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*Title Page, Preface, and Medical Director Authorization Page was moved to the end of the document for end user ease of use. Print Versions of this protocol normally has these pages in the front of the document. Any issues with this digital copy, please contact your Clinical Manager.

EXPRESS AMBULANCE SERVICE
A Global Medical Response Solution

Revisions

2023-11-14_Rev 1 - Changed page 6 titled "This Page Left Blank" to "Revisions". Removed page titled "Hypertensive Crisis". Replaced page titled "Stroke/TIA' with new protocol. Removed page 78 titled "Labetalol". Updated Table of Contents, Page Numbers and digital version hyperlinks. - Reggie Yancey, Terry Harris

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LEGEND

DEFINITION

GOALS

Decision/ Question

Standing Order

Go to a Clinical Guideline

Assessment Tools

A	Adult Medication
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Directive

Callout

Information Box

Information Box

Caution Box

Pearls

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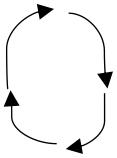
And



These symbols are used to denote the clinician's ability to alternate and change the course of the standing orders as needed based on patient condition and presentation.

Lowest Scope of Practice Level Per Medication Administration Protocol:

BASIC
ADVANCED
PARAMEDIC

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Initial Patient Assessment

I. Scene Size-up

A. Review Dispatch information
B. Assess need for BSI
C. Assess scene safety
D. Determine mechanism of injury/illness
E. Determine number and location of patients
F. Determine need for additional resources

II. Initial Assessment

A. General impression of patient
B. Assess AVPU (alert, voice, pain, unresponsive)
C. Assess C-circulation (pulse, major bleeding, skin color, capillary refill)
D. Assess A-airway
E. Assess B-breathing (mechanical “ventilation” and gaseous “respiration”)
F. Assess D-disability (Stroke/Neurological assessment as needed)
G. Expose/Examine/Exposures (Rapid assessment of head, neck, chest/back, abdomen, pelvis, extremities & prevent hypothermia as needed)
H. Identify priority patients (rapid scene time and transport)

III. Initial Management

A. Adult Medical Care
B. Adult Trauma Care
   1. Trauma Score
   2. GCS
C. Pediatric Medical Care
D. Pediatric Trauma Care
   1. Trauma Score
   2. GCS

Initial Patient Assessment

IV. Secondary Assessment

A. Medical Assessment
   1. Detailed Exam – when chief complaint or presenting problem cannot be established
   2. Focused Exam – when chief complaint or presenting problem can be established

B. Trauma Assessment
   1. Detailed Exam - when chief complaint or presenting problem cannot be established
   2. Focused Exam – when chief complaint or presenting problem can be established

C. Assess vital signs
   1. Respirations
   2. Pulse
   3. Blood pressure
   4. Capillary refill time
   5. Skin condition (color, temperature, moisture)
   6. Lung sounds

D. Obtain medical history (SAMPLE)
   1. S-symptoms (OPQRST)
      a. O-onset
      b. P-provocation/palliation
      c. Q-quality
      d. R-radiation, referred
      e. S-severity
      f. T-time
   2. A-allergies
   3. M-medications
   4. P-past medical history (pertinent)
   5. L-last oral intake
   6. E-events leading to illness or injury

V. Other assessment techniques

A. ECG monitoring
B. Continuous 12-lead monitoring and analysis
C. SpO_2 monitoring
D. Capillary Blood Glucose
E. Temperature monitoring
F. $EtCO_2$
G. Non-Invasive Blood Pressure monitoring
H. Respiration monitoring

Adult Routine Medical Care

1. Complete “Initial Patient Assessment”
2. Universal Patient Care/Initial patient contact guideline
3. Obtain and document vital signs (at least 2 on all patient encounters in which the patient receives treatment) to include: BP, pulse, respirations, SpO_2, $EtCO_2$, capillary refill time, skin condition, pain scale, CBG, Temperature and GCS/Trauma scores (when appropriate).
4. Other assessment techniques “Initial Patient Assessment”
5. EKG as indicated, 12-Lead on all suspected AMI and any patient >35 y/o with CAD risk factors
6. Chest pain, or “discomfort”, is present in two out of three patients with acute MI. Atypical presentations (commonly seen in diabetics, females, and geriatric patients) include the following ANGINAL EQUIVALENTS: respiratory distress, syncope, unexplained weakness, diaphoresis, palpitations, epigastric pain, and nausea. 12 leads MUST be performed on anyone with anginal equivalent.
7. Vascular access:
    a. By standing order
    b. At the discretion of the EMS clinician
    c. A saline lock or an infusion
    d. IO in place of IV
    e. Infusions are recommended in cardiac arrests or any situation that could potentially require a fluid resuscitation (i.e. trauma, shock, OB)
8. Medications are administered by the most appropriate route but can be administered by any route listed “for that medication,” in the formulary as the patient’s situation may dictate. The use of an alternate route is by standing order.
    a. All patients receiving medications shall be monitored with an ECG, NIBP and SpO_2.
    b. Medication will be administered by the clinician preparing the dosage to be given.
    c. The clinician will verify that the patient is receiving the right medication, at the right time, via the right route and in the correct dose.
9. While treating under a standing order guideline, if the prevailing condition resolves, it is not necessary to contact medical control to discontinue treatments as long as cessation of the condition is well documented.
10. While treating under a standing order guideline, if the prevailing condition does not resolve after all “standing orders” have been accomplished, contact medical control for advice or additional orders.
11. All patients are to be transported to the hospital of their choice unless their condition warrants the nearest and/or more appropriate medical facility. **LERN is to be used by the clinician to determine destination choice when LERN criteria is met.**
12. An ePCR will be completed at the conclusion of each patient encounter when a medical evaluation for any illness or injury was performed.
13. Consider abuse/neglect in any case of unexplained or suspicious trauma.
14. It is the clinician’s legal responsibility to report suspected abuse or neglect to a protective service.
15. All policies and procedures outlined in the Operations Policy and procedure Manual apply to all Clinical Guidelines.

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Pediatric Routine Medical Care

1. Complete "Initial Patient Assessment"
2. Pediatric guidelines will be applied to all patients less than 12 years of age, or less than 100 lbs. However, signs of puberty and the size and weight of the patient must be taken into consideration when determining whether to use "adult" or "pediatric" treatment plans.
3. A length based resuscitation tape or pediatric resuscitation system will be utilized to determine equipment size, medication dosages, and weight estimates on pediatric patients (Broselow, Handtevy).
4. Universal Patient Care/Initial patient contact guideline
5. ECG as indicated
6. Obtain and document vital signs (at least 2 on all patient encounters in which the patient receives treatment) to include: BP, pulse, respirations, SpO_2, $EtCO_2$, capillary refill time, skin condition, pain scale, CBG, Temperature and GCS/Trauma scores (when appropriate).
7. Vascular access:
    a. By standing order
    b. At the discretion of the EMS clinician
    c. A saline lock or an infusion
    d. Fluid boluses are 10ml/kg for 0-1 months, and 20 ml/kg for 1 month and older
    e. IO in place of IV
    f. Infusions are recommended in cardiac arrests or any situation that could potentially require a fluid resuscitation (i.e. trauma, shock).
8. Medications are administered by the most appropriate route but can be administered by any route listed "for that medication," in the formulary as the patient's situation may dictate. The use of an alternate route is by standing order.
    a. All patients receiving medications shall be monitored with an ECG, NIBP and SpO_2.
    b. Medication will be administered by the clinician preparing the dosage to be given.
    c. The clinician will verify that the patient is receiving the right medication, at the right time, via the right route and in the correct dose.
9. While treating under a standing order guideline, if the prevailing condition resolves, it is not necessary to contact medical control to discontinue treatments as long as cessation of the condition is well documented.
10. While treating under a standing order guideline, if the prevailing condition does not resolve after all "standing orders" have been accomplished, contact medical control for advice or additional orders.
11. All patients are to be transported to the hospital of their choice unless their condition warrants the nearest and/or more appropriate medical facility. **LERN is to be used by the clinician to determine destination choice when LERN criteria is met.**
12. An ePCR will be completed at the conclusion of each patient encounter when a medical evaluation for any illness or injury was performed.
13. Consider abuse/neglect in any case of unexplained or suspicious trauma.
14. It is the clinician's legal responsibility to report suspected abuse or neglect to a protective service.
15. All policies and procedures outlined in the Operations Policy and Procedure Manual apply to all Clinical Guidelines.

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Universal Patient Care/Initial Patient Contact

This guideline is intended for ANY patient encounter where an assessment is performed. This guideline serves as a definitive approach encompassing various assessment tools and observations the medical clinician may use to provide treatment. Assessment tools are grouped into two Tiers. Tier one is a baseline, mandatory acquisition on all patient encounters. Tier two is an expanded group of assessment tools the clinician may use as clinically indicated dependent upon patient presentation, condition, or procedures/treatments rendered. These two tier groups define a patient's "vital sign". A Minimum (2) sets of Tier One Vital Signs are to be obtained on every patient encounter. *

*Extenuating circumstances where (2) sets of V.S. are unable to be obtained may include: patient walk-off/refusal of care, MCI, and/or certain safety situations.

GOALS

- Scene size-up and determine need for additional resources
- Initial Patient Assessment to identify any compromise to airway, breathing, circulation
- Ongoing Patient Assessment to reevaluate interventions and assess for status changes

Universal Assessment:

Scene size up: Evaluate for Hazards/precautions, Mass Casualty, Additional resources, Equipment required/needed.
Primary assessment: Evaluate General impression, Airway, Breathing, Circulation, Disability, Exposure and address threats to life.
Secondary Medical assessment: History of present illness, Chief Complaint, Focused Exam versus Detailed Exam
Secondary Trauma assessment: Mechanism of Injury, Chief complaint, Focused Exam versus Detailed Exam

TIER ONE Assessment Tools:

AVPU scale
Blood Pressure
Heart Rate/Pulse Rate
Respiratory Rate & Quality
Pain Scale

TIER TWO Assessment Tools

GCS indications: Any patient presenting with altered mental status, neurological insult, high index trauma requiring trauma center activation
SpO_2 indications: Patients presenting with hypoxia and/or hypercapnia in any form, patients suspected of presenting with hypoxia and/or hypercapnia in any form, any patient receiving respiratory drive altering medications, any patient receiving advanced airway interventions and/or requiring ventilation, and high index trauma requiring trauma center activation
$ETCO_2$ indications: The same indications as SpO_2 and/or, patients with acid/base disruptions, patients with circulation and/or metabolic disruptions
CBG indications: Any patient that presents (or did present) with altered mental status, suspected stroke, shock, dizziness, syncope, near syncope, seizure, weakness leading up to 911 activation, or who is unresponsive; Known diabetic patients with a "diabetic complication complaint"
Temperature indications: Any patient exposed to environmental excessive heat/cold, R.O.S.C. achieved with targeted temperature management, burn patients, multi-systems trauma patients, suspicion of infection, excited delirium presentation, overdose patients, patients receiving paralysis/sedation induction agents, altered mental status, seizure
CO indications: Patient with CO poisoning presentation/suspicion
EKG 3 lead indications: Patients with a respiratory and/or possible cardiac complaint/presentation; typical, atypical, or contributing factors; Patients receiving medications that may have cardiovascular effects; Electrical insults (lightning strikes, electricity contact)
EKG 12 lead indications: Patients with a respiratory and/or possible cardiac complaint/presentation; typical, atypical, or contributing factors; Patients receiving medications known to cause cardiovascular effects; EVERY PATIENT THAT ACHIEVES R.O.S.C.
Revised Trauma Score indication: Any ADULT patient with high indexed trauma, requiring trauma center activation
Pediatric Trauma Score indication: Any PEDIATRIC patient with high indexed trauma, requiring trauma center activation
Orthostatic BP/HR indication: Any patient exhibiting signs and symptoms of dehydration/hypovolemia.

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Vascular Access

A procedure to establish a portal of entry into the patient's vascular space. Vascular access indications include medication administration, volume replacement, or the anticipation that any of the before mentioned may become indicated. Vascular access sites may be initiated at the discretion of the clinician for any patient via Standing Order. Vascular access sites may be accompanied by either a Saline Lock or an infusion-maintained at a "KVO" rate. Acceptable vascular sites include extremity/peripheral, intraosseous, and external jugular.

Assess Site Guidelines

Extremity

-Any patient where vascular access is indicated

Intraosseous

-Recommended for use on adult and pediatric patients any time vascular access is difficult to obtain in emergent, urgent or medically necessary situations

External Jugular

-Critically ill patients who require rapid vascular access for fluid resuscitation or medication administration into central circulation or in whom an extremity site is unavailable, or site is non-suitable for correct bore size

-Any life-threatening events where no obvious and/or adequate peripheral access site is available

Pearls

- The clinician must exhibit sound clinical judgment regarding access site with respect to patient pre-existing conditions. Some examples include but are not limited to: dialysis shunt, orthopedic surgeries, age of patient, cancers, etc.
- 25mm IO needle should be used on all patients 3kg or more. Note the notches are at 15 20 and 25 mm. For pediatric pts stop at 15 mm notch.

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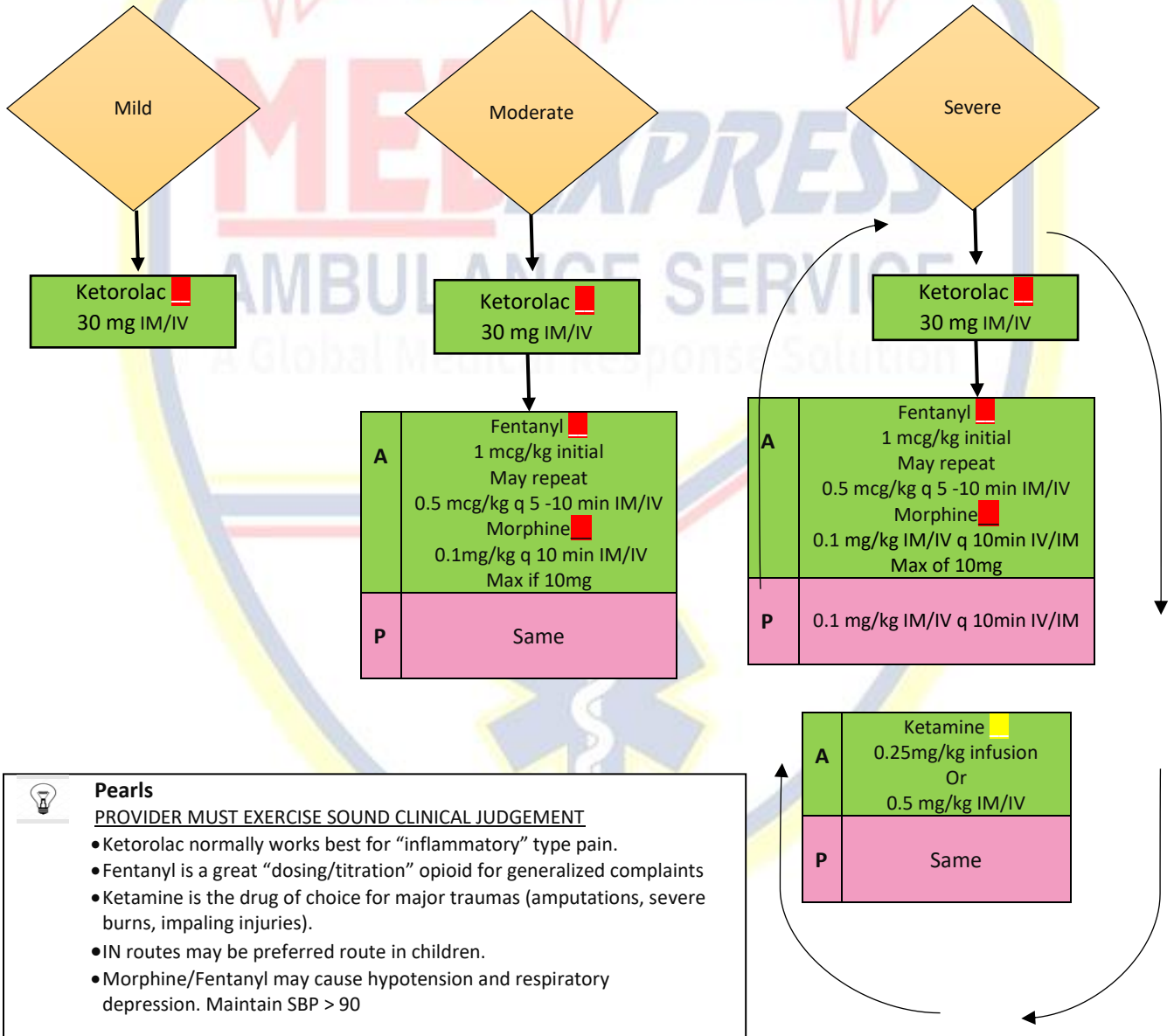
Pain Management

The process of medical care that alleviates or reduces all levels of pain

GOALS

-Reduction and control of pain to an acceptable level
-Identify and address the pain source
-Treat non-invasively and invasively as MUCH as needed



Pearls

PROVIDER MUST EXERCISE SOUND CLINICAL JUDGEMENT

- Ketorolac normally works best for "inflammatory" type pain.
- Fentanyl is a great "dosing/titration" opioid for generalized complaints
- Ketamine is the drug of choice for major traumas (amputations, severe burns, impaling injuries).
- IN routes may be preferred route in children.
- Morphine/Fentanyl may cause hypotension and respiratory depression. Maintain SBP > 90

This guideline is a RELATIVE guideline allowing increase of provider response for patient care.

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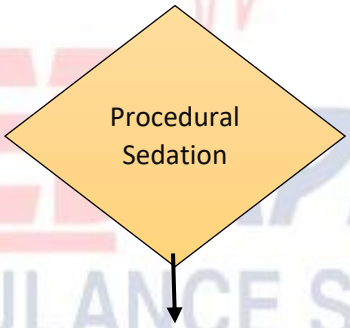
Procedural Sedation

Procedural sedation may be necessary to reduce anxiety and discomfort during certain procedures such as Transcutaneous Pacing, Synchronized Cardioversion, Extrication, Splinting Fractures, etc.

GOALS

-Reduce/prevent procedure induced anxiety/discomfort
-Appropriately sedate patient without compromising hemodynamic stability
-Maintain independent ventilatory function and patent airway



A	Midazolam 2-4 mg q 5 min [redacted] Max of 10 And/or Ketamine 1 mg/kg IV
P	Midazolam 0.05-0.1mg/kg q 5 min [redacted] And/or Ketamine 1 mg/kg IV

Pearls

- Continuous assessment of patient's respiratory and perfusion status should be performed.
- If patients are hemodynamically compromised, exercise caution before administering medications that can suppress the central nervous system. Ketamine may be a better option.
- Patient should be easily arousable to verbal stimulus. Avoid deep sedation.
- EKG monitoring

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Airway/Oxygenation

This guideline is intended for ANY patient encounter whereas clinical signs and symptoms have supported the use of oxygen carrying devices. Each oxygen application device indication is based upon the type of hypoxia needing to be corrected (hypoxic, hypemic, histotoxic, stagnant) and/or hypercapnia. Furthermore, should the patient condition present and/or worsen, warranting airway stabilization, this guideline outlines various adjuncts available to support and/or maintain a patent airway. The airway adjuncts may be utilized by the trained clinician at his/her skill level based upon patient presentation, condition, or procedures/treatment rendered via standing order.

Nasal Cannula Indication: Mild to moderate hypoxia correction applicator at flow rates of 2-6 lpm. Pre-intubation oxygenation using an apneic oxygenation technique at a flow rate of 15 lpm or higher; used in conjunction with another oxygen carrying applicator in the pre-oxygenation phase of elected intubations.
Nebulizer Indication: Mild to moderate hypercapnia correction applicator at flow rates of 6-8 lpm used to deliver bronchodilator and anti-cholinergic medications.
Non-Rebreather mask indication: Moderate to severe hypoxia correction applicator at flow rates of 10-15 lpm. Used in conjunction with a nasal cannula in the pre-oxygenation phase of elected intubations.
CPAP indication: Moderate to severe hypoxia correction applicator at rates of 5-10 cm H_2O. Enables airway splinting to correct hypercapnia at low rate pressures. At higher pressures, physiologic changes occur at the cellular and end organ level within the pulmonary/ cardiovascular system resulting in increased surface area tension of the lungs, decreased preload to the heart due to intrathoracic pressure increase, and improved diffusion through a liquid median. Can be used in conjunction with a nasal cannula.
Bag valve mask indication: Severe hypoxia, Respiratory arrest/failure, device used for positive pressure ventilation and the pre-oxygenation phase prior to advanced airway placement, may be used in conjunction with a nasal cannula.

Head Tilt Chin Lift: A manual and simple technique for opening an airway in the medical patient.
Modified Jaw Thrust: A manual and simple technique for opening an airway in the trauma patient. Can cause fatigue for the clinician during long durations of application.
Nasopharyngeal Airway: A basic life support adjunct introduced nasally to displace and prevent the tongue from resting on the back of oropharynx.
Oropharyngeal Airway: A basic life support adjunct introduced via mouth to displace the tongue up and away from tracheal opening.
Supraglottic Airway: An advanced airway that is blindly introduced through the oropharynx passageway resting in the supraglottic space allowing ventilation to the trachea.
Nasotracheal Intubation: An advanced airway that is introduced nasally into the trachea in instances where orotracheal intubation is not possible.
Orotracheal Intubation: An advanced airway introduced via oropharynx passageway into the trachea.

Pearls:

- **Hypoxic Hypoxia**- Failure of oxygen molecules from the atmosphere to diffuse in the lungs from alveoli to arterial blood. Think: CHF.
- **Hypemic Hypoxia**- The capacity of blood to carry oxygen is reduced. Think: anemia, blood loss and CO poisoning.
- **Histotoxic Hypoxia**- A failure of oxygen cellular delivery and/or exchange. Think: cyanide poisoning.
- **Stagnant Hypoxia**- A failure of adequate blood circulation. Think: various forms of shock and increasing intrathoracic pressure.

Oxygenation: Oxygen is considered a drug for medical use. Hyperoxia is debated regarding its effects. Oxygen is proven to increase blood pressure by increasing total peripheral vascular resistance due to systemic peripheral vasoconstriction. It is also reported to decrease intracranial pressure. This improves brain oxidative metabolism in severe head injury patients. However, because of the systemic immune response, ischemic changes may occur regarding reperfusion mechanisms. Thus, because of the disparity with oxygen clinical indications, delivery methods, and body system changes, clinicians should strive for a SpO_2 of between 94-99% with exception to Stroke/TIA, ACS, and patients with a lung disease history.

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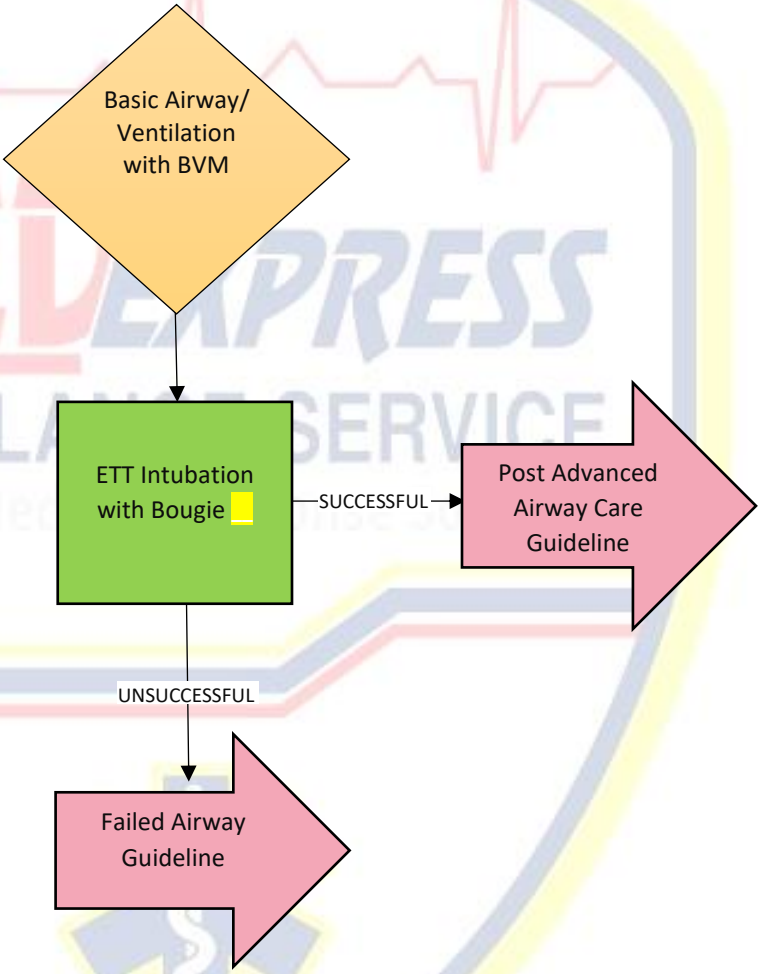
Crash Airway

Unresponsive; Unreactive; Near-Death

GOALS

- Provide positive pressure ventilation
- Secure and protect airway from aspiration
- Ensure adequate oxygenation to maintain SpO_2 above 90%



Crash Airway Criteria:

- Inability to maintain airway patency.
- Inability to protect airway against aspiration.
- Failure to oxygenate/ventilate.

Pearls

- If first attempt at endotracheal intubation is unsuccessful, proceed to Failed Airway Guideline.
- Maintain *apneic oxygenation* with high flow nasal cannula until airway/ventilation can be established.

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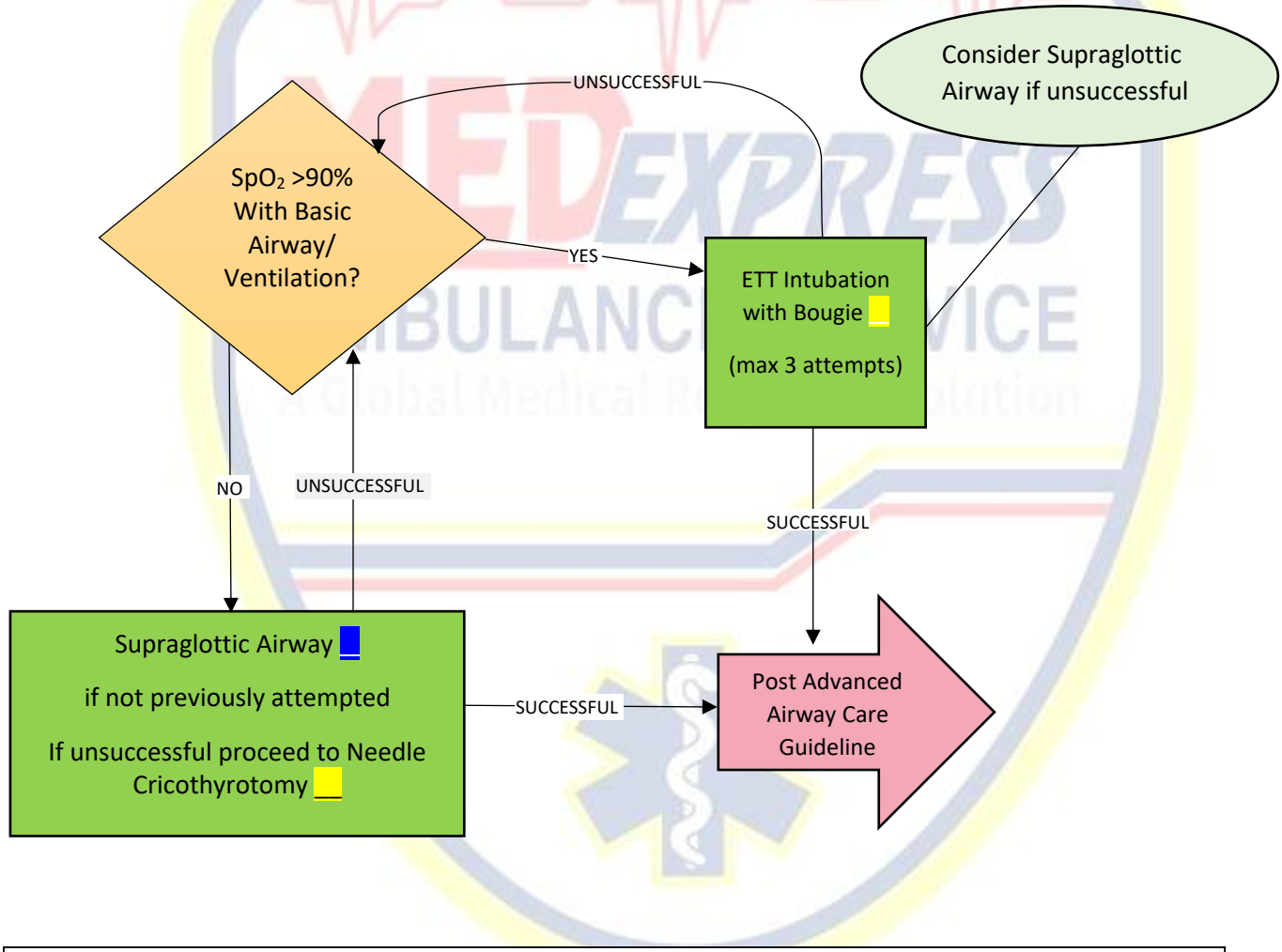
Failed Airway

Can't intubate. Can't oxygenate. Can't ventilate.

GOALS

- Provide positive pressure ventilation
- Secure and protect airway from aspiration
- Ensure adequate oxygenation to maintain SpO_2 above 90%



Pearls

- In some situations, the provider may elect to bypass certain airways: when clinical presentation excludes their use; when clinical presentation dictates; and when endotracheal intubation and supraglottic airway placement would most likely prove ineffective.
- It is acceptable to maintain oxygenation/ventilation with basic airway equipment and bag valve mask if deemed effective.
- It is also acceptable to pause the algorithm if the patient's SpO_2 is improving and restart it as needed.
- Maintain apneic oxygenation with high-flow nasal cannula until airway can be established.

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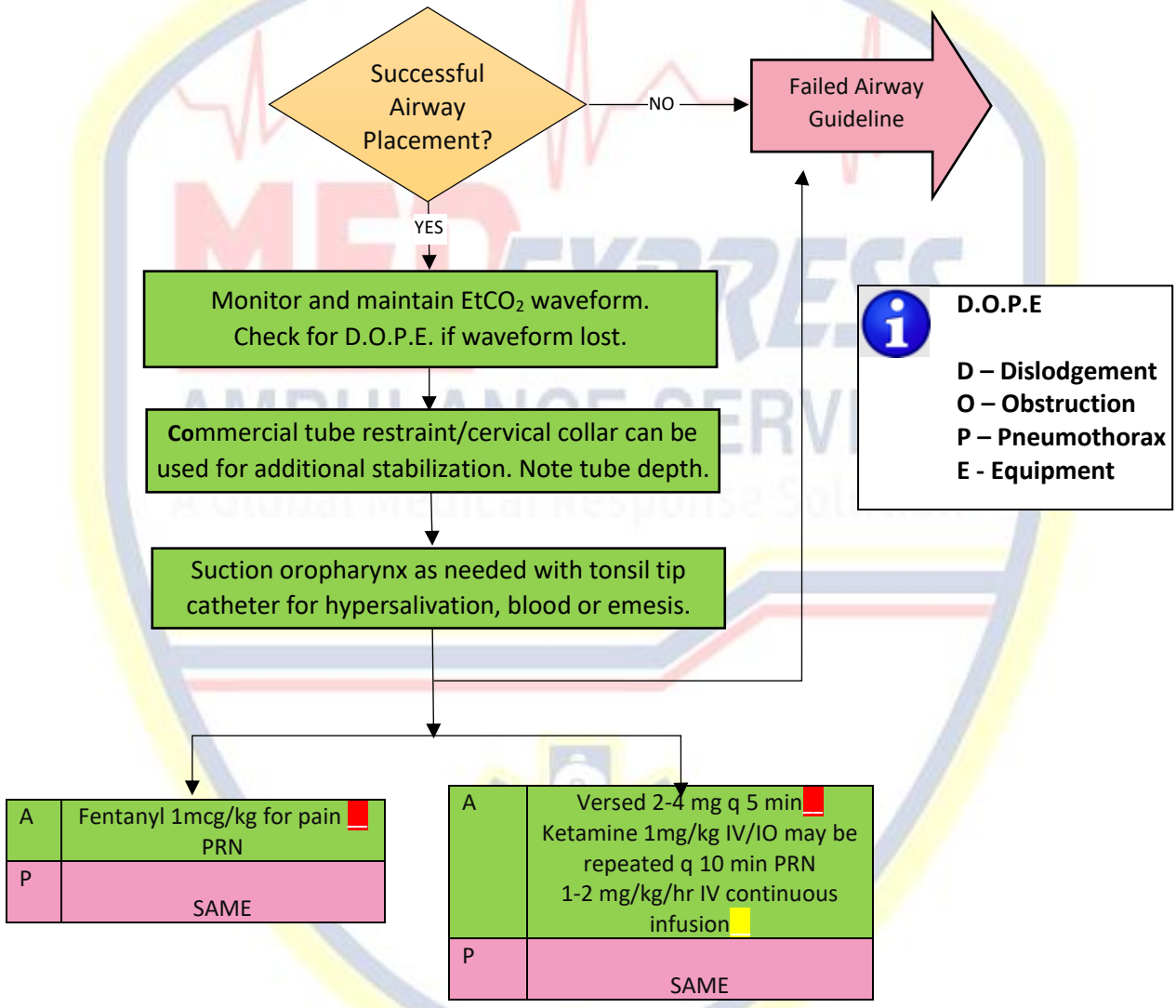
Post Advanced Airway Care

Patients with advanced airway placement requiring maintenance to ensure and maintain proper placement.

GOALS

- Confirmation and continuous monitoring of airway placement
- Provide comfort and tolerance to the patient requiring airway placement



Pearls

- Airway must be reassessed each time the patient is moved and frequently during patient care.
- It is imperative to use waveform capnography and capnometry when an advanced airway is placed to continuously monitor patency and appropriate placement.
- $EtCO_2$ monitoring will not identify endobronchial intubation.
- Unresponsive patients still have a physiological response to pain even though they cannot communicate painful stimulus. Pain management should be considered.

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Do Not Resuscitate

This guideline is to be used in the determination to withhold resuscitation in a patient with obvious signs of death or possible qualifying criteria.

GOALS

- Prevention of futile attempts at resuscitation when patients present clinically deceased

Presumptive Signs of Death:

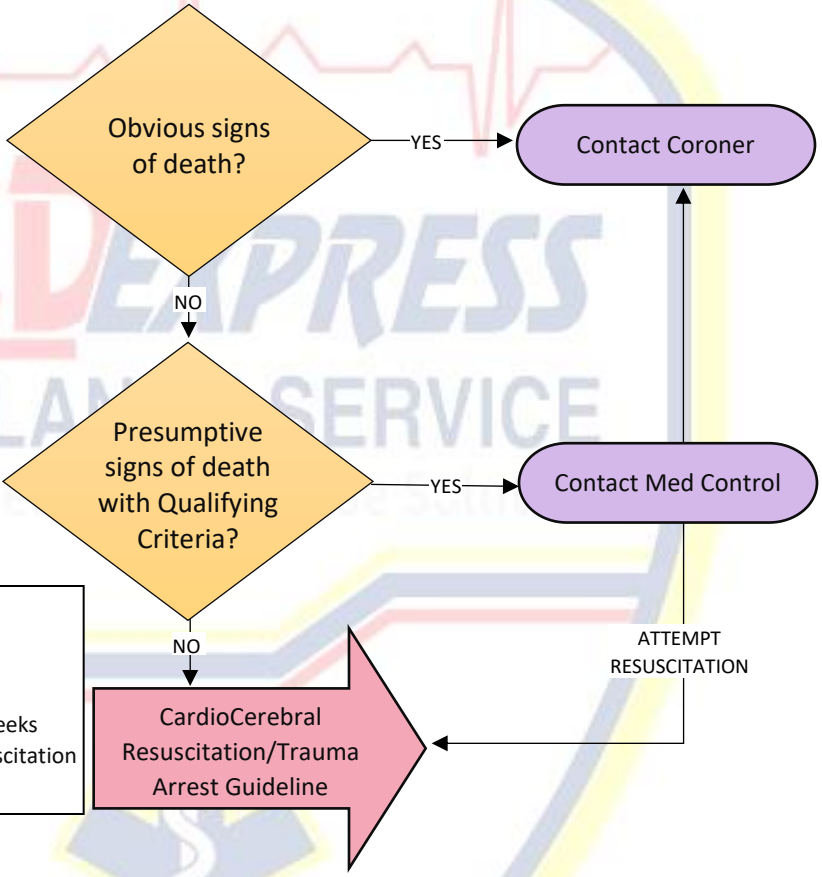
- Unresponsive
- Pulseless
- Apneic
- Fixed/Dilated Pupils

Obvious Signs of Death:

- Tissue Decomposition
- Lividity
- Rigor Mortis
- Injuries incompatible with life including, but not limited to:
  - Decapitation
  - Catastrophic brain injury
  - Hemicorporectomy
  - Grossly obvious mortal wounds
  - Injuries that do not permit effective administration of CPR

Qualifying Criteria:

- Legal DNR/Advanced Directive/Living Will
- End-Stage terminal illness
- Hospice
- Newborn w/confirmed gestation of <23 weeks
- When sound judgment indicates that resuscitation is unwarranted or futile.



Pearls

- If possible, resuscitation should be initiated when obvious signs of death are not present until Medical Control advises to terminate resuscitation, or an obvious sign of death is found after initiating resuscitation. If an obvious sign of death is found, the clinician can terminate the resuscitation. The clinician should then contact Medical Control to advise them of what was done.
- Clinicians should take into consideration the family's wishes when determining to withhold resuscitation. DNR's and living wills can be revoked by family.
- Clinicians should attempt resuscitation and transport if they feel they are in danger.
- CPR should be withheld if it places the rescuer at risk of physical injury or death.
- Exercise caution before deciding to not attempt resuscitation when in view of the public.

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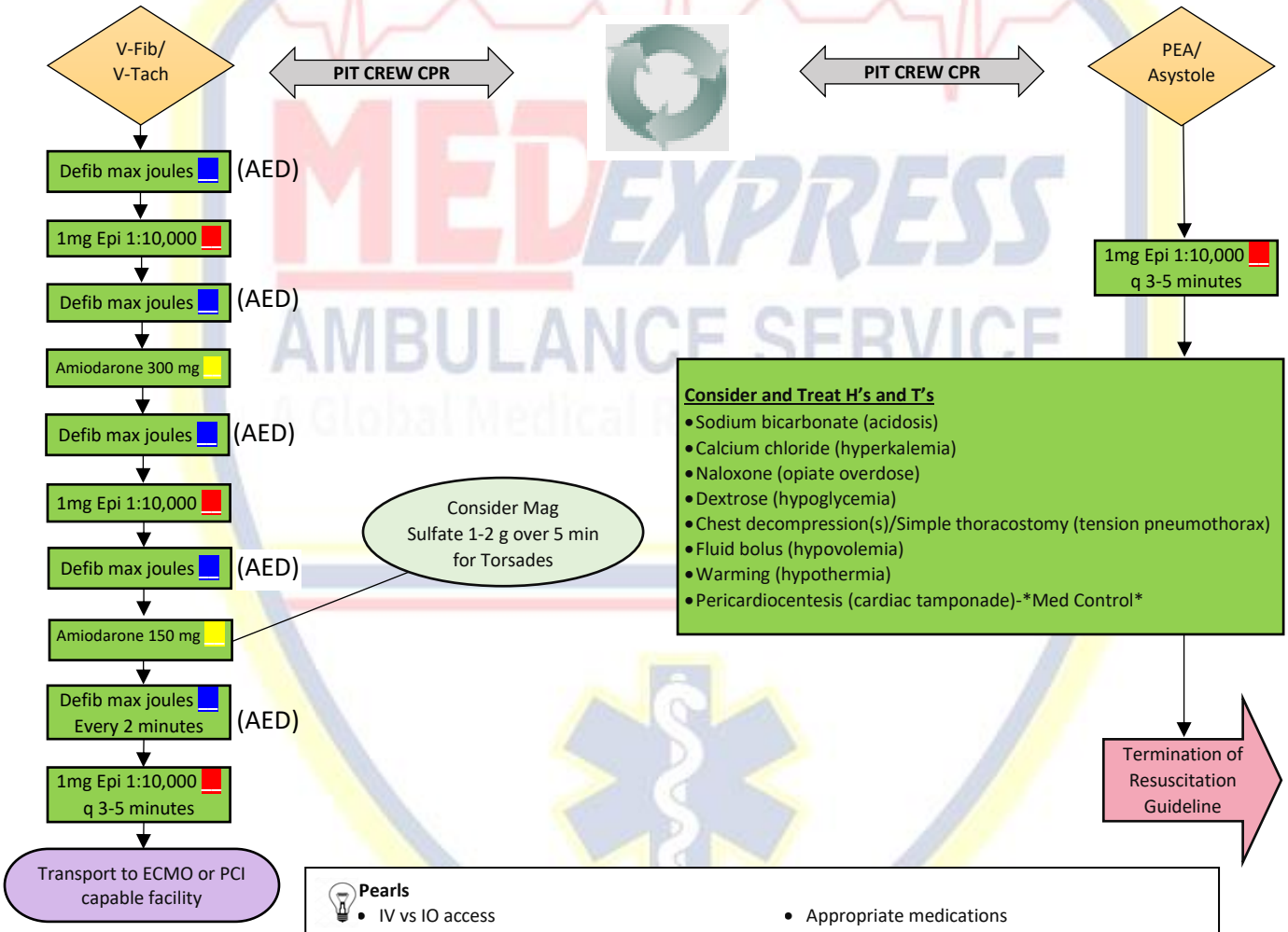
Cardio-Cerebral Resuscitation (Adult)

Patients that present pulseless and apneic in V-Fib/Pulseless V-Tach and Asystole/PEA.

GOALS

- BLS OWNS THE CODE! High quality chest compressions with early/frequent defibrillations take priority over all ALS treatment
- Immediate chest compressions, limiting interruptions to 10 seconds or less
- Compression rate of 100-120/minute
- 2 minute cycles with rhythm analysis and compressor change
- Rapid identification of shockable rhythm
- Charge defibrillator 15 seconds before end of cycle or utilize analysis mode with LifePack12 monitor
- Peri-shock pause interval (10 seconds or less). Defibrillate or Dump Charge or follow LifePack12 monitor prompts
- Limit ventilations to chest rise only at 10 bpm for reduction of intrathoracic pressure



Pearls

- IV vs IO access
- Basic vs advanced airway
- Mechanical Compression Device (rescuer fatigue or transport)
- For every interruption in CPR (EVEN ONE SECOND) it takes at least 30 seconds to regain adequate coronary and cerebral perfusion
- Cardiac arrest should be worked on scene, unless there is a treatment that can only be performed by a hospital or other circumstance that is in the best interest of the patient and provider.
- Appropriate medications
- $EtCO_2$
- Consider "Heads Up CPR" to promote cerebral perfusion
- Peri-shock pause is defined as the specific interruption in chest compressions prior to and following defibrillation shock.
- Drownings: resuscitation efforts are encouraged for any patient submerged <60 minutes. AHA Guidelines dictate immediate focus of Airway/Breathing first vs C.A.B approach.

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Cardio-Cerebral Resuscitation (Pediatric)

Patients that present pulseless and apneic in V-Fib/Pulseless V-Tach and Asystole/PEA. Because cardiac arrest often interchanges between shockable and non-shockable rhythms, this guideline focuses on the interchangeability dependent upon rhythm.

GOALS

- BLS OWNS THE CODE! High quality chest compressions with early/frequent defibrillations take priority over all ALS treatment
- Immediate chest compressions, limiting interruptions to 10 seconds or less
- Compression rate of 100-120/minute
- 2 minute cycles with rhythm analysis and compressor change
- Rapid identification of shockable rhythm
- Charge defibrillator 15 seconds before end of cycle or utilize analysis mode with LifePack12 monitor
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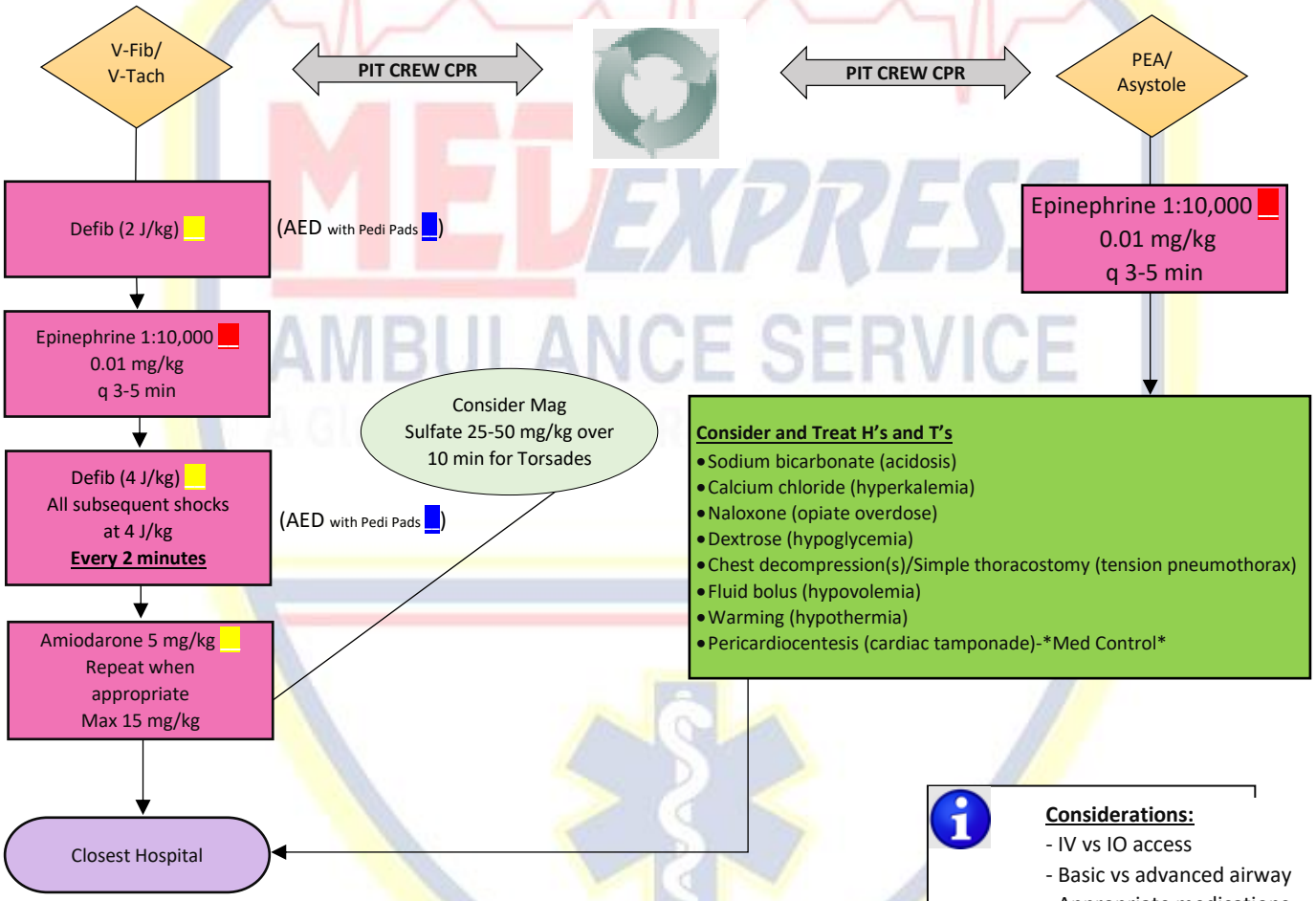
- Limit ventilations to chest rise only at 10 bpm for reduction of intrathoracic pressure



Pearls

- Respiratory arrest is the leading cause of cardiac arrest in children
- For every interruption in CPR (EVEN ONE SECOND) it takes at least 30 seconds to regain adequate coronary and cerebral perfusion.
- Cardiac arrest should be worked on-scene, unless there is a treatment that can only be performed by a hospital or other circumstance that is in the best interest of the patient.
- Drowning resuscitation efforts are encouraged for any patient submerged <60 minutes
- Simple airways are often acceptable for ventilating pediatric patients.

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Neonatal Resuscitation

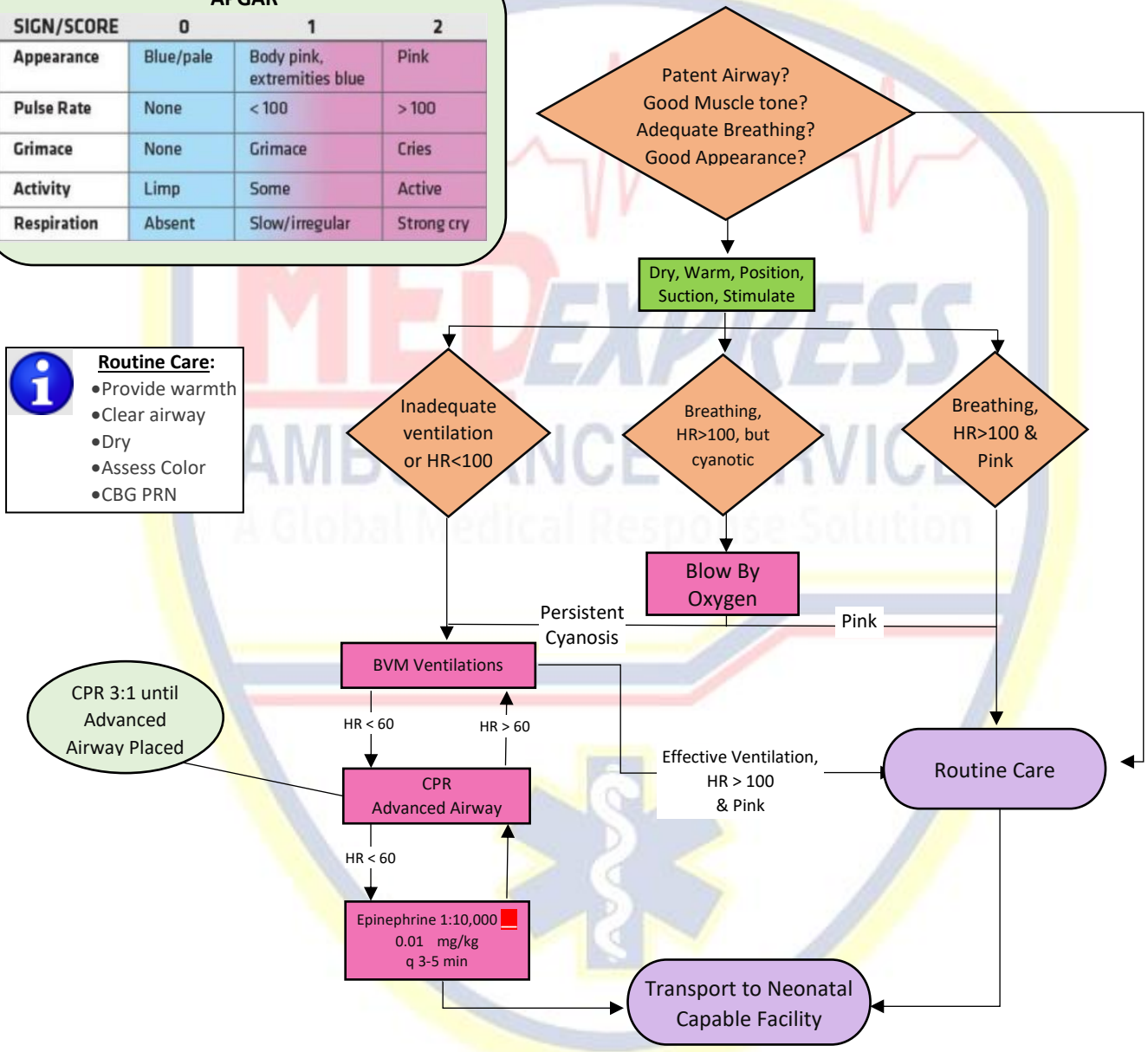
Complications of the newborn child

GOALS

- Maintain/restore oxygenation/ventilation/perfusion of a newborn child
- Assess APGAR at 1 and 5 minute intervals

APGAR

SIGN/SCORE	0	1	2
Appearance	Blue/pale	Body pink, extremities blue	Pink
Pulse Rate	None	< 100	> 100
Grimace	None	Grimace	Cries
Activity	Limp	Some	Active
Respiration	Absent	Slow/irregular	Strong cry



Pearls

- Heat packs should not be placed directly against the skin
- Each intervention should be trialed for approximately 30 seconds
- Infants who require significant resuscitation should be monitored and treated to maintain glucose >40 mg/dl
- A majority of newborns respond to simple measures
- Cyanosis is determined by examining the face, trunk and mucous membranes
- Treat hypoglycemia for CBG of <40 mg/dl with D10 per Diabetic Guideline. D50 remove 40 ml and replace with 40 ml NS=D10

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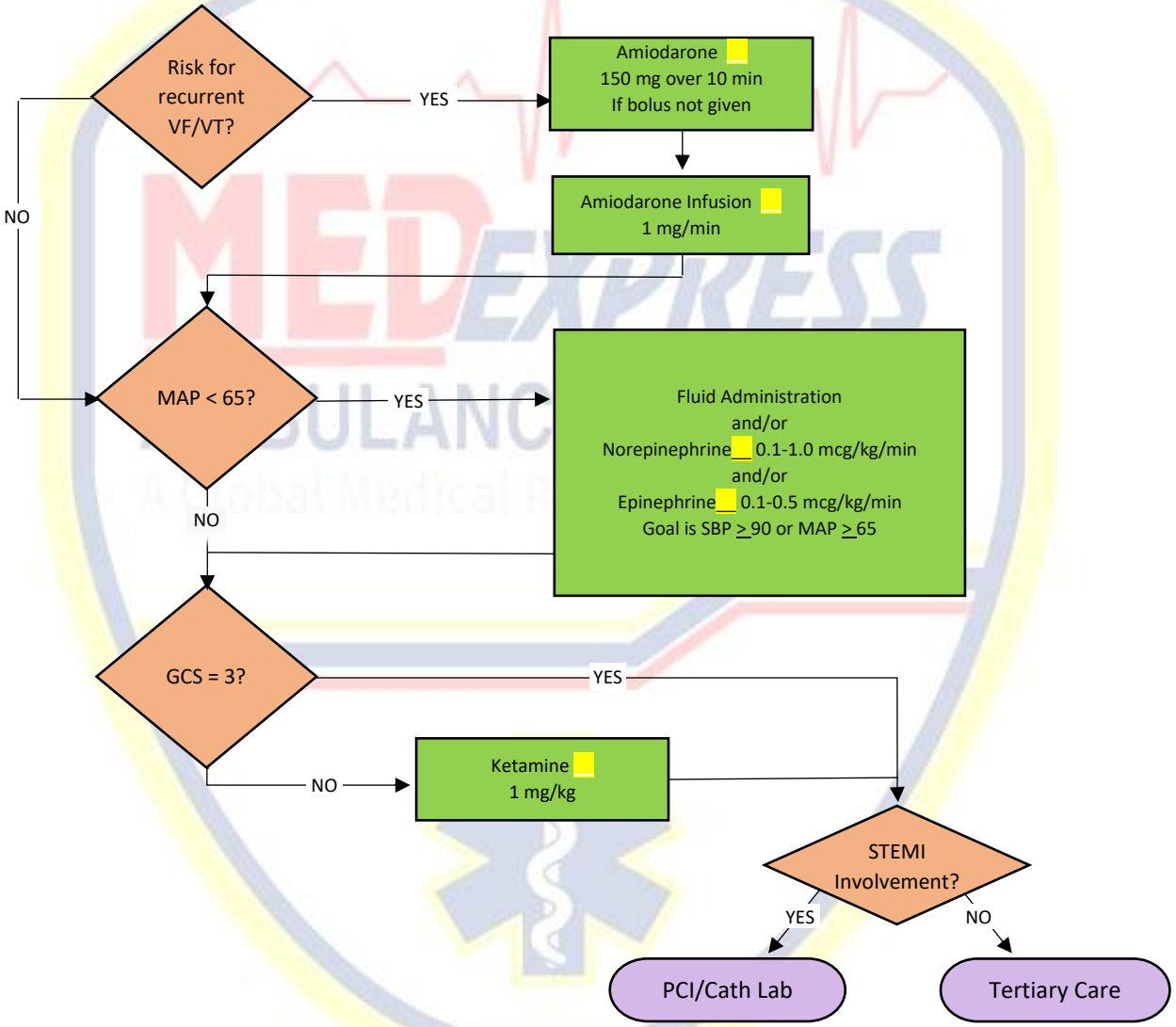
Post Resuscitation Care

Patients that achieve return of spontaneous circulation (ROSC).

GOALS

- REMAIN CALM!
- Maintain ventilation, cardiac and circulatory support
- Rapid identification of STEMI with early hospital notification
- Increase ventricular ectopy threshold
- Reduction of secondary brain injury risk



Pearls

- Remove Impedance Threshold Device if it was placed.
- DO NOT HYPERVENTILATE! Maintain ventilations at 10bpm. Maintain SpO_2 between 95-99% to prevent oxygen toxicity. Maintain $EtCO_2$ between 35-45 mmHg.
- A post-resuscitation patient's clinical presentation may change rapidly and frequently.
- Closely monitor patient trends (every 2-5 mins).
- Consider application of a cervical collar to prevent flexion/extension of neck (think distal tube placement).
- PEDIATRICS: Optimize oxygenation and ventilation. Fluids as needed. Contact Med Control PRN.

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Termination of Resuscitation

Rules that apply for termination of resuscitation in non-traumatic cardiopulmonary arrest.

GOALS

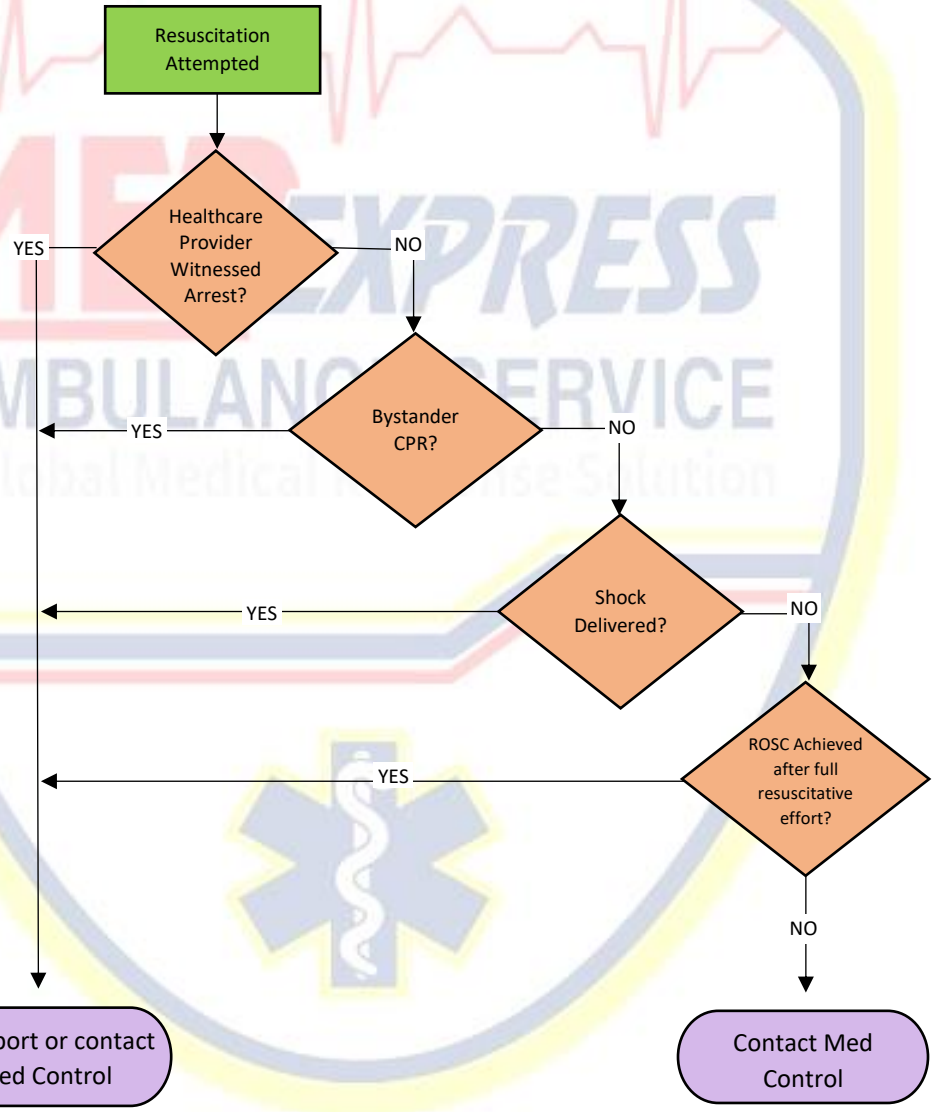
- Reduce the number of unnecessary ambulance transports of patients with no survival benefit
- Ensure appropriate management of the deceased patient
- Provide adequate support to patient's family

TOR Guideline should not be attempted in the following circumstances:

- Trauma
- Pediatrics
- Pregnancy
- Hypothermia
- Lightning Strikes
- Toxic exposure/Drug Overdose
- Conditions unsafe for EMS Providers

Full Resuscitative Effort:

- Definitive airway
- Vascular Access
- Defibrillation as needed
- 20-30 minutes of treatment following ACLS Guidelines and/or CardioCerebral Resuscitation Guideline



Pearls

- Patients who present with unwitnessed cardiac arrest, no bystander CPR, an un-shockable rhythm and no ROSC after prehospital care have greater than a 99% predictability of a very poor outcome.
- When TOR rules are implemented, we must ensure appropriate management of the deceased patient in the field and that we provide adequate support services for the patient's family.
- It may not be appropriate to terminate resuscitation when in view of the general public.

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ACS/STEMI/NSTEMI/Angina

ACS refers to a group of conditions due to decreased blood flow in the coronary arteries such that part of the heart muscle is unable to function properly or dies. ACS usually occurs as a result of one of three problems: STEMI, NSTEMI or unstable angina.

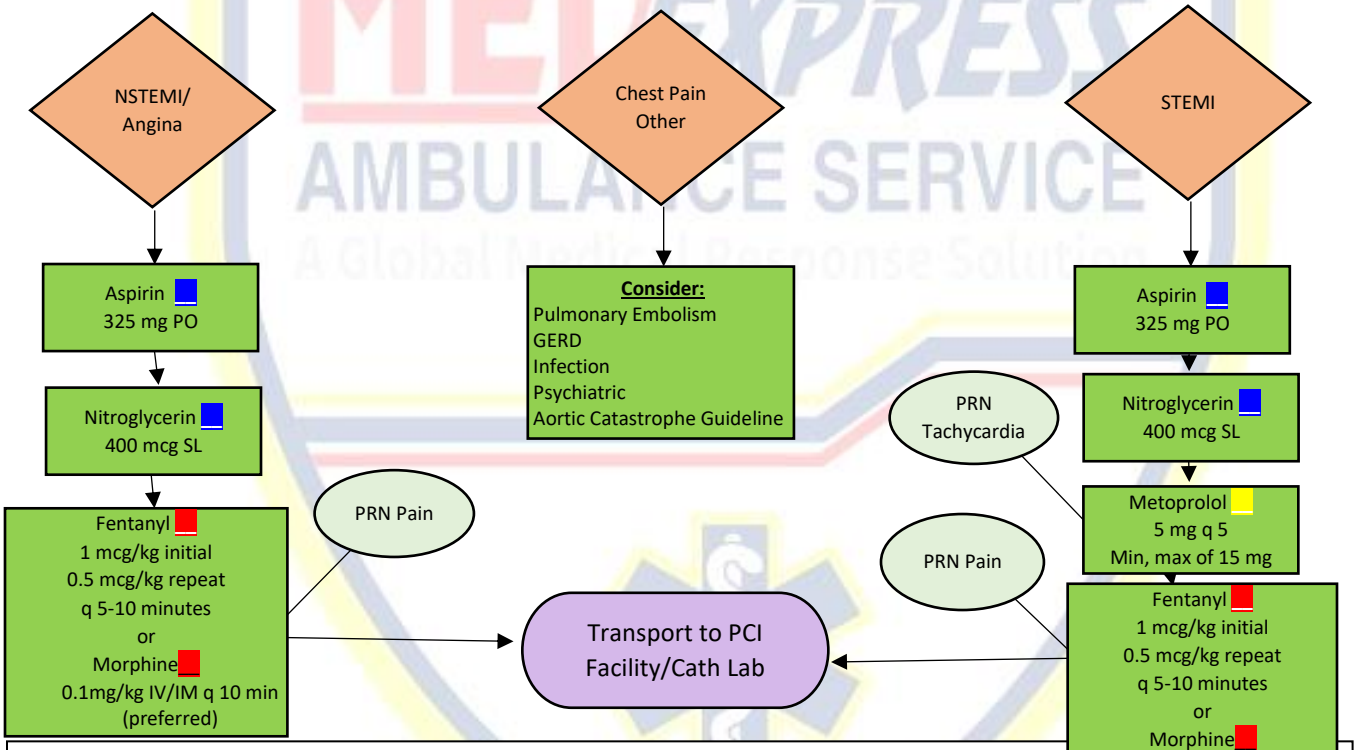
Based on pathology, the two main types of acute myocardial infarctions are:

STEMI: Transmural AMI is associated with a major coronary artery. It can be subclassified into anterior, posterior, inferior, lateral or septal. Transmural infarcts extend through the whole thickness of the heart muscle and are usually a result of complete occlusion of the area's blood supply. In addition, ST elevation and Q waves are seen on the ECG.

NSTEMI: Subendocardial AMI involves a small area in the subendocardial wall of the left ventricle, ventricular septum, or papillary muscles. The subendocardial area is particularly susceptible to ischemia. In addition, ST depression and possibly T wave changes may be seen on the ECG.

GOALS

- Reduction of platelet aggregation, cardiac workload, and cardiac oxygen demand. Control pain, blood pressure and heart rate
- Promote the body's natural clot lysis mechanisms to work normally.
- Rapid identification for STEMI to include continuous 12-lead monitoring and early notification to the receiving facility
- Reperfusion of occluded artery at a Primary PCI facility within 90 minutes of first EMS contact



Pearls

- Early hospital notification; destination determination/capability.
- Chest pain, or "discomfort", is present in two out of three patients with acute MI. Atypical presentations (commonly seen in diabetics, females, and geriatric patients) include the following **ANGINAL EQUIVALENTS:** respiratory distress, syncope, unexplained weakness, diaphoresis, palpitations, epigastric pain, and nausea. 12 leads **MUST** be performed on anyone with anginal equivalent.
- Limit scene time to 15 minutes or less.
- Be prepared for sudden ventricular fibrillation or pulseless ventricular tachycardia; defibrillate (Attach Defib Pads).
- Patients that present with hypotension or relative hypotension should not receive preload reducing medications and may need to be treated under the cardiogenic shock guideline
- Patients treated for ACS and initial EKG is negative for STEMI require continuous 12-Lead monitoring and/or serial 12-Lead EKG's at 5-minute intervals.

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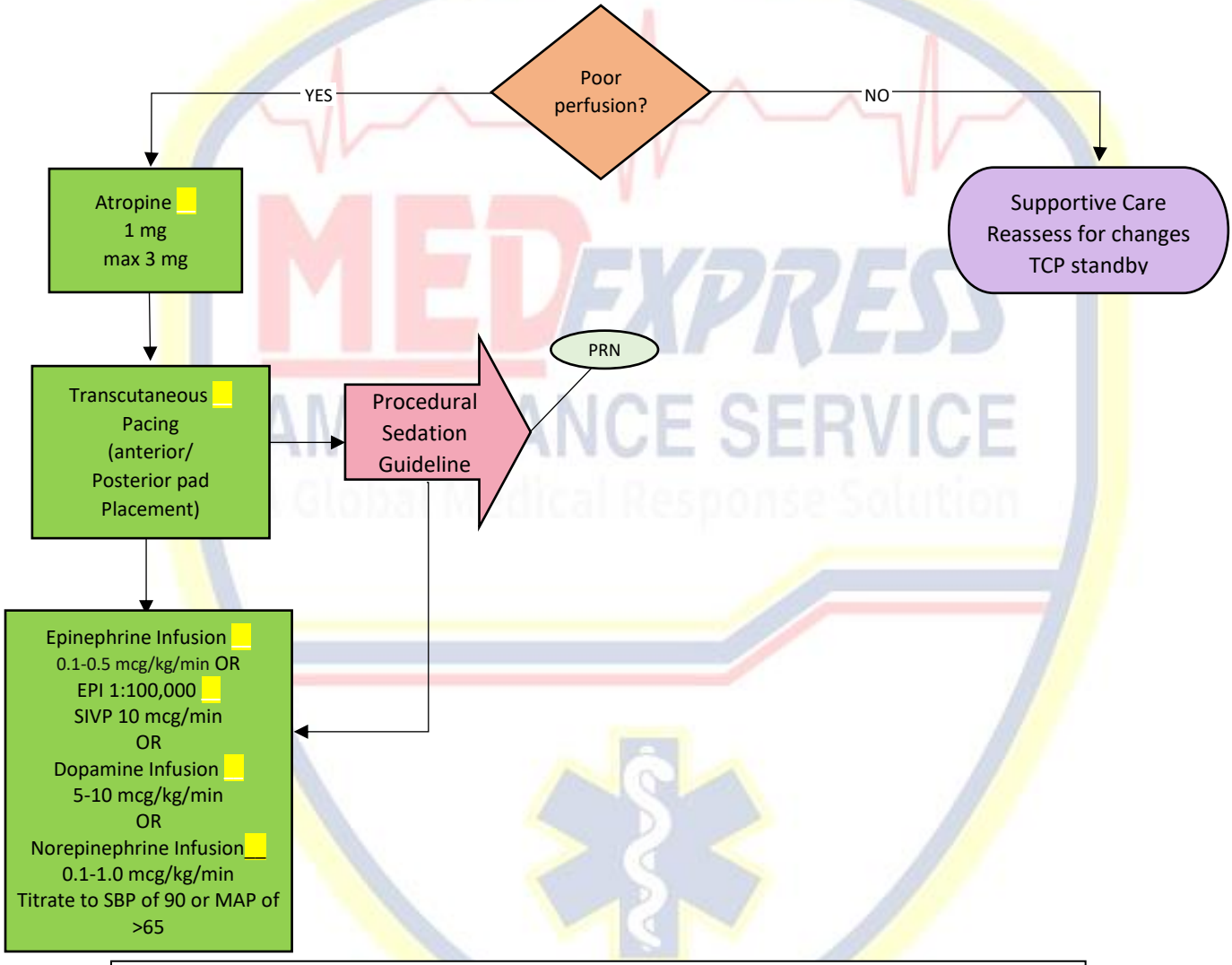
Bradycardia (Adult)

Patients that present with a heart rate less than 60 bpm that is inadequate for clinical condition.

GOALS

- Increase cardiac output
- Increase intrinsic rate
- Improve organ perfusion



Pearls

- Denervated transplanted hearts will not respond to atropine; TCP is the treatment of choice.
- TCP is the treatment of choice for high degree AV blocks (type II AV block and new Third Degree block with wide QRS complexes).
- DO NOT DELAY TCP for IV access if the patient is hemodynamically unstable.
- Use atropine with caution in patients with possible MI and/or ST segment changes.
- TCP STANDBY = Attach pacing pads anterior/posterior and observe for deterioration.

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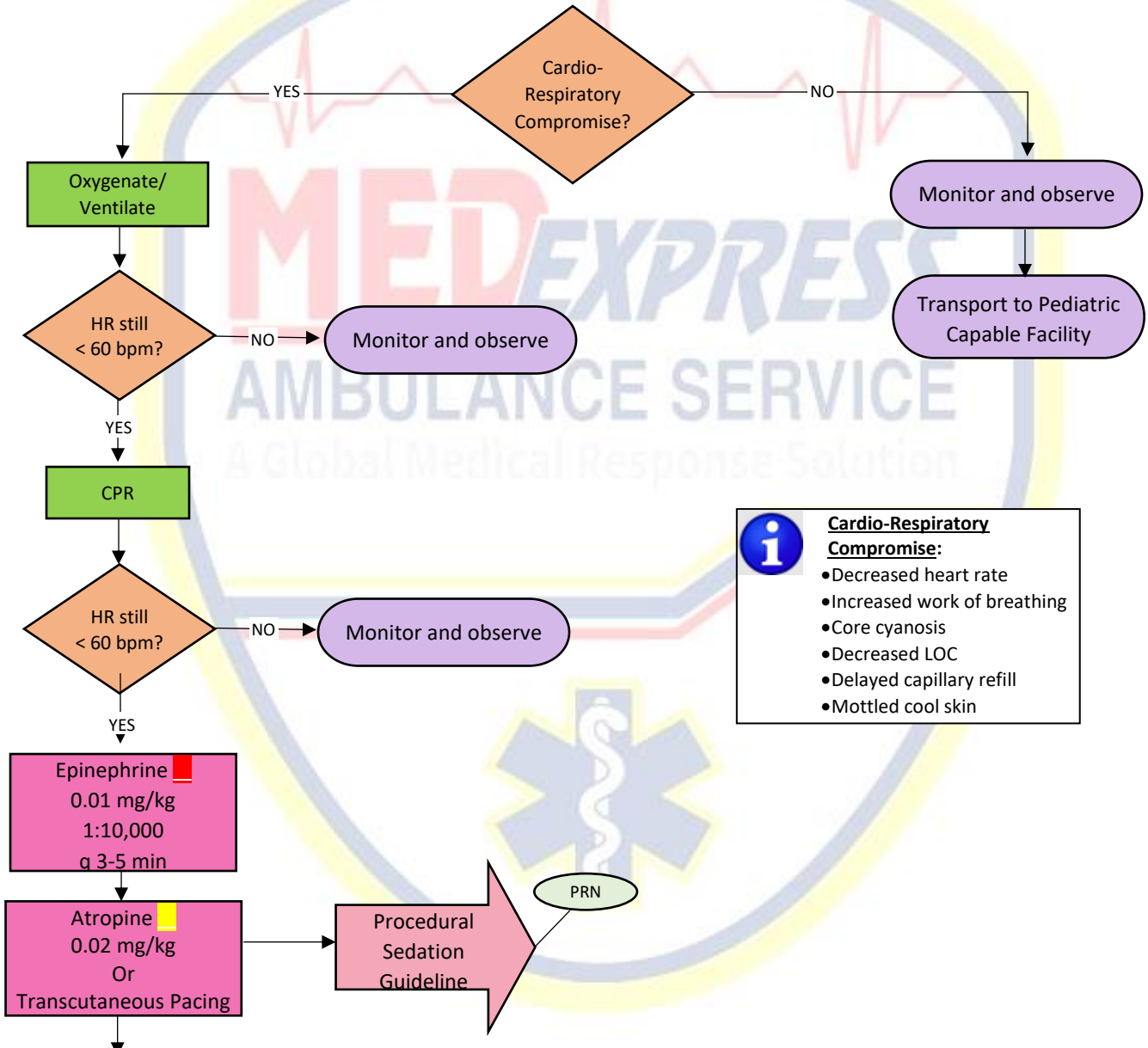
Bradycardia (Pediatric)

Patients that present with a heart rate less than 60 bpm that is inadequate for clinical condition.

GOALS

- Increase cardiac output
- Increase intrinsic rate
- Improve organ perfusion



Cardio-Respiratory Compromise:

- Decreased heart rate
- Increased work of breathing
- Core cyanosis
- Decreased LOC
- Delayed capillary refill
- Mottled cool skin

Pearls

- Hypoxia due to respiratory complications is the most common reason for bradycardia and cardiac arrest in children
- Hypoglycemia, narcotic ingestion and severe dehydration may be the cause of bradycardia

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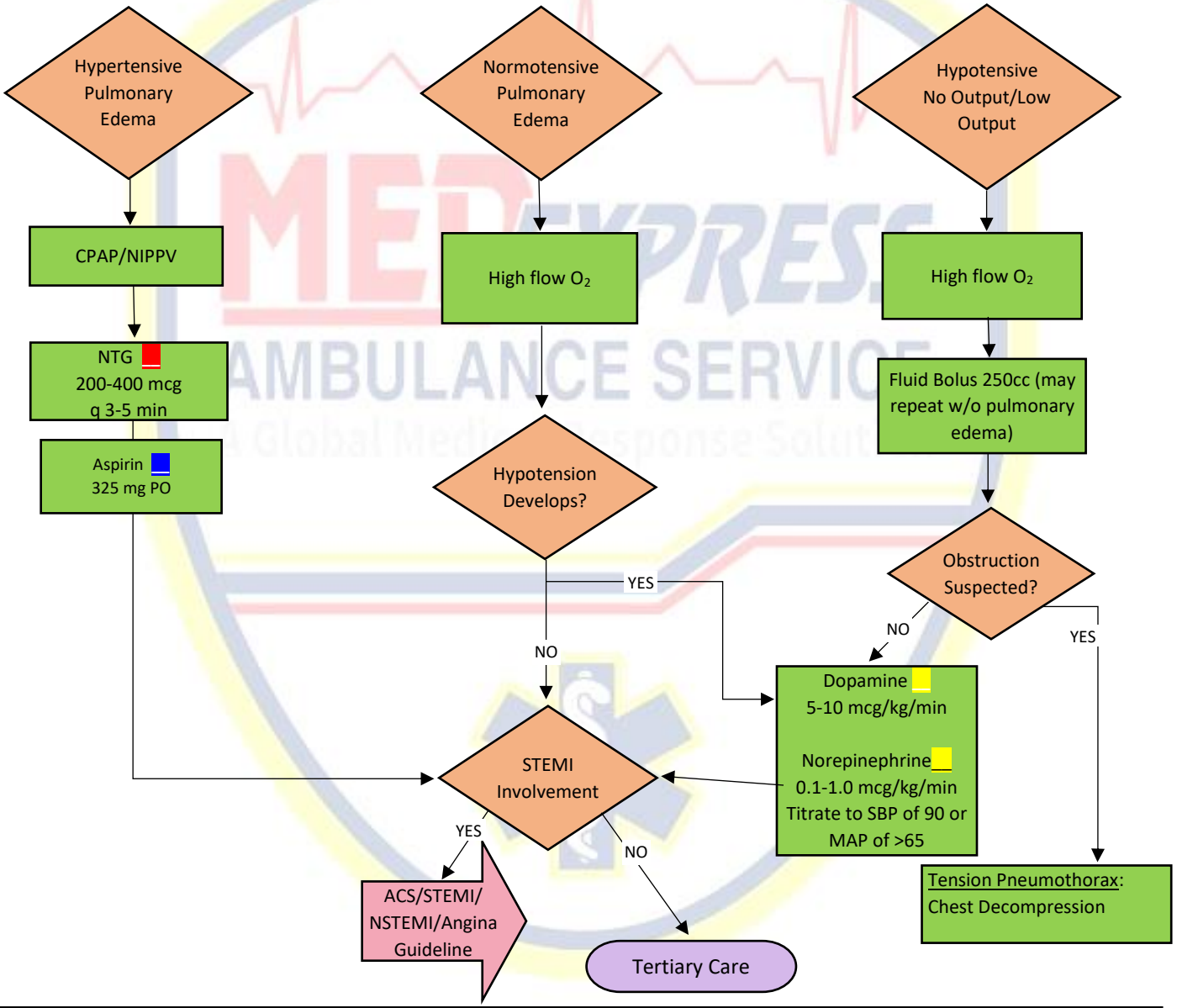
CHF/Cardiogenic Shock

Patients that present with disruptive circulation caused by the heart or obstruction of the heart, resulting in respiratory failure and/or shock.

GOALS

- Improve cardiac contractility
- Correct hypoxia and ensure proper ventilation management
- Control blood pressure, pre-load and after-load



Pearls

- Normotensive patients with pulmonary edema can deteriorate into cardiogenic shock rapidly
- Consider myocardial infarction in all of these patients. Aspirin 325 mg PO may be appropriate, if tolerable
- All efforts at verbal coaching should be utilized prior to Anxiolytic administration
- Patients that fail to respond to oxygen and/or NIPPV may require advanced airway management and ventilatory support

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Tachycardia

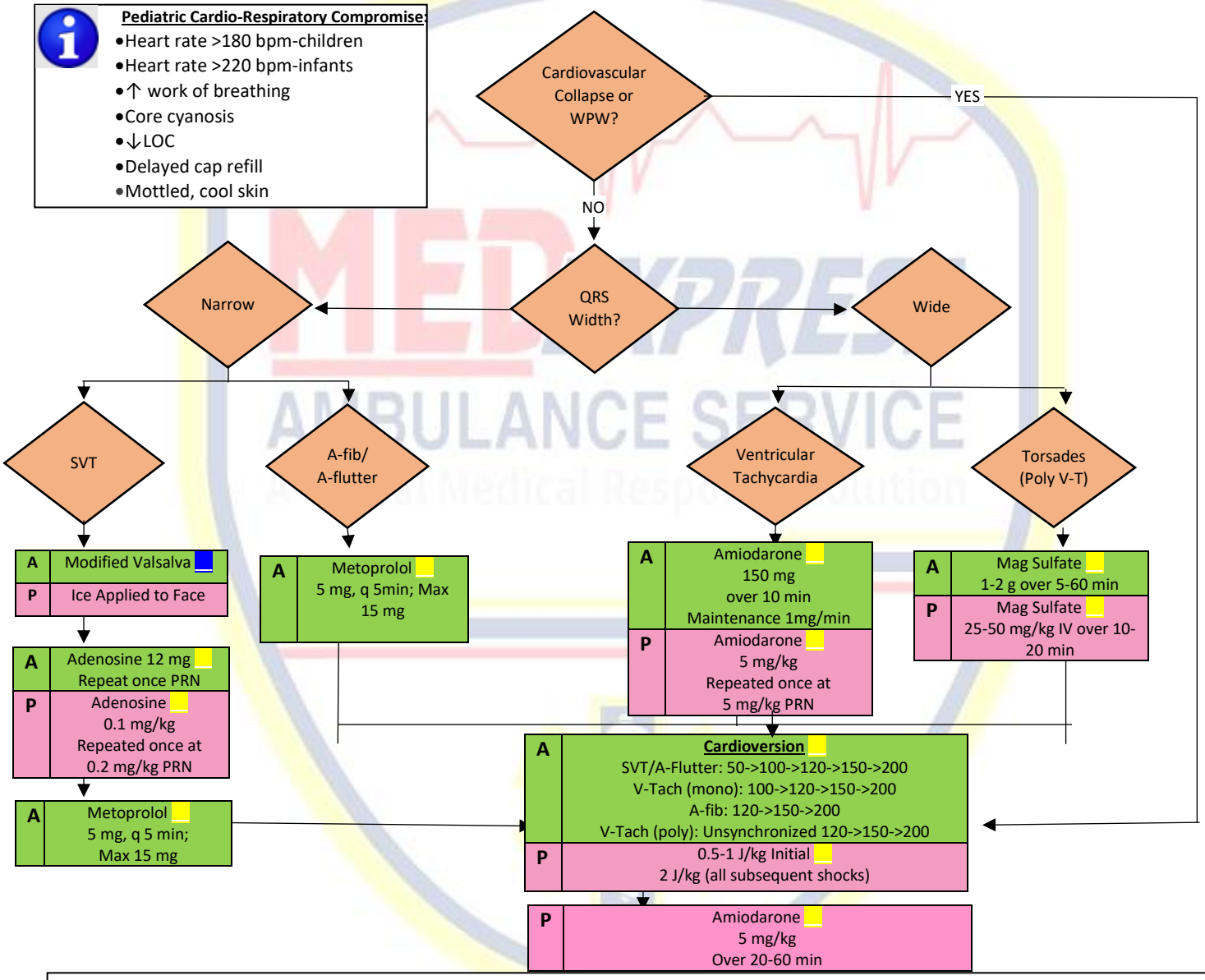
Tachycardias causing hemodynamic instability.

GOALS

- Increase diastole interval allowing adequate heart refill
- Slow conduction time and interrupt re-entry pathways through the AV node
- Suppress activity of the SA and AV nodes and prolong their refractory periods

Pediatric Cardio-Respiratory Compromise:

- Heart rate >180 bpm-children
- Heart rate >220 bpm-infants
- ↑ work of breathing
- Core cyanosis
- ↓LOC
- Delayed cap refill
- Mottled, cool skin



Pearls

- Heart rates <150 bpm seldom cause cardiovascular compromise
- Sinus tachycardia suggests underlying medical condition. (Treat appropriately)
- If the pt has a history of WPW or a 12-lead showing WPW, withhold beta blockers and adenosine. Treatment should only include Modified Valsalva, Cardioversion or Amiodarone.
- Use caution with adenosine in asthma patients.
- When rhythm regularity determination is not practical and the QRS is narrow, adenosine is acceptable to “slow the rate”.
- Amiodarone may be used as an alternate treatment for tachyarrhythmias under medical control direction.

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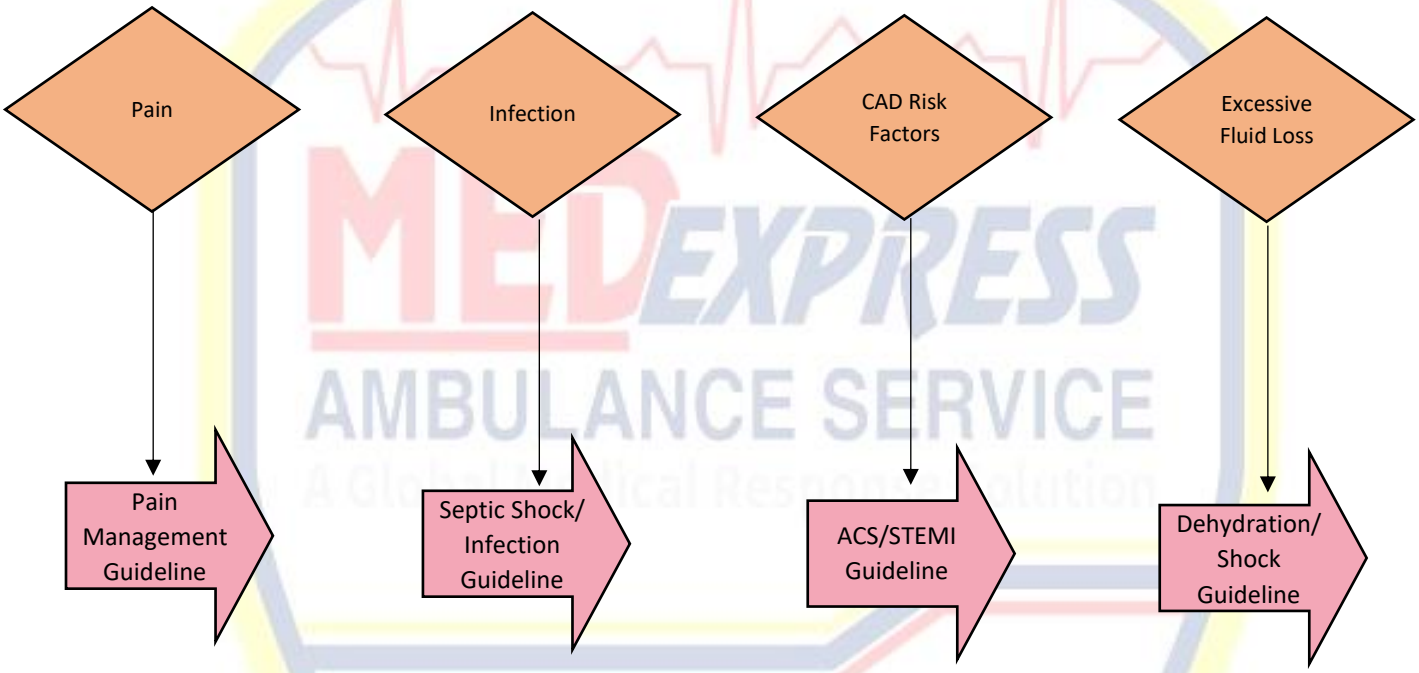
Abdominal Complications

Abdominal cavity complications of a medical nature.

GOALS

- Manage pain/discomfort and nausea
- Manage fluid loss and or hemorrhage
- Complete OPQRST assessment



Pearls

Abdominal Complications can include hemorrhage, infection, inflammation and obstruction to any of the various organs, vasculature and/or tissue. Pain is the most common complaint.

- Abdominal pain/discomfort may be the only symptom of a patient with Acute Myocardial Infarction
- Females of child bearing age should be suspected of ectopic pregnancy
- DKA can present with severe abdominal cramping due to hypovolemia
- Consider cardiac etiology inpatients >50 y/o, DM and/or female with increased abdominal complaints
- Consider Anaphylaxis in cases of abdominal cramps, vomiting and diarrhea in the presence of a possible trigger
- Consider Aortic Catastrophe in the elderly or over the age of 50 with CAD risk factors that present with hypotension/hypovolemia and abdominal pain

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Active Seizure(s)

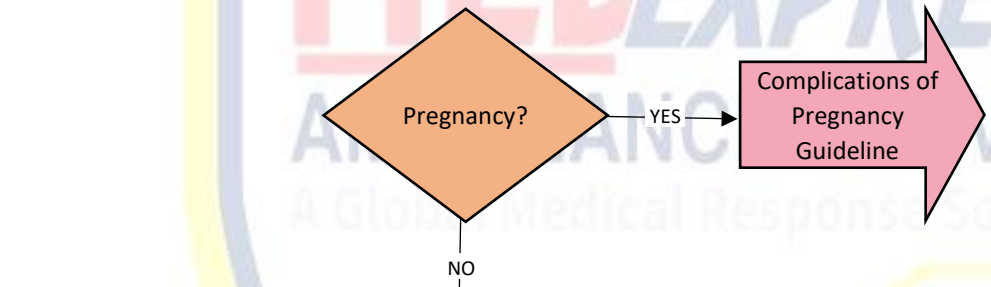
Varied observations of uncontrolled jerking movement (tonic/clonic seizure) to momentary loss of awareness (absent seizure), caused by the abnormal excessive or synchronous neuronal activity of the brain

GOALS

· Protect patient from further injury
· Airway Maintenance
· Reduce CNS response via benzodiazepine administration

A	Midazolam 2 - 4 mg IV/IO/IM max of 10mg q 5 min
P	Midazolam 0.2 mg/kg IV/IO/IN/IM, q 5 max 10mg

Eclampsia: A severe hypertensive disorder (>140/90) of pregnancy characterized by convulsions and coma, occurring between 20 weeks gestation and up to 6-8 weeks postpartum.



CT Capable ED
(new onset seizures)

Pt choice/Most Appropriate
(seizure history; normal seizure for pt)

Status Epilepticus: A prolonged seizure (>5 minutes) or a series of repeated seizures without a return to consciousness within about 5 minutes.
Grand Mal Seizure: Associated with loss of consciousness, incontinence and tongue trauma.
Focal Seizure (Petit Mal): Affects only one part of the body and is not usually associated with loss of consciousness.

Pearls

- Versed IM/IN is usually effective in terminating seizures. Do not delay IM/IN route for failed IV/IO access. Consider double dose for IM/IN.
- Anticipate airway problems and recurrent seizures.
- Treat hypoglycemia under diabetic guideline.

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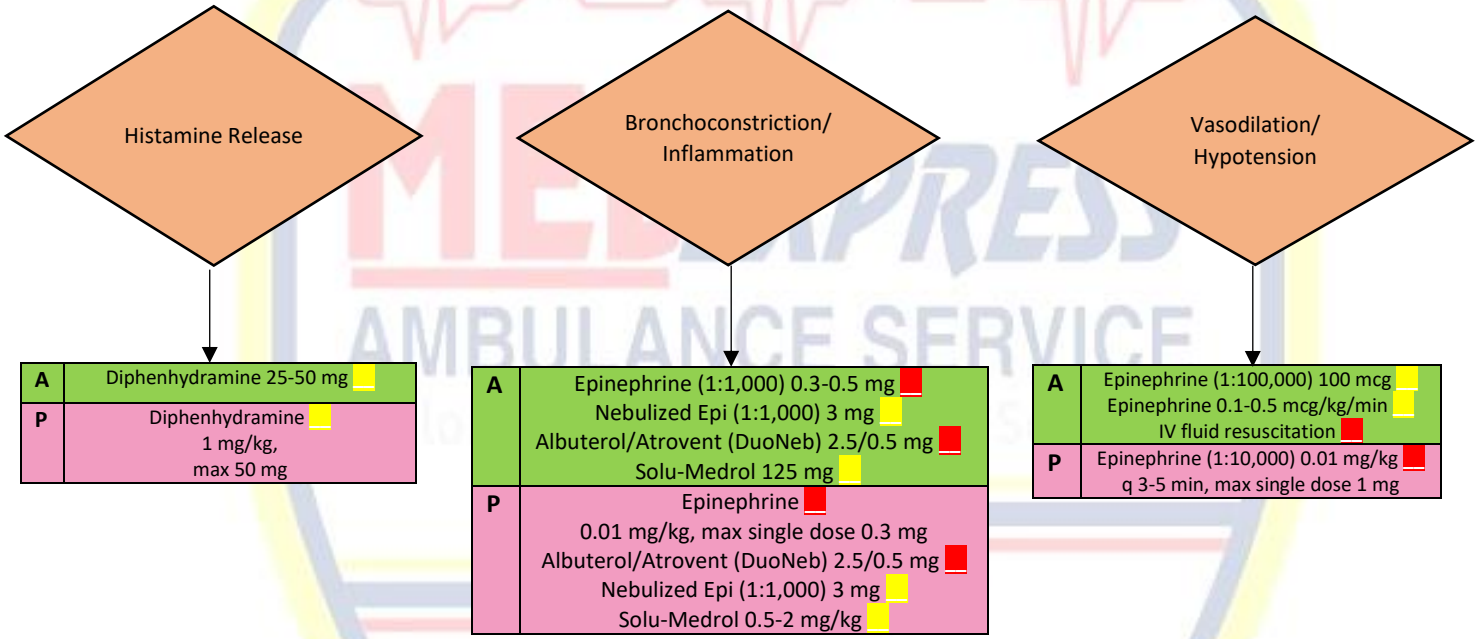
Allergic Reaction/Anaphylactic Shock

Sensitivity to allergens that come into contact with skin, nose, eyes, respiratory tract and/or GI tract resulting in misguided reaction of the immune system. These reactions may manifest from a mild local reaction and/or a moderate generalized reaction into anaphylactic shock. The severity of the reaction shall determine the level of treatment.

GOALS

- Histamine blockade
- Inflammation control
- Bronchodilation
- Vasoconstriction for distributive shock



Reaction Severities

Mild: rash, pruritus, and urticaria; excluding the face
Moderate: "mild reaction" with "normal perfusion", angioedema without airway compromise. Urticaria and pruritus to the face, minor wheezing may be present. N/V and/or abdominal pain with associated GI symptoms.
Severe: Respiratory compromise, angioedema and wheezing.
Anaphylactic Shock: Hypotension with evidence of poor perfusion leading to cardiovascular collapse. Pruritus and urticaria may not be evident secondary to poor perfusion. Itching (pruritus) may not be experienced.

Pearls

- Caution MUST be used in administering epinephrine to patients over the age of 50 and/or to patients with known cardiovascular disease, renal failure, and/or COPD. When treating these patients with epi, reduce the dose by half and monitor cardiac ischemia with continuous 12 Lead.
- Consider a severe reaction when responses from 2 or more body systems (cutaneous, respiratory, cardiovascular, neurologic or GI) are noted. Cardiovascular and respiratory systems may not always be involved in a severe reaction
- When 2 or more body systems are involved, Epi IM should be administered.
- Isolated severe angioedema may be secondary to ACE Inhibitors and is NOT and allergic reaction.
- Cardiac arrest can occur as soon as 5 minutes after medication induced anaphylaxis; 15 minutes for insects and 30 minutes for food.
- Epi 1:100,000 is EPI 1:10,000 remove 9 ml and replace with 9 ml NS.

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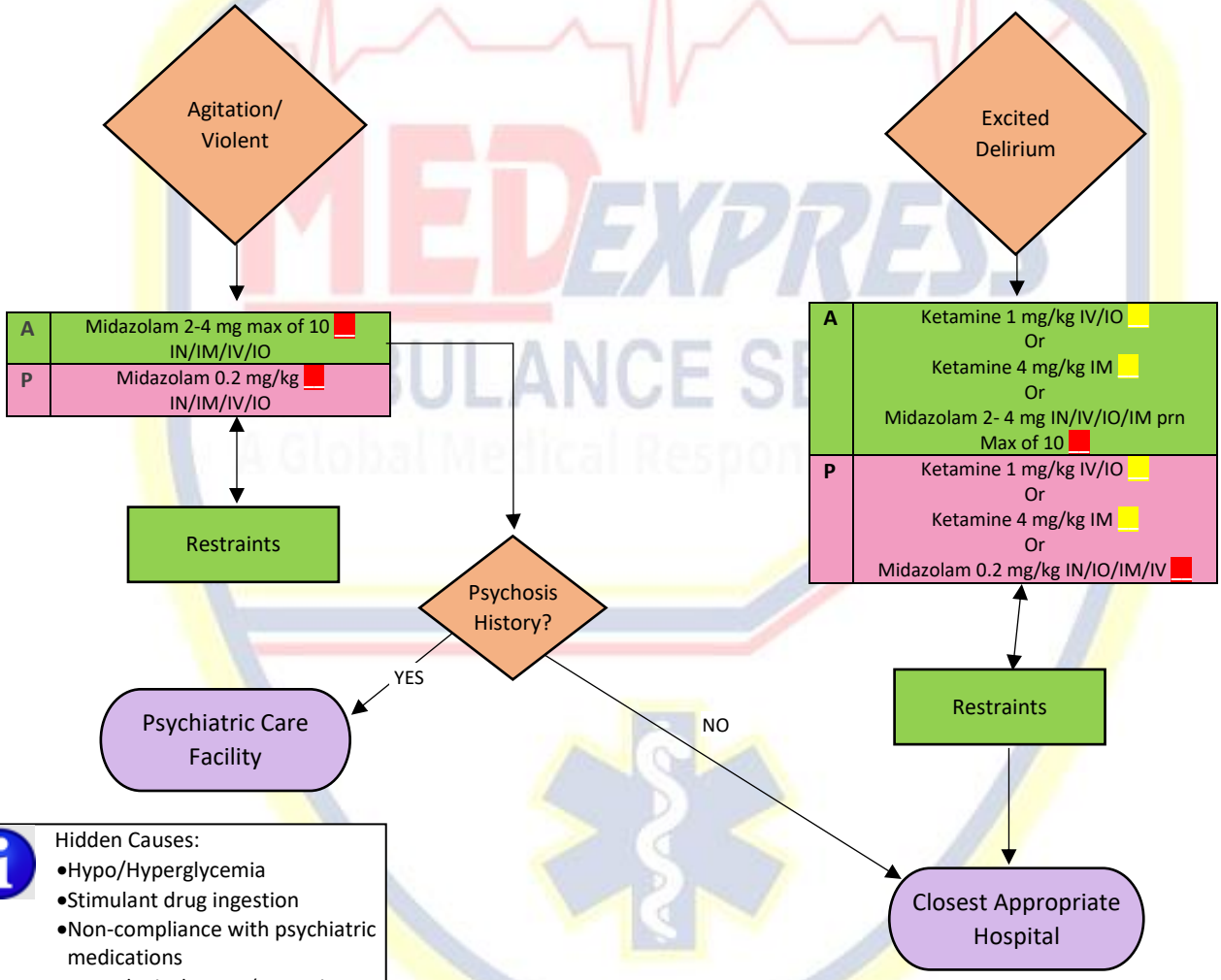
Anxious/Violent/Agitated

A patient who exhibits violent and/or agitated behavior where crew, public and/or patient safety is compromised. Focused assessments and patient care are unable to be adequately performed.

GOALS

- Physical and chemical restraints to prevent injury to providers and/or patient
- Gain control of certain patients requiring medical assessment and/or treatment
- Calm, safe transport to the ED
- Rule out hidden, reversible causes
- Reduce patient anxiety during certain medical procedures



Hidden Causes:

- Hypo/Hyperglycemia
- Stimulant drug ingestion
- Non-compliance with psychiatric medications
- Neurological event (TBI, seizure, stroke)
- Hypoxia

Pearls

- Never restrain patient face down!
- Excited delirium signs include agitation, delirium, anxiety, hallucinations, dilated pupils, violent bizarre behavior/paranoia, increased strength, hyperthermia/nakedness, and incoherent speech or shouting.
- NO KETAMINE IN ALCOHOL INTOXICATION

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Asthma (Adult)

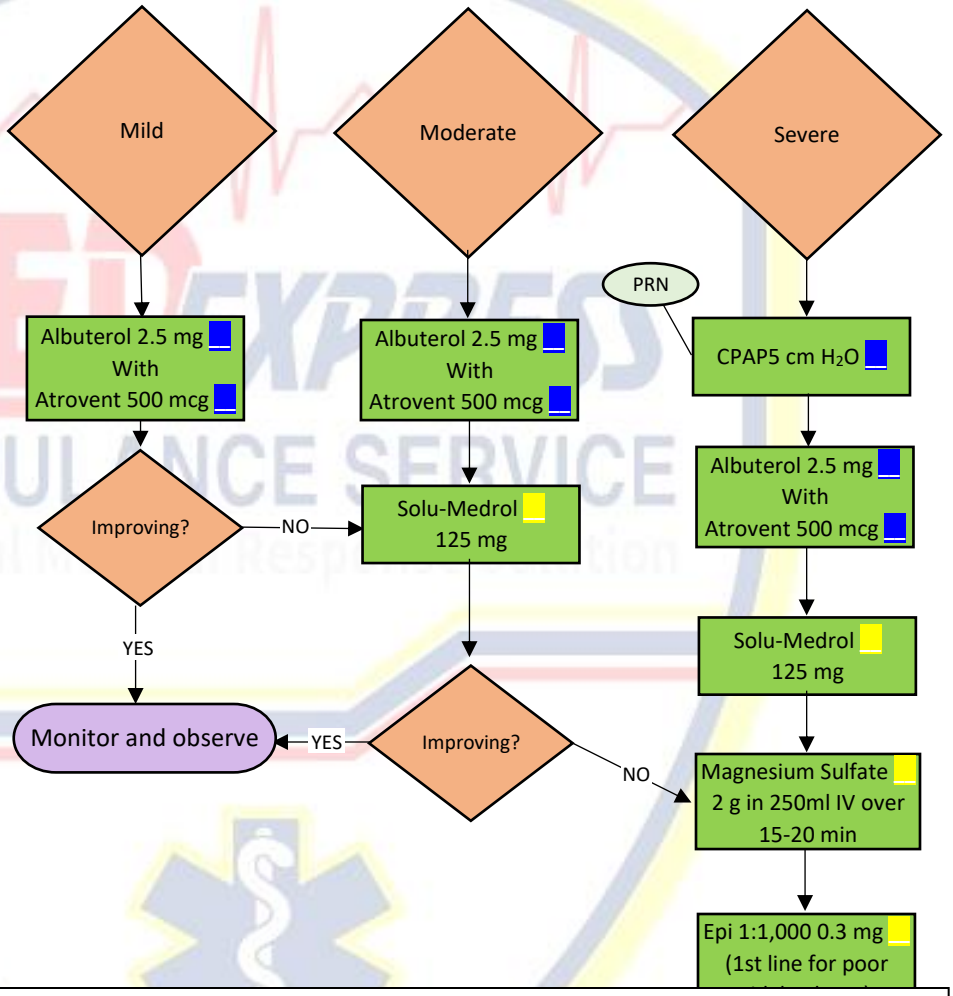
A common inflammatory disease of the lungs characterized by airway obstruction secondary to narrowing of the bronchioles. The narrowing is caused by spasms of smooth muscle, edema of the small airways and presence of mucus in the airway resulting from an immunological reaction.

GOALS

- Bronchodilation
- Reduce hypercapnia and intrinsic peep
- Reduction of airway swelling

Levels of Severity:

- **Mild**-Wheezing, no accessory muscle use, no nasal flaring, able to complete whole sentences.
- **Moderate**-Wheezing, minimal accessory muscle use and nasal flaring, difficulty completing sentences, decreased peak flow.
- **Severe**-Diffuse wheezing, or absence thereof with obvious dyspnea, full accessory muscle use, nasal flaring and decreased peak flow.



Pearls

- Patients >60 years of age with a cardiac history and/or renal failure should use extreme caution if giving magnesium sulfate or epinephrine.
- Atrovent onset is 20 minutes with peak action 60-90 minutes and is limited to 1 dose
- Corticosteroids are one of the only proven treatments for inflammatory response in asthma. (6 hour effect window; aids in reducing the possibility of hospital admission).
- CPAP can be used to help splint airways open to allow for adequate exhalation.
- $EtCO_2$ is a great tool for measuring patient response to treatment.
- Consider continuous albuterol for moderate/severe patients
- Consider Epi IM 1st line in cases of decreased tidal volume or decreased mental status.
- Beta-blocker medication should be withheld when B2 agonist medication is being administered. Patients with significant hypertension may need to be treated with Mag Sulfate.
- Wheezing can also be a sign of pulmonary edema in CHF. Wheezing does not always equate to asthma or other obstructive airway disorders.

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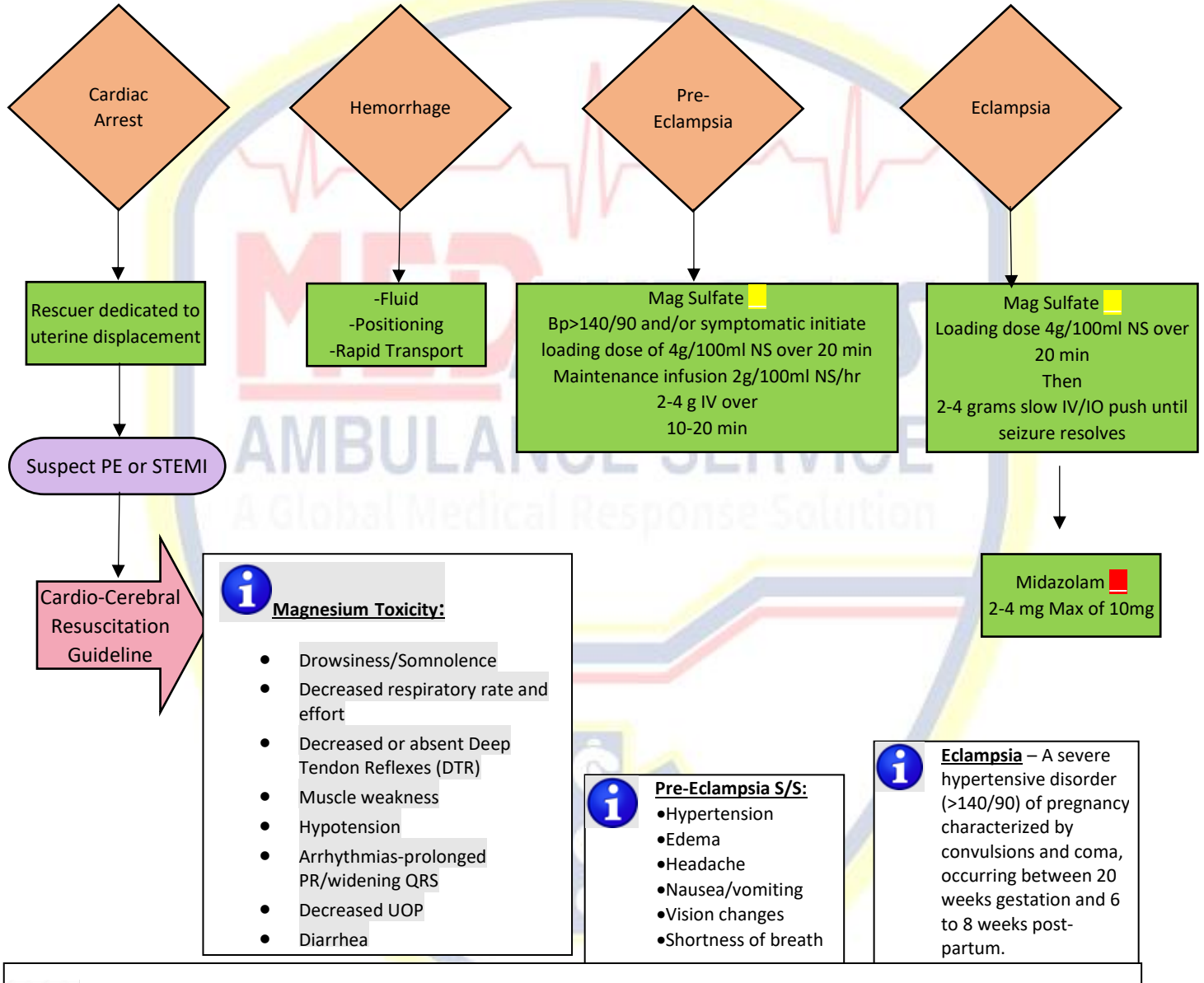
Complications of Pregnancy

Complications that arise pre- and post-partum.

GOALS

- Appropriately manage complications of pregnancy



Pearls

- Placenta Previa occurs in the last trimester or late mid-trimester and is characterized by painless bright red vaginal hemorrhage
- Abruptio Placentae occurs between 20 weeks of gestation and birth and is characterized by painful venous or arterial minor to heavy vaginal hemorrhage
- Ectopic pregnancy occurs in the early stages of pregnancy and are most commonly implanted in the fallopian tube. Characterized by painful hemorrhage of varying degrees
- Consider transporting the OB patient in the Left Lateral Recumbent position to prevent supine hypotension or if hypotension is present.

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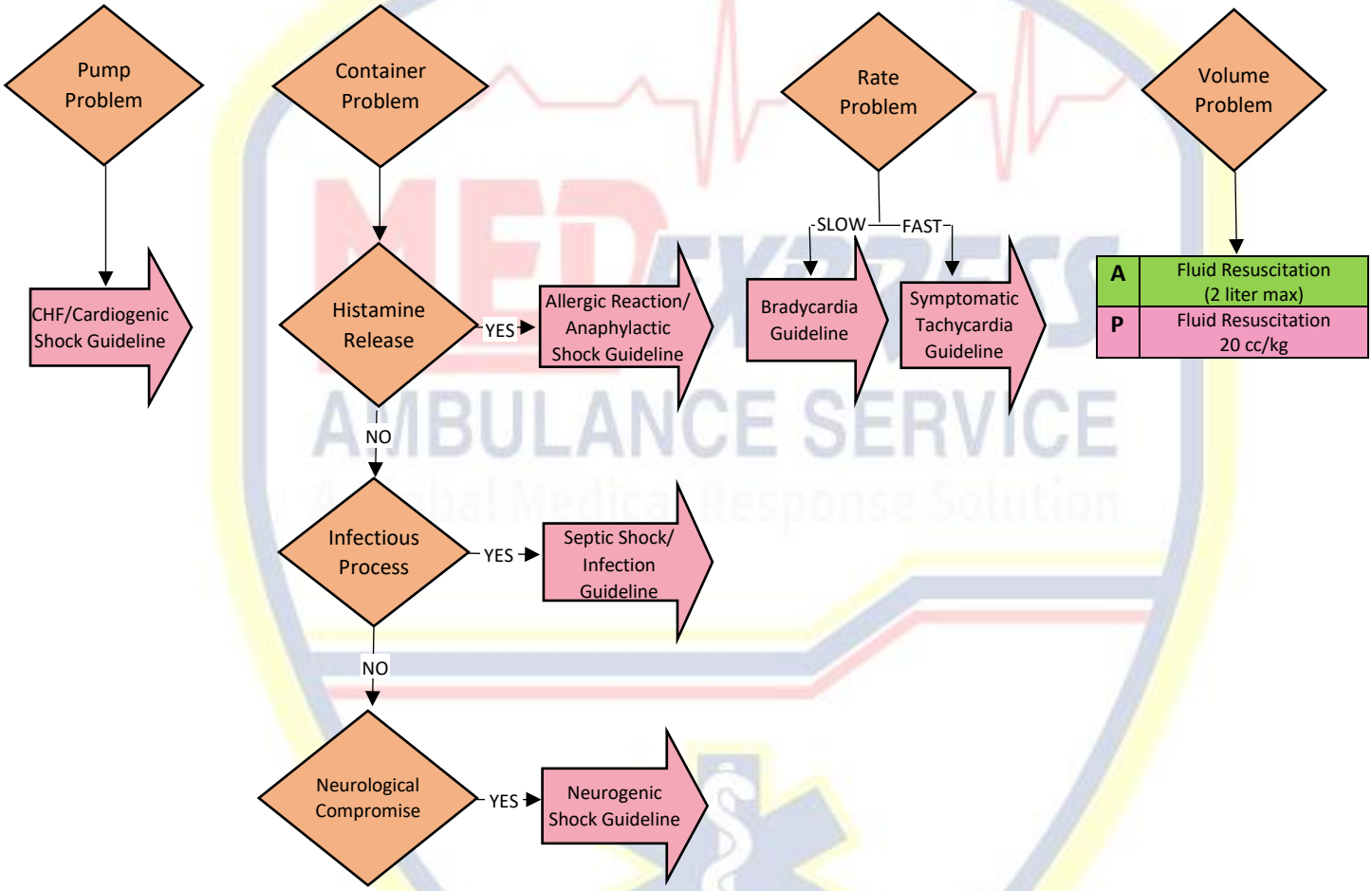
Dehydration/Shock

A potentially life-threatening condition secondary to a loss of blood products or free water which leads to end organ failure. Blood products include plasma, whole blood, and/or sodium.

GOALS

- Maximize oxygen delivery and ventilation
- Restore blood flow
- Fluid resuscitation



Pearls

- Hypovolemic/Hemorrhagic (Non-traumatic) shock: is a VOLUME PROBLEM. Causes include excessive vomiting, diarrhea, polyuria, excessive sweating, burns, internal/external hemorrhage (non-traumatic), tachypnea and poor oral fluid intake. Patients may present with cold/clammy skin, increased shallow breathing, elevated heart rate, altered mental status, pale/cyanotic/dry mucous membranes.
- Blood pressure is a "late sign" of dehydration. Patient can be normotensive or even hypertensive (relatively) and be dehydrated, requiring fluid resuscitation.
- For DM Type 1 pediatric patients, fluid resuscitation is 10 cc/kg where evidence of dehydration exists.

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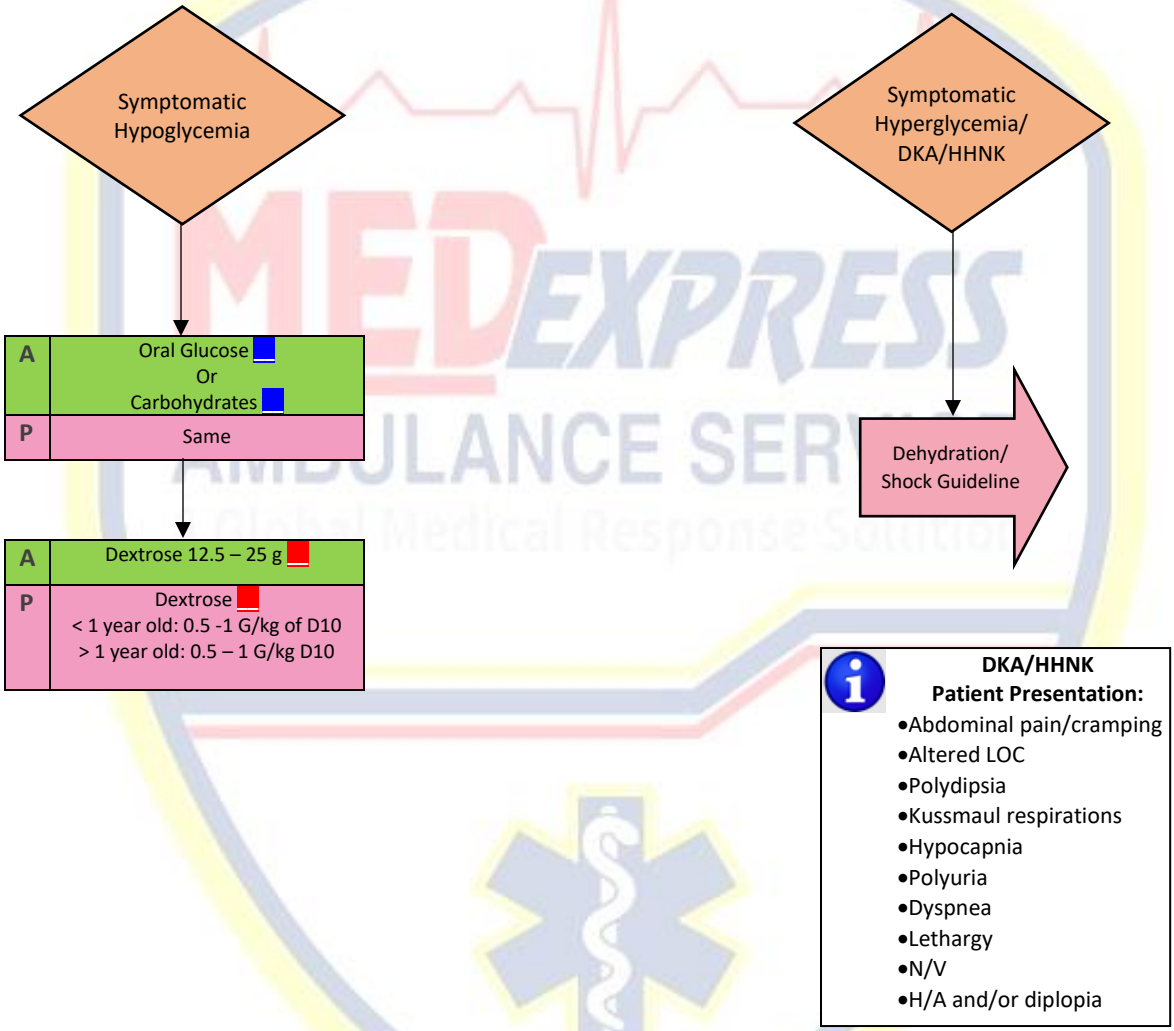
Diabetic

Patient who may or may not exhibit altered mental status and/or an unresponsive state in the presence of a low or elevated capillary blood glucose level.

GOALS

- Reverse hypoglycemia
- Manage dehydration associated with hyperglycemia
- Maintain/establish adequate ventilation



Pearls

- CBG is RELATIVE!
- HHNK is predominately found with Type II Diabetics & DKA is predominately found with Type I Diabetics. These patients will often present with severe dehydration.
- DKA produces ketones; HHNK does not produce ketones.
- Use caution with hypoglycemic patients with a hx of chronic alcoholism, severe malnutrition or recent gastric bypass. (Wenicke's Encephalopathy).
- Closely monitor DKA/HHNK patients via continuous 12-Lead; hyperkalemia.
- Insulin pumps should be suspended in the presence of hypoglycemia.

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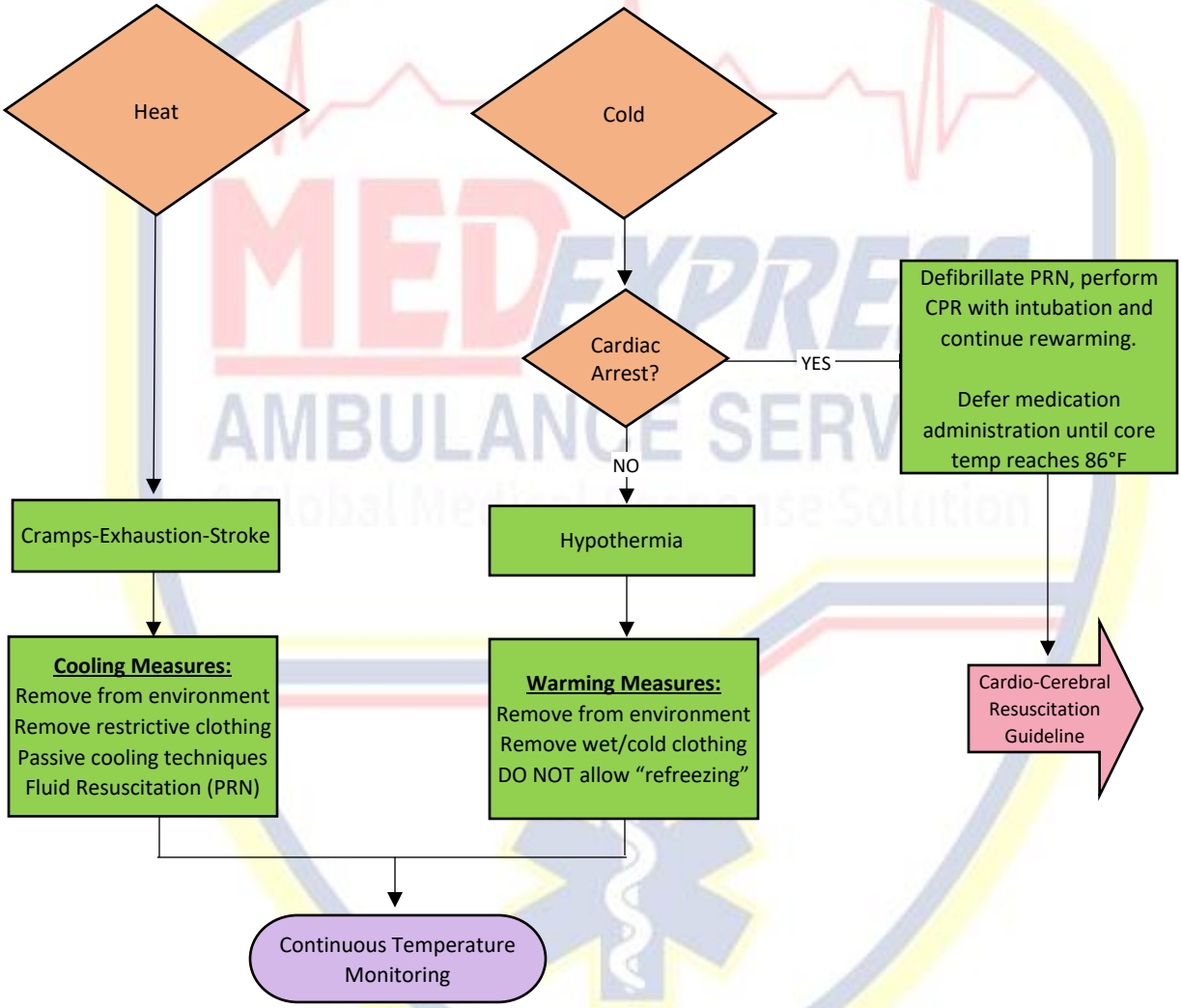
Environmental Exposure

Environmental exposure is defined by patients suffering from effects of extreme environmental temperatures.

GOALS

- Removal of patient from the environment
- Management/control of temperature



Pearls

- Handle hypothermic patients carefully to reduce the risk of sudden V-Fib.
- Heat stroke presents with AMS and usually have high core temps above 104°F, sweating generally disappears.
- Heat cramps may occur even with normal body temperature as a result of dehydration.
- Heat exhaustion may present with multiple signs & symptoms including: nausea/vomiting, weakness, dizziness, headache, tachycardia, hypotension and elevated temperature.
- Hyperthermia may be caused by illicit drug use or patients receiving general anesthesia for intubation.

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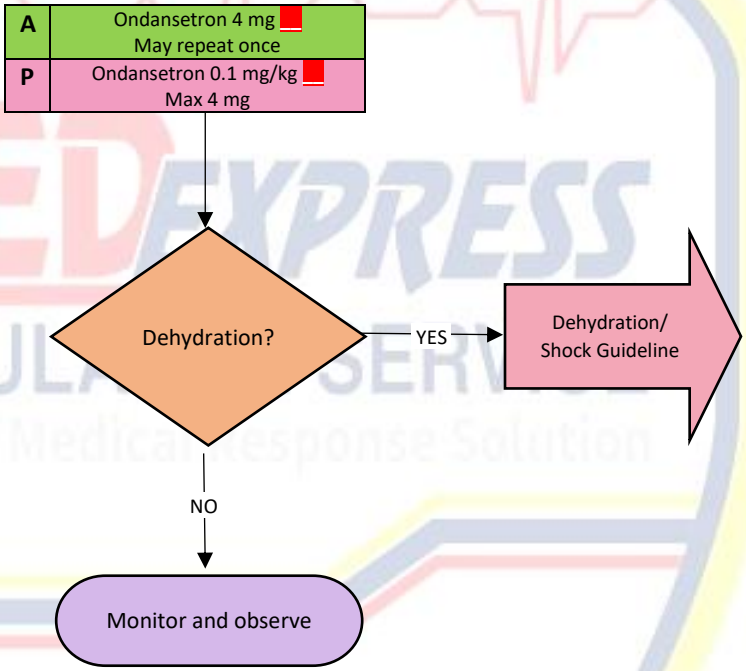
Nausea/Vomiting

Nausea is a non-specific symptom of an involuntary urge to vomit. Nausea may precede vomiting or present without vomiting at all. Many possible causes of nausea/vomiting exist.

GOALS

- Prevention or reduction of the symptom(s)
- Reduction of fluid loss from severe vomiting
- Rehydration of patients



Pearls

- Ondansetron may be given as a "pre-medication" for other nausea/vomiting causing medications/procedures.
- There are no studies to ascertain the safety in administration of ondansetron in the OB patient.
- Ondansetron can prolong QT intervals.
- Prolonged vomiting can result in hypocalcemia and other electrolyte imbalances.
- It may be appropriate to withhold ondansetron in patients who have ingested toxins where vomiting may be beneficial (alcohol).

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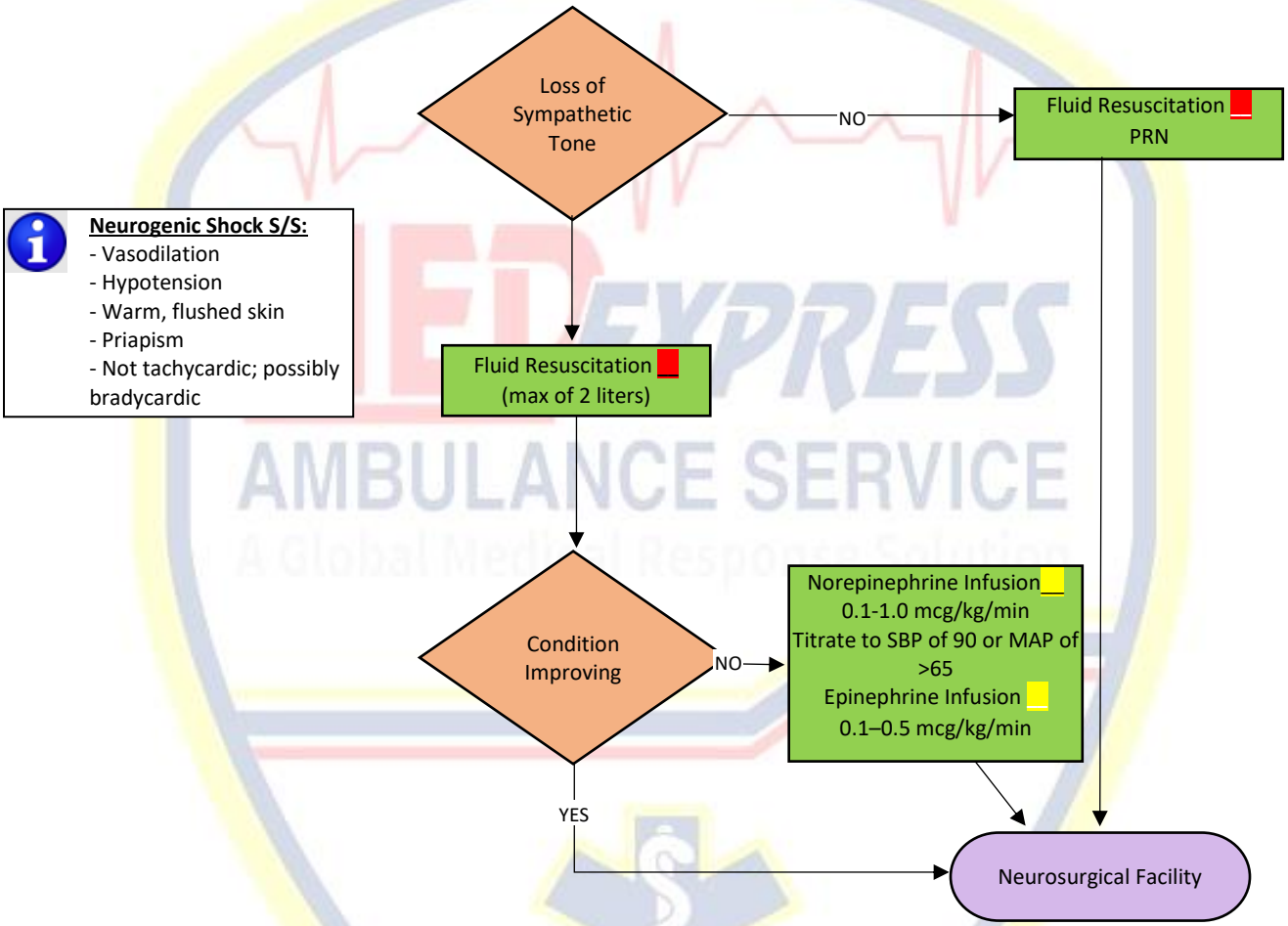
Neurogenic Shock

Classified as distributive shock whereas a disruption is occurring of the autonomic pathways within the central nervous system resulting in hypotension and occasional bradycardia.

GOALS

- Stabilize blood pressure, heart rate and body temperature
- Prevent tissue damage



Pearls

- Neurogenic shock can result from a brain injury or a high spinal cord injury above the level of T-6
- Fluid resuscitation to achieve a MAP ≥65 mmHg
- Assess and treat for hypothermia

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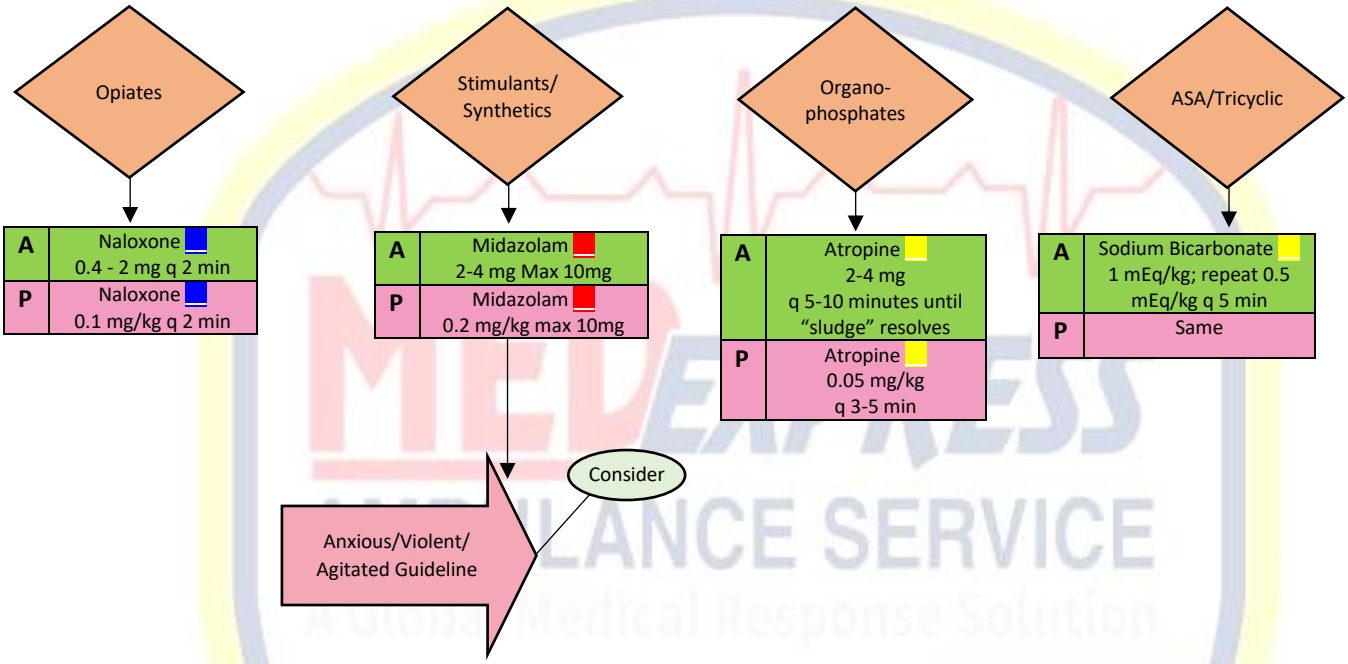
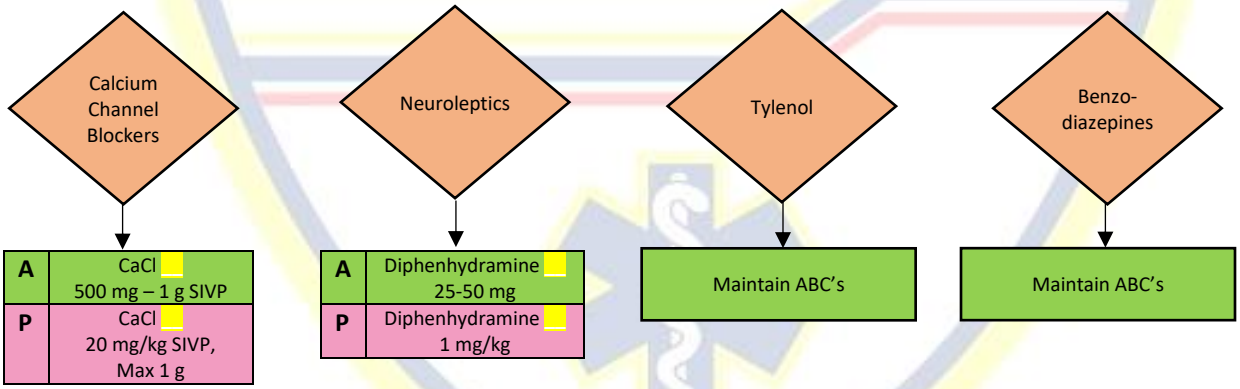
Overdose/Toxicity

The exposure of a drug or other substance in quantities greater than recommended resulting in toxic or lethal states.

GOALS

- Airway/Ventilation/Circulation management
- Antidote administration when applicable
- Poison Control Center Notification **(800-222-1222)**





Pearls

S/S of an overdose/toxic exposure can range from compromises of airway, breathing or circulation to violence and agitation

Opiates: heroin, fentanyl, morphine, hydrocodone, etc.
Stimulants/Synthetics: PCP, cocaine, amphetamines, MDMA, "mojo", "K-2", "spice"
Organophosphates: insecticides, herbicides and nerve agents
Tricyclics: elavil, amitriptyline * Goal of Sodium Bicarb in tricyclic overdose is to reduce widened QRS by half.
Calcium Channel Blockers: amlodipine, nifedipine, diltiazem, verapamil, benazepril
Neuroleptics: any "psychotropic" "behavior improving" medications like haldol, phenothiazines, Phenergan
Benzodiazepines: midazolam/Versed, valium, alprazolam/Xanax, clonazepam/Klonopin, lorazepam/Ativan

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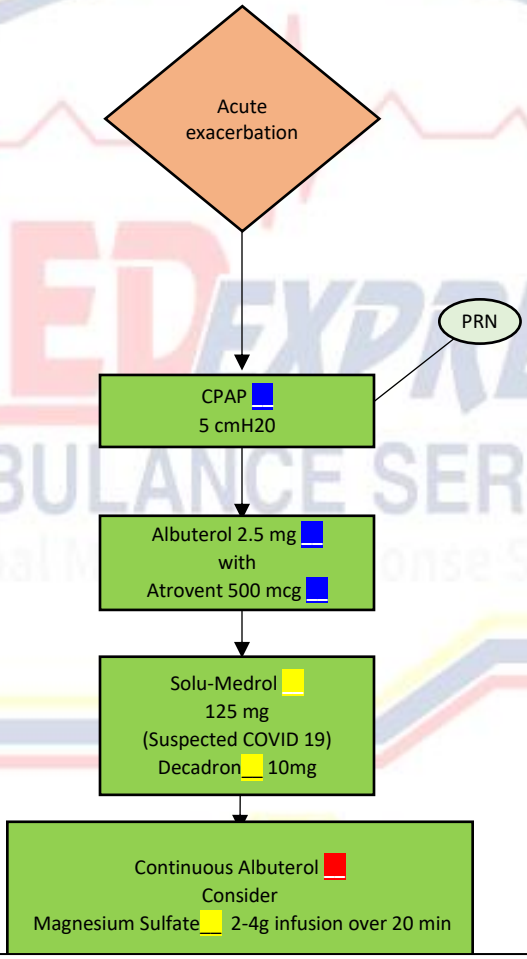
Respiratory Distress/COPD (Adult)

Chronic Obstructive Pulmonary Disease is a type of obstructive lung disease with long term poor airflow.

GOALS

- Treat acute exacerbations
- Bronchodilate airway
- Reduce mucous production
- Reduce swelling
- Address hypoxia and hypercapnia



Pearls

- PPV may be detrimental to continuity of care. **INTUBATION SHOULD BE A LAST RESORT.**
- Chronic findings (including wheezing, dyspnea upon exertion, "pink-puffer syndrome") are normal for these patients and should not be routinely treated in the emergency setting. Provider must exercise clinical judgment regarding the difference between a chronic finding and an exacerbation of symptoms complaint.
- These patients present with chronic hypercapnia.
- These patients respiratory drive is fueled by peripheral chemoreceptors not central chemoreceptors.
- Normal SpO_2 values may range from 88-94%, depending on stage of disease.
- Chronic steroid use can lead to adrenal insufficiency
- CPAP can be used to help splint airways open to allow for adequate exhalation
- $EtCO_2$ is a great tool for measuring patient response to treatment
- Beta-blocker medication should be withheld when β_2 agonist medication is being administered. Patients with significant hypertension ma need to be treated with nitroglycerin.
- Wheezing can also be a sign of pulmonary edema in CHF. Wheezing does not always equate to obstructive airway disorders.

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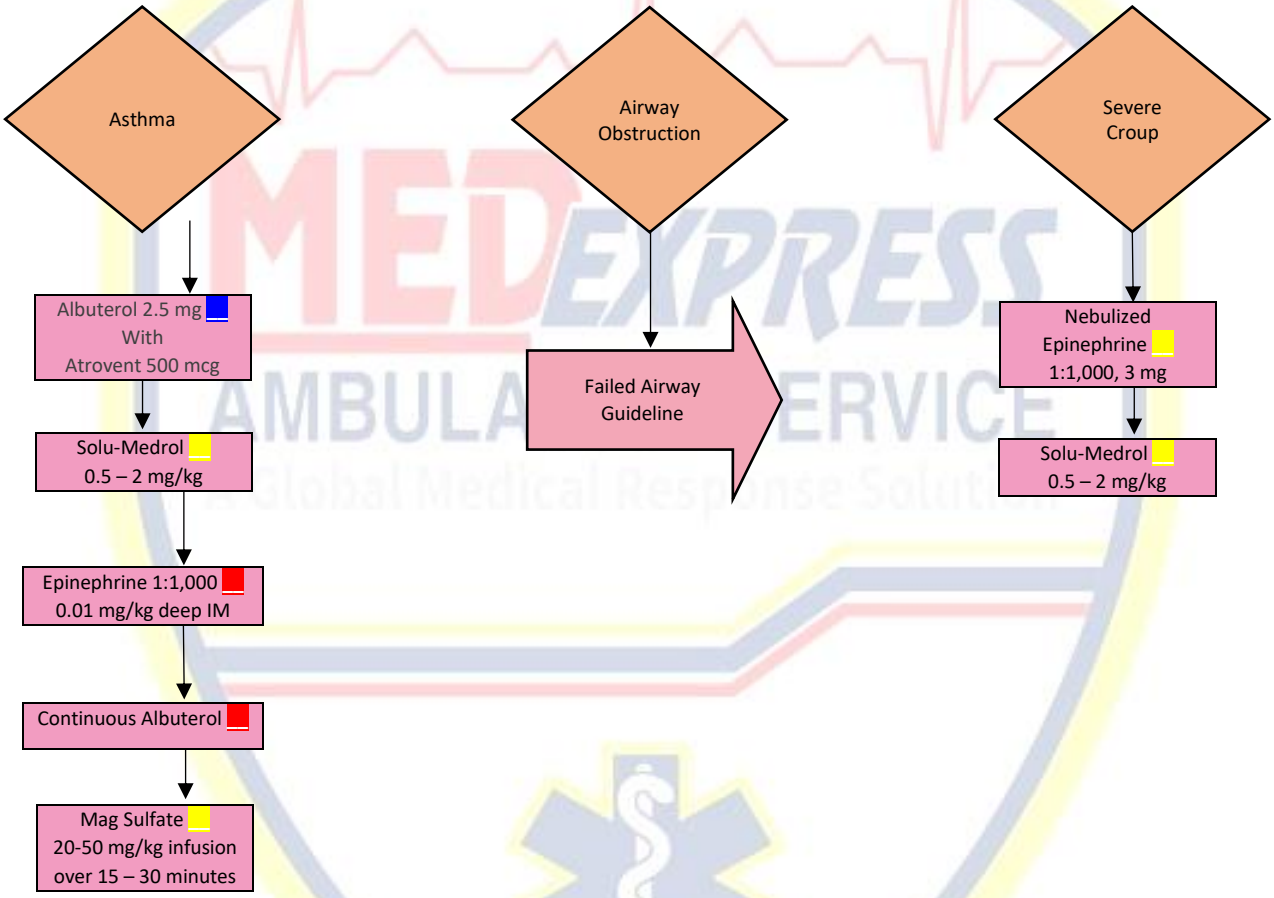
Respiratory Distress (Pediatric)

Common upper and lower respiratory disorders affecting the pediatric patient's respiratory system. Pediatric respiratory distress may lead to respiratory failure where inadequate gas exchange causes hypoxia, hypercapnia or both. This is the leading cause of cardiac arrest in children.

GOALS

- Bronchodilation
- Reduction of airway swelling
- Reverse and prevent hypoxia
- Reduce hypercapnia and intrinsic peep
- Obtain and maintain patent airway



Respiratory Distress:
- Nasal Flaring
- Retractions
- Stridor
- Wheezing
- Tachypnea
- "Cling to parent"

Respiratory Failure:
- Gurgling
- Head bobbing
- Altered mental status
- Decreased muscle tone
- Decreased respiratory rate
- "Help from anyone"

Pre Arrest:
- Bradypnea
- Agonal
- Poor pallor
- Diffuse cyanosis
- Non-responsive muscle tone
- Unresponsive

Pearls
- IV's should not routinely be attempted for young children who are stable.
- Supportive care only should be used for mild croup.
- Children with respiratory distress commonly sit up and lean forward to improve leverage for the accessory muscles and to allow for easy diaphragmatic movement."

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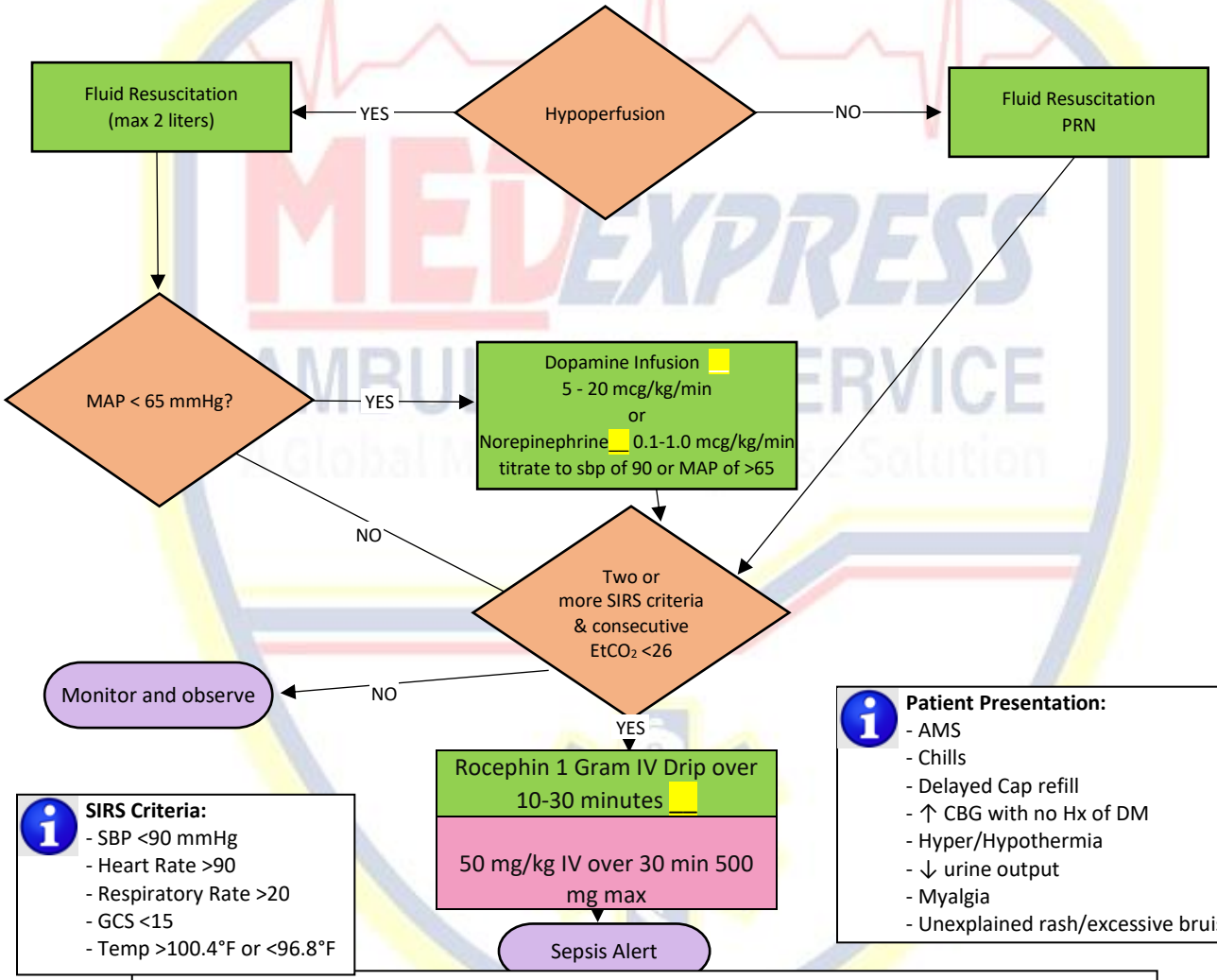
Septic Shock/Infection

Occurs when sepsis leads to dangerously low blood pressure and abnormalities in cellular metabolism. Classified as distributive shock. Septic shock is defined as hypotension following an infectious process that persists despite treatment with fluid administration. Bacterial infections are the most common culprit.

GOALS

- Fluid resuscitation for vasodilation and third spacing—"Fill up the tank"
- Reduce "run away" vasodilation
- Early antibiotic administration (in-hospital)
- Temperature management
- MAP of >65 mmHg to regain end organ perfusion



SIRS Criteria:
- SBP <90 mmHg
- Heart Rate >90
- Respiratory Rate >20
- GCS <15
- Temp >100.4°F or <96.8°F

Patient Presentation:
- AMS
- Chills
- Delayed Cap refill
- ↑ CBG with no Hx of DM
- Hyper/Hypothermia
- ↓ urine output
- Myalgia
- Unexplained rash/excessive bruising

Pearls

- $EtCO_2$ assessment should be used to aid in sepsis identification
- Early ED notification of "Sepsis Alert"
- These patients require high flow and high concentration of oxygen
- CPAP may be indicated for ARDS (5 cm H_2O max)
- Temperature management included fluid resuscitation and passive external cooling for hyperthermia
- Advanced stages of sepsis may present with *hypothermia*; management includes passive re-warming techniques

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Stroke/TIA

A life-threatening condition in patients with a thrombus or vessel rupture within the cranial space resulting in neurological compromise.

GOALS

- Determine last seen normal time
- Maximize cerebral perfusion and drainage
- Rapid determination and notification of appropriate stroke center

F.A.S.T./V.A.N.
Assessment

↓

Stroke Center Determination

STROKE ASSESSMENT TOOLS

Facial drooping
Arm weakness
Speech difficulties
Time last seen normal
Vision
Aphasia
Neglect

Signs/Symptoms Documentation:
- facial droop/unilateral weakness- unilateral arm weakness
- unilateral decreased grip strength
- speech difficulty/aphasia

History Documentation:
- time last known well
- seizure activity
- trauma before onset of symptoms
- recent illness, surgery, trauma
- current medications

Pearls

- Stroke Activation
- Continuous 12-Lead monitoring
- Place patients supine for ischemic strokes
- Place patients 15-30 degrees for hemorrhagic strokes
- Ischemic vs hemorrhagic=7:1; when in doubt, transport supine unless airway compromise apparent
- Oxygen is not recommended for SpO_2 ≥92% room air
- Limit scene time to 10 minutes
- Hypertension control only if systolic BP >185 mmHg or diastolic BP >110 mmHg and Last Seen Normal time <4.5 hours
- “Wake up” stroke still requires rapid assessment, treatment and transport
- Have a family member/witness remain with patient or obtain phone number
- A VAN Assessment should be done on every stroke patient with arm weakness.

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Thoracic Aortic Catastrophe

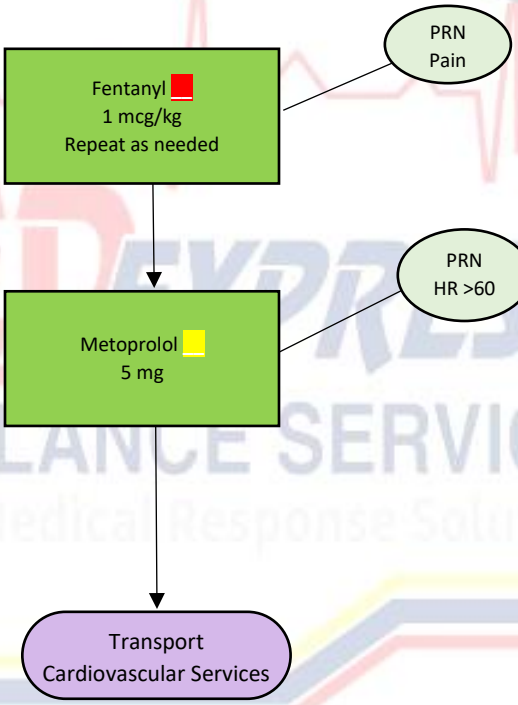
Aortic aneurysm: "ballooning of the vessel"
Dissecting aortic aneurysm: tearing of the tunica intima
Aortic rupture: Complete vessel transection, spilling blood into the thoracic and/or abdominal cavity causing exsanguination

GOALS

- Pain management
- Blood pressure and heart rate management: SBP between 100-120 and HR <60

Patient Presentation:

- Abrupt and severe pain described as sharp or tearing.
- Ascending aortic catastrophe may cause pain in the anterior and/or posterior chest
- Descending aortic catastrophe may cause pain in flank, back or abdomen.
- May show s/s of MI and/or stroke
- Disparity of blood pressure between upper extremities.
- Pericardial tamponade may be present and is the most common cause of death.



Pearls

- Hypertension and tachycardia are extremely dangerous in these patients!
- Aggressive pain management will aid in managing BP and HR.
- Pain management and heart rate control is priority. Once the HR ≤60, then BP management can be initiated.
- Marfan syndrome and Ehlers-Danlos syndrome are contributing factors in patients primarily under the age of 40
- Risk factors include chronic HTN, atherosclerosis, previous cardiovascular surgery

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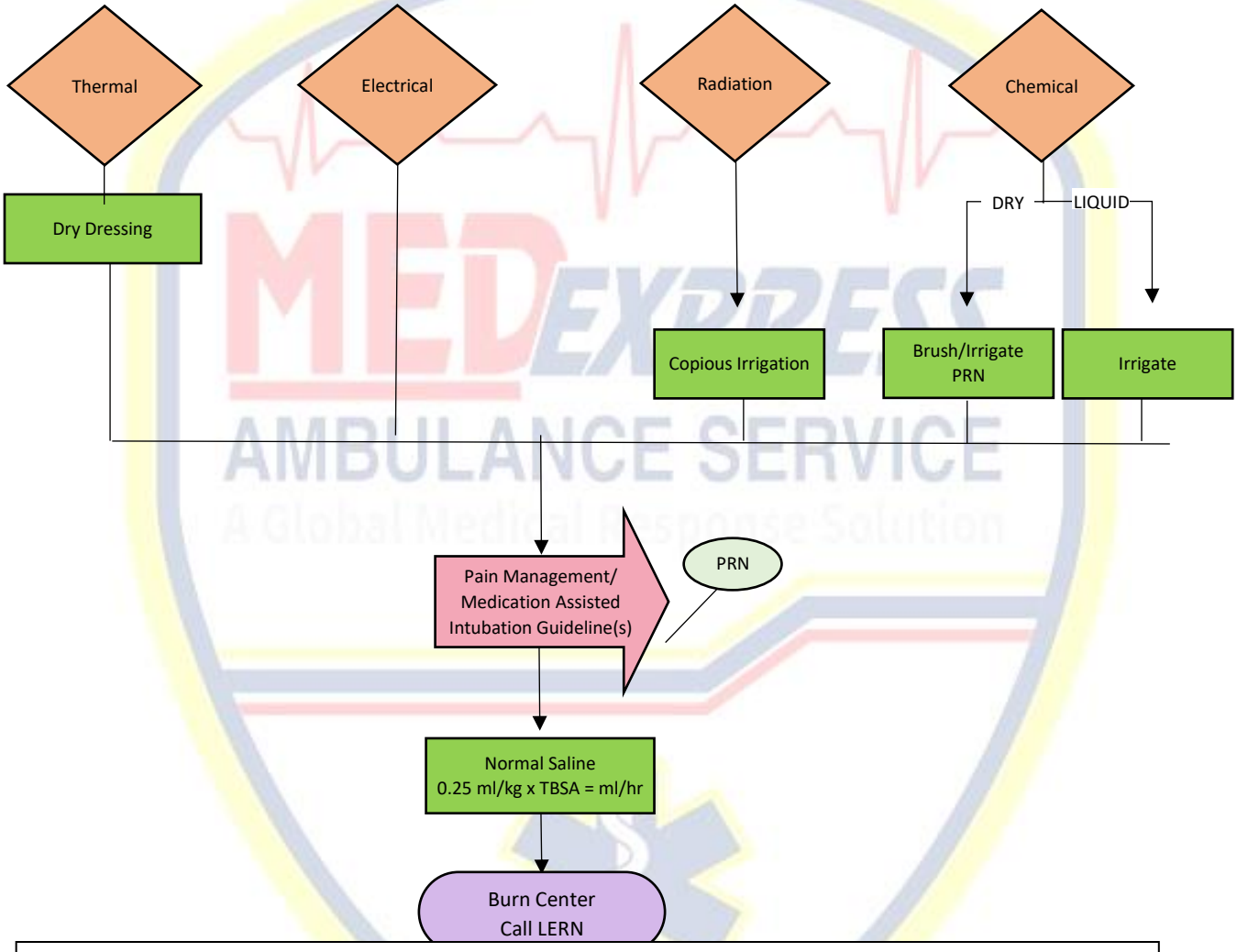
Burns

A type of injury to the skin caused by heat, cold, electricity, chemicals, friction or radiation

GOALS

- Consider inhalation injury and secure airway EARLY-as needed
- Remove patient from source and stop burning process
- Remove restrictive garments, equipment and/or devices
- Prevent hypothermia



Pearls

- Critical burns include: full thickness burns, partial thickness >10% BSA; burns to face, eyes, hands, feet, genitalia and major joints; electrical burns to include lightning injury; chemical burns; inhalation burns; burns with extremes of age or chronic disease; burns associated with major traumatic injury. These patients should be transported to a burn center with the exception of critical trauma patients. Critical trauma patients with burns should be transported to a trauma center.
- Consult the Emergency Response Guidebook for guidelines on chemical decontamination and burn management
- Do not apply ointments, creams or lotions during the initial management of a burn
- Electrical burns: DO NOT touch the patient until you are certain that the electrical source is disconnected. Anticipate EKG disturbances.
- Fluid resuscitation should be started @ 0.25 ml/kg x TBSA = ml/hr (ex: 70 kg pt with 40% TBSA = 700 ml/hr)
- Consider carbon monoxide and/or cyanide poisoning when appropriate.

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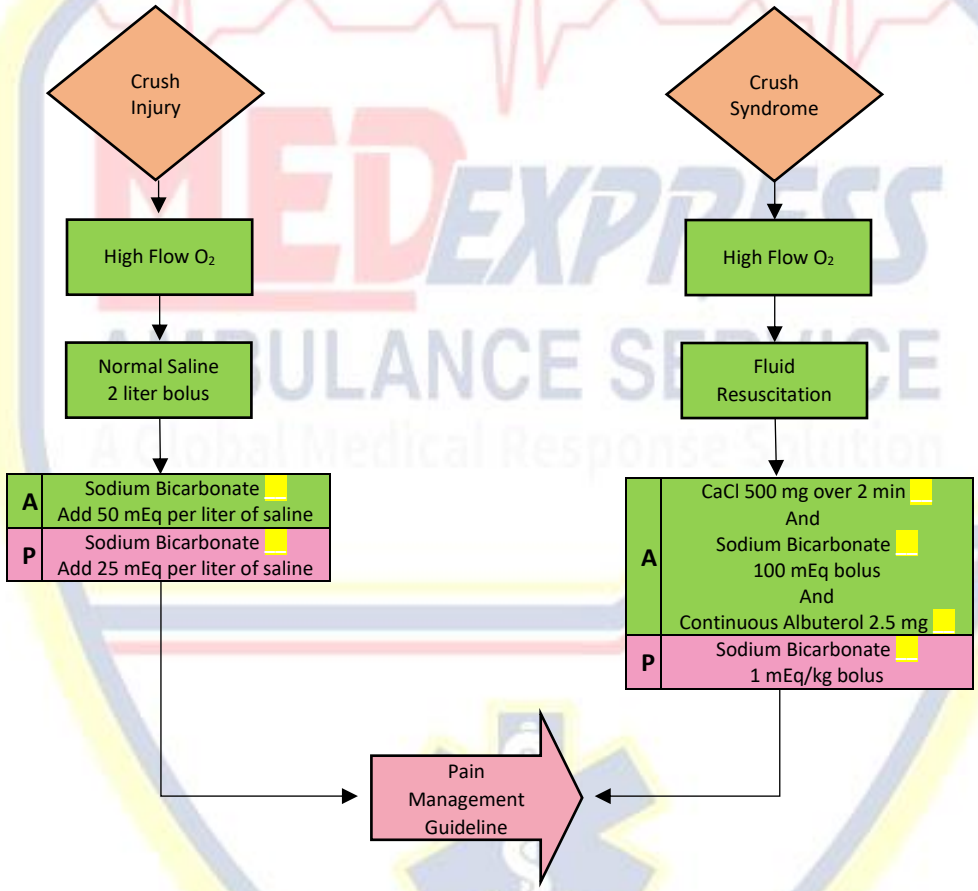
Crush Injury/Syndrome

Crush Injury is defined as compression of extremities or other major muscle groups causing muscle swelling and/or neurological impairment.
Crush Syndrome is defined as systemic manifestations of crush injury due to traumatic rhabdomyolysis and the release of potentially toxic cell components and electrolytes. This may lead to lethal dysrhythmias, hyperkalemia, hypocalcemia, renal failure, local tissue injury or death. May also lead to altered mental status and hypotension.

GOALS

- Rapid identification
- Minimalize/avoid renal failure or death
- Avoid hyperkalemia



Pearls

- Be aware of air quality in confined spaces.
- It's a good principle to start this therapy during extrication
- Hyperkalemia: Peaked T waves, QRS >0.12 seconds, QT interval >0.46 seconds, loss of P wave, sine wave
- Early, aggressive pain management/control is strongly encouraged
- Patients may become hypothermic rapidly even in warm environments
- **ONE AMPULE OF SODIUM BICARBONATE IS 50 mEq**
- **If administering CaCl and Sodium Bicarb, give in 2 different lines.**

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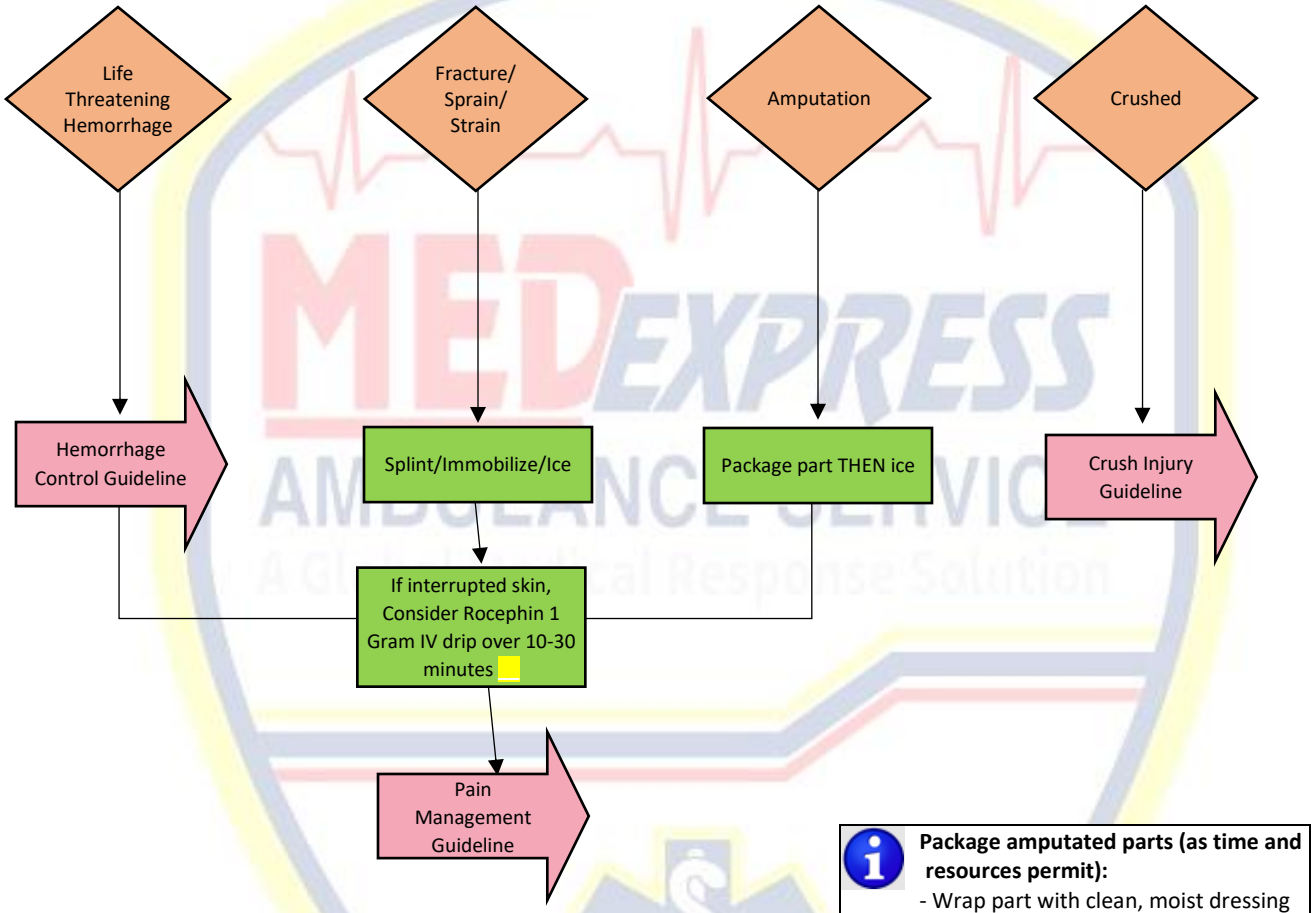
Extremity Injury

Any classification of a major injury to an extremity.

GOALS

- Preserve limb
- Prevent exsanguination
- Prevent further injury



Package amputated parts (as time and resources permit):

- Wrap part with clean, moist dressing
- Place in plastic bag
- Place in cold ice water

Pearls

- There are many times that these extremity injuries may be associated with one another.
- Femur fractures are at HIGH risk for hemorrhagic shock secondary to internal bleeding.
- Open fractures are at HIGH risk for infection. Should receive Rocephin therapy.
- Constant distal CMS assessment is critical, when applicable

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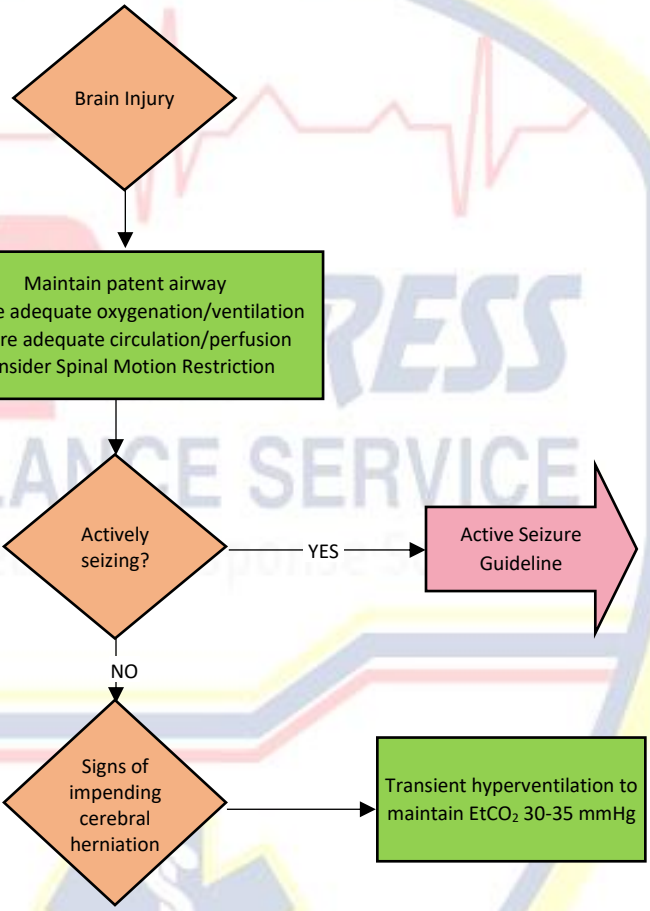
Head Trauma

Blunt and/or penetrating trauma to the head

GOALS

- Prevent or manage secondary brain injury
- Ensure adequate oxygenation, ventilation and perfusion
- Prevent or correct hypoxia and hypotension



Brain Injury S/S:

- Altered mental status
- Unconscious or Loss of consciousness
- Confused or combative
- Seizures
- Posturing
- Trismus
- Headache
- Nausea/vomiting
- Loss of coordination

Pearls

- Consider elevating the head of the stretcher 30° if patient has a systolic blood pressure of ≥90 mmHg to reduce ICP
- Maintain SpO_2 ≥94% and $EtCO_2$ 35-45 mmHg. Do not hypoventilate or hyperventilate. Transient hyperventilation is only indicated if signs of cerebral herniation are present. If transient hyperventilation is indicated, maintain $EtCO_2$ of 30-35 mmHg.
- Maintain a systolic blood pressure of 90 mmHg if hypotension is present.
- If patient is hypoglycemic (CBG ≤ 60), contact medical control for treatment orders
- Signs of impending cerebral herniation may include: decreased mental status, posturing, unilateral/bilateral pupil dilation, hypertension, bradycardia and abnormal ventilatory patterns

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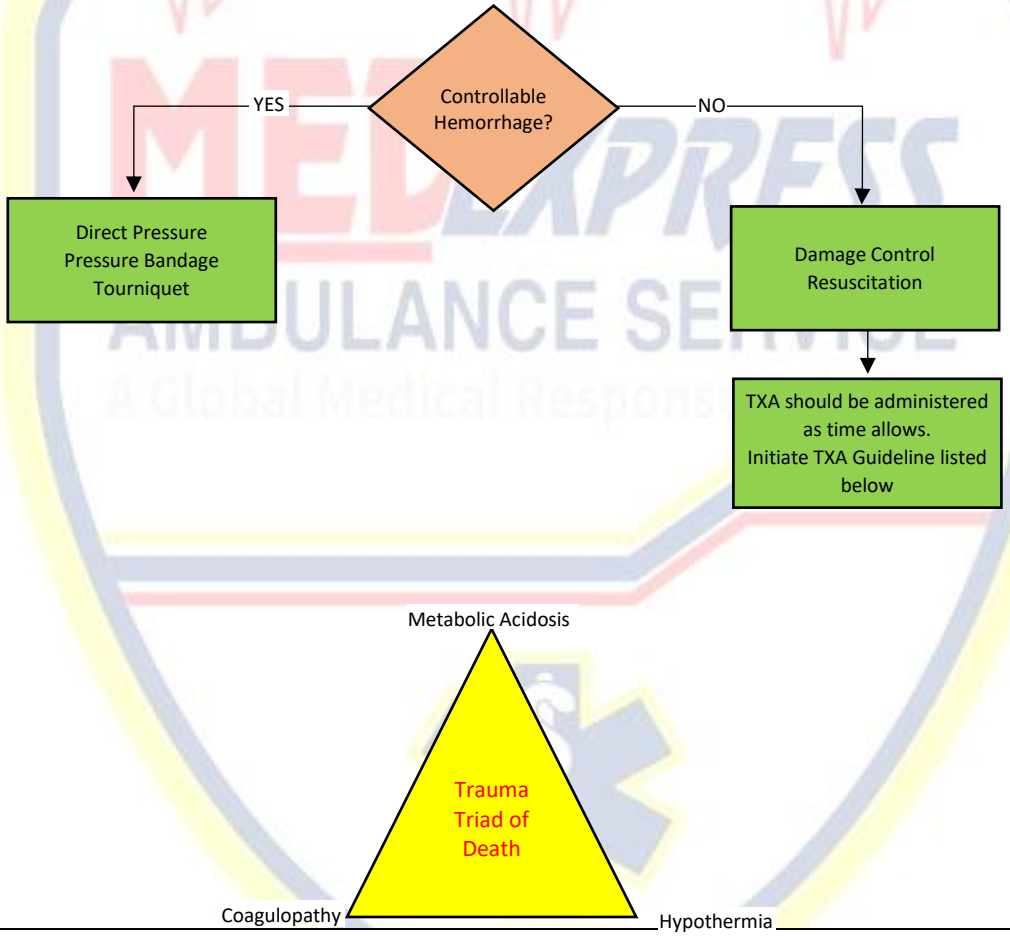
Hemorrhage Control

Patients that present with significant internal or external hemorrhage requiring manual, pharmaceutical and/or surgical intervention to control hemorrhage

GOALS

- **LIMIT SCENE TIME TO 5 MINUTES FOR UNCONTROLLABLE HEMORRHAGE**
- **Utilize TXA as appropriate to minimize uncontrollable hemorrhage**
- Interventions should not be completed on scene unless an immediate correctable life threat is identified.
- Rapid transport to closest trauma center
- Maintain patient condition until surgical intervention



Pearls

- Damage Control Resuscitation, also known as “permissive hypotension” is defined by the management of patient clinical signs and symptoms with limited minimal pre-hospital intervention. The goal is to ensure vital organs are being perfused while avoiding massive crystalloid resuscitation. Key indications that would prompt intervention include: systolic BP <80 mmHg, change in mental status, or loss of radial pulses. The preferred intervention is administering a limited amount of warmed crystalloid solution while enroute to the trauma center. And the administration of TXA per protocol
- The “Trauma Triad of Death” is a visual representation describing the combination of hypothermia, acidosis and coagulopathy. This combination is commonly seen in patients who have sustained severe traumatic injuries and results in a significant rise in the mortality rate.

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Spinal Motion Restriction

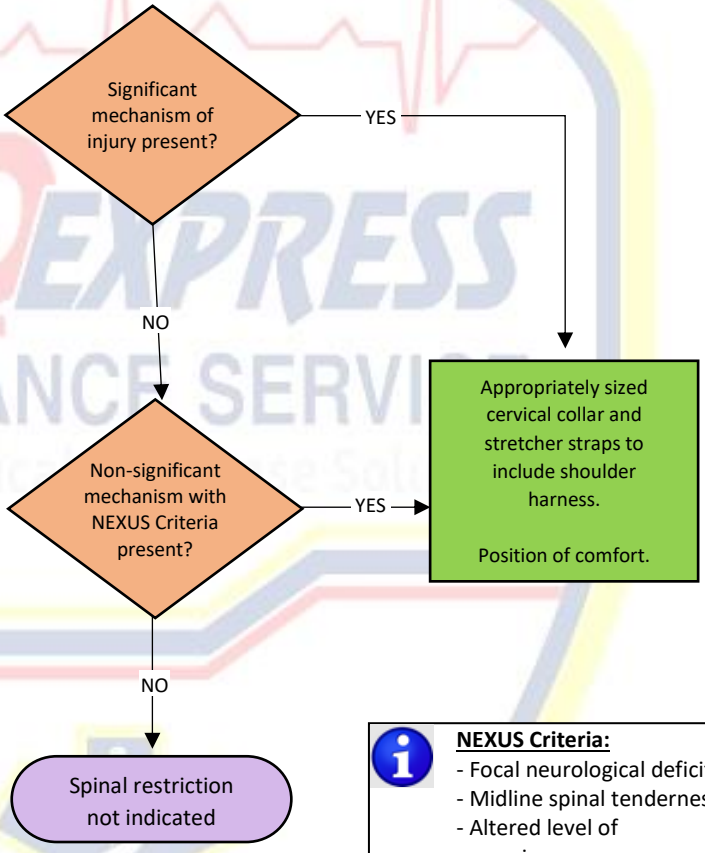
Maintenance of the spine in anatomic alignment and minimizes gross movement and does not mandate the use of specific adjuncts.

GOALS

- Should not interfere with critical airway management, hemorrhage control or rapid transport
- Backboards should not be used as a therapeutic intervention or as a precautionary measure
- Should not be used for patients with penetrating trauma without evidence of spinal injury and when spinal motion restriction will delay care
- Assess risk for spinal injury

Significant Mechanism of Injury:

- MVC with any Ejection, death of occupant, rollover, 12 inch intrusion into passenger compartment.
- Pedestrian struck or run over >20 mph
- Motorcycle/bicycle/ATV >20 mph
- Blast injuries
- Major blunt trauma to torso
- Falls of patient or objects >20 feet



Non-Significant Mechanism of Injury:

- Falls <20 feet
- Pedestrian struck <20 mph
- Minor MVC's
- Mechanism of isolated injury should not be included in this guideline (GSW to leg, fracture to ankle, industrial hand injury, etc.)

NEXUS Criteria:

- Focal neurological deficit
- Midline spinal tenderness
- Altered level of consciousness
- Intoxication
- Distracting Injury

Pearls

- LSB's can be used as extrication device
- It is recommended to remove motorcycle helmets
- Smaller children and others with cognitive impairment may not tolerate cervical collars therefore causing unwanted movement. It may be reasonable to withhold application of a cervical collar and leave small children in a car seat
- Patients 65 years or older have a higher risk of spinal injury that can be overlooked with NEXUS criteria. It is important to exercise sound clinical judgment when determining the need for spinal motion restriction in these patients. Insignificant mechanisms of injury can cause spinal fractures in the elderly population
- Patients with communication barriers (language, very old/young, or any other reason a patient cannot accurately report signs and symptoms) should be selected for spinal motion restriction

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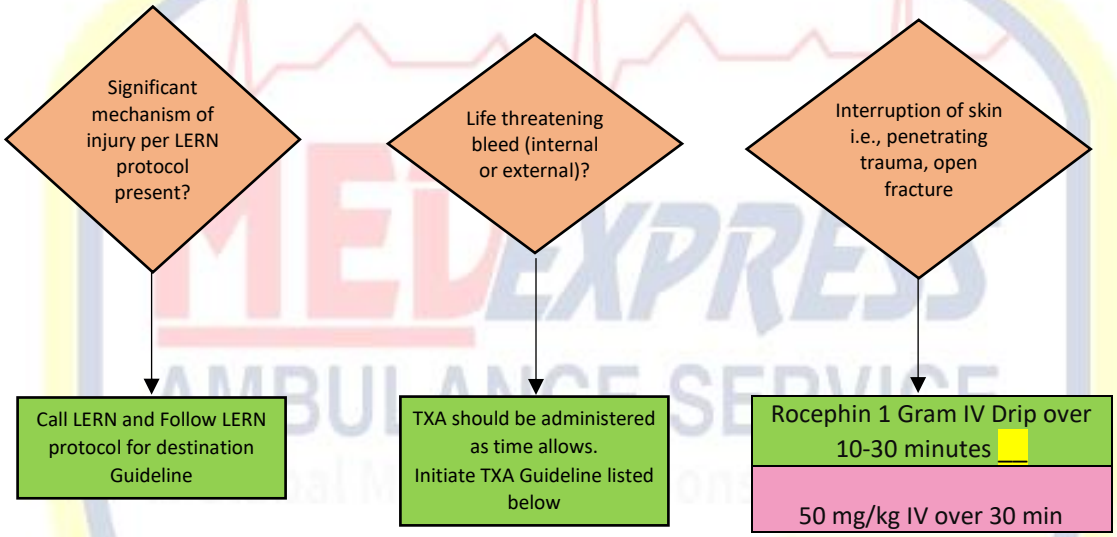
Major Trauma

Blunt and penetrating trauma that meet LERN Criteria for major trauma.



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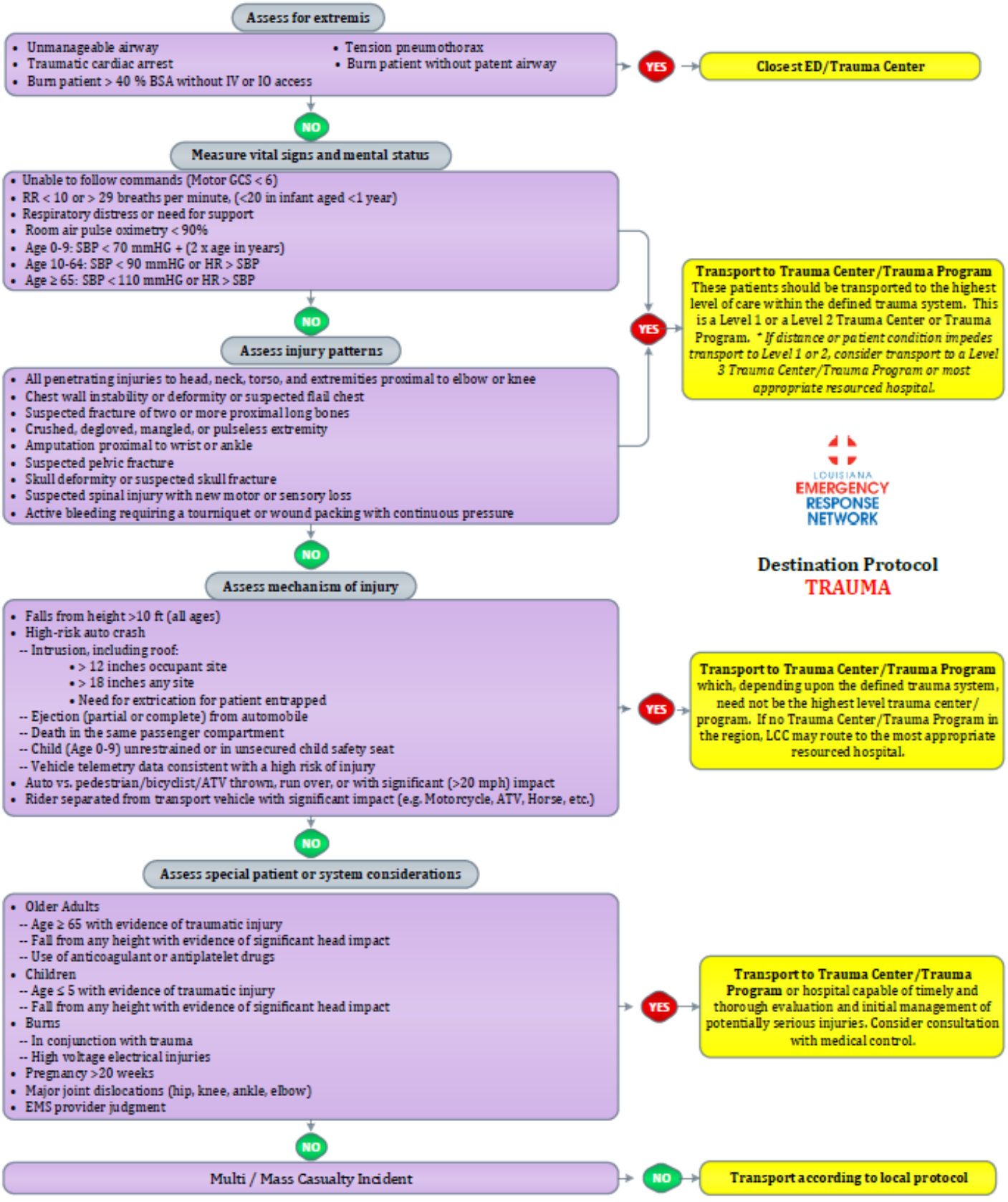
Call LERN Communication Center at 1-866-320-8293 for patients with a trauma mechanism and meeting one or more of the following criteria:



LOUISIANA EMERGENCY RESPONSE NETWORK

Destination Protocol
TRAUMA

When in doubt, transport to a trauma center.

Rev. 8/18/2022
Eff. 1/1/2023

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Initiation of Tranexamic Acid

GOALS

-Identify and treat patients with uncontrolled traumatic hemorrhagic shock and or traumatic intracranial hemorrhage who may benefit from Tranexamic Acid (TXA) and require critical care transport.

1.TXA should be administered within 3 hours of injury, however administration in any patient with uncontrolled traumatic hemorrhage (blunt or penetrating) or traumatic intracranial hemorrhage may be beneficial.

2.TXA is an option for the treatment of traumatic hemorrhage patients that meet ANY of the following criteria:
a. Known or suspected significant, uncontrolled hemorrhage after blunt or penetrating trauma.
b. Isolated traumatic intracranial hemorrhage with a GCS of 12 or less AND reactive pupils.
c. In adults, sustained hypotension (systolic blood pressure < 90mmHg) and/or sustained tachycardia (>120 beats per minute).
d. In pediatrics, ANY hypotension (below age adjusted normal) and/or sustained tachycardia (above age adjusted normal).

3. Adult (age 18 and older):
a. Administer a loading dose of 1 grams TXA IV/IO diluted in 100 ml
NS, infuse over 10 minutes.
b. If transport time will be over 1 hour, consider administering 2 grams TXA IV/IO diluted in 250 ml NS, infuse over 20 minutes instead of 1 gram over 10 minutes.

4. Pediatric (under age 18 and greater than 1 year):
CONTACT RECEIVING FACILITY PRIOR TO ADMINISTRATION
a. Administer a loading dose of 15 mg/kg TXA IV/IO diluted in 100 ml NS.
Infuse over 10 minutes (max dose 1gm)
In pediatric patients, closely monitor fluid volume infused and calculate to use the least volume possible

5. TXA may be administered concurrently with blood products utilizing a separate access site. If inadequate access to give both, give available blood products first.

6. Initiate transport to a definitive trauma center with capabilities to transfuse blood and administer/continue TXA.

Exclusion Criteria for the administration of TXA:
1. Known pregnancy.
2. Known allergy to TXA.
Considerations:
1. If patient is on a beta-blocker medication, reflex tachycardia may not be present. These patients, while in traumatic hemorrhagic shock, may present with hypotension and a normal heart rate.
2. Pediatric patients in traumatic hemorrhagic shock will present with tachycardia. Pediatric patients can maintain a normal BP until >20% of blood volume is lost, hypotension is a LATE sign and is indicative of impending cardiovascular collapse. Do NOT wait to see hypotension in patients under 18 years of age with suspected hemorrhagic shock to administer TXA.

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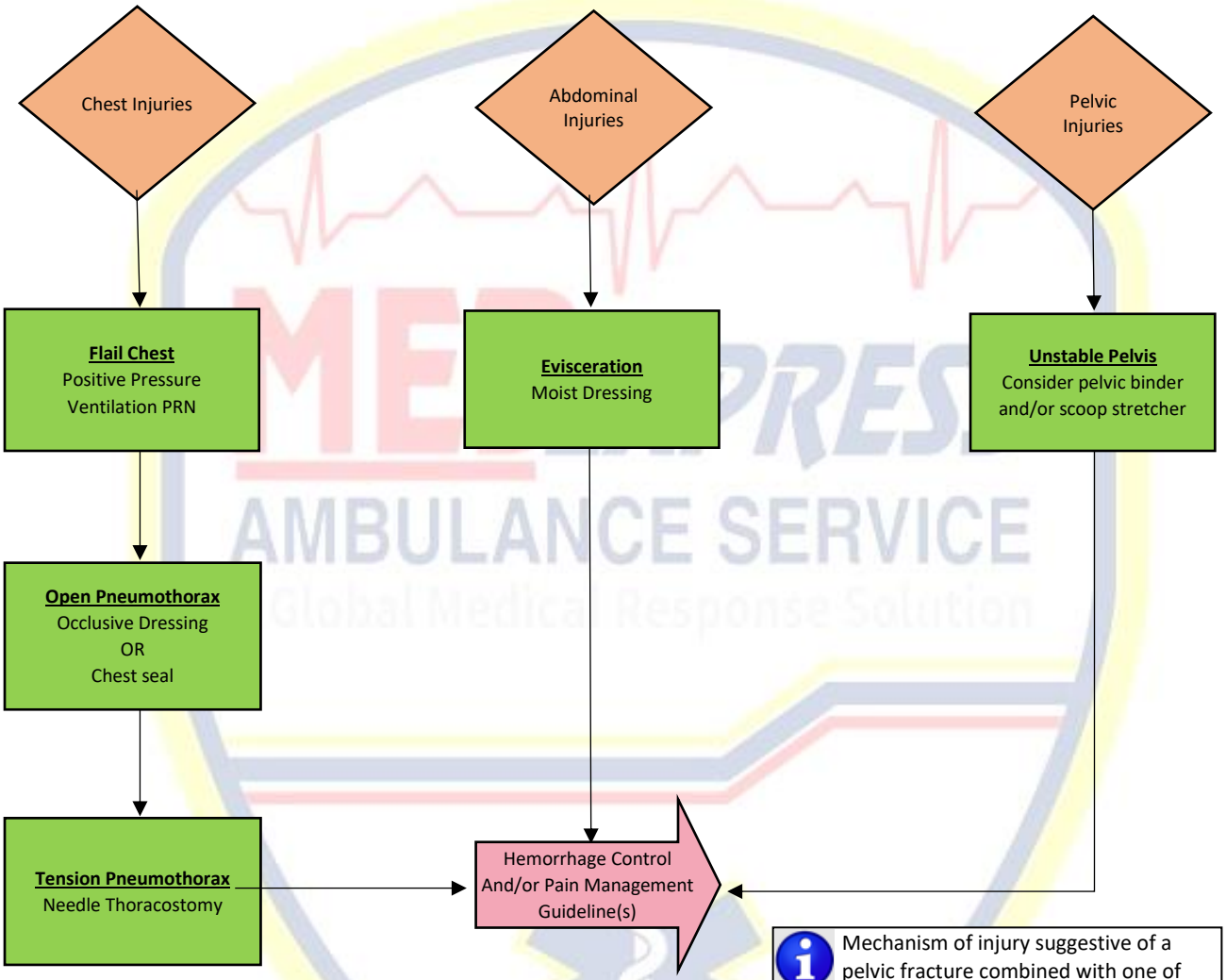
Torso Trauma

Blunt and/or penetrating trauma to the chest, abdomen or pelvic region.

GOALS

- Reduce hemorrhage
- Improve ventilation/oxygenation/perfusion
- Manage pain



Mechanism of injury suggestive of a pelvic fracture combined with one of the following indicates pelvic binder application:

- HR >100
- SBP <90
- GCS <14
- Distracting injury
- Pelvic pain on clinical assessment

Pearls

- Springing the pelvis to evaluate for pelvic fractures is unreliable and dangerous
- Pelvic injuries should be suspected when s/s of shock are present with blunt trauma and obvious causes of blood loss can't be determined.
- Bulky dressings are no longer recommended to stabilize a flail chest injury.

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Trauma Arrest

A pulseless patient caused by blunt and/or penetrating trauma. These patients may not be in cardiac arrest, rather just “pulseless”.

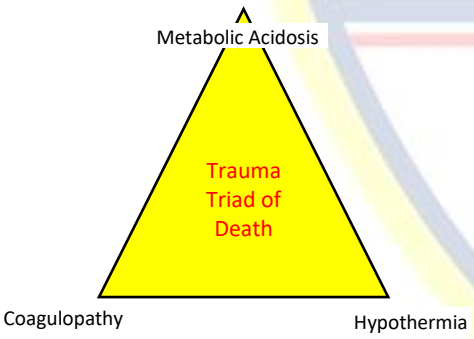
GOALS

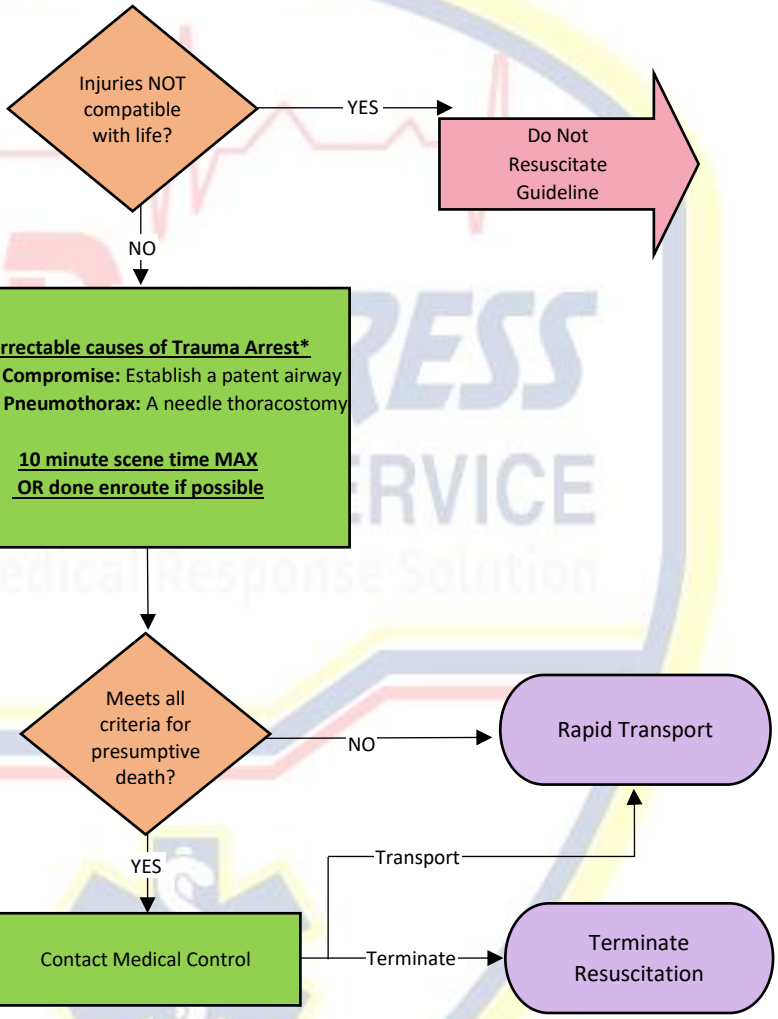
- Rapid identification of any correctable cause of the patient being pulseless, **OR**
- Identification of injuries non-compatible with life
- Rapid transport to a trauma center when indicated

Injuries not compatible with life:
Blunt or penetrating:
- Decapitation
- Catastrophic brain trauma
- Hemicorporectomy
- Incineration
- Grossly obvious mortal wound
- Injuries that do not permit effective administration of CPR
- Evidence of prolonged cardiac arrest, dependent lividity or rigor mortis

Presumptive Death: Blunt
- Asystole or PEA <40
- Apneic & Pulseless

Presumptive Death: Penetrating
- Asystole or PEA <40
- Apneic & Pulseless
- Without spontaneous movement
- Fixed, dilated pupils





Pearls

- Surgical intervention is definitive care. Do not waste time on scene establishing an advanced airway unless the compromised airway is suspected to be the cause, or a contributing factor of the arrest and an advanced airway is required to address the compromise
- When no correctable causes of trauma arrest exist, when there are no signs of presumptive death, and there are no injuries incompatible with life – **LOAD and GO**
- CPR is to be performed without emphasis on cardiac medication administration. Fluid resuscitation may be indicated
- Do not over ventilate
- Paramedics should use sound clinical judgment when determining “dead at scene”

**** This guideline does not supesede mass causality incident triage. ****

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Appendix A - Medications

Lowest Scope of Practice Level Per Medication Administration Protocol:

- BASIC
- ADVANCED
- PARAMEDIC

Adenosine

Additional Names:

Adenocard

Classification:

Endogenous nucleotide, atrial antiarrhythmic

Physiological Effects:

Adenosine is an endogenous nucleotide a derivative of Adenosine Triphosphate (ATP) which is 1 of 4 base pairs that makes up the structural unit of RNA and DNA. This means that adenosine is found in all cells of all living tissue. Adenosine slows conduction time through the AV-node and can interrupt re-entry pathways through the AV-node thus restoring sinus rhythms to patients experiencing SVT's.

Indications:

Stable narrow complex tachycardia (PSVT)
Consider for "unstable" narrow complex tachycardia while preparing for cardioversion
Consider a trial regimen for stable, regular wide-complex tachycardia with monomorphic QRS of undetermined etiology

Contraindications:

Known hypersensitivity
Bradycardias and AV blocks > than 1°
Sick-sinus syndrome
Poison induced tachycardia

Dosage:

Adult: Initial: 12 mg rapid IV/IO followed by 20 ml flush
2nd: 12 mg rapid IV/IO followed by 20 ml flush after 1 – 2 min

Pediatric: Initial: 0.1 mg/kg rapid IV/IO followed by 5 ml flush (max 6mg)
2nd: 0.2 mg/kg rapid IV/IO followed by 5 ml flush after 1 – 2 min (max 12 mg)

Side Effects:

Facial flushing, headache, sweating, chest pain, palpitations, hypotension, dyspnea, dizziness, tingling, burning, or heavy sensation in arms, apprehension

Additional Information:

Vagal maneuvers first when clinically appropriate
Half-life is less than 10 seconds
Administration in vein closest to cardiac circulation is preferred
Asystole and short lasting 1st, 2nd, or 3rd degree AV blocks possible
Does not convert atrial fibrillation, atrial flutter, or ventricular tachycardia
Larger doses may be required for patients taking Theophylline or Caffeine
Reduced doses may be required for patients taking dipyridamole (Persantine) or carbamazepine (Tegretol)

Clinical Guideline(s):

Tachycardia

Albuterol

Additional Names:

Proventil, Ventolin, Salbutamol

Classification:

β2 selective, sympathomimetic

Physiological Effects:

β2 sympathomimetic that produces bronchodilation by causing smooth muscle relaxation of the smooth bronchial muscles through the stimulation of the β2-adrenergic receptors in the lung tissue.

Indications:

Relief of bronchospasm
Asthma
COPD disease, chronic bronchitis, emphysema
Suspected Hyperkalemia

Contraindications:

Hypersensitivity
Symptomatic tachycardia

Dosage:

Adult: 2.5 mg/3 ml of NS added to nebulizer (oxygen flow rates of 6 – 8 lpm), may be repeated prn

Pediatric: 2.5 mg/3 ml of NS added to nebulizer (oxygen flow rates of 6 – 8 lpm), may be repeated prn

Side Effects:

Tachycardia, hypertension, angina, nervousness, tremors, headache, dizziness, insomnia, cough, dry mouth, exacerbation of symptoms, nausea, vomiting, GI distress

Additional Information:

Use cautiously in patients with CAD, hypertension, hyperthyroidism, and diabetes mellitus
Administer cautiously to patient on MAOI s or tricyclic anti-depressants
Albuterol and beta blockers are antagonistic (inhibit each other)
β2 selectivity is not absolute and some β1 effects (tachycardia or dysrhythmias) can occur in some patients

Clinical Guideline(s):

Asthma
Allergic Reaction / Anaphylactic Shock
Respiratory Distress / COPD
Respiratory Distress (Pediatric)
Crush Syndrome / Injury

Amiodarone

Additional Names:

Cordarone

Classification:

Antiarrhythmic (class III)

Physiological Effects:

Amiodarone is a complex, multiple anti-arrhythmic agent. Amiodarone prolongs the action potential and refractory period of the myocardium, while slowing the sinus rate. Amiodarone increases PR and QT intervals and decreases peripheral vascular resistance.

Indications:

Ventricular Tachycardia and other wide-complex tachycardias
Ventricular Fibrillation
Stable, narrow-complex tachycardia — PSVT

Contraindications:

Hypersensitivity
Poison induced tachycardia
Bradycardias, 2° and 3° AV Blocks

Dosage:

Adult:

Cardiac Arrest
Initial: 300 mg IV/IO
2nd: 150 mg IV/IO 3 – 5 min after 1st dose

Non-Cardiac Arrest (perfusing tachyarrhythmias)
Initial: 150 mg IV/IO bolus infusion over 10 minutes
2nd: 150 mg IV/IO bolus infusion q 10 min, prn
Maintenance Infusion 1 mg/min, (mix 250 mg in 250 cc, run at 60 cc/hr)
Max 2.2 g / day

Pediatric:

Cardiac Arrest
Initial: 5 mg/kg IV/IO (Maximum single dose 300 mg)
2nd: 5 mg/kg IV/IO up to total dose 15 mg/kg or 2.2 g in 24 hours (Max single dose 150 mg)

Non-Cardiac Arrest (perfusing tachyarrhythmias)
Initial: 5 mg/kg IV/IO bolus infusion over 20 – 60 min (Max single dose 300 mg)
2nd: 5 mg/kg IV/IO bolus infusion over 20 – 60 min (Max total dose 15 mg/kg or 2.2 g / day)

Side Effects:

Significant hypotension with cumulative doses 2.2 g IV in 24 hours, flushing, chest pains, tightness in chest, brief periods of asystole, bradycardia, and ventricular Ectopy

Additional Information:

Do not administer with other medications that prolong QT intervals
Terminal elimination extremely long (1/2 life up to 40 days)
Potentiates bradycardia and hypotension with β-blocker and Ca++ channel blockers

Amiodarone

Additional Information (continued):

Increases the risk of AV block and hypotension with Ca++ channel blockers
Increases anticoagulant effects of Warfarin
Decreases the metabolism of Phenytoin, Procainamide, Quinidine, and Theophylline, therefore increasing their serum levels

Clinical Guideline(s):

Cardio cerebral Resuscitation (Adult & Pediatric)
Post Resuscitation Care
Tachycardia

MEDEXPRESS AMBULANCE SERVICE A Global Medical Response Solution

Aspirin

Additional Names:

Ecotrin, Ascriptin, Bufferin, Excedrin

Classification:

Analgesic, non-steroidal anti-inflammatory (NSAID), antipyretic, antiplatelet

Physiological Effects:

Aspirin seems to cause inhibition of synthesis and the release of prostaglandins. Aspirin blocks the formation of thromboxane A – 2 which causes platelets to aggregate and arteries to constrict.

Indications:

ACS
Mild to moderate pain
Fever

Contraindications:

Hypersensitivity (relative)
Asthma with hypersensitivity
Active GI ulcerations or bleeding
Hemophilia or other bleeding disorders
Pregnancy
Children less than 12 y/o
Hemorrhagic stroke

Dosage:

Adult: 325 mg PO, chew and swallow

Pediatric: Contact Medical Control

Side Effects:

Nausea, vomiting, heartburn, stomach pain, tinnitus

Additional Information:

Do not administer for ACS if less than 4 hours since last full dose
Reduces the mortality associated with myocardial infarction
Caution in patients taking blood thinning medications
Ecotrin brands are enterically coated and will not dissolve in the mouth without being chewed
Morphine may reduce aspirin's ability to block platelet aggregation which leads to higher mortality in AMI patients

Clinical Guideline(s):

ACS/STEMI/NSTEMI/Angina

Atropine

Additional Names:

Atropisol

Classification:

Parasympatholytic, Anti-cholinergic

Physiological Effects:

An alkaloid extract from the atropa belladonna plant that competitively antagonizes the effects of acetylcholine at the muscarinic receptors of the parasympathetic nervous system. Secretions are decreased at salivary and bronchial glands at low doses. At moderate doses atropine causes relaxation of the bronchial smooth muscles causing bronchodilation, increased heart rate through a blockade of the vagus nerve activity of the parasympathetic nervous system, and causes dilated pupils. Atropine decreases gastric motility and stomach acid secretions at high doses.

Indications:

Hypersalivation
Pre-medication for medication assisted intubation
Symptomatic bradycardia
Organophosphate and some "nerve" agent poisoning

Contraindications:

None in the emergency setting

Dosage:

Adult:

Bradycardia
1 mg IV/IO q 3 – 5 min, prn to maximum of 3 mg

Organophosphate Poisoning
2 – 4 mg IV/IO q 5 - 10 min prn, until SLUDGEM dissipates

Pediatric:

Bradycardia
Initial 0.02 mg/kg IV/IO- (pre-medication dose or Medication Assisted Intubation)
2nd: 0.04 mg/kg IV/IO
Minimum individual dose 0.1 mg
Maximum individual doses 0.5 mg (child), 1 mg (adolescent)
Maximum total dose 1 mg (child), 2 mg (adolescent)

Organophosphate Poisoning
0.05 mg/kg IV/IO q 3 – 5 min prn, until SLUDGEM dissipates

Side Effects:

Pupil dilation, blurred vision, headache, restlessness, confusion, tachycardia, angina, palpitations, hypertension, flushing of skin, drying of secretions, dry mouth, difficulty swallowing

Additional Information:

Use only when O_2, ventilation, and epinephrine have failed for pediatric bradycardia
TCP is the primary treatment in AV blocks 2° or greater
SLUDGEM - salivations, lacrimation, urination, defecation, gastrointestinal pain, emesis, meiosis

Clinical Guideline(s):

Medication Assisted Intubation
Bradycardia (Adult & Pediatric)
Overdose/Toxicity

Atrovent

Additional Names:

Ipratropium bromide

Classification:

Inhaled anti-cholinergic, muscarinic antagonist

Physiological Effects:

A synthetic atropine derivative that antagonizes the effects of acetylcholine almost exclusively at the muscarinic receptors. Competitively binds to the muscarinic receptors without stimulating them. Decreases secretions at salivary and bronchial glands at low doses, while relaxing the bronchial smooth muscles causing bronchodilation, increased heart rate and causes dilated pupils at moderate doses. Atrovent decreases gastric motility and stomach acid secretions at high doses. Minimizes the side effects caused by organic belladonna.

Indications:

Relief of bronchospasms
Asthma
COPD disease chronic bronchitis, emphysema

Contraindications:

Hypersensitivity

Dosage:

Adult: 500 mcg nebulized (in addition to standard albuterol dose), (oxygen flow rates of 6 – 8 lpm)

Pediatric: 500 mcg nebulized (in addition to standard albuterol dose), (oxygen flow rates of 6 – 8 lpm)

Side Effects:

Tremor, dry mouth, blurred vision, photophobia, cough, exacerbation of symptoms, nervousness, dizziness, headache, palpitations, nausea, vomiting, GI Distress, anhidrosis

Additional Information:

Not indicated in the initial treatment of acute episodes of bronchospasms where rapid response is required
Acts along different pathway than β2 agonist (albuterol). Concurrent administration has additive effects
Most common side effect is dry mouth from residual in oral pharynx during administration

Clinical Guideline(s):

Allergic Reaction / Anaphylactic Shock
Asthma
Respiratory Distress / COPD
Respiratory Distress (Pediatric)

Calcium Chloride

Additional Names:

None listed

Classification:

Electrolyte

Physiological Effects:

Calcium chloride is essential for the physiological integrity of the nervous and muscular systems. It is necessary for normal cardiac function by increasing contractility, and operates the mechanism in the coagulation of blood.

Indications:

Suspected hypocalcemia
Hyper-magnesemia (magnesium sulfate overdose)
Suspected hyperkalemia
Calcium Channel blocker overdose

Contraindications:

Hypercalcemia
Digitalis toxicity
Cardiac arrest with ventricular fibrillation

Dosage:

Adult: 500 mg – 1 g IV/IO SIVP

Pediatric: 20 mg/kg IV/IO SIVP (Max 1 g)

Side Effects:

Sensation of “heat wave” or tingling, metal taste in mouth, local burning sensation

Additional Information:

Must be administered as a slow IV/IO push
Do not exceed 1 g/min for non-cardiac arrest situations
Rapid infusion may cause hypotension, bradycardia, or asystole
May antagonize effects of homebound calcium channel blockers
Do not administer simultaneously with Sodium Bicarbonate (flush with 5 – 10 cc of saline after administration to clear line)

Clinical Guideline(s):

Cardiocerebral Resuscitation (Adult & Pediatric)
Crush Injury / Syndrome
Overdose / Toxicity

Dextrose

Additional Names:

D_5W, $D_{10}W$, $D_{25}W$, $D_{50}W$

Classification:

Carbohydrate, hyperglycemic

Physiological Effects:

Dextrose is a monosaccharide which provides calories for the metabolic needs of the cell as an aerobic metabolic substrate of ATP synthesis. Dextrose reverses the CNS effects of hypoglycemia by rapidly elevating serum blood glucose when given parenterally.

Indications:

Known hypoglycemia
AMS of unknown origin (if hypoglycemia suspected)
Chronic alcoholic rehabilitation (if malnutrition suspected)
Malnutrition

Contraindications:

None in the emergency setting

Dosage:

Adult: 8 years and above: 12.5 g – 25 g IV/IO as needed

Pediatric: Less than 8 years: Use $D_{10}W$
0.5 – 1 g/kg IV/IO (5 – 10 ml/kg $D_{10}W$) as needed

Side Effects:

Irritation, thrombosis, or necrosis can occur if dextrose is infiltrated into tissue

Additional Information:

Use largest possible IV site and verify patency before administering
Solutions containing dextrose should not be used for volume replacement in the presence of hypovolemia or shock
Dextrose may cause Wernicke-Korsakoff syndrome in acute ETOH intoxication if given without thiamine supplement
Use caution with administering dextrose to patients with known or suspected intracranial bleeding ($D_{10}W$ or Glucagon should be considered)

Clinical Guideline(s):

Cardiocerebral Resuscitation (Adult & Pediatric)
Adrenal Crisis
Diabetic

Diphenhydramine

Additional Names:
Benadryl

Classification:
Antihistamine

Physiological Effects:
Antihistamines competitively bind the H_1 (located in the smooth muscle, vascular endothelium, the heart, and in the CNS) and H_2 (same as H_1 and gastric parietal cells) receptor sites on effector cells thus blocking the receptors stimulation by histamines during an immune system response to an antigen. Diphenhydramine prevents but does not reverse histamine responses. Antihistamines are also quite specific for reversal of the extrapyramidal (dystonic) reaction.

Indications:
Allergy symptoms (rhinitis, urticaria, itching)
Anaphylaxis
Dystonic reactions common with neuroleptics
Sedation
Motion sickness
Antiemetic

Contraindications:
Hypersensitivity
Patients taking MAOI's
Nursing Mothers
Patient with lower respiratory symptoms (asthma)

Dosage:

Adult: 25 – 50 mg deep IM/IV/IO (max 400 mg/day)

Pediatric: 1 mg/kg deep IM/IV/IO (max 50 mg/day)

Side Effects:
Drowsiness, confusion, sedation, disturbed coordination, palpitation, tachycardia, bradycardia, dry mouth and throat, thickening of bronchial secretions

Additional Information:
CNS depressants may enhance effects
Diphenhydramine toxicity can cause cardiac arrhythmias such as Torsades de Pointes

Clinical Guideline(s):
Allergic Reaction / Anaphylactic Shock
Overdose / Toxicity

Dopamine

Additional Names:

Intropin

Classification:

Sympathomimetic, catecholamine

Physiological Effects:

Dopamine is a naturally occurring neurotransmitter in the body that mediates through dopaminergic receptors in the CNS. Dopamine is also a sympathomimetic "amine" vasopressor, a member of the catecholamine family. A precursor to epinephrine and norepinephrine, Dopamine affects the sympathetic nervous system through α- adrenergic and β-adrenergic receptor stimulation. The sympathetic stimulation yields an increase in both heart rate and blood pressure. Receptor stimulation is dose dependent.

Indications:

Hypotension from Cardiogenic Shock
CHF (use with caution)

Contraindications:

Shock due to hypovolemia
Tachycardia
Patients with pheochromocytoma (adrenal gland tumor)

Dosage:

Adult: 2 – 20 mcg/kg/min infusion, titrate to effect
(Mix 400 mg in 250 ml NS, equals 1.6 mg/ml or 1600 mcg/ml)

Dopaminergic response:	1 – 4 mcg/kg/min
β-adrenergic response:	5 – 10 mcg/kg/min
α-adrenergic response:	10 – 20 mcg/kg/min

Pediatric: Contact Medical Control

Side Effects:

Tachycardia, tissue injury with extravasations

Additional Information:

> 20 mcg/kg/min doses may produce peripheral, renal, splenic vasoconstriction and ischemia
Do not mix with sodium bicarbonate
MAOI s may potentiate the effects of dopamine
Antagonists may inhibit inotropic response

Clinical Guideline(s):

Bradycardia (Adult)
CHF/Cardiogenic Shock

Epinephrine

Additional Names:

Adrenaline

Classification:

Sympathomimetic, catecholamine

Physiological Effects:

Epinephrine is an endogenous catecholamine that stimulates the α-adrenergic and β-adrenergic receptor sites in the sympathetic nervous system. In doing so, the general physiological expectation is smooth muscle relaxation of the bronchi, vasoconstriction in the arterioles of the skin and mucosa, and an increase in heart rate and blood pressure.

Indications:

Bronchoconstriction (bronchial asthma)
Croup/Stridor
Allergic reaction
Anaphylaxis
Pulseless arrest
Symptomatic bradycardia
Vasopressor in various shock states

Contraindications:

Hypersensitivity
Hemorrhagic Shock
Hypertension (relative)

Dosage:

Adult:

Cardiac Arrest
1 mg 1:10,000 IV/IO q 3 -5 min

Bronchoconstriction (Asthma or Moderate Allergic Reaction)
0.3 – 0.5 mg 1:1,000 IM, or EpiPen, repeat as needed
3 mg in 3 ml 1:1,000 added to nebulizer

Anaphylaxis (severe allergic reaction)
0.1 mg 1:100,000 IV/IO SIVP (contact medical control for subsequent dosages)

Bradycardia
10 mcg/min 1:100,000 SIVP, repeat as needed
2 – 10 mcg/min IV/IO infusion

Vasopressor in various shock states
0.1 – 0.5 mcg/kg/min infusion

Pediatric:

Cardiac Arrest
0.01 mg/kg 1:10,000 IV/IO q 3 – 5 min (Max single dose – 1 mg)

Bronchoconstriction (asthma)
3 mg in 3 ml 1:1,000 added to nebulizer, repeat as needed
0.01 mg/kg 1:1,000 IM, repeat as needed (Max single dose – 0.3 mg)

Croup/Stridor
3 mg in 3 ml 1:1,000 added to nebulizer, repeat as needed

Epinephrine

Pediatric (continued):

Bradycardia
0.01 mg/kg 1:10,000 IV/IO q 3 – 5 min (Max single dose – 1 mg)
0.1 – 1 mcg/kg/min infusion

Allergic Reaction (moderate allergic reaction)
0.01 mg/kg 1:1,000 IM, repeat as needed (Max single dose – 0.3 mg)

Anaphylaxis (severe allergic reaction)
0.01 mg/kg 1:10,000 IV/IO as needed q 3 -5 min for hypotension (Max single dose – 1 mg)

Side Effects:

Sweating, dizziness, nervousness, weakness, pale skin, headache

Additional Information:

Contact medical control for allergic reactions and anaphylactic patients with a history of CAD
May be deactivated by alkaline solutions, do not administer simultaneously
Contact medical control for use during pregnancy (risk to fetus)

Clinical Guideline(s):

Cardiocerebral Resuscitation (Adult & Pediatric)
Neonatal Resuscitation
Post Resuscitation Care
Bradycardia (Adult & Pediatric)
Allergic Reaction / Anaphylactic Shock
Asthma
Neurogenic Shock
Respiratory Distress (Pediatric)
Septic Shock / Infection

Fentanyl Citrate

Additional Names:

Sublimaze, Duragesic, Actiq

Classification:

Narcotic Analgesic

Physiological Effects:

Fentanyl is one of the most powerful opioid analgesics with a potency of approximately 81 times that of morphine. Fentanyl, a lipid soluble drug, is extensively used for anesthesia and analgesia. Fentanyl binds the opioid mu (μ) receptor. Like other opioids, Fentanyl acts directly on the CNS, through competitive binding to the receptor. Activation of these receptors is associated with euphoria, pain relief, dependence, and respiratory depression. Alterations in respiratory rate and alveolar ventilation may last longer than anesthesia. The onset of action is immediate upon IV injection, but the maximal analgesic and respiratory depressant effect may not be noted for several minutes.

Indications:

Pain management
Adjunct for anesthesia
Sedation

Contraindications:

Hypersensitivity

Dosage:

Adult: Initial: 1 mcg/kg IV/IO/IM/IN
2nd: 0.5 mcg/kg IV/IO/IM/IN, repeat as needed

Pediatric: Initial: 1 mcg/kg IV/IO/IM/IN
2nd: 0.5 mcg/kg IV/IO/IM/IN, repeat as needed
(Do not use in pediatrics < 2 y/o)

Side Effects:

Bradycardia, respiratory depression, apnea, muscle rigidity (particularly the muscles of respiration), diarrhea, nausea, constipation, dry mouth

Additional Information:

Effects are related to the dose and speed of administration. May cause sudden respiratory depression and respiratory arrest.
Usual effect last for 30 – 60 minutes, IM onset is 7 – 8 minutes with duration of 1 – 2 hours
Narcan must be available prior to administration
Use caution in the elderly or debilitated patients
Use with caution in patients taking other CNS depressant medications or consuming ETOH
Use with caution in patients with respiratory disease (i.e. COPD, asthma)

Clinical Guideline(s):

Pain Management
Medication Assisted Intubation
Post Advanced Airway Care
Cardiocerebral Resuscitation (Adult & Pediatric)
ACS/STEMI/NSTEMI/Angina
Thoracic Aortic Catastrophe

Insta-Glucose

Additional Names:
Glucola

Classification:
Carbohydrate, hyperglycemic

Physiological Effects:
Glucose provides calories for the metabolic needs of the cell as an aerobic substrate of ATP synthesis. Glucose reverses the CNS effects of hypoglycemia by rapidly elevating serum blood glucose when given orally.

Indications:
Known hypoglycemia (conscious patient with the ability to follow simple commands)

Contraindications:
Semi-conscious or unconscious patients (unable to manage airway or follow commands)

Dosage:
Adult: 15 G, 1 tube PO, in sips until CBG improves and patient feels better, repeat as needed

Pediatric: 15 G, 1 tube PO, in sips until CBG improves and patient feels better, repeat as needed

Side Effects:
Nausea/vomiting

Additional Information:
May cause Wernicke-Korsakoff syndrome in acute ETOH intoxication if given without thiamine supplement

Clinical Guideline(s):
Diabetic

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Ketamine

Additional Names:

Ketalar

Classification:

Dissociative anesthetic

Physiological Effects:

Ketamine acts primarily as an antagonist of the NMDA receptor which is mostly responsible for its anesthetic, hallucinogenic, and analgesic properties. In low doses Ketamine is a potent analgesic. In higher doses Ketamine will induce anesthesia and put the patient in a dissociative state. Unlike opiates, Ketamine does not suppress the central nervous system which makes it ideal for use when sedation or pain management is needed in the hemodynamically compromised patient.

Indications:

Induction agent for Medication Assisted Intubation
Pain management
Sedation
Agitation / Excited Delirium

Contraindications:

Hypersensitivity
Hypertensive Crisis

Dosage:

Adult:

Pain Management
0.5 mg/kg IM/IN
0.25 mg/kg IV bolus infusion over 15 minutes

Induction
1 – 2 mg/kg IV/IO

Sedation
1 mg/kg IV/IO
4 mg/kg IM
1-2 mg/kg/hr IV drip for prolonged sedation

Pediatric:

Pain Management
0.5 mg/kg IM/IN
0.25 mg/kg IV bolus infusion over 15 minutes

Induction
1 mg/kg IV/IO

Sedation
1 mg/kg IV/IO
4 mg/kg IM

Side Effects:

Emergence Phenomenon, hallucinations, respiratory depression when given rapidly, hypertension, elevated heart rate, bronchodilation, hypersalivation

Ketamine

Additional Information:

Use with caution in OB Patients
Administer slowly to avoid respiratory depression. If respiratory depression occurs, support ventilations.
IV infusion is recommended to reduce the negative effects of Ketamine.
Psychological effects such as hallucinations and emergence phenomenon occur when Ketamine begins to wear off. This can be mitigated with benzodiazepines.
Atropine can be administered in the presence of hypersalivation

Clinical Guideline(s):

Pain Management
Procedural Sedation
Medication Assisted Intubation
Post Resuscitation Care
Anxious / Violent / Agitated

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Ketorolac

Additional Names:

Toradol

Classification:

Non-steroidal anti-inflammatory

Physiological Effects:

Ketorolac is a nonsteroidal anti-inflammatory drug (NSAID) that inhibits synthesis of prostaglandins and may be considered a peripherally acting analgesic. Ketorolac possesses no sedative or anxiolytic properties.

Indications:

Pain

Contraindications:

Hypersensitivity to NSAIDS
Peptic Ulcer Disease or any form of GI Bleeding
At-risk for other types of internal bleeding
Current use of Aspirin or other NSAIDS
Pregnant or nursing mothers
Renal impairment (relative)
Asthma (Relative – Can cause bronchospasm)

Dosage:

Adult: 30 mg IM/IV/IO (15mg for ≥ 65 years of age, renal impaired, and/or less than 110lbs)

Pediatric: Not recommended it patients < 16 years of age

Side Effects:

Renal failure, headache, indigestion, nausea, vomiting, diarrhea, abdominal pain, internal bleeding, bronchospasm

Additional Information:

For breakthrough pain, it is recommended to supplement the lower end of the Ketorolac dosage range with low doses of narcotics as needed.

Clinical Guideline(s):

Pain Management

LEVOPHED (Norepinephrine)

Classification:

Sympathomimetic alpha and beta agonist

Physiologic Effect:

Acts directly on vascular smooth muscle to produce peripheral vasoconstriction.

Major Indications:

Acute hypotension
CHF
Cardiogenic shock

Primary Contraindications:

Hypersensitivity
Compensatory hypertension

Dosage: 0.1-1.0 mcg/kg/min Titrate to SBP of 90 or MAP >65

Pediatric not recommended

Side Effects:

Hypertension
Bradycardia
Retrosternal chest pain
Fatigue
Irritation at infusion site
Thiocyanate toxicity (life threatening)

Additional information:

Norepinephrine is light sensitive and should be protected from excessive light.
The half life is very short

Lidocaine

Additional Names:

Xylocaine

Classification:

Antiarrhythmic, sodium channel blocker

Physiological Effects:

Lidocaine has both an anesthetic property and an antiarrhythmic property. The anesthetic properties are caused when depolarization of the neuron is altered by a blockade of the fast Na^+ channels on the cell membrane. As an anti-arrhythmic agent, the Na^+ channels of the myocardial action potential are blocked. This slows automaticity by increasing the time the ventricle is depolarized. The suppression of premature ventricular depolarizations results.

Indications:

Anesthetic during intraosseous placement

Contraindications:

Hypersensitivity
Stokes-Adams syndrome
AV blocks > than 1°
Bradycardia
Wolff-Parkinson-White
In conjunction with Amiodarone

Dosage:

Adult: EZ-IO
40 mg over 2 min— Dwell for 1 min — Rapid flush of saline — 20 mg over 1 min

Pediatric: EZ-IO
0.5 mg/kg (max 40 mg) over 2 min— Dwell for 1 min — Rapid flush of saline — 0.25 mg/kg over 1 min (max 20 mg)

Side Effects:

Light-headedness, confusion, blurred vision, tinnitus, widening QRS, muscle twitching, seizure

Additional Information:

Elimination time increased in patients with liver dysfunction or taking β-blockers Increased plasma concentrations may cause myocardial and circulatory depression and seizures Use extreme caution when administering Lidocaine to the following: hypotension not caused by arrhythmia, accelerated idioventricular rhythms, elderly patients, and patients with impaired liver function. Anesthetic properties usually begin at the four minute mark and lasts from 30 minutes to 3 hours. Clinical Guideline(s): Vascular Access Medication Assisted Intubation

Clinical Guideline(s):

Vascular Access

Magnesium Sulfate

Additional Names:

Epsom salt, Phillip's Milk of Magnesia

Classification:

Anticonvulsant, Antiarrhythmic, Smooth muscle relaxant, Bronchodilator.

Physiological Effects:

Magnesium is the second most abundant ion in the intracellular fluid. It is essential for the activity of many enzyme systems and plays an important role in neuro -chemical transmission and muscular excitability. Magnesium sulfate reduces striated muscle contractions and blocks peripheral neuromuscular junction (synapses) by reducing acetylcholine release. Magnesium Sulfate effectively decreases the risk of preeclampsia progressing to eclampsia by preventing and treating seizures. Magnesium Sulfate reduces systolic blood pressure while having no effect on diastolic blood pressure which aids in maintaining perfusion to the fetus when treating the OB patient.

Indications:

Torsades de Pointes
Suspected hypomagnesemia
Preeclampsia & Eclamptic seizure
Bronchospasms after β-agonists and anticholinergic agents

Contraindications:

Heart Blocks / Bradycardia
Myocardial damage
Renal Failure
Shock

Dosage:

Adult:

Torsades de Pointes in cardiac arrest
1 – 2 g IV/IO over 5 - 20 minutes (dilute in 10 cc NS)

Torsades de Pointes with a pulse
1 – 2 g IV/IO bolus infusion over 5 – 60 min

Bronchospasm
2 g IV/IO bolus infusion over 15 – 20 min

Preeclampsia
2 – 4 g IV/IO bolus infusion over 10 – 20 minutes

Eclamptic Seizure
4 – 6 g IV/IO bolus infusion over 10 minutes

Pediatric:

Torsades de Pointes in cardiac arrest
25 – 50 mg/kg IV/IO over 10 minutes (max 2 g)

Torsades de Pointes with a pulse
25 – 50 mg/kg IV/IO bolus infusion over 10 – 20 min (max 2 g)

Bronchospasm
25 – 50 mg/kg IV/IO bolus infusion over 15 - 30 min (max 2 g)

Magnesium Sulfate

Side Effects:

Respiratory depression, drowsiness, flushing, depressed reflexes, reduced heart rate, circulatory collapse

Additional Information:

May enhance CNS depressants
Calcium gluconate and calcium chloride should be used as an antagonist to magnesium sulfate
Signs of magnesium sulfate intoxication include flushing, sweating, hypotension, depressed reflexes, flaccid paralysis, hypothermia, circulatory collapse, cardiac and CNS depression proceeding to respiratory paralysis.

Clinical Guideline(s):

Cardio cerebral Resuscitation
Tachycardia
Asthma
Complications of Pregnancy
Pediatric Respiratory Distress

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Metoprolol

Additional Names:

Lopressor, Toprol

Classification:

β-adrenergic blocker

Physiological Effects:

Metoprolol is a β-adrenergic receptor blocker, with preferential effect on β_1- adrenoceptors chiefly located in cardiac muscle. The preferential effect is not absolute and at high doses, β_2-adrenoreceptors chiefly located in the smooth bronchial muscles and vascular musculature can be affected. β-blocking activity in man is shown to reduce heart rate and cardiac output. Metoprolol has no intrinsic sympathomimetic activity.

Indications:

Acute Coronary Syndromes
Tachycardias
Electrical storm

Contraindications:

Bronchial asthma
Bradycardia
2° or 3° AV Blocks
Cardiogenic Shock

Dosage:

Adult: 5 mg IV/IO SIVP q 5 min (max 15 mg)

Pediatric: Safety has not been established

Side Effects:

Bradycardia, SOB, light-headedness, dizziness, weakness, nausea, vomiting, swelling ankles

Additional Information:

Use with caution in pulmonary disease and CHF

Clinical Guideline(s):

ACS/STEMI/NSTEMI/Angina
Tachycardia
Thoracic Aortic Catastrophe

Midazolam

MIDAZOLAM HCL (VERSED)

1. **Classification:**

Short acting benzodiazepine-sedative

2. Physiologic Effects:

Depresses subcortical levels of CNS (e.g., limbic and reticular formation), possibly by increasing activity of GABA. Shorter-acting benzodiazepine sedative- hypnotic useful in patients requiring acute and/or short-term sedation. Also useful for its amnestic effects.

3. Major Indications:

status epilepticus
premedication before transcutaneous pacing
anxiety and agitation
facilitated intubation

4. Absolute Contraindications:

hypersensitivity

5. Relative Contraindications:

shock
hypotension, especially in the head injured patient
coma
alcohol intoxication, use of barbiturates, narcotics or CNS depressants
pregnancy
chronic renal failure
congestive heart failure
chronic obstructive pulmonary disease
hepatic function impairment

6. Side Effects:

respiratory depression
respiratory arrest
hypotension
cardiac arrhythmias
headache
blurred vision
nausea and vomiting

7. Additional Information

Dilute for IV administration: Draw 10 mg (2 ml) in 10 ml syringe and dilute with 8 ml of saline for 1.0 mg/ml

Do not dilute for intramuscular administration: Draw 10 mg (2 ml) in 5-10 ml syringe give deep intramuscular injection

Do not dilute for intranasal administration: draw in 1 ml syringe and administer via the M.A.D.

Morphine

Classification:
Narcotic Analgesic

Physiological Effects:
Most commonly used in pain management, Morphine provides significant relief to patients afflicted with pain. Clinical situations that benefit significantly by medicating with morphine include management of palliative/end-of-life care, active cancer treatment, and Vaso-occlusive pain during sickle cell crisis. Morphine is widely used off-label for almost any condition that causes pain. In the emergency medicine, Morphine is given for musculoskeletal pain, abdominal pain, chest pain, arthritis, and even headaches.

Indications:
- Pain management
- Adjunct for anesthesia
- Sedation

Contraindications:
- Hypersensitivity

Dosage:

Adult:	Initial: 0.1 mg/kg IM/IV q 10min IV/IM Max 10 mg
Pediatric:	Initial: 0.1 mg/kg IM/IV q 10min IV/IM (Do not use in pediatrics < 2 y/o)

Side Effects:
Difficult or trouble breathing; Irregular, fast or slow, or shallow breathing; Shortness of breath; Very slow breathing; Blurred vision; Convulsions; Decreased urine output; Dizziness, faintness, or lightheadedness; Unusual tiredness or weakness

Additional Information:
- Effects are related to the dose and speed of administration. May cause sudden respiratory depression and respiratory arrest.
- Usual effect last for 30 – 60 minutes, IM onset is 7 – 8 minutes with duration of 1 – 2 hours
- Narcan must be available prior to administration
- Use caution in the elderly or debilitated patients
- Use with caution in patients taking other CNS depressant medications or consuming ETOH
- Use with caution in patients with respiratory disease (i.e. COPD, asthma)

Clinical Guideline(s):
- Pain Management
- Medication Assisted Intubation
- Post Advanced Airway Care
- Cardiocerebral Resuscitation (Adult & Pediatric)
- ACS/STEMI/NSTEMI/Angina
- Thoracic Aortic Catastrophe

Naloxone

Additional Names:

Narcan

Classification:

Opioid antagonist (synthetic)

Physiological Effects:

Naloxone competitively binds to the β-endorphin receptors in the CNS thereby reversing the effects of opiates and their derivatives. Because naloxone has a higher affinity for the β-endorphin receptors, it completely reverses the effects of opiates and opioids and causes a sudden rapid onset of withdrawal symptoms.

Indications:

Opiate/Opioid Toxicity

Contraindications:

Hypersensitivity

Dosage:

Adult: 0.4 – 2 mg/kg IM/IN/IV/IO q 2 min, titrate to adequate breathing (max 10 mg)

Pediatric: 0.1 mg/kg IM/IN/IV/IO q 2 min, titrate to adequate breathing (max 2 mg)

Side Effects:

Tachycardia, hypertension, dysrhythmias, nausea, vomiting

Additional Information:

May cause opiate withdrawal
Half-life is shorter than narcotic, may need to repeat doses. Continuously monitor respirations.
Narcan may be given as a bolus infusion to provide continuous titration as needed
IM injection produces a more long term effect than IV administration
In cardiac arrest situations where opiate/opioid toxicity is suspected focus should be placed on providing adequate oxygenation and ventilation. Narcan may then be considered as a treatment modality.

Clinical Guideline(s):

Cardiocerebral Resuscitation (Adult & Pediatric)
Overdose/Toxicity

Nitroglycerin

Additional Names:

Nitrostat, Transderm Nitro, Nitro-Dur, Nitrobid

Classification:

Vasodilator

Physiological Effects:

When nitroglycerin is administered, it is converted to nitric oxide by a chemical process that is not understood. Nitric oxide is a potent vasodilator in the body. Acting directly on the coronary arteries, this would enhance blood flow and subsequent oxygenation to the myocardium. NTG also has a dilatory effect on the peripheral vasculature thereby reducing both preload and afterload. This is beneficial in reducing the workload (myocardial oxygen demand) of the heart.

Indications:

Acute Coronary Syndromes
Congestive Heart Failure
Hypertension

Contraindications:

Hypersensitivity
If erectile dysfunction medications used in last 24 hours, (taldalafil 48 hours)
Heart rates < 50 bpm or > 100 bpm in ACS
Relative Hypotension
Right ventricular infarction

Dosage:

Adult:

Acute Coronary Syndromes
400 mcg (1 spray) SL q 3-5 min, to desired effect

Congestive Heart Failure
400 mcg (1 spray) SL q 3-5 min, to desired effect
200 – 400 mcg IV/IO every 3-5 minutes, to desired effect
5 – 400 mcg/min maintenance infusion

Hypertensive crisis
5 – 400 mcg/min infusion

Pediatric: Not recommended

Side Effects:

Headache, transient hypotension (postural syncope), reflex tachycardia, nausea, vomiting, abdominal cramps

Additional Information:

Do not shake aerosol spray because this affects metered dose
Not recommended in pregnancy
Light sensitive, protect from direct sunlight
Wear gloves when handling and use caution as to not inadvertently inhale the medication or get in eyes
While treating CHF, the IV/IO route is recommended to avoid interruptions in providing continuous positive airway pressure

Clinical Guideline(s):

ACS/STEMI/NSTEMI/Angina
CHF / Cardiogenic Shock
Hypertensive Crisis

Ondansetron

Additional Names:

Zofran

Classification:

Antiemetic

Physiological Effects:

Zofran is a serotonin 5-HT_3 receptor antagonist. Mechanism of action has not been fully characterized although it is not a dopamine-receptor antagonist. Serotonin 5-HT_3 receptors are present both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of "the area postrema," the part of the medulla oblongata that controls vomiting.

Indications:

Nausea
Vomiting

Contraindications:

Hypersensitivity

Dosage:

Adult: 4 mg IM/IV/IO SIVP (may be repeated once)

Pediatric: 0.1 mg/kg IM/IV/IO SIVP for patients weighing < 40 kg, use adult dosing for ≥ 40 kg (max 4 mg)

Side Effects:

Rare EKG changes including elongated Q-T intervals and angina
Diarrhea, headache, fever

Additional Information:

Multiday administration is shown to slow colonic transiting
Reduction in clearance and increase in elimination half-life seen in patients > 75 y/o

Clinical Guideline(s):

Nausea / Vomiting

Rocephin

Additional Names:

ceftriaxone

Classification:

Cephalosporins

Physiological Effects:

Ceftriaxone works by inhibiting the mucopeptide synthesis in the bacterial cell wall. The beta-lactam moiety of ceftriaxone binds to carboxypeptidases, endopeptidases, and transpeptidases in the bacterial cytoplasmic membrane. These enzymes are involved in cell-wall synthesis and cell division. Binding of ceftriaxone to these enzymes causes the enzyme to lose activity; therefore, the bacteria produce defective cell walls, causing cell death.

Indications:

Trauma with broken skin, i.e. open fracture, penetrating trauma, large avulsions, major interuptions in skin.
Sepsis that meets sirs criteria

Contraindications:

Hypersensitivity

Dosage:

Adult: 1 Gram IV/IO infusion over 10-30 Secondary route preference is IM mixed with 2 ml sterile water.

Pediatric: 50 mg/kg IV/IO infusion over 10-30 Secondary route preference is IM mixed with 2 ml sterile water.

Side Effects:

convulsions (seizures), severe stomach pain, diarrhea that is watery or bloody, sudden weakness or ill feeling, fever, chills, cold or flu symptoms, mouth sores, pale or yellowed skin, dark colored urine, severe pain in your upper stomach, skin rash or tight feeling, severe tingling or numbness, pain, muscle weakness, pain in your side or lower back spreading to your groin, blood in your urine, painful or difficult urination, and little or no urine

Additional Information:

Do not use diluents containing calcium, such as Ringer's solution or Hartmann's solution, to reconstitute Rocephin vials or to further dilute a reconstituted vial for IV administration. Particulate formation can result.

Clinical Guideline(s):

Sepsis, trauma

Sodium Bicarbonate

Additional Names:

None

Classification:

Buffer

Physiological Effects:

Bicarbonate is an anion (negative charge) that forms a salt (sodium bicarbonate) when it combines with its conjugate acid. Bicarbonate serves as the principal buffer for the body's acid/base buffer system maintaining the CO_2 level

Indications:

Hyperkalemia
Known preexisting bicarbonate responsive acidosis (Diabetic ketoacidosis, Tricyclic or ASA overdose, cocaine overdose, or Diphenhydramine overdose)

Contraindications:

Excessive vomiting or continuous gastric suctioning (resulting in metabolic alkalosis)
Metabolic alkalosis
Hypocalcemia
Hypokalemia

Dosage:

Adult:

Acidosis/Overdose
Initial: 1 meq/kg IV/IO
2nd: 0.5 meq/kg IV/IO q 5 – 10 min

Crush Injury/Syndrome
Injury: Add 50 meq per liter of saline / 2 liters of NS
Syndrome: 100 meq bolus IV/IO

Pediatric:

Acidosis/Overdose
Initial: 1 meq/kg IV/IO
2nd: 0.5 meq/kg IV/IO q 5 – 10 min

Crush Injury/Syndrome
Injury: Add 25 meq per liter of saline / 2 liters of NS
Syndrome: 1 meq/kg bolus IV/IO

Side Effects:

Metabolic alkalosis, Rise in intracellular PCO_2, Seizures

Additional Information:

Do not mix with calcium chloride or other salts
Do not mix with epinephrine
Sloughing will occur if infiltrated out of vein into tissue

Clinical Guideline(s):

Cardiocerebral Resuscitation (Adult & Pediatric)
Overdose/Toxicity
Crush Injury/Syndrome

Solu-Medrol

Additional Names:

Methylprednisolone, A-methaPred, DepoMedrol

Classification:

Adrenocortical steroid

Physiological Effects:

Solu-medrol is a synthetic corticosteroid. Corticosteroids are hormones produced by the adrenal glands adjacent to the kidney. Corticosteroids are involved in a number of physiological systems such as stress response, immune system response, and regulation of inflammation to name a few.

Indications:

Anaphylaxis
Asthma
COPD

Contraindications:

Hypersensitivity
Use with caution in patients with GI bleeding
Use with caution in diabetics

Dosage:

Adult: 125 mg deep IM/IV/IO

Pediatric: 0.5 – 2 mg/kg deep IM/IV/IO

Side Effects:

Dizziness, weakness, sleep disorders, weight gain, sodium and water retention, nausea, induced Cushing Syndrome, hypokalemia, hyperglycemia

Additional Information:

Caution in pregnancy, only if benefit outweighs the risk to fetus
Enhanced effect in patients with hypothyroidism and cirrhosis
Peak efficiency and onset times are not immediate

Clinical Guideline(s):

Allergic Reaction / Anaphylactic Shock
Asthma
Respiratory Distress / COPD
Pediatric Respiratory Distress

Tranexamic Acid (TXA)

Classification:

Anti-fibrinolytic

Physiologic Effects:

Serves by reversibly binding four to five lysine receptor sites on plasminogen. This reduces conversion of plasminogen to plasmin, preventing fibrin degradation and preserving the framework of fibrin's matrix structure.

Indications:

Bleeding patients typically from trauma.
May be considered (With medical direction) for patients in hemorrhagic shock from medical causes including massive postpartum hemorrhage, gynecological hemorrhage, gastrointestinal hemorrhage, massive epistaxis or vascular event (hemorrhaging shunt or fistula).

Primary Contraindications:

Hypersensitivity
History of thromboembolic or ischemic event such as PE, DVT, ischemic CVA, acute MI, or ischemic retinopathy

Dosage:

Adult:

1 Gram IV infusion in 100 ml NS over 10 min.
2 grams IV infusion in 250 ml NS over 20 min. for transports lasting over 1 hour.

Pediatric:

15 mg/kg IV infusion in 100 ml NS over 10 min (max 1 Gram) WITH MEDICAL DIRECTION

Side Effects:

Nausea
Vomiting
Diarrhea
Joint or muscle pain
Muscle cramps
Headache
May cause hypotension if administered too rapidly (faster than 100 mg/min.)

Additional Information:

No recommendations at this time for patients less than 18 years-old.
Use with caution in pregnant patients.
Must be given within 3 hours of injury.

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Pediatric Broselow-Color Coded Drug List *by Volume*

Return To Medications List

Length < 59.5 cm — Weight 3-5 Kg (~6-12 lbs) — Grey (0-3 months)

Vital Signs

Heart Rate	120-150
Respirations	24-48
BP Systolic	70 (+/-25)

Equipment

ET Tube	2.5 - 3.5
Blade Size	0 – 1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	15 Joules
2nd +Defibrillation	30 Joules
1st Cardioversion	4 Joules
2nd + Cardioversion	8 Joules

Normal Saline 80 ml

ACLS

Amiodarone (1st/2nd dose)	0.4 ml
Atropine	1 ml
Calcium Chloride	0.8 ml
Epinephrine 1:10,000	0.4 ml
Sodium Bicarbonate	4 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 0.4 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	0.27 ml
Albuterol	1.5 ml
Dextrose 25%	8 ml
Diphenhydramine	0.08 ml
Epinephrine 1:1,000 IM	0.04 ml
Fentanyl IV	0.4 ml
Fentanyl IN undiluted	0.08 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	0.4 ml
Methylprednisolone	0.12 ml
Midazolam IV	0.8 ml
Midazolam IN undiluted	0.16 ml
Morphine Sulfate	0.4 ml
Naloxone	0.4 ml
Ondansetron	0.2 ml

Length 59.5-66.5 cm — Weight 6-7 Kg (~13-16 lbs) — Pink (3-6 Months)

Vital Signs

Heart Rate	120-125
Respirations	24-48
BP Systolic	85 (+/-25)

Equipment

ET Tube	3.5
Blade Size	1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	30 Joules
2nd +Defibrillation	50 Joules
1st Cardioversion	7 Joules
2nd +Cardioversion	15 Joules

Normal Saline 130 ml

ACLS

Amiodarone (1st/2nd dose)	0.65 ml
Atropine	1.3 ml
Calcium Chloride	1.3 ml
Epinephrine 1:10,000	0.65 ml
Sodium Bicarbonate	6.5 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 0.6 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	0.44 ml
Albuterol	1.5 ml
Dextrose 25%	13 ml
Diphenhydramine	0.13 ml
Epinephrine 1:1,000 IM	0.07 ml
Fentanyl IV	0.65 ml
Fentanyl IN undiluted	0.13 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	0.65 ml
Methylprednisolone	0.21 ml
Midazolam IV	1.3 ml
Midazolam IN undiluted	0.26 ml
Morphine Sulfate	0.65 ml
Naloxone	0.65 ml
Ondansetron	0.33 ml

Length 66.5-74 cm — Weight 8-9 Kg (~17-21 lbs) — Red (7-10 Months)

Vital Signs

Heart Rate	120
Respirations	24-32
BP Systolic	92 (+/-30)

Equipment

ET Tube	3.5
Blade Size	1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	30 Joules
2nd + Defibrillation	70 Joules
1st Cardioversion	9 Joules
2nd +Cardioversion	20 Joules

Normal Saline 170 ml

ACLS

Amiodarone (1st/2nd dose)	0.85 ml
Atropine	1.7 ml
Calcium Chloride	1.7 ml
Epinephrine 1:10,000	0.85 ml
Sodium Bicarbonate	8.5 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 0.8 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	0.57 ml
Albuterol	1.5 ml
Dextrose 25%	17 ml
Diphenhydramine	0.17 ml
Epinephrine 1:1,000 IM	0.09 ml
Fentanyl IV	0.85 ml
Fentanyl IN undiluted	0.17 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	0.85 ml
Methylprednisolone	0.27 ml
Midazolam IV	1.7 ml
Midazolam IN undiluted	0.34 ml
Morphine Sulfate	0.85 ml
Naloxone	0.85 ml
Ondansetron	0.43 ml

Pediatric Broselow-Color Coded Drug List *by Volume*

Length 74-84.5 cm — Weight 10-11 Kg (~22-25 lbs) — Purple (11-18 Months)

Vital Signs

Heart Rate	115-120
Respirations	22-30
BP Systolic	96 (+/-30)

Equipment

ET Tube	4.0
Blade Size	1
ET Ins. Depth	11-12 cm

Defibrillation

1st Defibrillation	30 Joules
2nd +Defibrillation	70 Joules
1st Cardioversion	10 Joules
2nd +Cardioversion	20 Joules

Normal Saline 210 ml

ACLS

Amiodarone (1st/2nd dose)	1.05 ml
Atropine	2.1 ml
Calcium Chloride	2.1 ml
Epinephrine 1:10,000	1 ml
Sodium Bicarbonate	10 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	0.66 ml
Albuterol	1.5 ml
Dextrose 25%	21 ml
Diphenhydramine	0.2 ml
Epinephrine 1:1,000 IM	0.1 ml
Fentanyl IV	1 ml
Fentanyl IN undiluted	0.2 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1.05 ml
Methylprednisolone	0.32 ml
Midazolam IV	2 ml
Midazolam IN undiluted	0.4 ml
Morphine Sulfate	1 ml
Naloxone	1 ml
Ondansetron	0.5 ml

Length 84.5-97.5 cm — Weight 12-14 Kg (~26-32 lbs) — Yellow (19-35 Months)

Vital Signs

Heart Rate	110-115
Respirations	20-28
BP Systolic	100(+/-30)

Equipment

ET Tube	4.5
Blade Size	2
ET Ins. Depth	13.5 cm

Defibrillation

1st Defibrillation	50 Joules
2nd +Defibrilation	100 Joules
1st Cardioversion	15 Joules
2nd +Cardioversion	30 Joules

Normal Saline 260 ml

ACLS

Amiodarone (1st/2nd dose)	1.3 ml
Atropine	2.6 ml
Calcium Chloride	2.6 ml
Epinephrine 1:10,000	1.3 ml
Sodium Bicarbonate	13 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	0.87 ml
Albuterol	1.5 ml
Dextrose 25%	26 ml
Diphenhydramine	0.26 ml
Epinephrine 1:1,000 IM	0.13 ml
Fentanyl IV	1.3 ml
Fentanyl IN undiluted	0.26 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1.3 ml
Methylprednisolone	0.42 ml
Midazolam IV	2.6 ml
Midazolam IN undiluted	0.52 ml
Morphine Sulfate	1.3 ml
Naloxone	1.3 ml
Ondansetron	0.65 ml

Length 97.5-110 cm — Weight 15-18 Kg (~33-41 lbs) — White (3-4 yrs)

Vital Signs

Heart Rate	100-115
Respirations	20-26
BP Systolic	100(+/-20)

Equipment

ET Tube	5.0
Blade Size	2
ET Ins. Depth	14-15 cm

Defibrillation

1st Defibrillation	70 Joules
2nd +Defibrillation	125 Joules
1st Cardioversion	15 Joules
2nd +Cardioversion	30 Joules

Normal Saline 325 ml

ACLS

Amiodarone (1st/2nd dose)	1.65 ml
Atropine	3.3 ml
Calcium Chloride	3.3 ml
Epinephrine 1:10,000	1.7 ml
Sodium Bicarbonate	16.5 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	1.14 ml
Albuterol	3 ml
Atrovent	3 ml
Dextrose 25%	33 ml
Diphenhydramine	0.33 ml
Epinephrine 1:1,000 IM	0.17 ml
Fentanyl IV	1.65 ml
Fentanyl IN undiluted	0.33 ml
Glucagon	0.5 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1.64 ml
Methylprednisolone	0.53 ml
Midazolam IV	3.3 ml
Midazolam IN undiluted	0.66 ml
Morphine Sulfate	1.65 ml
Naloxone	1.6 ml
Ondansetron	0.8 ml

Pediatric Broselow-Color Coded Drug List *by Volume*

Weight 19-22 Kg (~42-51 lbs)

Length 110-122 cm

Vital Signs

Heart Rate	100
Respirations	20-24
BP Systolic	100(+/-15)

Equipment

ET Tube	5.5
Blade Size	2
ET Ins. Depth	16.5 cm

Defibrillation

1st Defibrillation	70 Joules
2nd +Defibrillation	150 Joules
1st Cardioversion	20 Joules
2nd +Cardioversion	50 Joules

Normal Saline 420 ml

ACLS

Amiodarone (1st/2nd dose)	2.05 ml
Atropine	4.2 ml
Calcium Chloride	4.2 ml
Epinephrine 1:10,000	2.1 ml
Sodium Bicarbonate	21 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	1.4 ml
Albuterol	3 ml
Atrovent	3 ml
Dextrose 25%	42 ml
Diphenhydramine	0.4 ml
Epinephrine 1:1,000 IM	0.21 ml
Fentanyl IV	2.1 ml
Fentanyl IN undiluted	0.42 ml
Glucagon	1 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	2.1 ml
Methylprednisolone	0.65 ml
Midazolam IV	4.2 ml
Midazolam IN undiluted	0.84 ml
Morphine Sulfate	2.1 ml
Naloxone	2 ml
Ondansetron	1 ml

Blue (5-6 yrs)

Weight 24-28 Kg (~52-64 lbs)

Length 122-137 cm

Vital Signs

Heart Rate	90
Respirations	18-22
BP Systolic	105(+/-15)

Equipment

ET Tube	6.0
Blade Size	2-3
ET Ins. Depth	17-18 cm

Defibrillation

1st Defibrillation	100 Joules
2nd +Defibrillation	225 Joules
1st Cardioversion	30 Joules
2nd +Cardioversion	50 Joules

Normal Saline 530 ml

ACLS

Amiodarone (1st/2nd dose)	2.6 ml
Atropine	5 ml
Calcium Chloride	5.3 ml
Epinephrine 1:10,000	2.7 ml
Sodium Bicarbonate	27 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	1.8 ml
Albuterol	3 ml
Atrovent	3 ml
Dextrose 25%	53.2 ml
Diphenhydramine	0.54 ml
Epinephrine 1:1000 IM	0.27 ml
Fentanyl IV	2.6 ml
Fentanyl IN undiluted	0.51 ml
Glucagon	1 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	2.65 ml
Methylprednisolone	0.83 ml
Midazolam IV	5 ml
Midazolam IN undiluted	1 ml
Morphine Sulfate	2.5 ml
Naloxone	2 ml
Ondansetron	1.3 ml

Orange (7-9 yrs)

Weight 30-36 Kg (~65-80 lbs)

Length 137-150 cm

Vital Signs

Heart Rate	85-90
Respirations	16-22
BP Systolic	115(+/-20)

Equipment

ET Tube	6.5
Blade Size	3
ET Ins. Depth	18.5-19.5 cm

Defibrillation

1st Defibrillation	125 Joules
2nd +Defibrillation	250 Joules
1st Cardioversion	30 Joules
2nd +Cardioversion	70 Joules

Normal Saline 660 ml

ACLS

Amiodarone (1st/2nd dose)	3.3 ml
Atropine	5 ml
Calcium Chloride	6.6 ml
Epinephrine 1:10,000	3.3 ml
Sodium Bicarbonate	33 ml

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000 1.0 ml
Repeat every 2-5 minutes PRN

Adenosine (1st/2nd dose)	2.2 ml
Albuterol	3 ml
Atrovent	3 ml
Dextrose 25%	66 ml
Diphenhydramine	0.66 ml
Epinephrine 1:1000 IM	0.3 ml
Fentanyl IV	3.3 ml
Fentanyl IN undiluted	0.66 ml
Glucagon	1 ml
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	3.3 ml
Methylprednisolone	1.06 ml
Midazolam IV	5 ml
Midazolam IN undiluted	1 ml
Morphine Sulfate	2.5 ml
Naloxone	2 ml
Ondansetron	1.65 ml

Green (10-12 yrs)

Pediatric Broselow-Color Coded Drug List *by* Dose

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Return To Medications List

Length < 59.5 cm — Weight 3-5 Kg (~6-12 lbs) — Grey (0-3 months)

Vital Signs

Heart Rate	120-150
Respirations	24-48
BP Systolic	70 (+/-25)

Equipment

ET Tube	2.5 - 3.5
Blade Size	0 – 1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	15 Joules
2nd +Defibrillation	30 Joules
1st Cardioversion	4 Joules
2nd +Cardioversion	8 Joules

Normal Saline 80 ml

ACLS

Amiodarone (1st/2nd dose)	20 mg
Atropine	0.1 mg
Calcium Chloride	80 mg
Epinephrine 1:10,000	0.04 mg
Sodium Bicarbonate	4 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	4 mcg

Medications

Adenosine (1st/2nd dose)	0.8 mg
Albuterol	1.25 mg
Dextrose 25%	2 gm
Diphenhydramine	4 mg
Epinephrine 1:1,000 IM	0.04 mg
Fentanyl IV/IN	4 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	200 mg
Methylprednisolone	8 mg
Midazolam IV/IN	0.8 mg
Morphine Sulfate	0.4 mg
Naloxone	0.4 mg
Ondansetron	0.4 mg

Length 59.5-66.5 cm — Weight 6-7 Kg (~13-16 lbs) — Pink (3-6 Months)

Vital Signs

Heart Rate	120-125
Respirations	24-48
BP Systolic	85 (+/-25)

Equipment

ET Tube	3.5
Blade Size	1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	30 Joules
2nd +Defibrillation	50 Joules
1st Cardioversion	7 Joules
2nd +Cardioversion	15 Joules

Normal Saline 130 ml

ACLS

Amiodarone (1st/2nd dose)	32.5 mg
Atropine	0.13 mg
Calcium Chloride	130 mg
Epinephrine 1:10,000	0.065 mg
Sodium Bicarbonate	6.5 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	6 mcg

Medications

Adenosine (1st/2nd dose)	1.3 mg
Albuterol	1.25 mg
Dextrose 25%	3.25 gm
Diphenhydramine	6.5 mg
Epinephrine 1:1,000 IM	0.065 mg
Fentanyl IV/IN	6.5 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	325 mg
Methylprednisolone	13 mg
Midazolam IV/IN	1.3 mg
Morphine Sulfate	0.65 mg
Naloxone	0.65 mg
Ondansetron	0.65 mg

Length 66.5-74 cm — Weight 8-9 Kg (~17-21 lbs) — Red (7-10 Months)

Vital Signs

Heart Rate	120
Respirations	24-32
BP Systolic	92 (+/-30)

Equipment

ET Tube	3.5
Blade Size	1
ET Ins. Depth	10-10.5 cm

Defibrillation

1st Defibrillation	30 Joules
2nd +Defibrillation	70 Joules
1st Cardioversion	9 Joules
2nd Cardioversion	20 Joules

Normal Saline 170 ml

ACLS

Amiodarone (1st/2nd dose)	42.5 mg
Atropine	0.17 mg
Calcium Chloride	170 mg
Epinephrine 1:10,000	0.085 mg
Sodium Bicarbonate	8.5 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	8 mcg

Medications

Adenosine (1st/2nd dose)	1.70 mg
Albuterol	1.25 mg
Dextrose 25%	4.25 gm
Diphenhydramine	8.5 mg
Epinephrine 1:1,000 IM	0.085 mg
Fentanyl IV/IN	8.5 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	425 mg
Methylprednisolone	17 mg
Midazolam IV/IN	1.7 mg
Morphine Sulfate	0.85 mg
Naloxone	0.85 mg
Ondansetron	0.85 mg

Pediatric Broselow-Color Coded Drug List *by* Dose

Table of Contents

Return To Medications List

Weight 10-11 Kg (~22-25 lbs)

Length 74-84.5 cm

Purple (11-18 Months)

Vital Signs

Heart Rate	115-120
Respirations	22-30
BP Systolic	96 (+/-30)

Equipment

ET Tube	4.0
Blade Size	1
ET Ins. Depth	11-12 cm

Defibrillation

1st Defibrillation	30 Joules
2nd +Defibrillation	70 Joules
1st Cardioversion	10 Joules
2nd +Cardioversion	20 Joules

Normal Saline 210 ml

ACLS

Amiodarone (1st/2nd dose)	52.5 mg
Atropine	0.21 mg
Calcium Chloride	210 mg
Epinephrine 1:10,000	0.1 mg
Sodium Bicarbonate	10 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	2.0 mg
Albuterol	1.25 mg
Dextrose 25%	5.25 gm
Diphenhydramine	10 mg
Epinephrine 1:1,000 IM	0.1 mg
Fentanyl IV/IN	10 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	525 mg
Methylprednisolone	21 mg
Midazolam IV/IN	2 mg
Morphine Sulfate	1.0 mg
Naloxone	1.0 mg
Ondansetron	1.0 mg

Weight 12-14 Kg (~26-32 lbs)

Length 84.5-97.5 cm

Yellow (19-35 Months)

Vital Signs

Heart Rate	110-115
Respirations	20-28
BP Systolic	100(+/-30)

Equipment

ET Tube	4.5
Blade Size	2
ET Ins. Depth	13.5 cm

Defibrillation

1st Defibrillation	50 Joules
2nd +Defibrillation	100 Joules
1st Cardioversion	15 Joules
2nd +Cardioversion	30 Joules

Normal Saline 260 ml

ACLS

Amiodarone (1st/2nd dose)	65 mg
Atropine	0.26 mg
Calcium Chloride	260 mg
Epinephrine 1:10,000	0.13 mg
Sodium Bicarbonate	13 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	2.6 mg
Albuterol	1.25 mg
Dextrose 25%	6.5 gm
Diphenhydramine	13 mg
Epinephrine 1:1,000 IM	0.13 mg
Fentanyl IV/IN	13 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	650 mg
Methylprednisolone	26 mg
Midazolam IV/IN	2.6 mg
Morphine Sulfate	1.3 mg
Naloxone	1.3 mg
Ondansetron	1.3 mg

Weight 15-18 Kg (~33-41 lbs)

Length 97.5-110 cm

White (3-4 yrs)

Vital Signs

Heart Rate	100-115
Respirations	20-26
BP Systolic	100(+/-20)

Equipment

ET Tube	5.0
Blade Size	2
ET Ins. Depth	14-15 cm

Defibrillation

1st Defibrillation	70 Joules
2nd +Defibrillation	125 Joules
1st Cardioversion	15 Joules
2nd +Cardioversion	30 Joules

Normal Saline 325 ml

ACLS

Amiodarone (1st/2nd dose)	82.5 mg
Atropine	0.33 mg
Calcium Chloride	330 mg
Epinephrine 1:10,000	0.17 mg
Sodium Bicarbonate	16.5 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	3.4 mg
Albuterol	2.5 mg
Atrovent	
Dextrose 25%	8.25 gm
Diphenhydramine	16.5 mg
Epinephrine 1:1,000 IM	0.17 mg
Fentanyl IV/IN	16.5 mcg
Glucagon	0.5 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	820 mg
Methylprednisolone	33 mg
Midazolam IV/IN	3.3 mg
Morphine Sulfate	1.65 mg
Naloxone	1.6 mg
Ondansetron	1.6 mg

Pediatric Broselow-Color Coded Drug List *by Dose*

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Return To Medications List

Weight 19-22 Kg (~42-51 lbs)

Length 110-122 cm

Vital Signs

Heart Rate	100
Respirations	20-24
BP Systolic	100(+/-15)

Equipment

ET Tube	5.5
Blade Size	2
ET Ins. Depth	16.5 cm

Defibrillation

1st Defibrillation	70 Joules
2nd +Defibrillation	140 Joules
1st Cardioversion	20 Joules
2nd +Cardioversion	50 Joules

Normal Saline 420 ml

ACLS

Amiodarone (1st/2nd dose)	102.5 mg
Atropine	0.42 mg
Calcium Chloride	420 mg
Epinephrine 1:10,000	0.21 mg
Sodium Bicarbonate	21 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	4.2 mg
Albuterol	2.5 mg
Atrovent	0.5 mg
Dextrose 25%	10.5 gm
Diphenhydramine	20 mg
Epinephrine 1:1,000 IM	0.21 mg
Fentanyl IV/IN	21 mcg
Glucagon	1.0 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1050 mg
Methylprednisolone	41 mg
Midazolam IV/IN	4.2 mg
Morphine Sulfate	2.1 mg
Naloxone	2.0 mg
Ondansetron	2.0 mg

Blue (5-6 yrs)

Weight 24-28 Kg (~52-64 lbs)

Length 122-137 cm

Vital Signs

Heart Rate	90
Respirations	18-22
BP Systolic	105(+/-15)

Equipment

ET Tube	6.0
Blade Size	2-3
ET Ins. Depth	17-18 cm

Defibrillation

1st Defibrillation	100 Joules
2nd +Defibrillation	225 Joules
1st Cardioversion	30 Joules
2nd +Cardioversion	50 Joules

Normal Saline 530 ml

ACLS

Amiodarone (1st/2nd dose)	130 mg
Atropine	0.5 mg
Calcium Chloride	530 mg
Epinephrine 1:10,000	0.27 mg
Sodium Bicarbonate	27 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	5.4 mg
Albuterol	2.5 mg
Atrovent	0.5 mg
Dextrose 25%	13.3 gm
Diphenhydramine	27 mg
Epinephrine 1:1000 IM	0.27 mg
Fentanyl IV/IN	26 mcg
Glucagon	1.0 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1325 mg
Methylprednisolone	52 mg
Midazolam IV/IN	5 mg
Morphine Sulfate	2.5 mg
Naloxone	2.0 mg
Ondansetron	2.6 mg

Orange (7-9 yrs)

Weight 30-36 Kg (~65-80 lbs)

Length 137-150 cm

Vital Signs

Heart Rate	85-90
Respirations	16-22
BP Systolic	115(+/-20)

Equipment

ET Tube	6.5
Blade Size	3
ET Ins. Depth	18.5-19.5 cm

Defibrillation

1st Defibrillation	125 Joules
2nd +Defibrillation	250 Joules
1st Cardioversion	30 Joules
2nd +Cardioversion	70 Joules

Normal Saline 660 ml

ACLS

Amiodarone (1st/2nd dose)	165 mg
Atropine	0.5 mg
Calcium Chloride	660 mg
Epinephrine 1:10,000	0.33 mg
Sodium Bicarbonate	33 mEq

Epinephrine 1:100,000 Push Dose Pressor

Epinephrine 1:100,000	10 mcg

Medications

Adenosine (1st/2nd dose)	6.6 mg
Albuterol	2.5 mg
Atrovent	0.5 mg
Dextrose 25%	16.5 gm
Diphenhydramine	33 mg
Epinephrine 1:1000 IM	0.33 mg
Fentanyl IV/IN	33 mcg
Glucagon	1.0 mg
Ketamine	See Attached Dosage Chart
Magnesium Sulfate	1650 mg
Methylprednisolone	66 mg
Midazolam IV/IN	5 mg
Morphine Sulfate	2.5 mg
Naloxone	2.0 mg
Ondansetron	3.3 mg

Green (10-12 yrs)

PEDIATRIC DRUG LIST

All volume dosages have been calculated on the medication concentration listed below. Use of any other concentrations will result in a dosage error.

Medication	Total Dose	Total Volume
Amiodarone	150 mg	3 ml
Atropine	1 mg	10 ml
Calcium Chloride	1000 mg	10 ml
Epinephrine 1:10,000	1 mg	10 ml
Epinephrine 1:1000	1 mg	1 ml
Epinephrine 1:100,000	100 mcg	10 ml

Preparation:
10 ml syringe of NS. Waste 1 ml. Draw up 1 ml of Epinephrine 1:10,000 (prefilled) yielding 10 mcg/ml.

Lidocaine	100 mg	5 ml
Sodium Bicarbonate	50 mEq	50 ml
Adenosine	6 mg	2 ml
Albuterol	2.5 mg	3 ml
Atrovent	0.5 mg	3 ml
Dextrose(D25W)**	12.5 g	50 ml
Diphenhydramine	50 mg	1 ml
Fentanyl (IN)	100 mcg	2 ml
Fentanyl (IV)*	100 mcg	10 ml

*Dilute fentanyl with 8 ml of saline to achieve 10:1 concentration for IV use

Glucagon	1 mg	1 ml
Ketamine	See Attached Dosage Chart	
Magnesium Sulfate	1000 mg	2 ml

* Mix desired dose with 50 ml of Normal Saline; infuse over 30 minutes using a micro drip set at 100 gtt/min.

Methylprednisolone	125 mg	2 ml
Midazolam (IN)	10 mg	2 ml
Midazolam (IV)*	10 mg	10 ml

*Dilute midazolam with 8 ml of saline to achieve 1:1 concentration for IV use

Morphine Sulfate*	10 mg	10 ml

*Dilute morphine with 9 ml of Saline to achieve 1:1 concentration for IV use

Naloxone	2 mg	2 ml
Ondansetron	4 mg	2 ml

**D25W= D50W diluted 1:1 with normal saline

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Appendix B - Procedures

Apneic Oxygenation

Apneic oxygenation is a technique used to supplement the pre-oxygenation phase of advanced airway management. Oxygen desaturation is one of the most frequent complications associated with emergent airway procedures. Current evidence supports the use of apneic oxygenation to reduce rates of desaturation and extend the safe apnea time.

Indications:

Patients requiring oxygenation prior to and during endotracheal intubation

Procedure:

1. During pre-oxygenation phase apply nasal cannula with NRB mask, CPAP or BVM
2. Connect nasal cannula to secondary source of oxygen
3. Adjust flow rate to 15lpm or higher
4. Maintain flow rate and maximum SpO_2 until airway procedure is complete
5. Ventilate patient with positive pressure ventilation via advanced airway
6. Disconnect nasal cannula from oxygen source

Additional Information:

1. Factors that decrease safe apnea include inadequate pre-oxygenation, increased oxygen consumption, critical illness, obesity, pregnancy, small children, airway occlusion, and pulmonary shunt.
2. In critically ill patients, critical desaturation can occur almost immediately despite optimal attempts at pre-oxygenation
3. Alveoli will continue to take up oxygen even without diaphragmatic movements or lung expansion assuming there is no airway obstruction.
4. Apneic oxygenation is merely an adjunct, it is not a substitute for effective pre-oxygenation
5. High flow rates of oxygen via nasal cannula provide very high levels of oxygen and a small amount of PEEP
6. Delivering gas at high flow rates without heating and humidification causes nasal irritation, however most patients requiring intubation are extremely sick and are past the point of noticing this discomfort.

Capillary Blood Glucose (CBG)

CBG evaluation is utilized to test the blood for the glucose levels. Glucose levels typically range between 60 mg/dL and 120 mg/dL. Some glucometers can display either “low” or “high”. Refer to owner’s manual to determine the measured level these designations indicate.

Indications:

Any patient present with altered mental status
Reported hypoglycemia
Diabetic patients with vague medical complaints
Strokes
Seizures

Procedure:

1. Prepare and assemble necessary equipment
    a. Glucometer
    b. Test Strip
    c. Lancet
    d. Alcohol Swab
    e. 4X4 Dressing
    f. Band-Aid
2. Select sample site on patient’s finger
3. Insert test strip into glucometer
4. Clean site with alcohol swab using aseptic techniques
5. Wipe site with sterile 4X4 dressing
6. Prick the finger at the site previously selected
7. Maintain the extremity in a position lower than the patient’s heart to facilitate blood return
8. Squeeze to accumulate blood droplet
9. Wipe away first droplet with 4X4 dressing (to avoid sample contamination with alcohol)
10. Squeeze again to accumulate blood droplet
11. Apply blood to test strip
12. Observe and document blood glucose level

Additional Information:

Test strips have an expiration date (maintain current date)

Chest Decompression

Needle Thoracostomy is an emergency procedure utilized to evacuate trapped air that can cause an in-crease in intrathoracic pressure resulting in a tension pneumothorax. Needle thoracostomy is accomplished by placing a 3.25 inch, 14 gauge, over-the-needle catheter into the pleural space.

Indications:

Tension pneumothorax

Procedure:

1. This procedure is performed as a standing order
2. Confirm that a tension pneumothorax exists by assessing for s/s listed below
3. Administer high concentration oxygen and assist ventilations as needed
4. Identify landmark: 2nd or 3rd intercostal space, mid-clavicular (preferred site)
   4th or 5th intercostal space, anterior-axillary (alternate site to be used only when preferred site is not available)
5. BSI
6. Prepare the site by cleansing with an alcohol swab
7. Insert the catheter while listening for air expulsion (feel for "pop" as you enter the pleural space)
8. When air escapes stop advancing the needle and push the remaining Teflon catheter into the cavity
9. Secure the catheter in place with tape
10. **Assess for signs of successful decompression (improved mental status/perfusion, increased BP**, decreased heart rate/respiratory rate). Equal chest rise / lung sounds may not be present if lung is compromised.
11. Monitor for signs of a reoccurring tension pneumothorax

Additional Information:

1. Signs and symptoms of a tension pneumothorax:
   a. Dyspnea or difficulty ventilating with BVM
   b. Tachypnea
   c. Unilateral decreased or absent lung sounds
   d. Hypotension
   e. Tachycardia
   f. Narrowing pulse pressures
   g. JVD
   h. Tracheal deviation (late sign)
   i. Mediastinal shift (late sign)
2. A pneumothorax develops in to a tension pneumothorax once pressure in the pleural space increases enough so that the heart and great vessels are compressed causing hemodynamic compromise.
3. The needle should be inserted over the top of the chosen rib to avoid the nerves and vasculature on the underside of the rib.
4. Continuously monitor the patient's respiratory status via pulse oximetry and $EtCO_2$ monitoring
5. Tracheal deviation is a late sign of a tension pneumothorax. The patient will typically be hemodynamically compromised well before tracheal deviation occurs. Chest decompression should not be delayed in the absence of tracheal deviation.
6. If a suspected tension pneumothorax reoccurs and the catheter is no longer patent then you must attempt decompression with a new 14g x 3.25" over-the-catheter needle lateral of the previous insertion site.

Clinical Guideline Deviation Report

The following report is to be completed in its entirety and routed to the Training Division no later than the end of the affected shift, for any and all instances in which a medic administers patient care not specifically delineated in the MedExpress Ambulance Service, Inc. Patient Care Protocols as a standard method or procedure, while representing MedExpress as a medical responder.

Date of Occurrence: _____ Time of Occurrence: _____

EM-Unit #: _____ On Duty Shift: _____ ePCR#: _____

Phys Ordering (on radio): _____ Receiving Hosp: _____
(PRINT First and Last)

Attending Medic: _____ 2nd Crewmember: _____

Description of Occurrence:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

**********Office Use Below**********

CQI Notes: _____ **Training Notes:** _____

_____ _____

_____ _____

_____ _____

_____ _____
(Signature)

_____ _____
(Signature)

CPAP

Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, and work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from hypoxemia caused by congestive heart failure, asthma, and COPD. The improvement seen following CPAP administration occurs through a combination of 1) preventing alveolar collapse and facilitating oxygen delivery to pulmonary capillaries; 2) increasing the functional residual capacity and opening collapsed alveoli which enhances gas exchange and oxygenation; and 3) reducing transmural pressure resulting in increased cardiac output.

Indications:
Patients who are in respiratory distress with signs and symptoms consistent with hypoxic hypoxia to include chronic obstructive pulmonary disease, asthma, pneumonia, congestive heart failure, neuromuscular disorders, acute lung injury, etc.

Contraindications:
1. < 30 Kg
2. Altered Mental Status or reduced levels of consciousness
3. Respiratory Arrest
4. Unstable Cardiorespiratory Status / Hypotension (shock)
5. Uncooperative patients
6. Inability to protect airway or follow commands
7. Trauma/Burns involving face
8. Penetrating chest trauma
9. Pneumothorax
10. Active upper GI bleeding or history of recent gastric surgery

Procedure:
1. Prior to use, check to be sure the device is free of obstructions and is structurally intact.
2. Connect directly to a 50psi gas source. For maximum flow, open the valve completely. Listen for leaks.
3. Place mask over patients face while explaining procedure. Use coaching as necessary to keep the patient calm. Utilize the head strap to secure the mask firmly in place.
4. Start with the O_2-CPAP valve at the appropriate pressure depending on patient's presentation.
5. Add nebulizer to the built-in port to administered medications as necessary.
6. Noticeable improvement should be seen in approximately 2-3 minutes. If the patient does not improve, increase the O_2-CPAP valve until the desired pressure is obtained (5.0 → 7.5 → 10 cm H_2O)

Additional Information:
1. CPAP works in the setting of CHF by impacting the osmotic pressures that leads to pulmonary edema. CPAP reverses the pressure gradients causing intra-alveolar fluid to be reabsorbed into the intravascular space.
2. CPAP works in the setting of COPD and Asthma by splinting airways for gas exchange and medication delivery. Use of the end-tidal capnography may assist in determining which patients are suitable for CPAP versus intubation
3. CHF patients typically benefit from higher CPAP pressures due to the higher pressure needed for oxygenation and reducing hydrostatic pressure in the lungs which is responsible for preventing pulmonary edema. COPD/Asthma patients typically respond well to lower CPAP pressures when the goal is exclusively to splint the airways to allow for exhalation of trapped CO_2 or for nebulized medication administration.
4. Do not remove CPAP until hospital therapy is ready to be placed on the patient
5. Monitor patient for gastric distension which may lead to vomiting
6. IV Nitroglycerin is the preferred route of administration during CPAP use to prevent having to remove the mask and lowering airway pressures.

Electrical Therapy

Defibrillation

Energy Levels:

Biphasic

Adult:	Initial:	200 J
	All subsequent:	200 J
	Dual sequential:	200 J each monitor
Peds:	Initial:	2 J/kg
	All subsequent:	4 J/kg

Cardioversion

Energy Levels:

Biphasic

Adult:	SVT and A-Flutter:	50 J → 100 J → 120 J → 150 J → 200 J
	Vtach with pulse:	
	Monomorphic:	100 J → 120J → 150 J → 200 J
	Polymorphic:	120 J → 150 J → 200 J **"unsynchronous"**
	Atrial fibrillation:	120 J → 150 J → 200 J
Peds:	All rhythms:	0.5 J/kg → 2 J/kg → 2 J/kg all subsequent shocks

(if 2nd shock is unsuccessful, give anti-arrhythmic trial before third shock)

Dual Sequential External Defibrillation

Indications:

Refractory ventricular fibrillation/tachycardia (not recurrent) despite 5 defibrillations. (not including bystander or first responder defibrillations with AED)

Procedure:

1. Ensure quality CPR is not compromised.
2. Prepare and attach an additional set of defibrillation pads (anterior/posterior) while avoiding contact with initial pads.
3. Ensure that both monitors are able to be controlled by a single provider who will be delivering shocks.
4. Simultaneously charge both cardiac monitors. When both monitors are charged to selected energy setting and all persons are clear, the provider will push both shock buttons in sequence as close together as possible while avoiding simultaneous delivery of shocks. The shocks should be one right after the other. Delivery of simultaneous shocks (shocks at the same time) can result in harm to the provider, patient, and/or monitor.

Additional Information:

An AED can be used when a second monitor is not available. When the AED is analyzing, the LifePak12 can be charged. When ready, the AED and LifePak12 can be used to deliver a sequential shock as described above.

Emergent Infectious Disease

This procedure is intended to address the transport and PPE requirements for a patient with a suspected emergent infectious disease. Responding crews will be notified of a suspected emergent infectious disease by medical communications using the statement, "Positive screening, additional PPE required."

PPE Requirements

At a minimum, the following PPE will be needed for each practitioner when treating and transporting a patient with an emergency infectious disease.

- Eye protection (goggles) and face shield
- N95 Respirator
- Exam gloves – three pair
- Tychem suit with hood
- Shoe covers
- Boot Covers

At a minimum, the following PPE will be needed for the donning/doffing partner to assist the practitioner when donning and doffing PPE.

- Eye protection (goggles)/face shield
- N95 Respirator
- Exam gloves three pain
- Shoe covers
- Boot Covers
- Disposable gown and/or Tyvek jumpsuit/coverall

Donning and Doffing of PPE

Donning and doffing procedures will be completed using a 'buddy system' to ensure the lowest possible risk of contamination. Do not attempt to don or doff PPE without a partner to monitor the situation.

Donning Procedure

When donning PPE, it is important to have an additional person not involved in patient care watch over and supervise the donning procedure to assure PPE is donned appropriately. All taping should be done with duct tape so that there is no tenting; and covering with a spacing of 50/50 on gloves/shoe covers and Tyvek/Tychem material. The following steps should be taken to don the PPE.

1. Remove all jewelry, watches, and belt attachments.
2. Remove outer uniform shirt.
3. With donning partner, inspect the Tychem suit for defects.
4. Place shoe covers over work foot gear.
5. Cleanse hands with alcohol hand gel.
6. Place Tyvek sleeves on each forearm.*
7. Apply first layer of gloves.
8. Tape first layer of gloves to Tyvek sleeves.*
9. Carefully place Tychem suit over shoe covers and slide arms into sleeves.
10. Place second, longer pair of gloves over the sleeves of the Tychem suit.
11. Tape second pair of gloves to the sleeves of the Tychem suit.
12. Apply boot covers over feet. If boot covers do not have elastic to fit snugly against Tychem suit, tape boot covers to the suit.
13. Apply N95 mask, making sure of a good fit and skin coverage.
14. Apply safety glasses/goggles.
15. Place hood on head, making sure all hair is inside of the hood.
16. Zip the suit.
17. Remove paper from adhesive and press the flap in place for the entire length.
18. Apply face shield.
19. Apply 3rd pair of gloves. These gloves may be removed, put into a bio hazard bag, and then re-placed as they become soiled.

** The Tyvek sleeves may be omitted if longer gloves are used.

Emergent Infectious Disease

Doffing Procedure

When doffing PPE, an additional person not involved in patient care shall watch over the doffing procedure to assure it is doffed appropriately minimizing the risk for contamination. The order and procedure in which PPE should be doffed is as follows:

1. Lay disposable sheet on ground to stand on and designate "clean/dirty" area.
2. Have doffing partner don PPE, except for Tychem suit.
3. Have biohazard bag within arms' reach.
4. Have doffing partner remove any gross contamination with MEDI-WIPE or similar product.
5. Have doffing partner mist Tychem suit, gloves and boot covers with disinfectant or 10% bleach solution and wait 10 minutes.
6. Remove boot covers and place in bio hazard bag.
7. Remove outer (3rd) layer glove and place in bio hazard bag.
8. Apply a clean pair of gloves.
9. Remove face shield and place in bio hazard bag.
10. Remove hood and place in bio hazard bag.
11. Unzip and remove Tychem suit by rolling it inside out with doffing partner assisting in the process – take care not to allow outside of suit to contact skin or clothing.
    a. When removing hands from sleeves, the outer layer and the taped layer of gloves should be carefully removed during this step.
12. Before proceeding in completely removing suit, apply a clean pair of gloves (there should two gloves on each hand).
13. Using the inside of the Tychem suit, roll it down to the ankles.
14. Remove feet from the suit, taking care to step only on the inside of the suit.
15. Remove inner boot covers and step into "clean" area after each removal.
16. Remove outer layer of gloves and place into "dirty" area.
17. Remove safety glasses/goggles and place into "dirty" area.
18. Remove N95 mask, taking care not to touch the face, and place into "dirty" area.
19. Remove last layer of gloves along with Tyvek sleeves (if applicable).
20. Using alcohol hand sanitizer, cleanse hands and/or wash hands as soon as possible.
21. Doffing partner will contain all of removed items onto disposable sheet and place into doubled bio hazard bags for proper disposal.

Ambulance Preparation

Ambulance preparation will be done with the purpose of segregating the cab from the patient compartment and covering the cabinets/shelves, ceiling, seating and floor with an impermeable barrier.

Supplies that will be needed include:

Plastic sheeting (visqueen)
Duct tape
Scissors

Procedure:

All sheeting should overlap prior sheets of plastic by a minimum of 1 inch. All seams should be sealed completely by duct tape.

1. Remove all unnecessary medical equipment and place in the cab of the ambulance.
2. Cover the ceiling of the patient compartment with plastic sheeting and affix with duct tape.
3. Place sheeting on the floor of the patient compartment area and affix to the bench seat, jump seat, and walls to create a bowl effect in an effort to channel any body fluids toward the center of the floor causing fluids to collect in one area.
4. Place plastic sheeting over the walls (sides and bulkhead) by affixing it to the edges of the sheeting for the ceiling and floor with duct tape to enable any flow of fluid to be captured on the sheet on the floor.
5. Wall sheeting should overlap with the upper portion over the lower portion to prevent any body flu-id from leaking between sheets by gravity.
6. The stretcher mounts will need to be accessible through the plastic sheeting for safe transport of the stretcher and the patient. Seal these openings generously with duct tape so that all fluids flow to the sheeting on the floor.
7. Leave openings around ventilation ports to allow proper airflow and exchange.
8. Continue to overlap sheeting down and over seating to the floor. Cover rear doors with plastic sheeting and duct tape.

Emergent Infectious Disease

Stretcher Preparation

Stretcher preparation will be done with the purpose of preventing contamination of areas that can-not be clean with disinfectant (i.e., mattress pad).

Supplies that will be needed:

- Impermeable Mattress Cover
- Disposable blanket
- Patient containment bag

Procedure:

Cover mattress pad with fitted impermeable mattress cover. Place disposable blanket on top of cover so that the patient can be wrapped with the blanket once on the stretcher.

Patient Care

If possible, prior to patient contact, each caregiver will don the PPE while the other crewmember assists by both checking for integrity issues or exposed body parts. Patient care should be limited to supportive care.

Ambulatory patient

If the patient is able to walk to the ambulance, have them don the PPE that is required for EMS personnel and walk to the ambulance

Non-ambulatory patient

If the patient is not ambulatory, place the patient in a patient containment bag and then put the patient on the protected stretcher.

Transport to the Hospital

1. Family or friends of the patient should not ride in the ambulance and should be instructed to stay home. Should there be an issue (i.e., minor child), consult with your supervisor and/or wait for a decision from the state authorities.
2. When calling the receiving facility, make them aware of the situation as soon as possible and ask for specific instructions as to where to unload the patient.
3. Preplan the unloading procedure with the receiving facility.
4. Upon arrival at the receiving facility, make contact with the staff and do not unload the patient until they are ready to receive them.

End Tidal CO_2 Detective ($EtCO_2$)

$EtCO_2$ is utilized to evaluate a patient's perfusion status, confirm proper advanced airway placement, and the ongoing monitoring of advanced airway placement by measuring the capnometry and capnography during exhalation. $EtCO_2$ is the "gold standard" in monitoring the respiratory integrity of the patient and perfusion status. $EtCO_2$ is also valuable in assessing the level of severity in and the therapeutic response of medications for patients experiencing bronchospasm and chronic obstructive lung diseases.

Indication:

Non-intubated patients:

1. Patients presenting with or suspected of having any type of hypoxic or hypercapnic disease pathology (Any form of shock, CHF, Asthma, Pneumonia, DKA, etc.)
2. Patients requiring any type of sedation
3. Patients receiving pain management or any other medication that affects circulation and/or respiration

Intubated patients:

1. After initial advanced airway placement of any type
2. Continuous monitoring of correct advanced airway placement and ventilation
3. Detection of loss of circulatory function
4. Verification of the effectiveness of CPR
5. Confirmation of return of spontaneous circulation

Procedure:

Non-Intubated Patients

1. Determine mechanism of distress (i.e. asthma, emphysema, CHF, etc.)
2. Attach ETCO2 monitor utilizing nasal cannula
3. Verify proper waveform and quantitative measures
4. Utilize diagnostic information (waveform and quantitative value) to verify the patient's condition
5. Initiate appropriate Clinical Guideline for pharmacological care

Intubated or Ventilated Patients (BVM, ETT, Surgical airway, or Supraglottic airways)

1. Intubate according to intubation procedure
2. Set up $EtCO_2$ monitor
3. Attach $EtCO_2$ monitor between advanced airway or mask and Bag valve
4. Verify proper waveform and quantitative measure to confirm tube placement and/or ventilation
5. Continuously monitor placement by assuring proper waveform and quantitative value

Additional Information:

1. In intubated patients, $EtCO_2$ does not replace clinical confirmation of placement (chest rise, tube moisture, bag compliance, (+) breath sounds, and (-) gastric sounds)
2. Shark fin pattern is indicative of the severity and presence of bronchospasms
3. $EtCO_2$ will be placed on all intubated patients and the non-intubated ones listed in above
4. Normal capnometry values are between 35-45mmhg. Values less than 35mmhg suggest decreased cellular metabolism (shock, poisoning, etc.) or hyperventilation. Values higher than 45 suggest hypoventilation or increased metabolic metabolism (hyperthermia, hyperthyroidism)

Endotracheal Intubation

The endotracheal intubation, or placement of an endotracheal tube, into the trachea is the preferred method of airway management when definitive airway care is warranted. Patients unable to maintain an adequate airway from various etiologies are candidates.

Indications:

1. Failure of ventilation/oxygenation or pending failure of ventilation/oxygenation
2. Patients unable to maintain or protect their airway
3. Patients with the potential of clinical deterioration
4. Airway obstruction of any type (edema, foreign body, trauma)
5. Crash airway scenarios

Procedure:

1. Assure a patent airway and hyper oxygenate with 100% O_2 prior to the procedure
2. Assemble and check all the necessary equipment. Utilize Medication Assisted Intubation Guideline as needed
3. Select the appropriate sized ETT
4. Place the patient in the "sniffing" position with the head extended
5. Insert laryngoscope blade into the right side of the mouth while sweeping the tongue to the left
6. Visualize right tonsillar fossa, centralize blade to the uvula
7. Look for the epiglottis and utilize the tip of the blade appropriately
    a. Macintosh inserts into the vallecula while lifting mandible to expose glottis
    b. Miller goes under the epiglottis to manually lift it to expose glottis
8. Visualize the glottic opening (vocal cords)
9. Insert the Coude-tip Bougie into the trachea while feeling for tracheal rings and advance until hold up.
10. Insert the ETT over the Bougie using a counter-clockwise motion and into the trachea until the desired depth is achieved
11. Withdraw the laryngoscope blade followed by the Bougie taking care as to not dislodge the ETT.
12. Inflate the distal cuff on the ETT with 10 ml of air or until you feel resistance on the syringe, whichever occurs first
13. Confirm bilateral breath sounds and absent epigastric sounds by auscultation
14. Confirm bilateral chest rise by visualization
15. Confirm placement with proper $EtCO_2$ waveform
16. Visualize moisture in the ETT
17. Verify adequate BVM compliance
18. Secure the ETT appropriately using a commercial device
19. Continue to provide oxygen as needed and ventilate using a bag valve device

Additional Information:

1. To problem solve any difficulty with the intubated airway, remember the pneumonic
    DOPE: **D**-dislodgement, **O**-obstruction, **P**-pneumothorax, **E**-equipment
2. Suction should be available at all times while performing this procedure
3. Supraglottic airway and/or equipment needed for surgical airway should be readily available in the event of unsuccessful endotracheal intubation. (Failed Airway Guideline)
4. The $EtCO_2$ and SpO_2 must be applied to all intubated patients for continuous airway monitoring
5. To protect the cervical spine in trauma, manual stabilization may be used when performing endotracheal intubation.
6. The Miller blade is recommended for pediatric patients

i-gel

INDICATIONS

• Advanced airway management when endotracheal intubation cannot be accomplished.

• Two unsuccessful attempts at endotracheal intubation by a single EMS provider. Or a total of three unsuccessful attempts by two EMS providers.

PRECAUTIONS

• Do not use in patients with intact gag reflex.

• Do not use in patients with known esophageal disease.

• Do not use in patients who have ingested caustic substance.

• Do not use in patients with unresolved foreign body obstruction

• Do not use in patients with a tracheostomy or stoma

• Do not force the I-gel airway device.

PROCEDURE

• Prepare equipment:

a. High-flow oxygen.

b. Bag valve mask.

c. I-gel kit.

d. Suction.

e. Lubricant.

• Hyperventilate patient with bag valve mask for 1-2 minutes with supplemental oxygen while preparing equipment. If CPR is in progress, do not interrupt continuous chest compressions.

• Remove dentures, loose or broken teeth.

• Position patient's head in neutral position.

• Choose the correct size I-gel airway

i-gel size	Patient size	Patient weight guidance (kg)
1	Neonate	2-5
1.5	Infant	5-12
2	Small paediatric	10-25
2.5	Large paediatric	25-35
3	Small adult	30-60
4	Medium adult	50-90
5	Large adult+	90+

i-gel

• Apply lubricant to the anterior, posterior and lateral edges of the cuff.

• Hold the I-gel at the integrated bite block with dominant hand. With the free hand, open mouth and apply gentle chin lift while maintaining C-spine precautions if indicated.

• Position the device so that the gel cuff outlet faces the patients chin. Advance the tip into the mouth of the patient following the hard palate.

• Without exerting excessive force, advance the device until a definitive resistance is felt.

• Begin ventilation with 100% oxygen, while bagging patient to assess ventilation.

• Confirm proper placement by auscultation, chest rise, end tidal CO2 monitoring or Colorimetric CO2 detector.

• Secure the I-gel with tape from maxilla to maxilla or with the included securing device.

• All patients with an inserted I-gel device should have their head and neck immobilized with a cervical collar.

• Document proper airway placement as well as method used to stabilize I-gel device.

• Reassess the position of the I-gel device, and again if patient is moved.

• Placement of the I-gel device should not delay CPR or patient care.

• Devices are single use and should be appropriately disposed of.

King LTS-D

The King LTS-D is a color coded supraglottic airway designed for positive pressure ventilation. The King LTS-D ranges in size (0 – 5) to accommodate pediatric patients less than 5 kg to adult patients greater than 6 ft. The anatomically shaped distal tip and cuff assist in the device's passage behind the larynx and into the normally collapsed esophagus providing ventilation into the trachea. The King LTS-D offers the ability to easily pass a gastric tube through a second channel of the device and into the esophagus and stomach to allow decompression of the stomach and gastric suctioning.

Indications:

1. Need for positive pressure ventilation
2. Rescue airway when endotracheal intubation cannot be achieved
3. Securing and maintaining airway patency when endotracheal intubation is unwarranted

Contraindications:

1. Intact airway reflexes
2. Conscious/semi-conscious patients
3. Ingestion of caustic substances
4. Known esophageal disease

Procedure:

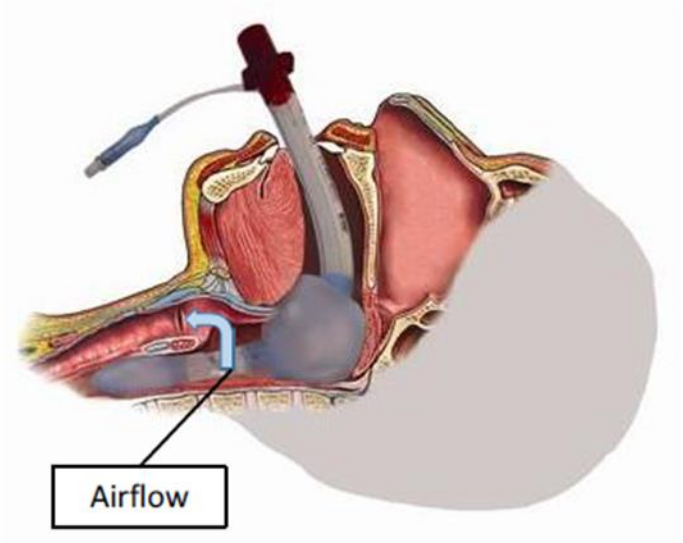
1. Apply chin lift and introduce KING LTS-D into corner of mouth
2. Advance tip under base of tongue, while rotating tube back to midline
3. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
4. Fully inflate cuffs using the maximum volume of the syringe included in the kit
5. Attach resuscitation bag. While gently bagging, slowly withdraw tube until ventilation is easy and free flowing (large tidal volume with minimal airway pressure)
6. If necessary, adjust/add cuff inflation volume to maximize the seal of the airway
7. Secure the device using a commercial tube restraint or tape.
8. Note device depth
9. Lubricate gastric tube prior to inserting into the KING LTS-D's gastric access lumen

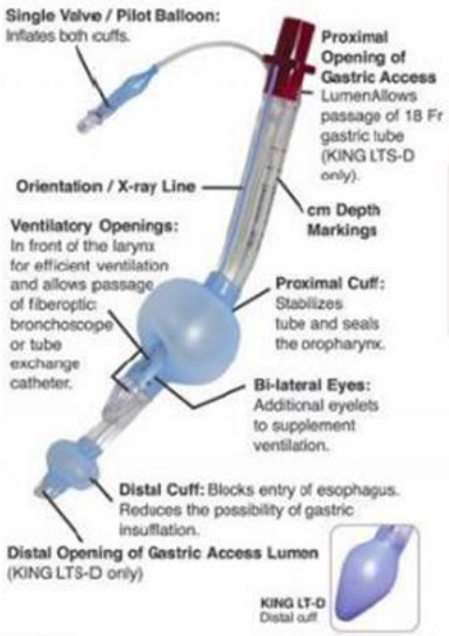
Additional Information:

1. This device may not protect the airway or allow for effective ventilation in the following situations:
    a. Active Vomiting – aspiration is likely
    b. FBAO
    c. Trauma/bleeding in the airway
    d. Edema to the airway – Burns, anaphylaxis, etc.

2. The second lumen of the KING LTS-D, which is open at the distal tip of the tube, provides three key additional benefits:
    a. Passage of gastric tube up to 18 French
    b. Channel for regurgitation, which significantly reduces potential for regurgitation to get past the cuff and therefore aids in reducing the chance for aspiration
    c. Provides "vent" for gastric pressure and stomach decompression

King LTS-D





Sizing Information

	Pediatric				Adult		
Tube Size	Size 0	Size 1	Size 2	Size 2.5	Size 3	Size 4	Size 5
Connector Color	Transparent	White	Green	Orange	Yellow	Red	Purple
Patient Criteria	<5 kg	5-12 kg	12-25 kg 90-115 cm	25-35 kg 105-130 cm	4-5 feet (122-155 cm)	5-6 feet (155-180 cm)	greater than 6 feet (>180 cm)
Recommended Cuff Volume	10 ml	20 ml	35 ml	40-45 ml	50-60 ml	70-80 ml	80-90 ml
Maximum Cuff Pressure	60 cm H_2O						
External Diameter of the Tube	9 mm	9 mm	14 mm	14 mm	17.6 mm	17.6 mm	17.6 mm
Bronchoscopy Via Ventilation Lumen	< 3.0 mm	< 3.0 mm	< 4.0 mm	< 4.0 mm	< 6.0 mm	< 6.0 mm	< 6.0 mm
Suction Catheter	10 Fr	10 Fr	16 Fr	16 Fr	18 Fr	18 Fr	18 Fr

Nebulizer

The nebulizer is a mechanical device utilized to administer medications via the tracheal-bronchial tree. Bronchodilators are the typical pharmacological agent administered via this route of administration. The nebulizer uses pressure from the oxygen flow delivered into a liquid medication of approximately 3 – 5 ml to aerosolize the liquid allowing absorption via the respiratory tissues.

Indications:

1. Bronchoconstriction
2. In conditions when the delivery of aerosolized medications is useful, efficient, and indicated.

Procedure:

1. Assemble the nebulizer unit and place the correct dosage of medication into the medication chamber
2. Connect the oxygen tubing to the bottom of the medication chamber and set the flow rate at between 6 – 8 liter/min to deliver the medication over a 10 - 20 minute time frame
3. Utilizing mouthpiece, have the patient form a seal around the piece with their lips
4. Utilizing the mask, form a proper mask seal by securing against the face with the cinch strap and pinching the nose piece to prevent aerosol escape at the eyes
5. Encourage the patient to take slow, deep breaths from the nebulizer to enhance deliver of the medication into the lower airways
6. It may be necessary to pluck or swirl the medication chamber ensure all of the medication is delivered
7. Utilizing the BVM, assemble the mouthpiece style nebulizer with a valved, blue T adaptor and remove the actual mouthpiece. This end will connect to the blue T adaptor and the Bag Valve. Place the elbow adaptor on the opposite end of the corrugate tubing. This will connect to the ETT and allow for tracheal suctioning.
8. Additional treatments may be given as indicated per Clinical Guideline

Additional Information:

1. Place the patient in either Fowler's or Semi-Fowler's position to administer the nebulizer
2. Note: the above flow range is based on necessary pressure to adequately deliver the mediations in aerosolized form. If nebulizer is placed on CPAP you may have to increase flow rate to allow for adequate aerosolization.

Needle Cricothyrotomy

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Indications:

- Epiglottitis
- Laryngospasms
- Facial trauma/Burns
- Laryngeal edema
- Fractured larynx
- Foreign body obstruction

Contraindications:

- ALS or BLS interventions can successfully maintain airway.
- Landmarks cannot be clearly identified.
- Transection of the trachea distal to cricothyroid site.
- Relative contraindications such as known tracheal disease, cancer, lower airway obstruction. However, this is a last resort procedure thus consider the benefit vs. risk.

Complications:

- Subcutaneous emphysema
- Tracheal mucosal injury
- Mediastinal emphysema
- Bending of catheter
- Hemorrhage
- Pneumocystis
- Esophageal or mediastinal puncture
- Aspiration
- Barotrauma
- Thyroid perforation

PROCEDURE:

1. Demonstrate Proper body substance isolation (BSI)
2. Select appropriate size (we carry 4.0 for adult only)
3. Place patient in supine position and assure stable position of neck in hyperextended position. (unless cervical spine compromise suspected)
4. Secure larynx laterally between the thumb and forefinger. Find the cricoid membrane (in midline between thyroid cartilage and cricoid cartilage) This is the puncture site.
5. Prep site vigorously with appropriate prep solution. (alcohol preps)
6. Firmly hold device and puncture the cricoid membrane at 90 degree angle.
7. After puncturing the cricothyroid membrane, check the entry of the needle into the trachea by aspirating air through a syringe. If air is present, the needle is in the trachea.
8. Now, change the insertion angle of the needle to 45 degrees (from the head) and advance the device forward into the trachea to the level of the stopper. The stopper reduces risk of inserting the needle too deeply and causing damage to the rear wall of the trachea.

Needle Cricothyrotomy

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9. Should no aspiration of air be possible because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle until entrance into trachea is made.
10. Remove stopper. After stopper is removed, be careful not to advance device any further with needle still attached.
11. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until flange rests on neck. Carefully remove needle and syringe.
12. Secure the cannula with neck strap.
13. Apply connecting tube to 15 mm connection and connect the other end to BVM or ventilator circuit.
14. Patient shall be placed on ETCO2 monitoring and data shall be entered into EPCR
15. Ventilate patient at appropriate rate.
16. **NEVER ATTEMPT TO PLACE RUSCH QUICK TRACH IN A MOVING VEHICLE!!!**

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Pulse Oximeter

Pulse oximeters are utilized to detect saturation of the hemoglobin molecule in the blood. Ultimately it is the oxygen saturation of hemoglobin that is the target. There are other gases and molecules that bind to the hemoglobin and those will render a saturation percentage as well. Pulse oximeters are also dependent on circulating volume to the periphery of the patient. Keeping those two limitations in mind, the pulse oximeter displays the quantified SpO_2 measurement.

Indications:

1. Patients with a chief complaint of respiratory distress
2. All patients receiving oxygen administration
3. All patients with the potential to develop hypoxia
4. All intubated patients and those being monitored with an $EtCO_2$
5. Patients receiving procedural sedation

Procedure:

1. Provide all supplemental support and necessary stabilizers
2. Attach appropriate size sensor to appropriate patient region
3. Obtain a measure prior to oxygen administration to determine a baseline
4. Verify reading is valid and consistent with patient's condition
5. Administer oxygen via the appropriate adjunct prn
6. Manage patient's airway accordingly

Additional Information:

There are certain issues that may represent an inaccurate reading:

1. Remove nail polish or artificial nails as necessary to obtain accurate reading
2. Obscure the sensor from bright light
3. The waveform should correlate with the radial pulse and/or the EKG waveform
4. CO gas has a higher affinity for hemoglobin and can measure 100% saturation
5. Other limiting factors:
   a. Cardiac arrest
   b. Local circulation dynamics
   c. Temperature of the extremity
6. Measures of hypoxia:
   a. 95% - 99% normal
   b. 91% - 94% mild hypoxia
   c. 86% - 90% moderate hypoxia
   d. < 85% severe hypoxia

Sedation

The following procedure is recommended for the patient requiring sedation for the purpose of performing a medical procedure necessary to treat the patient or in situations where a patient's behavior is physically dangerous to self or others. Appropriate emergency equipment for maintaining the patient's airway, ventilatory status and cardiac status must be readily available when sedation/analgesia medications are given to the patient.

Indications:

1. Patients requiring endotracheal intubation for ventilatory assistance, not able to tolerate laryngoscopy
2. Combative behavior that compromises patient care
3. Patients who experience CPR induced consciousness
4. Sedative medication prior to electrical cardioversion
5. Patients experiencing discomfort during transcutaneous pacing
6. Patients with ROSC who require sedation

Procedure:

1. IV access, airway equipment, and cardiac monitor should be available
2. Administer agent according to Clinical Guideline directive via appropriate route
3. Observe for signs of sedation
4. Monitor the patient's respirations, heart rate, and blood pressure closely
5. Apply pulse oximeter, $EtCO_2$, and cardiac monitor

Additional Information:

1. Midazolam will typically be utilized for sedating patients who require procedural sedation, or for continued sedation during post airway management.
2. Etomidate or Ketamine is utilized for the sedation of patients who need intubation but cannot tolerate laryngoscopy. Once laryngoscopy is achieved, administer Midazolam to maintain sedation of the patient.
3. Fentanyl and/or Ketamine can be used for the sedation of patients who experience CPR induced consciousness.
4. Ketamine should be utilized when patients have a compromised circulatory system or poor perfusion status
5. Geodon is utilized exclusively for behavioral emergencies who are violent and/or agitated with a psychiatric history

Tourniquet

Tourniquets have often been described as the technique of "last resort." Military experience in Afghanistan and Iraq plus the routine and safe use of tourniquets by surgeons, has led to reconsideration of this approach. The use of "elevation" and pressure on "pressure points" is no longer recommended because of insufficient data supporting their effectiveness. Tourniquets are very effective in controlling severe hemorrhage and should be used if direct pressure or a pressure dressing fails to control hemorrhage from an extremity

Indications:

1. Any external hemorrhage of an extremity that cannot be controlled by direct pressure and pressure dressing that is cause by penetrating trauma to an extremity or amputation of an extremity.
2. Any external hemorrhage of an extremity where the "life over limb" theory can be applied.

Procedure:

1. Apply the tourniquet just proximal to the hemorrhaging wound.
2. A tourniquet should be applied tight enough to block arterial flow and occlude the distal pulse.
3. Note application time and document on the tourniquet
4. A tourniquet placed in the prehospital setting should remain in place until the patient reaches definitive care at the closest appropriate hospital.

Side Effects:

Nerve injury
Muscle injury
Arterial injury
Skin damage

Additional Information:

1. If one tourniquet does not stop completely the hemorrhage, then another one should be applied just proximal to the first.
2. Once applied, the tourniquet site should not be covered so that it can be easily seen and monitored for recurrent hemorrhage.
3. A device that only occludes venous outflow from a limb will actually increase hemorrhage from a wound.
4. A direct relationship exists between the amount of pressure required to control hemorrhage and the size of the limb. Thus, on average, a tourniquet will need to be placed more tightly on a leg to achieve hemorrhage control than on an arm.
5. If application of a tourniquet is required, the patient will most likely need emergency surgery to control hemorrhage. Thus, the ideal receiving facility for such a patient is one with surgical capabilities
6. A tourniquet can be painful for a conscious patient to tolerate, and pain management should be considered.
7. A tourniquet should not be periodically loosened to allow for perfusion.
8. Tourniquets should not be placed over fractures.

Trans-Cutaneous Pacing (TCP)

External pacing is an electrical stimulation of the cardiac muscle used when the rate is bradycardic (< 60 bpm) and causes hemodynamic compromise.

Indications:
Bradycardia (hemodynamically unstable)

Procedure:
1. Assess the patient to determine need for pacemaker
2. Attach 3 – lead monitoring and electrodes
3. Attach pacing electrodes and cables anterior/posterior
4. Provide pain management/sedation prn.
5. Set pacemaker rate to 70 bpm
6. Click to turn pacer on
7. Default energy level begins at 30mA. Gradually increase by 10mA every 2 to 3 seconds until electrical capture is achieved on the oscilloscope
8. Assess carotid pulse to verify mechanical capture is achieved
9. Once mechanical capture is verified, increase 10 mA above threshold to ensure capture is maintained
10. If no mechanical capture is achieved, discontinue pacing
11. Contact medical control

Additional Information:
1. Hemodynamic instability: hypotension, chest pains, SOB, pulmonary edema, or altered mental status (must have hypoperfusion)
2. Pacer pads should be placed in the anterior/posterior position. Anterior/Posterior placement is clinically superior.
3. Pacing is the primary treatment if bradycardia presents with 2° AV block or higher (atropine may be considered while or after applying the pacemaker)
4. Utilize pediatric pads for patients < 15 kg
5. Electrical capture occurs when the pacer spike combines with the patient's intrinsic beat and becomes wide and bizarre compared to the intrinsic beat
6. Mechanical capture is when the carotid pulse equals the rate setting of the pacemaker and improvement in blood pressure, level of consciousness, skin color, and temperature occurs
7. Muscle twitching or shoulder shrugging is common

Vagal Maneuvers

Modified Valsalva maneuvers are a manual stimulation of the parasympathetic nervous system via one of several cranial nerves. Slowing of the heart rate is the result. Valsalva maneuvers are the first line treatment in stable patients prior to medication administration or electrical therapy. Electrical therapy remains primary treatment in the unstable patient.

Indications:

1. PSVT specifically
2. Tachycardia's in general

Procedure:

1. Provide all supplemental support and necessary stabilizers
2. Place the patient on the cardiac monitor
3. Place the patient in a semi- recumbent position
4. Modified Valsalva Maneuver:
    a. Instruct the patient to take a deep breath and blow into a 10cc syringe for a 15 second strain.
    b. Immediately reposition patient to a supine position and raise legs 45 degrees for additional 15 seconds
    c. Monitor EKG for results
    d. This procedure may be repeated

5. Ice water immersion of the face
    a. Prepare two ice packs (actual ice in water)
    b. Place the ice packs on both sides of the face to cover nose and eyes
    c. Monitor EKG for results.
    d. This procedure may be repeated

Additional Information:

1. Carotid sinus massage should not be attempted in the prehospital setting
2. Ice water immersion is preferred treatment for pediatric patients
3. Profound bradycardia or asystole may occur
4. The patient must be connected to a cardiac monitor
5. Postural modification to the standard Valsalva maneuver is highly effective, returning more than 40% of patients to sinus rhythm compared with 17% with a standard Valsalva

Vascular Access

This procedure is utilized to establish a portal of entry into the patient's vascular space for the purposes of medication administration and volume replacement. The procedure may be initiated at the discretion of the paramedic and by standing order.

Indications:

1. Patients that may need pre-hospital medication administration
2. Patients requiring pre-hospital volume replacement
3. Prophylactic access in anticipation of either of the above
4. Patients requiring venous access for definitive care at the hospital

Procedure:

1. Assess the patient to establish the need for vascular access
2. Provide other stabilization in anticipation of the procedure
3. BSI
4. Assemble all the necessary equipment and inspect for expiration dates and defects
5. Select an access point suitable to the patient and appropriate for the condition of the patient
6. Tourniquet the arm, palpate and distend a suitable vein
7. Swab with 70% alcohol swab (observe aseptic technique)
8. Perform venipuncture while watching for blood return (flash), entering the vein far enough to guarantee the Teflon has entered the vein
9. Push the Teflon off of the needle advancing only the catheter into the vein until the hub of the catheter touches the skin
10. Withdraw the catheter and place into sharps (never re-introduce the needle into the catheter to avoid shearing)
11. Attach either the IV tubing with assembled bag of fluid or primed saline lock connector set
12. Cover with tegaderm or similar dressing to secure the catheter
13. Flush with 10 ml of saline to verify patency of line and that there is no extravasation or infiltration
14. Observe patient and monitor site

Additional Information:

1. A saline lock may be utilized in all cases except volume replacement and cardiac arrest
2. Greater than 3 repeated attempts without medical control is discouraged. Consider IO access if applicable.

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Appendix C - References

12 Lead Guidelines

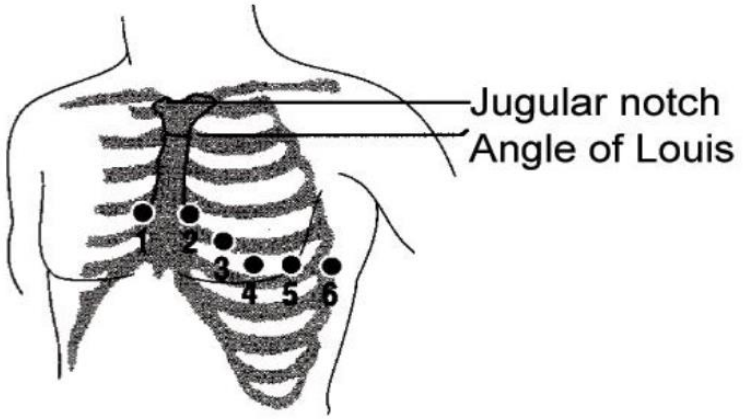
A 12-lead EKG must be transmitted to the receiving emergency department prior to transporting if possible in the following situations:

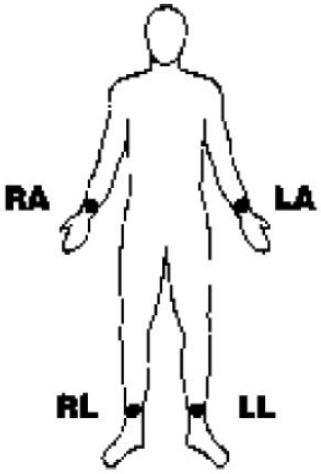
1. A STEMI is noted on the 12-lead EKG
2. A patient is being, or is going to be treated under a Cardiac Guideline (ACS, Bradycardia, or Tachycardia) or if the patient is being treated under the Post Resuscitation Care Guideline.
3. Any time the EMS practitioner feels that a 12-lead should be reviewed by a physician or is seeking advice or orders for a patient with a cardiopulmonary complaint.

When a STEMI is identified and after the EKG is transmitted, a radio report should be provided to the receiving emergency department as soon as possible to allow for ample time for mobilization of the heart team.

It is good clinical practice that patients being treated under the ACS Guideline or when the patient has a cardiopulmonary complaint, that the clinician utilize continuous 12-lead monitoring along with acquiring subsequent 12-lead EKGs to monitor EGK changes. Subsequent 12-lead EKGs which show significant changes should be transmitted to the receiving emergency department as soon as possible.

12 Lead EKG Placement

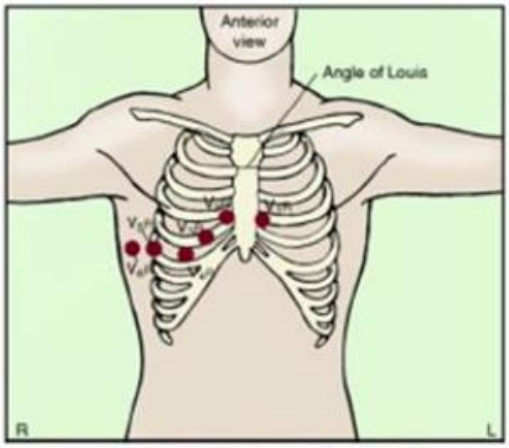




Place the precordial electrodes across the chest in the following locations:
V1 : Fourth intercostal space, at the right sternal margin.
V2 : Fourth intercostal space, at the left sternal margin.
V3 : Fifth rib, between leads V2 and V4.
V4 : Fifth intercostal space, on the left midclavicular line.
V5 : Left anterior axillary line, at the horizontal level of V4.
V6 : Left midaxillary line, at the same horizontal level as V4 and V5.
Note:
1 . When placing electrodes on female patients, always place leads V3-V6 under the breast rather than on the breast.
2. Limb leads must be placed on limbs. The 12-lead analysis is based on the assumption that the leads are placed on the limbs.

12 Lead Guidelines

Right Side and Posterior Wall EKG Placement



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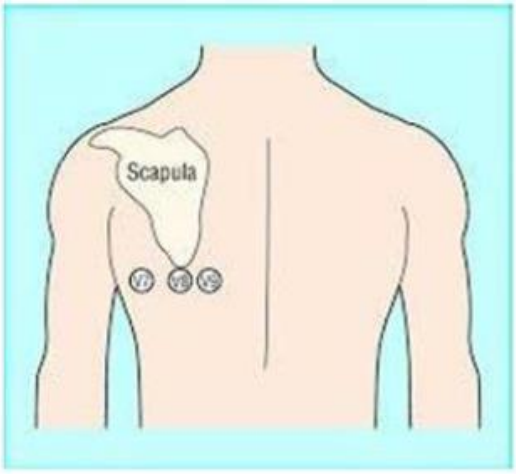
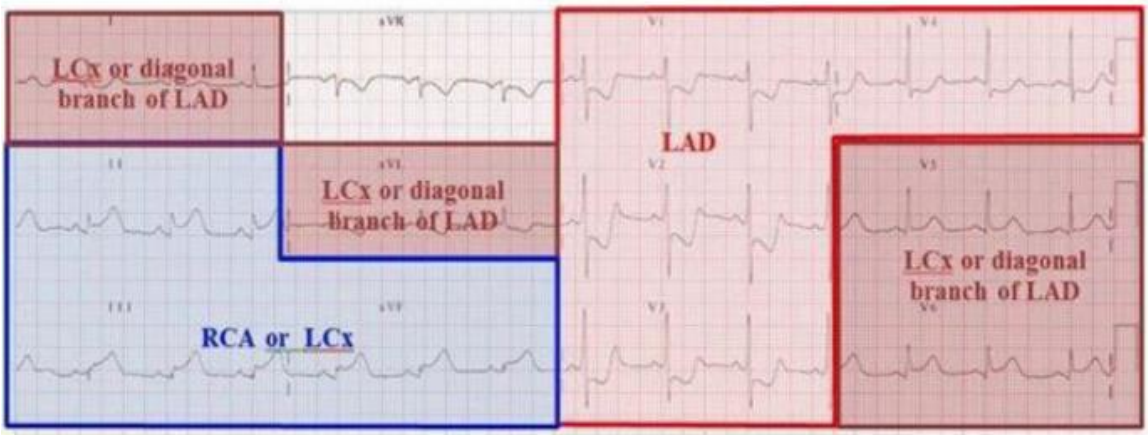


AMI Summary Chart

Leads	Artery	Presentation	Reciprocal Changes
V1, V2 Septal / V3, V4 Anterior	LAD	Classic, Hollywood MI- crushing CPR, diaphoresis	V7, 8, 9 Posterior
Lateral V5, V6	LAD or LCx		Inferior II, III, AVF
Inferior II, III, aVF	RCA or CIRX LCx	1) Epigastric Pain, N/V 2) Syncope 2° bradyarrhythmias from SA or AV node involvement	High Lateral I, aVL
I, aVL Lateral	LCx or LAD	Subtle signs, non-descript CP	Inferior II, III, aVF
Posterior V7, V8, V9	PDA: 80% RCA / 20% LCx	Back pain, Common with inferior	Anterior V1, V2, V3, V4
Right Ventricle V4R, V5R, V6R	RCA	Hypotension, can be associated with Inferior AMI	None

Culprit Artery Chart



APGAR

Sign	0	1	2
Appearance	Blue/Pale	Body pink, extremities blue	Pink
Pulse Rate	None	< 100	>100
Grimace	None	Grimace	Cries
Activity	Limp	Some	Active
Respiration	Absent	Slow/irregular	Strong cry

*APGAR should be measured and documented at the 1 and 5 minute intervals post delivery.

Score Range	Condition	Expectation
7 - 10	No Distress	Routine Care
4 - 6	Moderate Distress	Stimulation/Oxygenation/PPV
< 4	Severe Distress	Neonatal Resuscitation

Drip Rates

Dopamine (400mg/250ml)

	Weight in kg						
mcg/kg/min	40	50	60	70	80	90	100
5 mcg	8	9	11	13	15	17	19
10 mcg	15	19	23	26	30	34	38
15 mcg	23	28	34	39	45	51	56
20 mcg	30	38	45	53	60	68	75
	Microdrips per minute or cc/hr for 400mg/250ml						

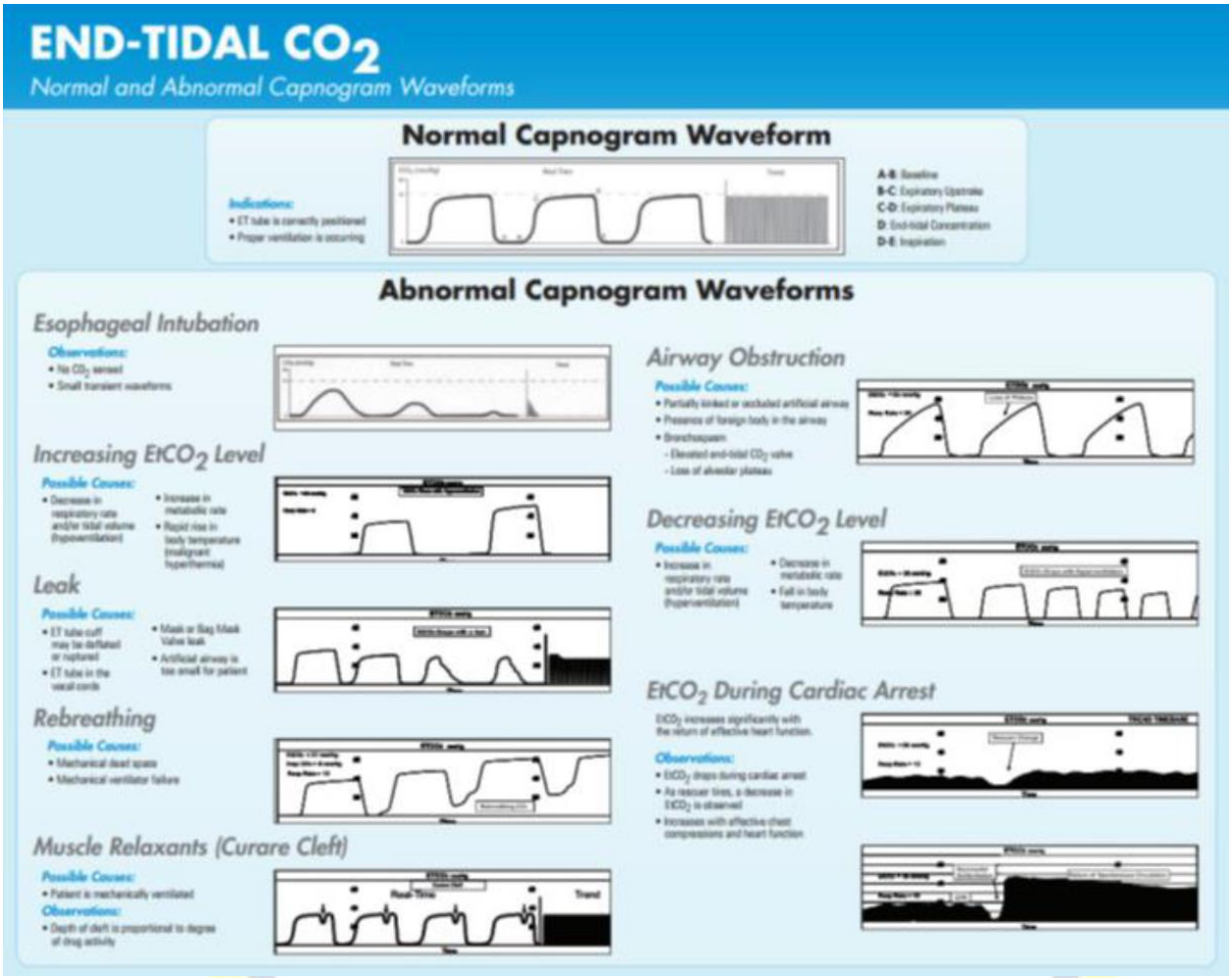
Epinephrine (4mg/250ml)

	Weight in kg						
mcg/kg/min	40	50	60	70	80	90	100
0.1	15	19	23	26	30	34	38
0.2	30	38	45	53	60	68	75
0.3	45	56	68	79	90	101	113
0.4	60	75	90	105	120	135	150
0.5	75	94	113	131	150	169	188
	Microdrips per minute or cc/hr for 4mg/250ml						

A Global Medical Response Solution

NORepinephrine														
Concentration: 4 mg in 250 mL D5W or normal saline yields **16 mcg/mL**														
Dose	Weight (kg)													
(mcg/kg/min)	*40 kg*	*45 kg*	*50 kg*	*55 kg*	*60 kg*	*65 kg*	*70 kg*	*75 kg*	*80 kg*	*85 kg*	*90 kg*	*100 kg*	*110 kg*	*120 kg*
0.1	15	16.9	18.8	20.6	23	24.4	26.3	28.1	30	31.9	33.8	37.5	41.3	45
0.15	22.5	25.3	28.1	30.9	34	36.6	39.4	42.2	45	47.8	50.6	56.3	61.9	67.5
0.2	30	33.8	37.5	41.3	45	48.8	52.5	56.3	60	63.8	67.5	75	82.5	90
0.25	37.5	42.2	46.9	51.6	56	60.9	65.6	70.3	75	79.7	84.4	93.8	103.1	112.5
0.3	45	50.6	56.3	61.9	68	73.1	78.8	84.4	90	95.6	101.3	112.5	123.8	135
0.35	52.5	59.1	65.6	72.2	79	85.3	91.9	98.4	105	111.6	118.1	131.3	144.4	157.5
0.4	60	67.5	75	82.5	90	97.5	105	112.5	120	127.5	135	150	165	180
0.45	67.5	75.9	84.4	92.8	101	109.7	118.1	126.6	135	143.4	151.9	168.8	185.6	202.5
0.5	75	84.4	93.8	103.1	113	121.9	131.3	140.6	150	159.4	168.8	187.5	206.3	225
0.55	82.5	92.8	103.1	113.4	124	134.1	114.4	154.7	165	175.3	185.6	206.3	226.9	247.5
0.6	90	101.3	112.5	123.8	135	146.3	157.5	168.8	180	191.3	202.5	225	247.5	270
0.65	97.5	109.7	121.9	134.1	146	158.4	170.6	182.8	195	207.2	219.4	243.8	268.1	292.5
0.7	105	118.1	131.3	144.4	158	170.6	183.8	196.9	210	223.1	236.3	262.5	288.8	315
0.75	112.5	126.6	140.6	154.7	169	182.8	196.9	210.9	225	239.1	253.1	281.3	309.4	337.5
0.8	120	135	150	165	180	195	210	225	240	255	270	300	330	360
0.85	127.5	143.4	159.4	175.3	191	207.2	223.1	239.1	225	270.9	286.9	318.8	350.6	382.5
0.9	135	151.9	168.8	185.6	203	219.4	236.3	253.1	270	286.9	303.8	337.5	371.3	405
0.95	142.5	160.3	178.1	195.9	214	231.6	249.4	267.2	285	302.8	320.6	356.3	391.9	427.5
1	150	168.8	187.5	206.3	225	243.8	262.5	281.3	300	318.8	337.5	0.75	412.5	450
	Infusion rate (mL/hr)													

End Tidal CO_2 Detection ($EtCO_2$)



Glasgow Coma Scale

Adult GCS

Eye Opening		Verbal Response		Motor Response	
Spontaneous	4	Oriented	5	Follows Commands	6
To voice	3	Disoriented	4	Localizes Pain	5
To pain	2	Incoherent Words	3	Withdrawals from pain	4
None	1	Incomprehensible sounds	2	Decorticate Posturing	3
		None	1	Decerebrate Posturing	2
				None	1

Pediatric GCS

Eye Opening		Verbal Response		Motor Response	
Spontaneous	4	Smiles/Coos; Oriented; Follows Objects	5	Spontaneous Movement	6
To voice	3	Consolable crying	4	Withdraws from touch	5
To pain	2	Inappropriate crying and/or screaming	3	Withdraws from pain	4
None	1	Grunts	2	Decorticate Posturing	3
		None	1	Decerebrate Posturing	2
				None	1

Medical Abbreviations

This list is the approved abbreviation list for MedExpress Ambulance Service, Inc. It is intended that these abbreviations can be used with all capital letters and/or all lower-case letters.

>	greater than
<	less than
=	equal
AAA	abdominal aortic aneurysm
A&O	alert and oriented
ABD	abdominal/abdomen
A/C	antecubital
A-FIB	atrial fibrillation
AIDS	acquired immunodeficiency syndrome
AED	automated external defibrillator
AKA	above knee amputation
ALOC	altered level of consciousness
AM	morning
AMA	against medical advice
AMI	acute myocardial infarction
AMSL	Advanced Medical Life Support
ARDS	acute respiratory distress syndrome
ASA	acetylsalicylic acid (aspirin)
BBB	bundle branch block
BBS	bilateral breath sounds
BCLS	basic cardiac life support
BID	twice a day
BKA	below knee amputation
BLS	basic life support
BM	bowel movement
BP	blood pressure
BPM	beats per minute
BSA	body surface area
BSI	body substance isolation
CA	cancer
CAD	coronary artery disease
CBBS	clear bilateral breath sounds
CBG	capillary blood glucose
C/C	chief complaint
CCU	coronary/critical care unit
CEC	Coroner's Emergency Certificate
CFD	Central Fire Department
CPD	Central Police Department
CHD	coronary heart disease
CHF	congestive heart failure
CID	cervical immobilization device
CM	centimeter
CNS	central nervous system
CO	carbon monoxide
C/O	complains of
COPD	chronic obstructive pulmonary disease
CP	chest pain
CPAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CSF	cerebrospinal fluid
CVA	cardiovascular accident
D50	dextrose 50%
D/C	discontinue(d)
DKA	diabetic ketoacidosis
DL	deciliter
DM	diabetes mellitus
DNR	do not resuscitate
DOA	dead on arrival
DOB	date of birth
DOE	dyspnea on exertion
DPS	Department of Public Safety
DVT	deep vein thrombosis
Dx	diagnosis
D5W	dextrose 5% in water
DWI	driving while intoxicated
ECF	extended care facility
ED	emergency department
EDD	estimated date of delivery
EJ	external jugular
EKG	electrocardiogram
EMS	emergency medical services
ePCR	electronic patient care report
ER	emergency room
ESRD	end-stage renal disease
ETOH	ethyl alcohol
EtCO2	end tidal carbon dioxide
ETI	endotracheal intubation
ETT	endotracheal tube
EXT	extremities
F	female
FD	fire department
Fx	fracture
G	gravida (as in number of pregnancies)
GCS	Glasgow coma score
GERD	gastroesophageal reflux disease
GI	gastrointestinal
GP	general practitioner
GSW	gunshot wound

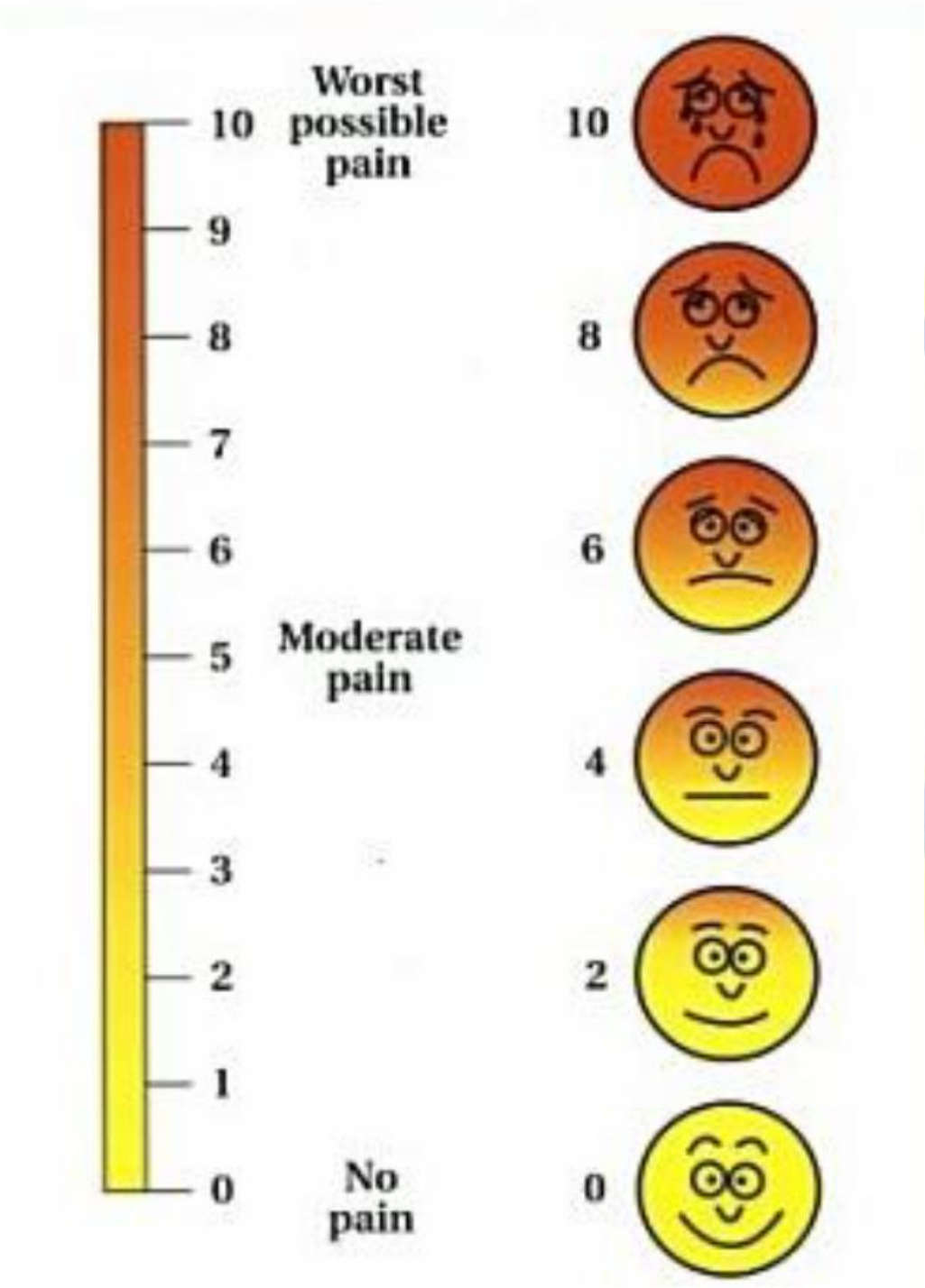
Medical Abbreviations

GU	genitourinary
GYN	gynecology
HR	heart rate
H1N1	hemagglutinin type 1 and neuraminidase type 1
HAV	hepatitis A virus
HBV	hepatitis B virus
HCP	health care professional
HCV	hepatitis C virus
HDV	hepatitis D
HEENT	head, eyes, ears, nose and throat
HEV	hepatitis E
HIV	human immunodeficiency virus
H/O	history of
H2O	water
HPI	history of present illness
HPV	human papillomavirus
HR	heart rate
HTN	hypertension
HX	history
ICD	implantable cardioverter defibrillator
ICP	intracranial pressure
ICU	intensive care unit
IDDM	insulin-dependent diabetes mellitus
IM	intramuscular
INF	Inferior
IO	intraosseous
IR	incident report
ISA	initial scene assessment
IV	intravenous
IVPB	intravenous piggyback
J	joule
JVD	jugular vein distention
JT	Joint
K	potassium
KG	kilogram
KVO	keep vein open
L	left
L&D	labor and delivery
LAT	lateral
LERN	Louisiana Emergency Response Network
LLE	left lower extremity
LLQ	left lower quadrant
LPM	liters per minute
LR	lactated ringers
LSB	long spine board
LSP	Louisiana State Police
LUE	left upper extremity
LUQ	left upper quadrant
M	male
MAE	moves all extremities
MCG	microgram
MDI	metered-dose inhaler
mEq	milliequivalent
MG	milligram
MI	myocardial infarction
ML	milliliter
MM	millimeter
mmHg	millimeters of mercury
MR	medical release
MS	Morphine Sulfate
Na	Sodium
NAD	no acute distress
NEB	Nebulizer
NC	nasal cannula
NICU	neonatal intensive care unit
NIDDM	noninsulin-dependent diabetes mellitus
NKA	no know allergies
NKDA	no known drug allergies
NPO	nothing by mouth
NRB	non-rebreather
NS	normal saline
NSR	normal sinus rhythm
NSTEMI	non-ST segment elevation myocardial infarction
N/V	nausea and vomiting
O2	oxygen
OB	obstetrics
OPC	Order of Protective Custody
OR	operating room
OSHA	occupational safety and health administration
OTC	over the counter
P	para (as in number of children)
PAD	peripheral arterial disease
PALS	pediatric advanced life support
PCP	primary care physician
PD	police department
PE	physical examination
PEC	physician’s emergency certificate
PEEP	positive and expiratory pressure
PEARL	pupils equal and reactive to light
PID	pelvis inflammatory disease
PMHx	past medical history
PMS	pulse, motor, sensation
PNS	peripheral nervous system

Medical Abbreviations

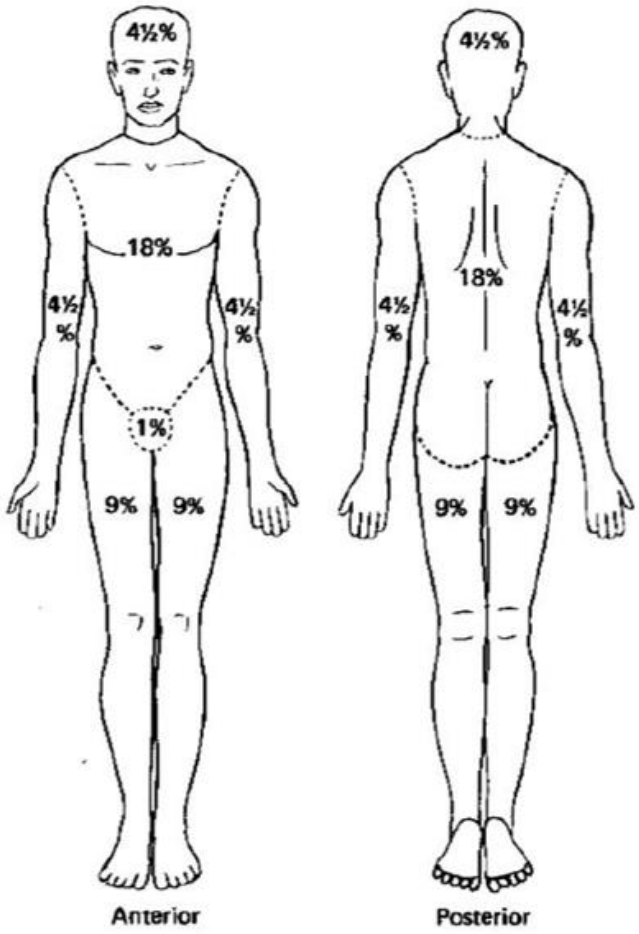
PO	orally
POST	Posterior
PT	patient
PTA	prior to arrival
PTOA	prior to our arrival
PRN	as needed
Q	every
R	right
RLE	right lower extremity
RLQ	right lower quadrant
R/O	rule out
ROM	range of motion
ROSC	return of spontaneous circulation
RR	recorded release
RUE	right upper extremity
RUQ	right upper quadrant
Rx	prescription
SBP	systolic blood pressure
SIDS	sudden infant death syndrome
SpCO	carbon monoxide saturation
SpO2	oxygen saturation
SQ	subcutaneous(ly)
STEMI	s-t segment elevation myocardial infarction
SUP	superior
Sx	symptoms
Sz	seizure
TBI	traumatic brain injury
T/D	treatment and disposition
TIA	transient ischemic attach
Tx	treatment
URI	upper respiratory infection
UTI	urinary tract infection
VF	ventricular fibrillation
V/S	vital signs
VT	ventricular tachycardia
W/	with
W/O	without
WT	weight
X	multiplied
Y/O	years old
YR	year

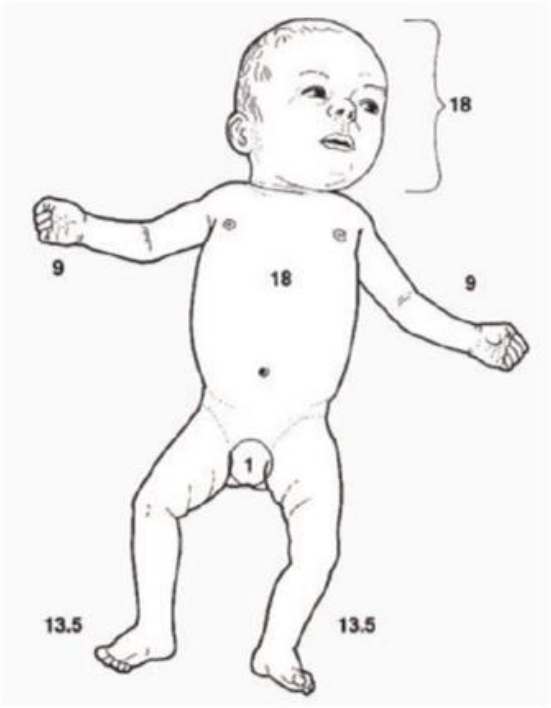
Pain Scale


Worst possible pain
10
9
8
7
6
Moderate pain
5
4
3
2
1
No pain
0
10
8
6
4
2
0

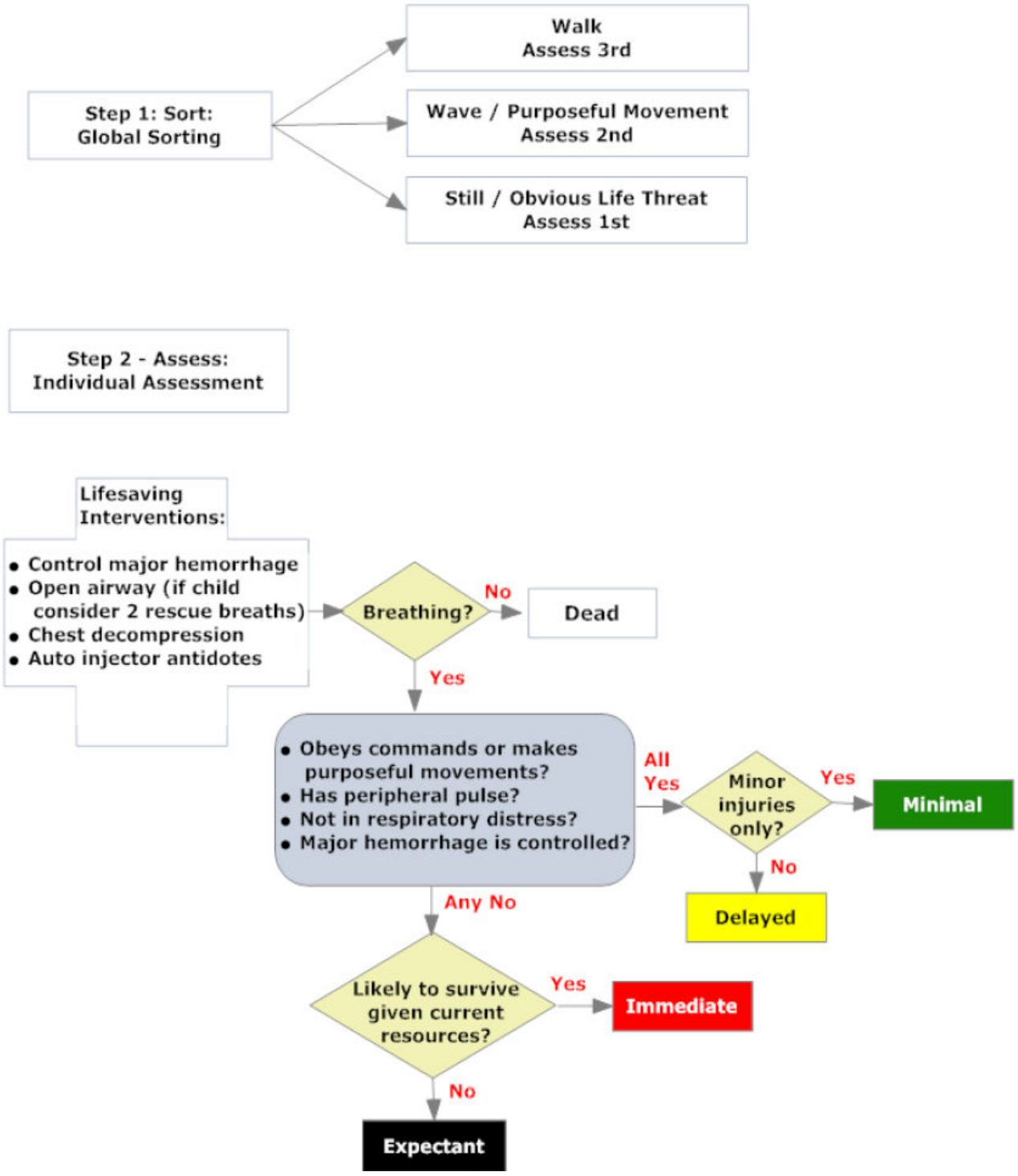
Rule of 9s

Pre-Hospital Fluid Resuscitation
Normal Saline: 0.25ml/kg x TBSA = ml/hr

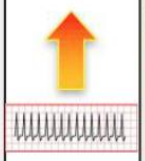
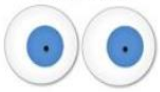
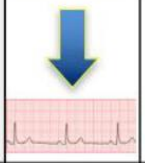
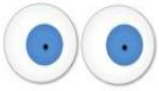
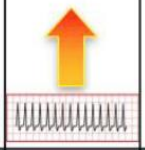
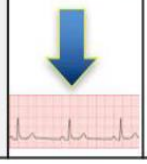




SALT Triage


Step 1: Sort:
Global Sorting
Walk
Assess 3rd
Wave / Purposeful Movement
Assess 2nd
Still / Obvious Life Threat
Assess 1st
Step 2 - Assess:
Individual Assessment
Lifesaving Interventions:
• Control major hemorrhage
• Open airway (if child consider 2 rescue breaths)
• Chest decompression
• Auto injector antidotes
Breathing?
No
Dead
Yes
• Obeys commands or makes purposeful movements?
• Has peripheral pulse?
• Not in respiratory distress?
• Major hemorrhage is controlled?
All Yes
Minor injuries only?
Yes
Minimal
No
Delayed
Any No
Likely to survive given current resources?
Yes
Immediate
No
Expectant

Toxidromes

	HR & BP	Resp.	Temperature	Pupils	Bowel Sounds	Diaphoresis
Anticholinergic **Anticholinergics** –Atropine, scopolamine, glycopyrrolate benztropine, trihexyphenidyl **Antihistamines** – Chlorpheniramine, Cyproheptadine, Doxylamine, Hydroxyzine, Dimenhydrinate, Diphenhydramine, Meclizine Promethazine		No change		Dilated 		
Cholinergic Organic Phosphorous Compounds: Carbamates • Arecholine, Pilocarpine, Urecholine (Betanechol), Carbachol, Choline, Metacholine, Mushrooms	No change	No change	No change	Pinpoint 		
Opioid Morphine • Codeine • Tramadol • Heroin • Meperidine • Diphenoxylate • Hydromorphone • Fentanyl • Methadone • Propoxyphene • Pentazocine • DXM • Oxycodone • Hydrocodone				Pinpoint 		
Sympathomimetic Caffeine, cocaine, amphetamines, methamphetamines, Ritalin, LSD, Theophylline, MDMA				Dilated 		
Sedative-Hypnotic anti-anxiety agents, muscle relaxants, antiepileptics and preanesthetic medications –Barbituates –Benzodiazepines				No change 		

Trauma Score

Adult Trauma Score

GCS		Systolic BP		Respiratory Rate	
13 - 15	4	> 89	4	10 - 29	4
9 - 12	3	76 - 89	3	>29	3
6 - 8	2	50 - 75	2	6 - 9	2
4 - 5	1	1 - 49	1	1 - 5	1
3	0	0	0	0	0

Pediatric Trauma Score

Assessment / Component	Score		
	2	1	-1
Weight	> 20 kg	10 - 20 kg	< 10 kg
Airway	Normal	Maintainable	Unmaintainable
CNS	Awake	+LOC	Comatose
Systolic BP	> 90 mmHg	50 - 90 mmHg	< 50 mmHg
Open Wounds	None	Minor	Major
Skeletal	None	Closed Fx	Open/Multiple Fx

Vital Signs

Age	SBP	HR	RR
PREEMIE	50 - 90	120 - 170	40 - 70
NB	60 - 100	100 - 160	30 - 60
4MO	70 - 100	105 - 160	30 - 60
6MO	70 - 100	110 - 160	24 - 38
1YR	75 - 105	90 - 150	22 - 30
2YR	75 - 110	85 - 140	22 - 30
3YR	76 - 115	85 - 140	22 - 30
4YR	78 - 115	75 - 120	22 - 26
5YR	80 - 115	70 - 115	20 - 24
6YR	82 - 120	70 - 115	20 - 24
7YR	84 - 120	70 - 110	16 - 22
8YR	86 - 120	70 - 110	16 - 22
9YR	88 - 120	65 - 105	16 - 22
10YR	90 - 120	60 - 100	16 - 22
11YR	90 - 120	60 - 100	16 - 22
12YR	90 - 120	60 - 100	16 - 22
13YR	90 - 120	60 - 100	16 - 22
ADULT	100 - 140	60 - 100	12 - 20

Postural (orthostatic) vital signs should be used as an additional assessment tool in the suspicion of hypovolemia. An initial set of vital signs should be taken with the patient in a supine position. A second set of vital signs should be taken after *one (1) minute* of standing. Indicators of positive orthostatic changes could be any *one* or any *combination* of the following:

1. Increase in pulse rate of ≥ 20 – 30 bpm after standing
2. Drop in systolic blood pressure of ≥ 20 mmHg after standing
3. Significant dizziness, lightheadedness, and/or syncope upon standing

NOTES:

- Certain medications can prevent a patient's pulse from increasing, even in the presence of hypovolemia
- Postural vital signs should not be assessed if a spinal injury is suspected
- Be prepared for the possibility of syncope while having a patient stand

STATUS 1

Assess for extremis

- Unmanageable airway
- Traumatic Cardiac arrest
- Burn patient > 40% BSA without IV or IO access
- Tension pneumothorax
- Burn patient without patent airway

YES → **Activate LERN**
Closest ED/Trauma Center

NO

Measure vital signs and mental status

- New onset GCS less than 13 or 2 less than patient normal.
  - Does not apply to hypoglycemic or overdose that can be reversed to GCS 15
- RR < 10 or > 29 breaths per minute, (<20 in infant aged <1 year)
  - Does not apply if RR can be lowered by calming (anxiety)
- Respiratory distress or need for support
- Room air pulse oximetry < 90%
- Age 0-9: SBP < 70 mmHG +(2 x age in years)

YES →

MOI TRAUMA

Activate LERN

Transport to Trauma Center
These patients should be transported to the highest level of care available. This is a Level 1 or Level 2 Trauma Center. **If distance or patient condition impedes transport to a Level 1 or 2, consider transport to a Level 3 or most appropriate hospital.*

MOI MEDICAL
Closest ED/Trauma Center as appropriate

NO

Move on to Status 2 criteria

STATUS 2

Assess Injury Pattern

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee
- Chest wall instability or deformity or suspected flail chest
- Suspected fracture of two or more proximal long bones
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist or ankle
- Suspected pelvic fracture
- Skull deformity or suspected skull fracture
- Suspected spinal injury with new motor or sensory loss
- Active bleeding requiring a tourniquet or wound packing with continuous pressure

YES

Activate LERN

Transport to Trauma Center
These patients should be transported to the highest level of care available. This is a Level 1 or Level 2 Trauma Center. **If distance or patient condition impedes transport to a Level 1 or 2, consider transport to a Level 3 or most appropriate hospital.*

NO

Assess Stroke/STEMI

- New onset stroke symptoms < 6 hrs
- ST elevation (>1mm) in at least 2 contiguous leads

YES

Activate LERN

Transport to PCI / Stroke Center as appropriate

NO

Move on to STATUS 3

STATUS 3

Assess Mechanism of Injury

- Falls from height > 10ft (all ages)
- High-risk auto crash
  - Intrusion, including roof:
  - > 12 inches occupant site
  - > 18 inches any site
  - Need for extrication for patient entrapped
  - Ejection (partial or complete) from automobile
  - Death in the same passenger compartment
  - Child (Age 0-9) unrestrained or in unsecured child safety seat
  - Vehicle telemetry data consistent with a high risk of injury
- Auto vs. pedestrian/bicyclist/ATV thrown, run over, or with significant (>20mph) impact
- Rider separated from transport vehicle with significant impact (e.g. Motorcycle, ATV, Horse, etc)

YES

Activate LERN

Transport to Trauma Center which depending on the defined trauma system, need not be the highest level trauma center. If no Trauma Center in the region, may transport to most appropriate resourced hospital

NO

Assess special patient or system considerations

- Older Adults
  - Age > 64 with evidence of traumatic injury
  - Fall from any height with evidence of significant head impact
  - Use of anticoagulant or antiplatelet drugs
- Children
  - Age > 5 with evidence of traumatic injury
  - Fall from any height with evidence of significant head impact
- Burns
  - In conjunction with trauma
  - High voltage electrical injuries
- Pregnancy >20 weeks
- Major joint dislocations (hip,knee,ankle,elbow)
- EMS provider judgement

YES

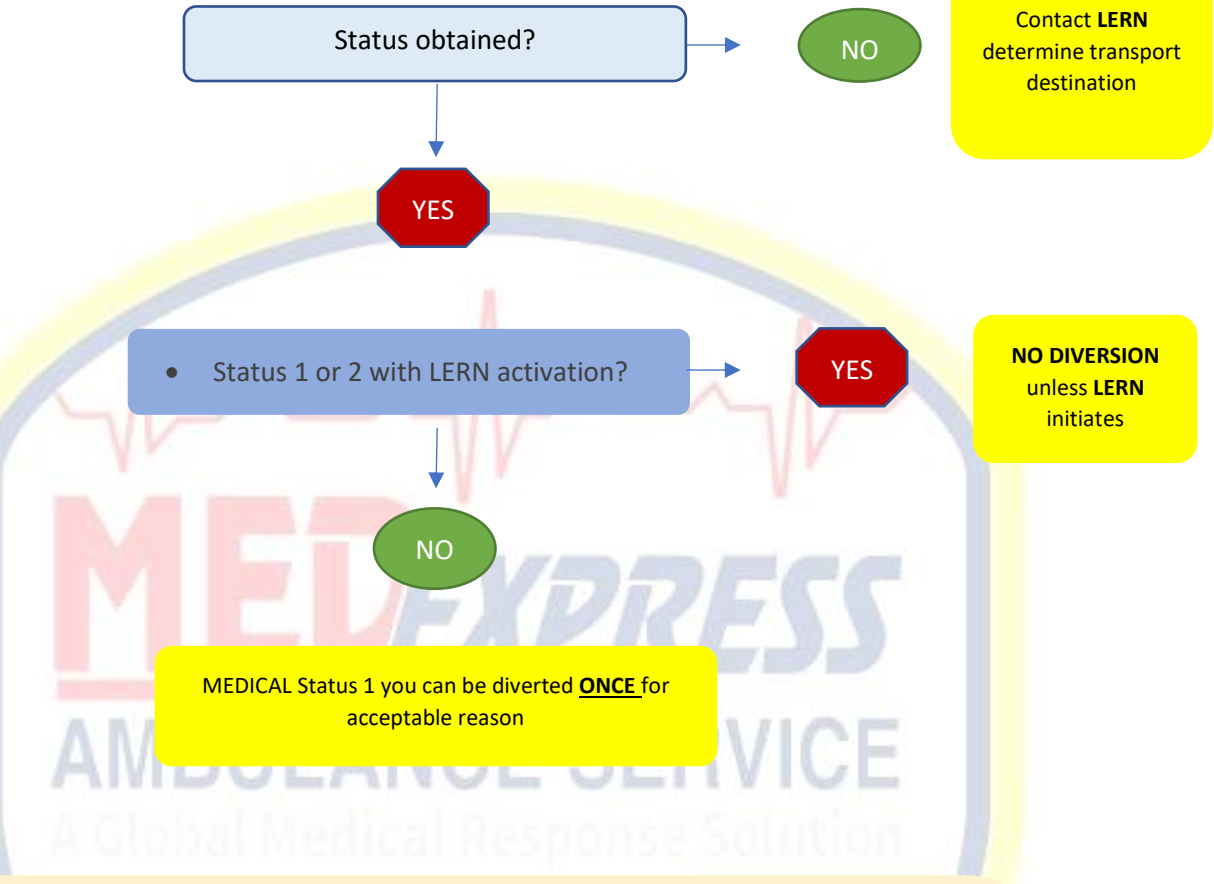
Activate LERN

Transport to Trauma Center or hospital capable of timely and thorough evaluation and initial management of potentially serious injuries. Consider consultation with Medical Control.

YES

If NO for all the above, patient is **STATUS 3** and transported at **EMS provider judgement**

DIVERSION



- We will **NOT** accept diversion on Status 3 patients **UNLESS** the patient accepts
- The following are the only acceptable reasons for diversion
  - Medical condition requires transport to alternate hospital for stabilization
  - Diagnostic equipment required is NOT working diagnostic or interventional equipment required for patient condition are not operational. (CT for stroke, PCI for STEMI etc)
  - ED Saturation
  - No general surgery
  - ED closure
- Patient choice supersedes diversion. After explaining the situation to the patient if they are still unwilling to go, **POLITELY** explain this to the receiving facility.
- If the closest hospital is definitive care, we will not honor diversion for status 1 medical

Table of Contents

MEDEXPRESS
AMBULANCE SERVICE
A Global Medical Response Solution

*This page was intentionally moved to the end of this document for ease of use by end users.

Medical Protocols / Clinical Guidelines

Rev. 2023

Medical Director Approval Authorization

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Due to the nature of Emergency Medical Services and the ever changing landscape of Emergency Medicine, MedExpress Ambulance Service, Incorporated shall have authorization for emergent changes to these Standing Order Guidelines approved by the Louisiana Medical Director of MedExpress Ambulance Service, Inc.

In the event that a medication or procedure that is approved within these guidelines becomes unavailable due to national shortages, or compelling evidence emerges that proves that the current standard of care could be harmful or futile, the EMS Medical Director shall have authority to immediately address the required changes so that patient care is not compromised.

Steven Simon, EMT-P
Operations Manager

1/31/2023
Date

Fernando L. Alemany Lopez, MD
Medical Director,
MedExpress Ambulance Service

12/5/22
Date

Equal Opportunity Employer

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Preface

*This page was intentionally moved to the end of this document for ease of use by end users.

The following pages are to serve as a guideline to all EMS clinicians (EMTs, advanced EMTs and Paramedics), for the treatment of patients in the out-of-hospital setting within the boundaries of MedExpress Ambulance Service operates. As a guide, this manual will serve as a common point of reference between an EMS clinician and a physician acting as medical control. The EMS clinician is expected to possess and practice sound clinical judgment, excellent critical thinking skills, as well as ethical and a professional demeanor, at all times.

These guidelines are to be used by all levels of certification. However, at no time do these guidelines give any healthcare practitioner permission to perform skills or administer medications outside the scope of practice for their designated provider level. MedExpress Ambulance Service, Inc. has adopted the Louisiana Scope of Practice for licensed EMS practitioners. The Louisiana EMS Scope of Practice Matrix is provided in the Reference section of this guideline.

The medical treatments contained in this document are based on current evidenced based medicine including the current National EMS Education Standards. Materials utilized to supplement the Education Standards include but are not limited to the American Heart Association, Emergency Cardiac Care Guidelines, the National Association of EMT's (NAEMT) Prehospital Trauma Life Support, the current national pediatric curriculum, and the NAEMT Advanced Medical Life Support.

The patient care guidelines in the manual have been approved by the MedExpress Ambulance Service Medical Director. It is possible and often occurs where a patient will present in such a manner as to require treatment under one or more guideline(s) simultaneously. The EMS clinician will therefore utilize all standing orders, in their entirety, as long as the patient's condition meets the criteria under which those orders were indicated. The EMS clinician will also contact medical control after completing the standing orders, as long as the condition still exists. Certain medications (i.e., pain medications) should be titrated to the patient's response, as different patients have different thresholds to certain medications. Treatment for critical patients should be initiated on scene, unless there is a situation that proves hazardous to the patient or EMS clinician.

If the presenting condition is alleviated by the clinician's care, the clinician may at his/her discretion discontinue the standing order guideline. The clinician should document this fact clearly in the ePCR. The clinician will follow any order directed by a medical control physician, as long as the order is within the lawful scope of practice for the clinician and whether or not the order is delineated as a technique in this manual. These deviations will be recorded on the Clinical Guidelines Deviation Report and routed to the Medical Director for review. The clinician should not routinely contact a medical control physician to request any alterations to the treatments and techniques outlined in this manual. However, if a situation arises that is not covered by a guideline in this manual, the clinician should contact medical control for advice, if needed, and offer suggestions based on the tools available to them; and/or document the situation thoroughly in the ePCR. Novel treatments or techniques should be presented to the Medical Protocols/Clinical Guidelines Committee chairperson for consideration in future updates.