Use aseptic technique to clean site</li> <li>Apply traction to skin above intended puncture site</li> <li>Insert angiocatheter into the vessel                      Decrease angle of insertion on noting “flash” of blood                      Advance needle/angiocatheter slightly</li> <li>Retract/lock the needle</li> <li>Attach line/lock                      Flush line/administer fluids</li> </ul>	

<p><b>Peripherally Inserted Central Catheter Access :</b></p> <ul style="list-style-type: none"> <li>Select the largest lumen available</li> <li>Remove cap on the end of the catheter</li> <li>Prep the end of the lumen with an alcohol swab</li> <li>Aspirate 10 ml of blood with the syringe and discard</li> <li>Flush the lumen with 10 ml normal saline using a 10 ml syringe</li> <li>Attach IV administration set and observe for free flow of fluid</li> <li>If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting</li> </ul> <div style="display: flex; justify-content: space-around;">   </div>	<p><b>Equipment:</b>                  10 ml syringe (empty), 10 ml syringe (normal saline) and sterile gloves (if available)                  Multi-Lumen Catheters (PICCs and Boviacs can have one, two, or three lumens)</p> <hr/> <p><i>If unable to aspirate blood</i></p> <ul style="list-style-type: none"> <li>re-clamp the lumen and attempt to use another lumen (if present)</li> </ul> <p><i>If clots are present</i></p> <ul style="list-style-type: none"> <li>Do not utilize</li> </ul> <p><i>If catheter does not flush easily</i></p> <ul style="list-style-type: none"> <li>If unable to flush, clamp line attempt different port (if available)</li> </ul> <p>PICC line will generally flush more slowly and with greater resistance than a typical intravenous catheter</p>	<p><b>ADVANCED</b></p>
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## Manual Defibrillation

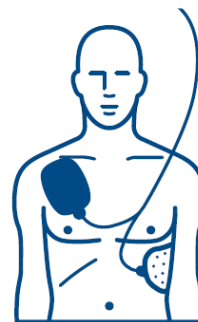
<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>→ Ventricular Fibrillation</li> <li>→ Pulseless Ventricular Tachycardia</li> </ul> <p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>→ None</li> </ul>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Withhold defibrillation until removed from standing water/conductive surfaces (metal)</li> <li>→ Hands on defibrillation not recommended</li> <li>→ Do not place defibrillator pads over implanted devices</li> </ul>	<b>BASIC</b>
<ul style="list-style-type: none"> <li>• Begin chest compressions</li> <li>• Apply defibrillator pads (after 3rd unsuccessful shock, change pad placement)</li> <li>• Continue chest compressions during defibrillator charging</li> <li>• Count down 10 seconds from intended shock delivery (aloud)</li> <li>• Inform entire resuscitation team prior to shock</li> <li>• Allow <u>no more than 3 seconds</u> of interruption prior to, and post, defibrillation</li> <li>• Immediately resume CPR 2 minutes</li> </ul>		
<p><i>During uninterrupted CPR</i></p> <ul style="list-style-type: none"> <li>• Charge defibrillator</li> <li>• Count down 10 seconds from intended shock delivery (aloud)</li> <li>• Inform entire resuscitation team prior to shock</li> <li>• Choreograph team to keep peri-shock pause ≤ 3 sec total</li> <li>• Attempt additional shock after 2 full minutes of CPR <i>as indicated</i></li> </ul>		<b>ASSIST</b>
<b>Electrical Dose Reference</b>		
<b>Adult</b>	<b>Pediatric/Infant</b>	
<p>Highest energy setting available</p> <p><i>No change: CPR performance, or energy if shocks from ICD</i></p>	<p>Begin at 2 J/kg increase by 2 J/kg q 2 min (max 10 J/kg or max energy setting)</p>	
<b>ADVANCED</b>		

Anterior/Posterior Pad Placement\*



\* variations do exist, use as appropriate for situation

Anterior Pad Placement



# Mechanical Compression Device

**Indications:**

- Adult cardiac arrest
- Situations where manual chest compressions increase risk to providers (highly-contagious diseases, confined spaces, etc.)

**Contraindications:**

- Application will delay CPR > 10 sec
- Patient size prevents proper application

**Pearls & Pitfalls:**

- Consider withholding Mechanical Compression Device placement until transport or ROSC if able to maintain quality uninterrupted manual CPR
- Minimally-interrupted manual CPR is better than perfect CPR after an unacceptable pause (> 10 seconds)

BASIC

ASSIST

- Follow Pit Crew Procedure to ensure high quality chest compressions prior to placement
    - Ensure monitor/AED applied and rhythm check ± defibrillation occurs prior to MCD placement
    - Do not attempt Mechanical Compression Device placement until at least 3 providers are at the bedside
  - Perform Pre-application Timeout
    - S: Size - determine if device will fit on patient per manufacturer recommendations
    - T: Turn on - ensure the device powers on and battery charge is adequate
    - A: Abort - voice abort procedure; ensure all providers are comfortable with procedure
    - R: Roles - ensure all providers understand their role in application procedure
    - S: Strap - abort procedure if neck strap unavailable
  - Power on device, prepare, and stage all equipment near patient’s head
  - Position providers at patient’s right and left shoulders, and above patient’s head
 

AT THE NEXT 2 MIN RHYTHM CHECK (DO NOT DELAY CPR > 10 SEC)
  - Each provider lift patient by respective shoulder
  - Third provider place the back piece below the patient’s back, under the armpit
  - Resume manual chest compressions immediately
 

AT THE NEXT 2 MIN RHYTHM CHECK (DO NOT DELAY CPR > 10 SEC)
  - Apply device arms to back plate and lock in place
    - LUCAS - Swing arm over and clamp on both sides
    - DefibTech - Clamp on both sides and insert piston
  - ADJUST the piston suction cup down to the midsternum, and lock in place (Manufacturer dependent)
  - Activate device using correct compression protocol and ensure appropriate rhythm/pulse check every 2 minutes
  - Apply neck and wrist straps
- If patient’s size not appropriate for Mechanical Compression Device application*
- Perform high-quality manual chest compressions
  - Continue Pit Crew Procedure and other treatment as appropriate

ADVANCED



## Needle Thoracostomy

### Indications:

- Suspected tension pneumothorax with signs of poor ventilation/cardiac output
- Traumatic cardiac arrest with blunt or penetrating injury to the torso

### Precautions:

- Insertion too low can cause trauma to the liver, spleen, bowel or diaphragm
- Do not delay the procedure when indicated

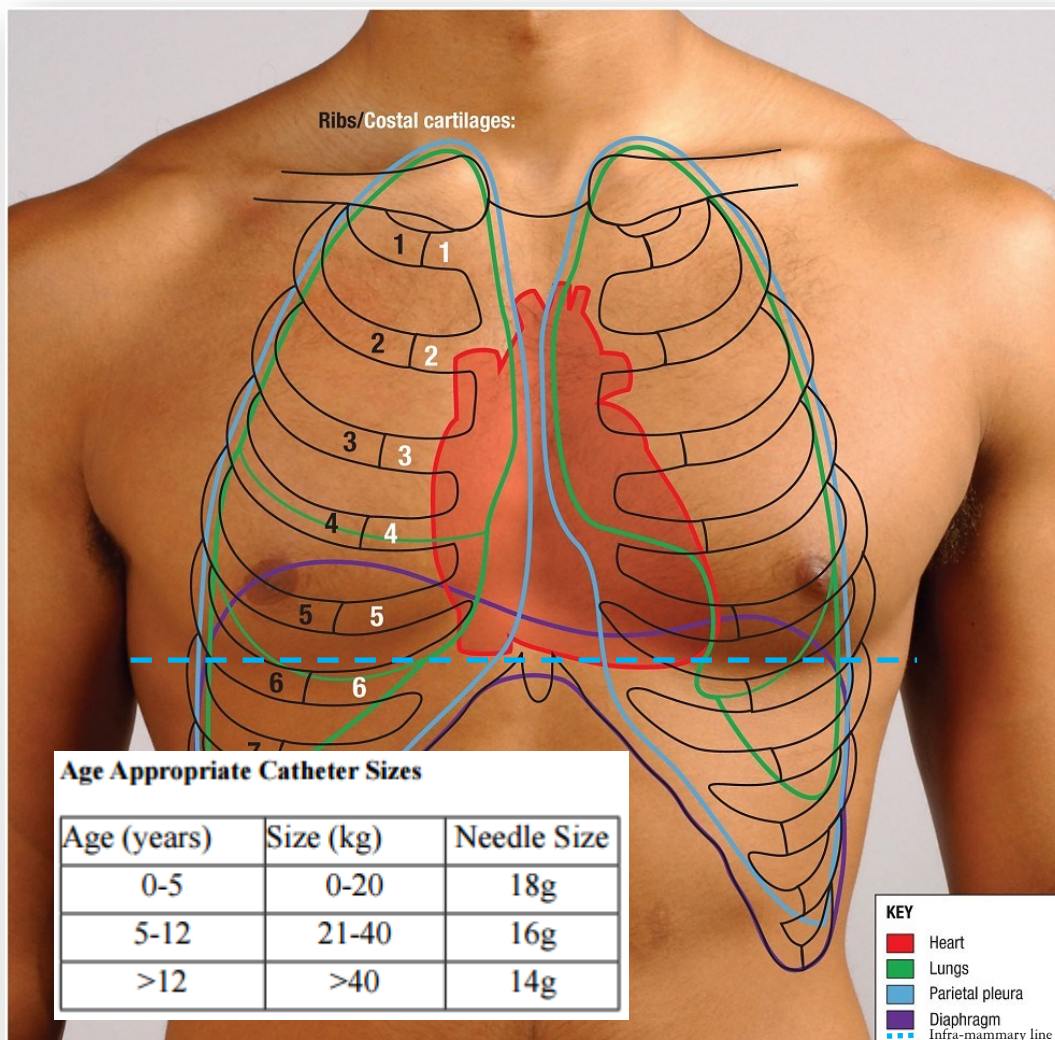
ASSIST

- Prepare equipment: 14 G (3-inch long) angiocatheter
- Apply monitor before if time allows; *EKG, Waveform EtCO<sub>2</sub>, NIBP every 2-minutes*
- Palpate the 5th-intercostal space, *at the infra-mammary line (just below the nipple line)*
- Insert the needle at a right angle to the chest wall, at the mid-axillary line, over the top of the lower rib
- *Insert until a rush of air is heard or the hub of the needle is reached*  
Decompress the other side as appropriate
- Remove the needle
- Leave catheter in place and open to air

*If patient in traumatic cardiac arrest:*

- Consider procedure bilaterally

ADVANCED





# Non-invasive Positive Pressure Ventilation (NIPPV)

## Indications:

- Respiratory distress with resistant hypoxia
- Awake, able to cooperate for device application
- Ability to wear adult size mask

## Contraindications:

- Pending respiratory failure
- Penetrating chest trauma
- Suspected pneumothorax
- Uncontrolled/persistent vomiting
- Facial deformity (traumatic or anatomic) preventing mask seal

## Pearls & Pitfalls:

- **Utilize EtCO<sub>2</sub> monitoring**, monitor for duration of placement
- Caution if patient unable to cooperate for procedure
  - Nausea/vomiting (retching/vomiting episodes)
  - Anatomic deformity (unable to create mask seal)
  - Risk of hemodynamic collapse
- Consider multiple causes for respiratory distress (pneumothorax/mediastinum, effusion, PE, etc.)
- Monitor trends in waveform capnography, CO<sub>2</sub> values, pulse oximetry, mental status, HR/BP
- q ≤ 5 min. reevaluation recommended for all monitoring/VS, document appropriately
- To increase FiO<sub>2</sub> when using NIPPV, consider additionally placing NC on patient as well

BASIC

ASSIST

## CPAP-only device (e.g. Flow-Safe II EZ)

- Maximize upright sitting position
- Connect oxygen tubing nipple to oxygen source
- Seal the mask to the patient's face using headpiece
- Turn on oxygen source
- Secure the face mask snugly to patient's face using head harness
- Slowly increase oxygen flow to roughly 15 lpm
- Check mask fit to patient and device connections for leaks
- Adjust the flowmeter until desired pressure is obtained

### CPAP-Only Device Flow:-Pressure Reference

Approx. Flow Rate	Pressure
15 lpm	5 cmH <sub>2</sub> O
20 lpm	7.5 cmH <sub>2</sub> O
25 lpm	10 cmH <sub>2</sub> O

## BPAP (Bilevel positive airway pressure - e.g. Flow-Safe II+ BiLevel)

- Maximize upright sitting position
- Connect O<sub>2</sub> tubing nipple to oxygen source
- Turn on oxygen source
- Ensure device is in Bilevel mode by rotating the green switch to the Bilevel setting
- Secure the face mask snugly to patient's face using head harness
- Slowly increase oxygen flow to 15 LPM, to achieve goal IPAP of roughly 8-10 cm H<sub>2</sub>O
- Check mask fit to patient and device connections for leaks
- Adjust EPAP knob until manometer reaches 5 cm H<sub>2</sub>O during exhalation

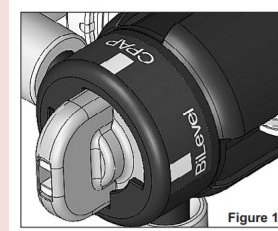


Figure 1.

→ Effective mask seal is required for device to shift into EPAP mode from IPAP mode

### *If simultaneous bronchodilators required*

- Maximize upright sitting position
  - Connect O<sub>2</sub> tubing nipple to oxygen source.
  - Seal the mask to the patient's face using headpiece
  - Turn on oxygen source
  - Ensure device is set in CPAP mode-Green switch is set to CPAP
  - Secure the face mask snugly to patient's face using head harness
  - Slowly increase oxygen flow to 6 - 8 LPM
  - Check mask fit to patient and device connections for leaks
  - Adjust the flowmeter until desired pressure is obtained
- Flow of 12 - 14 LPM is required to reach CPAP pressure of 8.5 - 10 cm H<sub>2</sub>O

### CPAP on CPAP/BPAP Device Flow:-Pressure Reference

Approx. Flow Rate	Pressure
10 lpm	6-7 cmH <sub>2</sub> O
15 lpm	11-12 cmH <sub>2</sub> O

### BPAP on CPAP/BPAP Device Flow:-Pressure Reference

15 lpm	8-10 cmH <sub>2</sub> O
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ADVANCED

# Pelvic Binder

**Indications:**

- Mechanism suggestive of pelvic injury and obvious signs of pelvic injury/instability on physical exam AND
- Signs of hemorrhagic shock (e.g. SBP < 90 and/or Shock Index ≥ 1)

**Contraindications:**

- Isolated proximal femur fracture (isolated “hip fracture”)

**Pearls & Pitfalls:**

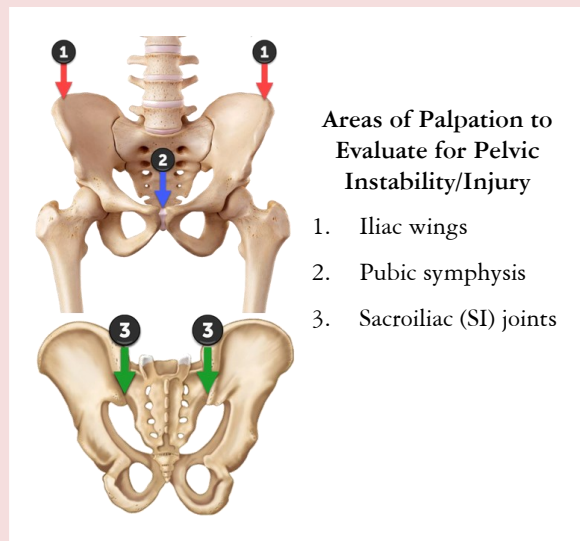
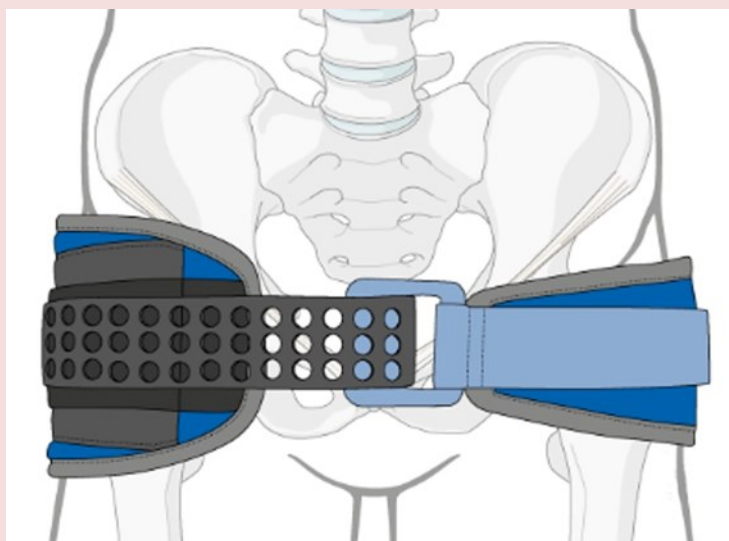
- Low energy mechanisms (e.g. falls from standing) rarely cause unstable pelvic fractures
- Do not “rock” or “spring” the pelvis. Gently compress iliac wings to assess for instability. Palpate for tenderness at pubic symphysis, iliac wings, sacrum/sacro-iliac joints
- In reliable patients with no leg/spinal cord injury and no analgesia, a painless straight leg raise test may exclude a pelvic injury
- Avoid log-rolling, use scoop stretcher or slide techniques
- Consider in blunt traumatic arrest with MOI/findings of pelvic injury

BASIC

ASSIST

**Pelvic binder device**

- Remove clothing from patient’s pelvic area
- Place the black side up beneath patient at the level of the greater trochanters
- Place black strap through buckle and pulls completely through
- Hold orange strap and pull black strap in opposite direction until buckle click is felt and heard (approx. 35 pounds of force)
- Maintain tension, immediately press black strap onto surface of the pelvic sling to secure



ADVANCED

**Improvised Pelvic Binder (no commercial device available)**

- Remove clothing from patient’s pelvic area
- Place the material beneath patient with the ends out to either side at the level of the greater trochanters
- Pull each end to the front of the pelvis

*If using a sheet and hemostats*

- Tuck one end into the opposite side and hold still against force being applied to the other side
- Pull against the sheet on the untucked end with 150 Newtons of force (approximately 35 pounds)
- Maintain tension, secure in place with hemostats at the upper and lower edge of the sheet (ideally at least 2 at each edge for best securement)

*If using a sheet only*

- Cross ends over the anterior pelvis gripping the side of the sheet that came from the side you are on
- Mirror this action on both sides
- Pull against your assistant until there is a combined force of 150 Newtons (approximately 35 pounds)
- Maintain tension, twist sheet ends an additional rotation and tuck into the portion encircling the pelvis. Add tape for improved securement

## Pit Crew (2 Responders)

### COMPRESSION NOTES

- "Hover Hands" over patient chest (every compressor  @ all rhythm checks)
- Continue Compressions during Charge
- Rate: 100-120
- Depth: 2-2.5 in
- Pauses: < 10 sec.
- Lean: 0

### DEFIBRILLATION:

- Witnessed Arrest**— Immediately apply, analyze, and shock (AED) as advised
- Unwitnessed**— 2 minutes CPR THEN analyze

### AIRWAY

- Defer 3 cycles/6 minutes (with/without shocks)
- UNLESS suspected/known choking
- Do not stop CPR to intubate/place SGA
- Flatline EtCO<sub>2</sub> WAVEFORM
- Remove device

### Monitor

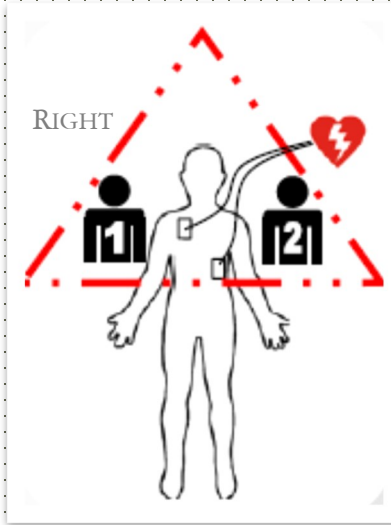
Compression monitoring device for all manual CPR

### Position 1

- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway

BASIC

Airway- defer unless ≥ 2 providers on scene



NO OBSTACLE ZONE

Move patient to suitable location

### Position 2

- Attach monitor/defib. Keep within arms reach
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

BASIC

### After 2 minutes of continuous CPR

Position 2 takes compressions/Position 1 applies oxygen (and opens airway)

Position 1	Position 2
(may be done as first CPR cycle is occurring) <ul style="list-style-type: none"> <li>• OPA ± NPA AND</li> <li>• Jaw Thrust/Head-tilt</li> <li>• NRB ± HFNC (15 LPM ea.)</li> </ul>	Complete 1 minute compressions <ul style="list-style-type: none"> <li>• BLS: AED "ANALYZE"</li> <li>• ALS: Rhythm Check ≤ 3 sec.</li> </ul>
"No Shock Advised" or Asystole/ <b>PEA</b> <ul style="list-style-type: none"> <li>• Position 1—Immediately begin CPR</li> </ul>	"Shock Advised" or VFIB/VT <ul style="list-style-type: none"> <li>• Position 1—RESUME CPR</li> <li>• Position 2— Charge defib.                             <ul style="list-style-type: none"> <li>• Clear patient</li> <li>• Deliver shock</li> <li>• Continue 2 min. CPR</li> </ul> </li> </ul>

Repeat x 3 before ETT/SGA insertion

## Pit Crew (3 Responders)

### COMPRESSION NOTES

- "Hover Hands" over patient chest (every compressor  $\square$  @ all rhythm checks)
- Continue Compressions during Charge
- Rate: 100-120
- Depth: 2-2.5 in
- Pauses: < 10 sec.
- Lean: 0

### DEFIBRILLATION:

**Witnessed Arrest**— Immediately apply, analyze, and shock (AED) as advised

**Unwitnessed**— 2 minutes CPR THEN analyze

**BLS only:** Fill assist/advanced preferred positions/ intervene within scope

### AIRWAY

Defer 3 cycles/6 minutes (with/without shocks)

UNLESS suspected/known choking  
Do not stop CPR to intubate/place SGA

Flatline EtCO<sub>2</sub> WAVEFORM

→ Remove device

### Position 3

- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)
- \*Do not interrupt compressions
- \*Confirm EtCO<sub>2</sub> q breath
- \*basic if no advanced/assist avail.

ASSIST

### Monitor

Compression monitoring device for all manual CPR

### Position 1

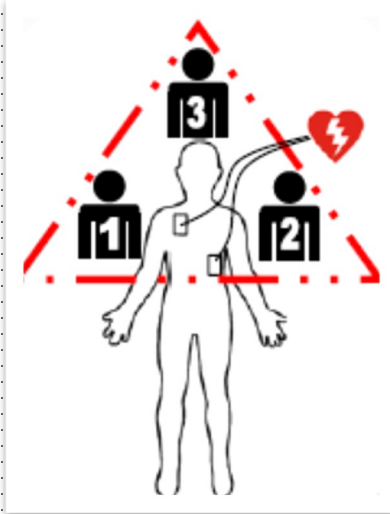
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway

BASIC

### Position 2

- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

BASIC



**NO OBSTACLE ZONE**

Move patient to suitable location

### After 2 minutes of continuous CPR

Position 2 takes compressions/Position 1 applies oxygen (and opens airway)

Position 1	Position 2
(may be done as first CPR cycle is occurring) <ul style="list-style-type: none"> <li>• OPA ± NPA AND</li> <li>• Jaw Thrust/Head-tilt</li> <li>• NRB ± HFNC (15 LPM ea.)</li> </ul>	Complete 1 minute compressions <ul style="list-style-type: none"> <li>• BLS: AED "ANALYZE"</li> <li>• ALS: Rhythm Check ≤ 3 sec.</li> </ul>
'No Shock Advised' or Asystole/PEA <ul style="list-style-type: none"> <li>• Position 1—Immediately begin CPR</li> </ul>	"Shock Advised" or VFIB/VT <ul style="list-style-type: none"> <li>• Position 1—RESUME CPR</li> <li>• Position 2— Charge defib.                             <ul style="list-style-type: none"> <li>• Clear patient</li> <li>• Deliver shock</li> <li>• Continue 2 min. CPR</li> </ul> </li> </ul>

Repeat x 3 before ETT/SGA insertion

## Pit Crew (4 Responders)

### COMPRESSION NOTES

- "Hover Hands" over patient chest (every compressor  $\square$  @ all rhythm checks)
- Continue Compressions during Charge
- Rate: 100-120
- Depth: 2-2.5 in
- Pauses: < 10 sec.
- Lean: 0

### DEFIBRILLATION:

**Witnessed Arrest**— Immediately apply, analyze, and shock (AED) as advised

**Unwitnessed**— 2 minutes CPR THEN analyze

**BLS only:** Fill assist/advanced preferred positions/ intervene within scope

### AIRWAY

Defer 3 cycles/6 minutes (with/without shocks)

UNLESS suspected/known choking  
Do not stop CPR to intubate/place SGA

Flatline EtCO<sub>2</sub> WAVEFORM

→ Remove device

### Position 3

- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)
- \*Do not interrupt compressions
- \*Confirm EtCO<sub>2</sub> q breath
- \*basic if no advanced/assist avail.

ASSIST

### Monitor

Compression monitoring device for all manual CPR

### Position 1

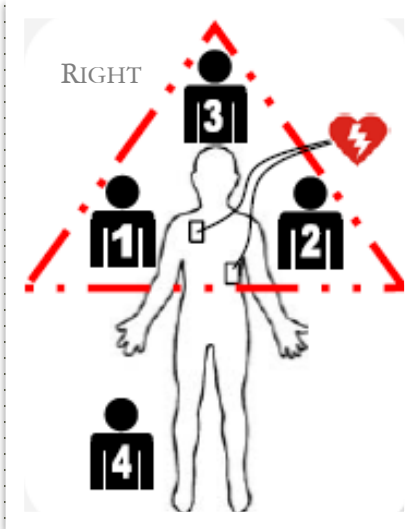
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway

BASIC

### Position 2

- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

BASIC



NO OBSTACLE ZONE

Move patient to suitable location

### Position 4

- Assist Position 1 and 2
- Equipment/airway/monitor
- IV/IO access
- Epi q 5 "On the 5's"*
- Other ACLS meds, as appropriate*
- Coordinates shock pause/defib. "On 2's"

ASSIST

### After 2 minutes of continuous CPR

Position 2 takes compressions/Position 1 applies oxygen (and opens airway)

Position 1	Position 2
(may be done as first CPR cycle is occurring) <ul style="list-style-type: none"> <li>• OPA ± NPA AND</li> <li>• Jaw Thrust/Head-tilt</li> <li>• NRB ± HFNC (15 LPM ea.)</li> </ul>	Complete 1 minute compressions <ul style="list-style-type: none"> <li>• BLS: AED "ANALYZE"</li> <li>• ALS: Rhythm Check ≤ 3 sec.</li> </ul>
'No Shock Advised' or Asystole/PEA <ul style="list-style-type: none"> <li>• Position 1—Immediately begin CPR</li> </ul>	"Shock Advised" or VFIB/VT <ul style="list-style-type: none"> <li>• Position 1—RESUME CPR</li> <li>• Position 2— Charge defib.                             <ul style="list-style-type: none"> <li>• Clear patient</li> <li>• Deliver shock</li> <li>• Continue 2 min. CPR</li> </ul> </li> </ul>

Repeat x 3 before ETT/SGA insertion



## Pit Crew (5 Responders)

### COMPRESSION NOTES

- "Hover Hands" over patient chest (every compressor  @ all rhythm checks)
- Continue Compressions during Charge
- Rate: 100-120
- Depth: 2-2.5 in
- Pauses: < 10 sec.
- Lean: 0

### DEFIBRILLATION:

- Witnessed Arrest**— Immediately apply, analyze, and shock (AED) as advised
- Unwitnessed**— 2 minutes CPR THEN analyze

### AIRWAY

- Defer 3 cycles/6 minutes (with/without shocks)
- UNLESS suspected/known choking
- Do not stop CPR to intubate/place SGA
- Flatline EtCO<sub>2</sub> WAVEFORM
- Remove device

**BLS only:** Fill assist/advanced preferred positions/ intervene within scope

### Position 5 (logistics)

- Assist all positions
- Gather PMH and HPI
  - Down time
  - Cause of the arrest
- Assists Position 4 *timekeeping*

BASIC

### Position 3

- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)
- \*Do not interrupt compressions
- \*Confirm EtCO<sub>2</sub> q breath
- \*basic if no advanced/assist avail.

ASSIST

### Monitor

Compression monitoring device for all manual CPR

### Position 1

- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway

BASIC

### Position 2

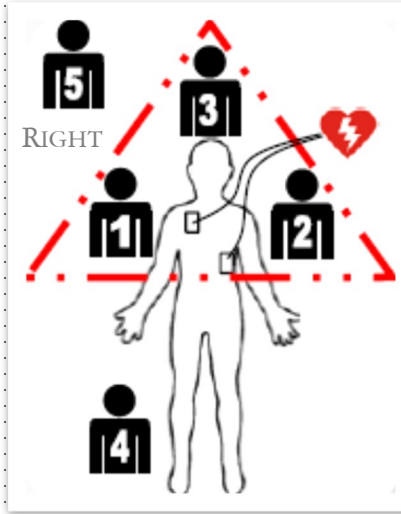
- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

BASIC

### Position 4

- Assist Position 1 and 2
- Equipment/airway/monitor
- IV/IO access
- Epi q 5 "On the 5's"*
- Other ACLS meds, as appropriate*
- Coordinates shock pause/defib. "On 2's"

ASSIST



NO OBSTACLE ZONE

Move patient to suitable location

### After 2 minutes of continuous CPR

Position 2 takes compressions/Position 1 applies oxygen (and opens airway)

Position 1	Position 2
(may be done as first CPR cycle is occurring) <ul style="list-style-type: none"> <li>• OPA ± NPA AND</li> <li>• Jaw Thrust/Head-tilt</li> <li>• NRB ± HFNC (15 LPM ea.)</li> </ul>	Complete 1 minute compressions <ul style="list-style-type: none"> <li>• BLS: AED "ANALYZE"</li> <li>• ALS: Rhythm Check ≤ 3 sec.</li> </ul>
"No Shock Advised" or Asystole/ <b>PEA</b> <ul style="list-style-type: none"> <li>• Position 1—Immediately begin CPR</li> </ul>	"Shock Advised" or VFIB/VT <ul style="list-style-type: none"> <li>• Position 1—RESUME CPR</li> <li>• Position 2— Charge defib.                             <ul style="list-style-type: none"> <li>• Clear patient</li> <li>• Deliver shock</li> <li>• Continue 2 min. CPR</li> </ul> </li> </ul>

Repeat x 3 before ETT/SGA insertion

## Spinal Motion Restriction

### AMBULATORY and Neurologically Intact

- Already self-extricated
- Already standing
- No Thoracic or Lumbar spinal tenderness

1. Place cervical collar
2. Bring stretcher as close as possible
3. Assist patient with pivoting & laying down in position of comfort (may elevate HOB if no thoracic/lumbar spine tenderness)
4. Secure patient to stretcher

BASIC

ASSIST

OR

### ALL OTHERS

1. Place cervical collar
2. Use device (KED/Vacuum Splint/Scoop stretcher/backboard\*) to move patient to stretcher
3. Move patient with as little movement as possible, *maintain in-line stabilization*
4. Secure patient SUPINE to stretcher (tape & seat belts)  
DO NOT leave EXTRICATION DEVICE in place

ADVANCED

\*Backboards and Scoop Stretchers are patient movement devices ONLY. DO NOT LEAVE IN PLACE FOR TRANSPORT



## Suction

### Indications:

- Trauma to the anterior head and/or neck
- Oral and Nasal Secretions and vomitus unable to be cleared by the patient themselves associated with any condition
- Meconium aspiration of non-vigorous neonate (respiratory distress/persistent cyanosis)

### Pearls & Pitfalls:

- Avoid prolonged suction intervals, oxygenate if possible between attempts at clearing the airway
- Avoid contaminating catheters used for deep suctioning  
*Rinse catheter often*
- Apply suction on withdrawal only
- Avoid inducing vomiting with oral suction, especially the partially alert patient
- Utilize commercial bite block or Yankauer suction catheter between the molars when inserting hands in patient mouth

### Nasal Suction (French catheter)

- Insert catheter (same technique as for nasal trumpet insertion)  
Stop insertion at depth of suspected location of blood/secretions/vomitus
- Apply suction  
Use vigorous spiral motion on removal  
(Slow removal when a pool of liquid is encountered until cleared)

### Yankauer and Manual Suction Devices

#### Perfusing (no CPR in progress):

- Drain patient mouth  
Roll patient to side (maintain in-line cervical stabilization as needed)  
Remove large or obvious foreign matter with gloved hand
- Sweep or Scoop bulk material if visible in mouth
- Suction mouth and pharynx on removal  
Area past the base of the tongue  
Use vigorous spiral motion on removal

#### CPR in progress (or unable to roll patient):

- Position head  
*Ear-to-sternal-notch*
- Open the patient's mouth  
*Scissor technique (thumb and index finger)*
- Pinch/remove large or obvious foreign matter with gloved hand
- Suction mouth and pharynx on removal  
area past the base of the tongue  
Use vigorous spiral motion on removal

### Meconium Aspiration Suction

- Obtain APGAR score (see [Newly Born Protocol](#))
- Keep patient warm
- Suction with bulb syringe  
Mouth, pharynx, then nose
- Effective BVM management (see [Bag Mask Ventilation Procedure](#))

### Tracheal Suction (ETT and Tracheostomy)

- Measure catheter from stoma/adaptor—to two fingers past sternal notch
- Insert catheter to premeasured depth
- Apply suction with vigorous spiral motion on removal

BASIC

ASSIST

ADVANCED

# Supraglottic Airway (King LTS-D)

**Indications:**

- Respiratory failure
- Cardiac Arrest

**Contraindications:**

- Caustic ingestions
- Known esophageal disease (Upper esophageal obstruction (e.g. mass, web, stricture)
- Known laryngectomy

**Indications for Removal:**

- Inability to confirm ventilation in  $\leq 5$ -breaths with waveform CO<sub>2</sub>
- Significant gastric contents, secretions, or vomitus in the ventilation port, with absent CO<sub>2</sub> waveform

**Definition of an Attempt**

Insertion of a supraglottic airway into the mouth

**Pearls & Pitfalls:**

- Pre-threading gastric tube into gastric port and connection to continuous suction will reduce likelihood regurgitation and aspiration (pressurized stomach/esophageal eruption)
- The most experienced airway manager available should perform the initial insertion\*
- Advanced providers may opt to use the device as a primary airway if unexpected difficult intubation is encountered
- Insert only after best attempt at achieving SpO<sub>2</sub>  $\geq 90\%$

BASIC

ASSIST

**SIZE GUIDE**

Estimated Patient Height	Tube Color	Estimated "Seal" Volume	Tube Size
6 foot and taller	Purple	90 ml	5
5 to 6 foot	Red	80 ml	4
4 to 5 foot	Yellow	60 ml	3
25-35 kg or 105-130 cm	Orange	40-45 ml	2.5
12-25 kg or 90-115 cm	Green	35 ml	2
5-12 kg	White	20	1
< 5 kg	Clear	10	0

ADVANCED

- Place patient in ear-to-sternal notch or neutral head position  
Suction airway as needed
- Open mouth using scissor technique and jaw thrust
- Insert device into the side of the mouth until no longer possible then
- Allow device to rotate midline until hub reaches lips or teeth
- Inflate to "seal" volume (see chart)
- Attach waveform EtCO<sub>2</sub> detector
- Attach & ventilate using BVM
- Withdraw device as needed for proper airway seating  
Use constant gradual force (perform ventilation and withdrawal simultaneously)
- Confirm ventilation  
4-phase waveform EtCO<sub>2</sub> for every breath (use subjective confirmation techniques as appropriate)
- Add 10 ml to pilot balloon as needed, for suspected poor seal

# Surgical Airway & Transtracheal Ventilation

**Indications:**

→ Failure to oxygenate and ventilate

**Procedure Selection:**

- Surgical airway: patient greater than 35 kg body weight or does not fit Broselow tape
- Transtracheal ventilation: patient less than 35 kg or Broselow tape size green or smaller

**Definition of an Attempt**

Insertion of a needle or scalpel through the neck

**Pearls & Pitfalls:**

- Follow Advanced Airway Preparation Procedure
- Utilize aseptic technique for all invasive procedures
- Continue to attempt to maintain oxygenation by BVM during the procedure

ASSIST

**Surgical Airway**

- Position supine-45° head elevation, head extended upward/backward
- Stabilize the larynx with non-dominant hand (index finger and thumb)
- Stabilize the thyroid cartilage with the provider's non-dominant hand
  - Feel for the depression at the bottom border of the thyroid cartilage
  - Stabilize the wrist/forearm of the incising hand on top of the patient's chest
- Make a vertical incision to the skin on the midline of the trachea large enough to identify the cricothyroid membrane with your finger
- Make a vertical stab incision into the cricothyroid membrane, maintain the scalpel position inside the incision
- Rotate the scalpel horizontally, and incise the cricothyroid laterally to the patients left and right side, leaving the scalpel inside the incision
- Pass a bougie alongside the scalpel pointing the tip toward the patient's feet feeling for hang-up to confirm tracheal placement
- Slide a size 6.0 endotracheal tube over the bougie, rotating at the cricothyroid membrane if unable to pass, until just past the tracheal cuff
- Inflate the cuff via pilot balloon
- Secure with a commercial securing device
- Ventilate and confirm ventilation using EtCO<sub>2</sub>; listen for lung sounds to rule out right main stem intubation

ADVANCED

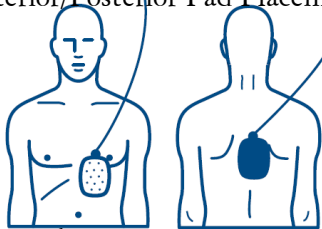
**Transtracheal Ventilation (Pediatric ONLY)**

- Position supine-45° head elevation, head extended upward/backward
- Stabilize the larynx with non-dominant hand (middle finger and thumb)
- Stabilize the thyroid cartilage with non-dominant hand (index finger)
  - Feel for the depression at the bottom border of the thyroid cartilage
  - Stabilize the wrist/forearm of the inserting hand on top of the patient's chest
- Puncture the cricothyroid membrane with a size 16-18G IV catheter, perpendicular to the trachea
- Maintain manual control of the IV catheter
- Orient the needle tip towards the patient's feet and advance the catheter until the hub is reached
- Attach the endotracheal tube connector from a size 3.0 ET tube
- Ventilate using an infant bag-valve-mask device
- Maintain manual control of the catheter until arrival at the hospital
- Attach ETCO<sub>2</sub> and confirm presence of waveform
- Deliver breaths until chest rise is noted, allow time for complete exhalation before next breath

## Synchronized Cardioversion

<p><b>Indications:</b> Tachycardia resulting in:</p> <ul style="list-style-type: none"> <li>→ Hemodynamic instability</li> <li>→ End organ dysfunction</li> <li>→ Hypotension; SBP ≤ 90 or relative ↓BP</li> </ul> <p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>→ Unsustained/intermittent tachycardias</li> </ul>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Withhold defibrillation until removed from standing water/conductive surfaces (metal)</li> <li>→ Hands on defibrillation can result in energy transfer to the provider</li> <li>→ Avoid implanted devices with defibrillator pads</li> </ul> <p>As time allows:</p> <ul style="list-style-type: none"> <li>→ Remove hair from pad</li> <li>→ Administer sedative agent</li> </ul> <p><i>(use caution until hypotension is corrected)</i></p>	<p>ASSIST</p>
<ul style="list-style-type: none"> <li>• Attach EKG monitoring electrodes (required for demand pacing)</li> <li>• Adjust view to lead with most upright QRS</li> <li>• Apply pads to patient's chest             <ul style="list-style-type: none"> <li>Use anterior-posterior placement for pediatrics</li> <li>+++Do not place pads over implanted devices+++</li> </ul> </li> <li>• Activate the "SYNC" function</li> <li>• Adjust the monitored lead until a marker is above each QRS</li> <li>• Charge to the appropriate energy setting:</li> </ul>		<p>ADVANCED</p>
<p style="text-align: center;"><b>Adult</b></p>	<p style="text-align: center;"><b>Pediatric/Infant</b></p>	
<p style="text-align: center;">Highest energy setting available <i>No change (CPR or energy) for shocks from ICD</i></p>	<p style="text-align: center;">0.5-1.0 joules/kg initial shock <i>Then</i> 2 joules/kg Shock</p>	
<ul style="list-style-type: none"> <li>• Clear entire resuscitation team audibly</li> <li>• Depress and <u>hold</u> the shock/discharge button till shock is delivered (expect delay)</li> <li>• Evaluate rhythm/hemodynamic status, repeat as needed</li> <li>• Treat other causes of hemodynamic instability</li> <li>• Observe for signs of improved hemodynamics</li> <li>• Treat other causes for poor hemodynamics</li> </ul>		

Anterior/Posterior Pad Placement\*


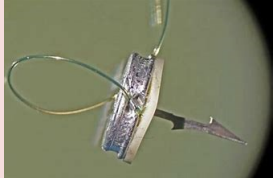


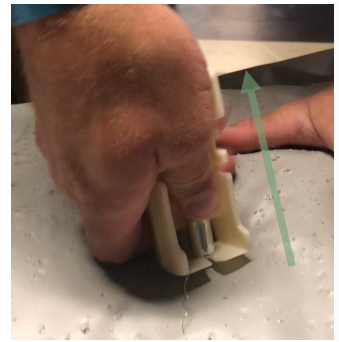
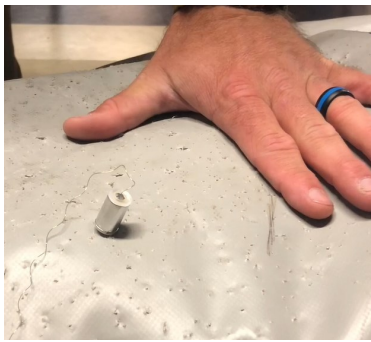
Anterior Pad Placement



\* variations do exist, use as appropriate for situation

## Taser Removal

<p><b>Indications:</b> Embedded Taser probes</p> <p><b>Contraindications:</b> Probes located in: → Face → Eye → Neck → Nipple/areola → Genitals or perineum Any probe in the provider's judgment requiring excessive force to remove</p>	<p><b>Pearls &amp; Pitfalls:</b></p> <p><b>HPI:</b> Number and duration of shocks if known</p> <p><b>Risk communication with Law enforcement:</b> Underlying etiologies which prompted Taser use may result in any of the following, and patient may still be at risk for in-custody death: → Hyperactive Delirium with Severe Agitation Arrhythmia/sudden cardiac arrest → Rhabdomyolysis/kidney injury-failure</p>	<b>BASIC</b>
<p><b>Procedure:</b></p> <ul style="list-style-type: none"> <li>• Ensure crew and patient safety</li> <li>• Stretch skin surrounding the probe site till tight</li> </ul> <p><i>If the traditional probe was used</i></p> <ul style="list-style-type: none"> <li>• Pull probe out of the skin in the opposite direction that it penetrated (use firm grip ± gauze)</li> </ul> <p><i>If the flat probe style was used</i></p> <ul style="list-style-type: none"> <li>• Use the probe removal tool pulling straight out the opposite direction the probe punctured the skin (do not pry the probe out against the skin)</li> </ul> <p><i>Once removed successfully</i></p> <ul style="list-style-type: none"> <li>• Clean and bandage puncture wound</li> <li>• Discard probe in sharp safe container</li> </ul>	 	<b>ASSIST</b>
		<b>ADVANCED</b>



# Tracheostomy Procedures

<p><b>Indications:</b> BVM</p> <ul style="list-style-type: none"> <li>→ Respiratory failure (acute or chronic)</li> <li>→ Cardiac arrest</li> <li>→ Suspected airway obstruction</li> </ul> <p>For exchange/replacement</p> <ul style="list-style-type: none"> <li>→ Failure of 3'Cs of troubleshooting to establish tracheostomy patency</li> <li>→ Complete tracheostomy dislodgement</li> <li>→ Massive tracheostomy hemorrhage and uncuffed tracheostomy</li> </ul> <p><b>Contraindications for exchange/replacement:</b></p> <ul style="list-style-type: none"> <li>→ Fresh Tracheostomy (&lt;7 days)</li> </ul>	<p><b>Pearls &amp; Pitfalls:</b></p> <ul style="list-style-type: none"> <li>→ Utilize PPE for all tracheostomy care</li> <li>→ Positioning is critical, tracheostomies are initially placed in hyperextended neck positioning</li> <li>→ If bougie trimmed cut off coude (hooked) tip</li> <li>→ Decision to replace/exchange should weigh risks/benefits (age of tracheostomy, anticipated difficulty)</li> <li>→ Fresh tracheostomies have significant risk of false-</li> </ul>	<p><b>BASIC</b></p>
<p><b>BVM Ventilation</b></p> <ul style="list-style-type: none"> <li>• <b>If tracheostomy patent:</b> Assisted Ventilation/Bag-Mask Ventilation Procedure             <ul style="list-style-type: none"> <li>• Position airway in slight extension</li> <li>• <i>If bagging via face</i> <ul style="list-style-type: none"> <li>• Perform MAX BVM</li> <li>• Gently occlude tracheostomy stoma to prevent air leak</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b><i>If bagging via stoma</i></b> (<i>tracheostomy removed and failure of ventilation or laryngectomy</i>)             <ul style="list-style-type: none"> <li>• Use pediatric mask (ideally circle) and adult sized reservoir/bag</li> <li>• Apply mask over the trach stoma                 <ul style="list-style-type: none"> <li>• May need to hold mouth/nose closed to prevent air leak from upper airway</li> <li>• Squeeze bag (confirm 4-phase EtCO<sub>2</sub> waveform every breath)</li> </ul> </li> </ul> </li> </ul>	
<p><b>Tracheostomy Replacement/Exchange</b></p> <ul style="list-style-type: none"> <li>• Preoxygenate to SpO<sub>2</sub> ≥ 94% if possible</li> <li>• Position the patient supine with neck hyperextended, consider padding under shoulders</li> </ul> <p><i>If no device in-situ</i></p> <ul style="list-style-type: none"> <li>• Maintain sterility of equipment as possible</li> </ul> <p><i>If replacement tracheostomy available</i></p> <ul style="list-style-type: none"> <li>• Remove inner cannula if present and insert tracheostomy obturator</li> <li>• If cuffed tracheostomy, assess integrity of cuff</li> <li>• Lubricate tracheostomy</li> <li>• Consider “preloading” tie or securing device to one side of tracheostomy</li> <li>• Gently insert tracheostomy initially at a 90-degree angle and then slowly rotate back to a neutral position and curve downward into the trachea in a sweeping motion</li> <li>• Mild resistance as balloon passes through stoma may occur</li> </ul> <p><i>If resistance, consider</i></p> <ul style="list-style-type: none"> <li>• Repositioning and inspection of tracheostomy</li> <li>• Smaller sized tracheostomy (back-up trach)</li> <li>• Do not advance tracheostomy and discontinue if marked resistance.</li> </ul> <ul style="list-style-type: none"> <li>• Insert trach gently until seated level with skin</li> <li>• Inflate cuff with 10 mL (or manufacturer recommended volume)</li> <li>• Remove obturator and replace inner cannula (if present and required)</li> </ul> <p><i>If replacement tracheostomy unavailable</i></p> <ul style="list-style-type: none"> <li>• Utilize 6.0 ETT or size appropriate for patient and lubricate tube</li> <li>• Insert until thick black line just deep to the skin</li> <li>• Inflate cuff with 10cc of air and gently withdraw the bougie</li> <li>• Secure device and verify placement with EtCO<sub>2</sub> and bilateral breath sounds</li> </ul> <p><i>If tracheostomy in-situ to facilitate exchange</i></p> <ul style="list-style-type: none"> <li>• Prepare equipment tracheostomy or ETT as above</li> <li>• No obturator required</li> <li>• Insert bougie through original tracheostomy, do not insert fully</li> <li>• While maintaining bougie remove original trach</li> <li>• Insert new device over bougie</li> <li>• Inflate cuff, as appropriate</li> </ul>		<p><b>ADVANCED</b></p>



## Traction Splint (Sager)

<p><b>Indications:</b> Mid-shaft femur fracture</p> <p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>• Injuries close to the knee or involving the knee itself</li> <li>• Hip or pelvic injuries</li> <li>• Lower leg or ankle injuries</li> <li>• Partial amputation or avulsion with bone separation while only marginal tissue connects the distal limb</li> </ul>		<b>BASIC</b>
<ul style="list-style-type: none"> <li>• After exposing the injured area, check the patient's pulse and motor and sensory function. Adjusts the thigh strap so that it lies anteriorly when secured</li> <li>• Estimate the proper length of the splint by placing it next to the injured limb</li> <li>• Fits the ankle pads to the ankle</li> <li>• Places the splint at the inner thigh, apply the thigh strap at the upper thigh, secure snugly</li> <li>• Tighten the ankle harness just above the malleoli. Snug the cable ring against the bottom of the foot</li> <li>• Extend the splint's inner shaft to apply traction at about 10% of body weight</li> <li>• Secures the splint with elasticized cravats</li> <li>• Checks pulse, motor, and sensory functions.</li> </ul>		<b>ADVANCED</b>



Critical Care protocols & procedures may be utilized by credentialed Critical Care Paramedics (CCP) for either:

- Augmenting advanced life support protocols on 911 response (unless otherwise specified);
- Interfacility transport

Protocols are written to address the standard EPAB approved treatment plan and may not address all possible circumstances or therapies. If a patient is receiving medications or therapies not addressed within the Out-of-Hospital & Mobile Integrated Healthcare Protocols, the CCP may continue the medication or therapy following the parameters ordered by the referring physician. OLPG physician shall be contacted for further guidance if the CCP is unfamiliar with the medication or therapy.

## Respiratory Distress

See [Respiratory Distress](#) for initiation of treatment

*If respiratory distress amenable to NIPPV, consider*

- BiPAP – IPAP 10 cmH<sub>2</sub>O & EPAP 5 cmH<sub>2</sub>O; titrate as appropriate; EtCO<sub>2</sub> Required

## Seizure/Status Epilepticus

See [Seizure/Status Epilepticus](#) for all other all other treatment

*If eclamptic seizure refractory to treatment, and if MAP  $\geq 110$*

- [Hydralazine](#) - 10 mg slow IV; over 1 min

## Stroke/CVA/TIA

See [Stroke/CVA/TIA](#) for initiation of treatment

*For Interfacility only;*

- [Nicardipine](#) (25 mg/250 ml NS) - 5 mg/hr to max 15 mg/hr

*If MAP drops 25% or more*

- Decrease by 2.5 mg/hr

*If Acute Ischemic Stroke*

*If candidate for, or if already treated with, tPA*

- Titrate to SBP  $\leq 180$  and DBP  $\leq 105$

*If not a candidate for tPA*

- Only treat for SBP  $\geq 220$  or DBP  $\geq 120$
- Discuss blood pressure parameters with sending facility if suspected or confirmed concomitant disease process potentially requiring more aggressive anti-hypertensive management: (e.g. Active ischemic coronary disease, heart failure, aortic dissection, hypertensive encephalopathy, acute renal failure, or pre-eclampsia/eclampsia)

*If Acute Hemorrhagic Stroke*

- Titrate to SBP  $\leq 150$  or MAP  $\leq 100$

## Respiratory Insufficiency/Failure & Drug Assisted Airway (DAA)

See Respiratory Insufficiency/Failure & Drug Assisted Airway for initiation of treatment [Adult](#) [Pedi](#)

*If advanced airway already in place*

- Ensure adequate pain control and sedation
- Apply ventilator, as appropriate; initial recommended settings (*see below*), Waveform EtCO<sub>2</sub> required

	Adult	Pediatric
TV	6-8 ml/kg ideal body weight	6-8 ml/kg to adequate chest rise
Mode	Volume Control	Volume Control
FiO <sub>2</sub>	30%-100% (Titrate O <sub>2</sub> to SpO <sub>2</sub> ≥ 90%)	100%
RR	12-16 bpm (Titrate to EtCO <sub>2</sub> of 35-45 mmHg)	Peds:20-30, Adolescents:15 (Titrate to EtCO <sub>2</sub> of 35-45 mmHg)
PEEP	5 cmH <sub>2</sub> O	5 cmH <sub>2</sub> O
I:E	1:2 (exception of Asthma 1:4)	1:2 (exception of Asthma 1:4)
Titrate setting to patient condition		

*If hypoxemic and dysynchronous with ventilator, and if refractory to optimized FiO<sub>2</sub> and PEEP*

- [Rocuronium](#) - 1 mg/kg IVP for paralysis, IIRR x 1
- Soft restraints to prevent self-extubation, as appropriate

*If advanced airway required (not already in place), and if Ketamine induction is insufficient to facilitate intubation,*

- [Succinylcholine](#) - 2 mg/kg IVP, OR
- [Rocuronium](#) - 1 mg/kg IVP (if succinylcholine contraindicated)

For interfacility only with advanced airway already in place:

*If hemodynamically stable (SBP ≥ 90), and if continuous sedation required*

- [Propofol](#) - 10-100 mcg/kg/min, titrate as appropriate

*If home ventilator failure*

- Utilize home ventilator settings for transport ventilator

*If unable to utilize home ventilator settings*

- Use recommended settings (see above), titrate as appropriate

*If hypotensive and PEEP ≥ 5 cmH<sub>2</sub>O*

- Consider reducing PEEP by progressive 2 cmH<sub>2</sub>O reductions

## Blood & Blood Products

1. A written consent is required for administration of any blood product. The consent is to be obtained by the sending facility, and a copy should be included in the patient's chart for transport to the receiving facility.
2. Every patient receiving blood or blood products is to have a recipient band in place.
3. If product is infusing at time of initial patient contact, verify facility transfusion checklist.
  - a. Patient's name and hospital number matched with transfusion record form (attached to product bag).
  - b. Type and number on transfusion record form matched with product bag.
  - c. Pre-transfusion temperature, pulse, respirations and blood pressure are documented on transfusion record form.
  - d. Nurse administering product has signed, dated and timed the transfusion record form.
  - e. All original copies of the transfusion slip should remain with the patient. Sending facility should make a copy of this for their records.
4. If CCP is going to initiate the transfusion of blood or blood products during transport, verify the order and facility transfusion checklist with patient's primary RN prior to transport.
5. Obtain necessary equipment, i.e. tubing, filters, etc. from sending facility to administer transfusion.
6. Prior to administering blood or blood products en route, the CCP will complete the facility's pre-transfusion checklist and document accordingly on the product slip and in the CCP run report.
7. Blood or blood products may NOT be piggybacked into an existing IV line. When administering via a multi-lumen central venous catheter it is suggested that the most distal lumen not already in use (e.g. vasopressors) be utilized.
8. Vital signs including temperature should be obtained and recorded 15 min, 45 min and then 1 hour, at a minimum, after initiating the transfusion until completed. If patient spikes a temperature 2° F greater than baseline, discontinue the blood infusion.
9. If the transfusion is completed en route, it is the CCP responsibility to document on the transfusion slip the date and time completed, amount given, whether or not the blood is warmed, if a reaction occurred and post-transfusion vital signs. All completed bags and tubing should be turned over to the receiving facility with the patient.
10. It is the receiving facility's responsibility to return the transfusion slip to the sending facility's blood bank.

### Whole Blood, Packed RBCs, Frozen RBCs, FFP, Platelets & Cryoprecipitate

1. Verify transfusion checklist.
2. Prime Y-type blood tubing with Normal Saline and begin infusion slowly.
3. Attach blood bag to Y-type blood tubing. Clamp tubing to saline. Open clamp to blood and adjust flow to run slowly for the first 15 minutes. If no adverse reaction, increase flow based on patient condition and transfusion times.
  - a. Whole Blood: 1-1/2 – 3 hours
  - b. Packed RBC's: 1-1/2 – 3 hours
  - c. Washed Packed Cells: 2 hours maximum
  - d. Fresh Frozen Plasma: 30 min (all units must be infused within 4 hours from thaw time)
  - e. Platelets: 30 min max
  - f. Cryoprecipitate: rapid infusion
4. Monitor vital signs as previously outlined.
5. Monitor for signs/symptoms of adverse reaction. If adverse reaction noted, stop infusion and refer to [Anaphylaxis and Allergic Reaction Protocol](#).
6. Blood tubing should be changed after each unit. EXCEPTION: If emergent situation and several units of blood are being administered rapidly, tubing should be changed every 4 hours or every other unit.
7. If suspected febrile non-hemolytic transfusion reaction (FNHTR), including temperature rise  $\geq 1^\circ$  F above baseline and/or rigors, either during or within 3-hours following blood product administration:
  - [Acetaminophen](#) - 1 g PO (if able to swallow), and
  - [Diphenhydramine](#) - 50 mg IV

## Chest Tube Management Procedure

1. Inspect the patient's chest wall to ensure that all connections are tight and that the tubing is not kinked. Also check the skin around the insertion site for subcutaneous emphysema. Be sure that all connections are tight and that all connections between the tube and the chest drain system are secured with non-porous tape.
2. Note color, consistency and amount of drainage.
3. Note any air leak in the water chamber. Ask the sending facility staff RN if there has been a prior leak.
4. Mark Pleur-evac (or other drainage system) with a pen at the current level of drainage in the system.
  - Be alert to sudden changes in the amount of drainage.
  - A sudden increase indicates hemorrhage or sudden patency of a previously obstructed tube.
  - A sudden decrease indicates chest tube obstruction or failure of the chest tube or drainage system.
5. Adjust wall suction to create a gentle rolling of bubbles in the water seal chamber or until suction indicator in appropriate range. Vigorous bubbling results in water loss. Note that some systems do not include a water seal chamber and therefore may not bubble.
6. Verify the level of the suction control chamber is at the level prescribed by the physician (usually -20 cm).
7. Do not clamp the patient's drainage tube at any time during travel. The water seal in the unit prevents backflow of air, whether or not suction is applied.
8. Position patient in semi-fowlers (if condition allows) to enhance air and fluid evacuation. NEVER raise the chest tube above the chest or the drainage will backup into the chest. Avoid any dependent loops as drainage problems and tube obstruction may occur. The tubing should be coiled flat on the bed and from there fall in a straight line to the chest drainage system.
9. After placing the patient in the ambulance, place the Pleur-evac next to the cot and secure with 3" tape so that it is kept upright during transport.
10. Dislodgment of the chest tube - If the chest tube falls out or is accidentally pulled out, it is important to quickly seal off the insertion site. Use a gloved hand until petroleum gauze is available. Petroleum gauze is necessary to prevent air from entering the pleural cavity. Apply 4-sided petroleum gauze occlusive dressing. If respiratory distress and/or signs of tension pneumothorax, remove one side of the dressing in an attempt to burp the chest.
11. Dislodgment from the drainage system (Pleur-evac) - If the chest tube becomes disconnected from the Pleur-evac or other collection device, clamp the chest tube (using Kelly clamps) until corrective action can be taken.

## Extracorporeal Membrane Oxygenation (ECMO) Procedure

ECMO accredited staff must be present to manage and maintain changes during transport.

Unlike standard cardiopulmonary bypass which provides cardiopulmonary support following cardiac surgery or cardiac arrest, ECMO provides longer-term support, typically over 3-10 days.

Prevention of complications is fundamental to successful ECMO care. Ensure and document the following prior to initiation of transport.

1. **Securing Cannula:** All ECMO lines **MUST** be secured at 2 points with properly adherent skin dressings. Initial securing is the responsibility of the cannulator (physician) and cannot be delegated.
2. Prior to transport, ensure that backup components of critical items are available
3. **Cannula positions:** Cannula position must be confirmed radiographically by medical staff prior to transport.
4. **ECMO Cannula dressings:** Sterility must be maintained and insertion sites kept unsoiled.
5. **Patient Movement:** Prevent tension or torsion to the ECMO circuits during patient movement.

During transport:

1. **Monitor** – vitals every 15 minutes and document all pertinent labs (i.e. INR, PLT) and medications.
2. Contact transferring physician or [OLMC](#) for additional guidance or concerns.

## Hemodynamic Monitoring Procedure

All patients who are transported by a Critical Care Paramedic that have invasive pressure lines will be monitored continuously with the use of a cardiac monitor. All pulmonary artery catheters will be monitored during transport. The following standards will be achieved on all patients meeting the criteria for hemodynamic monitoring.

1. Assess the pressure waveform displayed on the sending facility monitor.
2. Obtain a pre-transport strip of waveform from sending facility's monitoring equipment as well as a post-transport strip from receiving facility's monitoring equipment.
3. Obtain current pressure readings from the monitor and patient care records.
4. The CCP will evaluate the pressure transducer for compatibility with the CCP equipment. If the line is not compatible, the pressure line must be changed to facilitate monitoring by the CCP unit during the transport.
5. Flush the invasive line prior to changing over to CCP equipment to ensure patency.
6. Once line has been changed over, flush any visible air out of line via stopcock before flushing to patient.
7. The pressure bag will be inflated to 300 mmHg.
8. The pressure cable will be connected to the monitor and the patient end will be connected to the transducer port on the pressure tubing.
9. The transducer will be placed at the Phlebostatic axis (4th intercostal space, mid-chest level) line and taped securely.
10. All excess tubing will be coiled and taped in an orderly fashion.
11. The pressure line will be zeroed and calibrated to the monitor.
12. The waveform will be identified by the labels provided in the monitor (PA, ART).
13. The waveform will be assessed on the monitor, a pressure reading will be obtained and a strip will be printed showing the waveform. The strip will be identified as to the type of tracing.
14. Pulmonary artery pressures will be documented in conjunction with the secondary survey, as well as every 10 minutes for the duration of the transport. The pulmonary artery catheter should never be wedged during transport.
15. Arterial pressures will be documented in conjunction with the secondary survey, as well as every 10 minutes for the duration of the transport.
16. All distal pulses, capillary refill times, skin temperature, and sensation will be assessed and documented on extremities used.

## Hyperglycemic Emergencies

- Maintain NPO status
- If home continuous subcutaneous insulin pump present, disconnect tubing from “infusion set”/patch
- Review and document sending facility labs
  - If no electrolytes obtained within last 2 hours*
    - Perform iSTAT, recheck every 2 hours
  - If  $K^+ < 3.0$  mEq/L*
    - Discuss with transferring physician, consider holding insulin infusion until repleted to  $K^+ > 3.0$  mEq/L
    - Consider 12-lead EKG
  - If  $K^+ 3.0-5.5$  mEq/L*
    - Maintain IV potassium and insulin infusion
  - If no potassium repletion present*
    - Discuss with transferring physician potassium replacement
  - If  $K^+ > 5.5$  mEq/L*
    - Obtain 12-lead EKG to evaluate for hyperkalemic EKG changes
- Continue sending facility intravenous fluid bolus or maintenance fluid infusion
  - If no fluid previously initiated*
    - NS – 20 ml/kg IV bolus
    - Continue 500 ml/hr NS IV maintenance infusion
  - If signs or symptoms of volume overload are present or develop*
    - Contact OLPG
- Maintain sending facility insulin infusion (DO NOT BOLUS INSULIN)
- Assess blood glucose concentration hourly and for any signs/symptoms of hypoglycemia
  - If blood glucose concentration drops below 250 mg/dl*
    - Switch maintenance fluids to Dextrose 10% (25 g/ 250 ml) at 100 ml/hr
    - Recheck blood glucose after 10 minutes
    - Contact OLPG if glucose continues to fall despite Dextrose 10%
  - If blood glucose concentration drops  $< 70$  mg/dl or symptomatic hypoglycemia*
    - Discontinue insulin and contact OLPG

### Pearls:

- Hypovolemia is the main cause for hypotension, if adequate fluid resuscitation and hypotension/hypoperfusion persist, consider initiation of vasopressor
- HHS consists of minimal to no metabolic acidosis and ketones, elevated serum osmolality, and more severely elevated serum glucose levels (often  $> 600$  mg/dl)
- Fluid resuscitation is often more conservative in adolescent patients (max of 40 mL/kg). Monitor for signs of altered mental status/cerebral edema.
- If advanced airway required, monitor EtCO<sub>2</sub> closely and consider matching patient’s compensatory ventilatory rate



## Ventricular Assist Device Procedure (IABP)

### Procedure:

1. Review the most recent 12-lead EKG. Select lead with greatest R-Wave amplitude. Place patient in this lead on cardiac monitor for continuous monitoring during transport. Limit chest artifact. EKG leads for the IABP will be secured with tape to the patient's chest and maintained during transport. Lead selection may need to be changed in order to get the best R-wave and capture on the balloon pump (if EKG triggered).
2. Arterial line shall be maintained on the IABP. If a transducer is used, ensure that it is directly connected to the pump and in working order. Maintain adequate arterial tracing. If radial site is used, secure arm with arm board to protect site during transport. Secure tubing.
3. Evaluate balloon insertion site. Note balloon size in the medical record. Check dressing site appearance. Monitor site frequently (every 15 minutes and as needed) during transport. Instruct patient to keep affected leg straight. Ensure that a knee immobilizer is in place prior to transport for additional reinforcement.
4. Establish baseline condition. Evaluate hemodynamics and clinical condition.
5. Hemodynamic assessment will include: temperature; blood pressure; respiration rate and quality; heart rate and rhythm; arterial blood pressure; Augmented pressures, MAP; CVP; PAP; augmented diastolic pressure (ADP). Document findings including patient's weight.
6. Evaluate pulses, both radial sites as well as posterior tibial and dorsalis pedis to facilitate subsequent localization during transport, also capillary filling times and extremity temperature.
7. Review lab values and trends.
8. Maintain H.O.B. at lowest point tolerated by patient, never to exceed 30 degrees.
9. Evaluate and closely monitor urinary output. All patients will have an in-dwelling urinary catheter.
10. Maintain IABP at prescribed timing/ratio (i.e.: 1:1; 1:2; 1:4). Evaluate effects.
11. Document hemodynamics. Document: IABP type, model and trigger (EKG, A-Line)

### Precautions:

- Never leave balloon pump inactive in patient for more than 20-30 minutes (i.e., not inflating and deflating). Thrombosis formation could occur after 30 minutes. Utilize 60 ml syringe to manually fill and deflate balloon.
- Balloon leak: Observe tubing for blood. If blood is observed in the pneumatic tubing, shut off the balloon pump and leave intact. Maintain sterile technique and notify the physician and receiving facility immediately.
- IABP Failure: Evaluate patient's condition and hemodynamics. Troubleshoot the device and make every effort to correct the problem and maintain the patient's safety. If IABP is inoperable for greater than 20-30 minutes, inflate IABP manually with 60 cc syringe every 3-5 minutes to avoid clot formation (Inflate with 10cc less than balloon size).
- Ensure IABP battery is charged and Helium tank level is sufficient for transport. The balloon pump should be plugged into the ambulance inverter or generator outlets during transport.
- Ensure there is ample tubing length for transfer and loading the patient into the ambulance. Secure the IABP tubing at patient end and stretcher end, but not mid-line. Put loops in tubing if length permits.
- If bleeding is observed at the insertion site, apply direct pressure to the site until bleeding stops
- If CPR is required, the IABP should be switched to "pressure trigger" mode

## Mechanical Ventilation Procedure

All patients who are transported by the Critical Care Transport Unit will be monitored closely for the following:

1. Pulse oximetry- will be continuous and these patients will maintain an O<sub>2</sub> saturation of 90% or above. The pulse oximeter readings will be documented on the patient care record (EPCR) prior to departure from the sending facility and every 15 minutes throughout the duration of the transport. Report from the sending facility should include the patient's normal range of SpO<sub>2</sub>. This will set the parameters for the CCP team regarding SpO<sub>2</sub>. Some patients will not have, nor maintain an SpO<sub>2</sub> of 90% or greater due to their underlying pulmonary condition. Documentation of the reason for the variance from the CCP standard of care is essential.
2. Capnography- will be continuously monitored in all intubated patients. Tracheostomy patients will have capnography/capnometry monitored when indicated. Examples would be abnormal vital signs and/or changes from normal condition. Titrations in respiratory rate and/or tidal volume may be made in order to maintain EtCO<sub>2</sub> at normal range of 35-45 mmHg or level prescribed by physician or patient condition. Some patients will not have an EtCO<sub>2</sub> within the desired range due to their underlying condition. Documentation of the reason for the variance from the CCP standard of care is essential.
3. Ventilator settings- will be documented on the run sheet, as well as any changes that are made during the transport.
4. Endotracheal- or tracheal suctioning will be performed using aseptic technique when to maintain a patent airway; the type, color and amount of secretions will be documented on the run sheet.
5. Sedation: Patients that require sedation and/or a paralytic to maintain adequate oxygenation and reduce anxiety will be provided with medication as per protocol.
6. Tracheostomy Patients: The CCP will ensure that all patients whose airway is maintained by a tracheostomy tube will be provided with the obturator and an additional tracheostomy tube prior to leaving the sending facility.
7. AMBU Bag: The CCP will ensure that a bag valve mask (BVM) resuscitator is kept with the patient at all times. This will ensure adequate ventilation management in the event of mechanical ventilator failure.
8. Communication: Communicate with a vent patient, prior to switching to the CCP vent, the differences they will experience. Continue to talk with the patient and attempt to alleviate anxiety/restlessness.
9. Scene Call- In the presence of any advanced field airway, either placed by the CCP or prior to arrival, the CCP may utilize the ventilator with the initial recommended settings setting (waveform EtCO<sub>2</sub> required)
10. Patients on home ventilators- will remain on current ventilator for transport ensuring there is adequate power supply.

Patient may be moved over to the CCP ventilator if:

- a. Clinical indication (respiratory compromise) is present
- b. CCP is unfamiliar with home ventilator and family is unable to accompany patient during transport
- c. Equipment constantly malfunction/alarms

### GOALS:

1. To maintain pulmonary management of the ventilator dependent patient during transport.
2. To maintain or improve the patient's level of care.
3. To prevent complications of oxygen toxicity/dependence by providing the appropriate FiO<sub>2</sub>.
4. To provide quality patient care utilizing the transport team approach.
5. To prevent complications of positive pressure ventilation.

All infants requiring ventilatory support will be accompanied by either a neonatal nurse practitioner, respiratory therapist, and/or the sending/receiving neonatologist.

## Mechanical Ventilator Procedure

**Indications:**

1. Patients who require ventilatory assistance for extended time periods (such as interfacility transfers and long-distance/extended ETA transports).
2. Ventilatory assistance includes the use of assist control (A/C or ACV), synchronized intermittent mandatory ventilation (SIMV), and continuous positive airway pressure ventilation assistance (CPAP).

**Contraindications:**

1. Operation and application in a hazardous materials/flammable/combustible/WMD environment or with a contaminated/contagious patient. This model of ventilator is not appropriately sealed or filtered for these environments and/or patients.

Refer to ventilator specific manual for setup and troubleshooting or questions. Verify you are using the most current procedure manual before operation.

## Pulmonary Artery Catheter Procedure

1. Check and document PCWP at sending facility ONLY. Check PA systolic, diastolic and mean pressures at sending facility and every 10 minutes.  
The Pulmonary Artery Capillary Pressure (PCWP) will only be obtained at the sending facility
  - a. Normal Mean Values:
    - i. Pulmonary Artery Pressure (PAP) Systolic 15-30 mmHg Diastolic 4-12 mmHg
    - ii. Pulmonary Artery Capillary Pressure (PCWP): 4-10 mmHg
    - iii. Central Venous or Right Atrial Pressure (CVP): 0-12 mmHg  
(Therapeutic ranges may be somewhat higher than the above values)
  - b. Exceptions:
    - i. The optimal mean PCWP (wedge) may be 15-20 mmHg in patients with compromised left ventricular function, post-op stress or post MI.
    - ii. For patients with COPD and respiratory failure, expect PCWP pressures in the range of 30-50 mmHg. PCWP should be normal in pure pulmonary hypertension.
2. Trends in PAP and PCWP pressures are the most significant factors in detecting significant physiological changes in the patient's condition. Be sure to obtain history of these values prior to transport.
3. Inspect and document the insertion site. Note and document the PA insertion depth.
4. Calibrate the transducer at the beginning of the transfer before the patient is transferred over to the stretcher and with any major position changes.
5. Maintain pressurized flush system at 300 mmHg.
6. If change in waveform occurs, contact Medical Control for direction.
7. Follow set parameters for specific IV vasoactive drips as ordered by transferring physician or see protocol for IV vasoactive pharmaceutical titrations and/or communicate with the online physician.
8. CCP must document all interventions that take place regarding PA catheter.
9. Label all pressure tracings and document the tracings on the patient care report.

## Transvenous Pacemaker Procedure

1. Place a new battery in the temporary pacemaker and test it prior to use.
2. Connect pacer wires to Temporary Pacemaker Cables with leads/heartwires - the patient cable with lead or heartwire plugs into socket on top of unit. In the absence of patient cables, temporary transvenous leads plug directly into the two smaller sockets.
3. Match the positive (+) and negative (-) leads to the positive (+) and negative (-) sockets or clips (as applicable). There may be instances where the leads are reversed in polarity to obtain capture. CCP will connect in the same manner as the sending facility.
4. Set the pacemaker controls
  - a. Set the sensitivity (the highest number is least sensitive; the lowest is most sensitive)
5. Demand mode - (withholds its pacing stimulus after sensing a spontaneous depolarization) set the sensitivity value to detect intrinsic activity.
  - a. Set pacemaker's rate 10 bpm slower than patient's intrinsic rate (the sense indicator will flash regularly)
  - b. Reduce milliamps (output) to the minimum value (this avoids risk of competitive pacing).
  - c. Sensitivity should be set at its lowest value necessary to ensure mechanical capture, and should be increased only to the point of stopping any oversensing.
  - d. Restore original pulse generator rate and output values.
6. If asynchronous mode is indicated (stimulates at a fixed, preset rate independently of the electrical and/or mechanical activity of the heart) turn sensitivity dial to ASYNC (not the preferred mode for critical care transport).
  - a. Set the rate and milliamps (output)
  - b. Set the milliamps (output) at 5 and the rate at 60 or as directed by the physician orders.
7. Turn the pacemaker ON
8. Check the monitor to ascertain that capture (depolarization of the atria and/or ventricles) is obtained- if not, increase the milliamps slowly until capture is obtained, this is the threshold (minimum electrical stimulus needed to consistently elicit a cardiac depolarization). Then set the milliamps at two (2) x the threshold.

### Setting stimulation threshold:

1. Ensure the patient is connected to pacemaker and being monitored on EKG.
2. Set pulse generator rate at least 10 ppm faster than the patient's intrinsic rate (The pace indicator will be flashing regularly at the set rate).
3. Decrease the milliamps (output) until 1:1 capture is lost (the pace and sense indicators will be flashing intermittently).
4. Increase the milliamps (output) to restore 1:1 capture. This value is the stimulation threshold for the chamber being paced. (The pace indicator will be flashing; and the sense indicator will have stopped flashing.)
5. Set output value to 2-3 times the threshold value. This safety margin will allow for threshold variation while maintaining capture.
6. Restore original pacemaker rate value (60 or physician prescribed rate).

## Ventricular Assist Device Procedure (Impella)

The Impella is intended for partial circulatory support using an extracorporeal bypass unit, for periods from 6 hours (Impella 2.5) to 2 weeks (Impella 5.0).

1. Confirm that Impella placement has been verified with echocardiography. Document position of the Impella as reported by sending facility. If possible, bring reports and/or imaging studies that document confirmation of placement.
2. Verify the patient's Activated Clotting Time (ACT) has been checked and is between 160-180 seconds.
  - a. If the ACT is not verified, ensure it is evaluated before transport.
  - b. If the ACT is  $<160$  or  $>180$  seconds, request that it is addressed before transport per the sending facility guidelines.
3. Evaluate and confirm Impella settings. Document and monitor:
  - a. pump performance level (P2-P9)
  - b. flow (1.1 to 5.3 L/min {device dependent})
  - c. placement signal pulsatile [mmHg] (red waveform)
  - d. purge pressure 300-1100 mmHg
  - e. motor current  $<1000$  and pulsatile (green waveform)
  - f. pump position
  - g. purge fluid infusion rate (2-30 mL/hr)
4. Ensure the Tuohy bore on the Impella catheter is tight to prevent catheter migration (tighten completely to the right).
5. Evaluate insertion site for signs of bleeding, swelling or hematoma, and catheter on initial assessment, following each patient transfer, and frequently (every 15 minutes and as needed) during transport. Document findings following each evaluation.
6. Evaluate pulses, capillary filling time, and temperature of affected lower extremity on initial assessment, following each patient transfer, and frequently (every 15 minutes and as needed) during transport.
7. Evaluate urine output and color on initial assessment and monitor during transport. Changes in urine color may indicate hemolysis.
8. Establish the patient's baseline condition. Evaluate hemodynamics and clinical progression.
9. Patients should remain flat throughout transport. Under no conditions is head of bed (HOB) elevation to exceed  $30^\circ$ .
10. Instruct the patient to keep the affected leg straight. Apply knee immobilization device if needed to prevent movement.
11. During transport, maintain pump performance level and flow rate at ordered levels. If unable to maintain ordered flow rate at ordered levels, contact [OLMC](#) for guidance.
12. If alarms occur during transport, follow on-screen troubleshooting guidance for resolution. If alarms not resolved following troubleshooting, contact [OLMC](#) for further guidance.
13. If purge solution requires replacement during transport replace with D10 solution or solution provided by sending facility.
14. Refer to the hemodynamic monitoring protocol for arterial line maintenance.

Impella Precautions: Next Page

## Ventricular Assist Device Procedure (Impella)

### Precautions:

- Verify the battery charge level before unplugging and moving the Impella controller. A fully charged battery will support the system for approximately 60 minutes. The Impella controller should always be plugged in for transport.
- Place the Impella controller must on a flat surface, where the screen is easily visible during transport. The controller must be secured during transport to avoid accidental dislodgement of the sheath and to prevent the controller from becoming a dangerous projectile. Consider using the bed mount as a loop through which to secure the device with straps.
- Movement of the HOB is the primary cause of migration of the Impella during transport. Do not move the HOB from its initially established position.
- Keep the stopcock on the peel-away introducer or repositioning sheath in the closed position. Significant bleeding can occur if the stopcock is in the open position.
- Do not decrease pump performance (P) level below P2 as long as the pump is in the ventricle. Below P2, retrograde flow will occur across the aortic valve.
- CPR should be initiated immediately per MedStar protocol if indicated. When starting CPR, reduce the Impella flow rate to P2. If return of spontaneous circulation, return the flow rate to the previous P-level, by increasing one P-level every 30-60 seconds and assess placement signals on the controller.
- Infusion through the side port of the introducer can be done only after all air is removed from the introducer. If performed, the infusion should be done for flushing purposes only and NOT for delivering therapy or monitoring blood pressure or MAP.
- Base the management of the patient's hemodynamic status on MAP readings from an arterial line. Target MAP to >65 mmHg or level ordered by sending facility.
- If there are any changes in the patient's condition during transport or there are unresolved Yellow or Red alarms, contact the receiving facility with updated information so they can prepare for the proper interventions before patient arrival.
- Contact the 24-hour clinical support line at 1-800-422-8666 with any questions or concerns during transport. Use only for general information about the device functionality only. For any orders needed for patient management, contact [OLMC](#). the receiving facility with updated information so they can prepare for the proper interventions before patient arrival.



## Ventricular Assist Device Procedure (all others)

While some VADs produce pulsatile flow, most VADs use continuous flow technology, thereby creating a non-pulsatile continuous flow. This means most patients with a VAD will not have a palpable pulse and, therefore, taking a blood pressure with a manual cuff and stethoscope will rarely allow you to auscultate a pressure. It is imperative that the type and model of VAD be identified (i.e. HeartWare HVAD vs Jarvik 2000 FlowMaker). Important aspects of transport include allowing a family member to ride along with the patient because the family member can be an invaluable resource. They are often trained in the operation of the equipment and know how to handle an emergency, and can also be a comfort to the patient.

Refer to device specific manual for setup and troubleshooting or questions. Verify you are using the most current procedure manual before operation.

*If patient not responsive to pain and has capillary refill  $\geq 3$  seconds (inadequate perfusion)*

*If CPR and defibrillation can be performed on the patient (see VAD reference or documentation)*

- Refer to [Cardiac Arrest Protocol](#)

*If CPR and defibrillation are contraindicated*

1. Check controller for alarms. (I.e. low battery, driveline malfunction, pump stopped.)
2. Auscultate and feel left upper abdominal quadrant for a continuous whirring sound and vibrations.
3. Determine if there is a “hand pump” or external device to utilize.
4. Remember not to perform chest compressions because they could dislodge the pump, making the patient bleed to death. (Unless the patient is in obvious cardiac arrest and the pump isn’t working. Use the assistance of the VAD coordinator to figure this out before starting any compressions).
5. Perform all other BLS/ACLS protocols as written.
6. Avoid kinking or twisting driveline when strapping the patient onto the stretcher.
7. Keep batteries and controller in reach and secured to the patient during transport. Keep them dry.
8. Take the patient’s emergency travel bag when leaving the scene. (It has an extra controller, batteries and the VAD coordinator’s emergency contact number.) Access back up controller and power sources as needed.
9. Monitor and document all IBP (in hospital), EKG, and Wave form EtCO<sub>2</sub> and ventilator settings every 15 minutes.
10. Contact online medical control for further instructions.
  - \*If feasible, transport the patient to their implant hospital. If not, transport to the nearest most appropriate hospital.

*If patient is out-of-hospital and hemodynamically stable*

1. If available, utilize doppler device to auscultate blood pressure. The first sound heard is approximately equivalent to the mean arterial pressure (normal Doppler pressure range is 60–90 mmHg). A pressure of 60–90 mmHg is considered acceptable. Note that you may or may not hear normal heart tones with a stethoscope.
2. Assess the patient’s EtCO<sub>2</sub>, mental status, skin, and lips to assess perfusion status.
3. Take the patient’s emergency travel bag when leaving the scene. It may have an extra controller, batteries, and the VAD coordinator’s emergency contact number.
4. Ensure the controller and battery packs are close to the patient and aren’t dangling off the side of the cot. Be sure that the driveline (the power cord of the pump) isn’t pulled, kinked, or cut.

## Ventriculostomy Monitoring Procedure

1. Maintain patient's head position per physician's order (usually 30 degrees).
2. Check and document dressing site and appearance.
3. Confirm level of drain and any other patient specifics in regards to monitoring, as follows.
  - a. Review physician's order to place ventriculostomy to either drain or monitor.
    - i. *If ventriculostomy is placed to drain*
      - Verify that the stopcock at the zero level is opened to the drainage bag side. The drip chamber is placed so that the zero level is at the foramen of Monroe (Point of communication between the 3rd and lateral ventricles of the brain). Anatomical landmark for foramen of Monroe is the external auditory canal. Ensure the Burette is moved so that the pressure line is at the ordered level of drainage.
    - ii. *If ventriculostomy is set to monitor*
      - Do not collect measurements during transport.
4. The system must be secured on a pole at all times. The system is adjusted to obtain the zero level.
5. If tubing becomes occluded during transport, do not flush or manipulate line. Notify receiving staff upon arrival.
6. Document on PCR drainage amount, color, ICP and any other pertinent information.

## Congestive Heart Failure (CHF) Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

- Contact appropriate partner agency staff
- Review the patient clinical record, and interpret lab values in context of patient presentation
- Measure and document vital signs (BP, weight, O<sub>2</sub>, pulse)
- Perform 12-lead EKG
- Perform i-STAT (ensure sample not hemolyzed)

### Hypokalemia

*If  $K^+ < 2.5$  mEq/L or EKG findings consistent with hypokalemia*

- Administer patient's [Potassium](#) - 40 mEq PO
- Request ambulance for transport to ED

### Hyperkalemia

*If there are any EKG changes consistent with hyperkalemia*

- Request ambulance for transport to ED, and treat for hyperkalemia (see treatment box)

*If  $K^+ > 7.0$  mEq/L (regardless of EKG changes)*

- Request ambulance for transport to ED, and treat for hyperkalemia (see treatment box)

*If there are no EKG changes consistent with hyperkalemia*

*If  $K^+ > 5.0 - 6.0$  mEq/L, **AND** if the most recent  $K^+ > 5.0$  mEq/L (within the last 72 hrs)*

- Contact partner agency staff / [OLMC](#) for further guidance to discuss plan of care, to potentially include:
  - Stop oral potassium supplementation for 2 days
  - Recheck potassium at least daily until  $< 5$  mEq/L

*If the patient is not taking oral potassium AND is not scheduled for urgent diuresis*

- Request ambulance for transport to ED

*If  $K^+ > 5.0 - 6.0$  mEq/L, **AND** if the most recent  $K^+ < 5.0$  mEq/L (within the last 72 hrs)*

- Request ambulance for transport to ED

*If  $K^+ 6.0-7.0$  mEq/L (independent of previous  $K^+$  value)*

- Request ambulance for transport to ED

*If Creatinine  $> 3$  mg/dl*

- Contact PCMH

*If patient is on Coumadin*

- Review patient's PT/INR, when available, with the PCMH, who will provide instructions for changes in dosing and follow-up

- Adjust diuresis and potassium dosing per [CHF Protocol Dosing Schedule](#)

### Contraindications

- Weight gain of less than 2 lbs. over baseline.
- Potassium of  $< 2.5$  or  $> 5.5$  mEq/L (transport if present)
- Acute clinical changes such as chest pain, dyspnea, or signs of acute decompensation (transport if present)
- If in the MHP's clinical judgment the patient requires transport/ED evaluation

### Considerations for Patient Education

- Educate patient on appropriate dietary and medication compliance.
- Encourage ingestion of food or milk to reduce GI upset if increasing potassium dose.
- Have patient record weight daily.

### Urgent/Emergent Treatment of Hyperkalemia

- [Calcium Chloride](#) - 1 g IV slow push
- [Sodium Bicarbonate](#) - 1 mEq/kg IV/IO (if suspected acidosis)

# Congestive Heart Failure (CHF) Protocol (Dosing Schedules)

## Diuresis Dosing Schedule

3-5 lbs. over	>5 lbs. over
<ul style="list-style-type: none"> <li>Double PO <u>Lasix</u> or Bumex x 3 Days. <i>Refer to K<sup>+</sup> dosing schedule below</i></li> </ul>	<ul style="list-style-type: none"> <li>Administer double the patients PO dose of <u>Lasix</u> as IVP x 1.</li> <li>I.E. 40 mg/PO = 80 mg/IVP <i>Refer to K<sup>+</sup> dosing schedule below</i></li> </ul>
<ul style="list-style-type: none"> <li>MIHP follow-up in 24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>MIHP follow-up in 4 hours (can be phone call).</li> <li>24 hour follow-up in person</li> </ul>
<ul style="list-style-type: none"> <li>PCP notification</li> </ul>	<ul style="list-style-type: none"> <li>Extensivist / PCP follow up in 48 hours.</li> </ul>
<ul style="list-style-type: none"> <li>Extensivist / PCP follow up in 48 hours.</li> </ul>	

## Potassium Dosing Schedule:

K <sup>+</sup> = 2.5 -2.9	K <sup>+</sup> = 3.0 – 3.4	K <sup>+</sup> = 3.5-4.9	K <sup>+</sup> ≥ 5.0
Increase by 50% for the length of time patient has increased <u>Lasix</u> dosing.	Increase by 25% for the length of time patient has increased <u>Lasix</u> dosing.	No Change	Refer to protocol

**PEARLS:**

If diuresis is done more than 3-visits in a row refer to an advanced heart failure clinic.

1 mg Bumex = 40 mg Lasix

## COPD/Asthma Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

- Refer to [Respiratory Distress Protocol](#)
- Initiate transport if the patient fails to respond to nebulizer therapy

*If patient has a positive response to nebulizer therapy*

- Contact PCMH to arrange appropriate follow-up

## Diabetes Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

### *If patient is conscious*

- Measure Blood Glucose

*If blood glucose  $\leq 60$  mg/dl and symptomatic*

- Oral Glucose - 15 g buccal (if intact gag reflex and able to tolerate)
- Recheck blood glucose
- Contact PCMH for any suggested changes in dosing and/or for appropriate follow up

*If blood glucose  $\geq 300$  mg/dl and asymptomatic*

- Verify with appropriate partner agency that patient is on insulin sliding scale
  - Teach and assist patient with insulin self-administration

*If patient is unable to administer insulin*

- Contact PCMH for any suggested changes in dosing and/or for appropriate follow up

*If blood glucose  $\geq 300$  mg/dl and symptomatic (e.g. AMS, signs of hypovolemia, suspected DKA or hyperosmolar state)*

- Perform i-STAT

*If  $CO_2 \leq 16$  or anion gap  $\geq 20$*

- NS - 1 L IV bolus
- Contact PCMH and recommend ambulance transport to ED

### *If patient is obtunded, unconscious, or altered*

- Follow [Diabetic Emergencies Protocol](#) and transport patient to the hospital

## Failed Peripheral IV: Patient Administered Medication Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

- Review clinical record
- Contact PCMH
- Remove and restart IV for patient
- Notify appropriate partner agency staff



## First & Second Dose Antibiotic Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

- Meet nurse at the patient's home for 1st and 2nd dose of antibiotic
- Wait with the nurse for the first 30 minutes
- Arrange ambulance transport if the patient develops severe allergic reaction or anaphylaxis.

*If signs/symptoms of allergy or anaphylaxis*

- Assist patient with home health anaphylaxis pack
  - If unavailable or if inadequate response*
    - Refer to [Allergic Reaction/Anaphylaxis Protocol](#)

## High Utilizer Group (HUG) Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients eligible for, or enrolled in, the High Utilizer Group program. Patients with frequent utilization of the 911 EMS or hospital Emergency Department system are eligible for the High Utilizer Group (HUG) program. Patient will either be referred internally or by partner agencies. MedStar will conduct a series of home visits to help enable patients to navigate themselves through the healthcare system. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

### Referral Criteria

High Utilizer Group patients may include individuals who meet the following criteria:

- Requested 15 or more 911 ambulance responses during the past 90-days, OR
  - Referred by a partner agency for avoidable visits to the Emergency Department during the past 12-months
- AND
- Live in the MIH service area
  - Possesses mental capacity to support navigational assistance
  - Willing to participate in the program and allow MIHP into their home for assessment and follow-up

### Initial Home Visit/Patient Assessment

- Conduct initial assessment of barriers to the patient's care, which may include:
  - Living environment
  - Social barriers to appropriate engagement in care
  - Transportation
  - Access to primary care
  - Disease management
- Facilitate the development and implementation of a care plan by the PCMH, which may include:
  - Primary Care Provider (PCP) assignment (if necessary)
  - Series of home visits to educate the patient and family on appropriate care management
  - Assistance with navigation through the patient's primary care network/resources
  - Provision of 24/7 non-emergency number to request mobile healthcare provider support during the duration of the program enrollment

### Scheduled Home Visits

Enrolled patients will receive a series of home visits to educate:

- The patient and family on appropriate ways to manage their disease process
- The patient on how to navigate the healthcare system

### Unscheduled Home Visits

The patient will be provided a non-emergency phone number in the event they would like a phone consultation or an unscheduled home visit between scheduled visits.

### 911 Responses

Enrolled patients will be tracked in the computer aided dispatch (CAD) system, and in the event of a 911 call to their residence, a 911 ambulance response will be initiated, along with an MIHP who will be dispatched to the scene.

Once on-scene, the MIHP may be able to intervene and navigate the patient to an alternate source of care, including PCMH, urgent care, self-care, or by employing the use of the Disease Management MIH protocols.

### Record Keeping

Patients enrolled in the program have a continual electronic medical record (EMR) that allows all care providers mobile access to the patient's entire course of assessments and treatments during enrollment, including care notes, lab values, vital signs, ECG tracings and treatments initiated. These records can be provided to caregivers in accordance with the Treatment Payment Operations (TPO) definitions of Health Insurance Portability and Accountability Act (HIPAA).

## High Utilizer Group (HUG) Protocol

### Care Management Protocols (CMP)

The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#). In consultation with the PCMH, patients with conditions including, Diabetes, COPD, or CHF can either have their medications adjusted in the field, or they may receive in-home therapy through Care Management Protocols, with an in-office follow-up appointment to minimize any unnecessary transport to the Emergency Department. Refer to the appropriate CMP (e.g. Diabetes, CHF, COPD/Asthma)

### Program Length

Term of program will be a minimum of 30-days and a maximum of 90-days after acceptance into the program, based on patient compliance and meeting established program goals.

## Hospice Patients

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients.

*If a MedStar Crew arrives on-scene first and determines the complaint is not associated with the patient's hospice diagnosis*

- Consider transporting the patient to an appropriate acute care facility
  - This is only applicable if the crew feels they are unable to wait for the MIHP to arrive.
- Upon arrival on-scene, the MIHP will work with the patient/family to ensure their wishes are carried out and the appropriate care is provided, while awaiting the arrival of a hospice representative.

*If the patient/family insists on being transported to the ED for reasons associated with their hospice care*

- Attempt to arrange for a direct admit to an in-patient hospice care facility

*If the patient/family insists on being transported to the ED for any reason not associated with their hospice care, and are not willing to wait or discuss the situation with the responding Hospice representative*

- Facilitate transportation by ambulance to the appropriate acute care facility.
- Upon arrival on scene, the MIHP will assist in addressing the family/patients concerns. The MIHP will help to ensure the patient's comfort and may use the hospice supplied in-home comfort-pack if required once they have consulted with hospice provider or, if unavailable, [OLMC](#).
- The responding MIHP will remain with the family/patient until the hospice nurse arrives or until the family and patient are comfortable with the patient's status.



## Insulin Titration

This protocol is to be employed for patients with hyperglycemia or hypoglycemia on the second home visit who have recently been released from the hospital and have not seen their new PCP or the PCP has been contacted twice (on two subsequent visits) without a response.

- Contact appropriate partner agency
- Measure blood glucose

*If hyperglycemia present (blood glucose  $\geq 300$  mg/dl prior to short acting insulin treatment and asymptomatic)*

### Hyperglycemia

- Perform iStat and calculate anion gap

*If anion gap  $< 12$*

- Glucose 300-400 mg/dl increase long-acting insulin by 2 units on next dose
- Glucose 400+ increase long-acting insulin by 4 units on next dose

*If hypoglycemia present*

- For symptomatic with hypoglycemia use Diabetic Emergencies protocol and if no transport consider Insulin Titration protocol

### → Fasting or overnight

Blood glucose $< 54$	Blood glucose 55-70 and long-acting insulin	Blood glucose 55-70 and intermediate insulin
Reduce long acting insulin by 40%	Reduce long-acting insulin by 4 units or 10% (whichever is greater)	Reduce evening intermediate insulin dose by 2 units

### → Daytime and corresponds with sliding scale or set pre-prandial insulin dosage

(use sliding scale insulin dosage given 30 minutes-6 hours prior to hypoglycemic episode)

Blood glucose $\leq 54$	Blood glucose 55-70
Reduce sliding scale or pre-prandial insulin by 40%	Reduce sliding scale insulin dosage If sliding scale $< 10$ units reduce by 2 units If sliding scale 11-20 units reduce by 4 units If sliding scale $> 20$ units reduce by 8 units

### → Daytime & Does Not Correspond with Sliding Scale

Blood glucose $\leq 54$	Blood glucose 55-70 and long-acting insulin	Blood glucose 55-70 and intermediate insulin
Reduce long-acting insulin dose by 40%	Reduce long-acting insulin by 4 units of 10% whichever is greater)	Reduce morning and evening intermediate insulin dose by 2 units

### → Fasting or Overnight and Daytime & Corresponds with Sliding Scale

Blood glucose $\leq 54$	Blood glucose 55-70 and long-acting insulin	Blood glucose 55-70 and intermediate insulin
Reduce long-acting insulin dose by 40%	Reduce long-acting insulin by 4 units of 10% whichever is greater)	Reduce morning and evening intermediate insulin dose by 2 units

### → Daytime and Does Not Correspond with Sliding Scale

Blood glucose $\leq 54$	Blood glucose 55-70 and long-acting insulin	Blood glucose 55-70 and intermediate insulin
Reduce long-acting insulin dose by 40%	Reduce long-acting insulin by 4 units of 10% whichever is greater)	Reduce morning intermediate insulin dose by 2 units

### Pearls:

Intermediate-acting insulins (examples): Humulin N, Insulin NPH, Novolin N

Long acting (examples): Insulin glargine, insulin detemir, insulin degludec

For this protocol basal insulin is any intermediate or long-acting insulin

## i-STAT Procedure

### Precautions:

#### Avoid the Following Circumstances:

- Drawing a specimen from an arm with an I.V.
- Stasis (tourniquet left on longer than two minutes before venipuncture)
- Extra muscle activity (fist pumping)
- Hemolysis (alcohol left over puncture site, or a traumatic draw)
- Time delays before filling cartridge, especially lactate, ACT, and PT/INR

#### Criteria For Specimen Rejection:

- Evidence of clotting
- Specimens collected in vacuum tubes with anticoagulant other than lithium or sodium heparin
- Specimens for ACT or PT/INR collected in glass syringe or tube or with anticoagulant of any kind
- Incompletely filled vacuum tube for the measurement of ionized calcium or PCO<sub>2</sub>
- Other sample types such as urine, CSF, and pleural fluid

### Procedure:

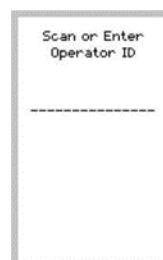
#### Cartridges:

A single-use disposable cartridge contains microfabricated sensors, a calibrant solution, fluidics system, and a waste chamber. A whole blood sample of approximately 1 to 3 drops is dispensed into the cartridge sample well, and the sample well is sealed before inserting it into the analyzer. An individual cartridge may be used after standing 5 minutes, in its pouch, at room temperature. An entire box should stand at room temperature for one hour before cartridges are used. Cartridges may be stored at room temperature (18 to 30° C or 64 to 86° F) for 14 days. Cartridges should not be returned to the refrigerator once they have been at room temperature, and should not be exposed to temperatures above 30° C (86° F). If the pouch has been punctured, the cartridge should not be used. Write the date on the cartridge box or individual cartridge pouches to indicate the two-week room temperature expiration date. Cartridges should remain in pouches until time of use. Do not use after the labeled expiration date.

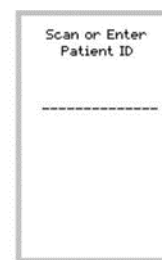
#### Testing:

Press the Power button to turn on the Handheld.  
DO NOT insert the cartridge to start the test.

Press the “2” button to start a new test. Follow the handheld prompts. For “Operator ID,” enter your MedStar ID number. For “Patient ID,” enter the run number for the call.



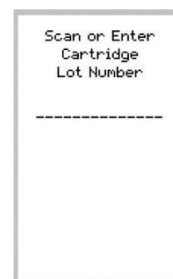
Screen 2



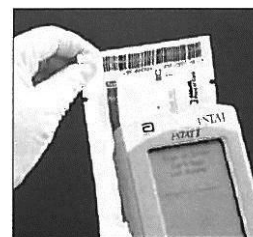
Screen 3

## i-STAT Procedure

Scan the Lot Number on the cartridge pouch. Position the barcode 3-9 inches from the scanner window on the handheld. Press and hold “Scan” to activate the scanner. Align the laser light to cover the entire barcode. The handheld will beep when it reads the barcode successfully. If you cannot scan the barcode, enter the lot number using the numbered keys, ignoring any letters. **DO NOT** open cartridge pouch before scanning the barcode.



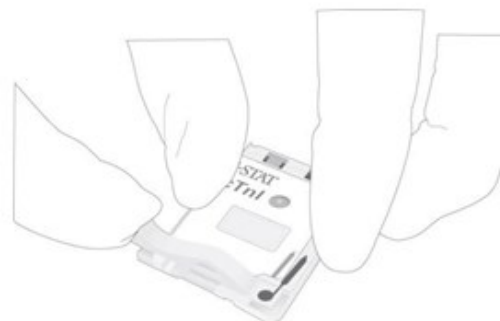
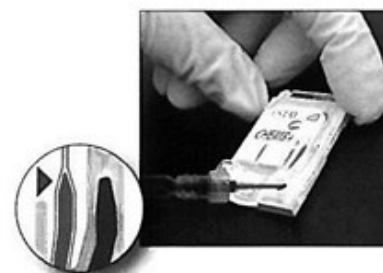
Screen 1



Remove cartridge from pouch. Handle the cartridge by its edges. Avoid touching the contact pads or exerting pressure over the center of the cartridge.



Mix blood and collection tube additives by inverting a tube gently at least ten times. Following thorough mixing of the sample, use a plastic capillary tube, pipette, or syringe to transfer sample from a tube to a cartridge. Direct the dispensing tip containing the blood into the sample well. Dispense the sample until it reaches the fill mark on the cartridge and the well is about half full. Close the cover over the sample well until it snaps into place. (Do not press over the sample well.)







## i-STAT Procedure

Insert the cartridge into the cartridge port on the analyzer until it clicks into place. The analyzer must remain horizontal during the testing cycle. Never attempt to remove a cartridge while the LCK or “Cartridge Locked” message is displayed.

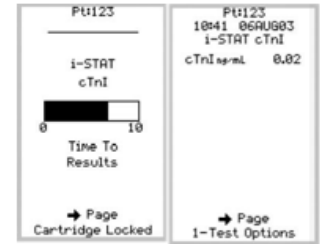
Wait until testing cycle is complete. Results are displayed numerically with their units. Electrolyte, chemistry and hematocrit results are also depicted as bar graphs with reference ranges marked under the graphs.

To print the results, turn printer on if green power light is not on. Align IR windows of analyzer and printer. Display results. Press the Print key.

Do not move analyzer or printer until printing is complete.

Note: Results printed on thermal paper will fade with time and are therefore not acceptable as a permanent chartable record.

To print a stored test record(s), select “Print Results” from the Stored Results menu. Select records to be printed by pressing the Key(s) corresponding to the numbers beside the record(s). Press the numbered key again to deselect a record. Then press the PRT Key. Do not move the analyzer while “Printing” is displayed.



Screen 4                      Screen 5

### Suppressed Results

There are three conditions under which the i-STAT System will not display results:

1. Results outside the System’s reportable ranges are flagged with a < or > , indicating that the result is below the lower limit or above the upper limit of the reportable range respectively. (See the table of Reportable Ranges.) The < > flag indicates that the results for this test were dependent on the result of a test flagged as either > or <.
2. Cartridge results which are not reportable based on internal device problem are flagged with \*\*\*. **Action:** Analyze the specimen again using a fresh sample and another cartridge. If the specimen integrity is not in question, the results that are not suppressed should be reported in the usual manner.
3. A Quality Check message will be reported instead of results if the analyzer detects a problem with the sample, calibrant solution, sensors, or mechanical or electrical functions of the analyzer during the test cycle. The device should be serviced as soon as possible.

The following should be used as a guideline to determine appropriate actions when any of the following are identified:

**Abnormal Lab Values** - When Chem 8 values are abnormal, but not “critical”, notification to client’s physician’s office must be made prior to terminating visit. This may be telephone or email but must also be documented in the client record.

**Critical Lab Values** - When Chem 8 values report in the “critical range” (as below) patient’s physician must be consulted immediately. If consultation with the patient’s physician cannot be completed, the Office of the Medical Director on-call physician, or delegate, must be consulted. Consider transport to appropriate facility as needed.

Test	Reference Range	Critical Levels
Sodium (Na)	138-146 mEq/L	<120 or >160
Potassium (K)	3.5-4.9 mEq/L	<2.5 or >6
Chloride (Cl)	98-109 mEq/L	<90 or >120
Ionized Calcium (iCa)	4.5-5.3 mg/dl	<4 or >6
Total CO <sub>2</sub> (TCO <sub>2</sub> )	24-26 mEq/L	<10 or >40
Glucose (Glu)	10-105 mg/dl	>400
Urea Nitrogen (BUN)	8-26 mg/dl	<2 or >80
Creatinine (Crea)	0.6-1.3 mg/dl	>2.8
Hematocrit (Hct)	38-51% PCV	<20 or >60
Hemoglobin (Hgb)	12-17 g/dl	<6 or >20
Anion Gap (Agap)	10-20 mEq/L	>20

## Non-Adherent HUG Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients who are found to be non-adherent with the High Utilizer Group program.

### Non-adherent Evaluation

When an agency official believes that an individual HUG patient may be chronically and inappropriately utilizing the 911 EMS system, a report shall be provided to the OMD with the following information:

- Identity of the individual
- 911 utilization before and during enrollment in the HUG program
- Chief Complaint when calling 911
- Past Medical History
- Any previous history of enrollment in MIH programs, and the outcomes of those enrollments
- History of Police utilization during prior 911 responses or patient visits
- Frequency of hospital visits
- Contact information for any known PCMH or other outpatient care providers (including mental health providers), and details of prior service requests, interactions, and discussions regarding facilitation of a care plan
- Assigned home hospital
- Copies of patient record forms completed by all EMS providers who have previously interacted with the patient

### Non-adherent Assignment

The Medical Director will review the report. If the individual is deemed non-adherent, the patient will be registered as such, and a memorandum will be sent to all appropriate agencies.

### Calls to 911

All 911 requests for Non-Adherent HUG patients shall receive an appropriate 911 response.

*If identified as a Non-Adherent HUG patient during 911 call-taking process*

- Communications Center will initiate MIHP response via radio, phone, email, or page

*If not identified as a Non-Adherent HUG patient during 911 call-taking process*

Responding crew shall:

- Perform and document a careful assessment on all patients
- Initiate a MIHP response via radio or phone request

*If the crew identifies an emergent or possible life-threatening condition*

- Initiate 911 treatment and transport, as appropriate

### MIHP Response, Management, and Disposition

- Respond, if available
- Assign themselves to the CAD incident, if not already done so by the Communications Center
- Respond in non-emergency mode
- Access the client's information, if available
- Take a verbal report from the responding 911 crew to obtain the following:
  - Current complaint
  - Vital signs
  - Significant history and examination findings
- Complete a thorough assessment
- Evaluate the patient for possible navigation to an alternative source of care, or initiate 911 transport to the ED

*If patient refuses recommended ED transport*

- Refer to [AMA Protocol](#)

## Non-Adherent HUG Protocol

*If patient is a candidate for alternate source of care*

- Contact **OLMC** for discussion of treatment, transport modality, and disposition
- Facilitate transport and allocation of additional resources, which may include:
  - Bus pass
  - Taxi voucher
  - Follow-up home visit
  - Assisting client to schedule visit with a doctor or urgent care

*If patient does not necessitate ED transport, or alternate source of care*

- Contact **OLMC**, and if agreement, assign disposition of Medical Director Refusal/Code 35

### MIHP Documentation

- Complete ePCR and sign as the primary paramedic, and include summary of **OLMC** disposition
- Attempt to have the client sign the authorization section, acknowledging the assessment provided and assigned disposition
  - If the client refuses to sign, place the client's name in the appropriate field and mark that the client "refused to sign"
- Attempt to obtain a witness signature

### Quality Assurance

- A file will be maintained on each OMD registered Non-Adherent HUG patient, including ePCR documentation of all transports and non-transports
- All cases will be reviewed for renewal on Non-Adherent HUG status every 6-months
- Patients whose 911 utilization falls below 1/3 of their original usage may have their non-adherent status removed

## Observation Avoidance Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients eligible for, or enrolled in, the Observation Avoidance program. Patients are referred by the Emergency Department case manager or any member of the care team. The MIHP initially consults with care providers and evaluates patients while in the ED. The MIHP then performs scheduled home assessment follow-up visits until patient care is transitioned to the PCMH, within 7-days. The primary point of contact for all patient consultations is that individual's PCMH primary provider contact or, if unavailable, contact [OLMC](#).

### Referral Criteria

To be eligible for enrollment into the Observation Avoidance Program, the patient must:

- Be referred prior to discharge, and be present in the ED when the MIHP arrives
- Possess mental capacity to provide informed consent for treatment and management
- Be willing to participate in the program and allow MIHP into the home for assessment and follow-up
- Live in the MIH service area
- Be eligible for a follow-up visit within the next 7-days

### Enrollment

To enroll patients into the program, the MIHP will:

- Perform an initial visit and assessment in the ED
- Meet with the patient and referring physician to discuss patient's management following discharge and prior to PCP or specialist follow-up
- Schedule an appointment with the follow-up care provider within 7-days.
- Explain to the patient the service that will be provided
- Schedule an in-home visit
- Provide the non-emergency contact number to the patient for episodic needs while enrolled in the program.

Any change in the patient's condition, or consultation regarding the patient's condition or treatments, will be communicated to the referring Emergency Department physician or PCMH, for inclusion in the patient record.

### Follow-up

The MIH coordinator or Triage Nurse will provide a report to the follow-up provider's office, including the patient's assessment, treatments provided, and any written documentation.

The MIH coordinator or ECNS Nurse will confirm the time of the patient's appointment, remind the patient of the appointment time, and ensure that the patient has transportation to the follow-up provider's appointment.

### Unscheduled Home Visits:

The patient will be provided a non-emergency phone number for the MIHP in the event they would like a phone consultation or an unscheduled home visit between scheduled visits.

### 911 Responses

Enrolled patients will be tracked in the computer aided dispatch (CAD) system, and in the event of a 911 call to their residence, a 911 ambulance response will be initiated, along with a MIHP who will be dispatched to the scene.

Once on-scene, the MIHP may be able to intervene and navigate the patient to an alternate source of care, including PCMH, urgent care, self-care, or by employing the use of the appropriate CMP protocols.

### Record Keeping

Patients enrolled in the program have a continual electronic medical record (EMR) that allows all care providers mobile access to the patient's entire course of assessments and treatments during enrollment, including care notes, lab values, vital signs, ECG tracings and treatments initiated. These records can be provided to caregivers in accordance with the Treatment Payment Operations (TPO) definitions of HIPAA.

### Program Length:

Completion of program is based on the patient's care being successfully transitioned to the PCMH. Term of program will be a minimum of 1-day and a maximum of 7-days.



## Peak Flow Procedure

### Indications:

- Patients with limited or severely restricted expiratory flow
- Patients on bronchodilator therapy
- Patient able to understand and physically able to attempt the test

### Contraindications:

- Age or cognition does not enable ability to comprehend or cooperate
- Facial condition or neurological condition that alters their ability to do the test.
- Respiratory distress level to point patient could deteriorate with testing

### Procedure:

- Ensure indicator is at the bottom of the number scale
- Position patient in an upright sitting or standing
- Instruct the patient to hold the peak flow meter horizontal being careful not to block the opening
- Instruct patient to inhale as deeply as possible and then place mouth firmly around the mouthpiece making a tight seal.
- Instruct patient to blow out as hard and fast as they can through the mouthpiece
- Move the indicator back to the bottom of the scale, and repeat steps 2-5 for two more attempts
- Instruct the patient to repeat this maneuver three times (if able to do so)
- Document the highest reading as the peak flow

\*\*\* Please contact the ordering community partner with the results of Peak Flow test\*\*\*

Zones	Signs & Symptoms
<p style="text-align: center;"><b>Green</b> (80% of predicted)</p>	<p>No asthma symptoms No nighttime cough Normal activities No need for rescue medications</p>
<p style="text-align: center;"><b>Yellow</b> (50-80% of predicted)</p>	<p>Some asthma symptoms Decreased peak flow</p>
<p style="text-align: center;"><b>Red</b> (&lt;50% of predicted)</p>	<p>Increased asthma symptoms Decreased in peak flow Poor or no response to rescue medications</p>

## Admission/Readmission Avoidance Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients eligible for, or enrolled in, the Admission/Readmission Avoidance program. Patients at risk for admission/readmission are referred by the patient's Case Manager or PCMH. The MIHP will conduct a series of home visits to educate the patient and family on appropriate healthcare management, coordinate in-home therapy, schedule a follow-up appointment with the PCMH, or facilitate emergency transport or navigation to an alternate source of care.

### Referral Criteria

To be eligible for enrollment into the Admission/Readmission Avoidance Program, the patient must:

- Be referred during an inpatient admission or be at high risk for a preventable readmission
- Possess mental capacity to make informed decisions regarding their disease management
- Be willing to participate in the program and allow the MIHP into their home for assessment and follow-up
- Have an established relationship with a PCMH
- Must live in the MIH service area

Patient may be deemed ineligible for the program if, for example, they are:

- Stage-3 or 4 Chronic Kidney Disease (CKD) without an attending nephrologist
- Pregnant
- Age 18-years or younger
- Living outside the MIH service area
- Currently receiving chemotherapy and/or radiation therapy
- Homeless and not living in a shelter
- Previously non-adherent with an MIH program

Any case, at any time, may be deemed ineligible and excluded from the MIH program after review by OMD. All reasonable efforts will be made by the MIHP to notify the client, PCMH, and home health partners of the client's status.

### Scheduled Home Visits

Enrolled patients will receive a series of home visits by an MIHP to:

- Educate the patient and family on appropriate management of their disease process, including:
  - Diet and weight management
  - Medication compliance
  - Healthy lifestyle changes
- Educate the patient on how to navigate their primary/specialty care network for the purpose of managing their disease process, including:
  - When to call for an appointment
  - Important information to share with providers

### Unscheduled Home Visits

The patient is provided a non-emergency phone number for the Mobile Healthcare Provider in the event they would like a phone consultation or an unscheduled home visit between scheduled visits.

### 911 Responses

Enrolled patients will be tracked in the computer aided dispatch (CAD) system, and in the event of a 911 call to their residence, a 911 ambulance response will be initiated, along with a MIHP who will be dispatched to the scene.

Once on-scene, the MIHP may be able to intervene and navigate the patient to an alternate source of care, including PCMH, urgent care, self-care, or by employing of the use of the appropriate CMP protocols.

### Record Keeping

Patients enrolled in the program have a continual electronic medical record (EMR) that allows all care providers mobile access to the patient's entire course of assessments and treatments during enrollment, including care notes, lab values, vital signs, ECG tracings and treatments initiated. These records can be provided to caregivers in accordance with the Treatment Payment Operations (TPO) definitions of HIPAA.

## Admission/Readmission Avoidance Protocol

In consultation with the patient's PCMH, patients with a Care Management Plan (CMP), e.g. Diabetes, CHF, COPD/Asthma, can either have their medications adjusted in the field, receive in-home therapy through their CMP, or with the PCMH. Refer to the appropriate CMP.



## Suture/Staple Removal Procedure

**Indications:** Request from a clinician to remove staples or a known type of suture

**Contraindications:** Signs of wound complications, dehiscence (wound edges do not meet), or infection

### Procedure:

- Visually assess the wound for uniform closure of the wound edges, absence of drainage, redness, and swelling
- Utilize non-sterile gloves and cleanse site with alcohol prep prior to beginning

### Simple Interrupted Suture Removal

- Gently grasp the knot or the tail of suture with forceps and raise slightly off skin
- Place the curved tip of the suture scissors directly under the knot or on the side, close to the skin
- Gently snip the suture and remove it with forceps. Never snip both sides of the knot.
- Ensure all suture material is removed and placed on sterile gauze
- Remove every second suture until the end of the wound line.
- Assess for signs of dehiscence after each removal (*if present see below*)
- Continue removal until all sutures removed

### Staple Removal

- Place the lower jaw of the staple remover under a staple
- Squeeze the handles completely to close the device bending the staple in the middle and pulling the edges of the staple out of the skin
- Gently move the staple away from the wound once both ends are visible
- Relax pressure on the staple remover's handles to release the staple onto clean gauze. Consider staple disposal into a sharps container.
- Remove every second staple until the end of the wound line
- Assess for signs of dehiscence (*if present see below*)
- Continue removal until all staples removed

### Post-removal care

- Apply sterile wound strips to reduce likelihood of dehiscence
- Advise patient of ongoing self-care and warning signs for infection

### Wound dehiscence care

- Discontinue suture or staple removal
- Cover wound with saline moistened gauze
- Contact referring clinician or OLPG for further guidance

### Pearls:

- Document # of sutures or staples removed, any dressing/adhesive wound strips applied, and appearance of wound
- Cleaning may loosen dried blood or crusted exudate, consider moistening with saline as necessary
- Mattress or running continuous sutures are not eligible for removal

## Urinary Catheter (Foley) Malfunction

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients.

- Review clinical record
- Consult with appropriate partner agency.
- Flush the catheter or remove as necessary
- Re-insert new urinary catheter

*If two unsuccessful attempts*

- Contact appropriate partner agency staff or, if unavailable, contact [OLMC](#)

## Wound VAC Malfunction Protocol

This protocol is to be used by an appropriately credentialed Mobile Integrated Health Provider (MIHP) as standing orders for patients enrolled in an approved Mobile Integrated Health program. This protocol may be used in visits requested by partner agencies or 911 calls from program clients.

- Review clinical record
- Contact appropriate partner agency staff or, if unavailable, contact [OLMC](#)
- Remove Wound VAC
- Pack wound with wet to dry dressings
- Cover dressing with 4×4 or abdominal pad and secure with tape.
- Notify appropriate partner agency staff

# Pharmacopeia

Medication	Class
Acetaminophen	Analgesic/Antipyretic
Indications:	Contraindications:
→ Acute Pain Management	→ Active and severe hepatic disease → Severe hepatic impairment → Hypersensitivity to acetaminophen

## Protocol, Dosage, and Administration

Adult – Acute Pain Management

Basic

Pain  $\leq 6$

1 g PO

Adult – Fever

Basic

Fever  $\geq 100.4$

1 g PO

Pedi – Acute Pain Management

Basic

Pain  $\leq 6$

15 mg/kg PO (Max 1 g)

Pedi – Fever

Basic

Fever  $\geq 100.4$

15 mg/kg PO (Max 1 g)

Contents

## Medication

## Class

Adenosine

Endogenous Nucleoside

### Indications:

- Conversion of SVT:PAT to sinus rhythm
- Identification of supraventricular rhythms (SVT:PAT vs. A. Flutter)

### Contraindications:

- Irregular wide complex tachycardia
- Second or third degree block
- Hypersensitivity to adenosine

## Protocol, Dosage, and Administration

### Adult – Tachycardias

#### Assist

Unstable SVT:PAT, if time allows while preparing for synchronized Cardioversion

12 mg rapid IV/IO

Stable SVT:PAT

12 mg rapid IV/IO

IIR x 1

Stable SVT w/ BBB or accessory pathway

12 mg rapid IV/IO

### Pedi – Tachycardias

#### Assist

Unstable SVT:PAT, if time allows while preparing for synchronized Cardioversion

0.1 mg/kg rapid IV/IO (max 6 mg)

Stable SVT:PAT

0.1 mg/kg rapid IV/IO (max 6 mg)

IIR 0.2 mg/kg x 1 (max 12 mg)

Stable SVT w/ BBB or accessory pathway

0.1 mg/kg rapid IV/IO (max 6 mg)

Contents

Medication	Class
Albuterol	Sympathomimetic, bronchodilator, beta-2 agonist
Indications:	Contraindications:
→ Treatment of bronchospasm → Wheezing	→ Hypersensitivity to albuterol

## Protocol, Dosage, and Administration

Adult – Allergic Reaction Anaphylaxis

Basic

Wheezing/Bronchospasm

2.5 mg with 0.5 mg ipratropium in 3 mL NS nebulized

IIRR x 2

Adult – Respiratory Distress

Basic

Pulmonary Edema/CHF/Asthma/COPD/Wheezing/Pneumonia

2.5 mg with 0.5 mg ipratropium in 3 mL NS nebulized

IIRR x 2

Pedi – Allergic Reaction Anaphylaxis

Basic

Wheezing/Bronchospasm

2.5 mg with 0.5 mg ipratropium in 3 mL NS nebulized

IIRR x 2

Pedi – Respiratory Distress

Basic

Wheezing/Bronchospasm

2.5 mg with 0.5 mg ipratropium in 3 mL NS nebulized

IIRR x 2

Contents

## Medication

## Class

Amiodarone

Antidysrhythmic

### Indications:

- Suppression of VF/pulseless VT refractory to defibrillation
- Suppression of stable VT

### Contraindications:

- Medication induced ventricular dysrhythmias
- Second or third-degree block
- Hypotension
- Bradycardia
- Torsades de Points
- Narrow Complex (QRS < 0.12 sec)
- Hypersensitivity to amiodarone

## Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest

Assist

VF/VT

300 mg IV/IO after second defibrillation

If persistent or recurrent VF/VT 150 mg IV/IO x 1

Adult – Tachycardias

Advanced

Stable Ventricular Tachycardia

150 mg IV over 15 min

IIRR x 1

Pedi – Non-Traumatic Cardiac Arrest

Assist

VF/VT

5 mg/kg IV/IO (max 300 mg) after second defibrillation

If persistent or recurrent VF/VT IIRR x 2 every other cycle /4 min

Pedi – Tachycardias

Advanced

Stable Ventricular Tachycardia

5 mg/kg IV (max 150 mg) over 10-5 min

Contents



## Medication

## Class

Aspirin

Anti-inflammatory, platelet inhibitor

### Indications:

→ Chest pain or anginal equivalents suggestive of ACS

### Contraindications:

→ Gastrointestinal bleeding

→ Hypersensitivity to NSAIDs

## Protocol, Dosage, and Administration

Adult – Ischemic Chest Pain/Acute Coronary Syndrome/STEMI

Basic

Pulmonary Edema/CHF

324 mg PO chewed

Adult – Respiratory Distress

Basic

324 mg PO chewed

Contents

## Medication

## Class

Atropine	Anticholinergic
Indications:	Contraindications:
→ Hemodynamically unstable bradycardia	→ Tachycardia
→ Organophosphate poisoning	→ Hypovolemic shock
→ Nerve agent antidote	→ Hypersensitivity to atropine

## Protocol, Dosage, and Administration

Adult – Symptomatic Bradycardia

Assist

While preparing for pacing

0.5 mg IV/IO

IIR to max dose 3 mg

Adult – Altered Mental Status/CNS Depression

Advanced

Organophosphate poisoning

2 mg IV/IM/IO

IIR 4 mg q 3 minutes until signs of significant atropinization

Adult – Overdose/Poisoning

Advanced

Organophosphate poisoning

2 mg IV/IM/IO

IIR 4 mg q 3 minutes until signs of significant atropinization

Pedi – Symptomatic Bradycardia

Assist

While preparing for pacing

0.02 mg/kg IV/IO (minimum dose 0.1 mg and max single dose 0.5 mg)

IIR x 1

Pedi – Altered Mental Status/CNS Depression

Advanced

Organophosphate poisoning

0.02 mg/kg IV/IM/IO

IIR until signs of atropinization

Pedi – Overdose/Poisoning

Advanced

Organophosphate poisoning

0.02 mg/kg IV/IM/IO

IIR until signs of atropinization

Contents

## Medication

## Class

Calcium Chloride (Adult)

Parenteral Mineral

### Indications:

- Calcium channel blocker overdose
- Hyperkalemia

### Contraindications:

- Suspected digitalis toxicity

## Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest

Advanced

Hyperkalemia

1 g IV/IO slow push

Calcium Channel Blockers

1 g IV/IO slow push

Adult – Symptomatic Bradycardia

Advanced

Hyperkalemia – wide complex rhythm, 12-lead EKG findings, dialysis hx

1 g IV slow push

Calcium Channel Blocker Overdose

1 g IV slow push

Adult – Tachycardias

Advanced

Hyperkalemia

1 g IV slow push

Adult – Altered Mental Status/CNS Depression

Advanced

If calcium channel blocker overdose

1 g IV/IO slow push

Adult – Overdose/Poisoning

Advanced

Calcium Channel Blocker

1 g IV/IO slow push

Adult – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia (peaked T-waves, wide QRS)

1 g IV/IO slow push

Contents

## Medication

## Class

Calcium Chloride (Pedi)

Parenteral Mineral

Indications:

- Calcium channel blocker overdose
- Hyperkalemia

Contraindications:

- Suspected digitalis toxicity

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Hyperkalemia

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Calcium Channel Blockers

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Symptomatic Bradycardia

Advanced

Hyperkalemia – wide complex rhythm, 12-lead EKG findings, dialysis hx

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Calcium Channel Blocker Overdose

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Tachycardias

Advanced

Suspected Hyperkalemia

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Altered Mental Status/CNS Depression

Advanced

If calcium channel blocker overdose

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Overdose/Poisoning

Advanced

Calcium Channel Blocker

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia (peaked T-waves, wide QRS)

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Contents

## Medication

## Class

Calcium Chloride (Pedi)

Parenteral Mineral

Indications:

- Calcium channel blocker overdose
- Hyperkalemia

Contraindications:

- Suspected digitalis toxicity

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Hyperkalemia

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Calcium Channel Blockers

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Symptomatic Bradycardia

Advanced

Hyperkalemia – wide complex rhythm, 12-lead EKG findings, dialysis hx

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Calcium Channel Blocker Overdose

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Tachycardias

Advanced

Suspected Hyperkalemia

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Altered Mental Status/CNS Depression

Advanced

If calcium channel blocker overdose

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Overdose/Poisoning

Advanced

Calcium Channel Blocker

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Pedi – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia (peaked T-waves, wide QRS)

20 mg/kg (0.2 mL/kg) IV/IO slow push (max dose 1 g)

Contents

## Medication

## Class

Dexamethasone

Adrenal Glucocorticoid

### Indications:

- Asthma
- Wheezing
- Pediatric anaphylaxis
- Barking cough/stridor

### Contraindications:

- Advanced glaucoma
- Systemic fungal infection
- Hypersensitivity to dexamethasone

## Protocol, Dosage, and Administration

Adult – Shock/Hypotension

Advanced

If documented history of Addison's disease/adrenal insufficiency,  
4 mg IV/IO/IM

Pedi – Allergic Reaction/Anaphylaxis

Advanced

In presence of signs of anaphylaxis/anaphylactic shock  
0.6 mg/kg (max dose 12 mg) IM/IV/PO

Pedi – Shock/Hypotension

If documented history of Addison's disease/adrenal insufficiency, and with explicit parental consent  
0.6 mg/kg (max 4 mg)

Pedi – Respiratory Distress

Advanced

Wheezing/bronchospasm  
0.6 mg/kg (max dose 12 mg) IM/IV/PO  
Barking cough/stridor at rest or on exertion (croup)  
0.6 mg/kg (max dose 12 mg) IM/IV/PO

Contents

# Medication

# Class

Dextrose 10%

Carbohydrate, Altered mental status

Indications:

- Hypoglycemia
- Altered mental status

Contraindications:

## Protocol, Dosage, and Administration

Adult – Altered Mental Status/CNS Depression

Assist

- If blood glucose < 60 mg/dL
- 100 mL IV/IO bolus
- IIRR up to 50 g (500 mL)

Adult – Diabetic Emergencies

Assist

- Hypoglycemia: If blood glucose < 60 mg/dL
- 100 mL IV/IO bolus
- IIRR up to 50 g (500 mL)

Adult – Seizure/Status Epilepticus

Assist

- If blood glucose < 60 mg/dL
- 100 mL IV/IO bolus
- IIRR up to 50 g (500 mL)

OB/GYN—Newly Born

Assist

- If blood glucose < 60 mg/dL
- 2 mL/kg IV/IO bolus

Pedi – Altered Mental Status/CNS Depression

Assist

- If blood glucose < 60 mg/dL
- 5 mL/kg IV/IO bolus
- IIRR up to 25 g (250 mL)

Pedi – Diabetic Emergencies

Assist

- If blood glucose < 60 mg/dL
- 5 mL/kg IV/IO bolus
- IIRR up to 25 g (250 mL)

Pedi – Seizure/Status Epilepticus

Assist

- If blood glucose < 60 mg/dL
- 5 mL/kg IV/IO bolus
- IIRR up to 25 g (250 mL)

Contents



## Medication

## Class

Diltiazem

Calcium channel blocker

Indications:

→ Control of rapid ventricular rates caused by atrial fibrillation or atrial flutter during interfacility transports

Contraindications:

Hypotension

Second or third-degree block

Wide complex tachycardia

Cardiogenic shock

## Protocol, Dosage, and Administration

Adult – Tachycardias

Advanced

A-fib or A-flutter

Maintain 5-15 mg/hr IV/IO (titrate to HR parameters from the sending facility)

[Contents](#)

## Medication

## Class

Diphenhydramine

Antihistamine, Anticholinergic

### Indications:

- Allergic reaction
- Anaphylaxis
- Acute dystonic reactions

### Contraindications:

- Hypersensitivity to diphenhydramine

## Protocol, Dosage, and Administration

Adult – Allergic Reaction/Anaphylaxis

Assist

50 mg IV/IM/IO

Adult – Overdose/Poisoning

Assist

Dystonia

50 mg IV/IM/IO

Pedi – Allergic Reaction/Anaphylaxis

Assist

1 mg/kg IV/IM/IO (max dose 50 mg)

Contents

# Medication

# Class

Epinephrine (Adult)

Sympathomimetic

## Indications:

- Cardiac arrest
- Anaphylaxis
- Shock/hypotension
- Severe allergic reaction
- Asthma
- Symptomatic Bradycardia

## Contraindications:

- Hypertension
- Hypothermia
- Trauma (push-dose only)

## Protocol, Dosage, and Administration

### Adult – Shock/Hypotension

#### Assist

If persistent hypotension despite adequate fluid administration, to temporarily stabilize blood pressure until vasopressor infusion can be initiated

- 0.1 mg in 10ml NS IV/IO
- 10mcg (1 ml) IIRR q 5-minutes, max total dose 50 mcg (5 ml)

#### Advanced

If suspected anaphylaxis/anaphylactic shock  
1 mg (10 mL) of 1:10,000 in 250 ml NS  
Infuse @ 2-30 mcg/min, start at 5 mcg/min

### Adult – Non-Traumatic Cardiac Arrest

#### Assist

- VF/VT  
1:10,000 - 1 mg IV/IO q 5-min. 3-dose-max
- Asystole/PEA  
1:10,000 - 1 mg IV/IO immediately, then q 5-min. 3-dose-max

### Adult – Symptomatic Bradycardia

#### Advanced

- Shock/hypotension  
Infuse @ 2-30 mcg/min, start at 5 mcg/min  
16-18 IV and AC preferred
- Beta Blocker Overdose  
Infuse @ 2-30 mcg/min, start at 5 mcg/min

### Adult – Allergic Reaction/Anaphylaxis

#### Basic

- Severe signs/symptoms  
0.3 mg 1:1,000 IM  
IIRR x 2 q 5 min (max total dose 0.9 mg)

#### Assist

- In presence of signs of anaphylaxis/anaphylactic shock (stridor and or hypotension/end-organ dysfunction), do not delay  
Epinephrine- 0.1 mg in 10ml NS IV/IO, 10 mcg (1 ml) IIRR q 5-minutes, max total dose 50 mcg (5 ml)

#### Advanced

- In presence of signs of anaphylaxis/anaphylactic shock do not delay  
Infuse @ 2-30 mcg/min, start at 5 mcg/min  
1 mg (10 mL) of 1:10,000 in 250ml NS

### Adult - Overdose/Poisoning/Adverse Drug Reaction Advanced

#### Beta Blocker

- Infuse @ 2-30 mcg/min, start at 5 mcg/min  
Add epinephrine 1:10,000 - 1 mg (10 ml) to 250 ml NS

### Adult – Respiratory Distress

#### Advanced

- For asthma only, and if impending respiratory failure or unable to tolerate neb  
0.3 mg 1:1,000 IM

### Push Dose Mixing Instructions

- Remove 1 ml from a 10 ml flush, leaving 9 ml of NS
- Into this syringe, draw up 1 ml from the cardiac epinephrine (1:10,000 Epi is 0.1 mg/ml)
- The syringe now contains 10 mls of Epinephrine 10 mcg/ml

### FOR CARDIAC ARREST ONLY

*If prefilled cardiac epinephrine syringe (1:10,000, 0.1 mg/ml) shortage*

- Remove 1 ml from a 10 ml flush, leaving 9 ml of NS
- Into this syringe, draw up 1 ml from a 1:1,000 (1 mg/ml) vial
- The syringe now contains 1 mg of cardiac epinephrine

Contents

# Medication

# Class

Epinephrine (Pedi)

Sympathomimetic

## Indications:

- Cardiac arrest
- Anaphylaxis
- Shock/hypotension
- Severe allergic reaction
- Asthma
- Symptomatic Bradycardia

## Contraindications:

- Hypertension
- Hypothermia

## Protocol, Dosage, and Administration

Pedi – Shock/Hypotension

Advanced

If suspected anaphylaxis/anaphylactic shock

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse 0.1 mcg/kg/min

Titrate to effect by increasing/decreasing by 0.1 mcg/kg/min q 2 min

Pedi – Non-Traumatic Cardiac Arrest

Assist

VF/VT

1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO q 5-min. 3-dose-max

Asystole/PEA

1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO immediately, then q 5 min 3-dose-max

Pedi – Symptomatic Bradycardia

Assist

While preparing for pacing

1:10,000 – 0.01 mg/kg IV/IO (max single dose 0.1 mg)

Advanced

Shock/hypotension

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse at 0.1 mcg/kg/min

Titrate by 0.1 mcg/kg/min q 2 min

Pedi – Allergic Reaction/Anaphylaxis

Basic

Severe signs/symptoms

1:1,000 – 0.01 mg/kg IM (max 0.3 mg)

IIRR x 2 q 5-10 min

Advanced

In presence of signs of anaphylaxis/anaphylactic shock do not delay

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse 0.1 mcg/kg/min

Titrate to effect by increasing/decreasing by 0.1 mcg/kg/min q 2 min

Pedi – Respiratory Distress

Assist

If barking cough/stridor at rest or on exertion (croup)

1:1,000 – 3 mg (3 ml) mixed with 3 ml NS nebulized

Repeat x 1

Advanced

For asthma only, and if impending respiratory failure or unable to tolerate neb

1:1,000 – 0.01 mg/kg IM (max dose 0.3 mg)

IIRR in 5 min

If shortage of epinephrine 1:10,000 (1 mg/10 ml) it may be mixed from 1:1000 (1 mg/1 ml) by dilution of 1 ml of 1:1000 in 9 ml of normal saline.

Contents

# Medication

# Class

Epinephrine (Pedi)

Sympathomimetic

Indications:

- Cardiac arrest
- Anaphylaxis
- Shock/hypotension
- Severe allergic reaction
- Asthma
- Symptomatic Bradycardia

Contraindications:

- Hypertension
- Hypothermia

## Protocol, Dosage, and Administration

Pedi – Shock/Hypotension

Advanced

If suspected anaphylaxis/anaphylactic shock

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse 0.1 mcg/kg/min

Titrate to effect by increasing/decreasing by 0.1 mcg/kg/min q 2 min

Pedi – Non-Traumatic Cardiac Arrest

Assist

VF/VT

1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO q 5-min. 3-dose-max

Asystole/PEA

1:10,000 - 0.01 mg/kg (max single dose 1 mg) IV/IO immediately, then q 5 min 3-dose-max

Pedi – Symptomatic Bradycardia

Assist

While preparing for pacing

1:10,000 – 0.01 mg/kg IV/IO (max single dose 0.1 mg)

Advanced

Shock/hypotension

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse at 0.1 mcg/kg/min

Titrate by 0.1 mcg/kg/min q 2 min

Pedi – Allergic Reaction/Anaphylaxis

Basic

Severe signs/symptoms

1:1,000 – 0.01 mg/kg IM (max 0.3 mg)

IIRR x 2 q 5-10 min

Advanced

In presence of signs of anaphylaxis/anaphylactic shock do not delay

1 mg (10 mL) of 1:10,000 in 250 ml NS

Infuse 0.1 mcg/kg/min

Titrate to effect by increasing/decreasing by 0.1 mcg/kg/min q 2 min

Pedi – Respiratory Distress

Assist

If barking cough/stridor at rest or on exertion (croup)

1:1,000 – 3 mg (3 ml) mixed with 3 ml NS nebulized

Repeat x 1

Advanced

For asthma only, and if impending respiratory failure or unable to tolerate neb

1:1,000 – 0.01 mg/kg IM (max dose 0.3 mg)

IIRR in 5 min

If shortage of epinephrine 1:10,000 (1 mg/10 ml) it may be mixed from 1:1000 (1 mg/1 ml) by dilution of 1 ml of 1:1000 in 9 ml of normal saline.

Contents

## Medication

## Class

Fentanyl

Analgesic, Opioid

### Indications:

→ Severe pain

### Contraindications:

- Opioid non-tolerance
- Respiratory depression
- Hemodynamic instability
- AMS
- Cervical spine trauma
- OB emergency/anticipated delivery (relative)
- Gastrointestinal obstruction
- Hypersensitivity to fentanyl

## Protocol, Dosage, and Administration

### Adult – Acute Pain Management

#### Assist

If pain > 6 in presence of burns, trauma, or other syndromes

1 mcg/kg IV/IN/IM (max single dose 100 mcg)

IIR x 3, titrate to pain relief and respiratory/hemodynamic status

(Max total dose of 400 mcg)

### Pedi – Acute Pain Management

#### Assist

If pain > 6 in presence of burns, trauma, or other syndromes

1 mcg/kg IV/IN/IM (max single dose 100 mcg)

IIR x 1, titrate to pain relief and respiratory/hemodynamic status

Contents

## Medication

## Class

Furosemide

Loop diuretic

### Indications:

- Congestive heart failure
- Pulmonary edema

### Contraindications:

- Hypersensitivity to Lasix
- Hypersensitivity to sulfa drugs

## Protocol, Dosage, and Administration

MIH – CHF

CCP/MHP

3-5 lbs over

Double PO Lasix x 3 days

> 5 lbs over

Administer double the patients PO dose of Lasix as IVP x 1

Contents



## Medication

## Class

Glucagon (Adult)	Antihypoglycemic, Pancreatic hormone, Insulin antagonist
Indications:	Contraindications:
→ Hypoglycemia	→ Hyperglycemia
→ Beta-blocker overdose	→ Insulinoma
	→ Hypersensitivity to glucagon

## Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest

Advanced

Beta-blocker overdose

1 mg IV/IO slow push over 1 min

IIRR 1 mg IV/IO x 1

Adult – Symptomatic Bradycardia

Advanced

Beta-blocker overdose

1 mg IV/IO slow push over 1 min

IIRR 1 mg IV/IO x 1

Adult – Altered Mental Status/CNS Depression

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

1 mg IM/IN

If beta-blocker overdose

1 mg IV/IO slow push over 1 min

IIRR 1 mg IV/IO x 1

Adult – Diabetic Emergencies

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

1 mg IM/IN

Adult – Overdose/Poisoning

Advanced

Beta-blocker overdose

1 mg IV/IO slow push over 1 min

IIRR 1 mg IV/IO x 1

Adult – Seizure/Status Epilepticus

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

1 mg IM/IN

Contents

## Medication

## Class

Glucagon (Pedi)	Antihypoglycemic, Pancreatic hormone, Insulin antagonist
Indications:	Contraindications:
→ Hypoglycemia	→ Hyperglycemia
→ Beta-blocker overdose	→ Insulinoma
	→ Hypersensitivity to glucagon

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Symptomatic Bradycardia

Advanced

Beta-blocker toxicity

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Altered Mental Status/CNS Depression

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

If beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Diabetic Emergencies

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

Pedi – Overdose/Poisoning

Advanced

Beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Seizure/Status Epilepticus

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

Contents

## Medication

## Class

Glucagon (Pedi)	Antihypoglycemic, Pancreatic hormone, Insulin antagonist
Indications:	Contraindications:
→ Hypoglycemia	→ Hyperglycemia
→ Beta-blocker overdose	→ Insulinoma
	→ Hypersensitivity to glucagon

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Symptomatic Bradycardia

Advanced

Beta-blocker toxicity

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Altered Mental Status/CNS Depression

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

If beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Diabetic Emergencies

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

Pedi – Overdose/Poisoning

Advanced

Beta-blocker overdose

0.1 mg/kg IV/IO slow push over 1 min (max single dose 1 mg)

IIRR 0.2 mg/kg IV/IO x 1 (max single dose 1 mg)

Pedi – Seizure/Status Epilepticus

Advanced

If blood glucose concentration < 60 mg/dL and if IV access cannot be obtained

0.1 mg/kg IM/IN (max dose 1 mg)

Contents

## Medication

## Class

Glucose - Oral

Antihypoglycemic

### Indications:

→ Conscious patient with suspected hypoglycemia

### Contraindications:

→ Decreased level of consciousness

→ Unable to swallow/maintain own airway

→ Nausea and vomiting

## Protocol, Dosage, and Administration

Adult – Altered Mental Status/CNS Depression

Basic

If blood glucose concentration < 60 mg/dL

15 g buccal

Adult – Diabetic Emergencies

Basic

If blood glucose concentration < 60 mg/dL

15 g buccal

Pedi – Altered Mental Status/CNS Depression

Basic

If blood glucose concentration < 60 mg/dL

7.5 g buccal

Pedi – Diabetic Emergencies

Basic

If blood glucose concentration < 60 mg/dL

7.5 g buccal

Contents

## Medication

## Class

Haloperidol

Dopamine Antagonist

### Indications:

- Schizophrenia
- Psychiatric Disease
- Refractory Nausea/Vomiting

### Contraindications:

- Unconsciousness
- Parkinson's Disease
- Reported or suspected pregnancy
- Hypersensitivity to haloperidol

## Protocol, Dosage, and Administration

Adult – Behavioral Emergencies/Agitation

Advanced

Known psychiatric disease or ETOH intoxication

5 mg IM

IIRR x 1 after 15 min

Adult—Nausea and Vomiting

Advanced

If vomiting persists despite ondansetron, or for patients with suspected gastroparesis or cyclical vomiting syndrome

2.5 mg IV

IIRR x 1 in 15-minutes

[Contents](#)

## Medication

## Class

Hydralazine

Peripheral vasodilator

Indications:

→ Eclampsia

Contraindications:

→ Hypersensitivity to hydralazine

## Protocol, Dosage, and Administration

CCP – Eclampsia

CCP

If refractory to treatment as per seizure protocol, MAP  $\geq$  110

10 mg slow IV over 1 min

Contents

## Medication

## Class

Hydroxocobalamin

Antidote

Indications:

→ Suspected cyanide poisoning

Contraindications:

→ None

## Protocol, Dosage, and Administration

Adult - Overdose/Poisoning/Adverse Drug Reaction

Assist— (if available)

In the setting suspected **cyanide poisoning** (inhalation (smoke), dermal or ingestion exposure) AND if altered mental status, hemodynamic instability, or cardiac arrest

5 g IV/IO over 15 minutes, IIRR x 1; contact [OLMC](#) following initial dose

Through a dedicated IV/IO

Pediatric - Overdose/Poisoning/Adverse Drug Reaction

Assist— (if available)

In the setting suspected **cyanide poisoning** (inhalation (smoke), dermal or ingestion exposure) AND if altered mental status, hemodynamic instability, or cardiac arrest

*0-2 years:* 0.625 g IV/IO over 15 minutes, IIRR x 1; contact [OLMC](#) following initial dose

*3-5 years:* 1.25 g IV/IO over 15 minutes, IIRR x 1; contact [OLMC](#) following initial dose

*6-13 years:* 2.5 g IV/IO over 15 minutes, IIRR x 1; contact [OLMC](#) following initial dose

Through a dedicated IV/IO

Contents



# Medication

# Class

Ipratropium Bromide

Bronchodilator, Anticholinergic

## Indications:

- Asthma
- COPD
- Emphysema
- Acute bronchospasm

## Contraindications:

- Hypersensitivity to atropine or its derivatives
- Hypersensitivity to ipratropium bromide

## Protocol, Dosage, and Administration

Adult – Allergic Reaction/Anaphylaxis

Basic

Wheezing/Bronchospasm

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Adult – Respiratory Distress

Basic

Pulmonary Edema/CHF

For wheezing/bronchospasm

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Basic

Asthma/COPD/Wheezing

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Basic

Pneumonia

For wheezing/bronchospasm

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Pedi – Allergic Reaction/Anaphylaxis

Basic

Wheezing/Bronchospasm

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Pedi – Respiratory Distress

Basic

If wheezing/bronchospasm

Mix 0.5 mg with 2.5 mg Albuterol in 3 mL NS and nebulize

IIRR x 2

Contents

## Medication

## Class

Isopropyl Alcohol (inhaled)

Antiemetic

Indications:

→ Nausea and vomiting

Contraindications:

→ Hypersensitivity to isopropyl alcohol

## Protocol, Dosage, and Administration

Adult— Nausea and Vomiting

3-pads, IIRR x 1

*Instruct patient to hold pads 1-2 cm from nose and inhale deeply as frequently as required to achieve nausea relief*

Pediatric—Nausea and vomiting

3-pads, IIRR x 1

*Instruct patient to hold pads 1-2 cm from nose and inhale deeply as frequently as required to achieve nausea relief.*

Contents

## Medication

## Class

Ketamine (1/2)

Anesthetic Adjunct

Indications:

- Sedation
- Induction agent in intubation

Contraindications:

- Hypersensitivity to ketamine

## Protocol, Dosage, and Administration

Adult – Respiratory Insufficiency/Failure and Drug Assisted Airway (DAA)

Advanced

If unable to intubate or achieve sufficient patient relaxation prior to intubation

2 mg/kg IV/IO (max single dose 200 mg)

Or 4 mg/kg IM (max single dose 500 mg)

If insufficient sedation, consider additional dose

2 mg/kg IV/IO (max single dose 200 mg)

If hypotensive

2 mg/kg IV/IO (max single dose 200 mg)

Adult – Cardiac Arrest

Advanced

If Signs/Symptoms of CPR Induced Consciousness

1 mg/kg IV/IO (max single dose 200mg)

Adult – Symptomatic Bradycardia

Assist

If time permits and if adequate respiration, consider sedation prior to/during pacing

0.5 mg/kg IV/IO

IIRR x 2

Adult—Tachycardia

Assist

If time permits, consider sedation prior to/during Cardioversion

0.5 mg/kg IV/IO

IIRR x 2

Adult – Behavioral Emergencies/Agitation

Advanced

Hyperactive Delirium with Severe Agitation

2 mg/kg IV (max single dose 200 mg)

Or 4 mg/kg IM (max single dose 500 mg)

Contents

## Medication

## Class

Ketamine (2/2)

Anesthetic Adjunct

Indications:

- Sedation
- Induction agent in intubation

Contraindications:

- Hypersensitivity to ketamine

## Protocol, Dosage, and Administration

Pedi – Respiratory Insufficiency/Failure and Airway

Advanced

If primary ETI fails and unable to ventilate or if unable to intubate or achieve sufficient patient relaxation prior to intubation

1 mg/kg IV/IO

Pedi – Symptomatic Bradycardia

Assist

If time permits and if adequate respiration, consider sedation prior to/during pacing

0.5 mg/kg IV/IO

IIRR x 2

Pedi—Tachycardia

Assist

If time permits, consider sedation prior to/during Cardioversion

0.5 mg/kg IV/IO

IIRR x 2

Pedi – Behavioral Emergencies/Hyperactive Delirium with Severe Agitation

Advanced

Hyperactive Delirium with Severe Agitation and unable to obtain behavioral control

1 mg/kg IV

Or 2 mg/kg IM

Contents

## Medication

## Class

Ketorolac

Nonsteroidal Anti-inflammatory Drug

### Indications:

→ Non-opioid analgesic

### Contraindications:

→ Hypersensitivity to ketorolac

→ Active peptic ulcer disease

→ Recent GI bleeding or perforation

→ Advanced chronic kidney disease with or without dialysis

→ Cerebrovascular bleeding (recent hemorrhagic stroke, ICH, or neurosurgery)

→ Bleeding disorder

→ Women in labor or breastfeeding

→ Renal Transplant

→ Shock/hypotension

## Protocol, Dosage, and Administration

Adult— Acute Pain Management

Assist

15 mg IV or 30 mg IM

Pedi—Acute Pain Management

Assist

0.5 mg/kg IV/IM max single dose 15 mg

Contents

## Medication

## Class

Lidocaine

Local anesthetic

Indications:

Contraindications:

IO access

Hypersensitivity to lidocaine

## Protocol, Dosage, and Administration

Procedure – Intraosseous (IO) Access

Assist

Adult

40 mg slow IO bolus prior to infusion

Pedi

0.5 mg/kg slow IO bolus prior to infusion

Contents

# Medication

# Class

Magnesium Sulfate

Electrolyte

## Indications:

- Torsades de Pointes
- Asthma
- Seizures due to eclampsia

## Contraindications:

- Heart block
- Renal disease

## Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest

Advanced

Torsades de Pointes

2 g IV/IO slow push

Adult – Tachycardias

Advanced

Torsades de Pointes

2 g IV/IO slow push

Adult – Respiratory Distress

Advanced

Severe Asthma/COPD/Wheezing

2 g in 250 mL NS over 15 min

Adult – Seizure/Status Epilepticus

Advanced

If suspected eclampsia/peripartum seizure

4 g IV over 15 min or 4 g IM

Follow with 2 g/hr IV infusion

Adult - Emergency childbirth

Advanced

If suspected pre-eclampsia

4 g IV over 15 min

Follow with 2 g/hr IV infusion

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Torsades de Pointes

25-50 mg/kg (max 2 g) IV/IO slow push

Pedi – Tachycardias

Advanced

Torsades de Pointes

25-50 mg/kg (max 2 g) IV/IO slow push

Pedi – Respiratory Distress

Advanced

If severe wheezing/bronchospasm

40 mg/kg over 15 min (max 2 g)

Contents



## Medication

## Class

Methylprednisolone

Adrenal Glucocorticoid

### Indications:

- Severe anaphylaxis
- Asthma
- COPD

### Contraindications:

- Hypersensitivity to methylprednisolone

## Protocol, Dosage, and Administration

Adult – Allergic Reaction/Anaphylaxis

Advanced

In presence of signs of anaphylaxis/anaphylactic shock

125 mg IV/IM

Adult – Respiratory Distress

Advanced

Asthma/COPD/Wheezing with subacute presentation

125 mg IV/IM

Pedi – Respiratory Distress

Advanced

If wheezing/bronchospasm with subacute presentation

1 mg/kg IV/IM (max 125 mg)

Contents

# Medication

# Class

Midazolam (Adult)

Short-acting benzodiazepine, CNS depressant

## Indications:

- Sedation
- Sympathomimetic overdose
- Behavioral emergencies
- Seizures

## Contraindications:

- Depressed vital signs
- Shock
- Hypersensitivity to midazolam
- Musculoskeletal spasms

## Protocol, Dosage, and Administration

Adult – Respiratory Insufficiency/Failure and Drug Assisted Airway (DAA)

Advanced

If further sedation is required once advanced airway is obtained

2.5 mg slow IV/IO

IIRR q 5 min to 10 mg max (caution hypotension)

Adult – Symptomatic Bradycardia

Advanced

If insufficient sedation after Ketamine

2.5 mg IV/IO

IIRR x 1

Adult – Tachycardias

Assist

If A-flutter or A-fib sympathomimetic associated

2.5 mg IV

IIRR as needed (max total dose 10 mg)

Adult – Behavioral Emergencies/Agitation

Assist

Behavioral emergency

2.5 mg slow IV/IO or 5 mg IM/IN

IIRR x 1 after 5 min

Advanced

If other cause of agitation or cause unclear (in addition to above midazolam dosing, as needed)

2.5mg IV/IO IIRR x 1 q 5-minutes

or 5 mg IM/IN, IIRR x 1

Adult – Overdose/Poisoning

Assist

Cocaine/amphetamine/stimulant/sympathomimetic

2.5 mg slow IV/IO or 5 mg IM/IN

IIRR x1 after 5 min (max total dose 10 mg)

Adult – Seizure/Status Epilepticus

Assist

If actively seizing or in status epilepticus

5 mg slow IV/IO or 10 mg IM/IN

IIRR q 5 min x 2

Adult – Hyperthermia/Heat Stroke

Assist

If uncontrolled shivering occurs during cooling

2.5 mg IV/IO/IN

Contents

## Medication

## Class

Midazolam (Pedi)

Short-acting benzodiazepine, CNS depressant

### Indications:

- Sedation
- Sympathomimetic overdose
- Behavioral emergencies
- Seizures

### Contraindications:

- Depressed vital signs
- Shock
- Hypersensitivity to midazolam

## Protocol, Dosage, and Administration

Pedi—Respiratory Insufficiency/Failure and Drug Assisted Airway (DAA)

Advanced

If further sedation or pain control is required once advanced airway obtained

0.1 mg/kg slow IV/IO

IIRR q 5-min to 10 mg max (caution hypotension)

Pedi – Symptomatic Bradycardia

Advanced

If insufficient sedation after Ketamine

0.05-0.1 mg/kg IV/IO/IN (max single dose 2.5 mg)

EtCO<sub>2</sub> required

Pedi – Behavioral Emergencies/Agitation

Assist

Behavioral emergency

0.05 mg/kg slow IV/IO or 0.1 mg/kg IM/IN (max 2.5 mg total)

IIRR x 1 after 5 min

Pedi – Seizure/Status Epilepticus

Assist

If actively seizing or in status epilepticus

0.15 mg/kg slow IV/IM/IN (max dose 2.5 mg)

IIRR x 1 after 5 min

Pedi – Hyperthermia/Heat Stroke

Assist

If uncontrolled shivering occurs during cooling

0.05 mg/kg slow IV/IO or 0.1 mg/kg IM/IN (max 2.5 mg total)

IIRR x 1 after 5 min

Contents

## Medication

## Class

Midazolam (Pedi)

Short-acting benzodiazepine, CNS depressant

### Indications:

- Sedation
- Sympathomimetic overdose
- Behavioral emergencies
- Seizures

### Contraindications:

- Depressed vital signs
- Shock
- Hypersensitivity to midazolam

## Protocol, Dosage, and Administration

Pedi—Respiratory Insufficiency/Failure and Drug Assisted Airway (DAA)

Advanced

If further sedation or pain control is required once advanced airway obtained

0.1 mg/kg slow IV/IO

IIRR q 5-min to 10 mg max (caution hypotension)

Pedi – Symptomatic Bradycardia

Advanced

If insufficient sedation after Ketamine

0.05-0.1 mg/kg IV/IO/IN (max single dose 2.5 mg)

EtCO<sub>2</sub> required

Pedi – Behavioral Emergencies/Agitation

Assist

Behavioral emergency

0.05 mg/kg slow IV/IO or 0.1 mg/kg IM/IN (max 2.5 mg total)

IIRR x 1 after 5 min

Pedi – Seizure/Status Epilepticus

Assist

If actively seizing or in status epilepticus

0.15 mg/kg slow IV/IM/IN (max dose 2.5 mg)

IIRR x 1 after 5 min

Pedi – Hyperthermia/Heat Stroke

Assist

If uncontrolled shivering occurs during cooling

0.05 mg/kg slow IV/IO or 0.1 mg/kg IM/IN (max 2.5 mg total)

IIRR x 1 after 5 min

Contents

# Medication

# Class

Naloxone

Opioid antagonist

## Indications:

- Opiate overdose with CNS depression, miosis, and respiratory depression (all 3)
- Coma of unknown origin

## Contraindications:

- Cardiac arrest with no evidence of opiate overdose
- Use with caution in narcotic dependent patients
- Use with caution in neonates of narcotic-addicted mothers
- Hypersensitivity to naloxone

## Protocol, Dosage, and Administration

### Adult – Altered Mental Status/CNS Depression

#### Basic

- If suspected opiate intoxication  
2 mg IN (1 mg in each nostril)  
IIRR x1 in 5 min

#### Assist

- If suspected opiate intoxication  
0.5 mg IV  
IIRR in 0.5 mg increments q 5 min to 4 mg max total dose

### Adult – Overdose/Poisoning

#### Basic

- If suspected opiate intoxication  
2 mg IN (1 mg in each nostril)  
IIRR x1 in 5 min

#### Assist

- If suspected opiate intoxication  
0.5 mg IV  
IIRR in 0.5 mg increments q 5 min to 4 mg max total dose

### Pedi – Altered Mental Status/CNS Depression

#### Basic

- If suspected opiate intoxication  
0.5 mg IN  
IIRR q 5 min to 2 mg max total dose

#### Assist

- If suspected opiate intoxication  
0.5 mg IV/IN  
IIRR q 5 min to 2 mg max total dose

### Pedi – Overdose/Poisoning

#### Basic

- If suspected opiate intoxication  
0.5 mg IN  
IIRR q 5 min to 2 mg max total dose

#### Assist

- If suspected opiate intoxication  
0.5 mg IV/IN  
IIRR q 5 min to 2 mg max total dose

Contents

## Medication

## Class

Nicardipine

Antihypertensive, Calcium channel blocker

Indications:

→ CVA

Contraindications:

→ Hypersensitivity to nicardipine

→ Aortic stenosis

## Protocol, Dosage, and Administration

CCP – Stroke/CVA/TIA

CCP

If acute neurologic deficit and MAP  $\geq$  130

25 mg in 250 mL NS at 5-15 mg/hr

Acute Ischemic Stroke – titrate to SBP  $\leq$  180 and DBP  $\leq$  105

If not a candidate for tPA, only treat for SBP  $\geq$  220 or DBP  $\geq$  120

Acute Hemorrhagic Stroke - titrate to SBP  $\leq$  150 or MAP  $\leq$  100

If MAP drops 25% or more decrease by 2.5 mg/hr

Contents

## Medication

## Class

Nitroglycerin

Nitrate, Coronary vasodilator

### Indications:

- Acute angina
- Ischemic chest pain
- Congestive heart failure pulmonary edema

### Contraindications:

- Recent use of erectile dysfunction medications
- Hypotension
- Hypovolemia
- Intracranial bleeding/head injury
- Hypersensitivity to nitroglycerine

## Protocol, Dosage, and Administration

Adult – Ischemic Chest Pain/Acute Coronary Syndrome/STEMI

Basic

0.4 mg SL q 5 min

Titrate to SBP  $\geq$  100 and signs/symptoms

Assist

0.4 mg SL q 5 min

Titrate to SBP  $\geq$  100 and signs/symptoms

Use with caution if borderline hypotension or suspected RV infarct

Adult – Respiratory Distress

Basic

Pulmonary Edema/CHF

0.4 mg SL q 5 min

Titrate to SBP  $\geq$  100 and signs/symptoms

Assist

0.4 mg SL q 5 min

Titrate to SBP  $\geq$  100 and signs/symptoms

Contents

## Medication

## Class

Norepinephrine

Sympathomimetic, Vasopressor

Indications:

Contraindications:

→ Hypotension

→ Traumatic hemorrhagic shock

## Protocol, Dosage, and Administration

Adult – Shock/Hypotension

Advanced

If any other suspected etiology of shock unresponsive to initial fluid resuscitation

4 mg in 250 mL NS

Infuse @ 2-30 mcg/min, start at 5 mcg/min, titrate to SBP  $\geq$ 90 and signs of improved perfusion

Contents



# Medication

# Class

Ondansetron

Antiemetic

Indications:

→ Nausea and vomiting

Contraindications:

→ Hypersensitivity to ondansetron

→ Suspected or confirmed first trimester pregnancy

## Protocol, Dosage, and Administration

Adult – Acute Pain Management

Basic

If not actively vomiting

4 mg ODT, IIRR x 1 in 10-min

Assist

For active nausea/vomiting

4 mg IV

IIRR x 1 after 10 min

Adult – Ischemic Chest Pain/Acute Coronary Syndrome/STEMI

Assist

For severe nausea/vomiting

4 mg IV, IIRR x 1

Adult – Nausea and Vomiting

Basic

If not actively vomiting

4 mg ODT

Assist

4 mg IV

IIRR x 1 after 10 min

Pedi – Acute Pain Management

Basic

If not actively vomiting

8-15 kg – 2 mg ODT

16-30 kg – 4 mg ODT

IIRR x 1 after 10 min

Advanced

For active nausea/vomiting

0.15 mg/kg IV (max dose 4 mg)

Pedi – Nausea and Vomiting

Basic

If not actively vomiting

8-15 kg – 2 mg ODT

16-30 kg – 4 mg ODT

IIRR x 1 after 10 min

Assist

For active nausea/vomiting

0.15 mg/kg IV (max dose 4 mg)

Contents

# Medication

# Class

Potassium

Electrolyte

Indications:

→ Hypokalemia

Contraindications:

→ Hyperkalemia

## Protocol, Dosage, and Administration

MIH - CHF

CCP/MHP

K+ 2.5-2.9

Increase by 50% for length of time patient has increased Lasix dosing

K+ 3.0-3.4

Increase by 25% for length of time patient has increased Lasix dosing

K+ 3.5-5.0

No change

K+ 5.1-5.4

Discontinue supplement

Contents

## Medication

## Class

Propofol	Sedative
Indications:	Contraindications:
→ Sedation for mechanical ventilation	→ Hypersensitivity to propofol → Allergy to eggs, soy, or peanuts

## Protocol, Dosage, and Administration

CCP - Sedation

CCP

If hemodynamically stable ( $SBP \geq 90$ ) and requiring sedation (Interfacility only)  
10-100 mcg/kg/min, titrate as appropriate

[Contents](#)

## Medication

## Class

Racemic Epinephrine

Bronchodilator

Indications:

→ Moderate to severe croup

Contraindications:

Hypersensitivity to epinephrine

## Protocol, Dosage, and Administration

Pedi - Respiratory Distress (croup)

Assist

> 10 kg - 0.5 ml (1-ampule) mixed with 3 ml NS nebulized, IIRR x1

≤ 10 kg - 0.25 ml (1/2-ampule) mixed with 3 ml NS nebulized, IIRR x1

Contents

## Medication

## Class

Rocuronium

Non-depolarizing Neuromuscular Blocker

Indications:

- Paralysis for intubation
- Contraindication to succinylcholine

Contraindications:

Hypersensitivity to rocuronium

## Protocol, Dosage, and Administration

CCP – Respiratory Insufficiency/Failure & Drug Assisted Airway (DAI)

CCP

If advanced airway already in place and if hypoxemic and dysynchronous with ventilator, and if refractory to optimized FiO<sub>2</sub> and PEEP

1 mg/kg IVP for paralysis, IIRR x 1

If no advanced airway in place, and if insufficient sedation to attempt direct laryngoscopy for intubation and if contraindications to succinylcholine

1 mg/kg IVP

Contents

# Medication

# Class

Sodium Bicarbonate (Adult)

Electrolyte

Indications:

- Known or suspected acidosis
- TCA overdose
- Hyperkalemia

Contraindications:

- Alkalosis
- Hypocalcemia

## Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest

Advanced

Metabolic acidosis etiology (e.g. DKA)

1 mEq/kg IV/IO

Hyperkalemia

1 mEq/kg IV/IO

Tricyclic Antidepressant Overdose

1 mEq/kg IV/IO

Adult – Symptomatic Bradycardia

Advanced

Hyperkalemia

1 mEq/kg IV/IO

Acidosis

1 mEq/kg IV/IO

Adult – Tachycardias

Advanced

Suspected Hyperkalemia

1 mEq/kg IV/IO

If suspected acidosis IIRR 0.5 mEq/kg

Adult – Altered Mental Status/CNS Depression

Advanced

If tricyclic antidepressant intoxication

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Adult – Behavioral Emergencies/Agitation

Advanced

For provider witnessed sudden cardiac arrest associated with prolonged agitation/Hyperactive Delirium with Severe Agitation

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Adult – Overdose/Poisoning

Advanced

Tricyclic Antidepressant (TCA)

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Adult – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Contents

# Medication

# Class

Sodium Bicarbonate (Pedi)

Electrolyte

Indications:

- Known or suspected acidosis
- TCA overdose
- Hyperkalemia

Contraindications:

- Alkalosis
- Hypocalcemia

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Metabolic acidosis etiology (e.g. DKA)

1 mEq/kg IV/IO

Hyperkalemia

1 mEq/kg IV/IO

Tricyclic Antidepressant Overdose

1 mEq/kg IV/IO

Pedi – Symptomatic Bradycardia

Advanced

Hyperkalemia

1 mEq/kg IV/IO

Acidosis

1 mEq/kg IV/IO

Pedi – Tachycardias

Advanced

Suspected Hyperkalemia

1 mEq/kg IV/IO

If suspected acidosis IIRR 0.5 mEq/kg

Pedi – Altered Mental Status/CNS Depression

Advanced

If tricyclic antidepressant intoxication

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Pedi – Overdose/Poisoning

Advanced

Tricyclic Antidepressant (TCA)

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Pedi – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Contents

# Medication

# Class

Sodium Bicarbonate (Pedi)

Electrolyte

Indications:

- Known or suspected acidosis
- TCA overdose
- Hyperkalemia

Contraindications:

- Alkalosis
- Hypocalcemia

## Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest

Advanced

Metabolic acidosis etiology (e.g. DKA)

1 mEq/kg IV/IO

Hyperkalemia

1 mEq/kg IV/IO

Tricyclic Antidepressant Overdose

1 mEq/kg IV/IO

Pedi – Symptomatic Bradycardia

Advanced

Hyperkalemia

1 mEq/kg IV/IO

Acidosis

1 mEq/kg IV/IO

Pedi – Tachycardias

Advanced

Suspected Hyperkalemia

1 mEq/kg IV/IO

If suspected acidosis IIRR 0.5 mEq/kg

Pedi – Altered Mental Status/CNS Depression

Advanced

If tricyclic antidepressant intoxication

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Pedi – Overdose/Poisoning

Advanced

Tricyclic Antidepressant (TCA)

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Pedi – Entrapment/Crush/Traumatic Rhabdomyolysis

Assist

If EKG findings of hyperkalemia

1 mEq/kg IV/IO

IIRR 0.5 mEq/kg x 1 after 10 min

Contents



## Medication

## Class

Succinylcholine

Depolarizing Neuromuscular Blocker

### Indications:

→ Paralysis for intubation

### Contraindications:

- Hypersensitivity to succinylcholine
- History of malignant hyperthermia
- Risk of, or suspected hyperkalemia:
  - Burns  $\geq$  6 hrs. old
  - Chronic kidney failure, including patients on dialysis
  - EKG changes consistent with hyperkalemia
  - Muscle crush injury (more than 5 days from onset until 6 months after)
  - Spinal cord injury (more than 5 days from onset until 6 months after)
  - Myopathy with elevated Creatine Phosphokinase
  - Serious intra-abdominal infection (more than 5 days from onset until resolved)
- Neuromuscular disorders (such as multiple sclerosis)
- Penetrating eye injury
- Narrow angle glaucoma

## Protocol, Dosage, and Administration

Respiratory Insufficiency/Failure & Drug Assisted Airway (DAA)

CCP

If no advanced airway in place, and if insufficient sedation to attempt direct laryngoscopy for intubation  
2 mg/kg IVP

Contents

## Medication

## Class

Tranexamic Acid (TXA)

Hemostatic agent

Indications:

- Significant tracheostomy hemorrhage (e.g. tracheo-innominate fistula)
- Postpartum hemorrhage
- Traumatic hemorrhage (if traumatic cardiac arrest, administer only if ROSC achieved)

Contraindications:

- Hypersensitivity to TXA
- $\geq 3$  hours since injury
- Early pregnancy
- Signs of DIC
- Upper or lower gastrointestinal bleeding

## Protocol, Dosage, and Administration

Adult - Shock/Hypotension

Advanced

If trauma with significant hemorrhage and  $SBP \leq 90$  or  $HR \geq 110$  with poor perfusion or TBI with inability to follow verbal instructions (Motor GCS  $< 5$ )

2 g IV/IO, slow push over 1 min

Do not give if injury occurred  $\geq 3$  hours before

Adult—Traumatic Cardiac Arrest

Advanced

2 g IV/IO, slow push over 1 min

Adult – Tracheostomy Emergencies

Advanced

If significant hemorrhage (e.g. tracheo-innominate fistula) and  $SBP \leq 90$  or  $HR \geq 110$  with poor perfusion

2 g IV/IO, slow push over 1 min

Do not give if bleeding onset  $\geq 3$  hours

Adult - General Trauma

Advanced

If trauma with significant hemorrhage and  $SBP \leq 90$  or  $HR \geq 110$  with poor perfusion or TBI with inability to follow verbal instructions (Motor GCS  $< 5$ )

2 g IV/IO, slow push over 1 min

Do not give if injury occurred  $\geq 3$  hours before

OB/GYN – Emergency Childbirth

Advanced

If postpartum hemorrhage

1 g IV/IO, slow push over 1 min

Contents

## Documentation

All completed ePCR's are expected to have complete and thorough documentation

All runs should have the following elements summarized in the narrative as well as documented fully in the appropriate sections of the chart:

- Patient's medical complaint(s)
- Past medical history, including current medications and allergies
- History of present illness (subjective)
- Primary assessment, secondary assessment and ongoing assessment, including vitals (objective)
- Thorough documentation of all treatments performed and results of treatment
- Differential and Working Diagnoses

## Medication Administration

All runs involving the administration of any medication may be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Indications for medication use
  - Dose of medication given (including infusion)
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and on-going patient assessments, including vitals

## IV Fluids

All runs involving the administration of IV fluids may be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Indications for IV fluid use
  - Bolus volume, IV rate, and total amount of fluid administered
  - Route and time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and on-going patient assessments, including vitals

## Pain Management

All runs involving the use of pain management medication may be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO<sub>2</sub> monitoring throughout case
- Thorough documentation including:
  - Indications for use
  - Documentation of pain scale
  - Dose, route, and time of medication given
  - Pre- and post-administration assessment, including vitals and pain scale

## Ketamine

All runs involving the use of ketamine may be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
- Dose, route, and time of ketamine given

All intubation documentation listed as appropriate including:

- Indications for use of drug assisted intubation
- Pre-administration patient assessment, including vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds
- Post-administration and ongoing patient assessments (vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds)
- Any adjuncts used to facilitate intubation (bougie, cricoid pressure)
- Any adverse reactions or problems

If midazolam is used in conjunction with ketamine, the following should be included as well:

- Indications for medication use
- Dose of medication given (including infusion)
- Route of administration
- Time of administration
- Pre-administration patient assessment, including vitals
- Post-administration and on-going patient assessments, including vitals

## Epinephrine

All runs involving the use of epinephrine or epinephrine infusion may be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO<sub>2</sub> monitoring throughout run
- Thorough documentation including:
  - Indications for IV epinephrine use
  - Dose of IV epinephrine given (including concentration)
  - Time of administration
  - Pre-administration patient assessment (vitals, pulse-ox, skin color/condition, and lung sounds)
  - Post-administration and ongoing assessments (vitals, pulse-ox, skin color/condition, and lung sounds)

## Sedatives

All intubations involving the use of sedative may be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO<sub>2</sub> monitoring throughout run
- Thorough documentation including:
  - Indications for medication use
  - Dose of medication given (including infusion)
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and on-going patient assessments, including vitals

## EtCO<sub>2</sub>

EtCO<sub>2</sub> detector is expected to be used in the following circumstances:

- Respiratory distress (diff. breathing, or requiring  $\geq$  2lpm)
- Decreased LOC/Somnolence
- Trending: Perfusion/respiration
- Positive pressure ventilation with BVM
- Advanced airway placement (ETT, King LT, cricothyrotomy)
- Narcotic/benzodiazepine/sedative administration

Any loss of CO<sub>2</sub> detection or 4 phase waveform indicates an airway problem and should be assessed, documented, and resolved

All advanced airways will require EtCO<sub>2</sub> waveform data to be attached to the ePCR

EtCO<sub>2</sub> detector should remain in place throughout the entirety of the call

### Quality Improvement Measurements:

- % of cases with EtCO<sub>2</sub> use for non-invasive ventilation management (CPAP, BVM) when equipped
- % of cases with EtCO<sub>2</sub> use for invasive ventilation management (SGA, ETT, Cric)
- % of successful ventilation management as evidenced by EtCO<sub>2</sub> waveform throughout the case

## Intubation (ETT or King LTS-D)

All intubations may be reviewed for the following:

- Protocol compliance
- EtCO<sub>2</sub> use throughout case
- Appropriate oxygenation prior to, during, and between attempts
- Appropriate length of attempt (<30 seconds)
- Use of cardiac monitoring during intubation
- If using VL device, upload any VL videos to VL Quality Assurance Folder
- Thorough documentation including:
  - Intubation indicators
  - Pre-intubation patient assessment, including vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds
  - Post-intubation and ongoing patient assessments, including vitals, pulse ox, EtCO<sub>2</sub>, and Lung sounds
  - Depth (cm at teeth), size, and location of tube
  - Any adjuncts used to facilitate intubation (bougie, cricoid pressure)
- If using VL Device—VL file name (ex. VXXXXXXX) in the procedure comments

### Quality Improvement Measurements:

- % of unrecognized failed advanced airway placements
- % of successful ETT placement as evidenced by waveform EtCO<sub>2</sub> throughout the case
- % of successful King LTS-D placements as evidenced by waveform EtCO<sub>2</sub> throughout the case
- % of first pass intubation success

## Airway Management

All runs requiring airway management may be reviewed for the following:

- Protocol compliance
- All advanced airway management (ETT or SGA) require EtCO<sub>2</sub> monitoring and monitor data upload
- Thorough documentation including:
  - Airway management progression, device used, O<sub>2</sub> flow rates, EtCO<sub>2</sub> levels
  - Pre- and post-intervention patient assessment (vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds)

## Termination of Resuscitation

All runs involving the use of the Termination of Resuscitation protocol may be reviewed for the following:

- Protocol compliance
- EtCO<sub>2</sub> for early termination of resuscitation
- Termination of resuscitation should not occur in pediatric patients
- Termination of Resuscitation should only occur:
  - After consideration of contraindications, differential diagnosis, comorbidities, etc.
  - In the presence of advanced airway + High quality CPR + ACLS drugs
- For traumatic arrest, termination of resuscitation should only occur after 15 minutes of resuscitative efforts including: CPR, Advanced airway management, ACLS drugs, and Needle thoracostomy as appropriate.
- Thorough documentation including:
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment findings as appropriate
  - Suspicious/inconsistent scene or physical findings

## Withholding Resuscitative Efforts

All runs involving the use of the Withholding Resuscitative Efforts protocol may be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Criteria for withholding resuscitative efforts for cardiac arrest
    - Pulseless/no heart tones, apnea, no pupillary response, and signs of irreversible death
  - Criteria for withholding resuscitative efforts for traumatic cardiac arrest:
    - Pulseless/no heart tones, apnea, no pupillary response, asystole on cardiac monitor
  - Position/location found
  - Any movement of the patient/surroundings
  - Access limitations
  - Assessment finding as appropriate
  - Suspicious/inconsistent scene or physical findings

## RAS/AMA

All runs resulting in non-transport may be reviewed for the following

- Protocol compliance
- Thorough documentation including:
  - Criteria for which a person qualifies for a RAS
  - Criteria for which a person qualifies for an AMA
- For AMA, thorough documentation of the following:
  - Differential Diagnosis
  - Risks and consequences of refusing treatment and/or transport at the patient's level of understanding, based on the differential diagnosis
  - Understanding of the risks and consequences of refusing treatment and/or transport, documented in the patient's own words
  - All AMA documentation not originated in the transport agency should be provided to OMD within 24 hours

## CPAP

All runs involving the use of CPAP may be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO<sub>2</sub> monitoring throughout case
- Thorough documentation including:
  - Indications for CPAP use
  - Positive airway pressure setting
  - Time CPAP was initiated
  - Pre-CPAP patient assessment, including vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds
  - Post-CPAP and on-going patient assessments, including vitals, pulse ox, EtCO<sub>2</sub>, and lung sounds

## Quality Improvement Measurements

- % of cases with EtCO<sub>2</sub> use for non-invasive ventilation management (CPAP, BVM) when equipped
- % of cases with EtCO<sub>2</sub> use for invasive ventilation management (SGA, ETT, Cric)
- % of successful ventilation management as evidenced by EtCO<sub>2</sub> waveform throughout the case

## Needle Thoracostomy

All runs involving the use of needle thoracostomy may be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Indications for use
  - Location utilized
  - Time of needle placement
  - Pre-administration patient assessment, including vitals and lung sounds
  - Post-administration and ongoing patient assessments, including vitals and lung sounds

## External Cardiac Pacing

All runs involving external cardiac pacing may be reviewed for the following:

- Protocol compliance
- ECG acquisition and interpretation
- No delay in pacing in the presence of:
  - Severe hemodynamic instability
  - Acute MI/ACS
  - High degree AV-block (Mobitz II 2nd-degree or 3rd-degree)
- Atropine usage
- Appropriate use of sedation
- Thorough documentation including:
  - Signs/symptoms, including pertinent negatives
  - Initial patient assessment, including vitals
  - Energy settings at which electrical/mechanical capture was achieved
  - Post-intervention and on-going patient assessment

## Synchronized Cardioversion

All runs with synchronized cardioversion may be reviewed for the following:

- Protocol Compliance
- Acquisition and interpretation of ECG
- No delay in synchronized cardioversion in the presence of severe hemodynamic instability
- Appropriate use of sedation
- Thorough documentation including
  - Indications for use
  - ECG interpretation
  - Energy settings used
  - Pre-intervention assessment, including vitals
  - Post-intervention assessment, including vitals

## Ischemic Chest Pain/ACS/STEMI

All ischemic chest pain/ACS/STEMI may be reviewed for the following documentation:

- 12 lead ECG interpretation, transmission, STEMI Alert, and attachment to chart.
- ASA administration or contraindications
- Nitroglycerine administration or contraindications
- Thorough documentation including:
  - History of present illness
  - Signs/symptoms, including pertinent negatives
  - Initial patient assessment, including vitals
  - Post intervention and on-going patient assessment, including vitals

## Quality Improvement Measurements:

- % of suspected STEMI patients correctly identified by EMS
- % of suspected STEMI patients w/ASA admin (in the absence of contraindications)
- % of suspected STEMI patients w/NTG admin (in the absence of contraindications)
- % of suspected STEMI patients with 12L acquisition within 10 minutes of patient contact
- % of suspected STEMI patients with 12L transmitted within 5 minutes of transport initiation
- % of suspected STEMI patients with PCI facility notified within 10 minutes of EMS patient contact
- % of patients with Suspected STEMI Transported to PCI Center
- % of suspected STEMI patients with EMS activation to Cath Lab intervention time < 90 minutes

## Altered Mental Status/CNS Depression

All runs with Altered Mental Status / CNS Depression may be reviewed for the following:

- Protocol compliance
- Assessment of blood sugar glucose
- 12 lead EKG
- Stroke screen as appropriate
- Thorough documentation including:
  - Time of onset of symptoms
  - Pre and post intervention assessment including vitals
  - Working diagnosis and differential diagnosis



## Stroke/CVA/TIA

All runs with suspected Stroke/CVA/TIA may be reviewed for the following:

- Protocol compliance
- Assessment of blood sugar glucose
- Documented stroke scale
- Stroke alert and transport to appropriate stroke facility
- Thorough documentation including:
  - Time of onset of symptoms
  - Initial and ongoing patient assessment including vitals

### Quality Improvement Measurements:

- % of suspected Stroke patients correctly identified by EMS
- % of suspected Stroke patients with blood glucose measured
- % of suspected Stroke patients with Cincinnati Stroke Scale measured

## Cardiac Arrest

All cardiac arrests may be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO<sub>2</sub> monitoring throughout case
- High quality CPR
- Placement of Mechanical CPR device ≤ 10 seconds
- Use of passive oxygenation
- Utilization of Pit Crew CPR
- Thorough documentation including:
  - Attachment of monitor data to ePCR
  - Relevant times (arrest occurrence, CPR start, ROSC times, etc.)
  - Other agencies on scene
  - Type of CPR provided (manual or mechanical)
  - Who initiated CPR
  - AED use
  - CPR feedback device usage
  - First monitored rhythm
  - ROSC, if applicable

### Quality Improvement Measurements:

- % of cases with CCF ≥ 90%
- % of cases with compression rate 100-120 cpm 90% of the time
- % of cases with compression depth > 2 inches 90% of the time
- % of cases with mechanical CPR device placement < 10 seconds pause in chest compression
- % of cases with peri-defibrillation CPR pause < 10 seconds
- % of cardiac arrests that arrive at ED with ROSC
- % of cardiac arrest patients discharged alive
- % of cardiac arrest patients discharged alive with good neurological outcome (CPC 1 or 2)

## INTUBATION CHECKLIST

\*SpO2 and BP criteria not required for cardiac arrest\*

### PLAN

#### AIRWAY PLAN VERBALIZED

- |                          |                     |               |
|--------------------------|---------------------|---------------|
| <input type="checkbox"/> | <b>P</b> rimary     | ETT           |
| <input type="checkbox"/> | <b>A</b> lternate   | King Airway   |
| <input type="checkbox"/> | <b>C</b> ontingency | BVM           |
| <input type="checkbox"/> | <b>E</b> mergency   | Surgical Cric |

### PREP

#### MAX BVM PRE-OXYGENATION

- |                          |                        |                          |                          |
|--------------------------|------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | ETSN                   | <input type="checkbox"/> | 2 NPAs, OPA as indicated |
| <input type="checkbox"/> | 2-hand grip/jaw thrust | <input type="checkbox"/> | HOB at 30 degrees        |
| <input type="checkbox"/> | High Flow NC           | <input type="checkbox"/> | PEEP $\geq$ 5            |
| <input type="checkbox"/> | EtCO2 w/ every breath  | <input type="checkbox"/> | Ketamine PRN             |

#### KIT DUMP

- |                          |                 |                          |                     |                          |                   |
|--------------------------|-----------------|--------------------------|---------------------|--------------------------|-------------------|
| <input type="checkbox"/> | Suction tested  | <input type="checkbox"/> | 2 blades            | <input type="checkbox"/> | Tube tamer        |
| <input type="checkbox"/> | Bougie (curved) | <input type="checkbox"/> | 2 sizes ET tubes    | <input type="checkbox"/> | King Tube         |
|                          |                 | <input type="checkbox"/> | 10 & 60 cc syringes | <input type="checkbox"/> | Surgical cric kit |
|                          |                 | <input type="checkbox"/> | EtCO2 detector      | <input type="checkbox"/> | UE Scope tested   |

#### KETAMINE PRN

- Adult: 2 mg/kg IV/IO IIRR x 1
- Pedi: 1 mg/kg IV/IO IIRR x 1

#### PARALYTICS (CCP ONLY)

- Succinylcholine 2 mg/kg IVP
- Rocuronium 1 mg/kg IVP

#### MONITOR APPLIED (CURRENT VITALS)

- SpO2  
 BP

- EtCO2  
 ECG

- GOAL: SPO2  $\geq$  94%**  
 **GOAL: SBP  $\geq$  90**

**\*\*IF UNABLE TO MEET ABOVE GOALS CONSIDER QUICK KING\*\***

### PERFORM

#### INTUBATE

- |                         |                      |
|-------------------------|----------------------|
| • Stabilize neck        | • Blade in vallecula |
| • Open C-Collar         | • Blade midline      |
| • Scissor/Blade/Suction | • 50/50 view         |
| • Progressive insertion | • Bougie             |



**\*\*ABORT ATTEMPT IF SPO2 DROPS < 94%, RESUME BVM\*\***

### POST INTUBATION

#### CONFIRM PLACEMENT

- EtCO2 > 5 mmHg  
 Auscultate for depth

#### MAINTENANCE ADULT

- Fentanyl 1 mcg/kg OR
- Midazolam 2.5 mg OR
- Ketamine 2mg/kg (low BP)

#### MAINTENANCE PEDI

- Fentanyl 1 mcg/kg OR
- Midazolam 0.1 mg/kg OR
- Ketamine 1mg/kg (low BP)

## MECHANICAL COMPRESSION DEVICE CHECKLIST

### PRE-APPLICATION TIMEOUT



### S-T-A-R-S

- **SIZE** - is the patient too big / small?
- **TURN ON** - ensure the device powers on and battery charge is good
- **ABORT** - when to stop application / resume manual CPR
- **ROLES** - role assignments / providers in place
- **STRAP** - no neck strap = no application

### 2 PHASE APPLICATION



### PHASE 1

1. After full 2 minute CPR cycle, pause CPR for rhythm check, manage rhythm
2. **\*\*BEGIN 10 SECOND COUNTDOWN\*\***
3. Providers lift patient by shoulders / roll patient to the side
4. Place back plate under patient ensuring attachment points are visible
5. **\*\*RESUME MANUAL CPR\*\***

### IF UNABLE TO COMPLETE IN 10 SECONDS - ABORT APPLICATION

**\*\*At 8 seconds prepare to ABORT and resume manual compressions for a full 2 minute cycle\*\***



### PHASE 2

1. After full 2 minute CPR cycle, pause CPR for rhythm check, manage rhythm
2. **\*\*BEGIN 10 SECOND COUNTDOWN\*\***
3. Apply device arms to back place and lock in place
  - **LUCAS** - swing arm over and clamp on both sides
  - **DEFIBTECH** - clamp on both sides and insert piston arm
4. Engage piston
  - **LUCAS** - pull piston down
  - **DEFIBTECH** - press button to lower piston
5. Press play on device

### IF UNABLE TO COMPLETE IN 10 SECONDS - ABORT APPLICATION

**\*\*At 8 seconds prepare to ABORT and resume manual compressions for a full 2 minute cycle\*\***

### POST APPLICATION



- Apply neck straps and arm straps
- Mark sharpie around piston / puck
- Keep hands and eyes on device watching for movement

### PHASE 1



### PHASE 2

