OFFICE OF THE MEDICAL DIRECTOR

EMERGENCY PHYSICIANS ADVISORY BOARD

Out-of-Hospital & Mobile Integrated Healthcare Protocols

May 8, 2016

One could say the ideal protocol is no protocol at all, because providers who are educated – especially, self-educated – and who continuously hone their critical thinking and clinical decision-making skills will always provide high-quality care. In their hands, protocols are no longer "recipes" in a patient care "cookbook," but instead they are a toolbox of cognitive and manual skills to be used with insight and judgment. We present these protocols in that spirit – to help guide your thought processes and serve as navigation tools for patient stabilization, treatment and care. We are also pleased to share with you several guiding principles we followed in the process of designing and developing them.

First, highly-trained and skilled providers should be able to effectively treat the majority of patients with the least potential for harm. Thus, for example, these protocols include the use of an induction agent to facilitate airway management. Our philosophy is that all advanced level providers should be equipped with the necessary tools to optimize skills performance and patient care. And once providers gain experience in the use of this drug as well as increased facility in direct laryngoscopy and endotracheal intubation, the introduction of a paralytic agent for rapid sequence intubation (RSI) would be a reasonable next step.

You will also notice that there are no longer any stringent requirements regarding the number of airway attempts allowed in cases of respiratory failure. Advanced airway management is ideally accomplished in a rapid and fluid fashion. But the danger of one prolonged attempt – for example, where a patient becomes hypoxic, bradycardic, is hypotensive, or aspirates or suffers airway trauma – is more concerning than two careful and controlled attempts during which there is no deterioration in the patient's hemodynamic, physiologic or clinical status. The built-in safety margin is provided by end-tidal CO2 waveform capnography.

Providers should have access to the simplest approaches or solutions to most clinical problems without increasing the margin for potential error and misapplication. These protocols were developed with an eye towards finding the best single drug to treat a wide range of conditions. So, while it might be beneficial to carry two induction agents, ketamine and etomidate, since they both have their particular benefits and risk profiles, we elected to choose one. We believe the benefits of providers becoming proficient in the expert use of just one drug would likely outweigh the benefits of using both intermittently. We chose ketamine as our selected agent because it also been introduced for the treatment of another entirely unrelated condition, excited delirium, thereby enabling the paramedic to treat two problems with a single drug. A similar approach was taken with regard to the use of vasopressors in shock, though here we felt that optimal management of a range of possible clinical scenarios required the inclusion of at least two agents – norepinephrine and epinephrine.

And while the evidence for most out-of-hospital medical interventions is still at an early developmental stage, we have tried to incorporate evidence-based best practices in these protocols for the use of pharmacologic agents, performance of skills, and application of monitoring and treatment modalities. Dopamine has now been replaced by norepinephrine as the vasopressor of choice for most causes of shock, while intravenous epinephrine is the preferred agent for anaphylactic-induced shock or laryngospasm, as well as for symptomatic bradycardia. We have also gone to a highest energy first-shock and preferred anterior-posterior pad placement, while end-tidal C02 waveform capnography is critical to all advanced airway interventions, including endotracheal intubation and blind insertion supraglottic airways.

These protocols were not designed to reflect minimum cognitive and manual skill levels in our discipline. Instead, they have been built to "raise the bar" to the highest standard and quality of care appropriate to each individual's scope of practice and credentialing level. As such, all advanced level providers will have "airway privileges" and will be expected to function as primary or lead medics, while basic providers will have an increase in their scope of practice including the use of Continuous Positive Airway Pressure (CPAP) as well as intranasal medications.

It's important to note that these protocols would be of little value in the absence of the Quality Assurance (QA) processes necessary to ensure their effective and safe use. Some of these QA elements are highlighted following the respective protocols to which they are attached. The purpose is to emphasize those aspects of patient care we anticipate you'll focus on as you treat your patients, as well as those we'll critically evaluate so we can provide you with meaningful feedback. This includes everything from CPR analytics – e.g., chest compression fraction (CCF) and frequency and duration of pauses – to continuous waveform capnography for all advanced airway evolutions or appropriate decisional capacity assessments for informed refusals of consent to transport or treat.

We gratefully acknowledge that these protocols could not have been completed without the dedicated, devoted and consistent effort of one of our colleagues, Levi Hejl, who performed this extraordinary task in an exemplary and always passionate fashion. Thanks to Dr. Veer Vithalani and Dr. Steven Davis for all of their very expert and skilled work, and to Jody Farr and Desiree Partain for their contributions to the Mobile Integrated Healthcare and Critical Care protocols. Special thanks to the members of the Emergency Physicians Advisory Board (EPAB) and to others - both within and outside our medical community - especially Rob Walker, Drs. Farhan Ali, Billy Dimas, Dan Guzman, and Mike McEvoy, for all of their thoughtful input, discussion and review. Lastly, we are indebted to rest of our OMD staff, including Buck Gleason, Dwayne Howerton, Kier Brister, Laura Long, Rayna Willis, and Sabrina Vlk for their efforts on behalf of the System, and to Matt Zavadsky, Sean Burton, Dr. Jeff Beeson and Dr. Steven Davis, for providing the foundation upon which the current Mobile Integrated Healthcare protocols were built.

And thanks to all of you for your devoted efforts to breathe life into these protocols – perhaps, sometimes literally – for the well-being of our patients and for the benefit of our entire community.

Sincerely,

Neal J. Richmond, M.D., FACEP
Medical Director

The Uniform EMS Ordinance, and related Interlocal Agreements, establish the Area Metropolitan Ambulance Authority, dba MedStar Mobile Healthcare. In conjunction with each member city's fire or police EMS first-response, the MedStar System provides service to more than 936,000 residents over 436 square miles, and responds to approximately 125,000 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 Emergency Physicians Advisory Board (EPAB) to provide medical direction and oversight to the entire system.

These protocol's jurisdictional authority pertains to the following members of the MedStar System:

Area Metropolitan Ambulance Authority	Blue Mound Fire Department
dba MedStar Mobile Healthcare	Edgecliff Village Fire Department
Fort Worth Fire Department	River Oaks Fire Department
Burleson Fire Department	Saginaw Fire Department
Forest Hill Fire Department	Sansom Park Fire Department
Haltom City Fire Department	Westworth Village Police Department
Haslet Fire Department	White Settlement Fire Department
Lake Worth 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 EPAB office by calling 817-923-1500 or in writing to the following address:

Office of the Medical Director
Emergency Physicians Advisory Board
2900 Alta Mere Drive
Fort Worth, Texas 76116

OFFICE OF THE MEDICAL DIRECTOR
EMERGENCY PHYSICIANS ADVISORY BOARD

APPROVED:
May 8, 2016

EXPIRATION:
May 31, 2017

Neal J. Richmond, M.D., FACEP
Medical Director

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

Emergency Physicians Advisory Board

The EPAB was created pursuant to the Uniform EMS Ordinance and adopted by each of the Member Jurisdictions. The EPAB is empowered to promulgate the clinical standards, rules, and regulations of ambulance and first responder services within the Service Area. The EPAB is composed of the System area hospital Emergency Department Medical Directors and additional licensed physicians appointed by the Tarrant County Medical Society. The EPAB powers and duties are defined in the Uniform EMS Ordinance.

Medical Director

The Medical Director is appointed by the EPAB to serve as the administrative officer in carrying out the duties and powers of the EPAB. 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. All medical protocols must be approved by the Medical Director. 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, and in a Professional Services Contract.

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 EPAB and 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 Transportation 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 procedures (endotracheal intubation, cricothyrotomy, needle thoracostomy, and vasopressor administration for shock).

Master & Subsection Identification

Master Section (Adult)

Subsection (Trauma)

Bulleted Actions

If statement

ADULT

General Trauma

BASIC

- Assist airway, as appropriate
- Titrate O_2 to SpO_2 ≥ 94% or work of breathing
- Spinal Motion Restriction, as appropriate
- Pelvic binder, as appropriate
- Keep patient warm

ASSIST

- 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

ADVANCED

- 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

BASIC

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

Abdominal/Pelvic Injuries

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

Extremity/Amputation Injuries

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

ASSIST & ADVANCED

Chest Injuries

- Tension Pneumothorax– Needle thoracostomy

Pregnancy Considerations:

- Left lateral recumbent (LLR) position

If signs of poor cardiac output

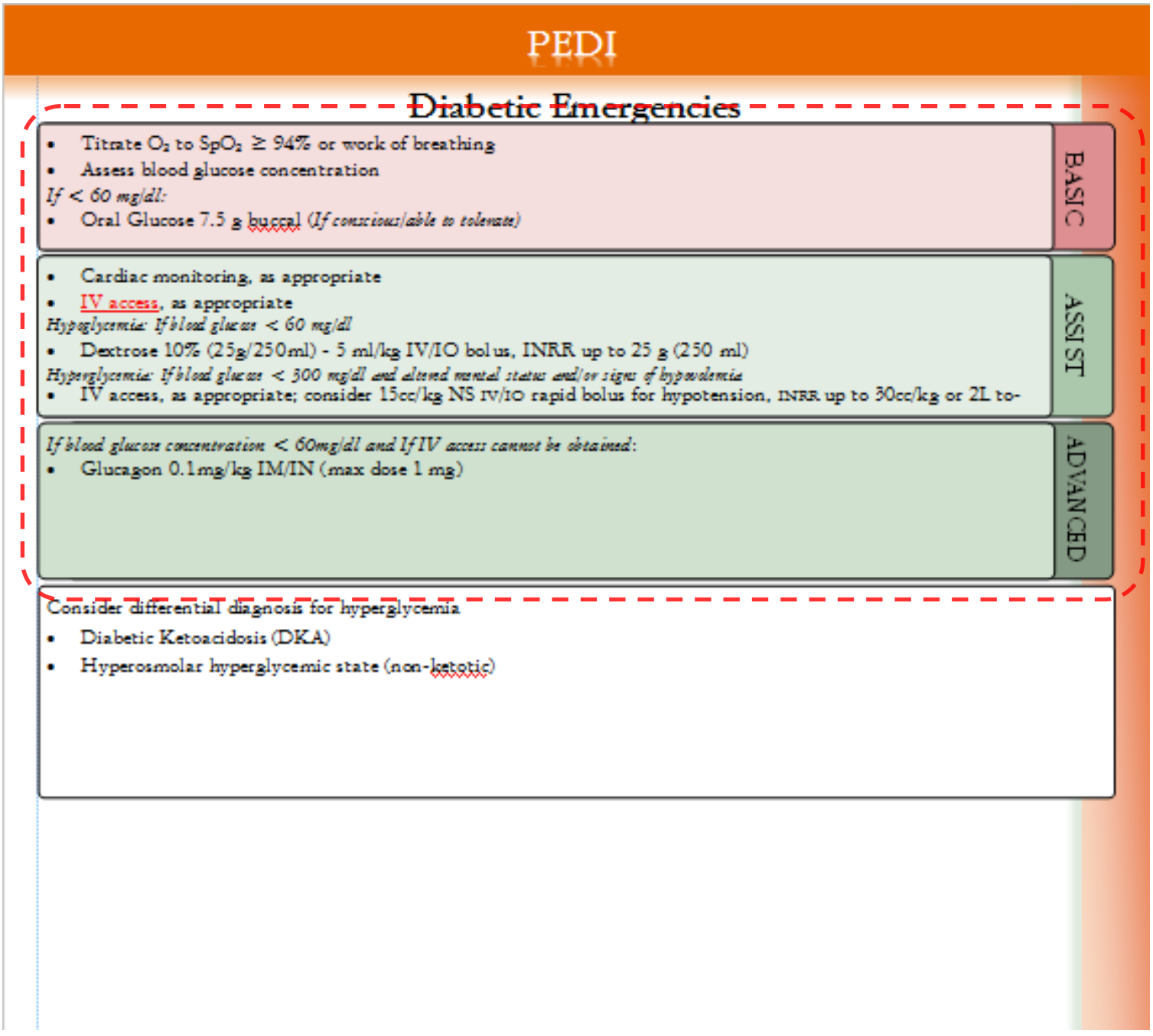
- Manual fundus displacement (to left)

Provider Tabs

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

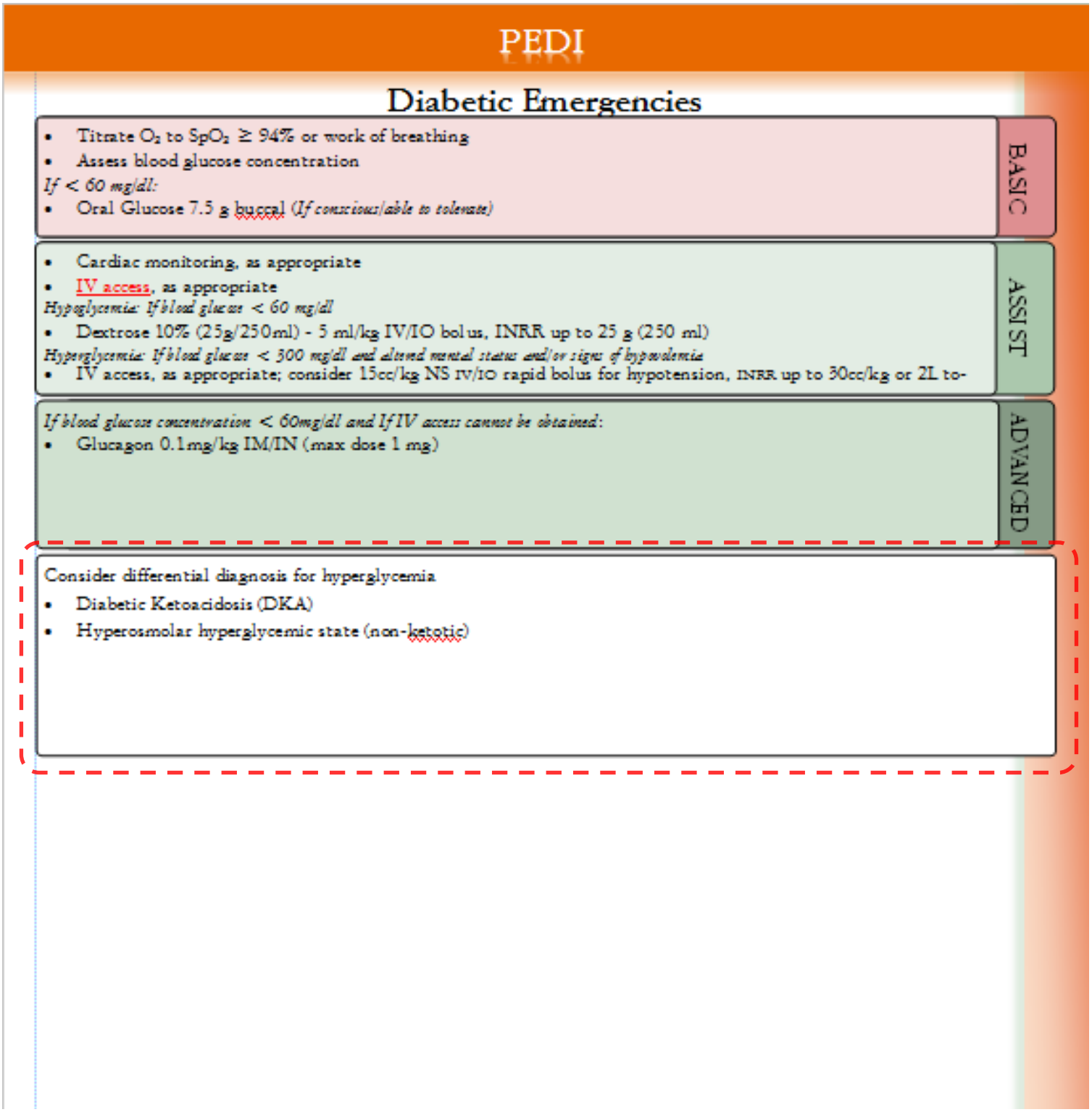
- Basic
- Assist
- Advanced

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.



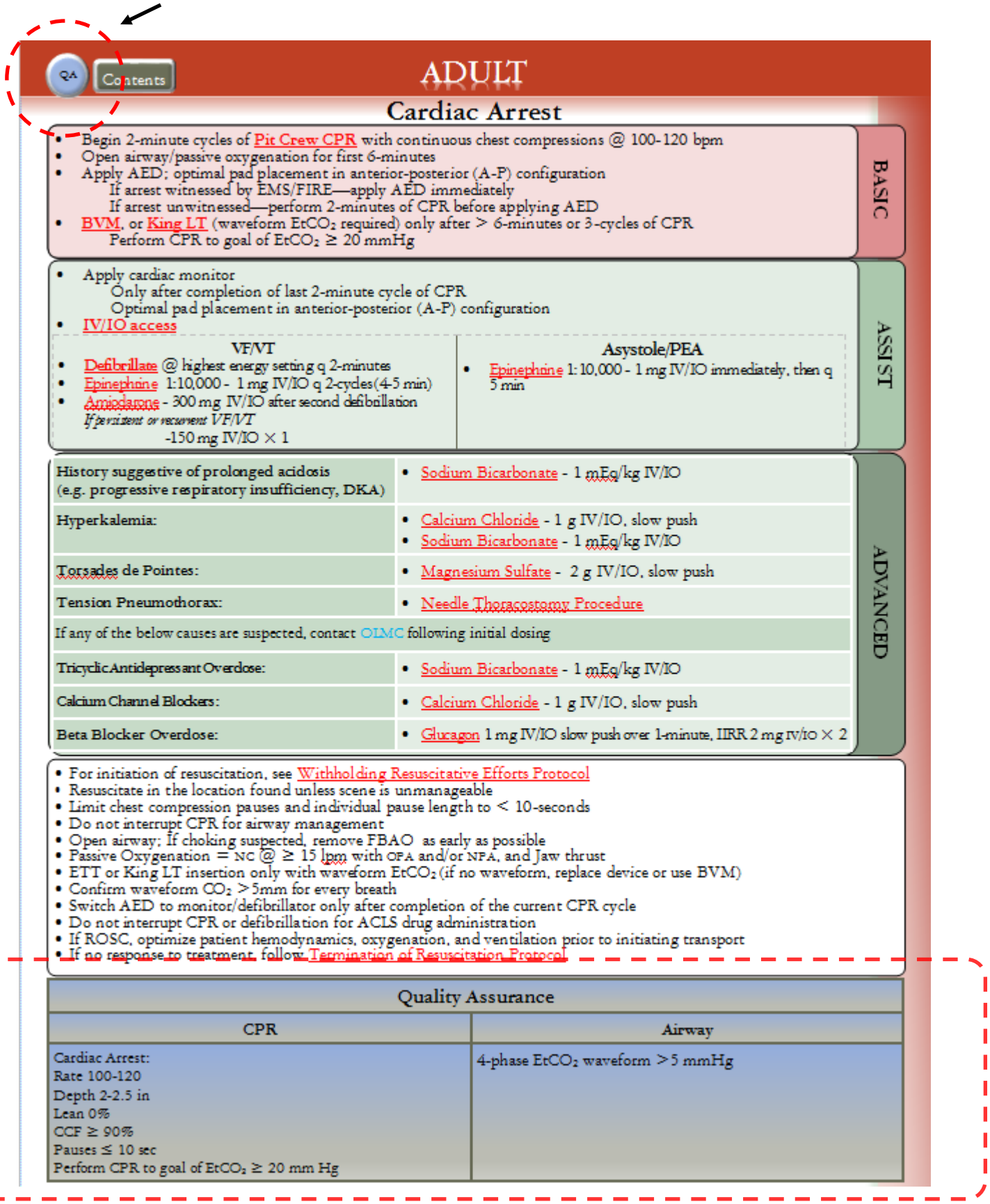
Pearls & Pitfalls

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.



Quality Assurance (QA) Points

Some protocols include a blue-gray Quality Assurance section, containing patient care metrics and documentation standards for performance measuring quality of care. These are summarized in, and hyperlinked to, the QA appendix. Each protocol has a blue QA button in the upper left corner that links to the QA section for easy reference.



QA Contents

ADULT

Cardiac Arrest

BASIC

- Begin 2-minute cycles of Pit Crew CPR with continuous chest compressions @ 100-120 bpm
- Open airway/passive oxygenation for first 6-minutes
- 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
- BVM, or King LT (waveform $EtCO_2$ required) only after > 6-minutes or 3-cycles of CPR
  - Perform CPR to goal of $EtCO_2 \geq 20$ mmHg

ASSIST

- 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

VF/VT	Asystole/PEA
• Defibrillate @ highest energy setting q 2-minutes • Epinephrine 1:10,000 - 1 mg IV/IO q 2-cycles (4-5 min) • Amiodarone - 300 mg IV/IO after second defibrillation *If persistent or recurrent VF/VT* -150 mg IV/IO × 1	• Epinephrine 1:10,000 - 1 mg IV/IO immediately, then q 5 min

ADVANCED

History suggestive of prolonged acidosis (e.g. progressive respiratory insufficiency, DKA)	• Sodium Bicarbonate - 1 mEq/kg IV/IO
Hyperkalemia:	• Calcium Chloride - 1 g IV/IO, slow push • Sodium Bicarbonate - 1 mEq/kg IV/IO
Torsades de Pointes:	• Magnesium Sulfate - 2 g IV/IO, slow push
Tension Pneumothorax:	• Needle Thoracostomy Procedure
If any of the below causes are suspected, contact OLMC following initial dosing	
Tricyclic Antidepressant Overdose:	• Sodium Bicarbonate - 1 mEq/kg IV/IO
Calcium Channel Blockers:	• Calcium Chloride - 1 g IV/IO, slow push
Beta Blocker Overdose:	• Glucagon 1 mg IV/IO slow push over 1-minute, IIRR 2 mg IV/IO × 2

- 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 = NC @ ≥ 15 lpm with OPA and/or NPA, and Jaw thrust
- ETT or King LT insertion only with waveform $EtCO_2$ (if no waveform, replace device or use BVM)
- Confirm waveform CO_2 >5mm 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 hemodynamics, oxygenation, and ventilation prior to initiating transport
- If no response to treatment, follow Termination of Resuscitation Protocol

Quality Assurance

CPR	Airway
Cardiac Arrest: Rate 100-120 Depth 2-2.5 in Lean 0% CCF ≥ 90% Pauses ≤ 10 sec Perform CPR to goal of $EtCO_2 \geq 20$ mm Hg	4-phase $EtCO_2$ waveform >5 mmHg

Glossary (Abbreviations and Terms)

Abbreviations	
ETSN	**E**ar-**t**o-**s**ternal **n**otch (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	**O**n-**L**ine **M**edical **C**ontrol
PIE	**P**rogressive **I**nsertion **E**piglottoscopy, 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 > 90 means Systolic Blood Pressure > 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
Excited Delirium	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 < 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 during airway management (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.

Laryngoscopy	Use of a laryngoscope to visualize the epiglottis and vocal folds.
Needle Thoracostomy	Insertion of a large-bore catheter into the chest for the purpose of relieving a tension pneumothorax
Spinal Motion Restriction	Means to mitigate potential or further trauma in patients with suspected spinal injury
Serial EKGs	Repeat EKGs, at minimum 2-tracings prior to arrival at the destination
Waveform Capnography	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
Withholding of Resuscitative Efforts	Formerly 'Dead on Scene', as differentiated from a worked cardiac arrest or 'Termination of Resuscitation'

General

Shock/Hypotension

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- Advanced airway management as appropriate

If suspected tension pneumothorax

- Needle Thoracostomy Procedure
- IV/IO access
- Cardiac monitoring; treat dysrhythmias and 12-lead EKG, as appropriate

- Least — **Volume Replacement** — **Most +**

Trauma

If SBP<90

- NS - 250 ml IV bolus
  IIRR 250 ml increments
  Titrate to SBP=90 (permissive hypotension)

Except if suspected intracranial injury/TBI

- Titrate to SBP=120

Cardiac

If SBP<90 and/or signs of hypoperfusion/end organ dysfunction

- NS - 500 ml IV bolus
  IIRR 500 ml increments to 2 L total
  Titrate to SBP 90 and/or signs of improved perfusion

Use caution if suspected acute pulmonary edema

Consider relative hypotension, especially if inferior wall ACS changes

General Medical (including Sepsis)

If SBP<90 and/or signs of hypoperfusion/end-organ dysfunction

- NS - 20 ml/kg IV bolus
  IIRR to improved SBP and clinical signs, max 2L total

If goals not met

- Contact OLMC

ADVANCED

If trauma

- Maintain permissive hypotension as above

If suspected anaphylaxis/anaphylactic shock or symptomatic bradycardia

- Epinephrine infusion - 1 mg (10ml) of 1:10,000 in 1L NS, infuse @ 1-10 mcg/min ("rule of 1's")
  Add epinephrine 1:10,000 - 1 mg (10ml) to 1L NS, and infuse at 1 mcg/min
  Titrate to effect by increasing/decreasing by 1 mcg/min q 2 min

If any other suspected etiology of shock unresponsive to initial fluid resuscitation

- Norepinephrine - 4 mg in 250ml NS, infuse @ 2-10mcg/min, titrate to SBP >90 and signs of improved perfusion

Quality Assurance:

Vasopressors
Needle thoracostomy
IV fluids

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

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If signs of upper airway obstruction

- Attempt to clear the airway by
  - Jaw thrust/head-tilt-chin-lift
  - Nasopharyngeal and/or oropharyngeal airway placement (NPA/OPA)
- Position the patient (ETSN)
- 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 $EtCO_2$ (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

ASSIST

For suspected tension pneumothorax

- Needle Thoracostomy Procedure

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

- Advanced airway management ($EtCO_2$ required)
  - Preoxygenate with 100% O_2 - non-rebreather mask (NRB) ± High flow nasal cannula (HFNC), as available
  - Initiate laryngoscopy/endotracheal intubation (ETI) or supraglottic airway (SGA/KING LT)
    - *If primary ETI fails, then initiate SGA rescue*

Laryngoscopy/ Endotracheal Intubation

- Establish KIT DUMP at patient's head, with all equipment out of its packaging and ready to be used
  - High flow nasal cannula at 15 lpm (HFNC)
  - Bougie
  - Suction
  - Tube securing device
  - OPA
  - $EtCO_2$ detector
  - Rescue device
  - Two of each (anticipated size and one size smaller)
    - Laryngoscope blade
    - Endotracheal tube (ETT)
- Maintain HFNC throughout the procedure
- Position patient's head in neutral or head elevated position to obtain best view (ETSN)
- Use assisted External Laryngeal Manipulation (ELM) as needed to obtain view
- Use Bougie to deliver tube, especially if anticipated difficult (Grade III) or failed initial attempt; use with caution if suspected laryngeal or tracheal injury
- Maintain visualization until tube is seen passing the cords
- Confirm $EtCO_2$ with *every breath*
- Promptly remove device and ventilate by other means if $EtCO_2$ waveform is lost

Supraglottic Airway (King LT)

- Suction before attempting insertion
- Maintain HFNC throughout the procedure
- Position patient's head in neutral or head elevated position
- Confirm $EtCO_2$ with *every breath*
- Promptly remove device and ventilate by other means if $EtCO_2$ 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 $EtCO_2$ line) replace detector and confirm waveform CO_2

Quality Assurance:

Entire airway evolution (HFNC, NRB, CPAP, ETT/SGA)

→ $EtCO_2$
→ CPAP
→ Ketamine
→ Intubation (ETT or SGA)
→ Needle Thoracostomy

If unable to place or maintain *advanced airway, and if unable to adequately oxygenate or ventilate (no $EtCO_2$ waveform and persistent hypoxia)*

- Surgical Airway Procedure (Cricothyrotomy)

ADVANCED

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

- Ketamine - 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)

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

- Fentanyl - 1 mcg/kg IV/IO (if hemodynamically stable, max single dose 100 mcg) OR (but not both)
- Midazolam - 2.5 mg slow IV/IO , IIRR q 5-min to 10 mg max (caution hypotension)

Or, if hypotensive

- Ketamine - 2 mg/kg IV/IO (max single dose 200 mg)

→ If King LT in place and ventilations are adequate, do not replace with endotracheal tube
→ CPAP should not be utilized for severe respiratory insufficiency/impending respiratory failure
→ Patients with COPD may have chronic low baseline SpO_2, so do not indiscriminately place on high flow O_2
  Start 2-3 lpm O_2 via NC, or double baseline flow rate, if known
  Titrate to patient's baseline SpO_2 (88-92%) and work of breathing

Acute Pain Management

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- Advanced airway management, as appropriate
- Monitoring, as appropriate
- IV access, as appropriate
- **$EtCO_2$ monitoring**

If pain scale > 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
- Head Trauma
- Cervical spine trauma
- Obstetric emergency/anticipated delivery

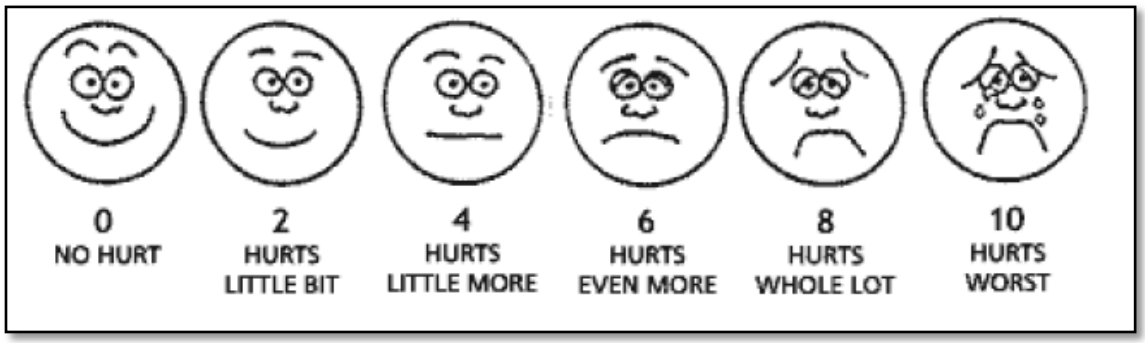
ADVANCED

- Fentanyl - 1 mcg/kg IV/IN/IM (max single dose 100 mcg), IIRR × 2, titrate to pain relief and respiratory/ hemodynamic status
- 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
  Or, for non-actively vomiting patients
  4 mg ODT, IIRR x 1 in 10-min

→ IV opiates are generally not indicated for Ischemic Chest Pain/ACS/STEMI
If necessary, contact OLMC



Quality Assurance:

Pain Management/IV opiates

Release at Scene (RAS)

BASIC ASSIST ASSIST

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

Quality Assurance:

RAS/AMA

Against Medical Advice (AMA)

Patients, patient's guardians, or patient's health care surrogates must demonstrate decisional capacity in order to make an informed refusal of consent for treatment and/or transport and, therefore, for a patient to be released Against Medical Advice.

All AMAs must be patient-initiated.

Assess the patient's decisional capacity as follows:

- Perform a thorough history & physical
- Develop a differential diagnosis specific to the patient presentation
- Offer appropriate treatment and transport to the patient
- 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 patient's level of understanding, based on the differential diagnosis**
- **Assess the patient's understanding of the risks and consequences of refusing treatment and/or transport, and document this in the patient's own words**
- Document all of the above in the PCR

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

If patient lacks decisional capacity, and refuses treatment or transport:

- Ensure provider safety first and foremost
- Request Police & Fire to scene
- Contact Field Supervisor
- Contact OMD as needed

Quality Assurance:
RAS/AMA

Non-Traumatic Termination of Resuscitation

ADVANCED

Indications for use of protocol

Unsuccessful resuscitative efforts following ADVANCED AIRWAY + HIGH QUALITY CPR + ACLS DRUGS

Contraindications for use of protocol

Any of the following are present,

→ Return of Spontaneous Circulation (ROSC) or presumed ROSC at any point in care
→ Abrupt ↑ $EtCO_2$ ≥ 10mmHg ± "pulses"
→ Hypothermic patients
→ Family request for continued efforts
→ Resuscitation attempted in public
→ Pregnancy

- Observe waveform $EtCO_2$ for every breath
  Follow trend of capnometry values throughout resuscitation

If persistent VF/VT

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

If asystole or PEA

If $EtCO_2$ ≤ 10 mmHg OR *no cardiac motion on ultrasound*

- Consider termination of resuscitation after 20-minutes

If $EtCO_2$ > 10

- Consider termination of resuscitation after 30-minutes

→ 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

ADVANCED

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, advanced airway management, and/or needle thoracostomy (as appropriate), and if none of the following:

→ ROSC or presumed ROSC at any point in care
  → abrupt ↑ $EtCO_2$ ≥ 10mmHg ± "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

Quality Assurance:

Termination of Resuscitation

Withholding Resuscitative Efforts

BASIC

If any of the following clinical signs of irreversible death
- → Rigor mortis/dependent lividity
- → Fetal death after preterm delivery (< 20 weeks gestation by best determination)
- → Decapitation, decomposition **or** incineration

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

Notification of law enforcement is required.

- Initiate resuscitative efforts, as per Cardiac Arrest Protocol

If patient has Out-of-Hospital Do Not Resuscitate order
→ See DNR Policy

ASSIST

ADVANCED

If no clinical signs of irreversible death in the setting of blunt or penetrating trauma, 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

Quality Assurance:
Termination of Resuscitation

→ 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 resuscitate efforts.

Cardiac

Cardiac Arrest

BASIC

- Begin 2-minute cycles of Pit Crew CPR with continuous chest compressions @ 100-120 bpm
- Open airway/passive oxygenation for first 6-minutes
- 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 **King LT** (waveform $EtCO_2$ required for King LT)
  - Perform CPR to goal of $EtCO_2 \geq 20$ mmHg

ASSIST

- 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 $EtCO_2$ required) only after > 6-minutes or 3-cycles of CPR

VF/VT	Asystole/PEA
• Defibrillate at highest energy setting q 2-minutes • Epinephrine 1:10,000 - 1 mg IV/IO q 2-cycles (4-5 min) • Amiodarone - 300 mg IV/IO after second defibrillation *If persistent or recurrent VF/VT* -150 mg IV/IO × 1	• Epinephrine 1:10,000 - 1 mg IV/IO immediately, then q 5-min

ADVANCED

History suggestive of prolonged acidosis (e.g. progressive respiratory insufficiency, DKA)	• Sodium Bicarbonate - 1 mEq/kg IV/IO
Hyperkalemia:	• Calcium Chloride - 1 g IV/IO, slow push • Sodium Bicarbonate - 1 mEq/kg IV/IO
Torsades de Pointes:	• Magnesium Sulfate - 2 g IV/IO, slow push
Tension Pneumothorax:	• Needle Thoracostomy Procedure
If any of the below causes are suspected, contact OLMC following initial dosing	
Tricyclic Antidepressant Overdose:	• Sodium Bicarbonate - 1 mEq/kg IV/IO
Calcium Channel Blockers:	• Calcium Chloride - 1 g IV/IO, slow push
Beta Blocker Overdose:	• Glucagon 1 mg IV/IO slow push over 1-minute, IIRR 2 mg IV/IO × 2

- 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 King LT insertion only with waveform $EtCO_2$ (if no waveform, replace device or use BVM)
- Confirm waveform CO_2 >5mmHg 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 hemodynamics, oxygenation, and ventilation prior to initiating transport
- If no response to treatment, follow Termination of Resuscitation Protocol

Quality Assurance

CPR	Airway
Rate 100-120 Depth 2-2.5 in Lean 0% CCF ≥ 90% Pauses ≤ 10 sec Perform CPR to goal of $EtCO_2 \geq 20$ mm Hg	4-phase $EtCO_2$ waveform >5 mmHg

Ischemic Chest Pain/Acute Coronary Syndrome/STEMI

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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)

ASSIST

- 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

For severe nausea/vomiting

- Ondansetron - 4 mg IV/ODT, IIRR x 1

ADVANCED

- STEMI alert, as appropriate
- Serial EKGs

→ 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 Diabetics Elderly	Dyspnea (exertional included) Lightheadedness/presyncope/syncope Palpitations Diaphoresis Nausea/vomiting Decreased exercise capacity	Smoking (and other forms of tobacco) Hypertension Diabetes Hypercholesterolemia Obesity Family history or coronary artery disease

Quality Assurance

Ischemic Chest Pain/ACS/STEMI

Symptomatic Bradycardia

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If chest pain or anginal equivalent symptoms

- Follow protocol for Ischemic Chest Pain/Acute Coronary Syndromes/STEMI

ASSIST

- Advanced airway management
- Cardiac monitoring and 12-lead EKG
- IV/IO access; consider 500 ml NS IV/IO rapid bolus for hypotension

Do not delay pacing for IV placement or ACLS drugs in the presence of

Severe hemodynamic instability
Acute MI/ACS with hypotension/relative hypotension
High degree AV-block (Mobitz II 2nd-degree or 3rd-degree)
Acute pulmonary edema (with hypotension/relative hypotension)

- External Cardiac Pacing
  - Begin at 30 mA and increase energy in 5 mA increments until capture achieved
  - Begin at 70 ppm and increase pacing rate in 10 ppm increments until hemodynamic response/improved perfusion

While preparing for pacing

- Atropine - 0.5 mg IV/IO, IIRR to max dose of 3 mg

If time permits, consider sedation prior to/during pacing

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

ADVANCED

If insufficient sedation and if adequate respiration OLMC

- Midazolam - 2.5 mg IV/IO, IIRR × 1

Shock/hypotension	• Epinephrine - 1-10 mcg/min IV/IO infusion ("rule of 1's") Add epinephrine 1:10,000 - 1 mg (10ml) to 1L NS, and infuse at 1 mcg/min Titrate to effect by increasing/decreasing by 1 mcg/min q 2 min
Hyperkalemia	WIDE COMPLEX RHYTHM, 12-LEAD EKG FINDINGS, DIALYSIS HX • Calcium Chloride - 1 g IV slow push • Sodium Bicarbonate - 1 mEq/kg IV/IO (if suspected acidosis)
Acidosis	• Sodium Bicarbonate - 1 mEq/kg IV/IO
If any of the below causes are suspected, contact OLMC following initial dosing	
Beta Blocker Overdose	• Glucagon - 1 mg IV/IO slow push over 1-minute, IIRR 2 mg IV/IO × 2
Calcium Channel Blocker Overdose	• Calcium Chloride - 1 g IV/IO slow push

→ Symptomatic Bradycardia (symptoms/signs do not generally occur unless rate < 50)
→ Signs of poor perfusion or end organ dysfunction
Hypotension (or relative hypotension)
ACS/Acute MI (with hypotension/relative hypotension)
Acute pulmonary edema (with hypotension/relative hypotension)

→ Atropine may worsen ischemia/ACS

Quality Assurance

Epinephrine IV/Infusion
Ketamine
External Cardiac Pacing

Tachycardias

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

ASSIST

- Advanced airway management
- Cardiac monitoring and 12-lead EKG
- Assess rhythm for rate, width and regularity
  Do not delay cardioversion for IV placement or ACLS drugs in the presence of severe hemodynamic instability
- IV access; consider 500 ml NS IV/IO rapid bolus for hypotension

Unstable

- Synchronized Cardioversion -
  At highest energy setting
  IIRR at highest energy setting, as needed

If time permits, consider sedation prior to/during Cardioversion

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

Narrow complex *(QRS < 0.12)*
SVT: PAT

If time allows, while preparing

- Adenosine - 12 mg rapid IV/IO

Stable

Narrow complex *(QRS < 0.12)*

Regular
(SVT: PAT or A-flutter)

- Vagal maneuver
- Adenosine - 12 mg IV
  IIRR × 1

If sympathomimetic associated

- Midazolam - 2.5 mg IV
  IIRR as needed
  (max dose 10 mg)

Wide complex *(QRS > 0.12)*

Irregular
(A-fib)

- Treat underlying cause
  (no adenosine or diltiazem)

Regular
(Ventricular Tachycardia or SVT w/ BBB or accessory pathway)

- Adenosine - 12 mg IV, IIRR × 1
  (unless known VT)

ADVANCED

Regular
(SVT: PAT or A-flutter)

If no response to adenosine

- Treat as below

Irregular (A-fib)

- Diltiazem - 0.25 mg/kg IV
  max dose 20 mg
  IIRR 0.35 mg/kg
  max dose 25 mg

If rate-control achieved

- Diltiazem - 5 mg/hr IV infusion

Regular
(Ventricular Tachycardia or SVT w/ BBB or accessory pathway)

- Amiodarone - 150 mg IV (over 10 min)
  IIRR × 1

Suspected Hyperkalemia

- Calcium Chloride - 1 g IV
- Sodium Bicarbonate – 1 mEq/kg IV/IO
  If suspected acidosis
  IIRR 0.5 mEq/kg

Torsades de Pointes

- Magnesium Sulfate - 2 g IV slow push

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

Quality Assurance:
Synchronized Cardioversion

Medical

Abdominal Pain

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock

ASSIST

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

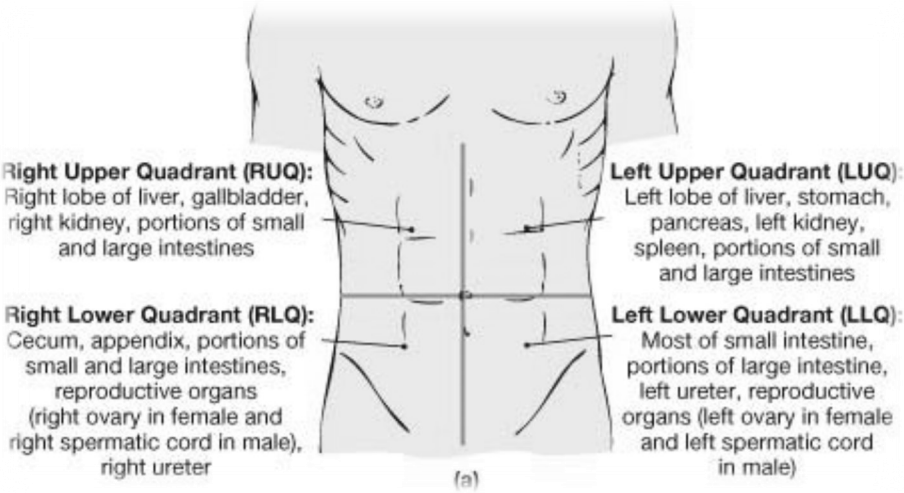
For severe nausea/vomiting

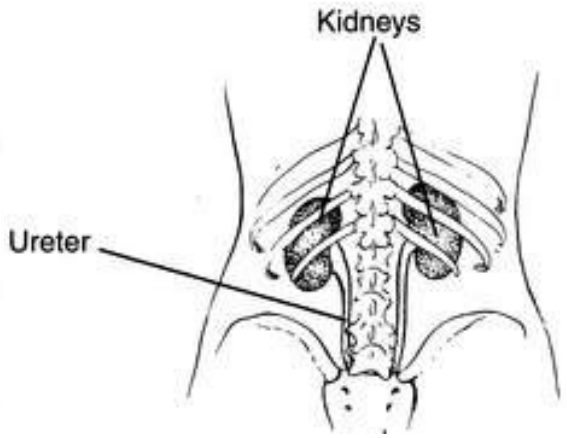
- Nausea and Vomiting Protocol

ADVANCED

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)





Allergic Reaction/Anaphylaxis

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

LOCAL REACTION/RASH/HIVES

- Observe for respiratory distress and hypotension

WHEEZING/BRONCHOSPASM

- Albuterol - 2.5mg/ipratropium - 0.5mg 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 - 0.3mg IM IIRR × 2 q 5 min (max total dose 0.9 mg)

ASSIST

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

If respiratory distress
- Initiate $EtCO_2$ monitoring

ADVANCED

In presence of signs of anaphylaxis/anaphylactic shock (stridor and or hypotension/end-organ dysfunction), DO NOT DELAY
- Epinephrine infusion - 1-10 mcg/min ("rule of 1's")
  Add epinephrine 1:10,000 - 1 mg (10ml) to 1L NS, and infuse at 1 mcg/min
  Titrate to effect by increasing/decreasing by 1 mcg/min q 2 min

Consider
- Methylprednisolone - 125mg IV/IM

→ 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)

Quality Assurance

Epinephrine IV/Infusion
Epinephrine IM

Altered Mental Status/CNS Depression

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Assess blood glucose concentration

If < 60 mg/dl:

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

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*

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

ASSIST

- $EtCO_2$ 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% (25g/250ml) - 100 ml IV/IO bolus, IIRR up to 50g (500 ml)

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*

- Naloxone - 0.4 mg IV/IM, IIRR in 0.4 mg increments q 5 min. to 4 mg max total dose

ADVANCED

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

- Glucagon - 1 mg IM/IN

If history or signs of alcoholism/malnourishment and suspected Wernicke's encephalopathy (ataxia, encephalopathy, ocular dysfunction)

- Thiamine - 100 mg IV/IM

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 2 mg IV/IO x 2

*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)

Quality Assurance

Altered Mental Status/CNS Depression

Behavioral Emergencies/Excited Delirium

BASIC

- 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_2 to $SpO_2 \geq 94\%$ 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:

ASSIST

- $EtCO_2$ monitoring
- Advanced airway management, as appropriate
- IV access, as appropriate; consider 500ml NS IV/IO bolus for severe dehydration or hypotension, IIRR to 2L 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

ADVANCED

If unable to achieve optimal sedation,

Excited delirium

- Ketamine - 2 mg/kg IV *or* 4 mg/kg IM
  Monitor respiratory and hemodynamic status

Known Psychiatric Disease or ETOH intoxicated

- Haloperidol - 5 mg IM, IIRR x 1 after 15 min. to total 10 mg. (caution; QT prolongation)

- Contact OLMC for additional dosing, if necessary

For provider-witnessed *sudden cardiac arrest, associated with prolonged agitation/excited delirium*

- Sodium Bicarbonate - 1 mEq/kg IV/IO; IIRR 0.5 mEq/kg × 1 q 10 minutes

Quality Assurance

Ketamine

Diabetic Emergencies

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Assess blood glucose concentration

If < 60 mg/dl:

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

ASSIST

- Cardiac monitoring, acquire and transmit 12-lead EKG
- IV access, as appropriate

Hypoglycemia: If blood glucose < 60 mg/dl

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

Hyperglycemia: If blood glucose >300 mg/dl and altered mental status and/or signs of hypovolemia

- NS - 250-500 ml IV bolus, IIRR to 2 L

ADVANCED

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

- Glucagon - 1 mg IM/IN

Consider differential diagnosis for hyperglycemia

→ Diabetic Ketoacidosis (DKA)
→ Hyperosmolar hyperglycemic state (non-ketotic hyperosmolar coma)
→ Infection/sepsis
→ ACS/MI

Quality Assurance:

IV Fluids

Nausea and Vomiting

BASIC

- Position patient to avoid aspiration
  Consider recovery position
- Suction, as appropriate

ASSIST

- IV access, as appropriate; NS - 250-500 ml for signs of dehydration, IIRR to 2 L total
- Ondansetron - 4 mg IV, or ODT (only for non-actively vomiting patients), IIRR x 1 in 10-min
  Contraindicated if suspected or reported 1st-trimester pregnancy

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

Overdose/Poisoning/Adverse Drug Reaction

BASIC

If suspected exposure to toxic agent
- 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_2 to $SpO_2 \geq 94\%$ or work of breathing
- Determine blood glucose concentration, treat as appropriate

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

*If suspected **carbon monoxide** (CO)*
- High flow O_2 by NRB + HFNC (as available) 15 lpm each

ASSIST

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

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*
- Naloxone - 0.4 mg IV/IM, IIRR in 0.4 mg increments q 5 min to 4 mg max total dose

*If **cocaine/amphetamine/stimulant/sympathomimetic intoxication***
- Midazolam - 2.5 mg slow IV/IO, IIRR x 1 q 5-min; or 5 mg IM/IN

*If **dystonic reaction***
- Diphenhydramine - 50 mg IV/IM/IO

Hydroxocobalamin
1 bottle = 5 g

*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
  - 5g IV over 15 minutes, IIRR x 1; contact OLMC following initial dose

ADVANCED

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

Tricyclic Antidepressant (TCA)
- Sodium Bicarbonate - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg x 1

Beta-blocker
- Glucagon - 1 mg IV/IO slow push over 1-min, IIRR 2 mg x 2

Calcium Channel Blocker
- Calcium Chloride - 1 g slow IV/IO

Organophosphate
- Atropine - 2 mg IV/IO, IIRR 4 mg q 3-minutes until signs of sufficient atropinization (drying of secretions)

→ SpO_2 may be a poor indicator of severity in CO poisoning; therefore, regardless of SpO_2, 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

Hydroxycarbolomin

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

Quality Assurance

Antidotes

Respiratory Distress

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

BASIC

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 CPAP (waveform $EtCO_2$ required, if equipped)
  Discontinue if SBP < 90

For wheezing/bronchospasm, consider
- Albuterol - 2.5mg/ipratropium - 0.5mg in 3 ml NS nebulized
  IIRR x 2

Asthma/COPD/Wheezing

- Albuterol - 2.5mg/ipratropium - 0.5 mg in 3 ml NS nebulized
  IIRR x 2

For moderate to severe respiratory distress
- Initiate CPAP (waveform $EtCO_2$ required, if equipped)
  Discontinue if hypotensive

Pneumonia (aspiration or other)

- Suction as appropriate (oral/nasal)

For moderate to severe respiratory distress
- Initiate CPAP (waveform $EtCO_2$ required, if equipped)
  Discontinue if hypotensive

For wheezing/bronchospasm
- Albuterol - 2.5mg/ipratropium - 0.5 mg in 3 ml NS nebulized
  IIRR x 2

For respiratory distress associated with near drowning
- CPAP may be utilized

ASSIST

- Advanced airway management, as appropriate ($EtCO_2$ 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 ($EtCO_2$ 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 ($EtCO_2$ required)
- IV access
- Cardiac monitoring, acquire and transmit 12-lead EKG

ADVANCED

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 50 ml NS over 10-15 min

For asthma only, and if impending respiratory failure or unable to tolerate nebulizer
- Epinephrine 1:1000 - 0.3 mg IM
  IIRR q 5 min. x 1

→ 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_2 saturations, so do not indiscriminately place on high flow O_2
  Start 2-3 lpm O_2 via NC or double patient's home O_2 flow rate, if known
  Titrate to patient's baseline SpO_2 (88-92%) and work of breathing

Quality Assurance

CPAP $EtCO_2$ Epinephrine IM

Seizure/Status Epilepticus

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Position patient to avoid injury and aspiration
  Consider recovery position
- Assess blood glucose concentration

ASSIST

- $EtCO_2$ monitoring
- Advanced airway management, as appropriate
- IV access, as appropriate

If blood glucose < 60 mg/dl
- Dextrose 10% (25g/250ml) - 100 ml IV/IO bolus, IIRR up to 50g (500 ml)
- Cardiac monitoring, acquire and transmit 12-lead EKG

If actively seizing, or in status epilepticus (≥ 2-seizures and without intervening lucid period)
- Midazolam - 10 mg IM/IN; or 5 mg slow IV/IO, IIRR x 1 q 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)

ADVANCED

If blood glucose concentration < 60mg/dl and If IV access cannot be obtained
- Glucagon 1mg IM/IN

If suspected eclampsia/peripartum seizure
- Magnesium Sulfate - 6 g IV over 15-20 min., followed by 2 g/hr IV infusion

→ Consider toxicologic causes of seizure
  Organophosphate/nerve gas (see chemical warfare policy)
  Sympathomimetic toxidrome (stuffers/packers, methamphetamine)
→ Anticipate that dispatch or initial clinical picture of seizure may be initial presentation cardiac arrest
→ Always consider eclampsia and treatment with magnesium with Seizures in 3rd trimester pregnancy, peri-partum, or post-partum (90% in 1st week)

Quality Assurance

Airway Management
Sedatives

Stroke/CVA/TIA

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

If Cincinnati Stroke Scale is positive (any of 3-criteria), and if time from onset is:

- If **less than 3-hours or greater than 12-hours,** transport to closest stroke facility
- If **between 3-hours and 12-hours** perform Los Angeles Motor Score (LAMS)
  - If LAMS score
    - →4-5: transport to closest Comprehensive Stroke Center (CSC)
    - →0-3: transport to closest Stroke Center

ADVANCED

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

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

Rule of 3's:

If onset of symptoms/signs is > 3-hours (and < 12-hours), and if LAMS > 3, transport to CSC

Quality Assurance

Stroke/CVA/TIA

Syncope/Fainting

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Measure blood glucose, treat as appropriate
- Complete **Initial** Stroke Screen *see* Stroke/CVA/TIA
- Assess orthostatic pulse and blood pressure, as tolerated

ASSIST

- Cardiac monitoring; acquire and transmit 12-lead EKG, treat dysrhythmias
- IV access; NS - 250-500 ml as appropriate for signs of hypovolemia

ADVANCED

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.)*

Environmental

Bites/Envenomation

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If bite involves extremity

- Immobilize affected limb below the level of the heart and remove all jewelry on affected limb

If stinger is present

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

ASSIST

ADVANCED

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

Consider other protocols as appropriate:

Allergic Reaction/Anaphylaxis
Shock/Hypotension

Hyperthermia/Heat Stroke

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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°*

- 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 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

Mild	Moderate	Severe
Muscle cramps, sweating	Headache, nausea/vomiting, malaise, dizziness, orthostatic hypotension, tachycardia	AMS, temperature >104° F, sweating may or may not be present

ASSIST

- 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 2L total

If uncontrolled shivering occurs during cooling

- Midazolam - 2.5 mg IV/IO/IN

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

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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 $> 90°F$)

ASSIST

- IV access, as appropriate; warm IV fluids if possible, consider 500ml NS IV/IO rapid bolus for hypotension, IIRR up to 2 L total
- Cardiac monitoring and 12-lead EKG

ADVANCED

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 $\geq 90°F$

Near Drowning

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If suspected cervical spinal trauma

- Spinal Motion Restriction

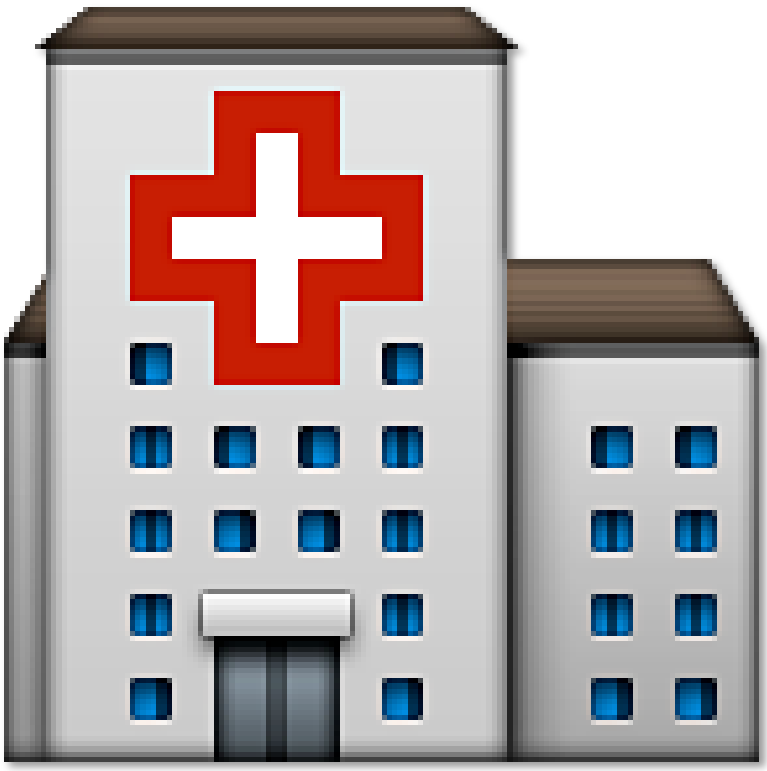
- Remove wet clothing and dry patient, and follow Hypothermia Protocol
- CPAP, as appropriate

ASSIST

- Advanced airway management, as appropriate
- Initiate $EtCO_2$ monitoring
- Cardiac monitoring, and treat dysrhythmias
- IV access, as appropriate

ADVANCED

Trauma



General Trauma

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Spinal Motion Restriction, as appropriate
- Pelvic binder, as appropriate
- Keep patient warm

ASSIST

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

If SBP < 90

- NS - 250 ml IV bolus, IIRR 250 ml increments (Shock/Hypotension)-permissive hypotension, unless TBI

ADVANCED

- Acute Pain Management, as appropriate

If traumatic arrest

- Consider Needle Thoracostomie(s) prior to following procedures for:

  Termination of Resuscitation or Withholding Resuscitative Efforts, as appropriate

BASIC

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 injury

- 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

If suspected open pneumothorax

- Partial occlusive dressing

Abdominal/Pelvic Injuries

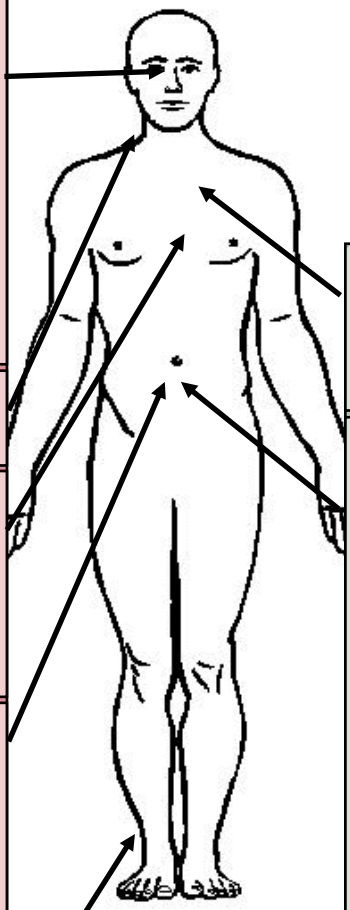
- Control bleeding
- Pelvic binder
- Stabilize impaled objects
- Evisceration– cover with saline moistened gauze

Extremity/Amputation Injuries

- Bleeding control (direct pressure, tourniquet)

If bleeding uncontrolled by tourniquet

- Pack wound tightly with QuickClot and kerlix gauze
- Splinting, as appropriate
- Sterile dressing– open fractures
- Care for amputated body part



ASSIST & ADVANCED

Chest Injuries

- Tension Pneumothorax– Needle thoracostomy

Pregnancy Considerations:

- Left lateral recumbent (LLR) position

If signs of poor cardiac output

- Manual fundus displacement (to left)

Quality Assurance:

Needle Thoracostomy

Burns

BASIC

Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If suspected carbon monoxide (CO)
- Ensure scene safety, and remove patient from toxic environment
- High flow O_2 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

ASSIST

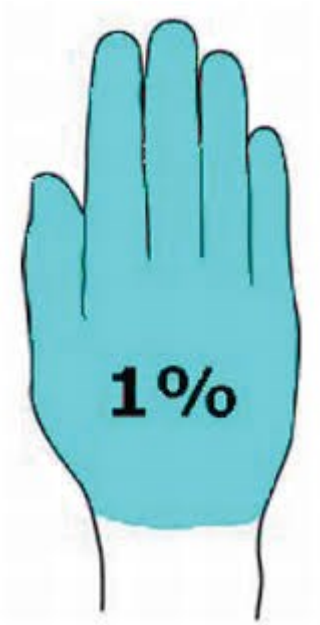
- Advanced airway management, as appropriate
  Maintain high index of suspicion for inhalation injury
  Stridor, muffled voice, singed facial/nasal hair, carbonaceous sputum
- Cardiac monitoring, and 12-lead EKG for electrical burns
- IV access, as appropriate; consider 500ml NS IV/IO rapid bolus for hypotension, IIRR up to 2L total

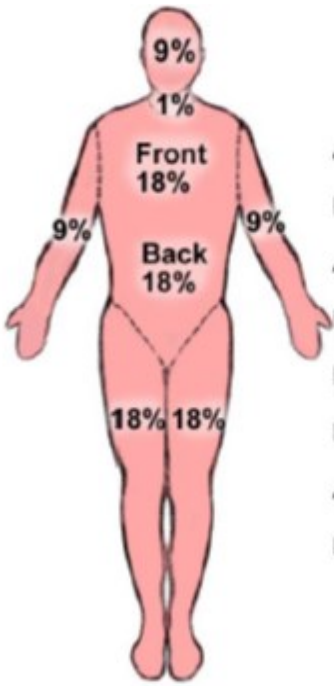
If ≥ 2° burns (>10% BSA)
- Administer IV fluids as per Advanced Burn Life Support (ABLS) guidelines, 500 ml/hr NS IV/IO
- Acute Pain Management, as appropriate

If severe symptoms/signs (> 10% BSA 2°, 3°, circumferential, or airway involvement)
- Provide notification and transport to nearest burn center

If unsecured airway
- Transport to the closest full-service hospital

ADVANCED





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

Amputated Body Part

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- 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)

ADVANCED

- Acute Pain management, as appropriate

Entrapment/Crush/Traumatic Rhabdomyolysis

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- Advanced airway management, as appropriate
- Cardiac monitoring, 12-lead EKG
- IV access, 15 ml/kg/hr NS Infusion IV/IO, to 2L total; if prolonged extrication decrease to 500 ml/hr (OLMC)

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

ADVANCED

- Calcium Chloride - 1 g IV/IO, slow push
- Sodium Bicarbonate - 1 mEq/kg IV/IO, IIRR 0.5 mEq/kg x 1
- Acute Pain Management Protocol, as appropriate

Spinal Motion Restriction

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 ≥ 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 > 3-feet or 5-stairs
Axial loading injury to the head (diving accident/sports injury)
Vehicular accident
High speed motor vehicle accident > 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 or paresthesias
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

OB/GYN

Emergency Childbirth

BASIC

- Administer O_2 and titrate to $SpO_2 \geq 94\%$ 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

- Emergency Childbirth Procedure*: 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_2 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

ASSIST

ADVANCED

If suspected eclamptic seizure

- Seizure/Status Epilepticus Protocol

If postpartum hemorrhage

- Oxytocin - 10 units in 500 ml NS IV; wide open or until bleeding controlled

Newly Born

BASIC

- Follow Emergency Childbirth Protocol
- Assess and document APGAR score at 1-minute and 5-minutes after birth

If breathing is inadequate:
- Stimulate the infant by gently rubbing the back and flicking the soles of the feet

If breathing is still inadequate:
- Begin assisted ventilation with a BVM at a rate of 40 to 60 breaths per minute

If breathing is adequate, but infant displays central cyanosis:
- Administer high flow O_2 via blow-by

If heart rate < 60:
- Assist ventilations
- Chest compressions at a rate of 120 (three compressions to each breath)
- Reassess patient frequently in route

ASSIST

- IV access, as appropriate

If Meconium Staining
- See Advanced Airway Preparation Procedure and Suction Procedure

If vigorous infant (crying, breathing, good muscle tone)
- Clear secretions mouth, pharynx, then nose

If non-vigorous infant
- Intubate trachea (3.0mm ETT) and suction on removal of the tube repeat × 2 as needed

ADVANCED

→ Assess heart rate by auscultation or by palpation of the umbilical cord stump

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)

Quality Assurance:

Airway Management

General

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

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ 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 $EtCO_2$ (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

ASSIST

For suspected tension pneumothorax

- Needle Thoracostomy Procedure

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

- Advanced airway management ($EtCO_2$ 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 $EtCO_2$*
      - Initiate SGA rescue (if size available); or BVM, optimize positioning/seal (ETSN, 2 rescuer seal)

Laryngoscopy/Endotracheal Intubation

- Establish KIT DUMP at patient head:
  - High flow nasal cannula at 15 lpm (HFNC)
  - Suction
  - Tube securing device
  - OPA/NPA
  - $EtCO_2$ detector
  - Two of each (anticipated size and one size smaller)
    - Laryngoscope blade
    - Endotracheal tube
- 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
- Maintain visualization until tube is seen passing the cords
- Confirm $EtCO_2$ *every breath*
- Promptly remove device and ventilate by other means if $EtCO_2$ waveform is lost

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 $EtCO_2$ *every breath*
- Promptly remove device and ventilate by other means if $EtCO_2$ 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 $EtCO_2$ line) replace detector and confirm $EtCO_2$

Quality Assurance:

Entire airway evolution

→ $EtCO_2$
→ CPAP
→ Ketamine
→ Intubation (ETT or SGA)
→ Needle Thoracostomy

If > 35 kg and unable to place or maintain advanced airway, and if unable to adequately oxygenate or ventilate (no $EtCO_2$ waveform and persistent hypoxia)

- Surgical Airway Procedure (Cricothyrotomy)

ADVANCED

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 200mg), IIRR x 1

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

- Fentanyl - 1 mcg/kg IV/IO (if hemodynamically stable, max single dose 100 mcg) OR (but not both)
- Midazolam - 0.1 mg/kg slow IV/IO , IIRR q 5-min to 10 mg max (caution hypotension)

Or, if hypotensive

- Ketamine - 1 mg/kg IV/IO (max single dose 200 mg)

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

Shock/Hypotension

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- 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

- Least **Volume Replacement** **Most +**

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 2L total

If goals not met

- Contact OLMC

ADVANCED

If suspected anaphylaxis/anaphylactic shock or symptomatic bradycardia

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

Acute Pain Management

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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)

ASSIST

- Advanced Airway management, as appropriate
- Monitoring, as appropriate
- IV access, as appropriate
- $EtCO_2$ 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
- Head Trauma
- Cervical spine trauma

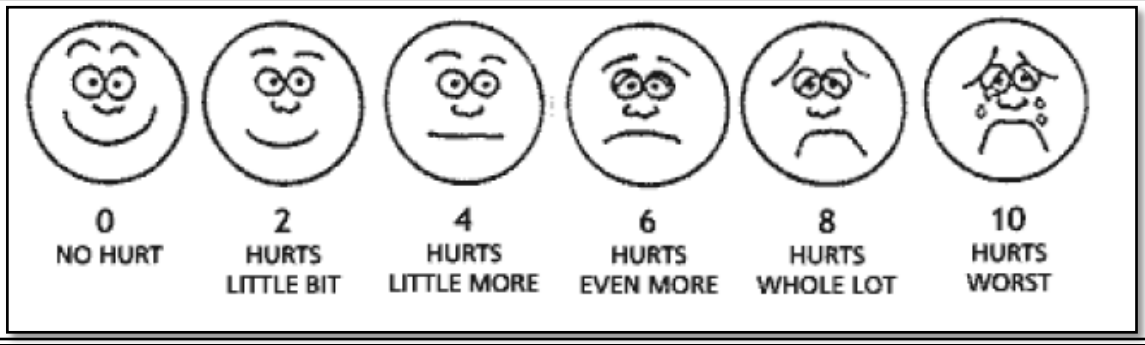
ADVANCED

- 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

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

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

Or, for non-actively vomiting patients
8-15 kg - 2 mg ODT, IIRR x 1 in 10-min
16-30 kg - 4 mg ODT, IIRR x 1 in 10-min



Quality Assurance:

Pain Management/IV opiates

Release at Scene (RAS)

BASIC ASSIST ASSIST

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

Quality Assurance:

RAS/AMA

Against Medical Advice (AMA)

Patient's parent or guardian must demonstrate decisional capacity in order to make an informed refusal of consent for treatment and/or transport and, therefore, for a patient to be released Against Medical Advice.

All AMAs must be parent or guardian-initiated.

Assess decisional capacity as follows:

- 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
- 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, based on the differential diagnosis**
- **Assess the parent or guardian's understanding of the risks and consequences of refusing treatment and/or transport, and document this in their own words**
- Document all of the above in the PCR

Patients who also possess decisional capacity may be involved in the decision making process, however any refusal or treatment/transport of a non-emancipated minors must be given by the parent or legal guardian.

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.

If no decisional capacity and refuses treatment or transport:

- Ensure provider safety first and foremost
- Request Police & Fire to scene
- Contact Field Supervisor
- Contact OMD as needed

Quality Assurance:
RAS/AMA

Withholding Resuscitative Efforts

BASIC

If any of the following clinical signs of irreversible death

→ Rigor mortis/dependent lividity
→ Fetal death after preterm delivery (< 20 weeks gestation by best determination)
→ Decapitation, decomposition **or** incineration

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

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

→ See DNR Policy

Notification of law enforcement is required.

ASSIST / ADVANCED

If no clinical signs of irreversible death in the setting of blunt or penetrating trauma, 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

Quality Assurance:

Termination of Resuscitation

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 resuscitate efforts.

Cardiac

Cardiac Arrest

BASIC

- 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 $EtCO_2$ 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 $EtCO_2 \geq 20$ mmHg
- Utilize Broselow tape

ASSIST

- ETI only after > 6-minutes or 3-cycles of CPR
- Apply cardiac monitor only after completion of last 2-minute cycle of CPR
- IV/IO access
- Advanced airway management (waveform $EtCO_2$ required) only after > 6-minutes or 3-cycles of CPR

VF/VT	Asystole/PEA
• Defibrillate at 4 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 IV/IO q 5 -min. (max dose 1 mg) • 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	• Epinephrine 1:10,000 - 0.01 mg/kg IV/IO immediately, then q 5 min (max dose 1 mg)

ADVANCED

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

- 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 $EtCO_2$ required for all advanced airways
  Confirm waveform $EtCO_2$ > 5 mmHg for every breath
  Remove airway if $EtCO_2$ < 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

Quality Assurance	
CPR	**Airway**
Rate 100-120 Depth 1/3 chest depth Lean 0% CCF ≥ 90% Pauses ≤ 10 sec Perform CPR to goal of $EtCO_2 \geq 20$ mm Hg	4-phase $EtCO_2$ waveform >5 mmHg

Symptomatic Bradycardia

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- 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

- Consider External Cardiac Pacing
  - Place pediatric pads in anterior/posterior position
  - Begin at 30 mA and increase energy in 5 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

ADVANCED

If insufficient sedation OLMC

- Midazolam - 0.05 - 0.1 mg/kg IV/IO/IN, max single dose 2 mg ($EtCO_2$ required)

Shock/hypotension	• NS - 20ml/kg IV/IO rapid bolus for hypotension; IIRR up to 2L total • Epinephrine 1:10,000 - 0.01 mg/kg IV/IO (max single dose 1 mg), IIRR q 2 min
Hyperkalemia	WIDE COMPLEX RHYTHM, 12-LEAD EKG FINDINGS, DIALYSIS HX • Calcium Chloride - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g) • Sodium Bicarbonate - 1 mEq/kg IV/IO
Acidosis	• Sodium Bicarbonate - 1 mEq/kg IV/IO
If any of the below causes are suspected, contact OLMC following initial dosing	
Beta Blocker Toxicity	• Glucagon - 0.1 mg/kg IV/IO slow push over 1-minute (max single dose 1 g), IIRR 0.2 mg/kg IV/IO × 2 (max single dose 2 mg)
Calcium Channel Blocker Toxicity	• Calcium Chloride - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)

→ **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

Quality Assurance

Initiation and utilization of CPR, epinephrine, pacing and/or atropine

Advanced interventions

Oxygen saturation, $EtCO_2$, Airway management

Tachycardias

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

ASSIST

- Advanced airway management
- Cardiac monitoring and 12-lead EKG
- Assess rhythm for rate, width and regularity
  Do not delay cardioversion for IV placement or ACLS drugs in the presence of severe hemodynamic instability
- IV access; NS 15ml/kg IV/IO rapid bolus for hypotension, IIRR up to 30ml/kg or 2L total

Unstable

- Synchronized Cardioversion- 0.5-1.0 J/kg, then 2 J/kg

If time permits, consider sedation prior to/during pacing

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

Narrow complex *(QRS < 0.12)*
(SVT: PAT)

While preparing/ if time allows

- Adenosine - 0.1 mg/kg rapid IV/IO (max 6 mg)

Stable

Narrow complex *(QRS < 0.12)*

Regular
(SVT: PAT or A-Flutter)

- Vagal maneuver
- Adenosine - 0.1 mg/kg rapid IV/IO (max 6 mg)
  IIRR 0.2 mg/kg IV/IO (max 12 mg)

Wide complex *(QRS > 0.12)*

Irregular
(A-fib)

- Treat underlying cause (no adenosine)

Regular
(Ventricular Tachycardia or SVT with BBB or accessory pathway)

- Adenosine - 0.1 mg/kg rapid IV/IO (max 6 mg), unless known VT

ADVANCED

Irregular
(A-fib)

- Treat underlying cause, contact OLMC as necessary

Regular
(Ventricular Tachycardia or SVT with BBB or accessory pathway)

- Amiodarone - 5 mg/kg IV, max 150 mg (over 10 min)

Suspected Hyperkalemia

- Calcium Chloride - 20 mg/kg (0.2 ml/kg) IV/IO, slow push (max dose 1 g)
- Sodium Bicarbonate – 1 mEq/kg IV
  If suspected acidosis
  IIRR 0.5 mEq/kg

Torsades de Pointes

- Magnesium Sulfate– 25-50 mg/kg (max 2 g) IV/IO, slow push

→ **Unstable Tachycardia** (symptoms/signs do not generally occur unless rate > 150)
  Hypotension (or relative hypotension with signs of poor perfusion or end organ dysfunction)
  Acute pulmonary edema
→ If **suspected sinus tachycardia or MAT,**
  Treat the underlying condition
→ Upper limit of sinus tachycardia is approx. 220 - patient age

Quality Assurance:
Synchronized Cardioversion

Medical

Abdominal Pain

BASIC

- Assist airway appropriate
- Titrate O_2 to SpO_2 of ≥ 94% or work of breathing
- Position patient for comfort
- Assess for hemodynamic instability and monitor for impending shock

ASSIST

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

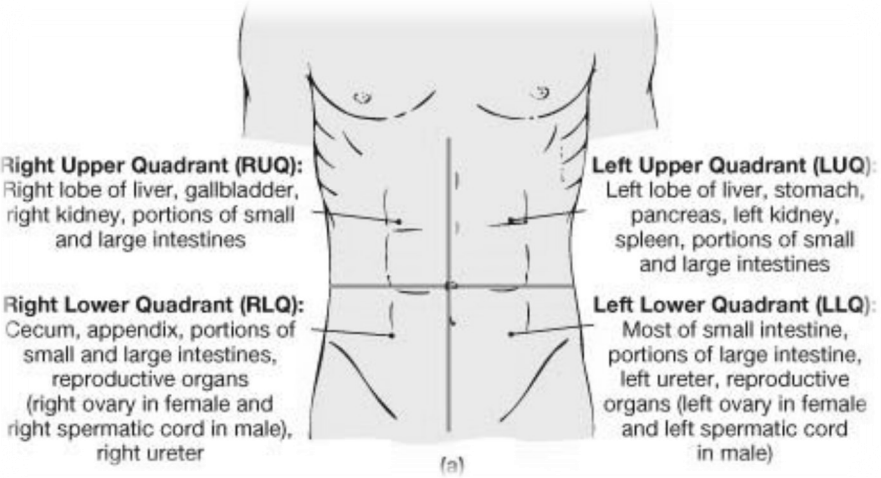
For severe nausea/vomiting

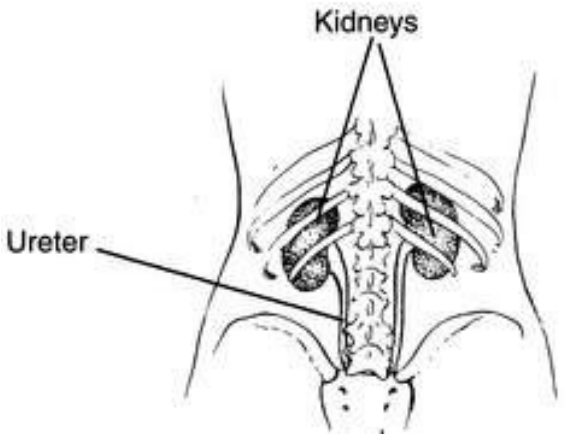
- Nausea and Vomiting Protocol

ADVANCED

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)





Allergic Reaction/Anaphylaxis

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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 - 2.5mg/ipratropium - 0.5mg 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.

ASSIST

- 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 $EtCO_2$ monitoring

ADVANCED

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

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

Consider

- Dexamethasone - 0.6 mg/kg PO/IM (max 16 mg)

→ 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)

Quality Assurance

Epinephrine IV/Infusion
Epinephrine IM

Behavioral Emergencies/Excited Delirium

BASIC

- 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_2 to $SpO_2 \geq 94\%$ 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:

ASSIST

- $EtCO_2$ monitoring
- Advanced airway management, as appropriate
- IV access, as appropriate; consider 15ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 30ml/kg or 2L total
- 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)

ADVANCED

If suspected Excited Delirium, and if unable to achieve optimal behavioral control

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

  Monitor respiratory and hemodynamic status

  Following initial dose, contact OLMC

Quality Assurance

Ketamine

Altered Mental Status/CNS Depression

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Assess blood glucose concentration

If < 60 mg/dl:

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

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*

- Naloxone - 0.1 mg/kg IN (max dose 0.4 mg), IIRR q 5 min. to 2 mg max total dose

ASSIST

- $EtCO_2$ 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% (25g/250ml) - 5 ml/kg IV/IO bolus, IIRR up to 25g (250 ml)

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*

- Naloxone - 0.1 mg/kg IV/IN/IM (max dose 0.4 mg), IIRR q 5 min. to 2 mg max total dose

ADVANCED

If blood glucose concentration < 60mg/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 2 (max dose 2 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)

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

→ General trauma

→ SMR

Quality Assurance

Altered Mental Status/CNS Depression

Diabetic Emergencies

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Assess blood glucose concentration

If < 60 mg/dl:

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

ASSIST

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

***Hypoglycemia**: If blood glucose < 60 mg/dl*

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

***Hyperglycemia**: If blood glucose > 300 mg/dl and altered mental status and/or signs of hypovolemia*

- IV access as appropriate; consider NS 20ml/kg IV/IO up to 2L total

ADVANCED

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

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

Consider differential diagnosis for hyperglycemia

→ Diabetic Ketoacidosis (DKA)

→ Hyperosmolar hyperglycemic state (non-ketotic)

→ Infection/sepsis

Quality Assurance:

IV Fluids

Nausea and Vomiting

BASIC

- Position patient to avoid aspiration
  Consider recovery position
- Suction, as appropriate

ASSIST

- IV access, as appropriate; NS - 20 ml/kg for signs of dehydration
- Ondansetron - 0.15 mg/kg IV (max dose 4 mg)
  Or, for non-actively vomiting patients
  8-15 kg: - 2 mg ODT, IIRR x 1 in 10-min
  16-30 kg: - 4 mg ODT, IIRR x 1 in 10-min

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

BASIC

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_2 to SpO_2 of ≥ 94% and work of breathing
- Determine blood glucose concentration, treat as appropriate

*If suspected **opiate intoxication***
- Naloxone - 0.1 mg/kg IN (max dose 0.4 mg), IIRR q 5 min. to 2 mg max total dose

*If suspected **carbon monoxide (CO)***
- High flow O_2 by NRB + HFNC (as available) 15 lpm each.

ASSIST

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

*If suspected **opiate intoxication** (meiosis, respiratory depression, CNS depression)*
- Naloxone - 0.1 mg/kg IV/IN/IM (max dose 0.4 mg), IIRR q 5 min. to 2 mg max total dose

*If **cocaine/amphetamine/stimulant/sympathomimetic intoxication***
- Midazolam - 0.05mg/kg (max dose 2.5mg) IV, IIRR 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, IIRR x 1; contact OLMC following initial dose
  - *0-2 years:* 0.625 g IV over 15 minutes
  - *3-5 years:* 1.25 g IV over 15 minutes
  - *6-13 years:* 2.5 g IV over 15 minutes

ADVANCED

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

Tricyclic Antidepressant (TCA)
- Sodium Bicarbonate - 1 mEq/kg IV, IIRR 0.5 mEq/kg x 1

Beta-blocker
- Glucagon - 0.1 mg/kg IV/IO (max dose 1 mg), IIRR 0.2 mg/kg IV/IO x 2 (max dose 2 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, IIRR until signs of atropinization

→ SpO_2 may be a poor indicator of severity in CO poisoning; therefore, regardless of SpO_2, 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

Hydroxocobalamin
1 bottle = 5 g
→ 0-2 years - 1/8 bottle
→ 3-5 years - 1/4 bottle
→ 6-13 years - 1/2 bottle

Quality Assurance

Antidotes

Respiratory Distress

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Seat patient (semi-) upright for SBP > 70 + (age in years × 2) and/or signs of adequate perfusion
- For suspected respiratory failure *see* Respiratory Insufficiency/Failure & Airway Protocol

If wheezing/bronchospasm

- Albuterol - 2.5mg/ipratropium - 0.5mg in 3 ml NS nebulized
  IIRR × 2

If barking cough/stridor at rest or on exertion (croup)

- Sit patient upright
- Keep patient calm

ASSIST

- Advanced airway management, as appropriate
- IV access
- Cardiac monitoring
- Albuterol - continuous nebulized (max 7.5 mg in 9 ml NS)

- Advanced airway management, as appropriate
- IV access
- Epinephrine 1:1,000 - 3 mg (3 ml) mixed with 3 ml NS nebulized
  Repeat × 1
- Cardiac monitoring

ADVANCED

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

- Dexamethasone - 0.6 mg/kg PO/IM (max 16 mg)
  - Ensure notification to ED staff of any dexamethasone administration

If severe presentation

- Magnesium Sulfate - 40 mg/kg IV/IO over 10-15 min, max dose 2 g

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

- Epinephrine 1:1,000 - 0.01 mg/kg IM IIRR q 5 min. x 1 max dose 0.3mg

- Dexamethasone - 0.6 mg/kg PO/IM (max 16 mg)
  - Ensure notification to ED staff of any dexamethasone administration

→ 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

Quality Assurance

CPAP
$EtCO_2$
Magnesium
Epinephrine IM

Seizure/Status Epilepticus

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Position patient to avoid injury and aspiration
  Consider recovery position
- Assess blood glucose concentration

ASSIST

- $EtCO_2$ monitoring
- Advanced airway management, as appropriate
- IV access, as appropriate

If blood glucose < 60 mg/dl:

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

ADVANCED

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

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

→ Consider toxicologic causes of seizure
  Organophosphate/nerve gas (see chemical warfare)
  Sympathomimetic toxidrome (stuffers/packers, methamphetamine)

Quality Assurance

Airway Management
Sedatives

Syncope/Fainting

BASIC

- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Measure blood glucose, treat as appropriate
- Assess orthostatic pulse and blood pressure, as tolerated

ASSIST

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

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.)*

Environmental

Bites/Envenomation

BASIC

- Assist airway, as appropriate
- Titrate O_2 to SpO_2 of ≥ 94% and work of breathing, follow Respiratory Distress Protocol

If on an extremity

- Immobilize affected limb below the level of the heart and remove all jewelry

If stinger is present

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

ASSIST

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

If suspected hymenoptera sting

- Follow Allergic Reaction/Anaphylaxis

ADVANCED

→ Consider other protocols as appropriate:
Allergic Reaction/Anaphylaxis
Shock/Hypotension

Hyperthermia/Heat Stroke

BASIC

- Assist airway, as appropriate
- Titrate O_2 to SpO_2 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°*

- 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

Mild	Moderate	Severe
Muscle cramps, sweating	Headache nausea/vomiting, malaise, dizziness, orthostatic hypotension, tachycardia	AMS, temperature >104° F, sweating may or may not be present

ASSIST

- 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 2L maximum

ADVANCED

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)

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

Hypothermia

BASIC

- Assist airway, as appropriate
- Titrate O_2 to SpO_2 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)

ASSIST

- IV access, as appropriate; warm IV fluids if possible, consider 20 ml/kg NS IV/IO rapid bolus for hypotension, IIRR up to 2L total
- Cardiac monitoring and 12-lead EKG

If patient is in pulseless ventricular tachycardia/ventricular fibrillation and not previously defibrillated (AED)

ADVANCED

- 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

Near Drowning

BASIC

- Assist airway, as appropriate
- Titrate O_2 to SpO_2 of ≥ 94% or work of breathing, follow Respiratory Distress Protocol

If suspected cervical spinal trauma

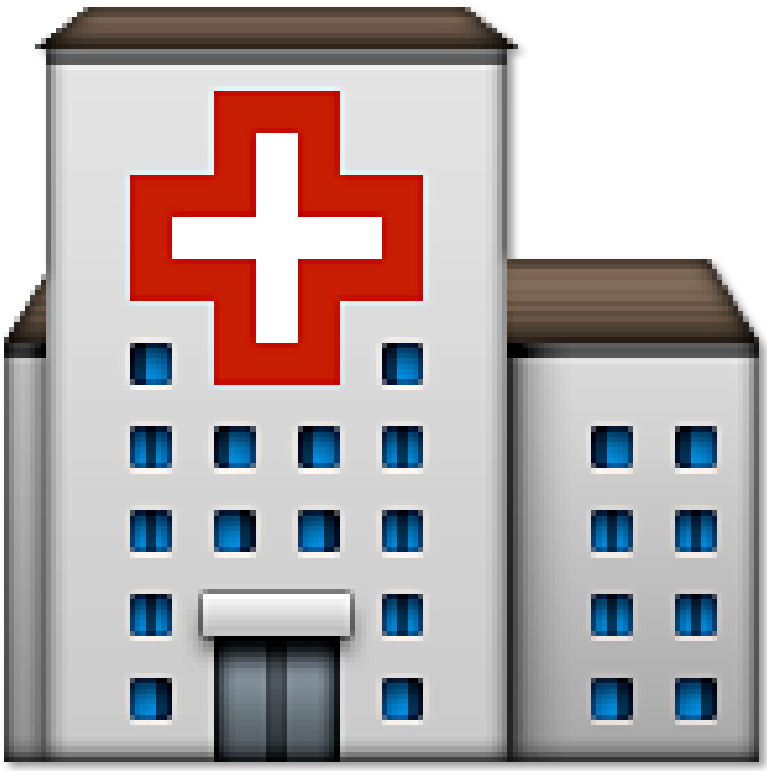
- Spinal Motion Restriction Procedure
- Remove wet clothing and dry patient, and follow Hypothermia Protocol

ASSIST

- Advanced airway management, as appropriate
- Initiate $EtCO_2$ monitoring
- Cardiac monitoring, and treat dysrhythmias
- IV access, as appropriate

ADVANCED

Trauma



General Trauma

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing
- Spinal Motion Restriction, as appropriate
- Emergency pelvic stabilization, as appropriate
- Keep patient warm

ASSIST

- Advanced Airway management, as appropriate
- Needle Thoracostomy for presumed tension pneumothorax
- Monitoring, as appropriate
- IV access, as appropriate;

If SBP < 70 + (age in years × 2) OR 90 mmHg (10 y/o or greater):

- NS - 20 ml/kg IV, IIRR to goal SBP

ADVANCED

- Acute Pain Management, as appropriate

If traumatic arrest

- Consider Needle Thoracostomy Procedure

BASIC

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 injury

- Do not delay transport

If outside socket:

- Cover in NS soaked gauze

Head/Neck Injuries

- Spinal Motion Restriction

Chest Injuries

- Bleeding control
- Stabilize impaled objects
- Stabilize flail segments

If suspected open pneumothorax

- Partial occlusive dressing

Abdominal/Pelvic Injuries

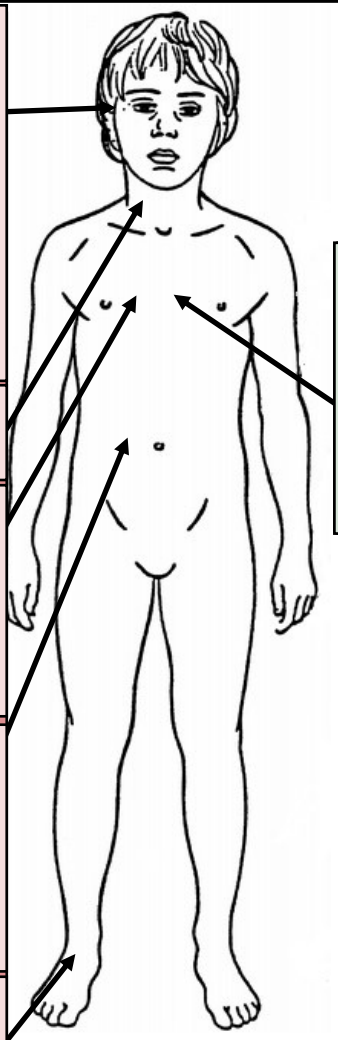
- Control bleeding
- Stabilize impaled objects
- Pelvic binder
- Evisceration– cover with saline moistened gauze

Extremity/Amputation Injuries

- Bleeding control (direct pressure, tourniquet)

If bleeding uncontrolled with tourniquet

- Pack wound tightly with QuickClot and kerlix gauze
- Splinting, as appropriate
- Sterile dressing– open fractures
- Care for amputated body part



Chest Injuries/Tension Pneumothorax

ASSIST & ADVANCED

- Needle thoracostomy

Quality Assurance:
Needle Thoracostomy

Amputated Body Part

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- Advanced Airway management, as appropriate
- Monitoring, as appropriate
- IV access, as appropriate;

If SBP < goal of 70 + (age in years x2) OR 90 (≥ 10 years)

- NS - 20 ml/kg IV, IIRR to goal SBP

ADVANCED

- Acute Pain Management, as appropriate

Burns

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ or work of breathing

If suspected carbon monoxide (CO)

- Ensure scene safety, and remove patient from toxic environment
- High flow O_2 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

ASSIST

- 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 ≥ 2° burns (> 10% BSA)
  ⇒ Administer IV fluids as per ABLS guidelines
  0-3 years 125 ml/hr NS
  3-14 years 250 ml/hr NS

If severe symptoms/signs (> 10% BSA 2°or 3° or circumferential) or airway involvement)

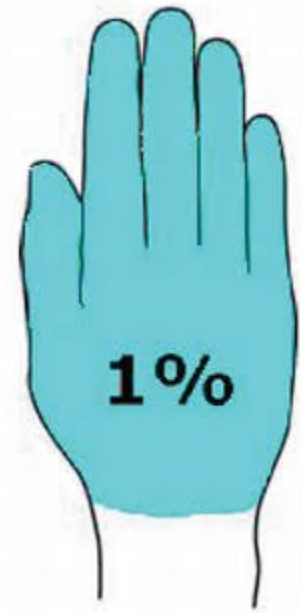
- Provide notification and transport to nearest burn center

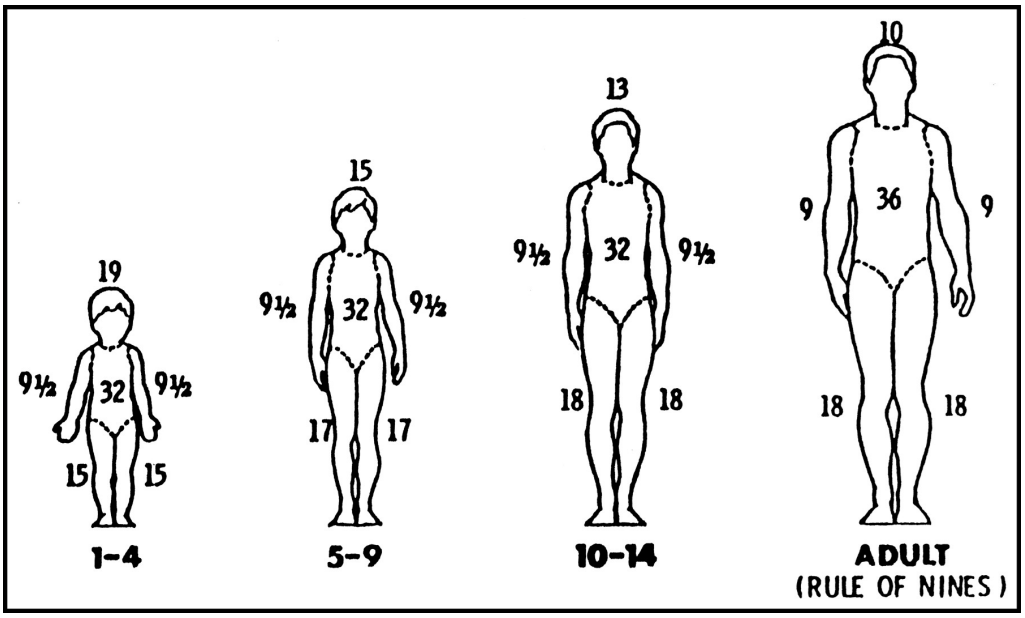
If unsecured airway

- Transport to the closest full service hospital

ADVANCED

- Acute Pain Management Protocol, as appropriate





Entrapment/Crush/Traumatic Rhabdomyolysis

BASIC

- Assist airway, as appropriate
- Titrate O_2 to $SpO_2 \geq 94\%$ 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

ASSIST

- Advanced airway management, as appropriate
- Cardiac monitoring, 12-lead EKG
- IV access, 20 ml/kg/hr NS nfusion IV/IO, to 2L 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

ADVANCED

- 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

Spinal Motion Restriction

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 ≤ 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 > 3-feet or 5-stairs

Axial loading injury to the head (diving accident/sports injury)

Vehicular accident

High speed motor vehicle accident > 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 or paresthesias

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

Procedures

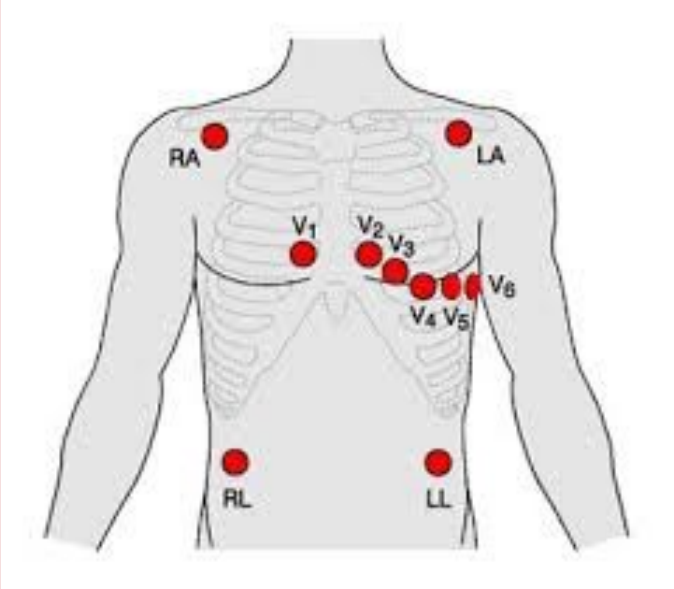
12-Lead EKG

BASIC

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



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

ASSIST

- Obtain serial 12-lead EKGs
- Continuously monitor EKG

ADVANCED

If Meets ST segment elevation (STE) MI Criteria

- Transmit/transport to STEMI facility or call for advanced intercept

If Any other interpretation

- Closest appropriate facility

- STEMI Alert *(patient is believed to need emergent PCI)*

  2 or more continuous leads with:

  STE ≥ 1 mm limb leads with reciprocal depression and/or
  STE ≥ 2 mm precordial leads with reciprocal depression and/or
  Relative STE ≤ 1 mm with reciprocal changes with QRS voltage ≤ 5 mm

Advanced Airway Preparation

Indications:

→ Insertion of any invasive airway device

→ Respiratory failure

→ Severe - critical hypoxia ($SpO_2 \leq 90$)

Procedure:

Pearls and pitfalls:

→ Failure to prepare for intubation puts patients at unnecessary risk for cardiac arrest

→ Ensure all needed equipment is out in the airway manager/assistants field of view to avoid unnecessary delays in retrieving critical equipment

Do not attempt intubation with $SpO_2 \leq 90$ until best attempt at below have failed:

PREOXYGENATE (60 sec minimum):

- Suction, as appropriate
- Up to NPA × 2 and OPA AND
- Head tilt/Chin Lift or jaw thrust AND
- Ear-to-sternal notch (head elevated) position AND
- NRB + HFNC OR
- BVM + HFNC

Assemble KIT DUMP (SEE PICTURE)

- Biohazard bag spread near HOB (place the following items, within the field of view)
  - Suction (Yankauer)
    powered, tucked under patient shoulder or mattress
  - 2 sizes endotracheal tube
    (out of packaging, ready to be used)
  - Bougie
  - 2 sizes laryngoscope blade
    (estimated size and next largest)
  - Backup airway device *i.e. king laryngeal tube*
    for unanticipated difficult intubation
  - BVM (if not already in use)
  - Rusch Quicktrach
    (unopened but in view)

BASIC

If advanced at bedside ALS assist to aid in procedure (required)

- Endotracheal Intubation/Direct Laryngoscopy
- Follow Respiratory Insufficiency/Failure & Drug Assisted Airway (adult or pediatric)

If "Can't Ventilate/Can't Oxygenate" situation ($EtCO_2$ 0 and falling/absent SpO_2)

- Surgical Airway Procedure (do not delay for critical hypoxia)

ASSIST

If induction required, during preoxygenation

- Prepare and separate medications

ADVANCED

Assisted Ventilation/Bag Mask Ventilation

Indications:
→ Hypoxia uncorrected by passive high FiO_2
→ Ineffective minute ventilation
→ Respiratory insufficiency/failure

Contraindications:
Mask– inability to obtain a mask seal
→ Oral/Facial/mandibular disfigurement
→ Edentulousness with/without emaciation

Pearls & Pitfalls:
If mask ventilating
→ Ensure $EtCO_2$ 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 $EtCO_2$ 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

Ventilation Rates:

Adult:
Cardiac Arrest:
- ≤ 12 Breaths per minute (every 5 seconds)

Perfusing:
- Titrate to SPO2 > 90 and eucapnia (as appropriate)

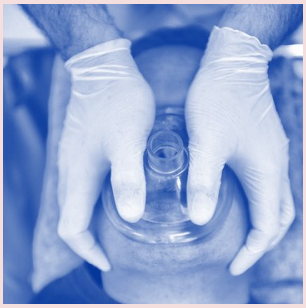
Pediatric:
Cardiac Arrest:
- 15 compressions 2 breaths (most arrests are asphyxia)

Perfusing:
- 12-20 Breaths per minute (every 3-5 seconds)

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 $EtCO_2$ waveform every breath)

Thenar Grip



EC "Clamp"

Capnography

Indications:
- → Respiratory distress *(diff. breathing, or requiring > 2 lpm O_2)*
- → Decreased LOC/somnolence
- → Trending: Perfusion/respiration
- → Advanced airway use (ETT and King LT)
- → Narcotic/benzodiazepine/sedative administration

Contraindications:
None

Pearls & Pitfalls:
- → Clogging of the detector should prompt appropriately aggressive airway clearance by use of suction (strongly consider removing any inserted device)
- → An advanced airway or BLS airway adjunct should be removed and reattempted if CO_2 waveform absent
- → $EtCO_2$ alone cannot detect right main stem intubation, confirm lung sounds after 4-phase waveform every ETT placement
- → Be vigilant for tube migration/dislodgment the duration of placement and for all patient moves

Airway in place *or* During mask ventilation:

Clogged Detector

- Suction airway immediately
- Replace detector

If no noted 4-phase waveform after 1 detector swap
- Remove airway device
- Ventilate by different device/method

Malpositioned tube/no ventilation

If King LT, ETT, OPA, BVM
- Remove device
- Reposition airway
- Ventilate by different device/method

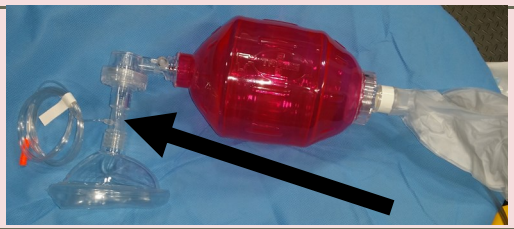
Causes: 0 mmHg $EtCO_2$
1. Loss of airway *e.g. apnea, failed tube, dislodged tube*
2. Loss of circulation *e.g. witnessed cardiac arrest, massive PE, exsanguination, RV rupture*

Side Stream Nasal Cannula

- Connect $EtCO_2$ detector line to machine
- Apply nasal cannula

Bag Mask Ventilation

- Connect $EtCO_2$ detector line to machine
- Insert "in-line" detector between the Bag-Valve and Mask
- Ventilate per Bag Mask Ventilation/Assisted Ventilation Procedure
- Appreciate 4-phase $EtCO_2$ waveform for every breath



"In-Line" $EtCO_2$ with Advanced Airway

- Connect $EtCO_2$ detector line to machine
- Insert "in-line" detector between the Bag-Valve and advanced airway
- Ventilate per Bag Mask Ventilation/Assisted Ventilation Procedure
- Appreciate 4-phase $EtCO_2$ waveform for every breath

CPAP/Non-invasive Positive Pressure Ventilation (NIPPV)

BASIC ASSIST ADVANCED

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

Contraindications:
- → Penetrating chest trauma
- → Suspected pneumothorax
- → Uncontrolled/persistent vomiting
- → Facial deformity (traumatic or anatomic) preventing mask seal

Pearls & Pitfalls:
- → Utilize $EtCO_2$ 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 (generally SBP < 80)
- → Consider multiple causes for respiratory distress (pneumothorax/mediastinum, effusion, PE, etc.)
- → Monitor trends in waveform capnography, CO_2 values, pulse oximetry, mental status, HR/BP
- → q ≤ 5 min. reevaluation recommended for all monitoring/VS, document appropriately

Procedure:
- Maximize upright sitting position
- Attach CPAP device to O_2 source
  15 lpm until secured/sealed
- Seal the mask to the patient's face using headpiece
- Adjust flow rate of O_2 for device, as needed
  Pressure recommendation on exhalation (noted on pressure gauge *if equipped*):

CPAP Flow:-Pressure Reference	
Approx. Flow Rate	Pressure
15 lpm	5 cmH_2O
20 lpm	7.5 cmH_2O
25 lpm	10 cmH_2O

Contact Precautions

Indications:
→ Patient care required for known or suspected infection with any drug resistant organism

Contraindications:
None

Precautions:
→ Blood/secretions/wounds
→ Clostridium Difficile
→ E. Coli
→ MRSA

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.

BASIC
ASSIST
ADVANCED

Emergency Childbirth

Indications:
Childbirth/labor

Contraindications:
None

Pearls & Pitfalls:
→ Inspect perineum for crowning on all pregnant females reporting symptoms of labor
→ Prepare for splashing fluids; sterile gloves, gown, mask/glasses

BASIC

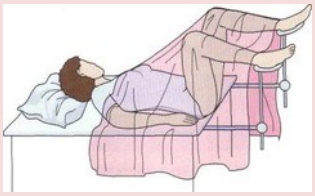
ASSIST

ADVANCED

Childbirth:

- Administer oxygen as appropriate
- Place patient in tilted Left Lateral Position if not crowning
- Visually inspect perineum for crowning
- If delivery imminent or in process, do not initiate or continue transport
- Prepare OB kit and area for delivery and position mother (lithotomy)

Lithotomy Position



As the head delivers:
- Use a gloved hand to control speed of head delivery
- Suction the mouth then nose with suction bulb if:
  Amniotic fluid is not clear
  Obvious obstruction to spontaneous breathing or if positive pressure ventilation required
- Address umbilical cord around newborn neck if present:
  If cord loose around neck: Attempt to pull cord over infant's neck
  If cord tight around neck: Clamp cord × 2 (2-inches apart), cut between clamps, and continue
- Apply gentle downward traction for the top shoulder to deliver with head *sandwiched* between both palms
- Apply gentle upward traction for the bottom shoulder to deliver with head sandwiched between both palms
- Place the newborn below the level of the birth canal after complete delivery of the newborn
- Clamp and cut the umbilical cord (minimum 6-inches from the neonate 2-inches apart) *unless already done*
- Dry and cover newborn (start with head, then body)
  Cover head and wrap body *use dry liner and foil*
  Place infant on mother's chest
- Assess for maternal bleeding and other signs of placental separation
  Lengthening cord, pelvic pain, etc.
- Encourage the mother to attempt breastfeeding
- Perform fundal massage *(vigorous massage of fundus watching for uterine tone/decreased bleeding)*
- Direct pressure for excessive bleeding from birth canal tears

Breech:

Delivering the legs, abdomen, and umbilical cord:
- Allow fetus to deliver to level of umbilicus
  After umbilicus is visualized extract 4-6 inch loop of umbilical cord
- Gently extract legs downward after buttocks are delivered

Delivering the shoulders:
- Gently align the fetus' shoulders anterior-posterior to the mother with the infant's face pointing laterally
- Gently guide fetus upward to deliver to deliver the posterior shoulder
- Gently guide fetus downward to deliver to deliver the anterior shoulder

Delivering the head/neck:
- Rotate the fetal face or abdomen AWAY from the maternal pubis after the shoulders are delivered

Upon delivery of the neck:
- Place gloved finger up into infant's mouth to keep head flexed AND
- Apply gentle pressure to the occiput with the other hand to aid in neck flexion AND
- Apply gentle upward traction on the body to aide in delivery of the head

Endotracheal Intubation/Direct Laryngoscopy

Indications:
→ Respiratory failure
→ Cardiac arrest
→ Suspected airway obstruction

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

Pearls & Pitfalls:
→ Unless clearing the airway, withhold laryngoscopy until the best attempt at preoxygenating to a $SPO_2 > 90$ (minimum 60 seconds high FIO_2 and open 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

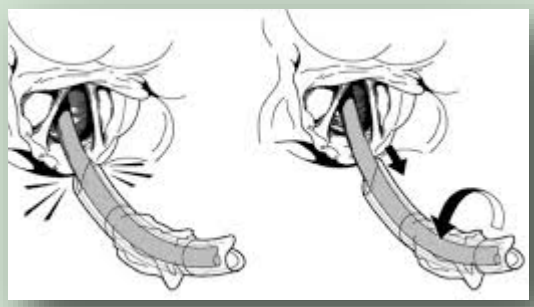
BASIC

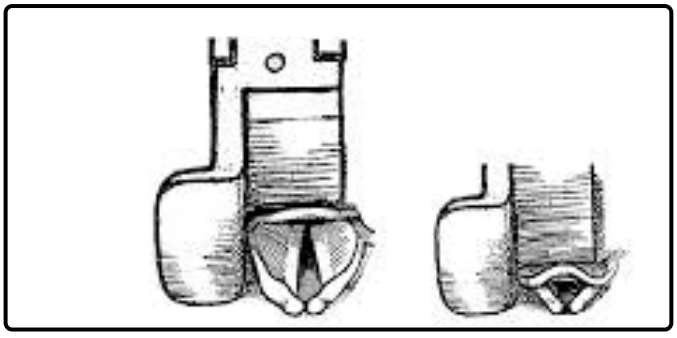
- Assist in preparation *see* Advanced Airway Preparation Procedure
  - Oxygenate/Preoxygenate
  - Establish Kit Dump
  - See Advanced Airway Preparation Procedure
- * External Laryngeal Manipulation (under guidance from laryngoscopist)

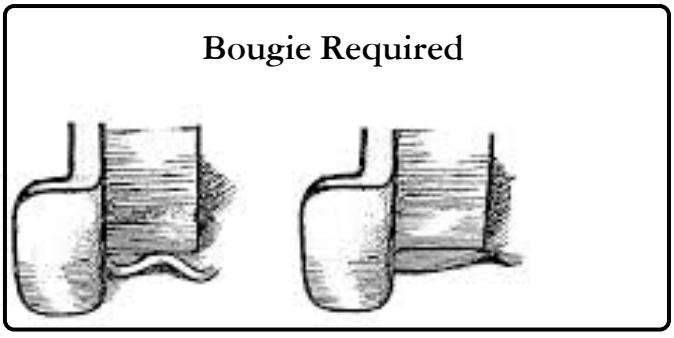
ASSIST

- Position for patency
  - Ear-to-Sternal-Notch (with ramp shoulders for patients >70 kg)
  - Neutral position (if suspected trauma)
- Open Patient's mouth
  - Use scissor technique (index/thumb)
- **Identify the epiglottis** (do not deliver tube if unable to visualize *epiglottis*)
  - Position blade tip:
  - Curved blade (inside vallecula, or directly lift epiglottis)
  - Straight blade (lift epiglottis)
- Guide Assistant's hand (External Laryngeal Manipulation)
  - Obtain the best view possible before attempting tube delivery
- Deliver ETT, or utilize Bougie
  - Maintain visualization until tube is inside trachea
  - If resistance to passage rotate ETT on bougie counterclockwise
- Primary Confirmation: WAVEFORM $EtCO_2$ every breath within 5-breaths
- Secondary Confirmation:
  - Bougie "hold-up"
  - Positive chest sounds
  - Absent/diminished epigastric sounds
  - "Misting" in tube

ADVANCED







Airway grades: I II III IV

External Cardiac Pacing

ASSIST

Indications:
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

Contraindications:
→ Severe hypothermia (core temp < 86°F)

Pearls & Pitfalls:
→ 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 OLMC for guidance)

As time allows:
→ Administer sedative agent
(*use caution until hypotension is corrected*)

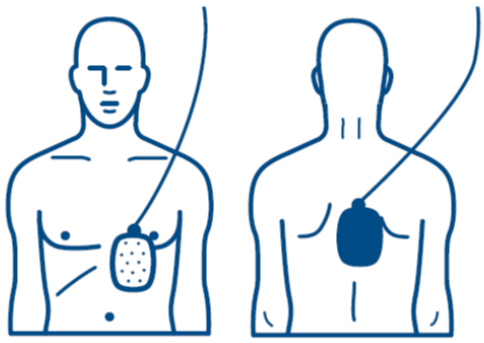
ADVANCED

- Sedative agent, as appropriate per protocol
- Attach EKG monitoring electrodes (required for demand pacing)
  Secure electrodes to wire connector/patient with sturdy tape/kling
- Adjust view to lead with most upright QRS
- Apply pads to patient's chest
  +++Do not place pads over implanted devices+++
- Select "PACER" function as per device manufacturer recommendations
- Set pacer rate, as follows:

PEDIATRIC				Adult
Age	0-36 Months	36 months—12 years	> 12 years	12 years and older
Rate	120 ppm	100 ppm	70 ppm	70 ppm

- Press/select "START" or depress the "PACER" button
(ensure: indicator light is on: Lifepak/ "pacer on": Philips)
- Increase output 5mA increments till capture is noted or maximum output is reached
- Increase rate in 10 bpm increments if low cardiac output
- Observe for signs of improved hemodynamics
- Treat other causes for poor hemodynamics

Anterior/Posterior Pad Placement*



* variations do exist, use as appropriate for situation

Anterior Pad Placement

Intraosseous (IO) Access

ASSIST

ADVANCED

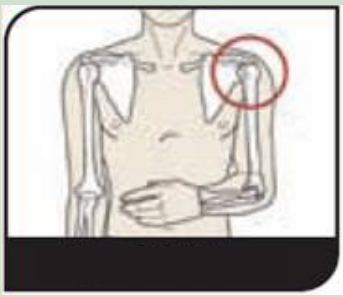
Indications:
→ Cardiac Arrest
→ Severe illness/injury and at risk for cardiac arrest

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:
→ 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)



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	≥ 7lbs	≥ 90 lbs (excess tissue)

Intravenous & Central Line Access

Indications:
Need or potential need for
→ Fluids
→ Medications
Invasive line Access
→ Cardiac arrest
→ Hemodynamic instability
→ Currently accessed

Pearls & Pitfalls:
→ Utilize other methods after 2 peripheral attempts if hemodynamically unstable
External Jugular Access
EZ-IO device
Invasive line access

Peripheral access (extremity or truncal)

- Apply band tourniquet to extremity
- Identify suitable venipuncture site
  Straight vein segment
  Intact, healthy skin
- Select an appropriate size angiocatheter
  Adult:
  Hemodynamic instability, continuous infusions
  18 g or larger
  Medication administration only
  20 g max preferred
  Pediatric:
  Hemodynamic instability, continuous infusions
  18 g max
  Medication administration only
  22 g max preferred
- Use aseptic technique to clean site
- Apply traction to skin above intended puncture site
- Insert angiocatheter into the vessel
  Decrease angle of insertion on noting "flash" of blood
  Advance needle/angiocatheter slightly
- Retract/lock the needle
- Attach line/lock
  Flush line/administer fluids

External Jugular Vein Access

- Lay patient with head dependent if possible
  (raise legs if unable to make head lower than torso)
- Identify the external jugular vein
  Examine both sides of the neck
  Use flat, straight vein segment
- Select venipuncture site highest point above clavicle possible
- Select appropriate size angiocatheter
  Adult:
  18 g or larger
  Pediatric:
  20 max preferred
- Use aseptic technique to clean site
- Apply traction to skin above intended puncture site
- Insert angiocatheter into the vessel
  Decrease angle of insertion on noting "flash" of blood
  Advance needle/angiocatheter slightly
- Retract/lock the needle
- Attach line/lock
  Flush line/administer fluids

ASSIST

Peripherally Inserted Central Catheter Access :

- Select the largest lumen available
- Remove cap on the end of the catheter
- Prep the end of the lumen with an alcohol swab
- Aspirate 10 ml of blood with the syringe and discard
- Flush the lumen with 10 ml normal saline using a 10 ml syringe
- Attach IV administration set and observe for free flow of fluid
- If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting

Equipment:
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)

If unable to aspirate blood
- re-clamp the lumen and attempt to use another lumen (if present)

If clots are present
- Do not utilize

If catheter does not flush easily
- If unable to flush, clamp line attempt different port (if available)

PICC line will generally flush more slowly and with greater resistance than a typical intravenous catheter

ADVANCED

Manual Defibrillation

BASIC

Indications:
→ Ventricular Fibrillation
→ Pulseless Ventricular Tachycardia

Contraindications:
→ None

Pearls & Pitfalls:
→ Withhold defibrillation until removed from standing water/conductive surfaces (metal)
→ Hands on defibrillation not recommended
→ Do not place defibrillator pads over implanted devices

- Begin chest compressions
- Apply defibrillator pads
- Continue chest compressions during defibrillator charging
- Count down 10 seconds from intended shock delivery (aloud)
- Inform entire resuscitation team prior to shock
- Allow no more than 3 seconds of interruption prior to, and post, defibrillation
- Immediately resume CPR 2 minutes

ASSIST

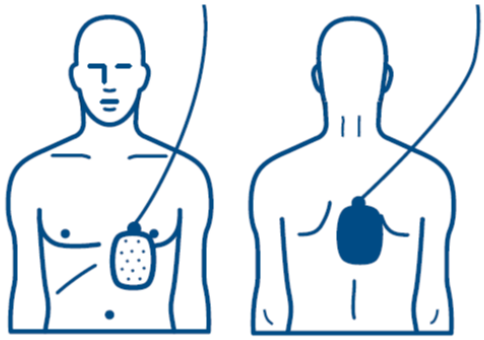
During uninterrupted CPR
- Charge defibrillator
- Count down 10 seconds from intended shock delivery (aloud)
- Inform entire resuscitation team prior to shock
- Choreograph team to keep peri-shock pause ≤ 3 sec total
- Attempt additional shock after 2 full minutes of CPR *as indicated*

ADVANCED

Electrical Dose Reference

Adult	Pediatric/Infant
Highest energy setting available *No change: CPR performance, or energy if shocks from ICD*	2 joules/kg initial shock *Then* 4 joules/kg *Then* 6 joules/kg *Then* 8 joules/kg *Then* 10 joules/kg

Anterior/Posterior Pad Placement*



* variations do exist, use as appropriate for situation

Anterior Pad Placement

Mechanical Chest Compression Device

BASIC ASSIST ADVANCED

Indications:
Adult cardiac arrest (after first full 6 minutes)
Contraindications:
→ Application will delay CPR > 10 sec
→ Absence of 2 full minutes of manual chest compressions immediately prior to application

Pearls & Pitfalls:
→ Consider withholding LUCAS 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)

Procedure:
- Follow Pit Crew Procedure
  Do not attempt Lucas placement until <u>at least</u> 4 providers are at the bedside
- Power unit, prepare and stage all equipment near the location it will be used

If patient's size not appropriate for LUCAS application
- Perform high-quality manual chest compressions
- Continue Pit Crew Procedure and other treatment as appropriate

Bottom (Caudal) approach

At any point during uninterrupted CPR
- Slide the back piece underneath the patient's lumbar region *may be necessary to lift the patient's legs*
- Fully assemble the arch above the patient's abdomen
  AT THE NEXT 2 MIN. <u>RHYTHM CHECK</u>
- Slide the device toward the head until piston is above the mid-sternum
  Provider positioning:
  - One provider right shoulder
  - One provider left shoulder
- Push the ADJUST button <u>and</u> push the piston suction cup down to the midsternum
- Push PAUSE to lock the start position
- Push ACTIVE continuous to begin compressions

Top (Cephalad) approach

Provider positioning:
- One provider right shoulder
- One provider left shoulder
- Each provider lift patient
- An additional provider place the back piece below the patient's back
- Return to CPR immediately
- Lock the side opposite the chest compressor, continuing CPR
  AT THE NEXT 2 MIN. <u>RHYTHM CHECK</u>
- Secure the other side of the arch
- Push the ADJUST button <u>and</u> push the piston suction cup down to the midsternum
- Push PAUSE to lock the start position
- Push ACTIVE continuous to begin compressions

Needle Thoracostomy

ASSIST

Indications:

→ Suspected tension pneumothorax with signs of poor ventilation/cardiac output

→ Penetrating traumatic cardiac arrest

Precautions:

→ Insertion too low can cause trauma to the liver, spleen, bowel or diaphragm

→ Do not delay the procedure when indicated

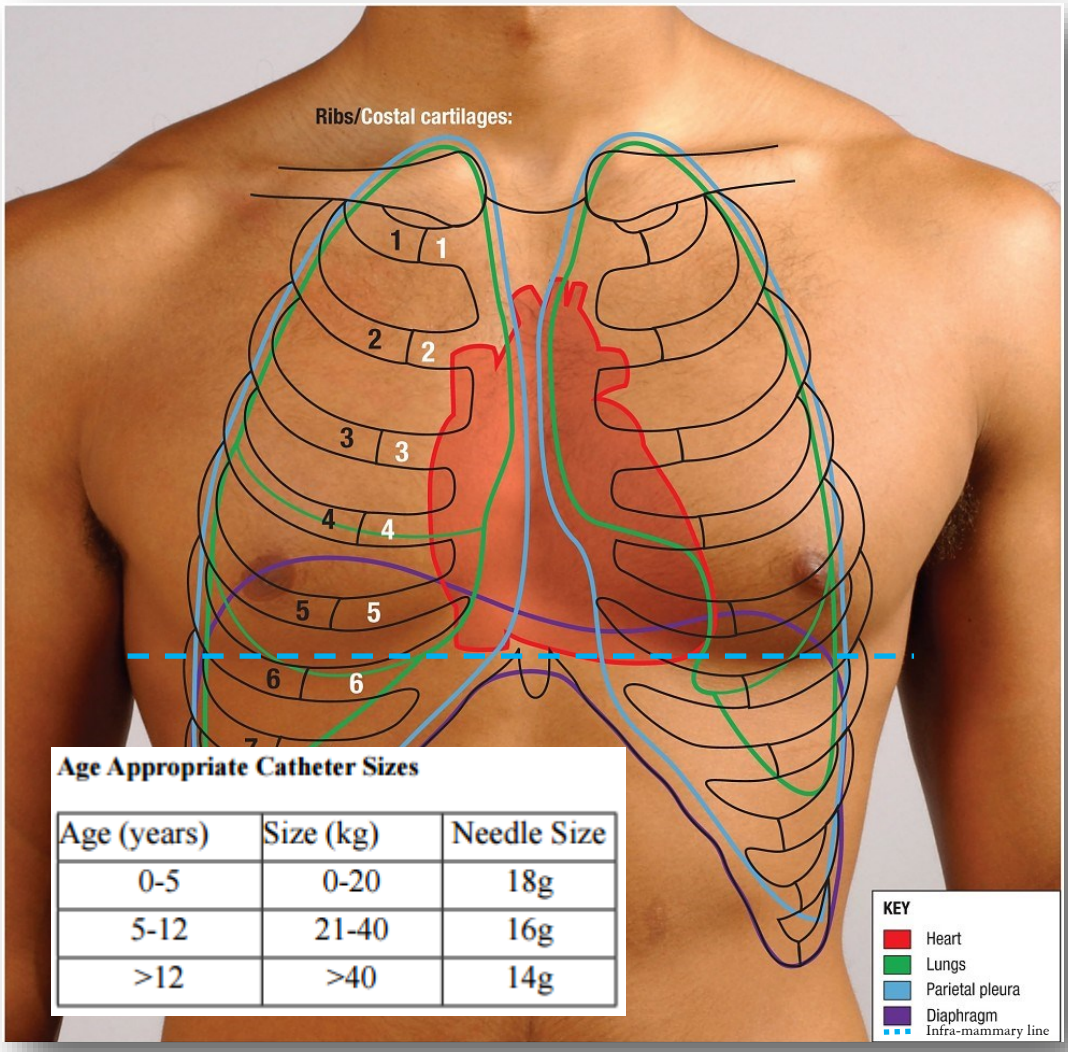
ADVANCED

- Prepare equipment: 14 G (3 inch long) angiocatheter
- Apply monitor before if time allows; *EKG, Waveform $EtCO_2$, 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



Age Appropriate Catheter Sizes

Age (years)	Size (kg)	Needle Size
0-5	0-20	18g
5-12	21-40	16g
>12	>40	14g

Pit Crew (2 Responders)

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

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

Unwitnessed— 2 minutes CPR *THEN analyze*

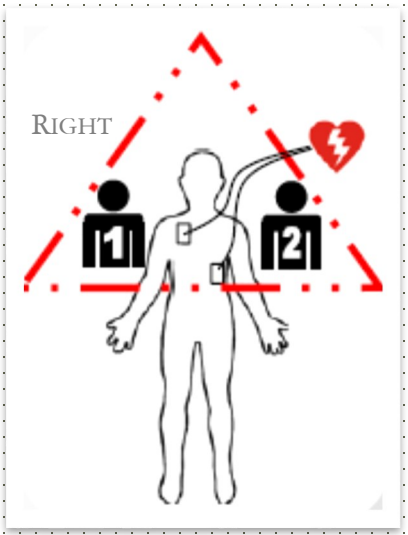
AIRWAY
Defer 3 cycles/6 minutes (with/without shocks)
UNLESS suspected/known choking
Do not stop CPR to intubate/place SGA

Flatline $EtCO_2$ WAVEFORM
→ Remove device

Monitor
Compression monitoring device for all manual CPR

Position 1 BASIC
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway

Airway- defer unless ≥ 2 providers on scene



Position 2 BASIC
- Attach monitor/defib. Keep within arms reach
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

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) • OPA ± NPA AND • Jaw Thrust/Head-tilt	Complete 1 minute compressions • BLS: AED "ANALYZE" • ALS: Rhythm Check ≤ 3 sec.

"No Shock Advised" or Asystole/ PEA
• **Position 1**—Immediately begin CPR
	"Shock Advised" or VFIB/VT
	• **Position 1**—RESUME CPR
	• **Position 2**— Charge defib.
	  • Clear patient
	  • Deliver shock
	  • Continue 2 min. CPR

Repeat x 3 before ETT/SGA insertion

Pit Crew (3 Responders)

COMPRESION NOTES
→ *"Hover Hands"* over patient chest (every compressor ▯ @ all rhythm checks)
→ Continue Compressions during Charge
→ Rate: 100-120
→ Depth: 2-2.5in
→ 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 $EtCO_2$ WAVEFORM
→ Remove device

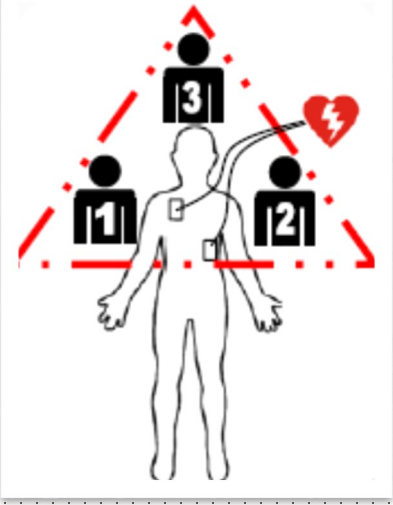
***BLS* only:** Fill assist/advanced preferred positions/ intervene within scope

Position 3 — ASSIST
- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)

*Do not interrupt compressions
*Confirm $EtCO_2$ q breath
*basic if no advanced/assist avail.

Monitor
Compression monitoring device for all manual CPR

Position 1 — BASIC
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway



Position 2 — BASIC
- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

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) • OPA ± NPA AND • Jaw Thrust/Head-tilt	Complete 1 minute compressions • BLS: AED "ANALYZE" • ALS: Rhythm Check ≤ 3 sec.

'No Shock Advised' or Asystole/PEA
• **Position 1**—Immediately begin CPR
	"Shock Advised" or VFIB/VT
	• **Position 1**—RESUME CPR
	• **Position 2**— Charge defib.
	  • Clear patient
	  • Deliver shock
	  • Continue 2 min. CPR

Repeat x 3 before ETT/SGA insertion

Pit Crew (4 Responders)

COMPRESION NOTES
→ *"Hover Hands"* over patient chest (every compressor ▯ @ all rhythm checks)
→ Continue Compressions during Charge
→ Rate: 100-120
→ Depth: 2-2.5in
→ 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 $EtCO_2$ WAVEFORM
→ Remove device

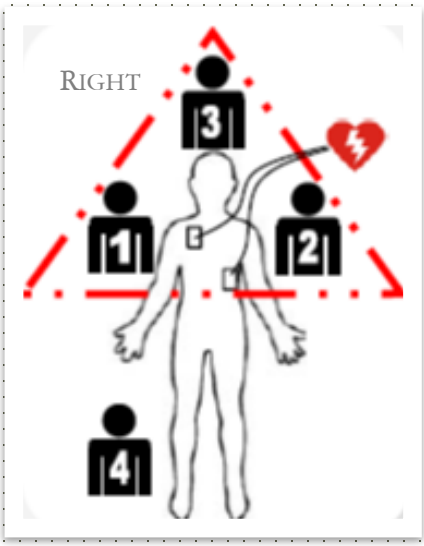
BLS only: Fill assist/advanced preferred positions/ intervene within scope

Position 3 — ASSIST
- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)

*Do not interrupt compressions
*Confirm $EtCO_2$ q breath
*basic if no advanced/assist avail.

Monitor
Compression monitoring device for all manual CPR

Position 1 — BASIC
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway



Position 2 — BASIC
- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

Position 4 — ASSIST
- Assist Postion 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"

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) • OPA ± NPA AND • Jaw Thrust/Head-tilt	Complete 1 minute compressions • BLS: AED "ANALYZE" • ALS: Rhythm Check ≤ 3 sec.

'No Shock Advised' or Asystole/PEA
• **Position 1**—Immediately begin CPR
	"Shock Advised" or VFIB/VT
	• **Position 1**—RESUME CPR
	• **Position 2**— Charge defib.
	  • Clear patient
	  • Deliver shock
	  • Continue 2 min. CPR

Repeat x 3 before ETT/SGA insertion

Pit Crew (5 Responders)

COMPRESION NOTES
→ *"Hover Hands"* over patient chest (every compressor ▯ @ all rhythm checks)
→ Continue Compressions during Charge
→ Rate: 100-120
→ Depth: 2-2.5in
→ 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 $EtCO_2$ WAVEFORM
→ Remove device

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

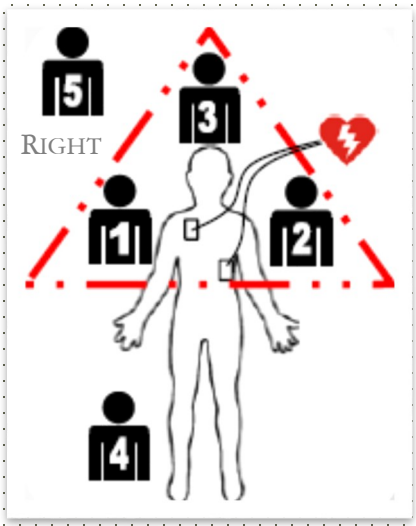
Position 5 (logistics) — BASIC
- Assist all positions
- Gather PMH and HPI
  - Down time
  - Cause of the arrest
- Assists Position 4 *timekeeping*

Position 3 — ASSIST
- OPA ± NPA AND
- Jaw Thrust/Head-tilt
- NRB ± HFNC (15 LPM ea.)
- ETT/SGA (when appropriate)

*Do not interrupt compressions
*Confirm $EtCO_2$ q breath
*basic if no advanced/assist avail.

Monitor
Compression monitoring device for all manual CPR

Position 1 — BASIC
- Assess LOC (≤ 3 seconds)
- Begin CPR
- Do not interrupt CPR for airway



Position 2 — BASIC
- Attach monitor/defib. Keep within arms reach
- Assist position 3 (airway/equipment)
- Prepare to relieve Position 1
- Do not interrupt CPR for airway

Position 4 — ASSIST
- Assist Postion 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"

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) • OPA ± NPA AND • Jaw Thrust/Head-tilt	Complete 1 minute compressions • BLS: AED "ANALYZE" • ALS: Rhythm Check ≤ 3 sec.

"No Shock Advised" or Asystole/ PEA
• **Position 1**—Immediately begin CPR
	"Shock Advised" or VFIB/VT
	• **Position 1**—RESUME CPR
	• **Position 2**— Charge defib.
	  • Clear patient
	  • Deliver shock
	  • Continue 2 min. CPR

Repeat x 3 before ETT/SGA insertion

Spinal Motion Restriction

BASIC / ASSIST

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

OR

ADVANCED

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

*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

BASIC

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

ASSIST

Tracheal Suction (ETT and Tracheostomy)

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

ADVANCED

Meconium Aspirator Tracheal Suction

- Obtain APGAR score see APGAR procedure
  Keep patient warm
- Prepare equipment see airway management preparation procedure
- Suction with bulb syringe
  Mouth—then—Nose
- Intubate the trachea
  Confirm with $EtCO_2$
- Suction using meconium aspirator
  Attach with aspirator to endotracheal tube adaptor
  Repeat x 1 with new ETT if significant meconium on suctioning

Supraglottic Airway (King LT)

BASIC | ASSIST | ADVANCED

Basic for Cardiac Arrest Only see pit crew procedure*

Indications:
Any of the below conditions in patients ≥ 4-feet in height:
→ Respiratory failure
→ Cardiac Arrest

Contraindications:
Caustic ingestions
Known esophageal disease

Indications for Removal:
→ Inability to confirm ventilation in ≤ 5-breaths with waveform CO_2
→ Significant gastric contents, secretions, or vomitus in the ventilation port, with absent CO_2 waveform

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_2 > 90%

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
Broslow: Orange	Orange	60 ml	2.5
Braolow: Green	Green	60 ml	2

- 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 $EtCO_2$ 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 $EtCO_2$ for every breath (use subjective confirmation techniques as appropriate)
- Add 10 ml to pilot balloon as needed, for suspected poor seal

Surgical Airway (Cricothyroidotomy)

ASSIST

Indications:

→ Failure to oxygenate and ventilate

Contraindications:

< 35 kg (Broslow: Green)

Pearls & Pitfalls:

→ Follow Advanced Airway Preparation Procedure

→ Utilize aseptic technique for all invasive procedures

ADVANCED

- Position supine-45° head elevation, head extended upward/backward
- Attach the needle to a sterile syringe if not already attached
- 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 cartilage
  - Stabilize the wrist/forearm of the inserting hand on the patient's chest
- Puncture the neck in the area of the depression
  - Make the initial insertion at a right angle to the trachea
  - Pull back on the plunger (successful if air bubbles are noted)

After initial puncture success:

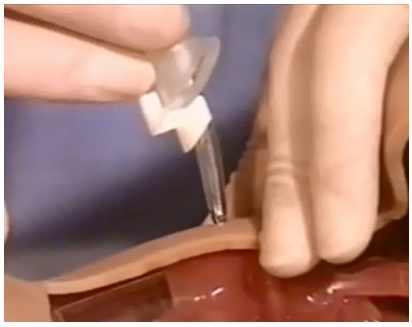
- Point tip of needle 45° toward the patient's feet
- Advance the device till contact is made with the stopper

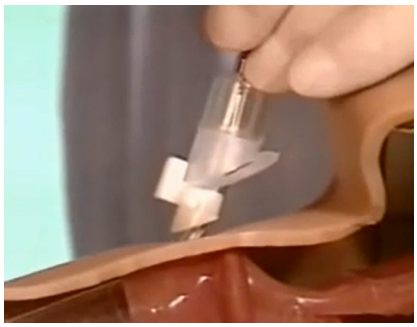
- Remove the introducer needle THEN advance the device fully
  - Till flange rests on the anterior neck
- Inflate the cuff via pilot balloon
- Secure around the back of the neck with provided strap
- Ventilate/Confirm using $EtCO_2$

Obscure Landmarks:

- Vertical incision– anterior neck (best estimate base of thyroid– cricoid ring)
- ID membrane via palpation (index finger into incision)

Patient will likely require retrograde intubation or full cricothyrotomy





Ventilation Rates:

titrate to SpO_2 >90 and eucapnia unless suspected severe metabolic acidosis

Synchronized Cardioversion

Indications:
Tachycardia resulting in:
→ Hemodynamic instability
→ End organ dysfunction
→ Hypotension; SBP < 90 or relative ↓BP

Contraindications:
→ Unsustained/intermittent tachycardias

Pearls & Pitfalls:
→ Withhold defibrillation until removed from standing water/conductive surfaces (metal)
→ Hands on defibrillation can result in energy transfer to the provider
→ Avoid implanted devices with defibrillator pads

As time allows:
→ Remove hair from pad
→ Administer sedative agent
(*use caution until hypotension is corrected*)

ASSIST

- Attach EKG monitoring electrodes (required for demand pacing)
- Adjust view to lead with most upright QRS
- Apply pads to patient's chest
  Use anterior-posterior placement for pediatrics
  +++Do not place pads over implanted devices+++
- Activate the "**SYNC**" function
- Adjust the monitored lead until a marker is above each QRS
- Charge to the appropriate energy setting:

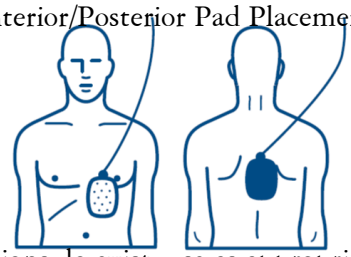
Adult	Pediatric/Infant
Highest energy setting available *No change (CPR or energy) for shocks from ICD*	0.5-1.0 joules/kg initial shock *Then* 2 joules/kg Shock

- Clear entire resuscitation team audibly
- Depress and hold the shock/discharge button till shock is delivered (expect delay)
- Evaluate rhythm/hemodynamic status, repeat as needed
- Treat other causes of hemodynamic instability
- Observe for signs of improved hemodynamics
- Treat other causes for poor hemodynamics

ADVANCED

- Midazolam, as appropriate for discomfort

Anterior/Posterior Pad Placement*



* variations do exist, use as appropriate for situation

Anterior Pad Placement

Taser Removal

Indications:
Embedded taser probes

Contraindications:
Probes located in:
→ Face
→ Eye
→ Neck
→ Nipple/areola
→ Genitals or perineum
Any probe in the provider's judgment requiring excessive force to remove

Pearls & Pitfalls:

HPI: Number and duration of shocks if known

Risk communication with Law enforcement:
Taser patients can have any of the following and be at risk for in custody death:
→ Excited delirium
→ Arrhythmia/sudden cardiac arrest
→ Rhabdomyolyis/kidney injury-failure

Procedure:
- Ensure crew and patient safety
- Stretch skin surrounding the probe site till tight
- Pull probe out of the skin in the opposite direction that it penetrated (use firm grip ± gauze)
- Clean and bandage puncture wound
- Discard probe in sharp safe container

CCP

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

Respiratory Distress

See Respiratory Distress for initiation of treatment

If respiratory distress amenable to NIPPV, consider

- BiPAP – IPAP 10 cmH_2O & EPAP 5 cmH_2O; titrate as appropriate; $EtCO_2$ Required

Seizure/Status Epilepticus

See Seizure/Status Epilepticus for all other all other treatment

If eclamptic seizure refractory to treatment, and if MAP >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 ≤ 180 and DBP ≤ 105

If not a candidate for tPA

- Only treat for SBP >220 or DBP >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 ≤ 150 or MAP ≤ 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 $EtCO_2$ required

	Adult	Pediatric
TV	6-8ml/kg ideal body weight	6-8ml/kg to adequate chest rise
Mode	Volume Control	Volume Control
FiO_2	30%-100% (Titrate O_2 to $SpO_2 \geq 90\%$)	100%
RR	12-16 Bpm (Titrate to $EtCO_2$ of 35-45 mmHg)	Peds:20-30, Adolescents:15 (Titrate to $EtCO_2$ of 35-45 mmHg)
PEEP	5 cmH_2O	5 cmH_2O
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_2 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 $\geq$ 5 cmH_2O

- Consider reducing PEEP by progressive 2 cmH_2O 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 ≥ 1° 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.

Intra-Aortic Balloon Pump (IABP) Procedure

The CCP will utilize a RN or perfusionist from the sending facility to maintain the IABP.

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_2 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_2. This will set the parameters for the CCP team regarding SpO_2. Some patients will not have, nor maintain an SpO_2 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 $EtCO_2$ at normal range of 35-45 mmHg or level prescribed by physician or patient condition. Some patients will not have an $EtCO_2$ 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 $EtCO_2$ 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_2.
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 (Enve/Impact)

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 CCP will utilize a RN from the sending facility to maintain the Impella Ventricular Assist device.

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. Document position of Impella as reported by sending facility. If possible, bring reports and/or imaging studies that document confirmation of placement.
2. Observe sheath site for signs of bleeding, swelling or hematoma.
3. Review last vital signs, presence or absence & location of pedal pulses.
4. Determine if the patient has chest discomfort, pain or shortness of breath.
5. The HOB should never be moved from the position it was originally established at. Movement of the HOB is the primary cause of migration of the Impella during transport. Most patients will need to remain flat throughout transport. Under no conditions is HOB ever to exceed 30°.
6. Refer to hemodynamic monitoring protocol for arterial line maintenance.

Precautions:

→ In sure that the stopcock on the peel-away introducer or repositioning sheath is always kept in the closed position. Significant bleeding can occur if the stopcock is left in the open position.

→ CPR should be initiated immediately per MedStar protocol if indicated for any patient supported by the impella. When initiating CPR, reduce the impella flow rate. When cardiac function has been restored, return flow rate to the previous level and assess placement signals on the controller

→ During defibrillation, do NOT touch the impella catheter, cables or automated imepella controller.

→ Infusion through the sideport 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.

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 > 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 ETC02 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 EtCo2, 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 Buretrol 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.

MIH

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_2, 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

Urgent/Emergent Treatment of Hyperkalemia
- Calcium Chloride - 1 g IV slow push
- Sodium Bicarbonate - 1 mEq/kg IV/IO (if suspected acidosis)

If Creatinine > 3mg/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 1bs. 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

Congestive Heart Failure (CHF) Protocol (Dosing Schedules)

Diuresis Dosing Schedule

2-3 lbs. over	3-5 lbs. over	>5 lbs. over
• Increase PO Lasix by 50% of daily dosing.	• Double PO Lasix x 2 Days. *Refer to K^+ dosing schedule below*	• Administer double the patients PO dose of Lasix as IVP x 1. • I.E. 40mg/PO = 80mg/IVP *Refer to K^+ dosing schedule below*
• MIHP follow-up in 24 hours.	• MIHP follow-up in 24 hours.	• MIHP follow-up in 4 hours.
• PCP notification	• PCP notification	• Extensivist / PCP follow up in 48 hours.
• Extensivist / PCP follow up in 48 hours.	• Extensivist / PCP follow up in 48 hours.	

Potassium Dosing Schedule:

K^+ = 2.5 -2.9	K^+ = 3.0 – 3.4	K^+ = 3.5-4.9	K^+ ≥ 5.0
Increase by 50% for the length of time patient has increased Lasix dosing.	Increase by 25% for the length of time patient has increased Lasix dosing.	No Change	Refer to protocol

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 < 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 ≥ 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 ≥ 300 mg/dl and symptomatic (e.g. AMS, signs of hypovolemia, suspected DKA or hyperosmolar state

  - Perform i-STAT

    If CO_2 < 16 or anion gap > 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.

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 PCO2
- 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.

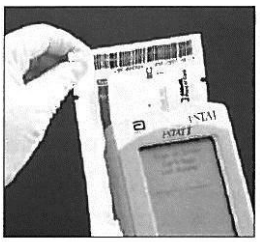
Screen 2

Screen 3

i-STAT Procedure

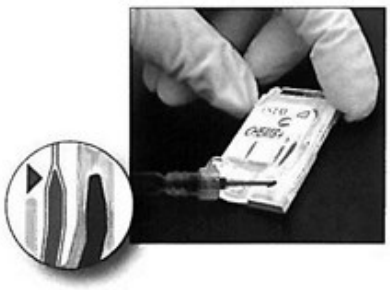
Scan the Lot Number on the cartridge pouch. Position the barcode 3-9 inches from the scanner window on the handheld. Press and hold "Scan" to activate the scanner. Align the laser light to cover the entire barcode. The handheld will beep when it reads the barcode successfully. If you cannot scan the 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.

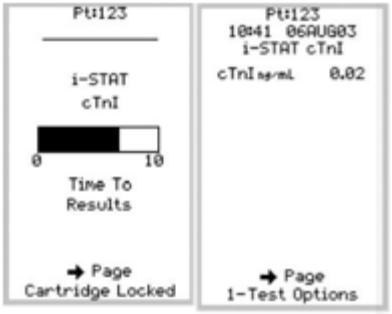
Mix blood and collection tube additives by inverting a tube gently at least ten times. Following thorough mixing of the sample, use a plastic capillary tube, pipette, or syringe to transfer sample from a tube to a cartridge. Direct the dispensing tip containing the blood into the sample well. Dispense 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.



Screen 4 *Screen 5*

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.

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.

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 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.

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.

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.

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

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)
- Through 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

Needle Thoracostomy

All runs involving the use of needle thoracostomy will 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

$EtCO_2$

$EtCO_2$ detector is expected to be used in the following circumstances:

- Respiratory distress (diff. breathing, or requiring > 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 CO2 detection or 4 phase waveform indicates an airway problem and should be assessed, documented, and resolved.

All advanced airways will require EtCO2 waveform data to be attached to the ePCR.

EtCO2 detector should remain in place throughout the entirety of the call

Ketamine

All intubations involving the use of ketamine will 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, EtCO2, and lung sounds
    - Post-administration and ongoing patient assessments (vitals, pulse ox, EtCO2, 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, dose, route, and time of midazolam use

Intubation (ETT or King LT)

All intubations will be reviewed for the following:

- Protocol compliance
- EtCO2 use throughout case
- Appropriate oxygenation prior to, during, and between attempts
- Appropriate length of attempt (<30 seconds)
- Use of cardiac monitoring during intubation
- Thorough documentation including:
  - Intubation indicators
  - Pre-intubation patient assessment, including vitals, pulse ox, EtCO2, and lung sounds
    - Post-intubation and ongoing patient assessments, including vitals, pulse ox, EtCO2, and Lung sounds
  - Depth (cm at teeth), size, and location of tube
  - Any adjuncts used to facilitate intubation (bougie, cricoid pressure)

Pain Management / IV opiates

All runs involving the use of pain management medication will be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO2 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

RAS / AMA

All runs resulting in non-transport will be reviewed for the following

- Protocol compliance
- Thorough documentation including:
  - Criteria for which a person qualifies for a RAS
- 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

Cardiac Arrest

All cardiac arrests will be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO2 monitoring throughout case
- High quality CPR metrics including:
  - Compression rate: 100 – 120 bpm
  - CCF ≥ 90%
  - Adequate depth percentage ≥ 90%
  - Adequate release percentage ≥ 90%
  - Individual interruptions in CPR ≤ 10 seconds
  - Placement of Mechanical CPR device ≤ 10 seconds
- Use of passive oxygenation
  - Completion of at least 6 minutes of CPR prior to advanced airway or supraglottic airway placement
  - Utilization of Pit Crew CPR
- Thorough documentation including:
  - Attachment of monitor data to ePCR

Ischemic Chest Pain/ACS/STEMI

All ischemic chest pain/ACS/STEMI runs will be reviewed for the following:

- 12-EKG interpretation, transmission, STEMI Alert, and attachment to chart
- ASA administration
- Nitroglycerin administration
- 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

External Cardiac Pacing

All runs involving external cardiac pacing will 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
  - 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

Epinephrine

All runs involving the use of epinephrine or epinephrine infusion will be reviewed for the following:

Protocol compliance

- Use of continuous EtCO2 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)

Antidotes

All runs involving the use of an antidote will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Indications for antidote use
  - Dose, route, and time of antidote given
  - Pre-administration patient assessment, including vitals
  - Post-administration and ongoing patient assessments, including vitals

CPAP

All runs involving the use of CPAP will be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO2 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, EtCO2, and lung sounds
  - Post-CPAP and on-going patient assessments, including vitals, pulse ox, EtCO2, and lung sounds

Stroke/CVA/TIA

All runs with suspected Stroke/CVA/TIA will 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

Synchronized Cardioversion

All runs with synchronized cardioversion will 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

Termination of Resuscitation

All runs involving the use of the Termination of Resuscitation protocol will be reviewed for the following

- Protocol compliance
- EtCO2 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 will 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

Altered Mental Status / CNS Depression

All runs with Altered Mental Status / CNS Depression will 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

Sedatives

All intubations involving the use of sedative will be reviewed for the following:

Protocol compliance

Thorough documentation including

- Dose, route, and time of sedative given
- Pre- and post-administration patient assessment (including vitals, pulse ox, EtCO2, and lung sounds)

Airway Management

All runs requiring airway management may be reviewed for the following

- Protocol compliance
- All advanced airway management (ETT or SGA) require EtCO2 monitoring and monitor data upload
- Thorough documentation including:
  - Airway management progression, device used, O2 flow rates, EtCO2 levels
  - Pre– and post-intervention patient assessment (vitals, pulse ox, EtCO2, and lung sounds)

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 ≤ 6

1 g PO

Pedi – Acute Pain Management

Basic

Pain ≤ 6

15 mg/kg PO (Max 1 g)

Contents

Medication	Class
Adenosine	Endogenous Nucleoside

Indications:	Contraindications:
→ Conversion of SVT:PAT to sinus rhythm → Identification of supraventricular rhythms (SVT:PAT vs. A. Flutter)	→ 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

IIRR 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 6mg)

Stable SVT:PAT

0.1 mg/kg rapid IV/IO (max 6mg)

IIRR 0.2 mg/kg x 1 (max 12 mg)

Stable SVT w/ BBB or accessory pathway

0.1 mg/kg rapid IV/IO (max 6mg)

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:	Contraindications:
→ Suppression of VF/pulseless VT refractory to defibrillation → Suppression of stable VT	→ 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
- Assist
  - Stable Ventricular Tachycardia
    - 150 mg IV over 10 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

Adult – Tachycardias
- Assist
  - Stable Ventricular Tachycardia
    - 5 mg/kg IV (max 150 mg) over 10 min

Contents

Medication	Class
Aspirin	Anti-inflammatory, platelet inhibitor

Indications:	Contraindications:
→ Chest pain or anginal equivalents suggestive of ACS	→ 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
    - IIRR to max dose 3 mg

Adult – Altered Mental Status/CNS Depression
- Advanced
  - Organophosphate poisoning
    - 2 mg IV/IM/IO
    - IIRR 4 mg q 3 minutes until signs of significant atropinization

Adult – Overdose/Poisoning
- Advanced
  - Organophosphate poisoning
    - 2 mg IV/IM/IO
    - IIRR 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)
    - IIRR x ?

Pedi – Altered Mental Status/CNS Depression
- Advanced
  - Organophosphate poisoning
    - 0.02 mg/kg IV/IM/IO
    - IIRR until signs of atropinization

Pedi – Overdose/Poisoning
- Advanced
  - Organophosphate poisoning
    - 0.02 mg/kg IV/IM/IO
    - IIRR until signs of atropinization

Contents

Medication	Class
Calcium Chloride (Adult)	Parenteral Mineral

Indications:	Contraindications:
→ Calcium channel blocker overdose → Hyperkalemia	→ 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
- Advanced
  - 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:	Contraindications:
→ Calcium channel blocker overdose → Hyperkalemia	→ 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

Advanced

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:	Contraindications:
→ Asthma	→ Advanced glaucoma
→ Wheezing	→ Systemic fungal infection
→ Barking cough/stridor	→ Hypersensitivity to dexamethasone

Protocol, Dosage, and Administration

Pedi – Respiratory Distress

Advanced

Wheezing/bronchospasm

0.6 mg/kg (max dose 16 mg)

Barking cough/stridor at rest or on exertion (croup)

0.6 mg/kg (max dose 16 mg)

Contents

Medication	Class
Dextrose 10%	Carbohydrate, Altered mental status
Indications:	Contraindications:
→ Hypoglycemia → Altered mental status	→ Hypoglycemia

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)

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:	Contraindications:
→ Control of rapid ventricular rates caused by atrial flutter → Atrial fibrillation	Hypotension Second or third-degree block Wide complex tachycardia Cardiogenic shock

Protocol, Dosage, and Administration

Adult – Tachycardias
Advanced
A-flutter or A-fib
0.25 mg/kg IV (max dose 20 mg)
IIRR 0.35 mg/kg (max dose 25 mg)
If rate control achieved: 5 mg/hr IV infusion

Contents

Medication	Class
Diphenhydramine	Antihistamine, Anticholinergic

Indications:	Contraindications:
→ Allergic reaction → Anaphylaxis → Acute dystonic reactions	→ Hypersensitivity to diphenhydramine

Protocol, Dosage, and Administration

Adult – Allergic Reaction/Anaphylaxis
- Assist
  - 50 mg IV/IM/IO

Adult – Overdose/Poisoning
- Advanced
  - 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:	Contraindications:
→ Cardiac arrest	→ Hypertension
→ Anaphylaxis	→ Hypothermia
→ Shock/hypotension	→ Coronary insufficiency
→ Severe allergic reaction	
→ Asthma	
→ Symptomatic Bradycardia	

Protocol, Dosage, and Administration

Adult – Shock/Hypotension
- Advanced
  - If suspected anaphylaxis/anaphylactic shock
    - 1 mg (10 mL) of 1:10,000 in 1L NS
    - Infuse @ 1-10 mcg/min
    - Titrate to effect by increasing/decreasing by 1 mcg/min q 2 min

Adult – Non-Traumatic Cardiac Arrest
- Assist
  - VF/VT
    - 1:10,000 - 1 mg IV/IO q 4 min
  - Asystole/PEA
    - 1:10,000 - 1 mg IV/IO q 4 min

Adult – Symptomatic Bradycardia
- Advanced
  - Shock/hypotension
    - 1-10 mcg/min IV/IO infusion
    - 16-18 IV and AC preferred
    - Titrate q 5 min
    - IIRR in 5 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)
- Advanced
  - In presence of signs of anaphylaxis/anaphylactic shock do not delay
    - 1 mg (10 mL) of 1:10,000 in 1L NS
    - Infuse @ 1-10 mcg/min
    - Titrate to effect by increasing/decreasing by 1 mcg/min q 2 min

Adult – Respiratory Distress
- Advanced
  - For asthma only, and if impending respiratory failure or unable to tolerate neb
    - 0.3 mg 1:1,000 IM

Contents

Medication	Class
Epinephrine (Pedi)	Sympathomimetic

Indications:	Contraindications:
→ Cardiac arrest	→ Hypertension
→ Anaphylaxis	→ Hypothermia
→ Shock/hypotension	→ Coronary insufficiency
→ Severe allergic reaction	
→ Asthma	
→ Symptomatic Bradycardia	

Protocol, Dosage, and Administration

Pedi – Shock/Hypotension
- Advanced
  - If suspected anaphylaxis/anaphylactic shock
    - 1 mg (10 mL) of 1:10,000 in 1L 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 IV/IO q 4 min (max dose 1 mg)
  - Asystole/PEA
    - 1:10,000 – 0.01 mg/kg IV/IO q 4 min (max dose 1 mg)

Pedi – Symptomatic Bradycardia
- Assist
  - While preparing for pacing
    - 1:10,000 – 0.01 mg/kg IV/IO (max dose 1 mg)
- Advanced
  - Shock/hypotension
    - 1:10,000 – 0.01 mg/kg IV/IO (max dose 1 mg)
    - IIRR 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 1L 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

Contents

Medication	Class
Fentanyl	Analgesic, Opioid

Indications:	Contraindications:
→ Severe pain	→ Opioid non-tolerance → Respiratory depression → Hemodynamic instability → AMS → Head trauma → Cervical spine trauma → OB emergency/anticipated delivery → 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)

IIRR x 2, titrate to pain relief and respiratory/hemodynamic status

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)

IIRR x 2, titrate to pain relief and respiratory/hemodynamic status

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 2 mg IV/IO x 2

Adult – Symptomatic Bradycardia
- Advanced
  - Beta-blocker overdose
    - 1 mg IV/IO slow push over 1 min
    - IIRR 2 mg IV/IO x 2

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 2 mg IV/IO x 2

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 2 mg IV/IO x 2

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 2 (max single dose 2 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 2 (max single dose 2 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 2 (max single dose 2 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 2 (max single dose 2 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:	Contraindications:
→ Conscious patient with suspected hypoglycemia	→ 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:	Contraindications:
→ Schizophrenia → Psychiatric Disease	→ Unconsciousness → Parkinson's Disease → Hypersensitivity to haloperidol

Protocol, Dosage, and Administration

Adult – Behavioral Emergencies/Excited Delirium

Advanced

Known psychiatric disease or ETOH intoxication

5 mg IM

IIRR x 1 after 15 min

Contents

Medication	Class
Hydralazine	Peripheral vasodilator
Indications:	Contraindications:
→ Eclampsia	→ Hypersensitivity to hydralazine

Protocol, Dosage, and Administration

CCP – Eclampsia

CCP

If refractory to treatment as per seizure protocol, MAP > 110

10 mg slow IV over 1 min

Contents

Medication	Class
Hydroxocobalamin	Antidote
Indications:	Contraindications:
→ Suspected cyanide poisoning	→ None

Protocol, Dosage, and Administration

Adult - Overdose/Poisoning/Adverse Drug Reaction

Assist

5g IV over 15 minutes, IIRR x 1; contact OLMC following initial dose

Pediatric - Overdose/Poisoning/Adverse Drug Reaction

Assist

0-2 years: 0.625 g IV over 15 minutes, IIRR x 1; contact OLMC following initial dose

3-5 years: 1.25 g IV over 15 minutes, IIRR x 1; contact OLMC following initial dose

6-13 years: 2.5 g IV over 15 minutes, IIRR x 1; contact OLMC following initial dose

Contents

Medication	Class
Ipratropium Bromide	Bronchodilator, Anticholinergic

Indications:	Contraindications:
→ Asthma → COPD → Emphysema → Acute bronchospasm	→ 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
Ketamine	Anesthetic Adjunct

Indications:	Contraindications:
→ Sedation → Induction agent in intubation	→ 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 – Symptomatic Bradycardia
- Advanced
  - If time permits and if adequate respiration, consider sedation prior to/during pacing
    - 0.5 mg/kg IV/IO/IN
    - IIRR x 2

Adult – Behavioral Emergencies/Excited Delirium
- Advanced
  - Excited delirium
    - 2 mg/kg IV (max single dose 200 mg)
    - Or 4 mg/kg IM (max single dose 500 mg)

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
- Advanced
  - If time permits and if adequate respiration, consider sedation prior to/during pacing
    - 0.5 mg/kg IV/IO
    - IIRR x 2

Pedi – Behavioral Emergencies/Excited Delirium
- Advanced
  - Excited delirium and unable to obtain behavioral control
    - 1 mg/kg IV
    - Or 2 mg/kg IM

Contents

Medication	Class
Lasix	Loop diuretic

Indications:	Contraindications:
→ Congestive heart failure	→ Hypersensitivity to lasix
→ Pulmonary edema	→ Hypersensitivity to sulfa drugs

Protocol, Dosage, and Administration

MIH – CHF

CCP/MHP

2-3 lbs over

Increase PO Lasix by 50% of daily dosing

3-5 lbs over

Double PO Lasix x 2 days

> 5 lbs over

Administer double the patients PO dose of Lasix as IVP x 1

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:	Contraindications:
→ Torsades de Pointes → Asthma → Seizures due to eclampsia	→ 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 50 mL NS over 10-15 min

Adult – Seizure/Status Epilepticus
- Advanced
  - If suspected eclampsia/peripartum seizure
    - 6 g IV over 15-20 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 10-15 min (max 2 g)

Contents

Medication	Class
Methylprednisolone	Adrenal Glucocorticoid

Indications:	Contraindications:
→ Severe anaphylaxis → Asthma → COPD	→ Hypersensitivity to methylprednisolone

Protocol, Dosage, and Administration

Adult – Allergic Reaction/Anaphylaxis
- Advanced
  - In presence of signs of anaphylaxis/anaphylactic shock do not delay
    - 125 mg IV/IM

Adult – Respiratory Distress
- Advanced
  - Asthma/COPD/Wheezing with subacute presentation
    - 125 mg IV/IM

Pedi – Allergic Reaction/Anaphylaxis
- Advanced
  - In presence of signs of anaphylaxis/anaphylactic shock do not delay
    - 1 mg/kg IV/IM (max 125 mg)

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:	Contraindications:
→ Sedation → Sympathomimetic overdose → Behavioral emergencies → Seizures	→ Depressed vital signs → Shock → Hypersensitivity to midazolam

Protocol, Dosage, and Administration

Adult – Respiratory Insufficiency/Failure and Drug Assisted Airway (DAA)
- Assist
  - 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
- Assist
  - If insufficient sedation after Ketamine OLMC
    - 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 dose 10 mg)

Adult – Behavioral Emergencies/Excited Delerium
- Assist
  - Behavioral emergency
    - 2.5 mg slow IV/IO or 5 mg IM/IN
    - IIRR x 1 after 5 min

Adult – Overdose/Poisoning
- Assist
  - Cocaine/amphetamine/stimulant/sympathomimetic
    - 2.5 mg slow IV/IO or 5 mg IM/IN
    - IIRR x1 after 5 min

Adult – Seizure/Status Epilepticus
- Assist
  - If actively seizing or in status epilepticus
    - 5 mg slow IV/IO or 10 mg IM/IN
    - IIRR x1 after 5 min

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:	Contraindications:
→ Sedation → Sympathomimetic overdose → Behavioral emergencies → Seizures	→ Depressed vital signs → Shock → Hypersensitivity to midazolam

Protocol, Dosage, and Administration

Pedi – Symptomatic Bradycardia
- Assist
  - If insufficient sedation after Ketamine OLMC
    - 0.05-0.1 mg/kg IV/IO/IN (max single dose 2 mg)
    - $EtCO_2$ required

Pedi – Behavioral Emergencies/Excited Delirium
- Assist
  - Behavioral emergency
    - 0.05 mg/kg slow IV/IO or 0.1 mg/kg IM/IN (max 0.5 mg/kg 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 x1 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 0.5 mg/kg total)
    - IIRR x 1 after 5 min

Contents

Medication	Class
Naloxone	Opiod antagonist

Indications:	Contraindications:
→ Opiate overdose with CNS depression → Coma of unknown origin	→ 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
    - 0.4 mg IV/IM
    - IIRR in 0.4 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
    - 0.4 mg IV/IM
    - IIRR in 0.4 mg increments q 5 min to 4 mg max total dose

Pedi – Altered Mental Status/CNS Depression
- Basic
  - If suspected opiate intoxication
    - 0.1 mg/kg IN (max dose 0.4 mg))
    - IIRR q 5 min to 2 mg max total dose
- Assist
  - If suspected opiate intoxication
    - 0.1 mg/kg IV/IM/IN (max dose 0.4 mg)
    - IIRR q 5 min to 2 mg max total dose

Pedi – Overdose/Poisoning
- Basic
  - If suspected opiate intoxication
    - 0.1 mg/kg IN (max dose 0.4 mg))
    - IIRR q 5 min to 2 mg max total dose
- Assist
  - If suspected opiate intoxication
    - 0.1 mg/kg IV/IM/IN (max dose 0.4 mg)
    - IIRR q 5 min to 2 mg max total dose

Contents

Medication	Class
Nicardipine	Antihypertensive, Calcium channel blocker

Indications:	Contraindications:
→ CVA	→ Hypersensitivity to nicardipine → Aortic stenosis

Protocol, Dosage, and Administration

CCP – Stroke/CVA/TIA

CCP

If acute neurologic deficit and MAP > 130

25 mg in 250 mL NS at 5-15 mg/hr

Acute Ischemic Stroke – titrate to SBP ≤ 180 and DBP ≤ 105

If not a candidate for tPA, only treat for SBP >220 or DBP >120

Acute Hemorrhagic Stroke - titrate to SBP ≤ 150 or MAP ≤ 100

If MAP drops 25% or more decrease by 2.5 mg/hr

Contents

Medication	Class
Nitroglycerin	Nitrate, Coronary vasodilator

Indications:	Contraindications:
→ Acute angina → Ischemic chest pain → Congestive heart failure pulmonary edema	→ 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 ≥ 100 and signs/symptoms

Assist

0.4 mg SL q 5 min

Titrate to SBP ≥ 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 ≥ 100 and signs/symptoms

Assist

0.4 mg SL q 5 min

Titrate to SBP ≥ 100 and signs/symptoms

Contents

Medication	Class
Norepinephrine	Sympathomimetic, Vasopressor
Indications:	Contraindications:
→ Hypotension	→ Hypotension secondary to blood volume deficit

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 @ 2-10 mcg/min

Titrate to SBP > 90 and signs of improved perfusion

Contents

Medication	Class
Ondansetron	Antiemetic
Indications:	Contraindications:
→ Nausea and vomiting	→ Hypersensitivity to ondansetron

Protocol, Dosage, and Administration

Adult – Acute Pain Management
- Advanced
  - 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/ODT
    - IIRR x 1

Adult – Nausea and Vomiting
- Assist
  - 4 mg IV or if not actively vomiting may give ODT
  - IIRR x 1 after 10 min

Pedi – Acute Pain Management
- Advanced
  - For active nausea/vomiting
    - 0.15 mg/kg IV (max dose 4 mg)
  - If not actively vomiting
    - 8-15 kg – 2 mg ODT
    - 16-30 kg – 4 mg ODT
    - IIRR x 1 after 10 min

Pedi – Nausea and Vomiting
- Assist
  - For active nausea/vomiting
    - 0.15 mg/kg IV (max dose 4 mg)
  - If not actively vomiting
    - 8-15 kg – 2 mg ODT
    - 16-30 kg – 4 mg ODT
    - IIRR x 1 after 10 min

Contents

Medication	Class
Oxytocin	Pituitary hormone, Uterine stimulant
Indications:	Contraindications:
→ Postpartum hemorrhage	→ Hypersensitivity to oxytocin

Protocol, Dosage, and Administration

OB/Gyn – Emergency Childbirth

Advanced

If postpartum hemorrhage

10 units in 500 mL NS IV

Run wide open or until bleeding controlled

Contents

Medication	Class
Potassium	Electrolyte
Indications:	Contraindications:
→ Hypokalemia	→ 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

CCP

If hemodynamically stable (SBP > 90) and requiring sedation (Interfacility only)

10-100 mcg/kg/min, titrate as appropriate

Contents

Medication	Class
Rocuronium	Non-depolarizing Neuromuscular Blocker
Indications:	Contraindications:
→ Paralysis for intubation → Contraindication to succinylcholine	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_2 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:	Contraindications:
→ Known or suspected acidosis → TCA overdose → Hyperkalemia	Alkalosis Hypocalcemia

Protocol, Dosage, and Administration

Adult – Non-Traumatic Cardiac Arrest
- Advanced
  - History suggestive of prolonged acidosis
    - 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/Excited Delerium
- Advanced
  - For provider witnessed sudden cardiac arrest associated with prolonged agitation/excited delirium
    - 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
- Advanced
  - 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:	Contraindications:
→ Known or suspected acidosis → TCA overdose → Hyperkalemia	Alkalosis Hypocalcemia

Protocol, Dosage, and Administration

Pedi – Non-Traumatic Cardiac Arrest
- Advanced
  - History suggestive of prolonged acidosis
    - 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
- Advanced
  - 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:	Contraindications:
→ Paralysis for intubation	→ Hypersensitivity to succinylcholine → History of malignant hyperthermia → Risk of, or suspected hyperkalemia: Burns > 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

CCP – Respiratory Insufficiency/Failure & Drug Assisted Airway (DAI)

CCP

If no advanced airway in place, and if insufficient sedation to attempt direct laryngoscopy for intubation

2 mg/kg IVP

Contents

Medication	Class
Thiamine	Vitamin B1
Indications:	Contraindications:
→ Altered mental status → Coma of unknown origin → Malnutrition with history of alcoholism	→ Hypersensitivity to thiamine

Protocol, Dosage, and Administration

Adult – Altered Mental Status/CNS Depression

Advanced

If history or signs of alcoholism/malnourishment and suspected Wernicke's encephalopathy

100 mg IV/IM

Contents