Thomas Jefferson EMS Council

Regional Patient Care Guidelines

2020

Special Thanks

There were many people involved with the updating of the 2017 Thomas Jefferson Emergency Medical Services Council's (TJEMS) Regional Guidelines. TJEMS would like to thank all of the Operating Medical Directors: Dr. George Lindbeck, Dr. Jeff Alberts, Dr. Debra Perina, Dr. Bill Brady, Dr. Scott Just, Dr. Alix Paget-Brown, Dr. Jeff Young, Dr. Robert O'Connor and Dr. Forrest Calland, as well as UVA Prehospital's Valerie Quick and Jim True for their input on the 2020 TJEMS Regional Guidelines.

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Executive Director

Thomas Jefferson Emergency Medical Services Council

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Adult General

General:
Universal Patient Care/Initial Patient Care

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Complete vital signs should be taken every five (5) minutes for critical patients and every 15 minutes for non-critical patients.
- Complete vital signs include a minimum of heart/pulse rate, respiratory rate and blood pressure.
- In most cases on-scene times should be limited to ten (10) minutes.
- All patients that refuse transport must have documented vital signs and the refusal must be signed. All patient refusals of any part of care need to be documented.

Scene safety/personal protective equipment
Primary Assessment with initial interventions as needed
Supplemental O2 (see "Oxygen Administration Guideline"); capnography as indicated
Obtain and document: Vital signs SAMPLE history Pain assessment OPQRST (medical) DCAP-BTLS (trauma) Consider glucometry if indicated
Cardiac monitor/12-lead ECG as indicated
Appropriate guidelines/consider differential diagnoses. If no guidelines apply or condition is unknown consult medical command
Transport per guidelines

Behavioral / Patient Restraint
Acute Psychological
Agitation

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Substance-induced disorders, diabetic emergencies and hypoxia must be ruled out. Suicidal patients are not permitted to sign a refusal.
- Consultation with law enforcement, mental health professionals and medical command should guide patient disposition.
- Verbally de-escalating the patient is preferable to medication therapy.
- Watch for extrapyramidal symptoms and treat with diphenhydramine if needed. Consider ETCO2 monitoring when Versed is administered.

EMT	Universal Care Guidelines
I/P	Agitation and/or substance abuse (adults 18 and over): Haldol 10 mg, Versed 5 mg, IM Agitation (65 y/o and over): Haloperidol 5 mg, Versed 2 mg, IM
Med Control	Repeat doses If patient refuses transport, consider Emergency Custody Order

Adult Cardiac

Chest Pain – Cardiac Suspected

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- If use of Viagra® or Levitra® use within the past 24 hours or Cialis® within 72 hours contact medical command.
- Inferior STEMI is preload dependent and may not tolerate NTG or morphine well, use IV fluids as needed.
- Use of Nitropaste may be preferable to SL NTG if hypotension is likely to occur.
- Diabetics, females, and geriatric patients often present with atypical chest pain or generalized complaints.
- For medication administration all patients should have cardiac monitoring.

Chest pain – Cardiac Suspected

EMT	Universal Care Guidelines
	Perform and transmit 12-lead ECG, consult medical command
	Transport to cath lab facility for known or suspected MI
	Aspirin 324 mg (4 baby aspirin) chewed
	Administer nitroglycerin 0.4 mg every 5 minutes as needed.Keep BP > 100 mm Hg
TJEMS – EMT	Nausea and/or vomiting, consider ondansetron (Zofran®) 4 mg ODT (orally disintegrating tablet)
	Administer nitroglycerin tablet 0.4 mg or 1" of Nitropaste, keep BP > 100 mm Hg
A	IV/IO/Vascular Access
	Nausea and/or vomiting, consider ondansetron (Zofran®) 4 mg IV/IM, repeated in 10 minutes if needed
I/P	Refer to hypotension and dysrhythmia guidelines as indicated
	Fentanyl (Sublimaze®) **Adults**: 1 microgram/kg IV, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Maximum total dose is 100mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV **Adults**: 2 microgram/kg IN, half of dose in each nostril, may be repeated in 10 minutes Maximum single dose is 100 micrograms Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting. **Adults**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV, may be repeated once in 10 minutes Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications

Bradycardia Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Unstable is defined as BP less than 90 mm Hg, altered mental status or signs of decreased perfusion.
- Transcutaneous pacing (TCP) is the preferred treatment in 2nd degree, Type II and 3rd degree blocks.
- Transplanted hearts will not respond to atropine.
- Fluid therapy should be initiated as an adjunct to rate therapies. Administer fluid cautiously to patients with symptomatic bradycardia.

EMT	Universal Care Guidelines
A	IV/IO/Vascular Access
I/P	For a symptomatic patient, consider atropine sulfate 1 mg repeated every 3 minutes as needed to a maximum of 3 mg
	Consider TCP for unstable patient
Med Control	Consider midazolam (Versed®) 2 – 5 mg IV, if needed during TCP when BP > 90 mm Hg
	For patients who have not responded to TCP and atropine sulfate, consider dopamine (Inotropin®) 5 to 20 micrograms/kg/minute to maintain BP of 90 mm Hg

Supraventricular Tachycardia (including Rapid Atrial Fibrillation)

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Stable is defined as a patient who is symptomatic with normal perfusion, normal vitals, and no alteration in mental status. Unstable is defined as BP less than 90 mm Hg, altered mental status, or signs of decreased perfusion.
- Adenosine (Adenocard®) should be administered in a proximal injection port followed by a 20 mL flush.
- Metoprolol (Lopressor®) should be avoided if cocaine, methamphetamine, or other
  - sympathomimetic use is known or suspected.
- Use manufacturer recommendations for escalating energy settings.
- Document all rhythm changes with monitor strips.

Atrial Fibrillation

EMT	Universal Care Guidelines
A	Vascular access procedure with fluid bolus
I/P	For a stable patient who is symptomatic with a ventricular rate (≥) greater than or equal to 150, consider metoprolol (Lopressor®) 5 mg IV, slow IV push. May repeat every 10 minutes to a maximum of 15 mg to achieve ventricular rate of less than or equal to 120
	For unstable patient, consider synchronized cardioversion (total of 2 attempts)
Med Control	For patients who do not respond to cardioversion or who have recurrent tachycardia, metoprolol (Lopressor®) 5 mg IV prior to repeated cardioversion
	Amiodarone (Cordarone®) 150 mg in 100 mL of D5W, IV piggyback over 10 minutes
	Midazolam (Versed®) 2 – 5 mg IV if needed prior to synchronized cardioversion

Supraventricular Tachycardia

EMT	Universal Care Guidelines
A	Vascular access procedure with fluid bolus
I/P	If patient is stable, attempt vagal maneuvers
	If symptomatic, adenosine (Adenocard®) 12 mg rapid IV push
	If no IV access and unstable (unstable is defined as BP less than 90 mm Hg, altered mental status, or signs of decreased perfusion), consider synchronized cardioversion May repeat cardioversion for a total of 2 attempts
	If no response to cardioversion or recurrent or refractory arrhythmias, metoprolol (Lopressor®) 5 mg slow IV push
Med Control	If no response to metoprolol (Lopressor®), amiodarone (Cordarone®) 150 mg IV piggyback over 10 minutes
	For 3rd cardioversion attempt after metoprolol (Lopressor®) or amiodarone (Cordarone®) has been infused
	Midazolam (Versed®) 2 – 5 mg IV if needed prior to synchronized cardioversion

Ventricular Tachycardia with Pulse

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Stable is defined as a patient who is symptomatic with normal perfusion, normal vital signs and no alteration in mental status.
- Unstable is defined as BP less than 90 mm Hg, altered mental status or signs of decreased perfusion.
- Follow manufacturer's recommendation for escalating energy settings.
- When drawing up amiodarone (Cordarone®), use a large bore needle, draw slowly and do not draw in air to avoid bubbling.

EMT	Universal Care Guidelines
A	Vascular access procedure with fluid bolus
I/P	If patient is stable, amiodarone (Cordarone®) 150 mg in 100 mL D5W IV piggyback over 10 minutes. May repeat in 10 minutes, if no response
	If patient is unstable, synchronized cardioversion at 100j and repeat with escalating energy
Med Control	Midazolam (Versed®) 2 – 5 mg IV, if needed prior to synchronized cardioversion

Adult Cardiac Arrest

Asystole/Pulseless Electrical Activity

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

EMT	Cardiac Arrest – BLS CPR Guideline
I/P	Confirm asystole in more than one (1) lead
	1 mg epinephrine (1:10,000) IV/IO every 3 – 5 minutes up to 3 doses
	Consider and treat for reversible causes as listed in differential diagnoses
Med Control	Contact medical command for special resuscitation situations
	Termination of Care Policy

Ventricular Fibrillation/ Pulseless Ventricular Tachycardia

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Follow manufacturer's recommendation for energy settings for defibrillation.
- Treatment priorities are uninterrupted compressions, defibrillation, IV/IO access, airway control.
- Medic level providers should utilize AED's only when manual defibrillation is not possible.

EMT	Cardiac Arrest – BLS CPR Guideline
EN/A	IV/IO/Vascular access
I/P	Defibrillate immediately
	Epinephrine (1:10,000) 1 mg IV/IO, every 3 – 5 minutes
	After 3rd shock, amiodarone (Cordarone®) 300 mg IV push, may repeat once at 150 mg
	Search for and treat reversible causes
Med Control	Termination of Care Policy

Basic Life Support CPR

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Change compressors every 2 minutes/5 cycles. Each cycle consists of 30 compressions and 2 ventilations.
- Allow full chest recoil.
- Check femoral/carotid pulse to verify effective CPR.

EMT	Universal Care Guidelines
	Refer to Criteria for Withholding Resuscitation Guideline
	CPR Interrupt compressions only as per AED prompt or every 2 minutes (5 cycles of CPR)
	Apply AED. Chest compressions and defibrillation should not be delayed
	Airway management, OPA, BVM, and suction as needed. Ventilate no more than 10 breaths/minute (1 breath every 6 – 8 seconds)
EN/A	IV/IO/Vascular access
I/P	Assess rhythm (do not use AED mode), refer to appropriate guidelines/algorithm
	Capnography procedure, if advanced airway is in place

Special Resuscitation Orders
Hypothermic Arrest

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- If patient is **centrally** cold to touch, consider severely hypothermic due to environmental exposure.

EMT	Universal Care Guidelines
	Confirm pulselessness for 30 seconds. Refer to CPR and AED Guidelines if needed (if advised allow only a single shock)
	Remove wet clothing. Protect from further heat loss
A	IV/IO/Vascular Access
I/P	Modify ACLS algorithms for cardiac arrest. Administer one (1) round of IV medications. Attempt one (1) defibrillation. Repeat medications and defibrillation as body temperature rises
Med Control	Consider termination of efforts if no response to initial therapy and prolonged time to definitive care

Adult Environmental

Heat Stroke/Hyperthermia

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Tricyclic antidepressants, phenothiazines, anticholinergics and alcohol, cocaine, amphetamines, and salicylates may increase the risk of elevated body temperature.
- The major difference between heat exhaustion and heat stroke is CNS impairment.
- Vigorous fluid administration may result in pulmonary edema, particularly in the elderly.

EMT	Move to cooler environment, remove excess clothing, protect from further heat gain
	For heat exhaustion, PO water, if patient can tolerate. Cool with wet towels or fan
	For heat stroke, use aggressive evaporation (fine mist spray, ice packs to groin and axillae)
A	IV/IO/Vascular Access
	See Hydration Guideline (see IV/IO/Vascular Access)

Hypothermia

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- If patient is **centrally** cold to touch, consider severely hypothermic.
- Avoid rough handling.
- Warm fluids as close to 109 degrees as possible by placing on heater or hot packs. Do not microwave.
- Avoid intubation if possible in the severely hypothermic patient.
- Consider “urban hypothermia” with high association of poverty or drug/alcohol abuse.

EMT	Refer to Cardiac Arrest: Special Resuscitation - Hypothermic Arrest Guideline, if needed
	Remove wet garments
	Protect from further heat loss. Increase ambient temperature
	Apply heat packs if patient is responsive
	If moderate to severely hypothermia, wrap head and core with blankets
	Airway management
A	IV/IO/Vascular Access

Bites and Envenomation Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Signs of pit viper envenomation are swelling that begins at the bite mark and spreads proximally within minutes, ecchymosis, hemorrhagic blisters and severe pain.
- Avoid using constricting bands or tourniquets, cold application, incision, suction and extractor devices in pit viper envenomation.
- Black widow spider envenomation may present with painful muscle spasms.

Bites and Envenomation/Land

EMT	Refer to Allergic Reaction Guideline if needed
	Minimize activity, remove tight clothing or jewelry, and maintain extremity at level of the heart
A	IV/IO/Vascular Access
I/P	**Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Maximum total dose is 100mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril, may be repeated in 10 minutes Maximum single dose is 100 micrograms Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting. **Adults**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IM, may be repeated once in 10 minutes Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications

Adult Medical

Medical:
Abdominal Pain

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Requirements for pain medication or frequency of administration that exceed the guidelines require consultation with on-line medical control.

Medical: Abdominal Pain

EMT	Universal Care Protocol
TJEMS – EMT	Nausea and vomiting, consider **ondansetron (Zofran®)** 4mg, ODT (orally disintegrating tablet).
EN/A	Vascular access procedure
	Nausea and vomiting, consider **ondansetron (Zofran®)** 4 mg IV/IM/ODT. May repeat in 10 minutes if needed.
I/P	**Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Maximum Total dose is 100 mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril Maximum single dose is 100 micrograms **Do not repeat** **Ketamine (Ketalar®)** **Adults**: 0.5 mg/kg IV once may be repeated once in 10 minutes Maximum single dose is 20 mg **Maximum Total dose is 40 mg** Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications.

Alcohol Related Emergencies Guideline	
Reviewed: 2020	Updated: 2020

Alcohol Related Emergencies

EMT	Monitor for respiratory depression.
	If seizures occur refer to the Seizure Guidelines.
	Treat suspected hypoglycemia.
EN/A	IV/IO/Vascular Access
I/P	For agitation, tachycardia, or hallucinations secondary to alcohol withdrawals, consider midazolam (Versed®) 5 mg IM, if blood pressure is > 120 mm Hg systolic, or evidence of tremors/seizure activity.

Allergic Reaction/Anaphylaxis

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Ipratropium bromide (**Atrovent®**) is not indicated for allergic reaction.

Allergic Reaction

EMT	Universal Care Protocol with an emphasis on adequate oxygenation. Remove from source of exposure, if safe.
EN/A	IV/IO/Vascular Access **1.** Diphenhydramine (Benadryl®) 25 mg IM or IV for mild to moderate reactions. 50 mg IM or IV for severe reactions. May repeat once in 10 minutes or max of 50 mg. **2.** Prednisone 60 mg PO **-OR-** Methylprednisolone (Solu-Medrol®) 125 mg IV over 1 minute for severe hives

Anaphylaxis

EMT	Universal Care Protocol with an emphasis on adequate oxygenation. Remove from source of exposure, if safe. Administer or assist patient with their own Epi-Pen for respiratory distress, inadequate perfusion or severe hives
TJEMS – EMT	Albuterol sulfate 2.5 mg; nebulized for wheezing/bronchospasm
EN/A	**1.** Epinephrine 1:1,000; 0.01 mg/kg IM (in thigh) (maximum 0.3 mg), for additional dosing, contact medical command. (For elderly and heart failure, maximum of 0.2 mg) **2.** Albuterol sulfate 2.5 mg; nebulized for wheezing/bronchospasm **3.** IV/IO/Vascular Access **4.** Diphenhydramine (Benadryl®); 1 mg/kg/IV (maximum 50 mg), or IM (in thigh) **5.** Methylprednisolone (Solu-Medrol®); 125 mg IV over 1 minute.
Med Control	If repeat doses of Epinephrine are required, contact Medical Control

Hypotension/Shock/Sepsis Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Hypovolemia must be corrected prior to dopamine infusion.
- Identify and manage underlying cause.
- Consider drug side effects or overdose.
- Sepsis requires aggressive fluid therapy.
- Pump use is preferred for vasoactive drips

EMT	Universal Care Protocol with an emphasis on adequate oxygenation.
	If cause of hypotension is known, consult specific protocol
EN/A	IV/IO/Vascular Access
	Consider 20 ml/kg bolus of Normal Saline To a maximum of 2L Reevaluate breath sounds and patient condition after 1L
Medical Control	If no response to fluid therapy or if CHF is present; dopamine (Inotropin®) 5 – 20 micrograms/kg/min. to maintain BP > 90 mm Hg. **If pressors are required, notify Medical Command**

Overdose/Poisoning/Toxic Ingestion Guideline	
Reviewed: 2020	Updated: June 2020

PEARLS:

- Intubated patients should not receive naloxone (Narcan®) unless hemodynamically unstable.
- Repeated administration of Narcan in small doses is desirable.
- If questions about the drug or poison involved, consider Poison Control consultation
- ***1-800-222-1222***
- DO NOT DELAY TRANSPORT!!!!!!
- Air medical resources will not transport contaminated patients.

Medical: Overdose/Poisoning/Toxic Ingestion

EMT	Universal Care Protocol
	Identify substance and assure decontamination. Flush skin/membrane with appropriate solution if indicated.
	If there is concern for poisoning, contamination or exposure alert Poison Control and Destination Hospital prior to transport **1-800-222-1222**
TJEMS – EMT	**For narcotics overdose**: Administer naloxone (Narcan®); 2 mg IN (1 mg per nostril)
EN/A	IV/IO/Vascular Access
	Naloxone (Narcan®) 0.2 – 0.4mg IV or IM, titrated to effect for narcotic overdose with respiratory depression.
	Diphenhydramine (Benadryl®) 1 mg/kg slow IV or IM for dystonic reaction. Max dose of 50 mg.
I/P	**For symptomatic tricyclic anti-depressant overdose**: (if QRS > 0.12 seconds, heart block, hypotension or dysrhythmias) Sodium bicarbonate 1 mEq/kg slow IV push over 2 minutes
	For symptomatic calcium channel blocker overdose: (bradycardia, QRS > 0.12 seconds, heart block, hypotension, lethargy, slurred speech, n/v) Calcium chloride 20 mg/kg slow IV push over 10 minutes Sodium bicarbonate 1 mEq/kg slow IV push over 2 minutes
	For symptomatic organophosphate poisoning: (secretions, bronchospasm, seizures, bradycardia) Atropine sulfate 0.05 mg/kg IV doubled every 5 – 10 minutes until decreased secretions **Note: Tachycardia is not a contraindication to administer Atropine for the organophosphate poisoning**

General Pain Management Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Requirements for pain medication or frequency of administration that exceed the guidelines require consultation with on-line medical control

Medical: General Pain Management

EMT	Universal Care Protocol
TJEMS – EMT	Nausea and vomiting, consider **ondansetron (Zofran®)** 4mg, ODT (orally disintegrating tablet).
EN/A	Vascular access procedure
	Nausea and vomiting, consider **ondansetron (Zofran®)** 4 mg IV/IM/ODT. May repeat in 10 minutes if needed.
I/P	**Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Maximum Total dose is 100 mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril Maximum single dose is 100 micrograms **Do not repeat** **Ketamine (Ketalar®)** **Adults**: 0.5 mg/kg IV once may be repeated once in 10 minutes Maximum single dose is 20 mg **Maximum total dose is 40 mg** Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications.

Adult Neuro

Altered Mental Status

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Medications are a common cause of altered mental status.
- Blood Glucose Levels may be helpful, but use caution, particularly if values are borderline.
- Intubated patients should not receive naloxone unless hemodynamically unstable.
- Goal of reversal therapy is to reverse respiratory and circulatory collapse.
- Repeated administration of Narcan in small doses is desirable.
- Naloxone (Narcan®) must be split into two (2) doses. Max of 2 mL per injection site.
- Consider Overdose / Suspected Overdose for additional protocols

EMT	Universal Care Protocol
	Spinal Restriction if indicated.
	Prevent heat loss; refer to Hypothermia Protocol if indicated.
	Consider Behavioral Emergency Protocols
TJEMS – EMT	Naloxone (**Narcan®**) 2mg Intranasal if suspected narcotic overdose with depressed respirations.
EN/A	IV/IO/Vascular Access
	For Hypoglycemia (BGL < 60 mg/dl) give Dextrose 50% 25 grams slow IV push. Glucagon 1 mg IM if no IV access.
	Naloxone (Narcan®) 0.2 – 0.4mg IV or IM, titrated to effect for narcotic overdose with respiratory depression.
	For hyperglycemia (BGL > 400 mg/dl), infuse 1 L NS over 30 – 60 minutes, followed by NS at 250 mL/hr.

Seizure Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Care during the postictal phase should be supportive only
- For actively seizing patients, initial medications should be administered IM to avoid any delay in care
- Active Seizure is described as generalized tonic/clonic activity lasting more than 1 minute

EMT	Universal Care Protocol
	Pulse oximetry and ETCO2 monitoring
	Protect patient – Do not attempt to restrain.
	If patient is pregnant and no history of seizure, refer to OB/GYN Eclampsia Protocol.
EN/A	IV/IO/Vascular Access
	For hypoglycemia (FSBG < 60mg/dl) Dextrose 50% 25 grams slow IV push.
	Glucagon 1 mg IM if no IV access
I/P	Midazolam (Versed®) 10 mg IM (in thigh) if actively seizing. **OR** Midazolam (Versed®) 5 mg IV for continued seizures with IV access.
Medical Control	If patient continues to have seizure activity after first dose of Midazolam (Versed®), contact medical control

Stroke/TIA Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Obtain and document onset of symptoms (time), medications and contact information for medical decision maker.
- Determine and report if the patient is taking:
  - warfarin (Coumadin®)
  - heparin
  - clopidagrel (Plavix®)
  - Lovenox
  - xarelto (Rivaroxban®)
  - pradaxa (Dabigatran®)
  - apixaban (Eliquis®).

Stroke/TIA

EMT	Universal Protocol
	Identify witness to last time patient was seen normal. Transport with patient if possible or obtain contact information for immediate contact by ED staff upon arrival.
	Focused neurological exam. Cincinnati Prehospital Stroke Scale or F.A.S.T. Repeat every 15 minutes.
	Instant glucose, 15 grams, for suspected hypoglycemia and able to maintain airway.
EN/A	IV/IO/Vascular Access
	Dextrose 50% 25 grams IV for suspected hypoglycemia.
	Glucagon 1 mg IM (in thigh) if no IV access.
Med Control	For onset of symptoms **under 24 hours**, contact medical command immediately for possible stroke alert and expedite transport.

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: *Have patient show teeth or smile.*

Normal: both sides of the face move equally

Abnormal: one side of face does not move as well as the other side

2. ARM DRIFT: *Patient closes eyes & holds both arms out for 10 sec.*

Normal: both arms move the same or both arms do not move at all

Abnormal: one arm does not move or drifts down compared to the other

3. ABNORMAL SPEECH: *Have the patient say "you can't teach an old dog new tricks."*

Normal: patient uses correct words with no slurring **Abnormal:** patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

STROKE is an Emergency.

Every minute counts.

ACT F.A.S.T!

FACE Does one side of the face droop? Ask the person to smile.

ARMS Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

SPEECH Is speech slurred? Ask the person to repeat a simple sentence. Is the sentence repeated correctly?

TIME If the person shows any of these symptoms, Call 911 or get to the hospital immediately.

Adult Respiratory

Pulmonary Edema/CHF Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- All wheezing is not asthma.
- Allow for position of comfort.
- Use of Nitropaste may be preferable to SL NTG if hypotension is likely to occur.
- ***DO NOT GIVE*** NTG with use of Viagra, Cialis, Levitra or herbal equivalents within past 24 hours.
- Use of IV fluids to treat hypotension may be harmful.
- Auscultate breath sounds prior to administration of IV fluids.

EMT	Universal Care Protocol
	Pulse oximetry and ETCO2 monitor.
	Consider CPAP protocol.
	12-lead ECG, proceed to Chest Pain Protocol, if acute coronary syndrome is suspected.
EN/A	IV/IO/Vascular Access
	Nitroglycerin 0.4 mg SL every 3 – 5 minutes if BP > 100 mm Hg. Repeat as needed until BP < 140 mm Hg.
	1 inch Nitropaste (nitroglycerin) if BP > 100 mm Hg.
Med Control	Consider dopamine (Inotropin®) 2 to 20 micrograms/kg/min. for BP < 90 mm Hg.

Respiratory distress/Asthma/COPD/ Pneumonia/Reactive airway

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Silent chest is a sign of impending respiratory arrest.
- Increased PEEP with CPAP may increase risk of barotrauma to COPD patients.

EMT	Universal Care Protocol
	Pulse oximetry and ETCO2 monitor.
	Assist with prescribed MDI, may repeat in five (5) minutes.
	Consider CPAP procedure.
	Consult Oxygenation guidelines when administering Oxygen
TJEMS – EMT	Albuterol sulfate 2.5 mg via nebulizer.
EN/A	Albuterol sulfate 2.5 mg/ipratropium (Atrovent®) 0.5 mg nebulized. May repeat treatments of albuterol if needed.
	IV/IO/Vascular Access
	Consider methylprednisolone (Solu-Medrol®) 125 mg slow IV push, if not relieved after 1st albuterol treatment or 60 mg PO prednisone.

Adult OB/GYN

Childbirth/Labor/Delivery
Breech Presentation

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- **Always contact medical command for guidance with any complicated delivery**.
- Seizures during pregnancy represent a medical emergency, contact medical command promptly

EMT	Universal Care Guidelines
	Visualize perineum for crowning and imminent delivery
	Support the baby's extremities or buttocks until the upper back appears. Grasp the baby's hips and apply gently downward traction. Do not apply traction to baby's legs or back. Swing the infant's body in the direction of least resistance. By alternate swinging, both shoulders will deliver posteriorly. Splint the humerus and apply gentle traction so the arms can be delivered. Gentle abdominal compression of the uterus to engage baby's head. Apply downward traction until the baby's head is visible. Grasp iliac crest to swing legs upward until the body is in vertical position which delivers head. Suction mouth then nostrils using bulb syringe. Clamp cord at 8 inches and 10 inches from the infant. Cut cord between the clamps. Keep infant warm, particularly the head. Record time of birth.
	Assess and record APGAR score at 1 minute and 5 minutes.
EN/A	IV/IO/Vascular Access

Childbirth/Labor/Delivery
Cephalic presentation

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- A pregnant patient in cardiac arrest should be managed per ACLS guidelines with rapid transport. Do not delay transport for delivery of the placenta.
- Manual vaginal exams should not be performed in the field.
- If birth is imminent, stay and deliver the baby. If high risk, attempt delivery en-route to hospital.
- Seizures during pregnancy represent a medical emergency, contact medical command promptly.
- If amniotic sac has not ruptured, it should be ruptured manually.

Cephalic Presentation

EMT	Universal Care Guidelines
	Visualize perineum for crowning and imminent delivery.
	Transport 3rd trimester patients in left lateral recumbent position. If immobilized, tilt spine board to left.
	Assess for amniotic sac rupture. If not ruptured and delivery is in progress, tear membrane. Support infant's head over perineum. Once head appears, suction mouth then nostrils with bulb syringe. Check for cord around the neck. Apply gentle traction downward on head until anterior shoulder appears. Guide infant upward to deliver posterior shoulder. Keep infant at same level of placenta. Clamp cord at 8 inches and 10 inches from the infant. Cut cord between the clamps. Keep infant warm, particularly the head. Record time of birth.
	Assess and record APGAR score at 1 minute and 5 minutes.
EN/A	IV/IO/Vascular Access

Apgar Scoring Chart

	Sign	0 Points	1 Point	2 Points
A	Activity (Muscle Tone)	Absent	Arms and Legs Flexed	Active Movement
P	Pulse	Absent	Below 100 bpm	Above 100 bpm
G	Grimace (Reflex Irritability)	No Response	Grimace	Sneeze, cough, pulls away
A	Appearance (Skin Color)	Blue-gray, pale all over	Normal, except for extremities	Normal over entire body
R	Respiration	Absent	Slow, irregular	Good, crying

Courtesy of Eric Apgar

Eclampsia
Eclamptic Seizures

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Hypertension in the pregnant patient is defined as 140/90 mmHg or an increase of 30 mmHg systolic or 20 mmHg diastolic from patient's normal BP.
- Seizures during pregnancy represent a medical emergency, contact medical command promptly.

EMT	Universal Care Guidelines
	Early notification to receiving facility, use appropriate terminology "eclampsia" when giving report
EN/A	IV/IO/Vascular Access
Med Control	**Intermediate and Paramedic:** Consultation for the use of adult seizure guidelines

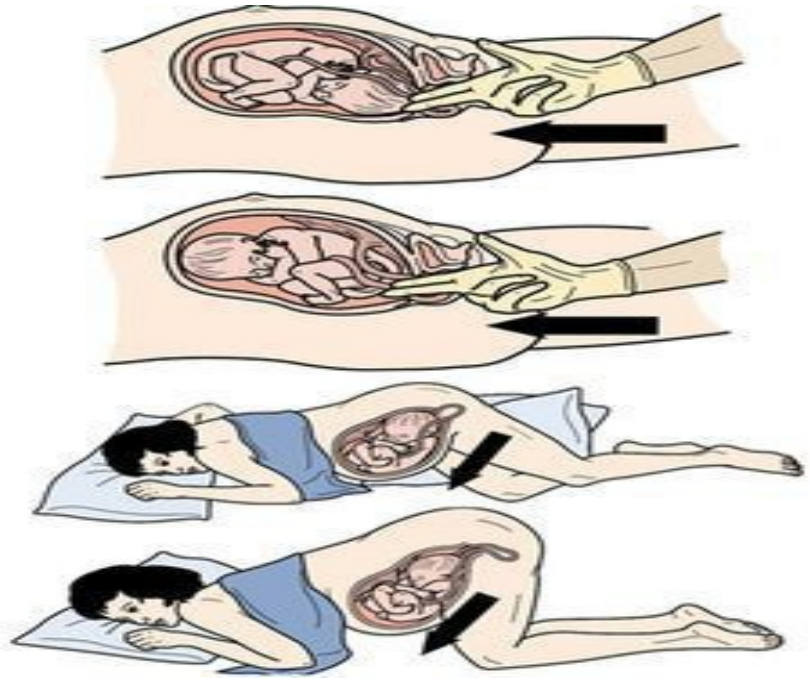
Pregnancy Related Emergencies
Prolapsed Umbilical Cord

Guideline

Reviewed: 2020	Updated: June 2020

PEARLS:

- **Always contact medical command for guidance with any complicated delivery.**
- Seizures during pregnancy represent a medical emergency, contact medical command promptly.



EMT	Universal Care Guidelines
	Visualize perineum for crowning and imminent delivery.
	Do not attempt to push the cord or limb back in. Insert two (2) fingers of gloved hand into vagina to raise presenting part off cord. Check cord for pulsations in vagina. Push baby's head away to keep pressure off cord and maintain. Place mother in knee-chest position. If unable, use Trendelenburg instead. Continue to hold pressure off cord. Keep cord moist with sterile saline. Transport immediately with early notification.
EN/A	IV/IO/Vascular Access

Gynecological Emergencies
Vaginal Bleeding

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Determine last menstrual cycle
- Always consider pregnancy and complications in women of child bearing age.
- Third (3rd) trimester bleeding may constitute a medical emergency, contact medical command promptly.

EMT	Universal Care Guidelines
	Collect any tissue or fetal parts. Place in paper bag then into plastic bag for physician examination.
	If hypotensive, refer to hypotensive guidelines.
EN/A	Vascular access procedure

Adult Injury

Amputation

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Tourniquets should be used with the smallest amount of pressure over the widest area.
- Never freeze the part by placing directly on ice.

EMT	Universal Care Guidelines
	Spinal motion restrictions, if indicated
	Apply direct pressure to control hemorrhage and consider tourniquet for life-threatening bleeding. See Hemorrhage Control Procedure
	If incomplete amputation, splint entire digit or limb in physiological position
	Place part in damp gauze, place in plastic bag, wrap in trauma dressing, and place on ice/water mix
EN/A	IV/IO/Vascular Access
I/P	**Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Maximum Total dose is 100mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IO/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril, may be repeated in 10 minutes Maximum single dose is 100 micrograms **Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of morphine sulfate (maximum dose 20 mg) or fentanyl (Sublimaze®) (maximum dose 200 micrograms) **Adults**: 0.5 mg/kg IV, may be repeated once in 10 minutes Maximum single dose is 20 mg **Maximum total dose is 40mg** Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting. **Adults**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes

Bleeding/Hemorrhage Control

Guideline

Reviewed: 2020	Updated: 2020

Uncontrollable bleeding – stable patient

Procedure/s:

- Start with direct pressure to the bleeding site with a sterile dressing to control bleeding
    - Clean dressing if sterile is not available
    - If bleeding is not controlled in 2 – 5 minutes move promptly to tourniquet placement
        - If trained, hemostatic dressing and/or compressive dressing can be used to control bleed
            - i.e. Israeli combat dressing, "H" dressing or other
        - Hemostatic dressings may be placed into a deep wound (packed) for management of ongoing bleeding that is not controlled with direct pressure.
            - NOTE: *Granular hemostatic products should not be used*

    - Tourniquet placement (*Commercial tourniquets are preferred*)
        - Place as far up (aka proximal) on the affected extremity as possible
            - In some cases (i.e. on the thigh) a second tourniquet may be required, if bleeding is not controlled
        - Tighten until bleeding is controlled
        - Document time tourniquet was placed on space provided on tourniquet
        - Write "TK" and time of placement on patient's forehead
        - Notify hospital personnel in radio report and during transfer of care report at hospital

        - Non-commercial (cravat)
            - Use placement step from above
            - Wrap the bandage twice around the extremity
            - Tie a single knot and place a stick/pen/etc. on the top of it
            - Tie a square knot over the stick, and then twist the stick until the bleeding stops
            - Secure the stick so that it will not unwind
        - Write "TK" and the exact time you applied the tourniquet on the patient's forehead
        - Notify the hospital personnel in radio report and during transfer of care report at hospital
- ALS care should be available or requested as soon as possible. Anticipate the need for IV access, pain control, and control of nausea/vomiting

- **Uncontrollable bleeding – unstable patient**

- If the patient has serious on-going extremity bleeding not controlled by direct pressure, or evidence of severe extremity bleeding and unstable vital signs and/or abnormal mental status at initial contact, move directly to a tourniquet for control of bleeding.

Burns/Thermal

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- In electrical burns, search for additional traumatic injury.
- In thermal burns, assess for carbon monoxide exposure.
- Remove jewelry and non-adherent clothing.
- Avoid establishing IV distal to extremity burn.
- Severe burns should not receive succinylcholine.
- Early intubation should be considered if airway edema is present or likely to develop.

EMT	Universal Care Guidelines
	Apply dry, clean dressings
	Spinal motion restrictions, if indicated
	Irrigate chemical burn with water if appropriate for chemical. If powder chemical, brush off
A	IV/IO/Vascular Access
I/P	**Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Max total dose is 100mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IO/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril, may be repeated in 10 minutes Maximum single dose is 100 micrograms **Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of morphine sulfate (maximum dose 20 mg) or fentanyl (Sublimaze®) (maximum dose 200 micrograms) **Adults**: 0.5 mg/kg IV, may be repeated once in 10 minutes Maximum single dose is 20 mg **Maximum total dose is 40mg** Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting. **Adults**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications.

Near Drowning

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Most near drowning victims will be hypothermic to some extent.
- Assess type of incident (surface impacted, object strike, propeller trauma).
- Assess water conditions (depth of submersion, length of time).
- Monitor airway status closely.

EMT	Remove from water if trained and safe
	Spinal motion restrictions, if indicated
	Prevent heat loss; refer to Hypothermia Guideline, if indicated
	For difficulty breathing consider CPAP
A	IV/IO/Vascular Access
I/P	Refer to specific cardiac arrhythmias guidelines as needed

General Trauma Management

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- GCS should be assessed, documented, and reported
- Never use Versed in a trauma patient unless authorized by OMD to RSI.

General Trauma Management (VA Specific)

EMT	Universal Care Guidelines
	Spinal motion restrictions if indicated
	Notify MedCom of possible trauma alert (alpha or beta [red or yellow]) category. Advise mechanism of injury, age, sex of patient, sites of injuries, vitals if available and ETA. 15 minutes or more ETA is requested
	For evisceration, cover with moist sterile dressing then occlusive (plastic), sealed on all four (4) sides. Do not push organs back into abdominal cavity
	For open chest wound, cover immediately with occlusive dressing, sealed on three (3) sides
A	IV/IO/Vascular Access
I/P	1 g TXA IV piggyback
	Needle Chest Decompression procedure if absent breath sounds and symptoms of shock.
	*****NOTE: Ketamine may be given for disentanglement of patients.** **ISOLATED EXTREMITY INJURIES OR BURNS ONLY** **Fentanyl (Sublimaze®)** **Adults**: 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Max total dose is 100mcg** *Reduced dose for elderly or ill patients* = 0.5 micrograms/kg IV/IO/IM **Adults**: 2 microgram/kg IN, half of dose in each nostril, may be repeated in 10 minutes Maximum single dose is 100 micrograms **Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of morphine sulfate (maximum dose 20 mg) or fentanyl (Sublimaze®) (maximum dose 200 micrograms) or isolated extremity injury **Adults**: 0.5 mg/kg IV, may be repeated once in 10 minutes Maximum single dose is 20 mg **Maximum total dose is 40mg** Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting. **Adults**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes
Med Contro	Consider cessation of efforts for traumatic cardiac arrest if transport is greater than 15 minutes

Head Trauma

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- GCS should be assessed anddocumented.
- Intracranial pressure may cause hypertension, bradycardia and altered mental respiratory rate.
- Haloperidol should not be administered to these patients.
- Avoid advanced airway procedures if there is any indication of an intact gag reflex.
- Maintain a capnography reading of 35 – 40 mmHg.

EMT	Universal Care Guidelines
	Spinal motion restrictions, if indicated
	Elevate patient's head if not hypotensive. Elevate head of spine board if immobilized
	Maintain patient warmth
AEMT	Advanced airway management with capnography
	IV/IO/Vascular Access

Sexual Assault

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Obtain only pertinent facts related to the trauma.
- Do not question about prior events or information not directly related to care (assailant description, etc.).
- Transport with provider of same gender if possible.

EMT	Universal Care Guideline
	Confirm scene safety
	Do not examine genitalia unless a hemorrhage requires bleeding control
	Save any clothing and place in a paper bag
	Advise patient not to urinate, defecate, douche or wash before Emergency Department evaluation
	Transport to facility with sexual assault examiner capabilities
AEMT	IV/IO/Vascular Access

Pediatric Cardiac Arrest

Pediatric: Cardiac Arrest
Asystole /Pulseless Electrical Activity

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- If pediatric pads are not available, use of adult pads is acceptable. Ensure they do not touch.
- IV medications should be followed by a 2-3 mL flush of NS in most proximal port.
- ETT placement should be confirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitationtape.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Epi 1:10,000 (Adrenalin)	0.01 mg/kg	0.5 mL	1 mL	1.2 mL	1.5 mL	2 mL	2.2 mL	2.5 mL	3 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Pediatric: Cardiac Arrest – Basic Life Support Guideline
I/P	Epinephrine 1:10,000: 0.01 mg/kg, IV/IO, maximum 1 mg, repeat every 3 – 5 minutes
	Identify and treat reversible causes (see above)

Pediatric: Cardiac Arrest
Basic Life Support

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- If pediatric pads are not available, use of adult pads is acceptable. Ensure they do not touch.
- IV medications should be followed by a 2-3 mL flush of NS in the most proximal port.
- ETT placement should be confirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.

EMT	Universal Care Guidelines, with emphasis on adequate oxygenation
	Check adequacy of CPR. Perform chest compression if HR persistently < 60 in child/infant or neonates
	AED Guideline using pediatric pads. Use adult pads when using multifunction device in AED mode, if no pediatric pads available. Ensure pads do not touch place anterior and posterior
	Ensure patient warmth
	Transport immediately with BLS measures while requesting ALS
A	IV/IO/Vascular Access
	Consider supraglottic airway
I/P	**Consider ET – Paramedic only**
	Evaluate cardiac rhythm. Go to appropriate guidelines for further management

Pediatric: Cardiac Arrest
Ventricular Fibrillation/Pulseless Ventricular Tachycardia

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Sodium bicarbonate should not be used during brief resuscitation attempts.
- If pediatric pads are not available, use of adult pads is acceptable. Ensure they do not touch.
- IV medications should be followed by a 2-3 mL flush of NS in the most proximal port.
- ETT placement should be confirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Pediatric: Cardiac Arrest - Basic Life Support Guideline
	AED Guideline using pediatric pads if stand-alone defibrillator. Use adult pads when using multifunction device in AED mode, if no pediatric pads available Ensure pads do not touch
I/P	Attempt defibrillation at 2 j/kg
	Epinephrine 1:10,000; 0.01 mg/kg, IV/IO, maximum 1 mg, repeat every 3 – 5 minutes
	Attempt defibrillation at 4 j/kg after two (2) minutes of CPR. Continue every two (2) minutes
Med Control	Consider amiodarone (Cordarone®) 5 mg/kg IV or IO

Pediatric Cardiac

Pediatric:
Bradycardia

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Bradycardia is commonly a manifestation of hypoxia.
- IV medications should be followed by a 2-3 mL flush of NS in most proximal port.
- ETT placement should be reconfirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Epi 1:10,000 (Adrenalin)	0.01 mg/kg	0.5 mL	1 mL	1.2 mL	1.5 mL	2 mL	2.2 mL	2.5 mL	3 mL
Atropine sulfate	0.02 mg/kg		2 mL	2.4 mL	3 mL	4 mL	4.4 mL	5 mL	5 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	If heart rate is persistently < 60 for child/infant or neonate, begin CPR. Refer to Cardiac Arrest: Unknown Rhythm (i.e. BLS) Guideline
A	IV/IO/Vascular Access
I/P	Epinephrine 1:10,000; 0.01 mg/kg, IV or IO, maximum 1 mg. Repeat every 3 – 5 minutes
	If suspected vagal tone: atropine sulfate; 0.02 mg/kg, IV or IO, repeat every 5 minutes. Maximum single dose for child 0.5 mg with total maximum of 1 mg
	Identify and treat reversible causes
Med Control	Consider transcutaneous pacing

Pediatric:
Supraventricular Tachycardia (including Rapid Atrial Fibrillation)

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Treatment of sinus tachycardia should be aimed at searching for and treating reversible causes (hypovolemia, hypoxia, fever, pain, anxiety, medication/drug effect). Please refer to the appropriate guideline(s) based on differential.
- Consider vagal maneuvers for supraventricular tachycardia, if stable.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Adenosine (Adenocard)	0.1 mg/kg		0.33 mL	0.4 mL	0.5 mL	0.66 mL	0.73 mL	0.83 mL	1 mL
Midazolam (Versed)	0.1 mg/kg		0.2 mL	0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
A	IV/IO/Vascular Access
I/P	**Probable Sinus Tachycardia** (P waves present and normal, variable R-R with constant P-R child rate < 180, infant rate < 220). Search for and treat potential causes as listed above in differential diagnoses
	Probable Supraventricular Tachycardia (QRS < 0.08 seconds, P waves absent, abrupt change to or from normal, child rate > 180, infant rate > 220) Consider vagal maneuvers if stable
Med Control	Adenosine (Adenocard®); 0.1 mg/kg, rapid IV push, maximum initial dose 6 mg, may repeat one time at twice the first dose to a maximum of 12 mg
	Synchronized cardioversion 0.5 to 1 j/kg, may increase up to 2 j/kg if ineffective
	Consider midazolam (Versed®); 0.1 mg/kg IV, maximum single dose of 2 mg Do not delay cardioversion

Pediatric

Wide Complex Tachycardia (Ventricular Tachycardia with Pulse)

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- VT is uncommon in the pediatric patient.
- The ventricular rate may vary from near normal to near 300 beats per minute.
- Slow rates may be well tolerated.
- IV medications should be followed by a 2-3 mL flush of NS in the most proximal port.
- The majority of children who develop VT have underlying structural heart disease or prolonged QT syndrome.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Amiodarone (Cordarone)	5 mg/kg		1 mL	1.2 mL	1.5 mL	2 mL	2.2 mL	2.5 mL	3 mL
Midazolam (Versed)	0.1 mg/kg		0.2 mL	0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
A	IV/IO/Vascular Access
I/P	Confirm QRS > 0.08 seconds
	If patient is unstable, synchronized cardioversion at 0.5 j/kg to 1 j/kg, may increase to 2 j/kg
Med Control	Consider amiodarone (Cordarone®); 5 mg/kg IV or IO, over 10 to 20 minutes
	Consider midazolam (Versed®); 0.1 mg/kg IV or IO. Do not delay cardioversion

Pediatric Environmental

Pediatric: **Heat Stroke/Hyperthermia** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Tricyclic anti-depressants, phenothiazines, anti-cholinergics, and alcohol predispose patients to hyperthermia.
- Cocaine, amphetamines and salicylates may elevate body temperature.
- The major difference between heat exhaustion and heat stroke is CNS impairment.
- Avoid dramatic decreases in temperature which can cause shivering and increase temperature. Vigorous fluid administration may result in pulmonary edema.

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Move to cooler environment, remove excess clothing, protect from further heat gains
	For heat exhaustion, oral water if patient can tolerate. Cool with wet towels or fans
	For heat stroke, use aggressive evaporation (fine mist water spray, ice packs to groin and axillae)
A	IV/IO/Vascular Access

Pediatric Medical

Pediatric:
Abdominal Pain

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Keep NPO (nothing by mouth), other than oral medications.

EMT	Universal Care Guidelines
TJEMS – EMT	Nausea and vomiting, consider ondansetron (Zofran®) 4mg, ODT (orally disintegrating tablet)
EN/A	IV/IO/Vascular Access
	Nausea and vomiting, consider ondansetron (Zofran®) 4mg IV, may repeat in 10 minutes
Med Control	**Fentanyl (Sublimaze®)** **Pediatrics (2 year old and greater):** 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms 2 micrograms/kg IN, half of dose in each nostril, may be repeated once in 10 minutes Maximum single dose is 50 micrograms Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting **Children (4 years old and greater)**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes **Pediatrics (less than 4 years old)**: 2 – 4 mg orally or IV/IO/IM Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Fentanyl (Sublimaze)	1 mcg/kg			0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Ondansetron (Zofran)	0.1 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL

Pediatric: **Allergic Reaction/Anaphylaxis** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Any patient receiving epinephrine must be transported.
- IM injection is preferred in the anterior lateral thigh.

Allergic reaction

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Remove from source of exposure, if safe
EN/A	Diphenhydramine (Benadryl®); 1 mg/kg/IM (in thigh) (maximum 50 mg)

Anaphylaxis

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Remove from source of exposure, if safe
	Administer or assist patient with their own Epi-Pen Jr. (Epi-Pen if greater than 30 kg/66 lbs) for respiratory distress, inadequate perfusion or severe hives
EN/A	**1.** Epinephrine 1:1,000; 0.01 mg/kg IM (in thigh) (maximum 0.3 mg), may repeat in 10 minutes. **2.** Albuterol sulfate 2.5 mg; nebulized for wheezing/bronchospasm **3.** IV/IO/Vascular Access **4.** Diphenhydramine (Benadryl®); 1 mg/kg/IV (maximum 50 mg), or IM (in thigh) **5.** Methylprednisolone (Solu-Medrol®); 1 mg/kg IV over 1 minute
Med Control	Consider additional doses of epinephrine

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Diphenhydramine (Benadryl)	1 mg/kg		0.2 mL	0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Epi 1:1,000 (Adrenalin)	0.01 mg/kg		0.1 mL	0.12 mL	0.15 mL	0.2 mL	0.22 mL	0.25 mL	0.3 mL
Methylprednisolone (Solu-Medrol)	1 mg/kg		0.16 mL	0.19 mL	0.24 mL	0.32 mL	0.35 mL	0.4 mL	0.48 mL

Pediatric: **Newborn Resuscitation** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- IV fluids should be administered over less than 20 minutes.
- IO access should be attempted if no peripheral access in 2 attempts or 90seconds
- Compression to ventilation ratio for neonates (Under 28 days old) is 3:1

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Assess ABC's using base of umbilical cord, brachial or femoral artery, or auscultation of heart sounds.
	Place newborn on back with neck in neutral position
	Suction mouth prior to nose. Note any meconium presence.
	After delivery, use mild stimulation (dry, warm, suction). If effective respirations are not present after 5 – 10 seconds of stimulation, BVM at 40 – 60 breaths/minute.
	If heart rate is < 60 bpm with no improvement after BVM for 30 seconds, begin CPR.
	Dry the newborn, wrap in blanket, head cap to maintain warmth, place baby against your skin. Do not allow newborn to become hypothermic.
	Record APGAR score at 1 and 5 minutes.
EN/A	Evaluate or treat for hypoglycemia. Dextrose 12.5% 2 mL/kg IV or IO
I/P	IO if required for medication or fluid (10 mL/kg bolus may repeat) administration.
	Follow specific algorithms for bradycardia, tachycardia or cardiac arrest

Pediatric:
Overdose/Poisoning/Toxic Ingestion

Guideline

Reviewed: 2020	Updated: 2020

History	Physical	Differential Diagnoses
Ingestion of toxic substance Route and quantity of ingestion Time of ingestion Reason (suicide/accidental) Available medications near patient Past medical history	Mental status change Hypotension/Hypertension Decrease respiratory rate Tachycardia Dysrhythmias Seizures Behavioral changes	Tricyclic anti-depressants Acetaminophen Depressants Stimulants Anti-cholinergic Cardiac medications Solvents, cleaning agents Insecticides (organophosphates) Aspirin Smoke inhalation

PEARLS:

- Intubated patients should not receive naloxone (Narcan®) unless hemodynamically unstable.
- Tachycardia is not a contraindication to atropine administration.
- Air medical resources will not transport contaminated patients.
- If questions about the drug or poison involved, consider Poison Control consultation **1-800-222-1222.**
- DO NOT DELAY TRANSPORT!

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Identify substance and assure decontamination. Flush skin/membrane with appropriate solution if indicated
TJEMS – EMT	**Overdose** Naloxone (Narcan®); 2 mg IN, 1 mg/mL in each nostril
EN/A	IV/IO/Vascular Access
	Naloxone (Narcan®); 0.1 mg/kg IV or IM, for suspected narcotic overdose. Maximum of 2 mg
	Diphenhydramine (Benadryl®); 1 mg/kg slow IV or IM for dystonic reaction. Maximum dose of 50 mg
I/P	**For symptomatic Tricyclic Anti-depressant Overdose**: (if QRS > 0.12 seconds, hypotension or dysrhythmia). Sodium bicarbonate 1 mEq/kg slow IV push over 2 minutes
	For symptomatic Calcium Channel Blocker Overdose: (if bradycardic, QRS > 0.12 seconds, heart block, hypotension, lethargy, slurred speech, nausea/vomiting). Calcium chloride; 10 mg/kg slow IV push over 10 minutes
	For symptomatic Organophosphate Poisoning: (secretions, bronchospasm, seizures, bradycardia) Atropine sulfate; 0.05 mg/kg IV, doubled every 5 – 10 minutes until decreased secretions

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Atropine sulfate	0.02 mg/k		2 mL	2.4 mL	3 mL	4 mL	4.4 mL	5 mL	5 mL
Calcium chloride	10 mg/kg		1 mL	1.2 mL	1.5 mL	2 mL	2.2 mL	2.5 mL	3 mL
Diphenhydrami ne (Benadryl)	1 mg/kg		0.2 mL	0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Naloxone (Narcan)	0.1 mg/kg	0.5 mL	1 mL	1.2 mL	1.5 mL	2 mL	2 mL	2 mL	2 mL
Sodium bicarb	1 mEq/kg		10 mL + 10 mL NS	12 mL + 12 mL NS	15 mL + 15 mL NS	20 mL + 20 mL NS	22 mL + 22 mL NS	25 mL + 25 mL NS	30 mL + 30 mL NS

Pediatric:
Respiratory Distress/Asthma
Croup/Reactive Airway

Guideline

Reviewed: 2020	Updated: 2020

- "Severely symptomatic" is defined as:
  - Inability to speak normally
  - Severe wheezing
  - Absent or diminished breath sounds; and/or
  - Poor perfusion
- In upper airway disorders, invasive airway maneuvers should be avoided if possible.
- Consider air medical request for prolonged transports.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 Kg	20 kg	22 kg	25 kg	30 kg
Epi 1:1,000 (Adrenalin)	0.01 mg/kg		0.1 mL	0.12 mL	0.15 mL	0.2 mL	0.22 mL	0.25 mL	0.3 mL
Methylprednisolone (Solu-Medrol)	1 mg/kg		0.16 mL	0.19 mL	0.24 mL	0.32 mL	0.35 mL	0.4 mL	0.48 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Allow child to assume position of comfort
	Assist patient with prescribed Metered Dose Inhaler
TJEMS – EMT	Albuterol sulfate 2.5 mg via nebulizer for wheezing and bronchospasm
EN/A	Albuterol sulfate 2.5 mg and Ipratropium (Atrovent®) 0.5 mg; via nebulizer for bronchospasm. May repeat albuterol sulfate as long as patient is symptomatic
	NS 2 – 3 mL; via nebulizer for suspected croup or epiglottitis
	IV/IO/Vascular Access
	Methylprednisolone (Solu-Medro®l); 1 mg/kg IV, for severe asthma or croup
I/P	Epinephrine 1:1,000; 2 mg plus 1 mL NS (total volume of 3 mL); nebulized for moderate to severe patients with suspected croup or epiglottitis
	Epinephrine 1:1,000; 0.01 mg/kg IM, single maximum dose 0.3 mg for severely symptomatic patients. May repeat every 20 minutes for a maximum of 3 doses if still symptomatic

Pediatric Neuro

Pediatric:
Altered Mental Status

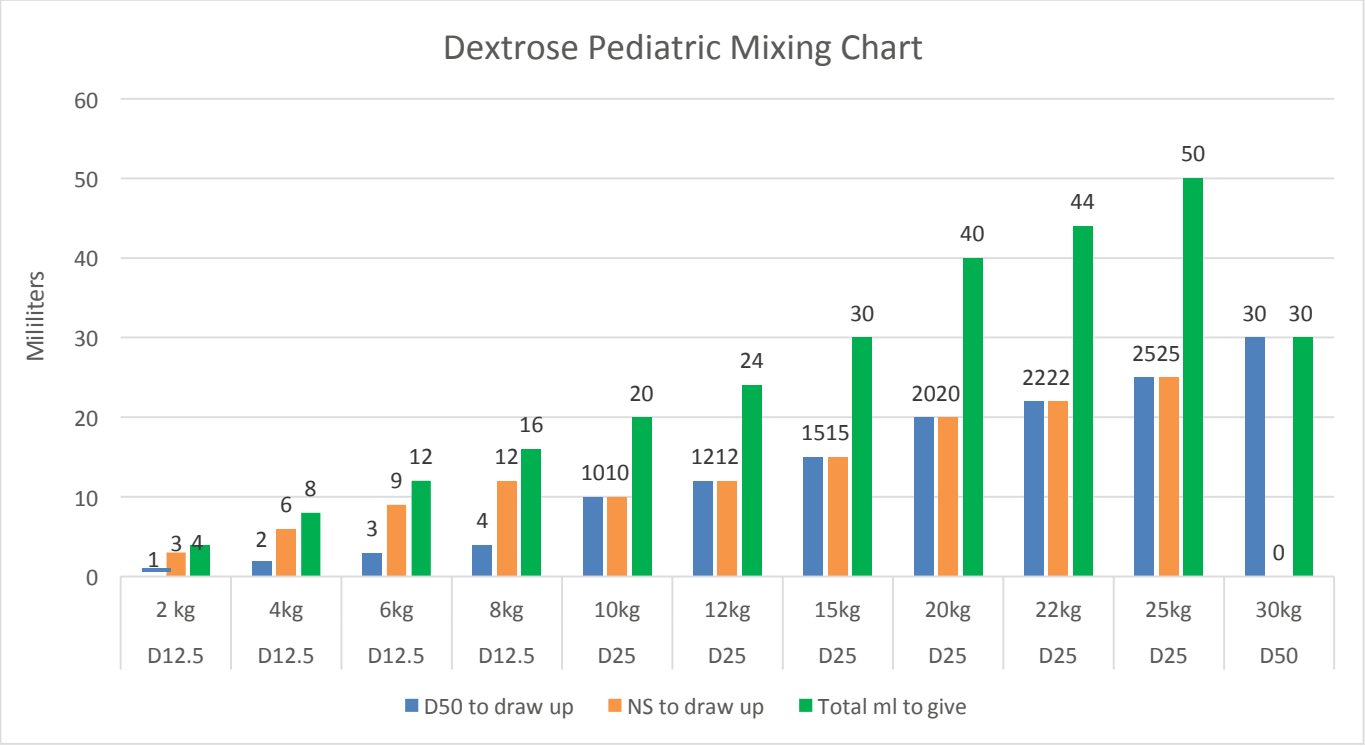
Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- Poison control cannot act as medical command, contact for advice only.
- Do not use patient's glucometer.

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
EN/A	IV/IO/Vascular Access
	Administer glucose if hypoglycemic: **Children > 8 years of age**: Dextrose 50% 1 mL/kg, IV or IO **Children 2 to 8 years of age**: Dextrose 25% 2 mL/kg IV or IO **Children 1 month to 2 years**: Dextrose 12.5% 4 mL/kg IV or IO
	Glucagon 1 mg IM
	Naloxone (Narcan®) 0.1 mg/kg IV, IO or IM for suspected narcotic overdose with respiratory depression. Maximum 2 mg



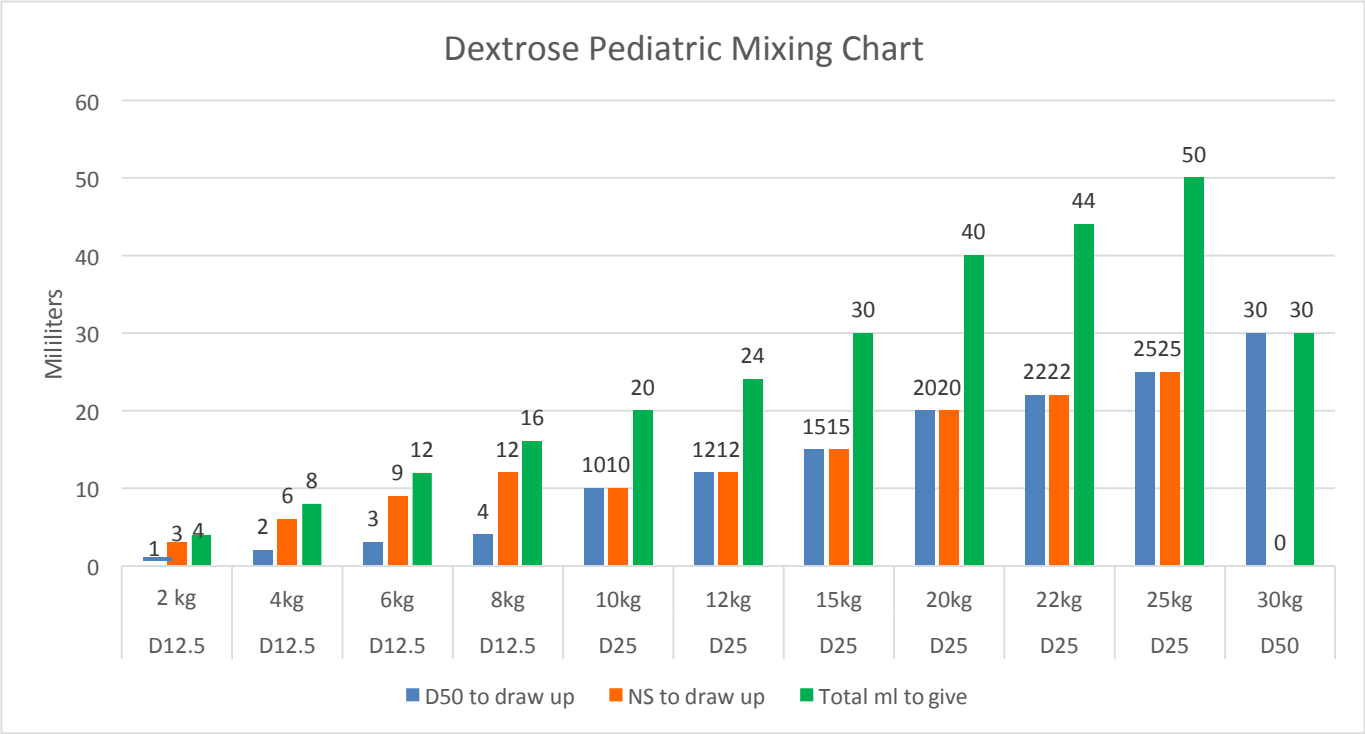
Pediatric: **Seizure** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- For actively seizing patients, initial medications should be administered IM to avoid any delay in care.

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 Kg	20 kg	22 kg	25 kg	30 kg
Midazolam (Versed)	0.1 mg/kg		0.2 mL	0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Encourage parents to use rectal Valium, if available
EN/A	IV/IO/Vascular Access
	Administer glucose **if hypoglycemic**: **Children > 8 years of age**: Dextrose 50% 1 mL/kg, IV or IO **Children 2 to 8 years of age**: Dextrose 25% 2 mL/kg, IV or IO **Children 1 month to 2 years**: Dextrose 12.5% 4 mL/kg, IV or IO **Newborn**: Dextrose 12.5% 2 mL/kg, IV or IO
	Glucagon 1 mg IM
I/P	For patient weight of 13 kg [28 lbs.] or greater: Midazolam (Versed®); 5 mg IM, if actively seizing. **OR** Midazolam (Versed®); 0.1 mg/kg IV/IO, maximum single dose of 5 mg. **Do not repeat**
Med Control	Contact Medical Command if seizure persists after first dose of benzodiazepine


Dextrose Pediatric Mixing Chart
Milliliters
60
50
40
30
20
10
0
1
3
4
2
6
8
3
9
12
4
12
16
10
10
20
12
12
24
15
15
30
20
20
40
22
22
44
25
25
50
30
0
30
2 kg
D12.5
4kg
D12.5
6kg
D12.5
8kg
D12.5
10kg
D25
12kg
D25
15kg
D25
20kg
D25
22kg
D25
25kg
D25
30kg
D50
D50 to draw up
NS to draw up
Total ml to give

Pediatric Injury

Pediatric: **Amputation** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Tourniquets should be used with the smallest amount of pressure over the widest area.
- Never freeze the part by placing directly on ice.
- Ketamine is not to be given to neonates, neonates= 28 days old or younger

Pediatric: Injury – Amputation

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Spinal immobilization if indicated
	Apply direct pressure to control hemorrhage. Elevate and consider tourniquet procedure (Hemorrhage Control)
	If incomplete amputation, splint entire digit or limb in physiological position
	Place part in damp gauze, place in plastic bag, wrap in trauma dressing and place on ice/water mix
EN/A	IV/IO/Vascular Access
I/P	**Fentanyl (Sublimaze®)** **Pediatrics (2 year old and greater)**, for **isolated extremity injury** 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms 2 micrograms/kg IN, half of dose in each nostril, may be repeated once in 10 minutes Maximum single dose is 50 micrograms Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting **Children (4 years old and greater)**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications
Med Control	**Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of fentanyl (Sublimaze®) **Pediatrics (12 years old and under)**: 0.5 mg/kg IV; may be repeated once in 10 minutes Maximum single dose is 20 mg **Pediatrics (less than 4 years old)**: ondansetron (Zofran®) 2 – 4 mg orally or IV/IO/IM

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Fentanyl (Sublimaze)	1 mcg/kg			0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Ketamine (Ketalar)	0.5 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL
Ondansetron (Zofran)	0.1 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL

Pediatric: **Burns/Thermal** Guideline	
Reviewed: 2020	Updated: 2020

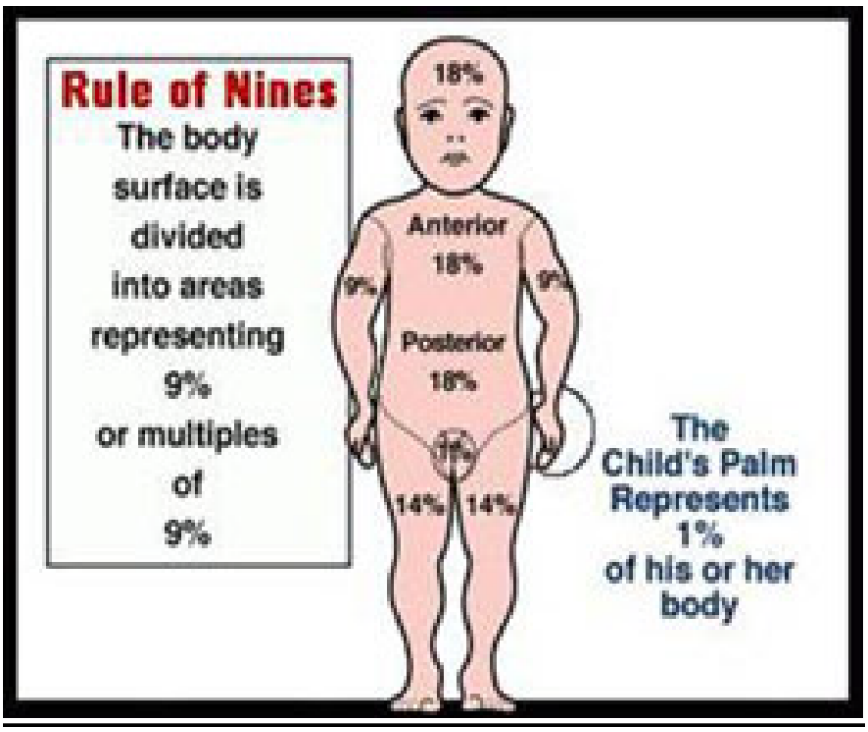
PEARLS:

- In electrical burns, search for additional traumatic injury.
- In thermal burns, assess for carbon monoxide exposure.
- Remove jewelry and non-adherent clothing.
- Avoid establishing IV distal to extremity burn.
- Severe burns should not receive succinylcholine.
- Early intubation should be considered if airway edema is present or likely to develop.
- Ketamine is not to be given to neonates, neonates= 28 days old or younger.

Pediatric: Injury/Burns – Thermal

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation Apply dry, clean dressing Irrigate chemical burn with water if appropriate for chemical. If powder chemical brush off
EN/A	IV/IO/Vascular Access
I/P	**Fentanyl (Sublimaze®)** **Pediatrics (2 year old and greater)**: 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms 2 micrograms/kg IN, half of dose in each nostril, may be repeated once in 10 minutes Maximum single dose is 50 micrograms Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting **Children (4 years old and greater)**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes Observe patient carefully for any signs of respiratory depression or changes in vital signs when administering pain medications
Med Control	**Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of fentanyl (Sublimaze®) **Pediatrics (12 years old and under)**: 0.5 mg/kg IV; may be repeated once in 10 minutes Maximum single dose is 20 mg **Pediatrics (less than 4 years old):** ondansetron (Zofran®) 2 – 4 mg orally or IV/IO/IM

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Fentanyl (Sublimaze)	1 mcg/kg			0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Ketamine (Ketalar)	0.5 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL
Ondansetron (Zofran)	0.1 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL


Rule of Nines
The body surface is divided into areas representing 9% or multiples of 9%
18%
Anterior 18%
9%
9%
Posterior 18%
1%
14%
14%
The Child's Palm Represents 1% of his or her body

Pediatric: **Near Drowning** Guideline	
Reviewed: 2020	Updated: 2020

PEARLS:

- Most near drowning victims will be hypothermic to some extent.
- Assess type of incident (surface impacted, object strike, propeller trauma).
- Assess water conditions (depth of submersion, length of time).
- Complications can appear up to 24 hours later. Transport should be highly encouraged.

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Remove from water if trained and safe
	Spinal immobilization if indicated
	Prevent heat loss; refer to Hypothermia Guideline, if indicated
EN/A	IV/IO/Vascular Access
I/P	Refer to specific cardiac arrhythmias guidelines as needed

Pediatric:
General Trauma Management

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- GCS should be assessed, documented and reported
- Ketamine is not to be given to neonates, neonates= 28 days old or younger

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Spinal immobilization if indicated
	Notify MedCom if possible trauma alert (alpha or beta [red or yellow]) Report the following: mechanism of injury, age and sex of patient, site(s) of injury, vitals if available and ETA (15 minutes preferred)
	For evisceration, cover with moist, sterile dressing, then bandage with plastic (occlusive), sealed on four (4) sides DO NOT push organs back into abdominal cavity
	Maintain patient warmth
EN/A	IV/IO/Vascular Access
Med Control	Needle chest compression procedure if absent breath sounds and symptoms of shock
	Consider pain management for isolated extremity injury and burns only **Fentanyl (Sublimaze®)** **Pediatrics (2 year old and greater)**, 1 microgram/kg IV/IO/IM, may be repeated once in 10 minutes Maximum single dose is 50 micrograms 2 micrograms/kg IN, half of dose in each nostril, may be repeated once in 10 minutes Maximum single dose is 50 micrograms **Ketamine (Ketalar®)** For patients who fail to have adequate pain relief after 2 subsequent weight based doses of fentanyl (Sublimaze®) **Pediatrics (12 years old and under)**: 0.5 mg/kg IV; may be repeated once in 10 minutes Maximum single dose is 20 mg Consider administration of **ondansetron (Zofran®)** to patients with significant pain who will receive narcotic pain medications and are already nauseated or at risk for nausea/vomiting **Children (4 years old and greater)**: 4 mg ODT (orally disintegrated tablet), may be repeated once in 10 minutes 4mg IV/IO/IM, may be repeated once in 10 minutes

Medication Name	Medication Dose	Newborn	10 kg	12 kg	15 kg	20 kg	22 kg	25 kg	30 kg
Fentanyl (Sublimaze)	1 mcg/kg			0.24 mL	0.3 mL	0.4 mL	0.44 mL	0.5 mL	0.6 mL
Ketamine (Ketalar)	0.5 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL
Ondansetron (Zofran)	0.1 mg/kg		0.5 mL	0.6 mL	0.75 mL	1 mL	1.1 mL	1.25 mL	1.5 mL

PEDIATRIC GLASGOW COMA SCALE (PGCS)				
	> 1 Year		**< 1 Year**	**Score**
EYE OPENING	Spontaneously		Spontaneously	4
	To verbal command		To shout	3
	To pain		To pain	2
	No response		No response	1
MOTOR RESPONSE	Obeys		Spontaneous	6
	Localizes pain		Localizes pain	5
	Flexion-withdrawal		Flexion-withdrawal	4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)	3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)	2
	No response		No response	1
	> 5 Years	**2-5 Years**	**0-23 months**	
VERBAL RESPONSE	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused	Inappropriate words	Cries and is consolable	4
	Inappropriate words	Persistent cries and screams	Persistent inappropriate crying and/or screaming	3
	Incomprehensible sounds	Grunts	Grunts, agitated, and restless	2
	No response	No response	No response	1
TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15):				

Pediatric
Head Trauma

Guideline

Reviewed: 2020	Updated: 2020

PEARLS:

- GCS should be assessed and documented.

EMT	Universal Care Guidelines with an emphasis on adequate oxygenation
	Spinal immobilization if indicated
	Maintain patient warmth
EN/A	Airway management with capnography
	IV/IO/Vascular Access

PEDIATRIC GLASGOW COMA SCALE (PGCS)				
	> 1 Year		**< 1 Year**	**Score**
EYE OPENING	Spontaneously		Spontaneously	4
	To verbal command		To shout	3
	To pain		To pain	2
	No response		No response	1
MOTOR RESPONSE	Obeys		Spontaneous	6
	Localizes pain		Localizes pain	5
	Flexion-withdrawal		Flexion-withdrawal	4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)	3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)	2
	No response		No response	1
	> 5 Years	**2-5 Years**	**0-23 months**	
VERBAL RESPONSE	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused	Inappropriate words	Cries and is consolable	4
	Inappropriate words	Persistent cries and screams	Persistent inappropriate crying and/or screaming	3
	Incomprehensible sounds	Grunts	Grunts, agitated, and restless	2
	No response	No response	No response	1
TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15):				

Operations Guidelines

Advanced Life Support

Operations Guideline

Reviewed: 2020	Updated: 2020

Technicians may only provide care that has been approved by the Operational Medical Director of each respective agency. In special situations, an on-line physician may authorize an ALS technician to perform a procedure outside the area guidelines but within the scope of the technician's training.

The Operational Medical Director must approve changes in medical procedures.

All issues that cannot be solved locally to the satisfaction of all those concerned may be brought to the Medical Direction Committee for recommendation.

The Operational Medical Director of each agency is ultimately responsible for all patient care. Therefore, the OMD has the right to suspend an ALS technician who fails to perform his/her duty as trained.

In order to practice as an ALS technician in this area, the technician must have the approval of the agency OMD and be released by their primary EMS agency as an EMT attendant-in-charge (AIC).

If in a life or death situation, a sole Junior ALS technician may provide ALS care within the scope of their training.

Anytime a technician operates outside the established regional guidelines, the technician should notify their OMD and may be subject to review by the OMD and/or the Medical Direction Committee.

Technicians are highly encouraged to attend all meetings where ALS calls run by their agency are discussed, and where both practical and lecture materials are reviewed.

ALS providers who are trained outside the TJEMS region and for those who are trained through a non-UVA training program must have a session involving their agency OMD or designee to evaluate their knowledge of the TJEMS Regional Guidelines as well as orient to the training and reporting process for this region with the UVA Pre-hospital program prior to actual field practice as an ALS provider.

Criteria for Death/ Withholding Resuscitation

Guideline

Reviewed: 2020	Updated: 2020

DNR/DDNR Patients

Indications:

- Pulseless, non-breathing patient who would normally require resuscitation **AND**
- Possess, and have on-scene, original or a legible copy of a properly completed Virginia DDNR form, POST form, approved jewelry, or other documents that contain the equivalent information as the State form.
- Only the patient, the provider who issued the DNR, or the person who obtained the DNR on behalf of an incompetent patient may revoke a DNR.

Procedure:

- Verify that the patient is the person named on the DDNR form.
- Cease all resuscitation efforts.
- Notify law enforcement.
- If the DDNR is imprinted with a number, this number should be documented on the PPCR/ePPCR. If the DDNR does not have a number, the provider should document the physician who signed the DDNR and their contact number.

Considerations:

- If the patient requires care and is NOT in cardiac arrest, provide care up to the limits of the DDNR and transport patient and DDNR form.
- Pre-hospital providers cannot honor other legal documents (living wills, etc.) without contacting medical command.
- DDNR forms may be overridden by patient.
- Physician Orders for life-Sustaining Treatment - forms are also acceptable, as are out-of-state DNR

Deceased Patients

Indications:

- Rigor mortis and/or lividity
- Decapitation
- Traumatic cardiac arrest upon arrival

Procedure:

- Do not resuscitate any patient who meets the above criteria.
- Notify law enforcement, if not already done so by local communications center.
- Have only 1 provider (AIC) enter the scene to confirm death via listening to apical heart sounds.
    - Make all attempts not to disturb the scene.
- If resuscitation efforts are in progress medical command must be contacted for orders to

discontinue efforts (see Documentation Policy).

Documentation Standards

Operations Guideline

Reviewed: 2020	Updated: 2020

The following policy outlines the minimum documentation required for each patient contact.

- History of present illness
- Includes chief complaint, SAMPLE, OPQRST, and pertinent negatives
- Physical exam
- Use of body systems approach is recommended
- Complete vital signs are defined as pulse, respirations and BP (add GCS)
- May include pulse oximetry, capnography and pain scale as indicated,
- Repeat and document every 15 minutes for stable patients and every 5 minutes for unstable patients,
- Repeat and document after every medication administration,
- BP not required in children under 3 years but parameters of perfusion should be assessed and documented (skin condition, capillary refill, mental status, distal vs. peripheral pulses),
- Record the time all vital signs are taken,
- Any abnormal vital sign should be repeated and closely monitored
- Use only standard medical abbreviations.
- Medication administrations should include dosage, route of administration, and time of administration, assessment of response and provider who administrated medication.
- Treatments should be listed and documented with time of procedure and provider who performed procedure as well as assessment of response.
- For immobilization of extremity or spine, document pulse, motor and sensation prior to and after immobilization.
- For IV administration, document size of catheter, location of placement, provider who initiated IV, number of attempts, type of fluid, flow rate and total amount of fluid infused at time of transfer of care. The IV site should also be labeled “field” and the gauge of the catheter.
- ECG interpretations should be documented. Attachment of printed strip to PPCR is recommended. Any changes in rhythm should be documented.
- 12-leads performed in the field should be documented on the PPCR/ePPCR. A copy of the 12- lead attached to the PPCR/ePPCR is recommended.
- Advanced airway documentation should include method of confirmation, size of device, number of attempts, capnography and SAO2 readings, provider performing procedure, centimeters at teeth (ETT only). A separate regional airway form is also required.
- Medical Command orders requested (whether approved or denied) should be documented with time and name of physician as well as the exact order given. A physician’s signature is only required for medications administered outside these guidelines. Medical command directed by these guidelines does not require a physician’s signature
- A physician’s signature is not required to exchange a drug box.
- Waste of narcotic administration must be documented with name of person wasting, witness and the amount and name of medication wasted.
- A brief face to face report should be performed between EMS and hospital staff at turnover of patient care.
- A copy of the PPCR should be turned over to the receiving nurse as promptly as possible (this becomes part of the patient’s chart). A completed copy of the patient’s PPCR must be sent to the receiving facility within 12 hours of the turnover of care. A copy is turned into pharmacy if drug box

is exchanged. If the drug box is not exchanged, a copy is turned into ED registration. The white copy is the original to be retained by the transporting agency.

Ebola Regional Response Guideline Operations Guideline	
Reviewed: 2020	Updated: 2020

Information on EVD is a dynamic situation; therefore information in this guideline may change frequently. Updates to this guideline will be posted on the TJEMS website (www.tjems.org) as they are made. At all times administrative personnel/providers/etc. are to follow the recommendations of the CDC.

PSAP (public safety answer point):

- During call taking process the Communication Officer are encouraged to:
  - Use travel screening tool (See Appendix A)
    - Call types to use screening tool
      - Sick person
        - N/V, fever, malaise, muscle aches, fatigue, headache, weakness
      - Hemorrhage (internal or non-traumatic)
      - Chest pain
      - Respiratory distress
      - Abdominal pain
      - Seizure
      - Unresponsive
  - Communication Officers will alert dispatched unit using the following designated regional alert information, if travel screening tool is positive:
    - Use "Fever/travel precautions" to alert responders to what type of patient they may be dealing with.
    - This designation may be different in other Regional EMS Council areas.
    - Modified responses may be in order in an effort to minimize personnel exposure
      - Recommendation for a "single" unit response (i.e. no fire apparatus, ambulance only)

Agency Responders

- Upon arrival
  - Send a **single responder**, adequately trained in and equipped with appropriate PPE, to:
    - Re-confirm travel screen
    - Assess patient:
      - Minimally ill patients
        - Assessment = pulse
      - More seriously ill patients
        - Assessment should be made through an indirect method (i.e.

through a door, etc.)

- If travel screen is confirmed to be positive, the provider should then:
  - Obtain a phone number in order for VDH staff to contact the patient directly
  - Call Virginia Department of Health
  - Normal business hours 8am – 430pm, Monday –Friday
    - Planning District 10
      - 1-434-972-6200
    - Planning District 9 (for Madison County)
      - 1-540-948-5481
    - After hours, weekend, holidays
      - 1-866-531-3068
      - Call Order:
        - Dr. Denise Bonds = 1-434-972-6226
        - Ryan McKay = 1-434-964-8662
  - Providers should expect the VDH staff to:
    - Ask further questions in regards to the travel screen
    - What type of exposures they would have had
    - Travel dates
    - Make transport decision and contact hospital in addition to the provider

<u>Transport</u>

- If EMS transport is determined to be necessary
  - Patient
    - Place a surgical mask on patient
  - Provider
    - Limit the number of providers in the back of the unit
  - Unit
    - Patient compartment must be “sheeted” with minimally 3mil plastic sheeting taped to the ceiling of unit using painters tape.
    - Non-disposable equipment should be moved to an exterior compartment and/or passenger seat.
    - Disposable equipment may also be moved to prevent contamination.
  - If patient is ambulatory
    - Have patient move to the unit under their own power
  - If patient is not ambulatory
    - Contact appropriate communication center; request additional personnel to respond to scene for vehicle operation and preparedness.
  - Provider is to contact appropriate hospital with a patient report via land-line (preferred), if not feasible, then radio communication can be done using the regional alert designation

- Transport to destination as facilitated by VDH.
  - UVA – transport to loading dock
    - 1-434-924-9287 to make report
  - MJH/Sentara – transport to ED
    - 1-434-654-7150 to make report
- Upon arrival at facility
  - Attendant is to remain in unit with patient
    - UVA
      - Personnel will meet unit to escort patient and crew to appropriate location
    - MJH/Sentara – ED
      - Further direction will be given upon arrival at facility
    - Other facilities
      - Follow direction of the facility

Post transport

- Providers
  - Decontamination –
    - Providers will doff and dispose of PPE utilizing CDC recommendations see CDC recommendations for doffing PPE at: http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html
    - In appropriate area
    - The use of the "buddy system" is required
- Ambulance –
  - Decontamination
    - See appendix B
- Waste
  - If patient is transported, waste is to be left at facility
  - No patient transport
    - Follow DEQ (Virginia Dept. of Environmental Quality) recommendations at: www.deq.virginia.gov

Provider return to service criteria

- Follow recommendations of VDH

Emergency Custody Order

Operations Guideline

Reviewed: 2020	Updated: 2020

Order of substitute decision makers for incompetent patient (Virginia Code § 54.1-2986)

1. "A guardian for the patient. This subdivision shall not be construed to require such appointment in order that a health care decision can be made under this section"; or
2. "The patient's spouse except where a divorce action has been filed and the divorce is not final"; or
3. "An adult child of the patient"; or
4. "A parent of the patient"; or
5. "An adult brother or sister of the patient"; or
6. "Any other relative of the patient in the descending order of blood relationship"

Note: Girl/Boyfriends, neighbors or others with no blood relationship DO NOT qualify as legal substitute decision makers.

Criteria for any ECO: a condition that is an immediate or imminent life threat with

- A patient who "because of mental illness....or any other mental disorder or physical disorder which precludes communication or impairs judgment, is incapable of making an informed decision about providing, withholding or withdrawing a specific medical treatment…"
- Note religious caveat (i.e. Jehovah Witness) that "no person shall authorize treatment…that such person knows is contrary to the religious beliefs of the patient unable to make a decision, whether expressed orally or in writing."
- Virginia Code § 16.1-336.Definitions:
    - "Consent" means the voluntary, express and informed agreement to treatment in a mental health facility by a minor fourteen years of age or older and by a parent or a legally authorized custodian.
    - "Incapable of making an informed decision" means unable to understand the nature, extent or probable consequences of a proposed treatment or unable to make a rational evaluation of the risks and benefits of the proposed treatment as compared with the risk and benefits of alternatives to the treatment. Persons with dysphasia or other communication disorders who are mentally competent and able to communicate **shall not** be considered incapable of giving informed consent.

Psych ECO (Virginia Code § 37.2-808)

Does NOT require a physician assessment to get from magistrate – family or witness to suicidal thoughts/actions/evidence of significant risk of self-harm can call magistrate and request if there exists "probable cause to believe that any person (i) has a mental illness and that there exists a substantial likelihood that, as a result of mental illness, the person will, in the near future, (a) cause serious physical harm to himself or others as evidenced by recent behavior causing, attempting, or threatening harm and other relevant information, if any, or (b) suffer serious harm due to his lack of capacity to protect himself from harm or to provide for his basic human needs, (ii) is in need of hospitalization or treatment, and (iii) is unwilling to volunteer or incapable of volunteering for hospitalization or treatment."

Medical ECO (Virginia Code § 37.1-134.21, § 37.2-1103)

Emergency custody orders for adult persons who are incapable of making an informed decision as a result of physical injury or illness.

Requires:

Application by **a licensed physician** verifying that the "adult patient is incapable of making an informed decision as a result of physical injury or illness AND that the medical standard of care indicates that testing, observation and treatment are necessary to **prevent imminent and irreversible harm**."

The physician's opinion of incapacity shall only be rendered after:

- Either personal evaluation or electronic communication with EMS personnel on-scene regarding their evaluation
- An attempt to communicate directly (or electronically) with the adult person to corroborate the
    - EMS assessment of incapacity
- An attempt has been made to obtain consent from the adult person
- The adult person has failed to consent
- The magistrate shall ascertain that the adult person:
- Has no legally authorized person to give consent AND
- Is incapable of making an informed decision regarding necessary treatment AND
- Has refused transport AND
- Has indicated intention to resist transportation AND
- Is unlikely to become capable of making an informed decision within the time required.

Should the patient's condition change and the patient becomes capable of making an informed decision (i.e. hypoglycemia resolved), the physician must be contacted and the patient's wishes respected.

Information needed from you for magistrate to issue medical ECO ("adult person" = patient):

- Name and permanent address of "adult person" if known,
- Name of law enforcement agency on-scene (+ officer, badge # if possible)
- Name, hospital affiliation and contact number of licensed physician requesting ECO
- Present location of "adult person"
- Name and address of hospital that "adult person" is to be transported to (UVA Hospital, 1215 Lee Street, Charlottesville, VA 22908).

You may also be asked what evaluation you plan to undertake. Since you haven't seen the patient yet, but you can't legally do anything that isn't on the order unless the patient consents, you may want to be fairly broad here. Some options may be: physical exam, radiologic studies (potentially including CT scan and MRI), intravenous access, medication therapy, possible mechanical ventilation, hospital admission, laceration repair, fracture management, etc.

Final Authority on Medical Command

Operations Guideline

Reviewed: 2020	Updated: 2020

In the majority of situations, on-line medical command provided by hospital based communication services will meet the needs of providers faced with situations that required medical command to initiate procedures/treatments or are not addressed with standing orders or guidelines.

In the case where medical command has been sought and received, the provider will be expected to follow those orders. If the on-line medical command orders are contradictory to local guidelines, or exceed the training/certification or the provider(s), then the on-line medical command physician needs to be informed immediately that the orders cannot be carried out. In the event that there is a disagreement between the provider and the on-lined medical command physician, the provider must communicate that concern to the medical command physician, and describe the reason(s) for concern in following the orders. Once this communication has occurred, if the recommended orders are within the training/certification of the provider(s) and in keeping with regional guidelines, then those orders will be expected to be carried out.

In the event that there is a disagreement between the provider(s) and the on-line medical command physician, the provider may consult with their agency OMD regarding the patient's care as long as the agency OMD is immediately available to provide medical command. If agency OMD is immediately available and willing to assume medical command, then the agency OMD will become the on-line medical command physician on that call. The provider involved is responsible to notify the previous on-line medical command provider that this change has occurred.

If there is a physician on-scene who is adequately identified to the providers, is qualified and willing to assume responsibility for direct medical command, then that physician's orders will supersede on-line medical command. An EMS physician who is on-scene may assume medical command even if they are not the agency OMD for the providers involved in the patient's care.

Helicopter Operations

Operations Guideline

Reviewed: 2020	Updated: 2020

When requesting helicopter medevac:

Contact MedCom with exact location for rendezvous. Include route numbers, any pertinent landmarks, landing zone, commander identification and radio frequency.

Provide MedCom with all available patient information and care being administered. Minimum information should include chief complaint, age, sex, weight, systolic BP, respiratory rate and Glasgow Coma Scale.

Set up a landing zone (LZ) that is at least 100 x 100 feet square and free of any obstructions or loose material (i.e. dirt, gravel or snow). Provide as level a surface as possible. Mark all four (4) corners of the landing zone with flares or other marker and place a fifth on the downwind side. Be sure to secure the markers, as the rotor wash can blow them a great distance and could possibly be a fire hazard. You can also mark the landing zone with rescue vehicles parked in a triangular fashion with their headlights on low beam until helicopter in on final approach, then no white lights (head lights or scene lights) at the landing zone. Also remember red flashing lights are an excellent way to mark your location. Landing zone courses are offered by helicopter services and ideally on LZ Coordinators who have completed this course should set up landing zones.

NEVER AIM ANY LIGHTS INTO THE PILOT'S EYES. THIS COULD DESTROY HIS/HER NIGHT VISION AND RESULT IN A CRASH!

If setting up your landing zone in the roadway, it is essential that you mark all utility lines and relay their exact location as well as any other hazards to the pilot. Utility lines must be marked with a line of flares (or other warning device) below the wires spaced 5 – 10 feet apart. Do this for all utility lines in the area. Remember utility lines are invisible from the air and can cause a catastrophe if not properly marked and identified to the pilot.

Once the aircraft has landed allow no one to approach the craft. You should only approach the aircraft after being instructed to do so by a member of the flight crew. **Safety musts:**

- Never approach the helicopter from the rear or on the uphill side of landing on a slope.
- Always stay in the pilot's view.
- Even though some helicopters have high set main rotors, some do not. To be safe, always walk in a slightly crouched position.
- No hats, except firefighter helmet with chin straps fastened, under the main rotor if helicopter is running.
- Never carry anything above the level of your head and secure blankets, sheets, etc.

STAY AWAY FROM THE TAIL SECTION OF THE AIRCRAFT AT ALL TIMES!

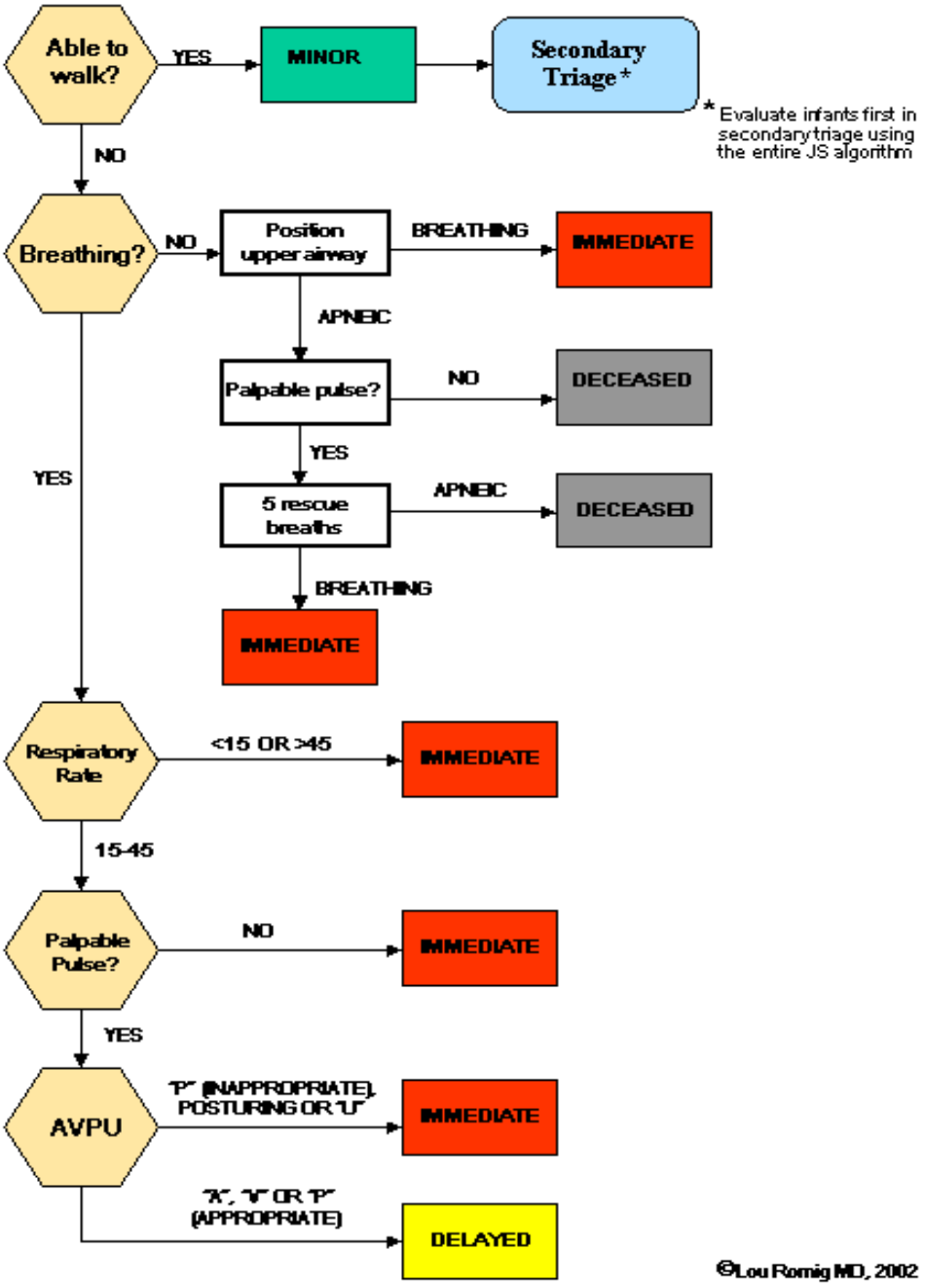
When loading your patient, a member of the flight crew will accompany you. Keep others away from the aircraft. Maintain communications with MedCom and the helicopter at all times on the frequency you initially called in on unless otherwise specified by MedCom.

Pediatric JumpSTART Triage

Operations Reference

Reviewed: 2020	Updated: 2020

JumpSTART Pediatric MCI Triage©



Guideline/Reviewed 2017

Patient Hand-off Information

Operations Reference

Reviewed: 2020	Updated: 2020

Essential Elements of Information

- Patient's name
- Age
- Chief complaint
- History
- Vital signs
- Last set taken
- Assessment
- Treatment/s
- Transport impact
    - Any changes in the patient's condition en-route
- "Do you have any questions for me?"

Refusals and Documentation

Operations Guideline

Reviewed: 2020	Updated: 2020

Anytime a patient refuses treatment and transport, an EMS informed consent to refuse statement should be obtained. If your documentation system does not have the "Informed Consent to Refuse" standardized format, you will have to write the refusal out on the PPCR and then have the patient sign. The Virginia OEMS PPCR has the standardized format on the back of the original copy. Please make sure you are documenting refusals properly, this includes a full set of vital signs and any procedures deemed necessary by the attendant-in-charge (AIC) but refused by the patient (i.e. spinal immobilization, intravenous cannulation,etc.).

Any refusal of treatment and/or transportation by or for a pediatric patient (under 4 years of age) must have Medical Control consultation.

Refusal you write out must include the following:

- Patient is awake and orientated to: person, place and situation
- Been informed of potential need for
- Further injury/illness care or management
- Other: _____

AND

- Been informed of the potential risks associated with the refusal of service
- Potential risk associated may include, but not limited to:
    - Undiagnosed injury or illness
    - Improper healing of injury
    - Worsening of injury or illness with or without changing signs and symptoms
    - Subsequent changes in condition including unconsciousness (coma) shock or death
    - Other: _____

AND

- Understand this refusal in no way reduces my ability to recall EMS services in the future.
- Witness signatures for patient refusals may be a by-stander, law enforcement, family member, etc. The use of response personnel as witnesses to refusals should be avoided.
- Patient repeats risks back to provider.

Emergency Custody Orders (ECO)

A person who is:

- Experiencing a behavioral emergency
- In need of further evaluation
- Who is incapable of volunteering or unwilling to volunteer for treatment, and is either:
    - An imminent danger to his/her self or others as a result of mental illness
    - So seriously ill as to be substantially unable to care for his/her self.

Those that meet the above criteria may be taken into emergency custody by law enforcement and transported for evaluation by a designee of a Community Services Board to determine the need for

involuntary hospitalization.

An ECO will generally not be issued for a person that you believe is in need of medical treatment but is refusing care; however, a law enforcement officer that has taken a person into custody may seek medical evaluation and treatment of the person if necessary.

A person meeting the criteria may be taken into emergency custody in two (2) ways:

- A law enforcement officer may take the person into custody without an order being issued by a magistrate and may transport the person for evaluation, or
- An Emergency Custody Order may be issued by a magistrate on the sworn petition of “any person” if he/she finds the person to be detained meets the criteria set out above, and law enforcement will serve thatorder.

If any of the above methods fail, contact Medical Direction

Regional Ambulance Restocking Agreement

Operations Guideline

Reviewed: 2020	Updated: 2020

January 3, 2002 is the effective date for the *Medicare and State Health Care Programs: Fraud and Abuse; Ambulance Replenishing Safe Harbor Under the Anti-Kickback Statue* (42 CFP Part 1001), otherwise referred to as the Ambulance Restocking Arrangements, Final Safe Harbor Conditions. The following outlines the regional process for those facilities within the Thomas Jefferson EMS Council region.

Hospitals will restock all ambulance providers who transport patients to their facility from the following category: all non-profit and governmental providers.

The restocking will include all medications, medical supplies and linen on a one-for-one basis used by ambulance providers in the treatment of the arriving patient. This includes the exchanging of opened or expired drug boxes from all agencies (for-profit or non-profit) that participate in the Thomas Jefferson EMS Council regional drug box program.

There are no charges created to the patient by the ambulance provider for the use of the aforementioned supplies and medications.

There are no charges generated to the ambulance providers for the restocking of the supplies as detailed in line 2 by the receiving facility.

Restocking of the ambulance provider pertains to both emergent and non-emergent transports.

All medications and supplies used by the ambulance provider will be documented on the agency “call report” and a copy provided to the receiving hospital. Minimum information includes the patient’s name, date of service (transport) and pertinent medications and/or supplies exchanged.

All ambulance providers within the Thomas Jefferson EMS Council must comply with all applicable Federal and state rules and regulations.

For further information regarding the Regional Ambulance Restocking Agreement or to obtain additional copies, please contact the Thomas Jefferson EMS Council at (434) 295-6146.

Pre-hospital ECG Guidelines for STEMI

Operations Guideline

Reviewed: 2020	Updated: 2020

Application: Those situations when EMS personnel have obtained a pre- hospital ECG suspicious for STEMI (ST-Segment Elevation MI)

1) EMS Providers should strive to achieve the National 10/10/10 goal.
- 10 minutes from first medical contact to EKG
- 10 minutes from EKG to Notification of Receiving Facility
- 10 Minutes from Hospital Notification for activation of Cath Lab

2) EMS should immediately contact Medical Command, clearly identify the incoming patient as a possible STEMI, and request to talk directly with the attending ED physician for medical command – even if EMS is unable to transmit the ECG to Hospital at that time.

3) MedCom will immediately notify the ED attending, who will then talk directly with EMS about the case and ECG findings. Med Com will not refer possible STEMI cases to residents or attempt to triage EMS calls.

4) The ED attending will discuss the case with EMS and (if applicable) evaluate any transmitted ECG images. Based on available information, the ED attending can either activate the cath lab prior to patient arrival (high probability of STEMI) or delay activation (diagnosis of STEMI uncertain) until the patient is seen in the ED.

5) Note: Direct phone conversation between EMS and the ED attending is required in order to activate cath lab. Viewing of a transmitted ECG prior to activation is optimal but not required; use physician judgment.

6) ED attending should then notify the ED Team Leader (shift manager) in order to prepare the ED for a possible STEMI. Potential STEMI patients should be evaluated immediately by an ED attending or senior resident.

7) Upon arrival, EMS should immediately notify ED staff that the patient is a possible STEMI ALERT and any pre-hospital ECG's should be immediately shown to the attending physician and ED care team.

8) At patient arrival all pre-hospital ECG's (or a copy) should be given to the ED physician or patient care team. EMS personnel are also encouraged to seek feedback from the ED staff on each STEMI case. This is vital for quality improvement purposes and feedback.

Resource Cancellation

Operations Guideline

Reviewed: 2020	Updated: 2020

Once EMS has established patient contact, only the Attendant-in-Charge (AIC) or scene medical command may cancel additional resources that have been requested for patient care. Anyone not on scene shall not cancel or change the resources that have been requested without specific agreement of the AIC/scene medical command. Additional resources may include helicopters, ALS support and specialty teams.

Rapid Sequence Intubation Guideline Operations Guideline	
Reviewed: 2020	Updated: 2020

Requirements for RSI program:

- Current NREMT-P/Paramedic certification and other training as required by agency medical director.
- Second provider on scene who is cleared to perform intubation.
- Drugs will only be administered by RSI approved provider. If allowed by agency OMD, intubation may be performed by another qualified intubator under the direct supervision of the RSI approved provider.
- Written approval for each provider by OMD of agency where RSI will be used.
- There will be 100% QI review of patient encounters.
- Maintenance of RSI approval will require continued OMD approval.

Contents of RSI pack:

- Pack to be stored in secured area like drug boxes
    - 2 – Etomidate 20 mg/19g needles
    - 2 – Vecuronium 10mg with filter needles
    - 2 – 10cc sterile water diluent/30 cc syringe
    - 2 – Succinylcholine 200mg/10cc syringes
    - 2 – Ketamine 200mg vials
    - 1 – Atropine 1mg bristojet type syringe
    - 2 – 3cc syringes with 20g needles
    - 5 – 10cc syringes
    - 2 – 30cc syringes
    - 7 – 19g needles
    - 10 – alcohol prep pads

Indications for RSI:

- RSI may be done under standing orders
- Patients over 18 years of age unless specific permission given prior to procedure by medical command.
- Need for intubation:
    - Burns with suspected significant inhalation injury
    - GCS < 8 related to traumatic injury
    - Acute or impending airway loss (inability to protect airway)
        - RR < 10 or > 30
- No known contraindications to RSI drugs

Procedure:

- Preparation
    - Monitoring (continuous ECG and SpO2, and BP pre- and post-)

- Monitoring waveform capnography
- Functional laryngoscope and BVM with high flow oxygen
- Endotracheal tube(s), stylet, 10cc syringe
- Alternate airway (i.e. rescue airways and cricothrotomy equipment) immediately available
- All medications drawn up and labeled

- Patent IV
- Assess for difficult intubation: LEMON
- Suction on and ready
- Tube confirmation equipment available (EtCO2 +EDD)

- Pre-oxygenation
  - Either 100% oxygen x 5 minutes or 8 vital capacity (deep) breaths on 100% O2
  - Patient on continuous pulse oximeter monitoring
- Paralysis and induction
  - Etomidate 0.3 mg/kg (20 – 30 mg)
  - Ketamine 1-2 mg/kg/IV
  - Succinylcholine 1.5 mg/kg (120mg)
    - **Contraindicated with
      - Burns > 24 hours old
      - Crush injury > 72 hours old
      - Denervation process (i.e. para/quadriplegia)
      - Risk of hyperkalemia (i.e. ESRD)
- Confirmation of placement
  - End-tidal CO2 color change or proper waveform
  - Breath sounds auscultated over lungs, no gastric sounds
  - Secure endotracheal tube, note position
- Post-intubation management
  - Long-term paralytic: Vecuronium 0.1 mg/kg(9mg)
  - Sedation: (May be repeated as indicated)
    - Midazolam 0.1 mg/kg
    - Fentanyl 1-2 mcg/kg
    - Ketamine 1-2mg/kg
  - Continuous waveform capnography
- Paperwork
  - PPCR
  - Airway form
  - RSI form
- Exchange
  - Kit will be exchanged in return for e/PPCR + Airway form + RSI form ONLY

Scene Authority for Patient Care

Operations Guideline

Reviewed: 2017	Updated: May 2015

Scene authority and transition of patient care may occur on several levels within our system. The senior level patient care provider may assume responsibility of pre-hospital care. In the event of a multi-agency response (1st Responder agency, transport agency, etc.), the agency assigned with the task of transport shall obtain and maintain the senior level of provider care responding to the incident. If there are concerns regarding the care of the patient, Medical Control shall be consulted.

Patient Care Transfer:

The 1st Responder responsible for patient care will provide a verbal report to the assuming transport provider. Once the report is received, the transport provider assumes patient care responsibilities. The transfer of care shall be noted on the call report and/or by radio communications.

The transport provider may request the assistance from the 1st Responder agency for "manpower" for those calls that are resource intensive (cardiac arrests, major illness/injury, etc.).

Should disagreements arise between the 1st Responder responsible for initial patient care and the receiving transport provider, they should be resolved in a quiet, professional manner prior to transport. If a resolution cannot be reached prior to transport, either Medical Control may be contacted for further resolution or the 1st Responder responsible for initial patient care may be requested to accompany the patient to the receiving facility. Each agency's OMD (or designee) shall be notified of the incident within twenty-four (24) hours.

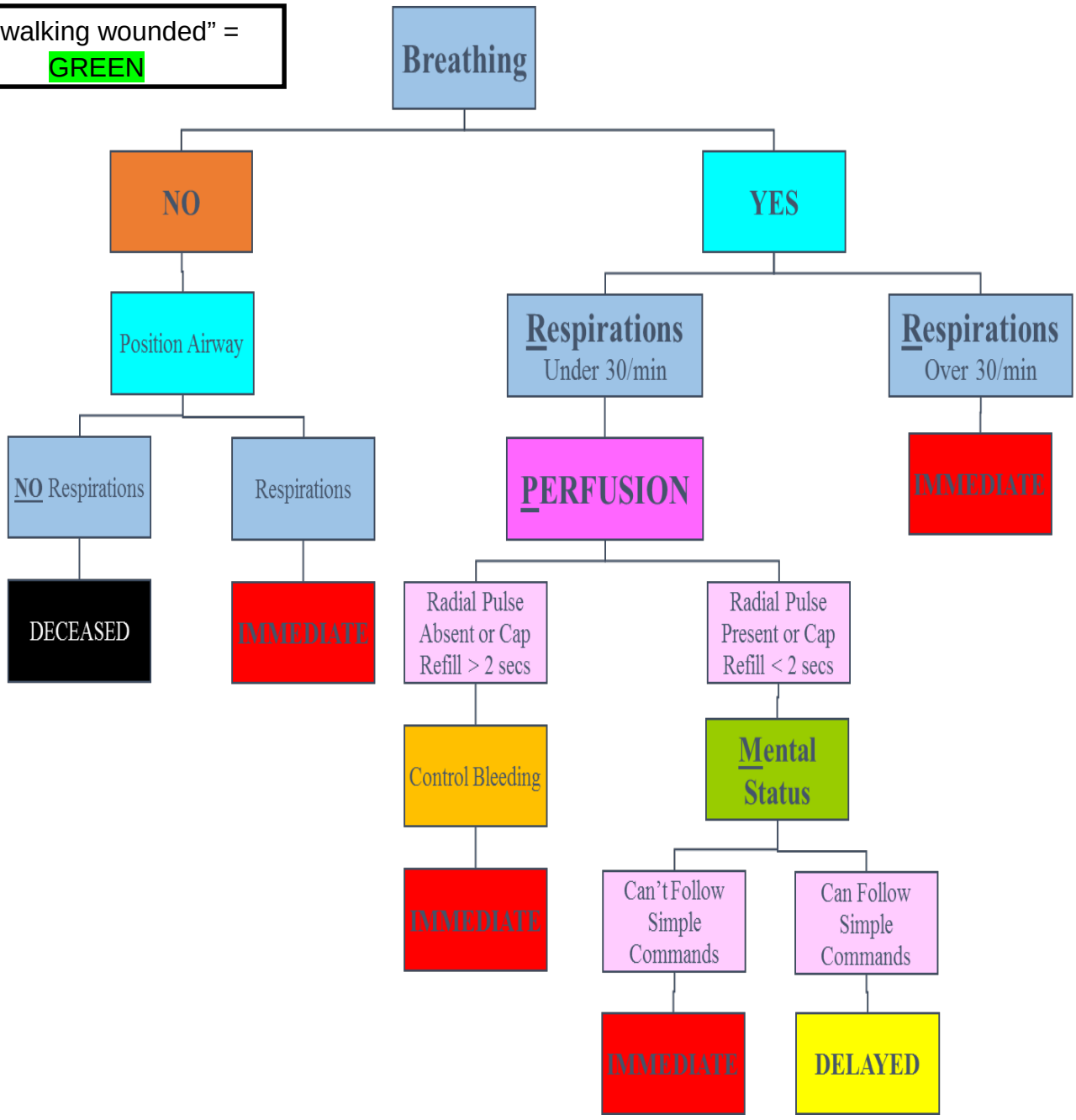
Once ALS level of care has been initiated (IV therapy, EKG monitoring, medical administration, etc.) that same level of care must be maintained until transfer of care to the appropriate receiving facility.

MCI:
S.T.A.R.T.

Operations Guideline

Reviewed: 2020	Updated: 2020

All “walking wounded” = GREEN



Termination of Resuscitative Efforts in the Field

Operations Guideline

Reviewed: 2020	Updated: 2020

Unless special circumstances exist, patients who are victims of cardiac arrest, either traumatic or non-traumatic, may be candidates for resuscitative efforts to be withheld or terminated in the field in certain situations.

Obvious signs of death:

- Injuries incompatible with life (i.e. decapitation)
- Dependent lividity
- Rigor mortis
- Decomposition

Termination Considerations:

Termination of resuscitation be considered if the adult, non-traumatic, out-of-hospital cardiac arrest patient has received:

- At least 20 minutes of cardiopulmonary resuscitative efforts
- Adequate airway management
- ETCO2 reading less than 10 with effective compressions
- Intravenous/IO access

yet remains in asystole or slow pulseless electrical activity with no return of spontaneous circulation in the field.

This would include patients:

- Attended by BLS providers who have had no shocks recommended by an AED for 20 minutes,
- When 20 minutes or greater has elapsed since the last shock recommendation,
- Suffer from an EMS witnessed arrest and have not responded to 20 minutes of resuscitative efforts.

The safety of the public and providers must be considered when transporting a working cardiac arrest patient.

Transport should not occur if the above criteria are met and on-line medical control should be consulted to terminate efforts.

Continued resuscitative efforts:
Patients who have continued or recurrent ventricular tachycardia, ventricular fibrillation, or continued "shock" recommended by an AED are candidates for continued resuscitative efforts.

Any patient who exhibits return of spontaneous circulation is a candidate for continued resuscitative efforts and transport.

Victims of traumatic cardiac arrest (blunt or penetrating) may have resuscitative efforts withheld if they are found to be:

- Pulseless and apneic
- Without signs of life including:
    - Pupillary reflexes
    - Spontaneous movement (including respiratory efforts)
    - Organized ECG activity on initial assessment.

Those suffering penetrating chest injuries that are within 15 minutes of definitive care, immediate transport must be considered.

Loss of vital signs, more than 15 minutes from trauma center – termination

Loss of vital signs, less than 15 minutes from trauma center – transport

Any patient who has return of signs of life, including organized ECG activity, should have resuscitative efforts continued and be transported to a trauma center.

Once resuscitative efforts have been initiated, termination of those efforts must be discussed with on-line medical command. Special circumstances may exist that might modify recommendations for transport, particularly hypothermia and drowning. These recommendations do not apply to infants and children, who are frequently candidates for continued resuscitative efforts, and who should have resuscitative efforts initiated unless they exhibit obvious signs of death such as rigor and dependent lividity.

Transfer of Care to Providers of Lesser Certification

Operations Guideline

Reviewed: 2020	Updated: 2020

The provider with the highest level of certification on the scene should conduct patient assessment to determine chief complaint and level of distress.

If it is determined that the patient is stable and all patient care needs can be managed by the lower level provider, patient care can be transferred to a provider of lower certification for transport.

All personnel on scene are encouraged to participate in patient care while on scene regardless of who “attends” the patient while en route to hospital.

Determination of the attendant in charge should be based upon the patient’s immediate treatment needs and any reasonably anticipated treatment needs en route to the hospital.

Both the transporting provider and the provider who transferred care must complete PPCR/ePPCR documentation that covers all aspects of assessment, care and disposition.

Treatment of Patients under Age 18

Operations Guideline

Reviewed: 2020	Updated: 2020

Persons subject to this policy:

This policy applies to persons under the age of 18 (except those who have an Order of Emancipation from a Juvenile and Domestics Relations District Court) who are in need of medical or surgical treatment, including such persons who report being sick or injured; who have obvious injury; and/or have a significant mechanism of injury which suggests the need for medical evaluation.

Authority of Parents, Guardians or Others:

Parents have the authority to direct or refuse to allow treatment of their children. A court appointed guardian, and any adult person standing *in loco parentis*, also has the same authority. "In loco parentis" is defined as "[I]n the place of a parent; instead of a parent; charged, fictitiously with a parent's rights, duties and responsibilities." Black's Law Dictionary, 708 (5th ed. 1979). 1987-88 Va. Op. Atty. Gen. 617 "Furthermore, I would point out that § 54.325.2(6) allow any person standing "in loco parentis" to consent to medical treatment for a minor child. This signifies, in my judgment, an intent to allow any responsible adult person, who acts in the place of a parent, to consent to the treatment of a minor child, particularly in emergency situations." 1983-84 Va. Op. Atty. Gen. 219. Such a person may be a relative, school teacher or principle, school bus driver, baby-sitter, neighbor or other adult person in whom care of the child has been entrusted.

Persons subject to policy with altered mental status:

A person meeting the criteria of paragraph 1 that is unconscious, has an altered mental status, signs of alcohol or substance abuse or head injury shall be treated under implied consent and transported, unless a parent or guardian advises otherwise. Medical control must be consulted if a parent or guardian or person *in loco parentis* refuses to allow treatment or transport.

Persons subject to policy under age 14:

A person meeting the criteria in paragraph 1 that is under the age of 14 shall be treated and transported unless a parent or guardian or persons *in locos parentis* advises otherwise. Do not delay treatment or transport for extended periods simply trying to contact a parent or guardian. If you believe that treatment is necessary, but the parent or guardian or person *in loco parentis* refuses to allow treatment, medical control should be consulted.

Person subject to policy aged 14 – 18:

A person meeting the criteria of paragraph 1 who is between the ages of 14 and 18 may refuse treatment and transport, unless a patient or guardian or person *in loco parentis* advises otherwise. If you believe that treatment is necessary, but the person refuses, an attempt should be made to contact a parent or guardian, and medical control should be consulted. If you believe that treatment is necessary, but the parent or guardian or person *in loco parentis* refuses to allow treatment, medical control should be consulted.

Persons subject to policy married or previously married:

A person meeting the criteria of paragraph 1 who is, or has been, married shall be deemed an adult for purposes of consenting or refusing medical treatment. Code of Virginia § 54.1-2969.

Persons subject to policy that are pregnant:

A person subject to this policy who is pregnant shall be deemed an adult for the sole purposes of giving consent for herself and her child to medical treatment relating to the delivery of her child; thereafter, the minor mother of such child shall be also deemed an adult for the purpose of giving consent to medical treatment for her child. Code of Virginia § 54.1-2969.

Pediatric Non-transport:

All pediatric patients under four (4) years of age who are not going to be transported after 9-1-1 access has been made will need to consult with Medical Control via UVA MedCom (434) 924-9287. Document all pertinent information including physician’s name involved with the consultation.

UVA EMS Adult Trauma Alert Criteria

Operations Reference

Reviewed: 2020	Updated: 2020

Alpha Alerts ≥ 16 yrs	Beta Alerts ≥ 16 yrs
• All pts intubated in the field • All pts with ongoing respiratory compromise, even intubated trauma transfers from OSH. Any pt with need for emergent airway. For example: o Sats < 90% ETCO2: >50 o Massive maxillofacial trauma o Airway trauma /hemorrhage o Stridor • **Circulation:** o Confirmed BP < 90 o Trauma transfers requiring blood to maintain VS • **Disability:** o GCS < 9 with trauma mechanism • **Mechanism:** o GSW or stab wound to neck, chest or ABD o GSW to extremities proximal to elbow or knee o EM or Trauma Service MD discretion • If any of the above criteria are met **ALPHA Alert should be activated!** ***Other important information: IS PT ON ANTI-COAGULANTS?***	• Intubated trauma transfers from OSH without ongoing respiratory distress • Facial burns or singed facial hair w/ altered phonation • **Circulation:** o Relative hypotension BP >90 but < 100 o BP <110 in ages > 65 y/o • **Disability:** o GCS < 15 in pts w/ severe headache, N/V, or if pts taking oral anticoagulants, or Plavix o GCS 9 – 13 or GCS 1 point below baseline (including GLF) o New tetraplegia, hemiplegia, or persistent neurologic deficit o Open or depressed skull fracture, GCS ≥ 9 o Known fracture to a vertebral body from outside imaging • **MOI** o Stable, severe system injury (e.g. known SDH / EDH, severe pelvic fx, etc.) o ≥ 2 proximal long bong fx o Amputation proximal to wrist or ankle, or crushed / degloved, mangled extremity o Advanced pregnancy; fundus above umbilicus with abd trauma o Concomitant thermal / multisystem injury o TBSA ≥ 40% o EM MD discretion

Please be sure to include the patient's GCS when calling a Trauma Alert.
Do NOT let someone else decide if you meet Alert criteria.
If they meet Trauma Alert Criteria, active a Trauma Alert!

UVA EMS Pediatric Trauma Alert Criteria

Operations Reference

Reviewed: 2020	Updated: 2020

Any patient should be upgraded at any time prior to admission to ICU if there is a decline in status

Please be sure to include the patient's GCS when calling a Trauma Alert.
Do NOT let someone else decide if you meet Alert criteria.
If they meet Trauma Alert Criteria, active a Trauma Alert!

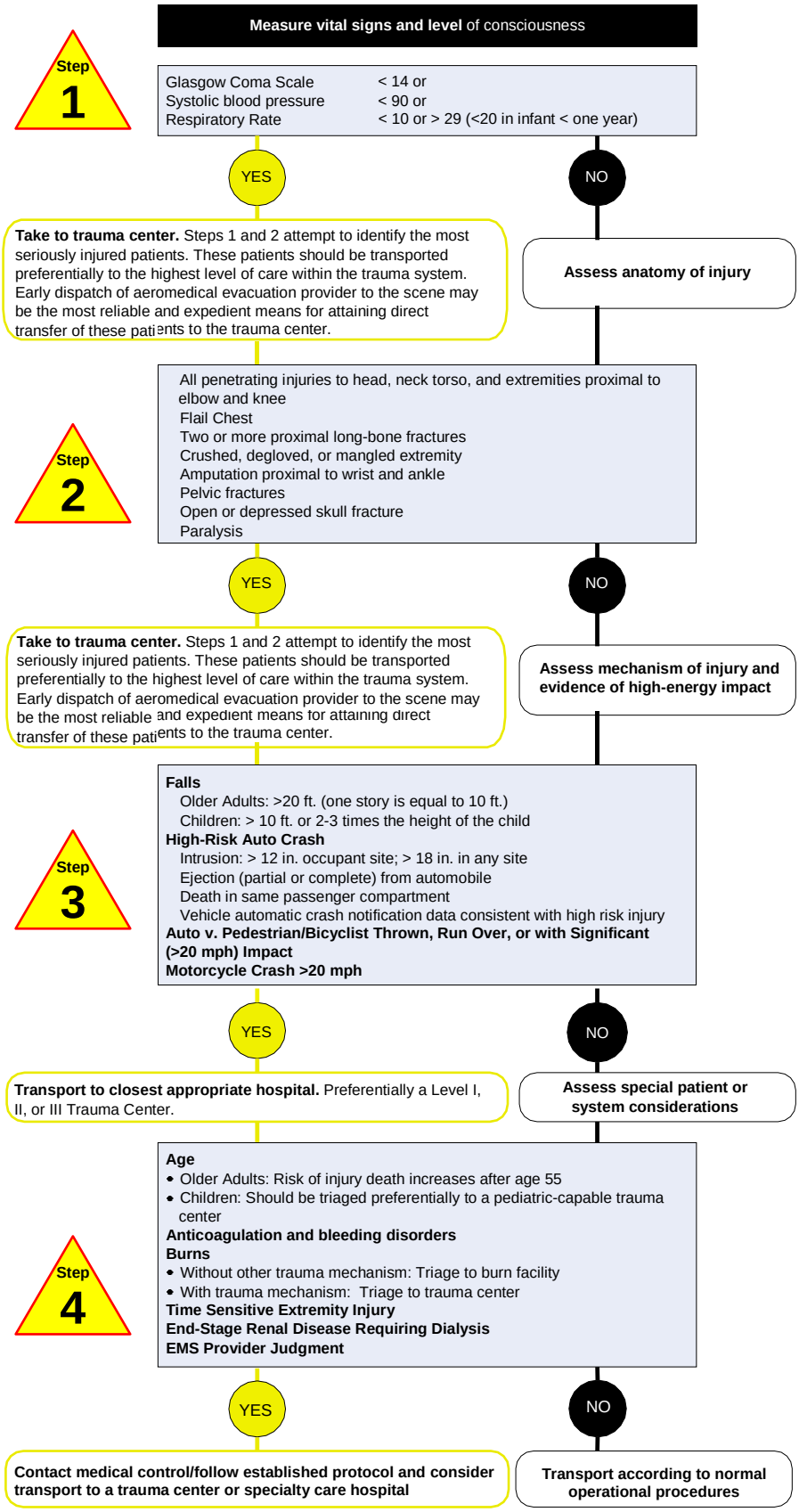
Alpha Alert Criteria (< 16 y/o)	Beta Alert Criteria (< 16 y/o)
• Airway / breathing: o Patients who are demonstrating ongoing respiratorycompromise o All intubated patients transported to UVA directly from thefield o (e.g., SAO2 < 90, massive maxillofacial trauma, airway hemorrhage, stridor, or flailchest) • Circulation: o Weak central pulses or absent peripheral pulses o Dysrhythmia o Hypotension (SBP < 70 mmHg + 2x age in years) ecognize any child with poor capillary perfusion and tachycardia is in shock, regardless of BP number o Pre-hospital cardiac arrest (any mechanism) o Patient requires fluid or blood administration to maintain blood pressure • Disability: o GCS < 9 with trauma mechanism or GCS declining by 2 with trauma mechanism o A V P U: responsive only to pain or unresponsive o New paraplegia or quadriplegia • Mechanism: o GSW or stab wound to neck, thorax or abdomen o GSW to extremities proximal to elbow or knee o Hangings, especially if any of the physiologic criteria above are present	• Airway / breathing: o Intubated inter-facility transfer patients without ongoing respiratory compromise. o Facial burns or singed facial hairwith alerted phonation. • Circulation: o Initial age specific hypotension stabilized after 20 cc/kg Isotonic Crystalloid IVF. • Disability o GCS 9 – 13 o Head injury / LOC with severe persistent headache, nausea / vomiting o Open or depressed skull fracture,GCS > 10 o Known fracture to a vertebral body from outside imaging • Mechanism / Injury: o Falls 10 feet or 2 – 3 times height of child o Pedestrian or bicyclist vs. car thrown, run over or significant > 20 mph impact o Stable severe injury (e.g., known SDH / EDH or pelvis fracture) o Concomitant thermal / multi-system injury o Burns with TBSA 10 – 15% (2^{nd} and 3^{rd} degrees only) o High voltage electrical burns • EM OR TRAUMA SERVICE PHYSICIAN DISCRETION

o Two or more proximal long-bone fractures or femur o Burns > 25% TBSA or inhalation injury o Threatened limb or complete/partial amputation proximal to wrist or ankle, crushed, degloved or mangled extremity. • EM or TRAUMA SERVICE PHYSICIAN DISCRETION	EDIATRIC TRAUMA TRANSFERS (<16 o) l trauma transfers must be evaluated in the emergency department regardless of the work-up prior to arriving at UVA. Direct admits from PICU are not trauma transfers. n alert should be activated PTA as with any other pediatric trauma, based on their current physiologic status.

Reference: Resources for Optimal Care of the Injured Patient: 2014

Injury:
State Trauma Triage
Guideline

Reviewed: 2020	Updated: 2020



Procedure Guidelines

12-Lead ECG Acquisition Guideline

Procedure/Reference

Reviewed: 2020	Updated: 2020

Providers of all levels should be trained to acquire 12-lead ECG's. Cardiac(rhythm) interpretation remains an EMT-I and EMT-P skill.

Initiating care of the clinically unstable patient takes precedence over 12-lead ECG acquisition; whenever possible patient care and 12-lead ECG should take place simultaneously. Obtaining a 12-lead ECG should be performed within ten (10) minutes of EMS contact.

The 12-lead ECG is not a triage tool used to make a decision whether or not to transport the patient.

Once a 12-lead ECG has been obtained, the patient **should** be transported. EMRs, EMTs and AEMT level providers must transmit anytime a provider suspects a STEMI or ECGs that display **"***ACUTE MI SUSPECTED***"** or **"***MEETS ST ELEVATION MI CRITERIA***"** to the receiving hospital and contact Medical Command and speak with the attending physician at that hospital for ECG interpretation. Once the 12-lead ECG is acquired and transmitted, the EMS provider should leave the leads connected and the ECG monitor on to allow the monitor to evaluate for ST segment changes.

If the patient has unstable vital signs **AND**/**OR** has a high risk history or complicated ALS complaints, reasonable attempts must be made to rendezvous with a medic level provider for transport.

Any change in patient status or condition should result in a medic being summoned to meet during transport. EMS should not delay transport while attempting to find or meet with a medic.

Acquisition Criteria:

EMS should acquire a 12-lead ECG on the following patients in no more than 10 minutes of EMS patient contact:

Patients > 30 years old experiencing any of the following:

- Chest pain, discomfort, pressure or tightness
- "Heartburn" or epigastric pain
- Complaints of "heart racing" (HR > 150 or irregular and > 120)
- Complaints of "heart too slow" (HR < 50 and symptomatic)
- A syncopal episode or severe weakness in patients > 45 years old
- New onset stroke symptoms (< 24 hours old)
- Difficulty breathing (with no obvious non-cardiac causes)

Patients (regardless of age) with any of the above symptoms and a history of:

- Prior cardiac disease such as a heart attack
- A family history of early heart attack
- Diabetes mellitus
- Severe obesity
- Recent illicit drug use

STEMI Patients: (All providers)

If an acute ischemic event or myocardial infarction is identified, or the monitor reads "*****ACUTE MI SUSPECTED*****" or "*****MEETS ST ELEVATION MI CRITERIA*****", the receiving Attending Physician should be contacted promptly, the care of the patient discussed, and additional resources may be mobilized as necessary to expedite patient care (i.e. potentially including Medic rendezvous, critical care transport or Medevac). If transmitting a 12-lead ECG, you must contact medical command and request to speak to the Attending Physician. Inability to transmit 12-lead ECG should **NOT** delay voice communication to the receiving Attending Physician. If SMJH ER Attending Physician is not immediately available, do not delay giving full report to the RN. When a STEMI is suspected, providers should use the phones to communicate with the Attending Physician so a name & date of birth can be communicated to pre-register the patient.

Obtaining the field 12-lead ECG is valuable for comparison to later 12-lead ECG's; the field ECG may be repeated if the patient's clinical situation changes. ALS providers should attempt to establish IV access, preferred 18-20 gauge. **If at all possible, the patient's right hand/wrist should be avoided for IV access.**

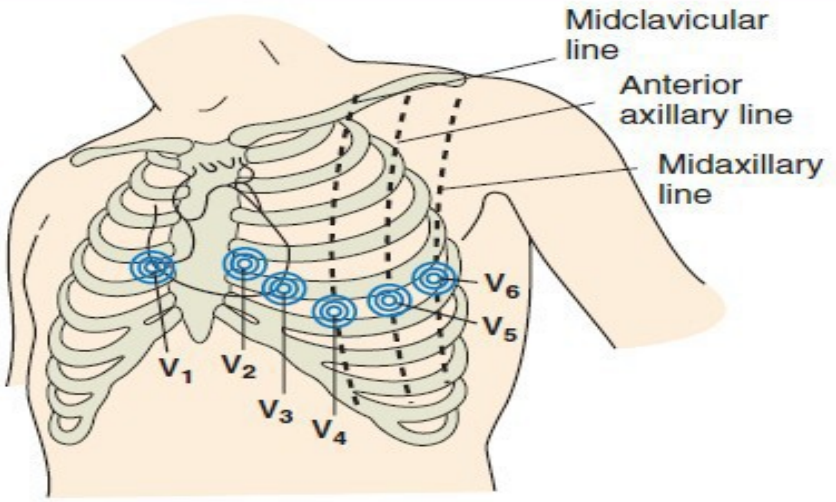
Field 12-lead ECG tracings should be provided to the receiving hospital for documentation in the patient's chart upon arrival.

Procedure:

- Expose chest and prep as necessary.
- Apply chest leads and extremity leads using following landmarks:
    - V1 – 4th intercostal space at the right sternal border
    - V2 – 4th intercostal space at the left sternal border
    - V3 – Directly between V2 and V4
    - V4 – 5th intercostal space at mid-clavicular line
    - V5 – 5th intercostal space at anterior axillary line
    - V6 – 5th intercostal space at mid-axillary line
- Instruct patient to hold still
- Press appropriate button to acquire 12-lead
- Print and transmit ECG, include patients sex and age

Chest Leads

Standard Chest Lead Electrode Placement



Elements of Chest Leads

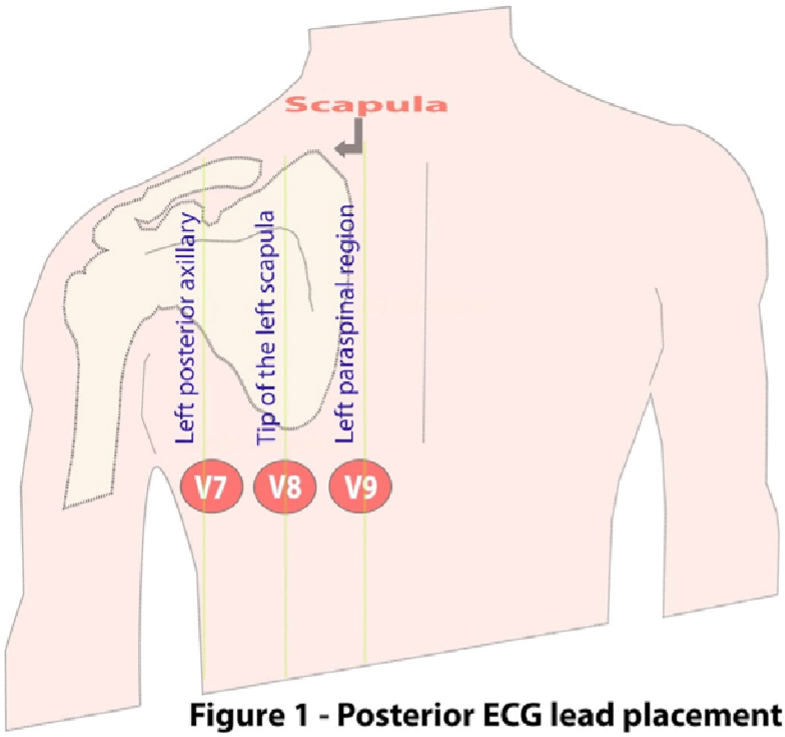
Lead	Positive Electrode Placement	View of Heart
V_1	4th Intercostal space to right of sternum	Septum
V_2	4th Intercostal space to left of sternum	Septum
V_3	Directly between V_2 and V_4	Anterior
V_4	5th Intercostal space at left midclavicular line	Anterior
V_5	Level with V_4 at left anterior axillary line	Lateral
V_6	Level with V_5 at left midaxillary line	Lateral

I - Lateral Circumflex Artery	**aVR**	**V1 - Septal** Left Anterior Descending Artery	**V4 – Anterior** Left Anterior Descending Artery
II - Inferior Right Coronary Artery	**aVL - Lateral** Circumflex Artery	**V2 - Septal** Left Anterior Descending Artery	**V5 - Lateral** Circumflex Artery
III - Inferior Right Coronary Artery	**aVF - Inferior** Right Coronary Artery	**V3 - Anterior** Left Anterior Descending Artery	**V6 - Lateral** Circumflex Artery

SITE	ST ELEVATION LOCATION	RECIPROCAL
ANTERIOR	V3, V4	NONE
ANTEROLATERAL	I, aVL, V3, V4, V5, V6	II, III, aVF
ANTEROSEPTAL	V1, V2, V3, V4	NONE
EXTENSIVE ANTERIOR	I, aVL, V1, V2, V3, V4, V5, V6	II, III, aVF
INFERIOR	II, III, aVF	I, aVL
LATERAL	I, aVL, V5, V6	II, III, aVF
POSTERIOR	V7, V8, V9	V1, V2, V3, V4
RIGHT VENTRICLE	II, III, aVF, V1, V4R	I, aVL
SEPTAL	V1, V2	NONE

Modified 12-lead Placement (Posterior)

Posterior ECG lead placement



V7
Left posterior axillary line:
in the same horizontal plane as V4-V6

V8
Tip of the left midscapula:
in the same horizontal plane as V7-V9

V9
Left paraspinal region:
in the same horizontal plane as V4-V6

V1-V3
Should remain unchanged from standard 12-lead ECG

Figure 1 - Posterior ECG lead placement

Posterior MI is suggestive by the following changes in V1-V3:

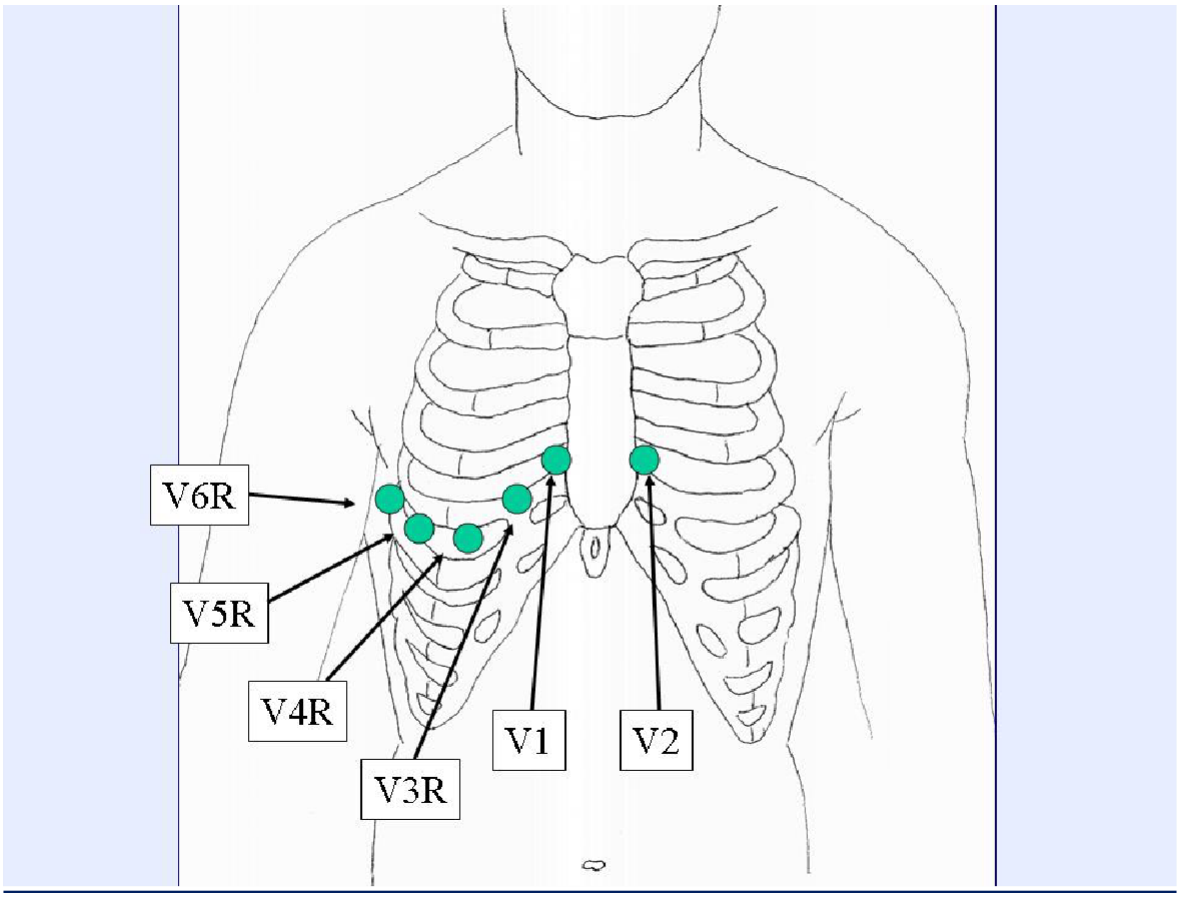
***Horizontal ST depression**
***Tall, broad R waves (>30ms)**
***Upright T waves**
***Dominant R wave (R/S ratio >1) in V2**

Please note that V6 is a good reference point for the horizontal placement of the posterior electrobes V7-9.

If you don't have access to to a 15 or 18 lead ECG machine, then leave V1-3 in their normal position and use V4-6, these leads will then become V7-9.

Be sure to strike through lead labels V4 - V6 and change to V7 - V9 on the print out

Modified 12-lead Placement (Right Sided)



Be sure to change the V3 – V6 lead labels to V3R - V6R on print out

Advanced Airway Management

Procedure Guideline

Written: June 2016 Reviewed: 2017	Updated: December 13, 2016

Airway management in an acutely ill or injured patient is one of the greatest challenges in pre-hospital care. The primary goals of airway management are adequate oxygenation and ventilation, and these should be achieved in the least invasive manner possible. Although endotracheal intubation is considered the “gold standard” of airway management in many emergency and acute care settings, its application in the pre-hospital setting is particularly challenging.

Shockable rhythm (pulseless VT and VF):

In these rhythm scenarios, the treatment priorities include chest compressions and defibrillation. Early airway management, in a resource-limited environment, should focus on strategies which do not adversely impact chest compressions and defibrillation. In this scenario, an oral airway with 100% NRB face mask is appropriate. In a non-resource-limited environment, early application of an invasive airway can be made, as long as its use does not adversely impact chest compressions and defibrillation. Later in the resuscitation (i.e., beyond 6 to 8 minutes), placement of an invasive airway can occur, as long as its use does not adversely impact chest compressions and defibrillation.

Non-shockable rhythm (asystole and PEA):

In these rhythm scenarios, the treatment priorities include chest compressions, invasive airway management, and IV medication administration. Earlier invasive airway
placement (i.e., within the first 2- 6 minutes of resuscitation) can be made, as long as its use does not adversely impact chest compressions and other therapies.

Goal:

- To establish a timely and effective airway while minimizing potential harm to patients.

Advanced Airway Attempt Defined as:

- Introduction of an airway device (ET or supraglottic) or insertion of laryngoscope blade past the teeth.
    - Laryngoscopy for the purpose of any other reason (i.e. management of airway obstructions or foreign bodies) should be recorded on the TJEMS airway form and in the narrative of the PPCR/ePPCR.

Supraglottic Insertion**

Note: order is alphabetic only

Combitube®

Description:

- Sterile; single use device
- Twin lumen device
- Cuffs are inflated using individual valve/pilot balloon
- Cuffs are designed to seal the esophagus and oropharynx

Indications:

- Unconscious patients in respiratory failure without an intact gag reflex
- Primary airway:
  - If intubation anticipated to be difficult and rapid airway control is necessary
  - In pulseless arrest, when attempts at intubation are likely to interrupt CPR
  - Anticipated need for prolonged positive pressure ventilation
  - Secondary method of airway management for failed intubation attempt

Contraindications:

- Responsive patients with intact gag reflex
- Patient less than five (5) feet tall
- Patients with known esophageal disease
- Patients who have ingested caustic substances
- Latex allergy

Warnings:

- Intubation of the trachea is possible
- Lubricate only the posterior surface

Insertion:

- Check baseline breath sounds
- Pre-oxygenate, if possible
- In large syringe (blue marking) draw up 100 mL of air
- In small syringe (white marking) draw up 15 mL of air; attach fluid deflector elbow
- Apply lubricant to distal tip
- Position head in “sniffing” (ideal) or neutral position
- With non-dominant hand; perform a tongue-jaw lift to open mouth
- With dominant hand, insert tube so curve of tube matches natural curvature of the pharynx, maintaining a midline position until the teeth lie between the two (2) printed bands

- Inflate #1 (one) (blue) pilot balloon with 100 mL of air from syringe; remove syringe
- Inflate #2 (two) (white) pilot balloon with 15 mL of air from syringe; remove syringe
- Attach bag-valve and start ventilating in “blue” tube. If chest rise seen, auscultate breath and epigastric sounds. Positive breath sounds and negative epigastric sounds, tube is placed correctly, continue to ventilate through this port
- If chest rise is not seen with ventilation through “blue” “1” tube, attempt ventilation through “white” “2” tube, follow same steps as above bullet for tube verification
- Verification of CO_2 by capnography
- Continuous end-tidal CO_2 waveform monitoring is recommended during transport
- Document all attempts (this includes any unsuccessful attempts)

Removal*:*

- Have suction available and ready
- Deflate cuff #1 (blue) first, then cuff #2 (white)
- Withdraw tube
- Suction as needed
- Be prepared to turn patient on side
- Re-assess ABC’s

King Airway®

Description:

- Sterile single use latex-free device
- Curved tube with ventilation ports between two (2) cuffs
- Both cuffs are inflated using a single valve/pilot balloon
- Cuffs are designed to seal the esophagus and oropharynx

Indications:

- Unconscious patients in respiratory failure without an intact gag reflex in patients over 35 inches in height or 12kg
- Primary airway:
    - If intubation anticipated to be difficult and rapid airway control is necessary
    - In pulseless arrest, when attempts at intubation are likely to interrupt CPR
- Anticipated need for prolonged positive pressure ventilation
- Secondary method of airway management for failed intubation attempt

Contraindications:

- Responsive patients with intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances

Warnings:

- High airway pressures may leak air into the stomach or atmosphere
- Intubation of the trachea is possible (although not reported)
- Lubricate only the posterior surface of the King airway

Insertion:

- Check baseline breath sounds
- Pre-oxygenate, if possible
- Choose correct size
    - Green connector **#2** for patients **35 – 45 inches** or **12 – 25kg**
    - Orange connector **#2.5** for patients **41 – 51 inches** or **25 – 35kg**
    - Yellow connector **#3** for patients **4 – 5 feet** in height
    - Red connector **#4** for patients **5 – 6 feet** in height
    - Purple connector **#5** for patients **over 6 feet** in height
- Apply lubricant to beveled distal tip and posterior side of tube avoiding air ports
    - Position head in "sniffing" (ideal) or neutral position
- Hold tube at colored connector end with dominant hand. With non-dominant hand; open mouth and apply chin lift
- Hold tube rotated laterally such that the blue line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue
- As tip passes behind tongue, rotate tube back to midline. Blue line will face chin
- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
- Inflate cuffs with volume per manufacturer's guideline
    - If a leak occurs add 50% of original volume
        - If a leak continues after attempting above step, a larger tube may be needed
- Attach bag/valve, while gently bagging, simultaneously withdraw airway until ventilation is easy and free flowing and no air leak noted
- Confirm proper position by auscultation, chest movement and verification of CO_2 by capnography
- Continuous end-tidal CO_2 waveform monitoring is recommended during transport
- Secure airway with commercial tube holder device
    - If using a tube holder be aware that not all commercial holders work,
    - Also even when using a tube holder, it may be necessary to hold the tube, and continuous monitoring for leaks

Removal:

- Turn on suction and place patient on side
- Deflate cuffs
- Withdraw tube
- Re-assess ABC's

Endotracheal Intubation

Indications:

- Unconscious patients in respiratory failure without an intact gag reflex
- Anticipated need for prolonged positive pressure ventilation
- Patient's with intact gag reflex see RSI guideline for approved providers

Contraindications:

- If intubation anticipated to be difficult and rapid airway control is necessary
- In pulseless arrest, when attempts at intubation are likely to interrupt CPR
- EMT-Intermediate:
    - Pediatrics (under 12 years old)

Insertion:

- Check baseline breath sounds
- Suction & pre-oxygenate, as necessary
- Providers should always have a backup airway ready (King Airway®, Combitube® or other device)
- Patients should have constant pulse oximetry and cardiac monitoring done before, during and after the procedure
    - Any patient de-saturation below 90% and/or drop in heart rate should result in immediate termination of the procedure and the patient should be bagged (ventilated) backup
- Check and prepare equipment
- Position patient:
    - If trauma: have assistant hold in-line spinal immobilization in neutral position
- If no trauma: sniffing position or slight cervical hyperextension is preferred
- Place ETT
- Correct tube depth may be estimated as 3 times the internal diameter of tube at teeth or gums (e.g: 7.0 ETT is positioned at 21cm at teeth)
- Confirm and document tracheal location by:
    - $ETCO_2$ waveform or colormetric device
    - Presence and symmetry of breath sounds
    - Stable or rising SpO_2

- All devices shall be secured appropriately
    - For non-trauma patients, if excessive movement is anticipated, consider immobilization of patient to better prevent dislodged endotracheal tubes
- Any movement or change in the patient's status shall result in immediate re-evaluation of the airway placement

IMPORTANT NOTES:

- De-saturation below 90% and/or drop in heart rate should result in immediate termination of the procedure and the patient should be bagged (ventilated) back up
    - Respiratory disease patients may not be able to get sats above 88-90%. Use caution as those patients will desaturate quickly
- After two (2) unsuccessful intubation attempts on the patient, providers should terminate intubation attempts and promptly move forward with their planned rescue/salvage procedure to secure the airway
- Endotracheal intubation is associated with worse outcomes among pediatric patients and head injured patients when compared to BLS airway maneuvers. Therefore, it is relatively contraindicated in these populations
- Endotracheal Intubation is associated with interruptions in chest compressions during CPR, which is associated with worse patient outcomes. Additionally, intubation itself has not been shown to improve outcomes in cardiac arrest
- Providers shall fill out the TJEMS airway form located on the www.tjems.org website and submit it after any attempted airway procedure

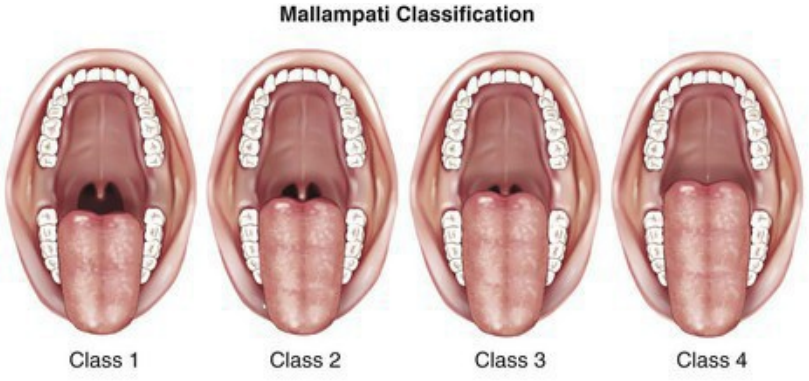
Helpful Tips for Endotracheal Intubation:

- Use of an "endotracheal introducer" or "gum elastic bougie" to assist in endotracheal intubation is strongly encouraged for initial attempts or with an anticipated or proven difficult airway

- The availability of equipment such as video laryngoscopy should be considered for all agencies/providers undertaking endotracheal intubation

L.E.M.O.N.

- **L**ook - at the patient's anatomy, any facial trauma, large tongue, beard, etc.
- **E**valuate - 3, 3, 2 fingers between: teeth, hyoid and mentum, hyoid and thyroid
- **M**allampati Classification
- **O**bstruction – secretions, stridor, muffled voice, mass and/or foreign body
- **N**eck Mobility – limited neck mobility



Class 1; soft palate, fauces, uvula, pillars
Class 2; soft palate, fauces, portion of uvula
Class 3; soft palate, base of uvula
Class 4; hard palate only

Capnography

Procedure Guideline

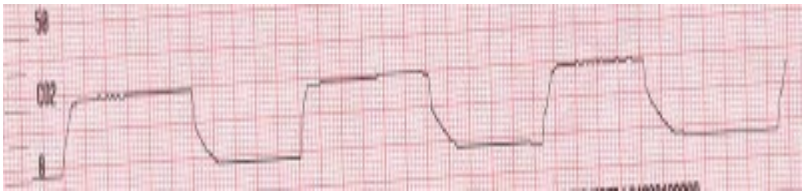
Reviewed: 2020	Updated: 2020

Capnography must be used on all endotracheal airways and should be used with supraglottic airways. It may also be used with spontaneously breathing patients whose respiratory status may be further evaluated with the use of waveform capnography.

Procedure:

1. Attach capnography sensor to endotracheal tube, supraglottic airway, nebulizer or oxygen delivery device.
    a. If you are unable to obtain a CO2 reading, re-evaluate your airway device and may include removal of device, reverting back to an OPA/NPA.

2. Note CO2 level and waveform changes.
    a. Normal levels: ETCO2 of 35 – 45 mmHg
    b. Example of “normal” waveforms:



3. The capnometer shall remain in place and be monitored throughout transport.
    a. A rise in CO2 above normal indicates inadequate ventilation and requires increase in rate of ventilation.
    b. A CO2 below normal or falling indicates hyperventilation and requires decrease in rate of ventilation.

4. Colorimetric devices may be used for confirmation but not for monitoring.

5. Documentation of initial reading and reading at the time of transfer of care should be recorded. Both strips should be attached to regional airway form. Attaching a copy of the strips to the PPCR/ePPCR is also required.

Cardioversion

Procedure Guideline

Reviewed: 2020	Updated: 2020

Indications: **Unstable** patients with supraventricular tachycardia or ventricular tachycardia with pulse or rapid atrial fibrillation.

Procedure

- Ensure patient is properly attached to monitor/defibrillator and capturing.
- Set energy selection to appropriate setting per manufacturer recommendations.
- Set monitor to sync mode.
- Charge the device.
- Ensure the patient is clear of all personnel.
    - Press and hold the shock button to cardiovert. Stay clear until energy has been delivered (there may be a delay from the time the shock button is pushed until the energy is delivered).
- Note response and perform immediate defibrillation if indicated.
    - If patient's condition is unchanged, repeat using escalating energy until maximum setting or the rhythm stabilizes.
- Document procedure, response, time and energy settings on PPCR.

Continuous Positive Airway Pressure (CPAP)

Procedure Guideline

Reviewed: 2020	Updated: 2020

Continuous positive airway pressure (CPAP) is a treatment modality that is used in conjunction with medical therapy in the management of pulmonary edema. Pulmonary edema most frequently occurs due to cardiac causes (congestive heart failure), although it can occur from non-cardiac causes such as near drowning and fluid overload from renal failure. CPAP maintains a positive pressure in the respiratory system throughout the respiratory cycle and can reduce the work of breathing and improve oxygenation in patients with pulmonary edema. This guideline has been developed for use with the Whisperflow CPAP system, but the general principles apply to any CPAP system. CPAP is a non-invasive therapy that can be used by both ALS and BLS providers.

Indications for CPAP:

- Pulmonary edema due to CHF, fluid overload or near-drowning
    - Hypoxia – pulse oximetry less than 90%
- Significant respiratory distress including use of accessory muscles and retractions
- Associated signs of CHF including edema of the legs, neck vein distention and rales/wheezing on chest examination

Contraindications for CPAP include:

- Lack of spontaneous respiration
- Unconscious
- Inability to maintain on open airway
- Pneumothorax
- Significant trauma to the face or chest
- Hypotension (systolic BP <90)
- Uncontrolled vomiting

Monitor patient's vital signs

- If the patient is unable to tolerate the CPAP mask, therapy may need to be discontinued and high flow oxygen therapy re-instituted.
- The CPAP mask must be removed if the patient begins vomiting and not re-applied until vomiting
    - is controlled.
    - If the patient's condition deteriorates to the point they lose consciousness or they lose the ability to maintain their posture and the seal of the mask then CPAP will need to be discontinued and BVM assistance of respiration initiated.
    - If the patient's blood pressure drops below 90 systolic, discontinue CPAP therapy.
- If the patient has adapted to using the CPAP mask and the system is operating properly but
    - oxygen saturations remain less than 90%, increase the inspired oxygen concentration by attaching standard oxygen tubing to the port just below the pressure valve adapter and add oxygen using the low pressure oxygen regulator.
    - Start at flow rates of 2 L/minute and increase by 2 L/minute until saturations improve to 90% or better.

If the patient does not seem to be responding to CPAP

- Double check connections from the oxygen source to the generator and from the generator to the patient circuit.
- Make sure that your oxygen source has adequate reserve to power the generator. CPAP requires a closed system to maintain positive pressure, so check for leaks around the mask and the connections.
- Inform the receiving hospital that CPAP therapy has been initiated so that a CPAP generator can be made available when the patient reaches the emergency department.
- The corrugated patient circuit tubing, mask, head straps and the pressure valve are single patient use only.

Cardiopulmonary Resuscitation (CPR) and Manual Defibrillation

Procedure Guideline

Reviewed: 2020	Updated: 2020

Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

Adults

- Continuous chest compressions only with passive ventilations (room air or NRB mask)
    - Rate of 100 to 120 beats/minute
    - Adequate depth of compression
- Adults, minimum 2", but no more than 2.4"
    - Adequate chest recoil
        - **If staffing allows:**
        - Continuous compressions w/1 breath every 6 seconds (basic maneuver and/or airway adjunct)
- Advanced airway (supraglottic or ET) placement if and/or when ROSC (return of spontaneous circulation)

Infants and Children

- Ratio of 30:2 for infants and children (single rescuer)
    - 15:2 for two (2) rescuer
        - Prioritize ventilation
- Basic airway maneuver and/or adjuncts

-

- Defibrillation should occur as soon as an AED or monitor is available.
- Apply defibrillation pads.
- Set the appropriate energy setting per manufacturer recommendation. If appropriate energy setting is unknown, use 200j for biphasic devices.
- Charge the defibrillation while continuing chest compressions.
- Stop compressions and "clear" the patient visually and verbally ensuring no person is in contact with the patient and the oxygen source has been adequately removed.
- Press the shock button to deliver the shock.
- Immediately resume compressions.
- After two (2) minutes of CPR, assess rhythm and check pulse if appropriate for rhythm.
- Repeat procedure every two (2) minutes with energy setting per manufacturer recommendation.
    - If appropriate energy setting is unknown, use 200j for biphasic devices.
- Limit interruptions of CPR and limit pulse checks to every two (2) minutes. Any interruption in CPR ideally should be less than 10 seconds.

Endotracheal Tube Introducer (Bougie)

Procedure Guideline

Reviewed: 2020	Updated: 2020

The bougie, often called a gum elastic bougie (GEB), is a long, flexible stylet which is introduced through the glottis opening before the ETT, whether visualization of the vocal cords can be achieved or not. The distal end is curved upward and there are markings at 10 cm intervals to measure ETT insertion depth. This shape and size of the GEB are designed to be easier to place in the trachea than the ETT when faced with a difficult airway. The following guideline is meant to facilitate the use of this highly efficient and easy-to-use difficult airway tool.

Indications:

- Unsuccessful intubation attempts
- Predicted difficult intubation

Contraindications:

- Less than eight (8) years old
- ETT size less than 6.5 mm

***Procedure*:**

- Select proper ETT without stylet, test the cuff and prepare suction
- Lubricate the distal end and cuff of the ETT and the distal ½ of the bougie
    - Note: failure to lubricate the bougie and the ETT may result in failure
- Visualize the vocal cords using laryngoscopy and introduce the bougie with curved tip anteriorly
    - The tip should be seen passing through the vocal cords or above the arytenoids if the cords cannot be visualized.
- Once inserted, gently advance the bougie until you meet resistance (“hold-up”) or movement of the tip on the tracheal rings (“washboard”). If resistance is not met and/or tracheal rings are not felt then a probable esophageal intubation has occurred and insertion should be attempted again.
- Once the tip has been properly place, a second provider should be used to load the ETT and hold proximal control of the bougie to keep it in the trachea while the operator is still holding laryngoscopic pressure.
- Gently advance the bougie and loaded ETT until you feel hold-up or tracheal rings again, thereby assuring proper placement.
- While maintaining a firm grasp on the proximal bougie, slide the ETT over the bougie to the appropriate depth.
- If you are unable to advance the ETT into the trachea and the bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER-clockwise to turn the bevel of the ETT posteriorly. If this technique fails, direct laryngoscopy while advancing the ETT might be necessary (this will require an assistant to maintain the position of the bougie and advance the ETT).
- Once the ETT is correctly placed, hold it securely and remove the bougie.
- Confirm tracheal placement with all pertinent methods, secure tube and reassess frequently.

External Jugular Cannulation

Procedure Guideline

Reviewed: 2020	Updated: 2020

Provider level: Intermediate and Paramedic

Indications:

- Critically ill patient who is >12 years of age and requires IV access for fluid or medication administration when an extremity cannulation is not possible.
- Can be attempted initially in life threatening situations where no obvious peripheral site is noted.
- Consider intra-osseous insertion as a viable alternative

Procedure:

- Use personal protective equipment.
- Gather all necessary equipment, attach extension tubing when possible.
    - Place the patient in a supine, head down position. This helps distend the vein and decreases the chance for air embolism
- Turn the patient's head toward the opposite site of insertion if no risk of cervical injury exists.
- Prep the site as per the peripheral IV.
- Align the catheter with the vein and aim toward the same side shoulder.
    - "Tourniqueting" the vein lightly with one (1) finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle to cannulate the vein in the usual method.
- Attach the IV and secure the catheter avoiding circumferential dressing or taping.
    - Label with "field", date and initials of person performing procedure.
- Set proper flow rate.
- Use caution to not inadvertently pull out the line.
    - Document procedure, time, type of fluid, flow rate, total infusion at the time of transfer, provider who performed procedure and response to treatment.

IV/IO/Vascular Access
Fluid resuscitation/hydration rates

Procedure Guideline

Reviewed: 2020	Updated: 2020

Indications:

- Any medical or traumatic patient where either fluid or medication therapies are needed or the need for such may arise.

Fluid resuscitation/hydration rates:

- KVO or TKO rates are:
  - Adults
    - 30 – 60 mL/hr
  - Children 4 years and under:
    - No more than 30 mL/hour
  - Neonates:
    - See below
- Adults:
  - Fluid boluses when indicated should generally be 500 mL and can be repeated until:
    - A maximum of two (2) liters
    - SBP reaches 90 –110 mmHg and/or MAP ≥ 65 (mean arterial pressure)
    - Increase in respiratory distress/increasing hypoxemia
  - Fluid boluses of less than 500 mL may be indicated according to patient condition.
- Pediatric:
  - Fluid boluses should be 20 mL/kg repeated as needed for poor perfusion.
    - After 2 – 20 mL/kg call medical command for further instructions.
- Neonatal (<30 days):
  - Fluid boluses should be 10 mL/kg over 30 minutes as needed for poor perfusion.
    - After 2 – 10 mL/kg call medical command for further instructions.

IV Procedure:

- Gather necessary equipment.
- Select appropriate fluid and administration set.
  - NS is generally the fluid of choice.
  - Use macro-drip (15gtt) set for trauma patients and medical patients where fluid overload is unlikely and infusion of IV medications is not anticipated.
  - Use micro-drip (60gtt) set when possibility of fluid overload is a concern (CHF or pediatric patients) or when infusion IV medications may be indicated (dopamine or amiodarone drips).
  - Use of extension tubing is required on all insertions. Use of the short or long extension tubing is at the discretion of the provider according to patient condition.
- Apply personal protective equipment.
- Select appropriate site.
  - Begin with the most distal site suitable. Avoid the use of the both hands if establishing bilateral IV's. Cardiac arrest, acute stroke and SVT should have antecubital IV.

- Avoid extremities with injury or where venous access is contraindicated (radical mastectomies, dialysis, etc.).
- Lower extremities should be avoided in patients with poor distal circulation such as diabetics.

- Perform the IV insertion using aseptic techniques.
- Set the appropriate rate, as indicated above in the fluid replacement/hydration section.
- Secure the IV in a manner to ensure it remains as clean as possible.
  - Uses of commercial products such as Tegaderms are encouraged when available.
  - Sterile dressing can be folded and placed over the hub of the catheter prior to taping.
  - Taping should be applied in a manner that uses the least amount of tape feasible and reasonably allows tubing to be disconnected.
  - All field insertions should be labeled with "Field" and the gauge of catheter.
- Consider insertion of second line when shock is present or anticipated.
- Document procedure, time, provider performing insertion, number of attempts, type of fluid, rate of administration, total infusion at the time of transfer and any response to fluid therapy.

IO Procedure:

Intra-osseous Insertion
EZ-IO®

Indication:

- The EZ-IO® is approved for patients weighing 40kg (88lbs) or more. The EZ-IO PD® is approved for patients weighing 3-39kg (6.5-85lbs). Placement is indicated when a patient is in or approaching extremis and either intravascular fluid resuscitation or medications are <u>essential</u> to resuscitation efforts, but traditional vascular access techniques are not possible or require multiple or prolonged attempts. Such patients should undergo two (2) **<u>RAPID</u>** IV attempts prior to utilizing the EZ-IO® system.
- Appropriate <u>patient examples</u> (not all inclusive):
  - Near arrest
  - <u>Status</u> epilepticus (no response to IM Versed)
  - Patients in profound shock with or without altered level of consciousness
  - Severe burns
  - Cardiac arrest
  - Post resuscitation
  - Profoundly hypoglycemic patients with no response to Glucagon after 5 – 10 minutes
- **Patients who are NOT appropriate candidates**:
  - Unconscious but without significant trauma
  - Hemodynamic instability
  - Seizure

Contraindications:

- Fracture of the bone you intend to place the IO in (tibia or humerus)
- Previous orthopedic procedures (i.e. knee replacement) in the area of intended insertion (as indicated by a large scar)
- The extremity is compromised by a pre-existing condition (i.e. tumor)
- Skin infection at the insertion site (i.e. redness, skin lesions)
- Inability to locate landmarks
- Excessive tissue over the insertion site (If the 5mm mark on the IO needle is not visible once the needle has been placed through the skin, but has not reached to the bone, then there is too much tissue)
- If any of these contraindications are noted, check another extremity for possible insertion

Equipment:

- EZ-IO® driver and appropriate needle set for patient size (EZ-IO PD® is pink)
- 10ml syringe
- Alcohol or Chlorhexidine swabs
- Extension set or EZ-Connect
- IV fluid, tape or gauze
- Pressure bag and/or bolus fluid administration set-up

Procedure:

- Observe BSI precautions and aseptic techniques
- Locate the proper site for EZ-IO® insertion (tibia only for pediatric patients; tibia or humerus for adults)
    - **Adult tibial insertion**:
        - With the leg extended, locate the patella (kneecap), feel the anterior surface of the leg just below the patella, approximately 2 fingers widths. This round, oval bump is the **tibial tuberosity**. From the tibial tuberosity **move 1 finger width medial** (towards the centerline of the body) to the flat part of the tibia. This is the insertion site.
    - **Adult humeral insertion**:
        - Expose the shoulder and place the patient's arm against the patient's body, resting the elbow on the stretcher or ground and the forearm resting on the abdomen. Note the humeral head on the anterior-superior aspect of the upper arm or the anterior-lateral shoulder. Palpate and identify the **mid-shaft humerus** and continue palpating toward the proximal end (humeral head). Near the shoulder feel for a **small protrusion**, this is the base of the **greater tubercle** and the insertion site. With the opposite hand, "pinch" the anterior and inferior aspects of the humeral head, while confirming the identification of the greater tubercle. This will help ensure that you have located the midline of the humerus.
    - **Pediatric tibial insertion**:
        - If the tibial tuberosity **CAN** be palpated, the insertion site is one finger width below the tuberosity and then medial along the flat aspect of the tibia. If the tibial tuberosity **CANNOT** be palpated, the insertion site is two (2) finger widths below the patella and then medial along the flat aspect of the tibia. EZ-IO PD® Pediatric is **ONLY** for tibial insertion, not humerus.
- Clean the insertion site thoroughly using alcohol or Chlorhexidine for at least a 3" diameter around the site.
- Prepare the EZ-IO®
- Remove the driver and one (1) EZ-IO® cartridge.
- Open the cartridge and attach the proper size needle set to the driver (you should feel a "snap" as the set connects to the driver).
- Remove the needle set from the cartridge.
- Remove the safety cap from the needle set. With the needle facing you, grasp the cap tightly and rotate clockwise to loosen and remove. (Attempting to pull the cap may remove the needle set from the driver, and rotating counter-clockwise will cause the catheter and stylet to separate.)
- Insert the EZ-IO® needle set.
- Hold the driver in one hand and stabilize the insertion site laterally with the opposite hand. Make sure your hands and fingers are out of the path of insertion, and that the patient is prevented from moving suddenly (i.e. do not position your hand behind the extremity).
- Position the driver at the insertion site with the needle at a 90 degree angle to the bone.
- Power the needle set through the skin at the insertion site until it encounters the bone surface. If in doubt, verify that there is enough needle length (not too much tissue) by observing the 5mm mark.
- Apply firm and steady pressure on the driver and apply power, ensuring the driver is maintained at a constant 90 degree angle to the bone.

- Stop when the needle flange touches the skin or a sudden decrease in resistance is felt. This indicates entry into the marrow cavity. “STOP WHEN YOU FEEL THE POP”
- Remove the driver from the needle set.
- Support the needle set in on hand, gently pull straight up on the driver and lift away.
- Remove the stylet from the catheter by grasping the hub firmly with one hand, rotate the stylet counter-clockwise (unscrew the stylet from the catheter). Pull the stylet out and place in a sharps container.
- Attach a 10cc syringe and attempt to aspirate marrow (no aspirate alone does not indicate improper placement).
- Flush the IO with 10cc’s of NS
- Confirm placement with one (1) or more of the following criteria:
    - Firm 90 degree position
    - Blood at the tip of stylet
    - Aspiration of marrow
    - The device flushes easily and fluids flow freely without subcutaneous swelling or fluid leakage.
- Attach the infusion, secure and stabilize the catheter to the insertion site.
- Monitor for any change in placement and remove as necessary.
- Assure that you can fully visualize the area of insertion so that you can fully assess.
- On-going assessment should include frequent palpation and inspection of the placement site both anteriorly and posteriorly to assure there is no infiltration or extravasation of fluid.
- Due to the anatomy of the IO space, flow rates may be slower compared with normal IV catheters.
    - Use a pressure bag for rapid infusions or administer by slow bolus via syringe.
    - PEDIATRIC: administration should be by syringe bolus only.
- Apply wristband to patient to identify that an IO has been placed (optional).
- Document use of EZ-IO® on PPCR with indication and placement confirmation method per above criteria.
- For pain with fluid administration, administer 2% Lidocaine (<u>preservative free</u>) 20 – 40 mg for adults and 0.5 mg/kg for children. <u>Use extreme dosage precautions to avoid medication error</u>.

Removal:

- Removal should be a smooth clockwise rotation of the needle, NOT a rocking motion.
- If there is indication of improperly placed EZ-IO® attempt in another extremity.
- **NEVER attempt a second IO in the same bone as a previous attempt.**
- If improper placement is suspected, gently pull out the needle, seal off the access and advise hospital staff on your arrival of improper placement, so that the site can be properly monitored for any complications during the patient’s hospital course.

King Airway

Procedure Guideline

Reviewed: 2020	Updated: 2020

Description:

- Sterile single use latex-free device
- Curved tube with ventilation ports between two (2)cuffs
- Both cuffs are inflated using a single valve/pilot balloon
- Cuffs are designed to seal the esophagus and oropharynx

Indication:

- Airway management in patients over 35 inches in height or 12 kg

Contraindications:

- Responsive patients with intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances

Warnings:

- King airway does not protect the airway from aspiration or regurgitation
- High airway pressures may leak air into the stomach or atmosphere
- Intubation of the trachea is possible (although not reported)
- Lubricate only the posterior surface of the King Airway

Insertion:

- Check baseline breath sounds
- Choose correct size
    - Green connector **#2** for patients **35 – 45 inches** or **12 – 25kg**
    - Orange connector **#2.5** for patients **41 – 51 inches** or **25–35kg**
    - Yellow connector **#3** for patients **4 – 5 feet** in height
    - Red connector **#4** for patients **5 – 6 feet** in height
    - Purple connector **#5** for patients **over 6 feet** in height
- Apply lubricant to beveled distal tip and posterior side of tube avoiding airports
- Pre-oxygenate, if possible
    - Position head in “sniffing” (ideal) or neutral position
- Hold tube at colored connector end with dominant hand. With non-dominant hand open mouth open and apply chin lift.
- Hold tube rotated laterally such that the blue line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue.
- As tip passes under tongue, rotate tube back to midline. Blue line will face chin.

- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
- Inflate cuffs with volume as above.
    - If a leak occurs add 50% of original volume,
    - If a leak continues after attempting above step, a larger tube may be needed.
- Attach bag/valve. While gently bagging, simultaneously withdraw airway until ventilation is easy and free flowing and no air leak noted.
- Confirm proper position by auscultation, chest movement and verification of CO_2 by capnography if available.
- Continuous end-tidal CO_2 monitoring is recommended during transport.
- Secure airway with tape or tube holder device
    - If using a tube holder be aware that not all commercial holders work,
    - Also even when using a tube holder, it may be necessary to hold the tube, and continuous monitoring for leaks.

Removal:

- Airway is well tolerated until the return of protective reflexes
- Turn on suction and place patient onside
- Deflate cuffs
- Withdraw tube
    - Re-assess ABC's

Needle Cricothyrotomy

Procedure Guideline

Reviewed: 2020	Updated: 2020

A needle cricothyrotomy airway is a standing-order, Paramedic-level procedure designed for the viable patient airway that cannot be successfully managed with the available non-invasive (BVM) or invasive airway devices/procedures, which include the supraglottic devices and endotracheal intubation. This procedure provides limited, short term oxygenation but provides little ventilation. It should be used only as a temporary airway.

Level of care: Paramedic

Indications:

- Massive facial trauma
- Foreign body aspiration
- Laryngoedema
- Laryngospasm
- Airway burns
- Laryngeal fracture
- Epiglottis

Complications:

- Vocal cord injury
- Failure to place catheter in trachea

Procedure:

- Place patient in a supine position and hyperextend the neck using stable positioning. Consider keeping the trauma patient's head in a neutral position.
- Prepare equipment including 14g Jelco type needle, 10cc syringe, ventilation tubing (pre-made kits should consist of short piece of IV tubing with hub in tact with the other end inserted and taped into a piece of oxygen tubing in which a slit has been made).
- Secure the larynx laterally between thumb and forefinger. Identify the cricothyroid membrane puncture site which is bounded superiorly by the thyroid cartilage and inferiorly by the cricoid cartilage.
- Cleanse the area properly with alcohol
- Insert 14g catheter at a 45 degree angle toward the feet
- Attach a 10cc syringe and attempt to aspirate air
- Thread the catheter completely to hub
- Connect tip to adapter with 15L O2
- Occlude the slit that has been cut into the oxygen tubing to provide a breath for the patient. The slit should be covered for one (1) second and uncovered for three (3) seconds to allow for the necessary prolonged expiratory phase.

- Additional needles may be placed in the cricothyroid membrane as needed and there is space to do so. Placement of additional catheters will allow for better ventilation. The hubs of all catheters should be occluded for one (1) second inhalation and uncovered for three (3) second exhalation.
- Assess placement and secure
- Documentation should include person performing procedure, indication for procedure, other methods of airway interventions that were attempted, time of procedure and response to treatment. A regional airway form should be completed.

Needle Decompression

Procedure Guideline

Reviewed: 2021	Updated: 2021

Provider level: Intermediate and Paramedic (actively practicing for 2 years)

Indications:

- Bilateral needle decompressions may be considered for a patients with significant torso trauma where medical providers have witnessed a traumatic cardiac arrest or the patient is unconscious with agonal breathing & absent pulses/bradycardia.
- Severe/progressive respiratory distress, hypoxemia, an absence of breath sounds, significantly altered mental status (GCS < 8) associated with signs of shock or clinical deterioration of vital signs may indicate the need for needle decompression in a patient with penetrating or severe blunt chest trauma.

Procedure:

- Use gloves and eye protection
- High flow oxygen
    - Identify the intercostal space between the 4th and 5th ribs at the mid-axillary line on the affected side
- Cleanse the site with alcohol
- Select a 14g needle at 3.25 inches in length from the drug box
    - Note: Jelco needles are supplied in the medication drawer
- Insert the catheter into the skin over the top of the 5th rib into the intercostal space
    - Advance the catheter until a “pop” is felt and either air or blood is noted from the catheter
- Remove the needle, leaving the catheter in place
- Secure the catheter hub to the chest wall
- Consider placing a finger cut from a glove over the hub after cutting a small hole in the end of the finger to make a flutter valve

Orogastric Tube Insertion

Procedure Guideline

Reviewed: 2020	Updated: 2020

Providers: Intermediate/Paramedic

Indications:

- Gastric decompression in intubation or ventilated patients

Procedure:

- Estimate length of insertion by measuring from corner of mouth, around ear to xiphoid process
- Lubricate the distal end of the tube
- Pass through the patient's mouth along the tongue
- Continue to advance tube until appropriate depth of insertion as measure above is reached
    - Confirm placement by using a Toomey syringe filled with air. Auscultate over the stomach for a "swish" of air or bubbling. Aspiration of gastric contents may also be attempted
- Secure the OG tube to the patient's face with tape
- Decompress the stomach by connecting tube to suction (100 mmHg) or manually
- aspirating with Toomey syringe
- Document procedure, time and person performing procedure

Oxygen Administration

Procedure Guideline

Updated: 2020	Approved: 2020

Oxygen administration has been one of the cornerstones of pre-hospital care since its inception, and in many cases the dictum was “the more the better”, resulting in the administration of high-flow oxygen to most, if not all, patients who received oxygen therapy. There is increasing evidence that administration of excessive amounts of oxygen during pre-hospital care can cause measurable adverse effects on patient outcomes.

Patients with chronic obstructive lung disease (COPD) should receive oxygen at the lowest flow rate required to keep their oxygen saturations at 90-92%. Oxygen therapy – if necessary – can be started at 2L/min via nasal cannula and titrated upwards as needed in 1 L/min steps. Patients on home oxygen should be started at their normal flow rate, or at an increased flow rate as directed by the patient, and then titrated upwards as required. Nebulized medications should be delivered using air rather than oxygen when possible to avoid high oxygen concentrations.

Patients with acute coronary syndrome should be treated with oxygen only if they are hypoxic, oxygen saturations of less than 90-92%. They should be started on flow rates of 2 L/min via nasal cannula and titrated upwards in 1 L/min steps as needed.

In general attention should be given to administering oxygen in a step wise manner at the flow rate necessary though the device necessary to maintain oxygen saturations in the range of 90-92%. There are some cases in which high flow oxygen is therapeutic, such as possible carbon monoxide poisoning, in which high flow rates/concentrations are still the goal of therapy.

References:

Austin MA et al: Effect of high flow oxygen on mortality in chronic obstructive pulmonary disease patients in prehospital setting: randomized controlled trial. BMJ 2010; 341:c5462

Wijesinghe W et al: Pre-hospital oxygen therapy in acute exacerbations of chronic obstructive pulmonary disease. IMJ 2207 618-622 doi:10.1111/j.1445-5994.2010.02207.x

Stub, D et al: A randomized controlled trial of oxygen therapy in acute myocardial infarction Air Verses Oxygen In myocarDial infarction study (AVOID Study) Am Heart J 2012; 163:339-345.e1

Pelvic Binder

Procedure Guideline

Reviewed: 2020	Updated: 2020

Indications (for patient's ≥ 16 years old):

- Help control hemorrhage in pelvic fractures with ongoing hypotension
- May be applied in trauma patients with all of the following:
  - Ongoing hypotension after two (2) liters of NS
  - No other suspected reason for hypotension
    - Continued external blood loss, tension pneumothorax, etc.
  - Suspected pelvic fracture

Contraindications:

- None

Application procedure (EMT's may assist with application):

- Remove objects from the patient's pockets or pelvic area.

SAM Pelvic Sling® Method: (preferred device by experts)

- Place SAM sling printed side down under patient at level of the buttocks (greater trochanters / symphysis pubis).
- Wrap non-buckle side of sling around patient.
- **Firmly wrap** buckle side of sling around patient, positioning buckle at midline. Secure in place by velcroing blue flap to sling.
- Lift **black strap** away from sling by pulling upward.
- Firmly pull orange and black straps in opposite directions until you hear and **feel click**.
- **Maintain tension!**
- **Immediately** press black strap onto blue flap to secure it. *Do not be concerned if you hear a second click after sling secure.*

https://www.youtube.com/watch?v=KVOk1WB2yhM

Sheet or blanket Method:

- Place sheet or blanket under patient at level of buttocks (greater trochanters / symphysis pubis).
- Wrap sheet tightly around patient's pelvis to gradually compress pelvis at this level.
- Cross sheet ends and twist from opposing sides, applying pressure.
- Secure sheet ends.

- https://www.youtube.com/watch?v=Omg79Ced6s0

Considerations:

- Assess pulse, motor and sensation after splinting
- The splint should not be removed in the prehospital setting due to risk worsening hemodynamic instability.

Rapid Sequence Intubation (RSI)

Procedure Guideline

Reviewed: 2020	Updated: 2020

Requirements for RSI program:

- Current NREMT-P/Paramedic certification and other training as required by agency medical director.
- Second provider on scene who is cleared to perform intubation.
- Drugs will only be administered by RSI approved provider. If allowed by agency OMD, intubation may be performed by another qualified intubator under the direct supervision of the RSI approved provider.
- Written approval for each provider by OMD of agency where RSI will be used.
- There will be 100% QI review of patient encounters.
- Maintenance of RSI approval will require continued OMD approval.

Contents of RSI pack:

- Pack to be stored in secured area like drug boxes
    - 2 – Etomidate 20 mg/19gneedles
    - 2 – Vecuronium 10 mg with filter needles
    - 2 – 10cc sterile water diluent/30 cc syringe
    - 2 – Succinylcholine 200 mg/10ccsyringes
    - 2 – Ketamine 200 mg vials
    - 1 – Atropine 1 mg bristojet type syringe
    - 2 – 3cc syringes with 20gneedles
    - 5 – 10cc syringes
    - 2 – 30cc syringes
    - 7 – 19g needles
    - 10 – alcohol prep pads

Indications for RSI:

- RSI may be done under standing orders
- Patients over 18 years of age unless specific permission given prior to procedure by medical command.
- Need for intubation:
    - Burns with suspected significant inhalation injury
    - GCS < 8 related to traumatic injury
    - Acute or impending airway loss (inability to protect airway)
        - RR < 10 or > 30

- No known contraindications to RSI drugs

Procedure:

- Preparation
    - Monitoring (continuous ECG and SpO2, and BP pre- and post-)
    - Monitoring waveform capnography
    - Functional laryngoscope and BVM with high flow oxygen
    - Endotracheal tube(s), stylet, 10ccsyringe
    - Alternate airway (i.e. rescue airways and cricothyrotomy equipment) immediately available
    - All medications drawn up and labeled
    - Patent IV
    - Assess for difficult intubation: LEMON
    - Suction on and ready
    - Tube confirmation equipment available (EtCO2+EDD)
- Pre-oxygenation
    - Either 100% oxygen x 5 minutes or 8 vital capacity (deep) breaths on 100% O2
    - Patient on continuous pulse oximeter monitoring
- Paralysis and induction
    - Etomidate 0.3 mg/kg (20 – 30mg)
    - Ketamine 1 – 2 mg/kg/IV
    - Succinylcholine 1.5 mg/kg (120mg)
        - **Contraindicated with
            - Burns > 24 hours old
            - Crush injury > 72 hours old
            - Denervation process (i.e. para/quadriplegia)
            - Risk of hyperkalemia (i.e. ESRD)
- Confirmation of placement
    - End-tidal CO2 color change or proper waveform
    - Breath sounds auscultated over lungs, no gastric sounds
    - Secure endotracheal tube, note position
- Post-intubation management
    - Long-term paralytic: Vecuronium 0.1 mg/kg(9mg)
    - Sedation: (May be repeated as indicated)
        - Midazolam 0.1 mg/kg
        - Fentanyl 1 – 2 mcg/kg
        - Ketamine 1 – 2 mg/kg
    - Continuous waveform capnography
- Paperwork
    - PPCR
    - Airway form
    - RSI form
- Exchange
    - Kit will be exchanged in return for PPCR + Airway form + RSI form ONLY

Spinal Motion Restrictions

Procedure Guideline

Reviewed: 2020	Updated: 2020

Patient ≥ 16 years old

Full Motion Restrictions	Modified Motion Restrictions	Motion Restrictions NOT required
C-collar, spider straps, head blocks on a back board	**C-collar only, transport in supine position, unless not tolerated, then position of comfort**	**Transport in position of comfort**
Multi-system blunt trauma (meets CDC triage level 1 or UVA Alpha or Beta alert criteria)	MVC, awake and alert, neck pain only, no neurologic symptoms – allow opportunity to self-extricate with C-collar only	Ambulatory at scene after fall/MVC without acute neurologic symptoms – direct patient to stretcher
Acutely abnormal mental status due to trauma	Facial or head trauma – not meeting alpha or beta criteria	Ground level falls with hip/lower extremity injury, NO acute neurologic symptoms or acute spine pain
Acute neurologic symptoms due to blunt and penetrating trauma, including weakness, numbness, tingling		Seizure and ground level fall – not meeting other criteria
Tenderness on palpation		Awake and alert after MVC, in the vehicle, with NO neurologic symptoms, should be allowed the opportunity to self-extricate. Stop if patient complains of pain that limits motion or develops neurologic symptoms
		NO “standing take down” of ambulatory patients

Other considerations:

- Patients should not be forced or “wrestled” into motion restrictions, transport in position of comfort acceptable to patient. Make the motion restrictions conform to the patient, not the patient to the motion restrictions.
- If motion restriction procedures/devices worsen or cause symptoms, including pain, neurologic symptoms including numbness, weakness, tingling, or respiratory distress then discontinue procedure/device that aggravated the symptoms.
- Penetrating trauma to head, neck, torso without neurologic deficits should not be placed in motion restrictions
    - Manage acute life threats and emphasize prompt transport
- Consider removing spider straps, blocks/rolls, and long back board after patient has been transferred to ED stretcher in non-priority trauma patients

Surgical Cricothyrotomy

Procedure Guideline

Reviewed: 2020	Updated: 2020

A surgical airway is a standing-order, Paramedic procedure designed for the viable patient whose airway cannot be successfully managed with the available non-invasive (BVM) or invasive airway devices/procedures, which include the supraglottic devices (i.e. LMA, King, Combitube) and endotracheal intubation. Providers performing this skill must be released at their designated skill levels and be approved by their medical director.

Level of care: Paramedic

Indication/s: Not recommended for children less than 8 years of age

- Massive facial trauma
- Foreign body aspiration
- Laryngoedema
- Laryngospasms
- Airway burns
- Laryngeal fracture
- Epiglottitis

Complications:

- Severe bleeding
- Vocal cord injury
- Failure to place catheter in trachea

Procedure:

- Place patient in a supine position and hyperextend the neck using stable positioning. Consider keeping the trauma patient's head in a neutral position.
- Secure the larynx laterally between thumb and forefinger. Identify the cricothyroid
- membrane puncture site which is bounded superiorly by the thyroid cartilage and inferiorly by the cricoid cartilage.
- Cleanse the area properly with betadine swab.
    - With scalpel, make a 1.0 to 2.0 cm shallow, vertical incision over the skin. Have fingers on either side providing mild to moderate spreading pressure to open the incision, if landmarks are obscured by marked obesity or subcutaneous air, make a 2.0 to 3.0 cm vertical incision through the skin, and dissect bluntly down to identify the cricothyroid membrane.
- Once the membrane has been located, make a 1.0 cm horizontal puncture.
- Enlarge the incision with the handle of the scalpel or other appropriate surgical instrument. NEVER enlarge the incision with the scalpel blade. A bougie can be used to determine whether the incision was made all the way through the anterior wall of the

trachea. While moving the bougie, proper positioning should be indicated by feeling a “washboard” feeling as the bougie tip rubs against the tracheal rings.

- Insert the appropriate size tracheostomy tube (in the absence of a tracheostomy tube, an endotracheal tube may be used). Insert the tube only until the cuff enters the trachea then inflate the cuff. Remove the obturator, ventilate and confirm successful airway placement:
    - Observe chest wall rise on ventilation
    - Auscultate for bilateral breath sounds
    - ETCO2 waveform/SpO2 monitoring is required to determine and maintain correct tracheal tube placement
    - Secure the tube with twill tape

Transcutaneous Pacing

Procedure Guideline

Reviewed: 2020	Updated: 2020

Indications:

- Heart rate less than 60 beats per minute with signs and symptoms of inadequate perfusion.

Procedure:

- Attach cardiac monitor leads.
- Apply multi-function or pacing pads per manufacturer recommendation.
- Select pacing function on cardiac monitor.
- Set heart rate to 80 bpm for adults and medical control for children.
- Note pacer spikes on ECG screen.
- Slowly increase output (mA) from the lowest setting until electrical capture is attained.
    - Electrical capture occurs when the pacer spike immediately precedes the QRS complex.
- If unable to capture while at maximum current output, turn the pacer off.
    - If electrical capture is attained, check the patient for corresponding pulse (mechanical capture) and assess vital signs.
- Consider the use of sedation or analgesia if indicated when BP > 90 mmHg.
- Document response to pacing. Attachment of ECG strips to the PPCR/ePPCR is required.

References

Common Abbreviations

Units of Measure

gm	gram
L	liter
mcg	microgram
mEq	milliequivalent
mg	milligram
mL	millilter
U	unit

Medication routes of entry

IM	intramuscular
IN	intranasal
IO	intraosseous
IV	intravenous
po	per os (by mouth)
SL	sublingual

IV Terms

gtt	drops
LR	lactated Ringer's
NS	normal saline
KVO	keep vein open
TKO	to keep open

Weight

kg	kilogram
lbs	pounds

Airway adjuncts/Oxygen delivery

BVM	bag-valve mask
LPM	liters per minute
NC	nasal cannula
NPA	nasopharyngeal airway
NRB	non-rebreather
OPA	oropharyngeal airway

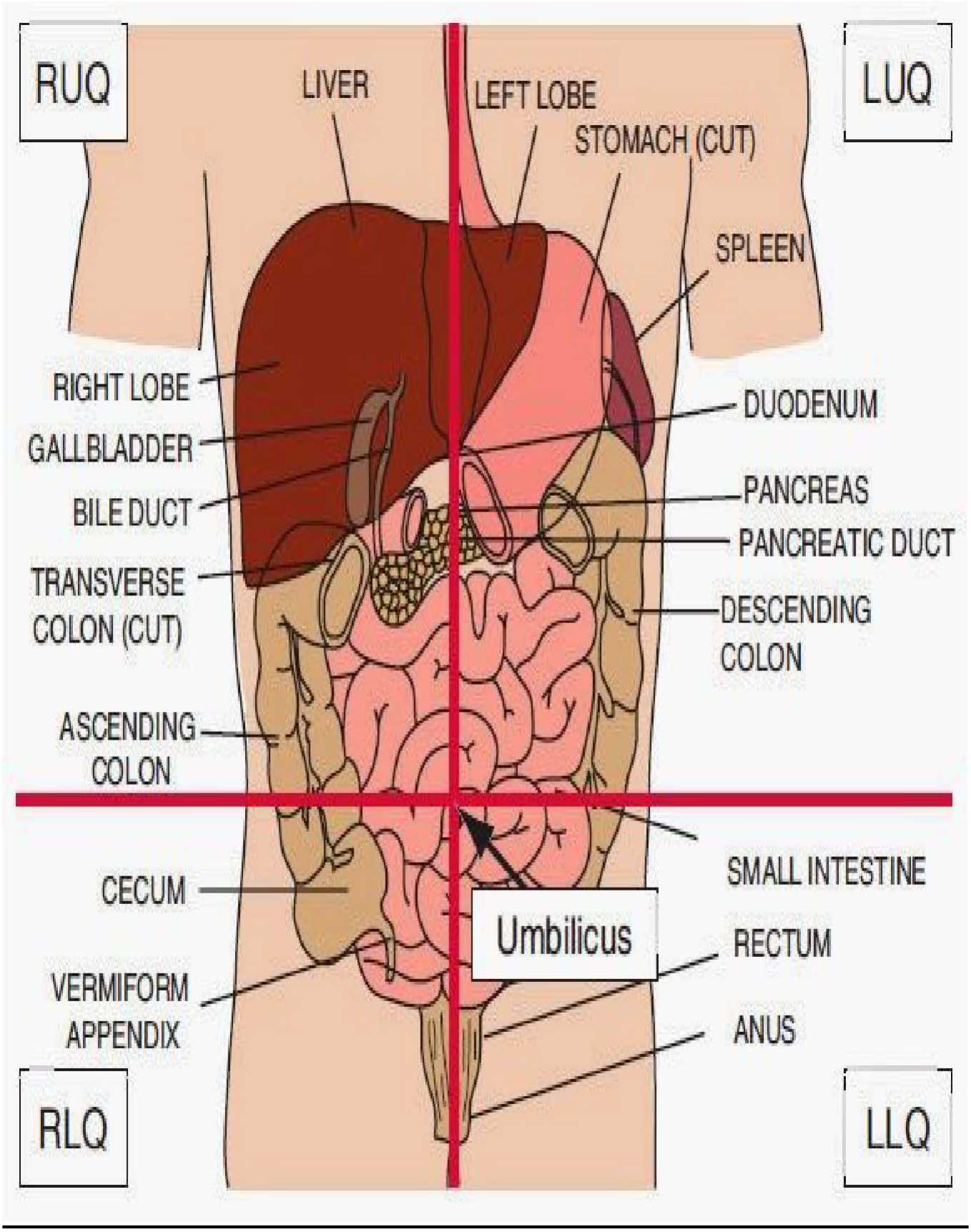
Medications

ASA	aspirin
NTG	nitroglycerin
ODT	orally disintegrating tablet

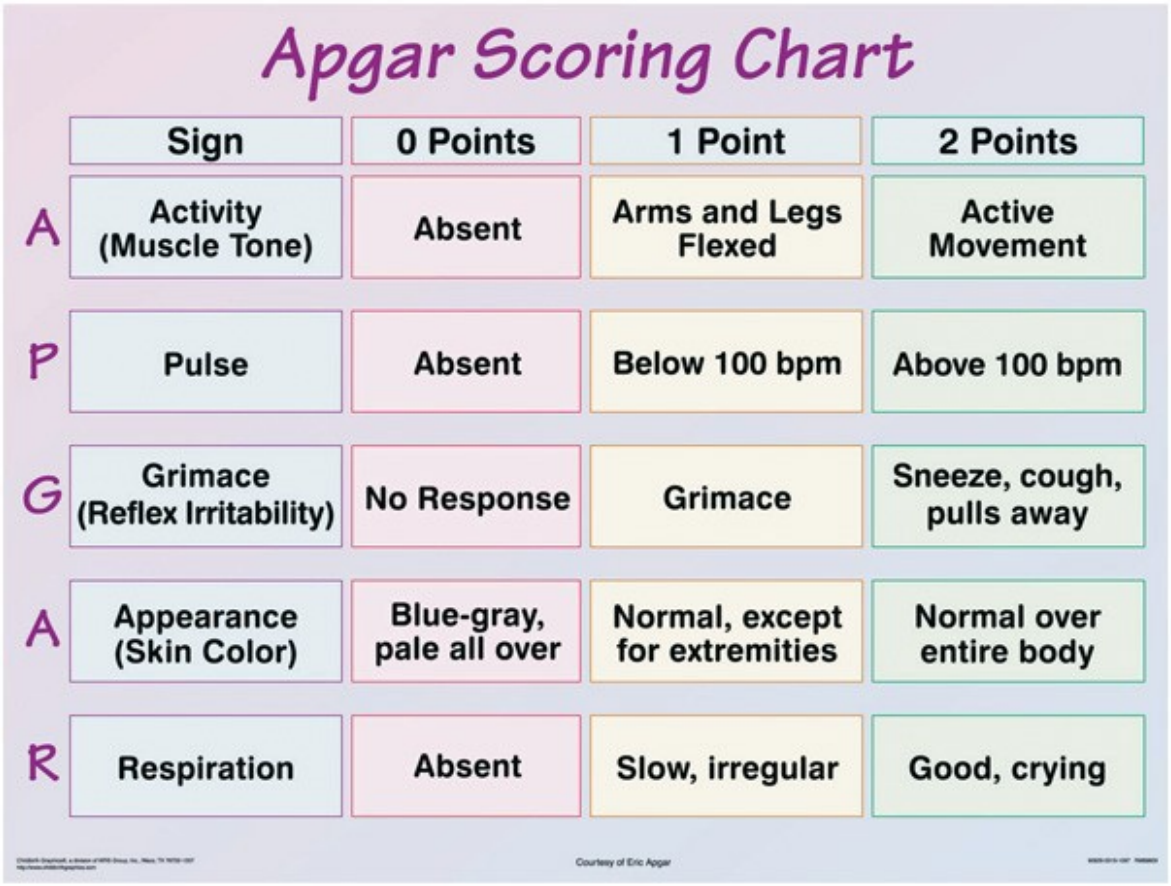
Commonly used abbreviations

ACS	acute coronary syndrome
AMA	against medical advice
AMI	acute myocardial infarction
AMS	altered mental status
BSA	body surface area
CABG	coronary artery bypass graft
CAD	coronary artery disease
CHF	congestive heart failure
CSF	cerebrospinal fluid
CVA	cerebrovascular accident
DVT	deep vein thrombosis
ECG	electrocardiogram
GI	gastrointestinal
GSW	gun-shot wound
GU	genitourinary
HTN	hypertension
ICP	intra-cranial pressure
IICP	increased intra-cranial pressure
IDDM	insulin-dependent diabetes mellitus
JVD	jugular vein distention
LMP	last menstrual period
MI	myocardial infarction
NIDDM	non-insulin dependent diabetes mellitus
NKA	no known allergies
NKDA	no known drug allergies
OB	obstetrics
PEA	pulseless electrical activity
PEARL	pupils equal & reactivity to light
PERL	pupils equal, reactivity to light
PERRL	pupils equal, round & reactivity to light
PEEP	positive end-expiratory pressure
PID	pelvic inflammatory disease
PVD	peripheral vascular disease
SIDS	sudden infant death syndrome
SBO	small bowel obstruction
SOB	short of breath
STD	sexually transmitted disease
TIA	transient ischemic attack
UTI	urinary tract infection

Abdominal Organs/Quadrants

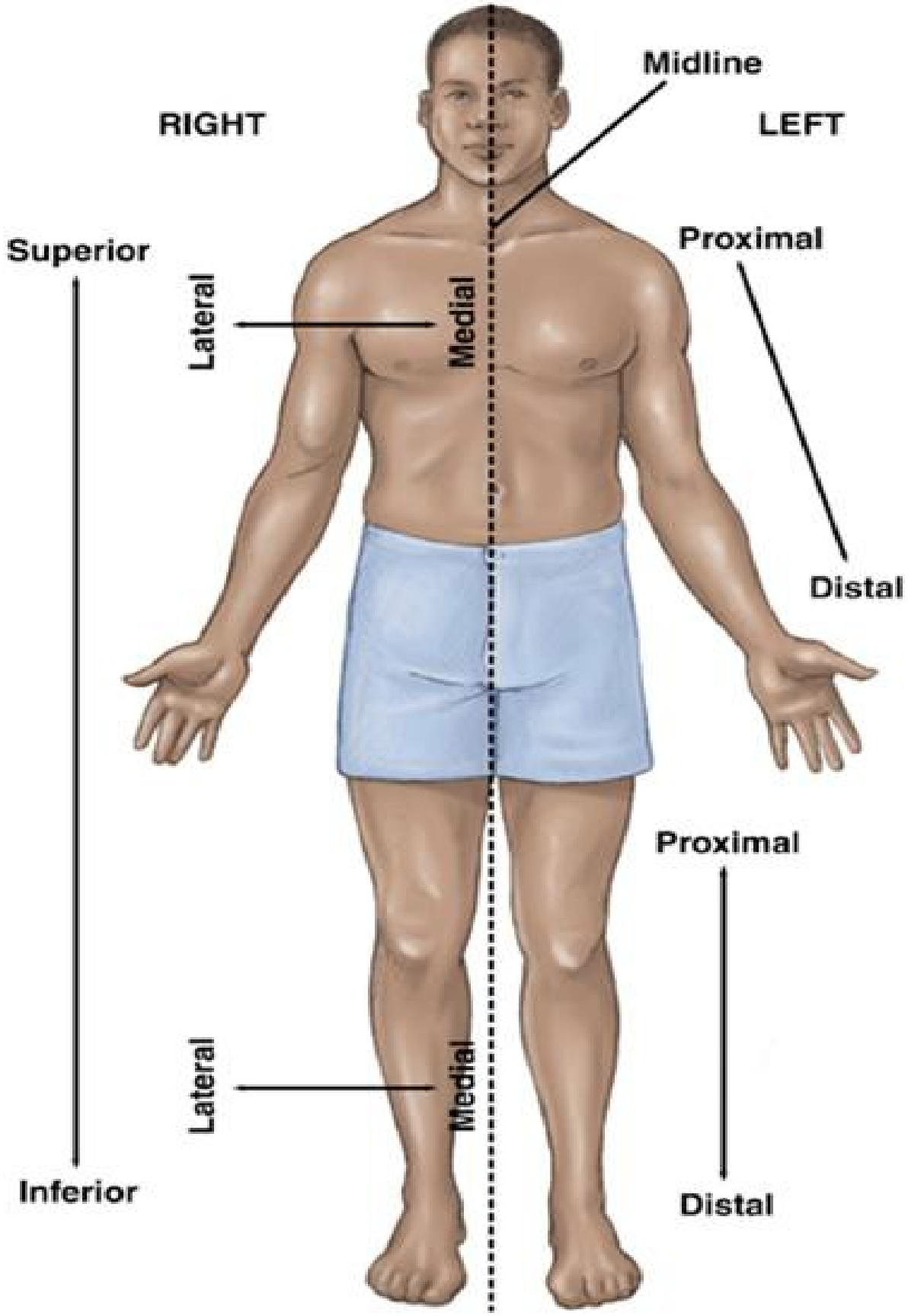


APGAR Score

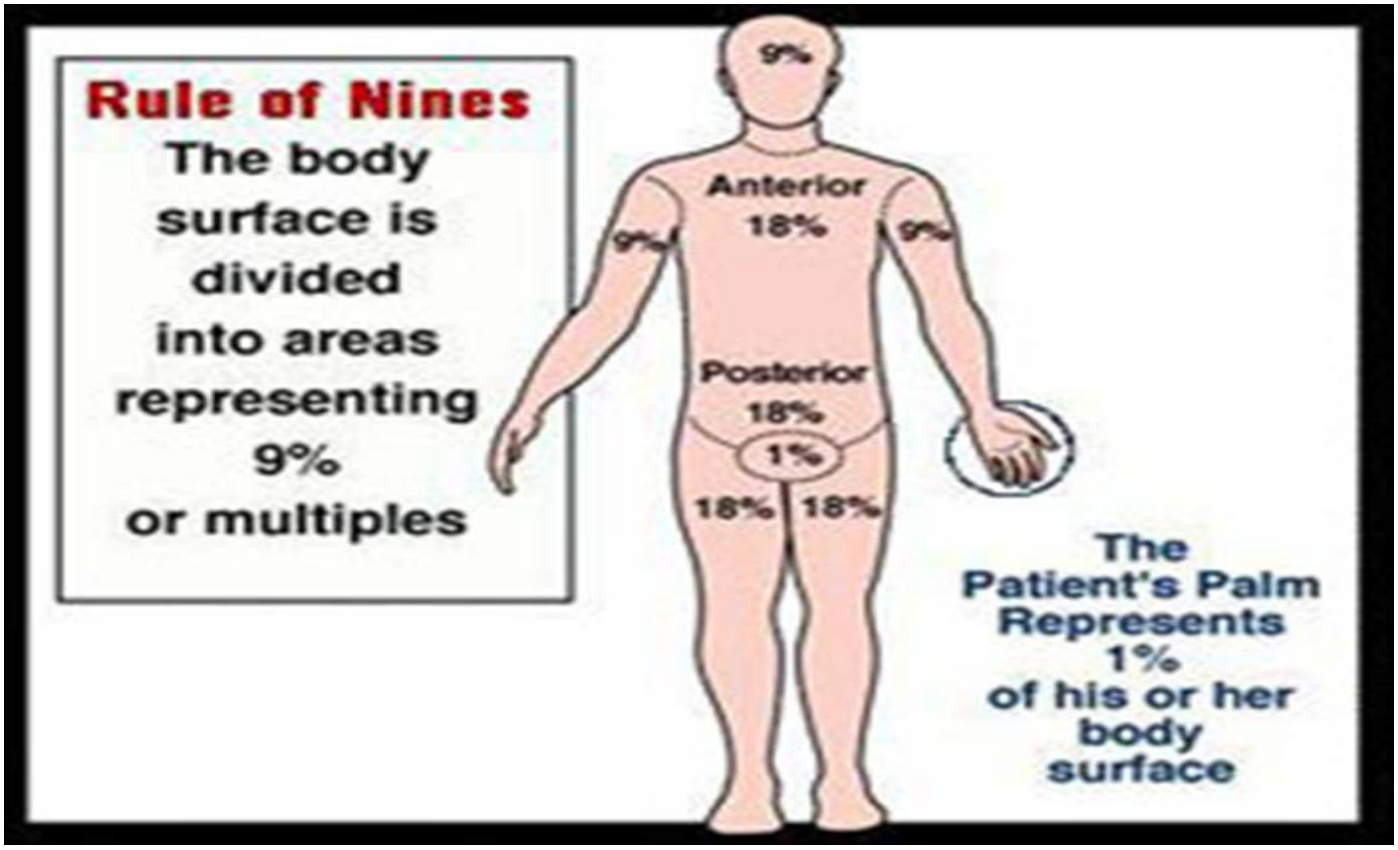


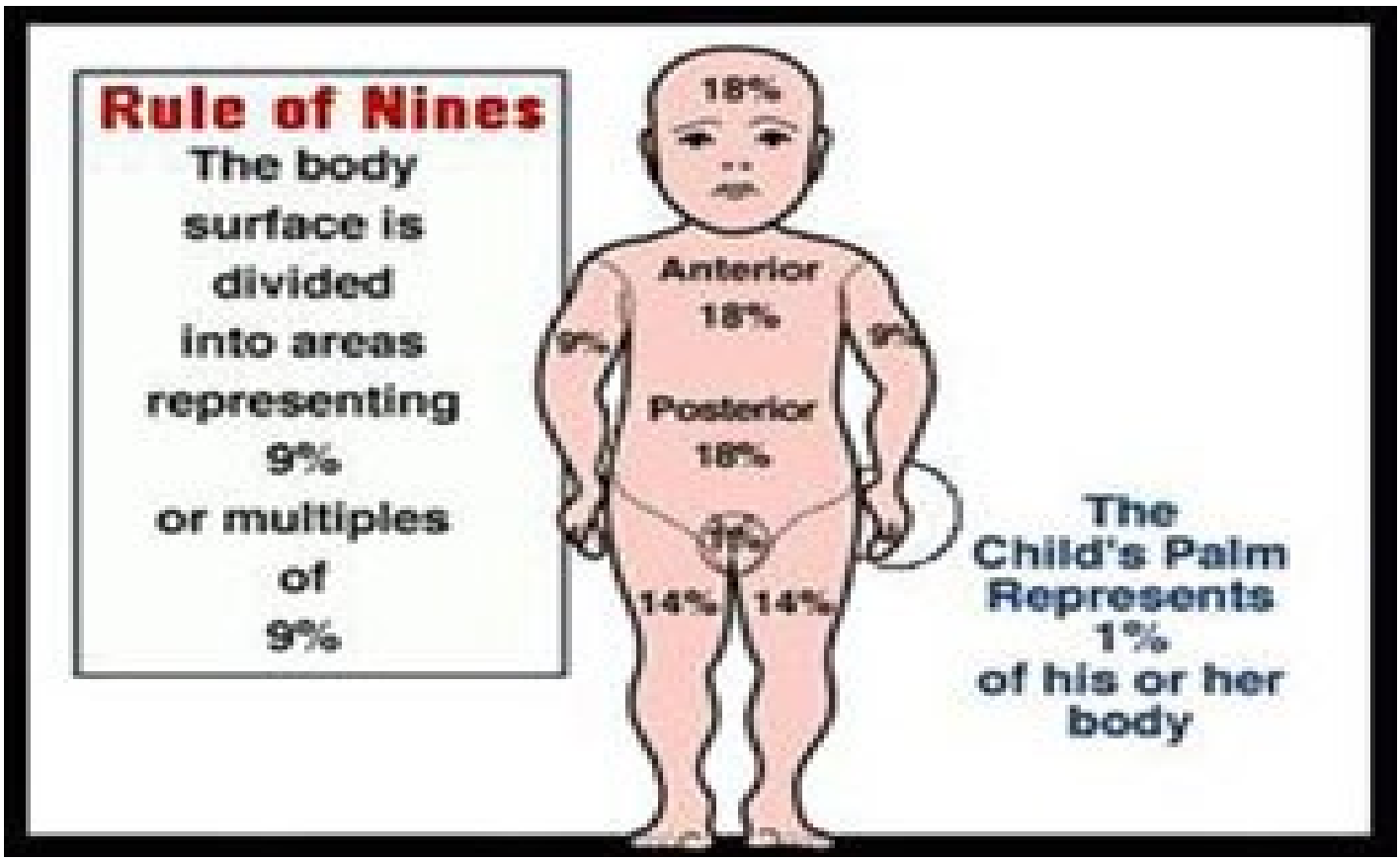
References/Updated 01.2015

Anatomic Position and Directions



Burns – Rule of 9's

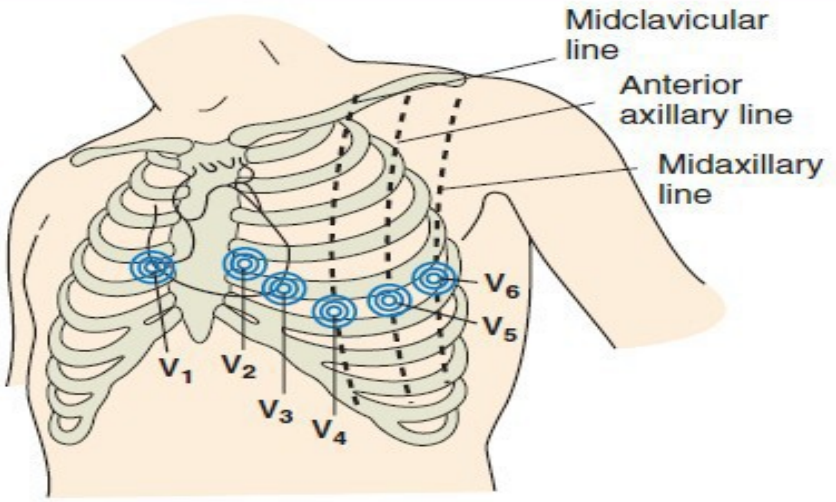




References/Updated 01.2015

Chest Leads

Standard Chest Lead Electrode Placement



Elements of Chest Leads

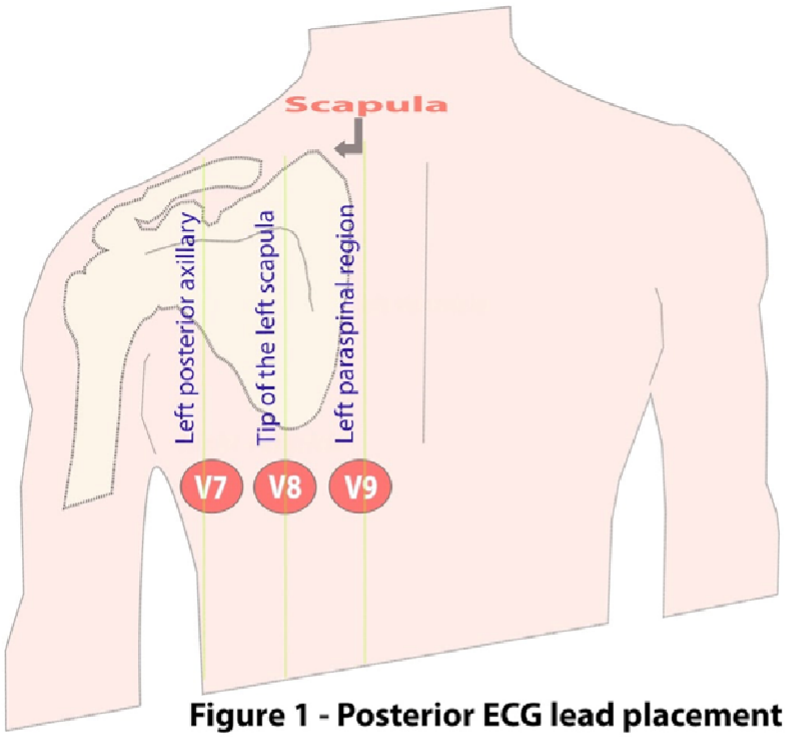
Lead	Positive Electrode Placement	View of Heart
V_1	4th Intercostal space to right of sternum	Septum
V_2	4th Intercostal space to left of sternum	Septum
V_3	Directly between V_2 and V_4	Anterior
V_4	5th Intercostal space at left midclavicular line	Anterior
V_5	Level with V_4 at left anterior axillary line	Lateral
V_6	Level with V_5 at left midaxillary line	Lateral

I - Lateral Circumflex Artery	**aVR**	**V1 - Septal** Left Anterior Descending Artery	**V4 – Anterior** Left Anterior Descending Artery
II - Inferior Right Coronary Artery	**aVL - Lateral** Circumflex Artery	**V2 - Septal** Left Anterior Descending Artery	**V5 - Lateral** Circumflex Artery
III - Inferior Right Coronary Artery	**aVF - Inferior** Right Coronary Artery	**V3 - Anterior** Left Anterior Descending Artery	**V6 - Lateral** Circumflex Artery

SITE	ST ELEVATION LOCATION	RECIPROCAL
ANTERIOR	V3, V4	NONE
ANTEROLATERAL	I, aVL, V3, V4, V5, V6	II, III, aVF
ANTEROSEPTAL	V1, V2, V3, V4	NONE
EXTENSIVE ANTERIOR	I, aVL, V1, V2, V3, V4, V5, V6	II, III, aVF
INFERIOR	II, III, aVF	I, aVL
LATERAL	I, aVL, V5, V6	II, III, aVF
POSTERIOR	V7, V8, V9	V1, V2, V3, V4
RIGHT VENTRICLE	II, III, aVF, V1, V4R	I, aVL
SEPTAL	V1, V2	NONE

Modified 12-lead Placement (Posterior)

Posterior ECG lead placement



V7
Left posterior axillary line:
in the same horizontal plane as V4-V6

V8
Tip of the left midscapula:
in the same horizontal plane as V7-V9

V9
Left paraspinal region:
in the same horizontal plane as V4-V6

V1-V3
Should remain unchanged from standard 12-lead ECG

Figure 1 - Posterior ECG lead placement

Posterior MI is suggestive by the following changes in V1-V3:

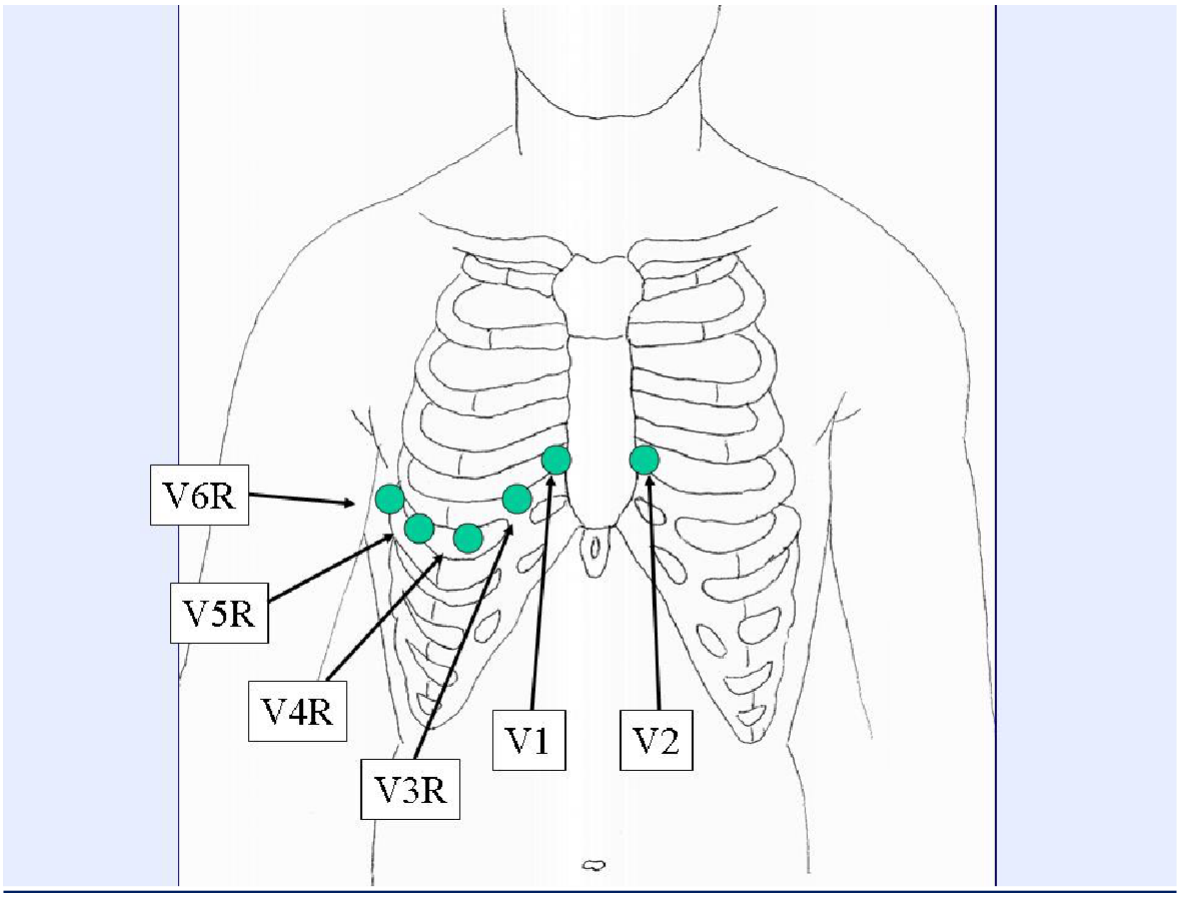
***Horizontal ST depression**
***Tall, broad R waves (>30ms)**
***Upright T waves**
***Dominant R wave (R/S ratio >1) in V2**

Please note that V6 is a good reference point for the horizontal placement of the posterior electrobes V7-9.

If you don't have access to to a 15 or 18 lead ECG machine, then leave V1-3 in their normal position and use V4-6, these leads will then become V7-9.

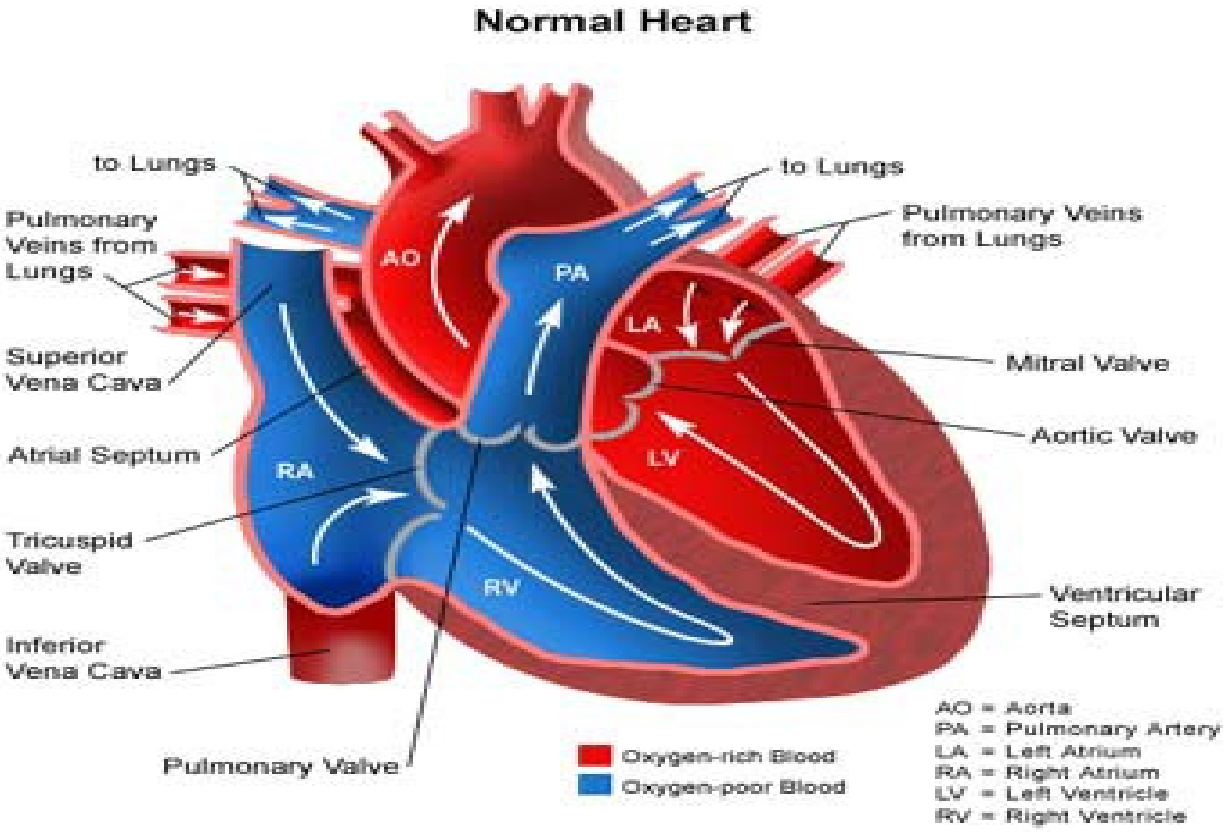
Be sure to strike through lead labels V4 - V6 and change to V7 - V9 on the print out

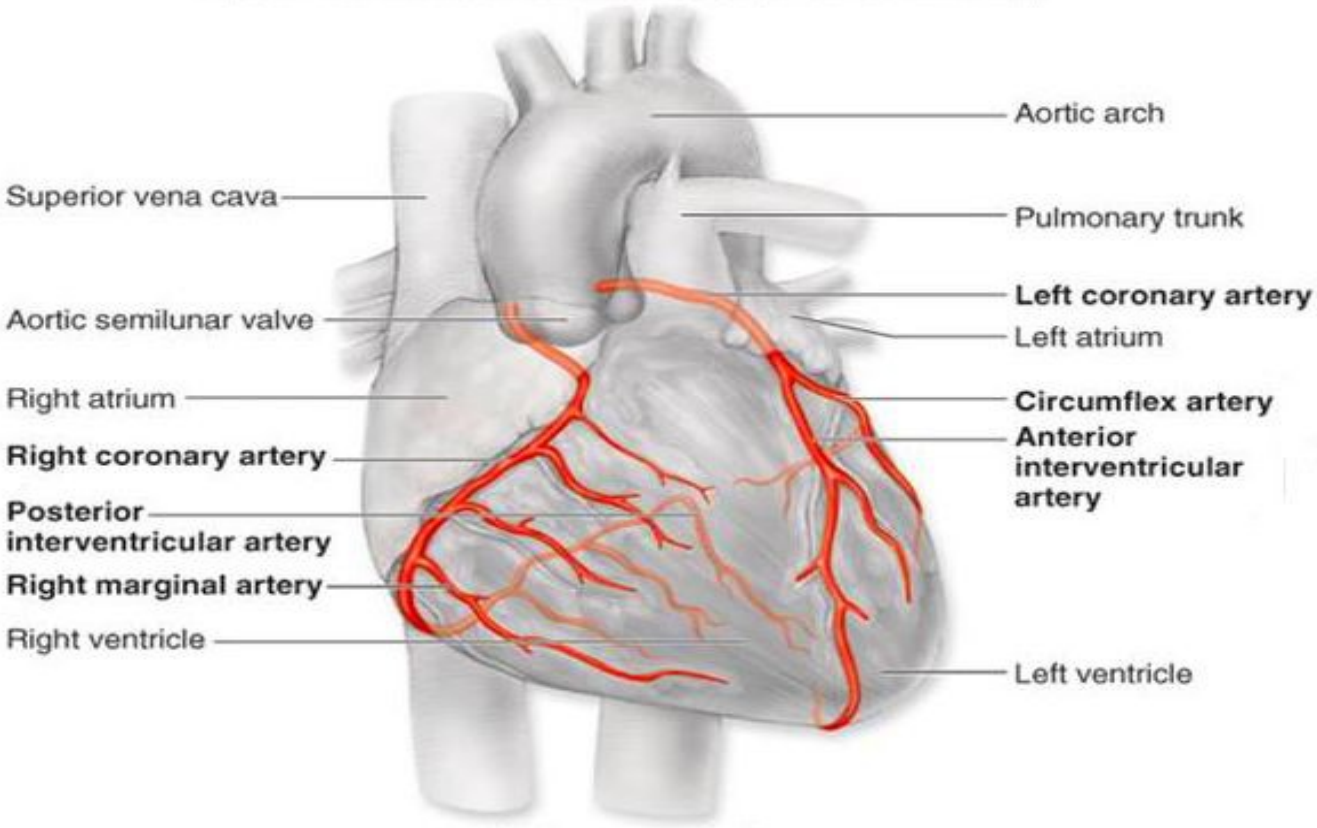
Modified 12-lead Placement (Right Sided)



Be sure to change the V3 – V6 lead labels to V3R - V6R on print out

Heart Anatomy and Coronary Arteries





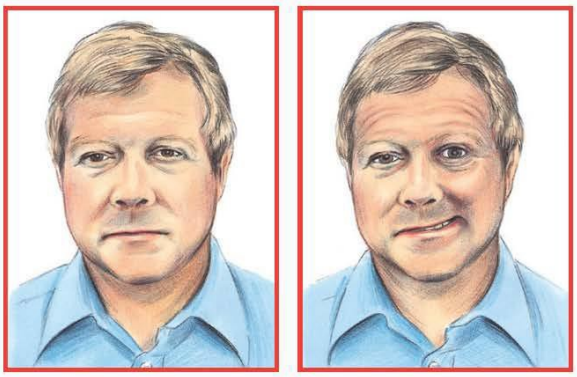
Cincinnati Stroke Scale

Stroke Assessment

The Cincinnati Prehospital Stroke Scale

Facial Droop (have patient show teeth or smile):

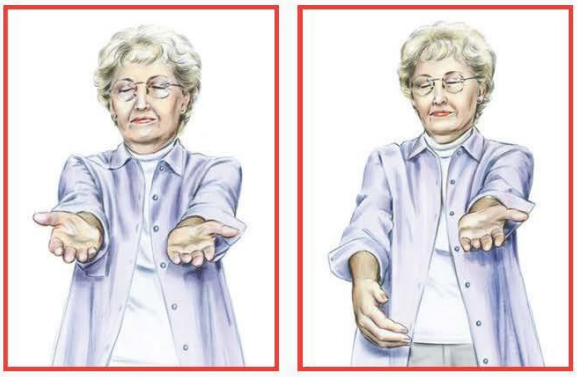
- Normal—both sides of face move equally
- Abnormal—one side of face does not move as well as the other side



Left: Normal. Right: Stroke patient with facial droop (right side of face).

Arm Drift (patient closes eyes and extends both arms straight out, with palms up, for 10 seconds):

- Normal—both arms move the same *or* both arms do not move at all (other findings, such as pronator drift, may be helpful)
- Abnormal—one arm does not move *or* one arm drifts down compared with the other



Left: Normal. Right: One-sided motor weakness (right arm).

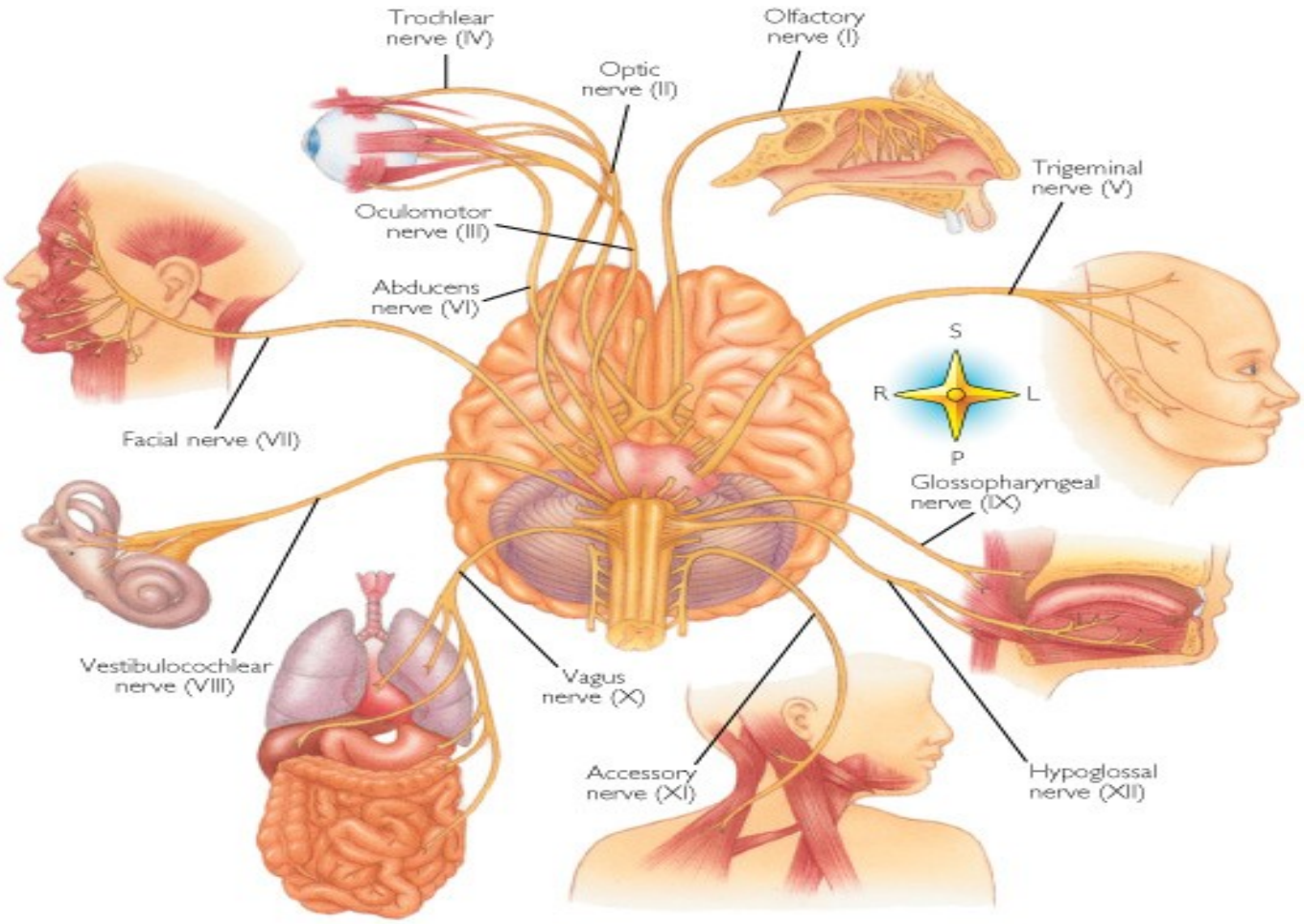
Abnormal Speech (have the patient say "you can't teach an old dog new tricks"):

- Normal—patient uses correct words with no slurring
- Abnormal—patient slurs words, uses the wrong words, or is unable to speak

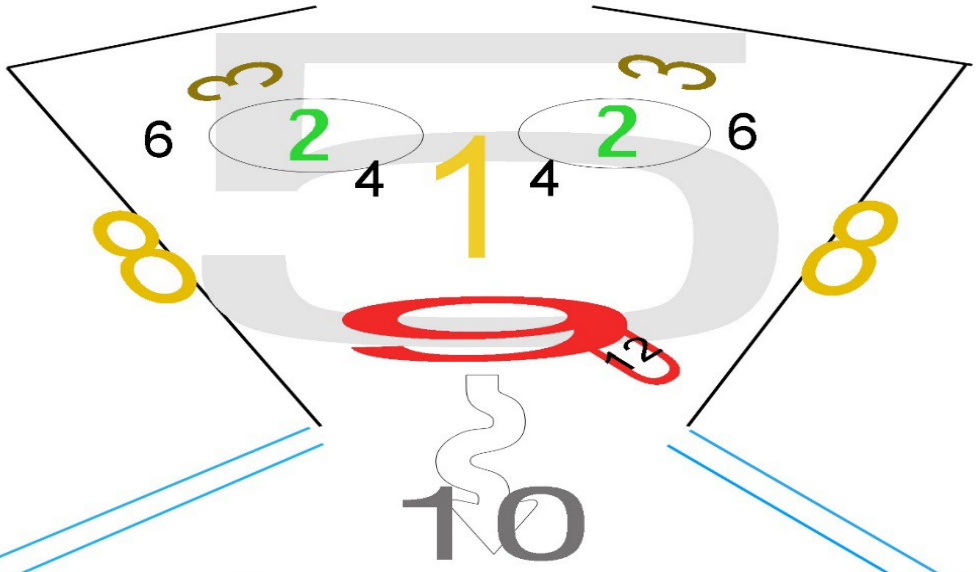
Interpretation: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

References/Updated 01.2015

Cranial Nerve Information



1. Olfactory
2. Optic
3. Oculomotor
4. Trochlear
5. Trigeminal
6. Abducens
7. Facial
8. Acoustic
9. Glossopharyngeal
10. Vagus
11. Spinal Accessory
12. Hypoglossal



Sarah Martin, 2011

The Cranial Nerves

F.A.S.T. Scale

STROKE is an Emergency.
Every minute counts.
ACT F.A.S.T!

FACE — Does one side of the face droop? Ask the person to smile.

ARMS — Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

SPEECH — Is speech slurred? Ask the person to repeat a simple sentence. Is the sentence repeated correctly?

TIME — If the person shows any of these symptoms, Call 911 or get to the hospital immediately.

References/Updated 01.2015

Glasgow Coma Scale (GCS)

ADULT		INFANT
Eye opening	**E**	**Eye opening**
Spontaneous	4	Spontaneous
To speech	3	To speech
To pain	2	To pain
No response	1	No response
Best motor response	**M**	**Best motor response**
Obeys verbal command	6	Normal movements
Localizes pain	5	Localizes pain
Flexion - withdraws from pain	4	Withdraws from pain
Flexion - abnormal	3	Flexion - abnormal
Extension	2	Extension
No response	1	No response
Best verbal response	**V**	**Best verbal response**
Oriented and converses	5	Coos, babbles
Disoriented and converses	4	Cries but consolable
Inappropriate words	3	Persistently irritable
Incomprehensible sounds	2	Grunts to pain/restless
No response	1	No response

References/Updated 01.2015

Patient Assessment Mnemonics

AVPU	
A	Alert
V	Verbal
P	Pain
U	Unresponsive

Medical History SAMPLE	
S	Signs and Symptoms
A	Allergies • Medications • Food • Environmental
M	Medications • Prescribed • OTC • Herbal
P	Past Pertinent History
L	Last oral intake
E	Events leading up

Trauma Assessment DCAP-BTLS	
D	Deformities
C	Contusions
A	Abrasions
P	Punctures/penetrations
B	Burns
T	Tenderness
L	Lacerations
S	Swelling

Pain Assessment OPQRST	
O	Onset • When did it start
P	Provocation • What could have caused it?
P	Palliation • Is there something that makes it feel better?
P	Position • Is there a position that is more comfortable?
Q	Quality • Can you describe the pain?
R	Radiation • Does the pain move anywhere?
R	Region • Where is the pain? Show me?
S	Severity • On a scale of……..?
T	Time • Since it started has it been constant, intermittent, etc.?

Altered Mental Status	
A	Alcohol, acidosis
E	Encephalitis, epilepsy, electrolytes
I	Insulin
O	Opiates and other drugs
U	Uremia
T	Trauma, temperature
I	Infection
P	Psychiatric, poison
S	Shock, stroke, space-occupying lesion, subarachnoid hemorrhage

Patient Assessment Mnemonics Continued

Pulseless Electrical Activity (PEA) Causes H's and T's	
Hypoxia	Tamponade (cardiac)
Hypovolemia	Tension pneumothorax
Hypothermia	Thrombosis (myocardial infarction)
Hydrogen ion (acidosis)	Thrombosis (pulmonary embolus)
Hypoglycemia	Trauma
Hyperkalemia	Toxins

Pediatric Appearance: TICLS	
T	Tone • Moving or resisting exam? • Limp, listless, or flaccid?
I	Interactiveness • How alert is child? Does child reach for toy, etc. • Is child uninterested?
C	Consolability • Can child be consoled? • Unrelieved by reassurance?
L	Look or gaze • Fix gaze on face? • "Nobody home", glassy eyed stare?
S	Speech or cry • Strong and spontaneous? • Weak or high pitched? • Content of speech age-appropriate?

Shortness of Breath Assessment	
P	Progression • Did it start suddenly or over time?
A	Associated chest pain
S	Sputum • Coughing up any? What color?
T	Talking tiredness • Can patient speak in full sentences?
E	Exercise tolerate • Ask about what patient was able to do before this started, has anything changed?

Patient Assessment Mnemonics Continued

Child Abuse	
C	Consistency of the injury with the child's development age
H	History inconsistent with injury
I	Inappropriate parental concerns
L	Lack of supervision
D	Delay in seeking care
A	Affect
B	Bruising of varying ages
U	Unusual injury pattern
S	Suspicious circumstances
E	Environmental clues

Symptoms of Nerve Gas Exposure			
Military: SLUDGEM		**Medical: DUMBELS**	
S	Salivation, sweating	**D**	Diarrhea
L	Lacrimation (excessive tearing)	**U**	Urination
U	Urination	**M**	Miosis (pinpoint pupils)
D	Defecation, drooling, diarrhea	**B**	Bradycardia, bronchospasm
G	Gastric upset and cramps	**E**	Emesis (vomiting)
E	Emesis (vomiting)	**L**	Lacrimation (excessive tearing)
M	Muscle twitching/miosis (pinpoint pupils)	**S**	Seizures, salivation, sweating

Weapons of Mass Destruction (WMD) or Weapons of Mass Casualty (WMC)			
B	Biologic	**C**	Chemical
N	Nuclear	**B**	Biologic
I	Incendiary	**R**	Radiologic
C	Chemical	**N**	Nuclear
E	Explosive weapons	**E**	Explosive weapons

Vital Sign Ranges

Ages	Heart Rate	Respiratory Rate	Systolic Blood Pressure	Temperature
Infancy (Birth to 1 Year)	100 to 160 (first 30 minutes) Settling around 120 bpm	40 to 60 initially 30-40 after first few minutes. 20-30 by one year	70 at Birth to 90 at 1 year	98-100
Toddler (12 to 36 Months) and Preschool Age (3 to 5 Years)	80 to 130 bpm 80 to 120 bpm	20 to 30 20 to 30	70 to 100 mmHg 80 to 110 mmHg	96.8 – 99.6
School-Age Children (6 to 12 Years)	70 to 110 bpm	20 to 30	80 to 120 mmHg	98.6
Adolescence (13 to 18 Years)	55 to 105 bpm	12 to 20	100 to 120 mmHg	98.6
Early Adulthood (20 to 40 Years)	70 bpm	16 to 20	120 to 80 mmHg	98.6
Middle Adulthood (41 to 60 Years)	70 bpm	16 to 20	120 to 80 mmHg	98.6
Late Adulthood (61 Years and Older)	Depends on patient's physical and health status.	Depends on patient's physical and health status.	Depends on patient's physical and health status.	98.6

Wong-Baker FACES Pain Rating Scale

References/Updated 01.2015

Medication References

Adenosine (Adenocard®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Antiarrhythmic

Action: Slows the conduction of electrical impulses at the AV node.

Indication/s: SVT; does not convert AF, atrial flutter or VT; narrow QRS < 0.12 seconds; SVT with aberrancy.

Contraindications: Sick sinus syndrome, second or third degree heart block, poison/drug induced or reflex tachycardia secondary to shock or dehydration, ventricular arrhythmias.

Dosage: **Adult:** 12 mg IV rapidly over 1 – 2seconds.

Pediatric: 0.1 mg/kg (maximum 6 mg) IV rapidly over 1 – 2 seconds. If no effect after 2 minutes, give 0.2 mg/kg (maximum 12 mg) IV/IO rapidly over 1 – 2 seconds.

10 kg child = 0.33 mL

Note: Adenosine should be delivered only by rapid IV bolus with a peripheral IV or directly into a vein, in a location as close to the heart as possible, preferably in the antecubital fossa. Administration of adenosine must be immediately followed by a saline flush, and then the extremity should be elevated.

Special Considerations: Use with caution in patients with pre-existing bronchospasm and those with a history of AF.

Elderly patients with no history of PSVT should be carefully evaluated for dehydration, shock and rapid sinus tachycardia.

Pregnancy class C.

Supplied: 6 mg/2 mL

Albuterol Sulfate (Proventil®, Ventolin®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Bronchodilator, beta agonist

Action: Binds and stimulates beta 2 receptors, resulting in relaxation of bronchial smooth muscle. Temporarily shifts potassium into the cells and out of the bloodstream.

Indication/s: Asthma; bronchitis with bronchospasm; COPD; known hyperkalemia.

Contraindications: Angioedema, sensitivity to albuterol or levalbuterol. Use with caution in lactating patients, cardiovascular disorders, cardiac arrhythmias.

Adverse Effects: Hyperglycemia, hypokalemia, palpitations, sinus tachycardia, anxiety, tremor, nausea/vomiting, throat irritation, dry mouth, hypertension, dyspepsia, insomnia, headache, epistaxis, paradoxical bronchospasm.

Dosage: *__Adult:__ 2.5 mg/3 mL through hand-held nebulizer with oxygen flow at 4 – 6 liters, may repeat if necessary. A modified nebulizer may be used with a BVM or a simple facemask, may repeat.

*__Pediatric:__ 2.5 mg/3 mL through hand-held nebulizer with oxygen flow at 4 – 6 liters, may repeat if necessary. A modified nebulizer may be used with a BVM or a simple facemask, may repeat.

*__TJEMS - EMT's may administer, albuterol portion ONLY.__

Special Considerations: Pregnancy class C.

Supplied: 2.5 mg/3 mL bullets

Amiodarone (Cordarone®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-arrhythmic, class III

Action: Acts directly on the myocardium to delay repolarization and increase the duration of the action potential.

Indication/s: Ventricular arrhythmias; second-line agent for atrial arrhythmias.

Contraindications: Sick sinus syndrome, second or third degree heart block, cardiogenic shock, when episodes of bradycardia have caused syncope.

Adverse Effects: Burning at the IV site, hypotension, and bradycardia.

Dosage:

Adult:

Cardiac arrest situations: 300 mg IV/IO push.
Unstable arrhythmias: 150 mg IV/IO over 10 minutes, mixed in 100 mL D5W, may be repeated once if needed for recurrent arrhythmia.

Pediatric: Medical Command Only, 5 mg/kg (maximum dose 300 mg),

10 kg child = 1 mL

Special Considerations: Pregnancy class D.

Supplied: 150 mg/3 mL vials

Amiodarone Drip

Medication Information

Reviewed: 2020	Updated: 2020

Patients with a pulse:

Establish primary IV line with 15 gtt set TKO

Draw up amiodarone (Cordarone®), 150 mg into 3 mL syringe

Open 100 mL bag D5W

Clean medication addition port and inject amiodarone (Cordarone®)

Label 100 mL bag with “medication added” label

Spike 100 mL back with 60 gtt set and clear tubing of air

Clean medication on primary line and connect 100 mL bag

Ensure primary line is running fast enough to carry amiodarone (Cordarone®) to patient

Open the 100 mL bag to run wide open over 10 minutes

Observe drip chamber to ensure amiodarone (Cordarone®) is infusing

Aspirin

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-platelet agent, non-narcotic analgesic, antipyretic

Action: Prevents the formation of a chemical known as thromboxane A2, which causes platelets to clump together or aggregate and form plugs that cause obstruction or constriction of small coronary arteries.

Indication/s: Angina, acute MI, patients complaining of chest pain, pressure, squeezing or crushing in the chest that may be cardiac in origin.

Contraindications: GI bleed, trauma, active ulcer disease, hemorrhagic stroke, bleeding disorders, known sensitivity.

Adverse Effects: Anaphylaxis, angioedema, bronchospasm, bleeding, stomach irritation, nausea/vomiting.

Dosage: **Adult:** 324 mg/chewed if using 81 mg (4)

Special Considerations: Pregnancy class C except the last 3 months of pregnancy, then considered class D.

Supplied: 81 mg/chewable tablets

Atropine Sulfate

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-cholinergic(anti-muscarinic)

Action: Competes reversibly with acetylcholine at the site of the muscarinic receptor. Receptors affected, in order from the most sensitive to the least sensitive, include salivary, bronchial, sweat, eye, heart and GI tract.

Indication/s: Symptomatic bradycardia, nerve agent exposure, organophosphate poisoning.

Contraindications: Acute MI; myasthenia gravis; GI obstruction; closed-angle glaucoma; known sensitivity to atropine; belladonna alkaloids, or sulfites. Will not be effective for infranodal (type II) AV block and new third-degree block with wide QRS complex.

Adverse Effects: Decreased secretions, resulting in dry mouth and hot skin temperature; intense facial flushing; blurred vision or dilation of the pupils with subsequent photophobia, tachycardia and restlessness. Atropine may cause paradoxical bradycardia if the dose administered is too low if the drug is administered too slowly.

Dosage:

Adult:

Bradycardia: 1 mg IV/IO up to a total of 3 mg.
Organophosphate poisoning: 2 mg IV/IO every 5 – 10 minutes.

Pediatric:

Bradycardia: 0.02 mg/kg (minimum of 0.1 mg, maximum dose of 0.5 mg)

10 kg child = 2 mL Organophosphate

poisoning: 0.05 mg/kg

Special Considerations: Half-life 2.5 hours

Pregnancy class C; possibly unsafe in lactating mothers.

Supplied: 1 mg/10 mL

Calcium Chloride 10%

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Electrolyte solution

Action: Counteracts the toxicity of hyperkalemia by stabilizing the membranes of the cardiac cells, reducing the likelihood of fibrillation.

Indication/s: Hyperkalemia; hypocalcemia; hypermagnesemia; beta blocker overdose; calcium channel blocker toxicity.

Contraindications: VF; digitalis toxicity, hypercalcemia.

Adverse Effects: Soft tissue necrosis, hypotension, bradycardia (if administered to rapidly).

Dosage:

Adult:

20 mg/kg slow IV/IO

Pediatric:

10 mg/kg slow IV/IO

10 kg child = 1 mL

Special Considerations: Do not administer by IM or SQ routes, which causes significant tissue necrosis.

Pregnancy class C.

Supplied: 1 gram/10 mL

Cefazolin (Ancef®, Kefzol®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Antibiotic

Action: Bactericidal actions against many gram-positive and gram-negative aerobes.

Indication/s: Open skeletal fracture; a break in the skin over a fracture site

Contraindications: History of anaphylaxis (not simple rash) to penicillin,
Known allergy to the cephalosporin group of antibiotics:

Biocef® (cephalexin)	Cedax® (cefibuten)	Cefizox® (ceftizoxime)
Cefobid® (cefoperazone)	Cefotan® (cefotetan)	Ceftin® (cefuroxime)
Cefzil® (cefprozil)	Ceptax® (ceftazidime)	Claforan® (cefotaxime)
Duricef® (cefadroxil)	Fortaz® (ceftazidime)	Keflex® (cephalexin)
Lorabid® (loracarbef)	Maxipime® (cefepime)	Mefoxin® (cefoxitin)
Omnicef® (cefdinir)	Panixine® (cephalexin)	Raniclor® (cefaclor)
Rocephin® (ceftriaxone)	Spectrecef® (cefditoren)	Suprax® (cefixime)
Tazicef® (ceftazidime)	Vantin® (cefpodoxime)	Velosef® (cephradine)
Zinacef® (cefuroxime)		

Dosage: Adult (18 y/o and over):
≥ (equal to or greater than) 80 kg: 2 grams IM/IV
≤ (equal to or less than) 80 kg: 1 gram IM/IV

IM (preferred route): appropriate site is anterolateral thigh
≥ 80 kg: 2 grams IM over 2 – 3 seconds
≤ 80 kg: 1 gram IM over 2 – 3 seconds

IV bolus: dilute each reconstituted gram of Ancef® with an additional 5 mL of normal saline, give each gram slowly over 3 – 5 minutes.

IV "piggyback": added appropriate number of reconstituted Ancef® vials (1 or 2 grams) to 100 cc bag of normal saline.

Side effects: Diarrhea, pain at IM injection site

Special Considerations:

Supplied: 2 – 1 gram vials (each gram to be reconstituted with 2.5 mL of sterile water) ***Note:*** *after reconstitution with 2.5 mL sterile water there is approximately 330mg/mL*
1 – 10 mL sterile water (for reconstitution)

Dextrose 50%

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-hypoglycemic

Action: Increases blood glucose concentrations.

Indication/s: Hypoglycemia; altered mental status.

Contraindications: Known intracranial and intra-spinal hemorrhage, delirium tremens; solution is not clear; seals are not intact.

Adverse Effects: Hyperglycemia; warmth, burning from IV infusion. Concentrated solutions may cause pain and thrombosis of the peripheral veins.

Dosage:

Adult:

25 gram bolus in free flowing IV

Pediatric:

0.5 gram/kg. See dilution on pediatric dosage chart.

10 kg child = 20 mL (D25%)

Special Considerations: Pregnancy class C.

Supplied: 25 gram/50 mL

Diphenhydramine HCL (Benadryl®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-histamine

Action: Binds and blocks H1 histamine receptors.

Indication/s: Anaphylactic reactions; dystonic reactions; allergic reactions.

Contraindications: Acute asthma, which thickens secretions; nursing mothers; patients with cardiac histories; known sensitivity.

Adverse Effects: Drowsiness; dizziness; headache; excitable state(children); wheezing; thickening of bronchial secretions; chest tightness; palpitations; hypotension; blurred vision; dry mouth; nausea/vomiting; diarrhea.

Dosage:

Adult:

25 to 50 mg IV or deep IM per specific guideline

Pediatric:

1.0 mg/kg slow IV (over 2 minutes) maximum dose of 50 mg

10 kg child = 0.2 mL

Special Considerations: Pregnancy class B.

Supplied: 50 mg/mL

Dopamine HCL (Inotropin®)

Medication Information

Reviewed: 2020	Updated: 2020

(Medical Command Required)

Classification: Adrenergic agonist, inotrope,vasopressor

Action: Stimulates alpha and beta adrenergic receptors. At moderate doses (2 – 10 micrograms/kg/min), dopamine stimulates beta 1 receptors in inotropy and increased cardiac output while maintaining dopaminergic-induced vasodilatory effects. At high doses (> 10 micrograms/kg/min), alpha adrenergic agonism predominates and increased peripheral vascular resistance and vasoconstriction result.

Indication/s: Hypotension and decreased cardiac output associated with cardiogenic shock and septic shock; hypotension after return of spontaneous circulation following cardiac arrest; symptomatic bradycardia unresponsive to atropine.

Contraindications: VF, VT or other ventricular arrhythmias; Pheochromocytoma; known sensitivity (including sulfites). Correct any hypovolemia with volume fluid replacement before administering dopamine.

Adverse Effects: Tachycardia; arrhythmias; skin and soft tissue necrosis; severe hypertension from excessive vasoconstriction; angina; dyspnea; headache; nausea/vomiting

Dosage:

Adult:

Drip only: 200 mg in 250 mL D5W IV/IO piggyback 2 to 20 microgram/kg/min titrated to BP of 90 mm Hg systolic.

Quick calculation: drops/min = kg x microgram/kg/min x 0.075

Special Considerations: Half-life 2 minutes.

Pregnancy class C.

Supplied: 200 mg/5 mL

Dopamine HCL (Inotropin®) Drip

Medication Information

Reviewed: 2020	Updated: 2020

Establish primary IV line with 15 gtt set TKO

Draw up dopamine (Inotropin®) 200 mg into 10 mL syringe

Open 250 mL bag D5W

Clean medication addition port and inject dopamine (Inotropin®)

Label 250 mL bag with “medication added” label

Spike 250 mL back with 60 gtt set and clear tubing of air

Clean medication on primary line and connect 250 mL bag

Ensure primary line is running fast enough to carry dopamine (Inotropin®) to patient

Observe drip chamber to ensure dopamine is infusing

Mix 200 mg in 250 mL of D5W (800 microgram/mL) as above:

Weight in kg

Mcg/kg/min	40 kg	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg
2	6	8	9	10	12	14	15
5	15	19	22	26	30	34	38
10	30	38	45	52	60	68	75
15	45	56	68	79	90	101	112
20	60	75	90	105	120	135	150

Drug Dose Calculations

2 x age + 8 = approximate weight in kg

Weight in pounds divide by 2.2 = weight in kg

$$\frac{\text{Desired Dose (mg)}}{\text{Amount in 1 mL}} = \text{mL to administer}$$

Epinephrine (Adrenalin®) 1:1,000

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Adrenergic agent, inotrope

Action: Binds strongly with both alpha and beta receptors, producing increased blood pressure, increased heart rate, and bronchodilation.

Indication/s: Bronchospasm; allergic and anaphylactic reactions; cardiac arrest.

Contraindications: Arrhythmias other than pulseless VT/VF, asystole, PEA; cardiovascular disease; hypertension; cerebrovascular disease; shock secondary to causes other than anaphylactic shock; closed-angle glaucoma; diabetes; pregnant women in active labor; known sensitivity to epinephrine or sulfites. No contraindications if in anaphylaxis.

Adverse Effects: Anxiety; headache; cardiac arrhythmias; hypertension; nervousness; tremors; chest pain; nausea/vomiting.

Dosage:

Adult:

1:1,000: 0.3 mg IM, may repeat every 10 – 20 minutes

Pediatrics:

1:1,000: 0.01 mg/kg IM

10 kg child = 0.1 mL

Special Considerations: Half-life 1 minute.

Pregnancy class C.

Supplied: 1 mg/mL

Epinephrine (Adrenalin®) 1:10,000

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Adrenergic agent, inotrope

Action: Binds strongly with both alpha and beta receptors, producing increased blood pressure, increased heart rate, and bronchodilation.

Indication/s: Bronchospasm; allergic and anaphylactic reactions; cardiac arrest.

Contraindications: Arrhythmias other than pulseless VT/VF, asystole, PEA; cardiovascular disease; hypertension; cerebrovascular disease; shock secondary to causes other than anaphylactic shock; closed-angle glaucoma; diabetes; pregnant women in active labor; known sensitivity to epinephrine or sulfites. No contraindications if in anaphylaxis.

Adverse Effects: Anxiety; headache; cardiac arrhythmias; hypertension; nervousness; tremors; chest pain; nausea/vomiting.

Dosage:

Adult: Cardiac arrest

1:10,000: 1 mg IV/IO every 3 – 5 minutes

Pediatrics:

1:10,000: 0.01 mg/kg IV/IO, repeat every 3 – 5 minutes

10 kg child = 1 mL

Special Considerations: Half-life 1 minute.

Pregnancy class C.

Supplied: 1 mg/10mL

Fentanyl Citrate (Sublimaze®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Narcotic analgesic; schedule C-II

Action: Binds to opiate receptors, producing analgesia and euphoria.

Indication/s: Pain of any origin.

Contraindications: Known sensitivity. Use with caution in traumatic brain injury, respiratory depression. Do not give in trauma patients except for isolated extremity fractures.

Adverse Effects: Respiratory depression; apnea; hypotension; nausea/vomiting; dizziness; sedation; euphoria; sinus bradycardia; sinus tachycardia; palpitations; hypertension; diaphoresis; syncope; pain at injection site.

Dosage:

Adult:

1 microgram/kg; maximum single dose of 50 micrograms, IV/IO/IM, may repeat once at same dose in 10 minutes if needed for control of severe pain. Maximum total dose is 100 micrograms.
For additional dosing, contact Medical Command

Reduced dose: 0.5 micrograms/kg; for elderly and severely ill patients.

2 micrograms/kg; maximum dose 100 microgram, **IN** (1/2 dose in each nostril using atomizer on syringe), may repeat once at same dose in 10 minutes if needed for control of severe pain.

Pediatrics: Age less than 12 years and greater than 2 years:

1 microgram/kg; maximum single dose 50 micrograms, IV/IO/IM, may repeat once at same dose in 10 minutes if needed for control of severe pain.

2 micrograms/kg; maximum single dose of 50 micrograms, **IN** (1/2 dose in each nostril using atomizer on syringe), may repeat once at same dose in 10 minutes if needed for control of severe pain.

Less than 2 years of age: **Medical Command only**

Special Considerations: Pregnancy class B.

Supplied: 100 microgram/2 mL

Glucagon

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Hormone

Action: Converts glycogen to glycose.

Indication/s: Hypoglycemia.

Contraindications: Pheochromocytoma; insulinoma; known sensitivity.

Adverse Effects: Nausea/vomiting; rebound hyperglycemia; hypotension; sinus tachycardia.

Dosage:

Adult:

1 unit (1 mL) IM

Pediatrics:

1 unit (1 mL) IM, if greater than 20 kg/44lbs or
0.5 unit if less than 20 kg/44lbs

10 kg child = 0.5 mL

Special Considerations: Pregnancy class B.

Supplied: 1 unit (1 mg/mL to be mixed)

Haloperidol (Haldol®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-psychotic agent

Action: Selectively blocks postsynaptic dopamine receptors.

Indication/s: Psychotic disorders; severe agitation.

Contraindications: Decreased mental status; Parkinson's disease; history of prolonged QT syndrome; children under 18; cardiac arrhythmias; lactation.

Adverse Effects: Extrapyramidal symptoms; drowsiness; tardive dyskinesia; hypotension; hypertension; VT; sinus tachycardia; QT prolongation; torsades de pointes.

Dosage:

Adult:
5 mg IM to control acute agitation

Over 65 years old:
2.5 mg IM to control acute agitation

Special Considerations: Pregnancy class B.

Supplied: 5 mg/1 mL vial

Ipratropium Bromide (Atrovent®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Bronchodilator, anti-cholinergic

Action: Antagonizes the acetylcholine receptor on bronchial smooth muscle; producing bronchodilation.

Indication/s: Asthma; bronchospasm associated with COPD.

Contraindications: Closed-angle glaucoma; bladder neck obstruction; prostatic hypertrophy; known allergy to peanuts or soybeans and atropine or atropine derivatives.

Adverse Effects: Paradoxical acute bronchospasm; cough; throat irritation; headache; dizziness; dry mouth; palpitations.

Dosage:

Adult:

0.5 mg/3 mL through hand-held nebulizer with oxygen flow at 4 – 6 liters, mixed with 1st dose of albuterol. A modified nebulizer maybe used with a BVM or a simple face mask.

Pediatric:

0.5 mg/3 mL through hand-held nebulizer with oxygen flow at 4 – 6 liters, mixed with 1st dose of albuterol. A modified nebulizer maybe used with a BVM or a simple face mask.

Special Considerations: Ipratropium bromide is not typically used as a sole medication in the treatment of acute exacerbation of asthma. Ipratropium bromide is commonly administered after or with a beta agonist.

Care should be taken to not allow the aerosol spray (especially in the MDI) to come into contact with the eyes. This can cause temporary blurring of vision that resolves without intervention within 4 hours.

Pregnancy class B.

Supplied: 0.5 mg/3 mL bullet

Ketamine (Ketalar®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Dissociative, anesthetic agent

Action: MDMA receptor blockade.

Indication/s: Pain management for isolated extremity injuries and burns.

For severe pain in multi-trauma patients, contact Medical Command.

Contraindications: Known sensitivity; open globe (eye) injury.

Adverse Effects: Central nervous system (CNS) depression; salivation; unpleasant emergence.

Dosage:

Adult:

0.5 mg/kg IV may be repeated once in 10 minutes. Maximum single dose is 20 mg. Maximum total dose of 40mg.

Pediatric: Intermediate and Paramedic on Medical Command

0.5 mg/kg IV may be repeated once in 10 minutes. Maximum single dose is 20 mg.

Special Considerations:

Supplied: 200 mg/20 mL

Methylprednisolone (Solu-Medrol®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Corticosteriod

Action: Reduces inflammation by multiple mechanisms.

Indication/s: Anaphylaxis; asthma; COPD.

Contraindications: Known sensitivity.

Adverse Effects: Depression, euphoria; headache; restlessness; hypertension; bradycardia; nausea/vomiting; swelling; diarrhea; weakness; fluid retention; paresthesias.

Dosage:

Adult:
125 mg IV over one (1) minute

Pediatric:
1 mg/kg IV

10 kg child = 0.16 mL

Special Considerations: May mask signs and symptoms of infection.

Use caution in cancer patients undergoing chemotherapy.

Pregnancy class C.

Use with caution in active infections, renal disease, penetrating spinal cord injury, hypertension, seizures, CHF.

Cushing's syndrome; fungal infection; measles; varicella; known sensitivity (including sulfites).

Supplied: 125 mg/2 mL

Metoprolol (Lopressor®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Beta adrenergic; antagonist; anti-anginal; anti-hypertensive; class II anti-arrhythmic.

Action: Inhibits the strength of the hearts contractions as well as heart rate. This results in a decrease in cardiac oxygen consumption. Also saturates the beta receptors and inhibits dilation of bronchial smooth muscle (beta2 receptor).

Indication/s: Hypertension; SVT; atrial flutter; A-fib; thyrotoxicosis.

Contraindications: Cardiogenic shock; AV blocks; bradycardia; known sensitivity. Use with caution in hypotension and chronic lung disease (asthma and COPD).

Adverse Effects: Tiredness; dizziness, diarrhea; heart block; bradycardia; bronchospasm; decrease in blood pressure.

Dosage:

Adult:

5 mg IV/IO over 2 minutes; may repeat every 10 minutes to a maximum of 15 mg to achieve ventricular rate of 120 or less.

Special Considerations: Blood pressure, heart rate and ECG should be monitored carefully.

Use with caution in patients with asthma.

Pregnancy class C.

Supplied:

5 mg/5 mL

Midazolam (Versed®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Benzodiazepine, schedule C-IV

Action: Binds to the benzodiazepine receptor and enhances the effects of the brain chemical (neurotransmitter) GABA. Benzodiazepines act at the level of the limbic, thalamic and hypothalamic regions of the CNS to produce short acting CNS depression (including sedation, skeletal muscle relaxation and anti-convulsant activity).

Indication/s: Sedation; anxiety; seizures; skeletal muscle relaxation.

Contraindications: Acute-angle glaucoma; pregnancy; shock.

Adverse Effects: Respiratory depression; respiratory arrest; hypotension; nausea/vomiting; headache; hiccups; cardiac arrest. Pediatric patients may have a paradoxical affect.

Dosage:

Adult:

Sedation: 2 – 5 mg IV

Seizures: 10 mg IM, if actively seizing, may repeat once in 10 minutes if seizures continue.
5 mg IV for continued seizures with IV access may repeat once in 10 minutes if seizures continue.

Pediatric:

Sedation: 0.1 mg/kg IV, maximum dose 2 mg

10 kg child = 0.2 mL

Seizures: for patient ≥ 13 kg/28lbs: 5 mg IM if actively seizing, may repeat once in 10 minutes if seizures continue.
0.1 mg/kg IV (maximum single dose of 5 mg), may repeat once in 10 minutes for continued seizure.

Special Considerations: Patients receiving midazolam required frequent monitoring of vital signs and pulse oximetry. Be prepared to support patient's airway and ventilation.

Use caution in elderly patients.

Pregnancy class D.

Supplied: 5 mg/1 mL

Morphine Sulfate

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Opiate agonist, schedule C-II

Action: Binds with opioid receptors; capable of inducing hypotension by depression of the vasomotor centers of the brain, as well as release of the chemical histamine. In the management of angina, it reduces stimulation of the sympathic nervous system caused by pain and anxiety. Reduction of sympathetic stimulation reduces heart rate, cardiac work and myocardial oxygen consumption.

Indication/s: Preferred in burn patients; moderate to severe pain, including chest pain associated with Acute Coronary Syndrome (ACS); CHF; pulmonary edema.

Contraindications: Respiratory depression; shock.

Adverse Effects: Respiratory depression; hypotension; nausea/vomiting; dizziness; lightheadedness; sedation; diaphoresis; euphoria; dysphoria; worsening of bradycardia and heart block in some patients with acute inferior wall MI; seizures; cardiac arrest; anaphylactoid reactions.

Dosage:

Adult:

0.1 mg/kg, IV/IO/IM, maximum single dose of 5 mg, may repeat another 5 mg if needed and tolerated.
May repeat up to a maximum of 10 mg.

Reduced dose for elderly or ill patients = 0.05 mg/kg

Special Considerations: Monitor vital signs and pulse oximetry closely. Be prepared to support patient's airway and ventilations.

Overdose should be treated with naloxone (Narcan®).

No longer recommended opiate analgesia

Use with caution in hypotension; acute bronchial asthma; respiratory insufficiency; head trauma

Pregnancy class D.

Supplied: 10 mg/mL

Naloxone HCL (Narcan®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Opiate antagonist

Action: Binds with opioid receptors and blocks the effect of narcotics.

Indication/s: Narcotic overdoses; reversal of narcotics; newborns with respiratory depression; narcotic using mothers.

Contraindications: Known sensitivity to naloxone, nalmefene ornaltrexone.

Do not use on intubated patients.

Adverse Effects: Nausea/vomiting; restlessness; diaphoresis; tachycardia; hypertension; tremulousness; seizures; cardiac arrest; narcotic withdrawal. Patients who have gone from a state of somnolence from a narcotic overdose to wide awake may become combative.

Dosage:

Adult:

Up to 0.8 mg slow IV/IM titrated to respirations. Repeat up to 2 mg

Pediatric:

0.1 mg/kg IV/IM, up to 2 mg

***Intra-nasal administration (adults and pediatrics):**

1 mg (1 mL) in each nostril using the MAD for a total of 2 mg

10 kg child = 2 mL

*TJEMS - EMT's with training may administer following guideline.

Special Considerations: Pregnancy class C.

Use with caution in patients with supraventricular arrhythmias or other cardiac disease; head trauma; brain tumor.

Supplied: 2 mg/2 mL

Nitroglycerine (tablet, spray and paste)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-anginal agent

Action: Relaxes vascular smooth muscle, thereby dilating peripheral arteries and veins. This causes pooling of venous blood and decreased venous return to the heart, which decreases pre-load. Also reduces left ventricular systolic wall tension, which decreased after-load.

Indication/s: Angina; ongoing ischemic chest discomfort; hypertension; myocardial ischemia associated with cocaine intoxication; pulmonary edema.

Contraindications: Hypotension; severe bradycardia or tachycardia; increased ICP; intracranial bleeding; patients taking any medication for erectile dysfunction (sildenafil [Viagra®], tadalafil [Cialis®], vardenafil [Levitra®], or herbal equivalents; known sensitivity to nitrates.

Adverse Effects: Headache; hypotension; bradycardia; lightheadedness; flushing; cardiovascular collapse; methemoglobinema.

Dosage:

Adult:

***Tablet:** 1 tablet (0.4 mg), SL titrated to pain relief as long as BP > 100 mm Hg, systolic
***Paste:** 1 – 2 inches, topically
Spray: 1 spray to the underside of patients tongue

*TJEMS - EMT's may use from drug box, must follow guideline

Special Considerations: Administration of NTG to a patient with right ventricular MI or inferior MI, can result in hypotension.

Use caution in anemia, closed-angle glaucoma; hypotension; postural hypotension; uncorrected hypovolemia.

Pregnancy class C

Supplied: 0.4 mg/tablet (1/150thgrain)
0.4 mg per spray

Ondansetron (Zofran®)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Antiemetic

Action: Selectively blocks serotonin receptor that produces nausea and vomiting.

Indication/s: Treatment and prevention of nausea and vomiting.

Contraindications: Hypersensitivity and known prolonged QT interval.

Dosage:

Adult:

*****4 mg ODT (orally disintegrating tablet), may repeat 4 mg per guideline or in 10 minutes.
4 mg IM or slow IV over 2 – 5 minutes, may repeat 4 mg in 10 minutes.

Pediatric:

*****4 mg ODT (4 years old and up)
0.1 mg/kg up to 20 kg/44lbs, over 20kg give adult dose.

10kg child = 0.5 mL

*TJEMS - EMT's may use from drug box, must follow guideline

Special Considerations: Pregnancy class C

Supplied: 4 mg/ODT
4 mg/2 mL

Prednisone

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Corticosteriod

Action: Prevents the release of substances in the body that cause inflammation. It also suppresses the immune system.

Indication/s: COPD/bronchospasm; allergic reaction.

Contraindications: Known sensitivity.

Adverse Effects: Depression, euphoria; headache; restlessness; hypertension; bradycardia; nausea/vomiting; swelling; diarrhea; weakness; fluid retention; paresthesias; hyperglycemia.

Dosage:

Adult:

60 mg/PO (by mouth)

Pediatric: Minimum 6 years old

20 kg – 30 kg [44 – 66 lbs] = 20 mg
31 kg – 50 kg [68 – 110 lbs] = 40 mg
51 kg [112 lbs] and over = 60 mg

Special Considerations: May mask signs and symptoms of infection.

Use caution in cancer patients undergoing chemotherapy.

Pregnancy class C.

Use with caution in active infections, renal disease, penetrating spinal cord injury, hypertension, seizures, CHF.

Cushing's syndrome; fungal infection; measles; varicella; known sensitivity (including sulfites).

Supplied: 20 mg tablet/PO (must be taken with liquid)

Sodium Bicarbonate (8.4%)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Electrolyte replacement

Action: Counteracts existing acidosis.

Indication/s: Acidosis; drug intoxications (i.e. barbiturates, salicylates, methyl alcohol); certain overdoses such as tricyclic anti-depressants.

Contraindications: Metabolic alkalosis.

Adverse Effects: Metabolic alkalosis, hypernatremia; injection site reaction; sodium and fluid retention; peripheral edema.

Dosage:

Adult:

1 mEq/kg IV followed by ½ the initial dose every 10 minutes.

Pediatric:

1 mEq/kg. Dilute 1:1 with IV fluid.

10 kg child = 10 mL + 10 mL NS

Special Considerations: Do not administer into an IV/IO line in which another medication has been given.

Because of the high concentration of sodium within each ampule of sodium bicarbonate, use with caution in patients with CHF and renal disease.

Pregnancy class C

Supplied: 50 mEq/50 mL

Tranexamic Acid (TXA)

Medication Information

Reviewed: 2020	Updated: 2020

Classification: Anti-fibrinolyticagent

Action: Used to treat or prevent excessive blood loss due to trauma.

Indication/s: Blunt trauma patients, with evidence of significant bleeding (systolic BP less than 90 mm Hg and/or heart/pulse rate more than 110 beats/minute); penetrating trauma to the neck and torso; given with one (1) hour ofinjury.

Contraindications: Patients under 17 years old. Administration of TXA should not delay transport.

Adverse Effects: Acute gastrointestinal disturbances(nausea/vomiting, diarrhea). Hypotension has been observed when intravenous injection is too rapid.

Dosage:

Adult:

Drip only: 1 gram in 100 mL D5W IV/IO piggyback infused over 10 minutes.

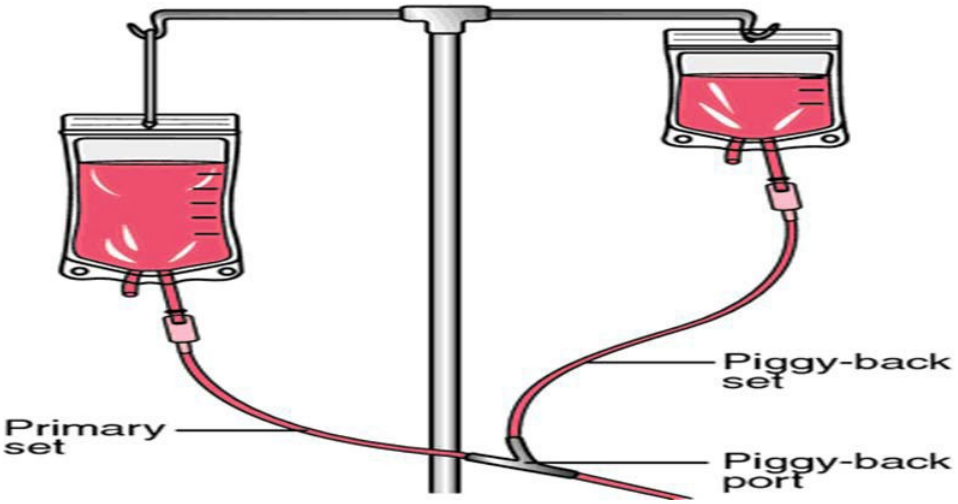
Special Considerations:

Supplied: 1 gram powdervial

- Must be reconstituted via manufacturer recommendation

or

1000 mg/10 mL vial



Drug Box Information

Drug Box Program
Best Practices

Reference

Reviewed: 2020	Updated: 2020

The TJEMS Drug Box Program Best Practices relate to the use of the TJEMS Drug Box. These best practices sever to provide guidance on the acquisition, storage, usage and maintenance of the drug box system. Local pharmacies may issues policies that supersede or supplement these best practices. The success of the drug box program is based on the full understanding and support of the system by EMS providers, hospital pharmacists, Operational Medical Director and emergency department attending physicians. Please contact Thomas Jefferson EMS Council at (434) 295-6146 if you have any questions or need assistance.

1. Exchanging Used DrugBoxes

1.1. A printed or written call sheet with documented administered medication must accompany a drug box when being exchanged. Every effort should be made to include the patient's name, date of birth, incident date and Attendant-in-Charge name. A physician signature is ONLY required if there is a variance from standing protocol. The pharmacy representative will open the out-going drug box and verify with an EMS provider the count of controlled substances (CII-V) and seal the drug box.

1.2. If a patient is transported to a hospital not participating in the TJEMS drug box exchange, pronounced dead on scene or transferred to another agency and the drug box cannot be immediately exchanged, the following steps should be taken:

1.2.1. Verify all unused controlled substances(CII-V)

1.2.2. Seal the box with a different colored tag not utilized by participating hospitals

1.2.3. Document new tag number on/inPPCR/ePPCR

1.2.4. Write "used" across a piece of tape and place on top of box

1.2.5. Place competed PPCR/ePPCR with used drug box

1.2.6. Secure drug box in approved area until exchange

1.2.7. Every effort should be made to exchange used drug box within 48 hours.

2. Broken Drug Box Seals or Missing Controlled Substances

2.1. Drug boxes are to be sealed at all times.

2.2. Should a seal be accidentally broken, or a drug box opened but not used, the controlled substances (CII-V) should be immediately verified and the box returned to the hospital/pharmacy to be exchanged.

2.3. Should an EMS provider find a box with a broken seal, the contents need to be inspected and inventoried. If there are controlled substances missing (Fentanyl®, morphine, Ketamine® or Versed®) or the drugs appear to have been tampered with, take the following actions:

2.3.1. Limit additional handling the box.

2.3.2. Notify local lawenforcement.

2.3.3. Notify the hospital pharmacy where the box was packed.

2.3.4. Notify the agency Chief or Captain.

2.3.5. Complete and file a drug diversion form with the Office of EMS (see 12 VAC 5-31-520, D of the Virginia EMS Rulesand Regulations); http://www.vdh.virginia.gov/OEMS/files_page/regulation/DrugDiversionForm.pdf

2.3.6. Have drug box inspection forms ready for police, pharmacy and Office of EMS personnel.

2.4. If the seal on the drug box is discovered missing while performing patient care or after arriving at the hospital:

2.4.1. Continue patient care, you may continue to utilize the contents of the box.

2.4.2. If the drug needed is not present consider requesting another unit to meet en route, but do not delay transport.

2.4.3. Follow the procedures listed above.

3. Drug Box ContentProblems

3.1. From time to time the field provider may open a drug box to find certain medications, fluids or other supplies missing or the box may not be stocked appropriately. In these cases, a “Drug Box Incident Report” should be completed by the field provider finding the problem. After completion, the form should be returned to the pharmacy in the drug box, a copy should be faxed to TJEMS (434-295-2009) and a copy should be retained by the EMS agency. “Drug diversion” should also be reported to the Virginia Office of EMS (refer to section 2.3.5).

3.2. If the problem with a drug box is found by pharmacy staff, the "Drug Box Incident Report" should be completed and forwarded to TJEMS.

3.3. The "Drug Box Incident Reports" are stocked in the drug boxes.

4. Drug Box Inventory

4.1. An inventory of all drug boxes is to be performed by each EMS agency on a routine basis. The inventory should track drug box expiration dates and be performed with a frequency such that drug boxes do not expire. An agency may only exchange two (2) expired drug boxes at a time. The boxes should be exchanged prior to the expiration date. Pharmacies are not expected to exchange expired drug boxes after hours and on weekends.

5. Storage and Security of Drugs and Related Supplies

5.1. An area used for storage of drugs and administration devices and a drug kit used on an EMS vehicle shall comply with requirement established by the Virginia Board of Pharmacy and the applicable drug manufacturer's recommendations for climate-controlled storage.

5.2. Drug and drug kits shall be maintained within their expiration date at all times.

5.3. Drug and drug kits shall be removed from vehicles and stored in a properly maintained and locked secure area when the vehicle is not in use unless the ambient temperature of the vehicle's interior drug storage compartment is maintained within the climate requirements specified in this section.

5.4. An EMS agency shall notify the Office of EMS in writing of any diversion of (i.e. loss or theft) or tampering with any controlled substances, drug delivery devices or other regulated medical devices from an agency facility or vehicle. Notification shall be made within 15 days of the discovery of the occurrence.

5.5. An EMS agency shall protect EMS vehicle contents from climate extremes.

Reference: *Virginia EMS Regulations 12 VAC 5-31-520*.

6. Drug Box Acquisition and Entry Into the System

6.1. When an agency places an ALS vehicle in service, the agency is required to contact TJEMS for advisement of the appropriate drug boxes to be purchased. Before being

placed into the system, the drug boxes are assigned an inventory control number and are labeled by TJEMS. After receiving inventory control numbers and labeling, the boxes are taken by the agency to the closest pharmacy for initial stocking. The pharmacy will advise when the stocked drug box may be picked up by the agency.

7. Drug Box Cleanliness

7.1. When a drug box is used, the EMS provider is responsible for disposing of all opened or used sharps and other trash that may be in the box prior to returning the box to the pharmacy for exchange. In addition, the boxes should be cleaned and free of blood or other body fluids.

7.2. Before accepting a drug box for exchange, pharmacy staff should check to ensure that the box is clean and free of exposed sharps. If it is not, pharmacy staff should advise the EMS provider of this and require the box to be cleaned before making the exchange. I the event the box is left at the hospital during hours the pharmacy is not open, or in an ED exchange lockers, the receiving pharmacy should contact that agency and require that a representative of the agency respond immediately to clean the box. Pharmacy personnel should also complete a "Drug Box Incident Report" and forward the report to TJEMS.

8. Drug Box Contamination and Decontamination

8.1. It is recommended that providers access the rug box with clean hands. If possible, providers should change gloves or use hand sanitizer after providing direct patient contact.

8.2. Pharmacies will not accept boxes visibly contaminated with blood/body fluid or that have potentially been contaminated by VRE, GRE, MRSA or *C.diff (Clostridiumdifficile).*

8.3. Procedures for cleaning drug boxes that are contaminated with known VRE, GRE, MRSA and *C. diff.*

8.3.1. Contamination is defined as known or suspected exposure to blood or body fluid.

8.3.2. In order to avoid contamination of the drug box, ensure that the contents of the drug box must only be touched by "clean" hands. If a gloved provider just touched a patient, they would have to remove the gloves, cleanse their hands, handle the drug, and then put gloves back-on. Or the other provider could be considered "clean" and not touch anything dirty and be responsible for handling the medications.

8.3.3. If at any time contamination is suspected, proceed with the following:

8.3.3.1. Two (2) providers will be needed

8.3.3.2. First provider holds clean basin (obtain from ED staff). Be sure that clean basin is not placed on any contaminated surface.

8.3.3.3. Second provider wears gloves and empties all medications in plastic bag into clean basin. All medications that are not in plastic bags will be discarded into Contaminated Material Boxes.

8.3.3.4. Empty drug boxes along with contaminated surfaces in ambulance must be cleaned with approved cleaner.

8.3.3.4.1. VRE, GRE, MRSA use hospital provided cleaner

8.3.3.4.2. *C. diff.* bleach wipes must be used

8.3.3.5. Rewrite ambulance report on a clean form. ADD "Drug box has been decontaminated. Medications not in plastic bags have been placed in CMC box and medications in plastic bags have been returned in clean basin."

8.3.3.6. If controlled medications (CII-V) were not in plastic bag or have been contaminated, waste the medication in the presence of another EMS provider as witness.

8.3.3.7. Bring clean drug box, re-written and/or clean call sheet and basin of clean medications to pharmacy for drug box exchange.

8.3.3.8. Boxes used but not contaminated, it is recommended that they be completed wiped down externally before exchanging in pharmacy after use.

9. Disposal of Partially-Used Controlled Medications

9.1. Partially used controlled substances (CII-V) not administered to the patient will be discarded at the hospital. The disposal must be witnessed by an EMS provider. The witness must counter-sign the Patient Care Report or designated form, where the advanced life support (ALS) provider has clearly indicated the medication wasted.

10. Variance of Drug Box Contents

10.1. Any variance of drug box contents should be communicated to TJEMS Pharmacy Committee group via email. Variances should include:

10.1.1. Decrease in par level due to shortage

10.1.2. Substitution of drug or supply contents

10.1.3. Medication variances will be noted on the white sticker located on top of the drug box.

1st drawer

2 - 14g Protectiv IV catheters 1 1/4" 2 - 16g Protectiv IV catheters 1 1/4" 3 - 18g Protectiv IV catheters 1 1/4"	(1) 3-way stopcock	3 - 20g Protective IV catheters 1 1/4" 2 - 22g Protectiv IV catheters 1 1/4" 2 - 24g Protectiv IV catheters 1 1/4"
2 - 4X4 2 - 2X2 8 - Alcohol Preps 2 - Tourniquets 2 - Pair large gloves (non-latex)	4 - 18 or 19g Needles	2- 10 cc vials sterile saline or 2 saline flushes
	1 - Transpore Tape 2 - Braun Ultrasite valves	1- Gray Top Tube 1 - Vacutainer Holder 1 - Vacutainer Adaptor 8 - Alcohol Preps

2nd drawer

2 Benadryl (Diphen-hydramine) 50 mg/mL slot 1	2 Morphine 10 mg/mL vials slot 2	4 Midazolam (Versed) 5 mg/mL vials slot 3	1 Ketamine 200mg/20mL vial slot 4	2 Fentanyl 100mcg/2mL slot 5	1 Tranexamic Acid 1 gm powder vial slot 6	slot 7	2 Nitro paste 1 " pre-measured 1-bottle Nitro tablets 1/150 gr (tape top, discard if not) slot 8	6 Aspirin 81 mg/tab 1- bottle slot 9
1 2% Lidocaine 20mg/mL (2mL) without preservative for ONLY Intraosseous slot 10	3 Amiodarone 150mg/3mL vials slot 11	4 Epinephrine 1:1000 1mg/ mL 4 filter needles slot 12	2 Dopamine (Intropin) 200 mg/5mL vials slot 13	1 Glucagon w/dilutent 1 mg slot 14	2 Haldol (Haloperidol) 5 mg/mL slot 15	2 Ondansetron (Zofran) 4 mg/2 mL 2 Ondansetron (Zofran) 4 mg tablets slot 16	1 SoluMedrol (Methylpredni-solone) 125 mg/2mL 3 Prednisone 20 mg tablets slot 17	3 Metoprolol (Lopressor) 5 mg/5mL slot 18

3rd drawer

4 Atropine 1 mg/10mL O-Ject slot 19	3 Adenosine 6 mg/2mL vials 2 Ancef (Cefazolin) 1 gr/powder vial 1 Sterile water 10 mL slot 20	1 Calcium Chloride 1 gm/10mL slot 21	1 Narcan (Naloxone) 2mg/2mL vial 2 Mucosal Atomization slot 22	4 Epinephrine 1:10,000 1 mg/10mL O-Ject slot 23	4 Epinephrine 1:10,000 1 mg/10mL O-Ject slot 24	2 14g Catheters >2 " Jelco type for Chest Decompression slot 25	

Bottom of Box

4 - 1cc syringes w/25g needle 2 - 3cc syringes w/21g 1½ " needle 2 - 5cc syringes 2 - 10 or 12cc syringes	2 Normal Saline 1000 mL bag	2 Sodium Bicarb 50 mEq/50mL	2 Macrodrip IV tubung w/injection sites
	2 D5W 250 mL bag	2 50% Dextrose 25 gm/50mL	2 Minidrip IV tubing w/injection sites
2 Short Arm Boards			2 Braun CSE8TSL extension sets
2 - 30 or 35cc syringes	1 D5W 100 mL bag	1 Handheld Nebulizer ATTACHED TO NEBULIZER BAG 1- Ipatropium Unit Dose 6- Albuterol 3 mL Unit Dose	1 - Drug Box Contents List
1 - Sharps Container			1 - Problem Interception Report
1 - Biohazard Bag			1 - Medication added label (can be put in slot 13)

Cardiac Drug Box

Plano 747 M

UVA/TJEMS

Effective 12/10/2015

TRAUMA BOX FLAMBEAU PM 2272

(Orange Box)

1st drawer

slot 1	slot2	slot 3	slot 4	slot 5	slot 6	slot 7
(2) -22g 1" Protectiv IV catheters (2)- 24g 3/4" Protectiv IV catheters	(3)- 18g 1 1/4" or 1"Protectiv IV catheters (3)- 20g 1 1/4" or 1"Protectiv IV catheters	(2)- 14g 1 1/4" or 1"Protectiv IV catheters (2)- 16g 1 1/4" or1"Protectiv IV catheters (1)- 3-way stopcock	(1)- roll of tape Transpore (2) 14g =/>2" Jelco IV catheters for chest decom-pression (1) gray top tube (1) vacutainer holder (1) vacutainer adapter (8) alcohol preps	(4)- 18 or 19g needles (2) Ondansetron 4mg/2mL vials (2) Ondansetron 4 mg SL tablets (2) Benadryl 50mg/mL vials (2)-Braun Ultrasite valves for injection ref# 415110 (2) sterile NS 10mL or saline flushes	(2) Epinephrine 1:1000 1mg/mL ampules or vials (2)-filter needles (1) Glucagon w/ 1mL Dilutent (1) SoluMedrol 125mg/2mL (3) Prednisone 20mg tablets	(2) Nitro paste 1" prefilled (1) Small bottle nitroglycerine tabs 1/150 grain (top taped-disgard if broken) (6) Aspirin 81mg chewable tabs

2nd drawer

(2) 50% Dextrose 25g/50mL	(1) Naloxone 2mg/2mL vial	(2) Ancef 1 gr/powder vials	(2) 4X4 (2) 2X2 (2) Tourniquets
(1) Biohazard bag	(2) Mucosal Atomization Devices	(1) Sterile water 10 mL	(2) Pair large gloves (8) alcohol preps

Bottom of box

(2) Macrodrip IV tubing-Braun 15drop/mL with Untrasite injection ports Ref #352049
(1) Microdrip IV tubing -Braun 60 drops/mL Untrasite Primary IV set ref# 375101
(2) Ext sets-Braun female luer lock adaptor, 2 Ultasite injection sites ref# 473436
(3) Normal Saline (1000cc)

(1) D5W (250cc) (2) Short Arm Boards (1) Sharps container (1) Problem Interception Report (1) Drug Box Contents List	In plastic bag (4) 1cc sryinges w/25g needle (2) 3cc syringes w/21g 11/2" needle (2) 5cc syringes (2) 10 cc syringes	(1) Ipatropium (atrovent) 0.5 mL unit dose (6) Albuterol 2.5mg/3 mL unit dose (1) Handheld Nebulizer

Effective: November 5, 2015