FORT LAUDERDALE FIRE RESCUE

EMS Protocols 2026

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STATEMENT OF PURPOSE

The following protocols shall serve as a guideline for the treatment and transport of the sick and injured. Because it would be impossible to develop a set of protocols that addresses every possible patient encounter, Fort Lauderdale Fire Rescue relies on the judgment of the treating Paramedics and EMT's to provide emergency care in the best interest of the patient.

Our goals are to provide rapid assessment, stabilization and transportation to the appropriate care facility. Above all else, Paramedics and EMTs should ensure that a patient arrives at the appropriate facility with a patent airway, oxygenated and ventilated with a perfusing blood pressure. Any deviation from these protocols must be approved by the Medical Director.

ADMINISTRATION

FIRE ADMINISTRATION

Stephen Gollan, Fire Chief

Robert F. Bacic, Deputy Fire Chief

Chantal Botting, Deputy Fire Chief

Garrett Pingol, Deputy Fire Chief

EMERGENCY MEDICAL SERVICES

Kevin "Matt" Green, Assistant Chief

Chris Davis Partridge, Battalion Chief

Stefanie Silk, Lieutenant

Benjamin Glenn, Lieutenant

AUTHORIZATION

These protocols are granted under the authority of Chapter 401 of the Florida Statutes, and 64J-1.004 of the Florida Administrative Code.

The Medical Director shall be the only one authorized to make changes to these protocols.

Effective Date:

01/01/2026

Dr. James Roach

Medical Director

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GENERAL INFORMATION

SECTION 1

Section 1

General Information

1.1 Protocol Deviation Criteria

INFORMATION

The following standard requirements shall be performed on all patients. Whenever possible, verbal consent should be obtained prior to treatment.

It is recognized that the EMS protocols cannot address every possible scenario. Therefore, two concurring paramedics are given the authority to apply **current protocols** to best fit the situation in question and as required to benefit patient care that is not specifically addressed in the protocol. Good judgment and the patient's best interest must always be considered. When applying this protocol, always document the reason clearly and consult an EMS OFFICER when available.

In addition, if time allows the medical director should be contacted real time to advise.

In every case this is applied, the EMS division and medical director must be notified in writing, and the case must be reviewed in QA/QI process.

1.2 Incapacitated Persons

FLORIDA INCAPACITATED PERSONS ACT : 401.445

Patient who have a medical emergency and lack capacity to refuse transport shall be transported to the appropriate Emergency Department for evaluation.

Emergency examination and treatment of incapacitated persons:

1) No recovery shall be allowed in any court in this state against any emergency medical technician, paramedic, or physician as defined in this chapter, any advanced registered nurse practitioner certified under s. 464.012, or any physician assistant licensed under s. 458.347 or s. 459.022, or any person acting under the direct medical supervision of a physician, in an action brought for examining or treating a patient without his or her informed consent if:

    a) The patient at the time of examination or treatment is intoxicated, under the influence of drugs, or otherwise incapable of providing informed consent as provided in s. 766.103;

    b) The patient at the time of examination or treatment is experiencing and emergency medical condition; and

    c) The patient would reasonably, under all the surrounding circumstances, undergo such examination, treatment, or procedure if he or she were advised by the emergency medical technician, paramedic, physician, advanced registered nurse practitioner, or physician assistant in accordance with s. 766.103(3).

    d) Examination and treatment provided under this subsection shall be limited to reasonable examination of the patient to determine the medical condition of the patient and treatment reasonably necessary to alleviate the emergency medical condition or to stabilize the patient.

1.2 Incapacitated Persons

In examining and treating a person who is apparently intoxicated, under the influence of drugs, or otherwise incapable of providing informed consent, the emergency medical technician, paramedic, physician, advanced registered nurse practitioner, or physician assistant, or any person acting under the direct medical supervision of a physician, shall proceed wherever possible with the consent of the person. If the person reasonably appears to be incapacitated and refuses his or her consent, the person may be examined, treated, or taken to a hospital or other appropriate treatment resource if he or she needs emergency attention, without his or her consent, but unreasonable force shall not be used.

To apply the ” Incapacitated Persons Act”

1. A medical emergency must be present.
2. The patient does not have “Capacity”.

Capacity is determined by the EMS personnel’s assessment of the patients’ ability to understand and articulate the risk of refusal.

1.3 Patient Assessment/Treatment

INFORMATION

The following standard requirements should be performed on patients whenever possible, verbal consent should be obtained prior to treatment.

ASSESSMENT: S.O.A.P

Subjective

- **CHIEF COMPLAINT:** Why did the person call 911?
- **HISTORY OF THE PRESENT ILLNESS** (O,P,Q,R,S,T,A)
  - ONSET: Did the symptoms appear gradual or sudden?
  - PALLIATIVE: What makes the symptoms better?
  - PROVOKE: What makes the symptoms worse?
  - PREVIOUS: Previous similar episodes?
  - QUALITY: (What kind of pain?) pressure, squeezing, aching, dull, etc.
  - RADIATION: Does the pain or discomfort radiate? Where?
  - Severity of pain: 1-10 scale, Faces pain scale for pediatrics.
  - Time: What time did the symptoms begin?
  - Associated: What are the associated signs and symptoms?

- **S.A.M.P.L.E HISTORY**
  - SIGNS & SYMPTOMS
  - ALLERGIES
  - MEDICATIONS: Prescribed, over the counter, or not prescribed to patient.
  - PAST MEDICAL HISTORY: Heart attack, asthma, COPD, diabetes, hypertension, stroke, etc.
  - LAST ORAL INTAKE
  - EVENTS PRECEDING

Objective

- **Physical EXAM**
  - Vital Signs.
  - Physical exam findings.

- **Assessment and Plan**
  - In narrative form **summarize diagnosis, treatment, and disposition**.

1.3 Patient Assessment/Treatment

AIRWAY

- Positioning: Head-tilt/chin-lift or modified jaw thrust for suspected spinal cord injury.
- Semi-conscious patients with an intact gag reflex shall have a nasopharyngeal airway inserted, unless contraindicated.
- Unresponsive patients without a gag reflex shall have an oropharyngeal airway inserted, unless contraindicated. If ventilation is required for more than two minutes, SGA or ETT should be inserted (Adults).
- Pediatric: The preferred method for ventilating pediatric patient is with a BVM in conjunction with an oral or nasal airway. Pediatric patients who can not protect their airway, are unable to maintain oxygen saturation despite BVM ventilation, and/or can not be effectively ventilated with a BVM, should be upgraded to an advanced airway. Infants and children who have an advanced airway placed during CPR should be ventilated at a rate of **1 breath every 6 seconds.**
- Pediatric patients in respiratory distress, who have had a recent illness accompanied by fever, drooling, or stridor; should not have an NPA or OPA inserted. DO NOT STRESS PATIENT.
- Recovery position for spontaneously breathing patients: Altered mental status, postictal, suspected drug overdose, etc., if no suspected spinal cord injury.

1.3 Patient Assessment/Treatment

OXYGENATION

- Oxygen should be administered ONLY as needed to maintain an SpO_2 of at least 95% for general, cardiac, and stroke patients, and at least 90% for patients with COPD or asthma.
- Do not withhold oxygen if the patient is dyspneic, tachypneic or hypoxic.
- Traumatic Brain Injury (TBI) patients shall receive 15 Lpm via NRB.
- Pregnancy 3rd trimester trauma patients shall receive 15 Lpm via NRB.
- Pulse oximetry should be documented (pre and post oxygen administration) and applied for continuous monitoring on all ALS patients.
- If oxygen saturation cannot be maintained, ventilatory support should be provided.

VENTILATION

- Ventilatory support shall be accomplished via BVM (with either an NPA/OPA), SGA, or ETT intubation and **PEEP**(5 cmH2O).
- Oxygenation Goal is to maintain an SpO2 of 95% and 90% for chronic COPD patients.
- EtCO2 levels between 35-45 mmHg.
- Endotracheal intubation shall be confirmed by: visualization of the ETT passing through the vocal cords, auscultation, and continuous EtCO2 monitoring.

VENTILATORY RATES

- Adults: 10 breaths/minute (1 breath every 6 seconds) with and without a pulse.
- Children: 20 breaths/minute (1 breath every 3 seconds) with a pulse.
- Children: 10 breaths/minute (1 breath every 6 seconds) without a pulse.
- Neonates: 40 breaths/minute (Cadence: **Breathe** two three, **breathe** two three…) **with and without a pulse.**

CIRCULATION

- Carotid and radial pulse present, assess capillary refill, assess skin color, condition and temperature.
- Apply AED/LP/ZOLL on all unconscious patients.
- Perform MICCR (Minimally interrupted cardio-cerebral resuscitation) on all cardiac arrest patients and defibrillate as needed. No interruptions in CPR.

1.3 Patient Assessment/Treatment

Pediatric Bradycardia (<60 BPM)

- **BVM- oxygenation/ventilation of 1 minute for infants/children and 30 seconds for neonates (birth to 1 month).**
- **Begin chest compressions if the heart rate remains below 60 BPM with signs of poor perfusion (AMS).**

ETCO2 - MONITORING

The following patients should be monitored with the EtCO2 nasal cannula sampling device when available:

- In respiratory distress
- With an altered mental status
- Sedated patients or patients receiving pain medication
- Patient administered Ketamine
- Seizure patient
- Requiring ventilatory support (ETT, SGA, CPAP, etc.)
- **ALL "ALERT" patients (SEPSIS, Cardiac, Stroke, and Trauma)**

ECG MONITORING

- All ALS patients shall be continuously monitored in lead II.
- Patients who present with any of the following cardiac or possible cardiac symptoms shall have a 12 lead ECG performed:
  - Chest/arm/neck/jaw/upper back/shoulder/epigastric pain or discomfort
  - Palpitations
  - Syncope, lightheadedness, general weakness, or fatigue
  - CHF, SOB, or hypotension
  - Unexplained diaphoresis or nausea
- 12 lead ECGs shall be repeated every 5 minutes and upon a ROSC (if transporting leave cables connected until patient is turned over to the ED staff).

GLUCOSE

A BGL shall be documented for patients with any of the following: history of diabetes, suspected drug or alcohol use, altered mental status, general weakness, seizure, syncope/lightheadedness, dizziness, poisoning, stroke, and cardiac arrest.

1.3 Patient Assessment/Treatment

VITAL SIGNS: All patients will be evaluated with a complete set of vital signs which shall be documented as follows (BP, HR, RR, Skin, Temp, O2 Sat.)

- Priority 3 at least 2 sets of complete vital signs and every 15 minutes
- Priority 2 patients every 5 minutes
- Blood Pressure/Capillary Refill
- HR- Pulse (rate and quality)
- Respiratory (rate and quality)
- Skin (color, condition, and temperature)
- A blood pressure shall be checked before and after the administration of a drug known to effect blood pressure.
- For the purposes of these protocols, adult hypotension is defined as a systolic blood pressure less than 100 mmHg.
- A manual blood pressure should be taken to confirm any abnormal or significant change of an automatic blood pressure cuff reading.

DEFINITIONS OF A PEDIATRIC PATIENT

- EMS: The absence of puberty is the definition of a pediatric patient. Puberty is defined as breast development for females and underarm, chest, or facial hair on males. Once a child reaches puberty, use the adult EMS Protocols.

- Medical ED: For Medical ED age is the determinate for pediatric vs adult.
  Pediatric is defined as 17 y/o or younger
  ≥ 18 = adult medical ED

- Trauma Alert: Trauma Alert **Adult** = 16 y/o or older Broward Health and 15 y/o or older Memorial Regional.

Pediatric Cardiac Arrest

Pediatrics: After BVM- oxygenation and ventilation of 1 minute for infants/children and 30 seconds for neonates (birth to 1 month), begin chest compressions if the heart rate remains below 60 BPM with signs of poor perfusion (AMS).

1.4 Patient Priority AND Transport Destination

The Hospital Capabilities Matrix provides the capabilities of each hospital and is not an absolute directive to determine transport destination.

DETERMINATION OF "APPROPRIATE INITIAL RECEIVING FACILITY"

Determination of the most appropriate medical receiving facility will depend on the patient disposition as determined by the on-scene paramedic after performing his/her patient examination.

Priority One: Patients in Cardiac, Trauma, or Respiratory Arrest.
Priority Two: Unstable patients with life-threatening conditions.
Priority Three: Stable patients with no life-threatening conditions.

OBSTETRICAL PATIENTS (DEFINED AS PREGANCY 20 WEEKS OR GREATER)

- Patients less than 20 weeks are GYN cases and can be transported to closest ED.
- Over 20 weeks with a minor concern for mother, patient can go to the closest ED.
- **Over 20 weeks with any abdominal/pelvic pain transport to the closest OB hospital.**
- **IF PATIENT IS OVER 20 WEEKS WITH ANY CONSTITUTIONAL SYMPTOMS OR CONCERN FOR UNBORN BABY, TRANSPORT TO OB HOSPITAL.**
- Stable patients over 20 weeks may go to the OB hospital of their choice within 30 minutes as per operations.
- Over 20 weeks and in cardiac arrest transport to closest OB Hospital.
- Over 20 weeks and trauma transport to Trauma/OB Hospital.
- OB PATIENTS MEETING TRAUMA ALERT CRITERIA MUST GO TO THE CLOSEST OF EITHER MEMORIAL REGIONAL OR BHMC

FREE STANDING EMERGENCY DEPARTMENT

- **DO NOT TRANSPORT PATIENTS TO A FREESTANDING ED UNDER ANY CIRCUMSTANCES.**

1.5 Transport Destination

Cardiac Arrest:

All cardiac arrest patients will be **transported to the closest approved STEMI Facility.**

STEMI ALERTS

- Once a STEMI Alert has been determined, a 12-lead ECG shall be obtained within **5 minutes of patient contact** and transmitted within **10 minutes of patient contact**. Transport should be expedited to the **closest approved STEMI facility**.
- The patient shall be transported by air (if available) to the closest approved STEMI facility with surgical backup if the ground transport time to the closest approved STEMI Facility is greater than 20 minutes. Refer to the Hospital Capabilities List "MATRIX" for the approved STEMI Facilities and STEMI Facilities with surgical backup.

STROKE ALERTS

All Stroke Alert patients will be transported to **Thrombectomy Capable Facility or Comprehensive Stroke center.**

PEDIATRIC STROKE (Less than 18 years of age)

All Pediatric Stroke Alerts shall be transported to a Pediatric Comprehensive ED/Comprehensive Stroke Center. (BHMC or JDCH)

PEDIATRIC COMPREHENSIVE HOSPITALS

- These hospitals have pediatric admitting capabilities and surgery options. They also have pediatric intensive care units (PICU).
- Pediatric patients in cardiopulmonary arrest shall be transported to a comprehensive pediatric emergency department.

1.5 Transport Destination

TRUAMA PATIENTS

- **EMTALA does not Apply to Helipad: THE HELICOPTER LANDING WITHIN 250 YARDS OF HOSPITAL DOES NOT TRIGGER EMTALA LAW REQUIRING MEDICAL SCREENING EXAM BY THE ED.**

- Follow the Broward County Trauma Transport Protocols unless otherwise stated in writing by Medical Director and EMS Chief.
- Whole Blood: patients who receive whole blood can be taken to any facility based on the underlying condition as respective protocol. In the case of medical reasons for whole blood these patients may go to a non trauma center (medical emergency department). Air Rescue will follow the Broward County Trauma Protocols but has the discretion to go to the closest most appropriate facility if the transport time difference is not relevant.
- All adult and pediatric trauma alert patients meeting trauma alert criteria, shall be transported to the closest appropriate (Pediatric or Adult) Trauma Center.
- **Trauma patients who arrest in the presence of Fire Rescue personnel, shall be transported to the closest APPROPRIATE Trauma Center.**
- All pregnant (visibly or by history of gestation >20 weeks) patients meeting Trauma Alert criteria shall go to closest Trauma/OB Facility. **(Broward Health Medical Center or Memorial Regional)**
- All intubated 911 initiated emergency transfers MUST be both paralyzed and sedated by the sending facility. If the sending facility physician refuses to administer paralytics, The Battalion Chief or EMS supervisor will be contacted.

1.5 Transport Destination

DECOMPRESSION SICKNESS & CARBON MONOXIDE POISONING

Patients with decompression sickness or carbon monoxide poisoning shall be transported to closet ED WITH HELIPAD.

Consider Air Rescue transport if transport time is greater than 20 minutes. (Maximum 500 ft.)

Diver Alert Network (D.A.N) is a good resource (800) 662-3637

EMTALA does not Apply to Helipad

FYSA: Hospital with Hyperbaric/ Dive Chamber:

1. Mercy Hospital Miami and

2. St. Mary's Hospital PBC

PSYCHIATRIC PATIENTS

- Psychiatric patients shall be transported to the closest appropriate Emergency Department regardless of their inpatient psychiatric capabilities.

HELICOPTER OPERATIONAL CRITERIA

The guidelines for air ambulance transport include, but are not limited to the following:

- Trauma patients that meet the trauma scorecard methodology and criteria as set forth in the rules and regulations of Broward County Trauma Report.
- Pre-hospital ground transport to a Trauma Center is greater than 20 minutes; or,
- Pre-hospital scene extrication time of a trauma patient is >15 minutes; or
- Pre-hospital ground response time to the scene is greater than 10 minutes; or,
- Mass Casualty Incidents involving multiple patients with traumatic injuries; or,
- To augment or expedite pre-hospital ground transport, or
- To transport a patient upon request by the EMS provider.
- **Air Rescue 85 should be considered for trauma patients requiring whole blood.**

HELICOPTER WILL NOT BE USED (GROUND TRANSPORT WILL BE REQUIRED)

- Any patient the pilot or crew determines is not safe to transport.
- Bariatric patient weight- as per pilot's judgement.
- Patient who is combative and cannot be physically and/or chemically restrained.
- Hazmat contaminated patient.
- Prison in custody (as per pilot and crew).

1.6 Hospital Capabilities Matrix

HOSPITAL NAME	TRAUMA	Comp Peds	OB	PSYCH	STROKE	CATH	LVAD	WHOLE
Broward Hospitals								
Updated 07/2025	CENTER	PICU		FACILITY	CAPABLE	CENTER	CENTER	BLOOD
Broward Health Coral Springs			Y			Y		
Broward Health Imperial Point				ADULT				
Broward Health Medical Center	ADULT/ PED	Y	Y	ADULT	Y	Y		Y
Broward Health North	ADULT				Y	Y		Y
Cleveland Clinic Hospital					Y	Y	Y	
Florida Medical Center					Y	Y		
HCA University			Y					
HCA Woodmont						Y		
HCA Northwest			Y			Y		
HCA Westside					Y	Y		
Holy Cross Hospital					Y	Y		
Memorial Miramar			Y					
Memorial Pembroke								
Memorial South								
Memorial West			Y		Y	Y		
Memorial Regional	ADULT/ PED	Y	Y	ADULT/ PED	Y	Y	Y	Y
Palm Beach Border Hospitals								
Boca Regional Hospital			Y		Y	Y		
Delray Medical Center	ADULT/ PED	Trauma Only		Y	Y	Y		
West Boca Medical Center		Y	Y					
Miami Dade Border Hospitals								
HCA Aventura	ADULT			Y	Y	Y		y
HCA Kendall	ADULT/ PED	Y	Y	Y	Y	Y	Y	Y

1.7 Abuse / Domestic Violence

RECOGNITION AND REPORTING (PARTNER, ELDERLY ABUSE, CHILD ABUSE)

- Domestic violence is physical, sexual, or psychological abuse and/or intimidation that attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.
- Child abuse is the physical, sexual or emotional mistreatment or neglect of a child by another person.
- Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and well-being of senior citizens.

If a child, elder or disabled adult is involved, EMS providers are required by law to contact the Florida Department of Children and Families on the Florida Abuse Hotline: 1-866-LE-ABUSE.

PURPOSE

Assessment of an abuse case is based upon the following principles:

- Protect the patient from harm, as well as protecting the EMS team from harm and liability.
- Suspect that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- Respect the privacy of the patient and family.
- Collect as much information as possible and preserve physical evidence.

1.7 Abuse / Domestic Violence

PROCEDURE

- Assess the patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
- Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
- Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
- Immediately report any suspicious findings to the EMS Supervisor or Battalion Chief (whether transported or not) and then the receiving hospital (if transported).
- Dependent on the situation, fire rescue personnel should contact law enforcement for all cases of abuse or neglect are obvious.
- Document the call to the Florida Abuse Hotline in the EMS Report and include:
    - Name of the call taker
    - Call taker's ID number
    - Time the call was placed.
- Once completed, an email shall be sent to the following by the paramedic that notified the hotline with a brief description and incident number.
    - FLFR- FLFREMS@fortlauderdale.gov
    - BSO- Pending
    - Sunrise- Pending
- EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the Florida Domestic Violence Hotline at (800) 500-1119.

1.8 Do Not Resuscitate Orders (DNRO)

LEGISLATIVE AUTHORITY

Under Chapter 401.45, section (3)(a) Florida Statues (F.S.) "Denial of Emergency Treatment Civil Liability" a competent adult, or an incompetent adult, through health care surrogate who was previously chosen, or proxy or guardian, has the right to be able to control decisions regarding medical care, including the withdrawal or withholding of life-prolonging procedures. This legislation authorizes EMS personnel to honor a pre-hospital Do Not Resuscitate Order (DNRO). **Which means a DNRO is ONLY in force when a patient is in Cardiac Arrest. This legislative authority does not include a "Living Will."**

VALID DO NOT RESUSITATE ORDERS

- An original yellow DNRO DH Form 1896 executed as required by State Statute (with original signatures).
- A copy on yellow paper (or similar color to the original) of DNRO DH Form 1896 executed as required by State Statute (with original signatures).
- The DNRO DH Form 1896 may be printed in other languages besides English. An official Florida Health logo will be present.
- Oral orders from non-Physician staff members, or telephoned requests from an absent Physician do not adequately assure Paramedics that the proper decision-making process has been followed and are NOT acceptable.
- Law enforcement officers do not have the right to refuse resuscitative attempts for the patient.
- The presentation of a DNRO does not preclude the paramedic or emergency medical technician from treating for pain relief, and other medically indicated care short of resuscitative measures.
- All medical procedures shall be utilized to prevent the patient from going into cardiopulmonary arrest.
- If there is any question regarding the validity of the DNRO, resuscitation efforts must be commenced.

1.8 Do Not Resuscitate Orders (DNRO)

CONFIRMATION AND DOCUMENTATION

- The Paramedic must confirm the identity of the patient with a DNRO through a driver's license, other photo identification, or from a witness in the presence of the patient. If a witness is used to identify the patient, this shall be documented in the Patient Care Report and will include:
    - The full name of the witness.
    - The address and telephone number of the witness.
    - The relationship of the witness to the patient.
- Document receipt of the properly executed DNRO by taking a photo of it with a Department-issued reporting device and attaching it to the EMS report.

REVOCATION

The DNRO form can be revoked by the patient or health care surrogate at any time either orally or in writing, by physical destruction, by failure to present it, or by orally expressing a contrary intent

OUT OF STATE DNRO

In the event a patient has an out of state Do Not Resuscitate Order and is fully executed, contact with Medical Control must be made for orders to withhold resuscitation efforts.

1.8 Do Not Resuscitate Orders (DNRO)

State of Florida
DO NOT RESUSCITATE ORDER
(please use ink)

Patient's Full Legal Name: ______ (Print or Type Name) Date: ______

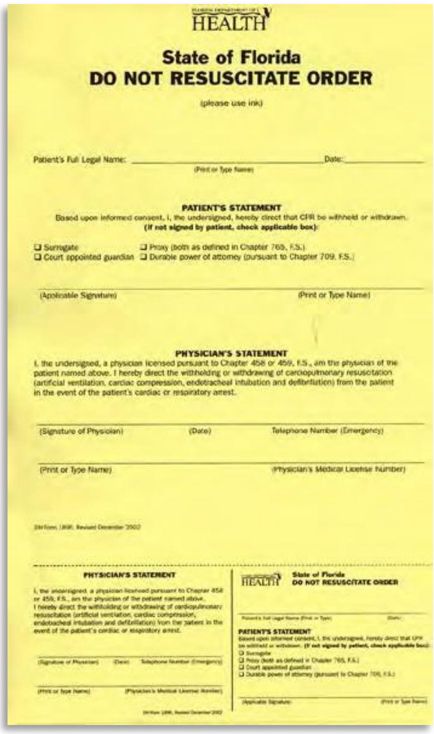
PATIENT'S STATEMENT
Based upon informed consent, I, the undersigned, hereby direct that CPR be withheld or withdrawn.
(If not signed by patient, check applicable box):
☐ Surrogate ☐ Proxy (both as defined in Chapter 765, F.S.)
☐ Court appointed guardian ☐ Durable power of attorney (pursuant to Chapter 709, F.S.)

(Applicable Signature) (Print or Type Name)

PHYSICIAN'S STATEMENT
I, the undersigned, a physician licensed pursuant to Chapter 458 or 459, F.S., am the physician of the patient named above. I hereby direct the withholding or withdrawing of cardiopulmonary resuscitation (artificial ventilation, cardiac compression, endotracheal intubation and defibrillation) from the patient in the event of the patient's cardiac or respiratory arrest.

(Signature of Physician) (Date) Telephone Number (Emergency)

(Print or Type Name) (Physician's Medical License Number)



HEALTH
State of Florida
DO NOT RESUSCITATE ORDER
(please use ink)

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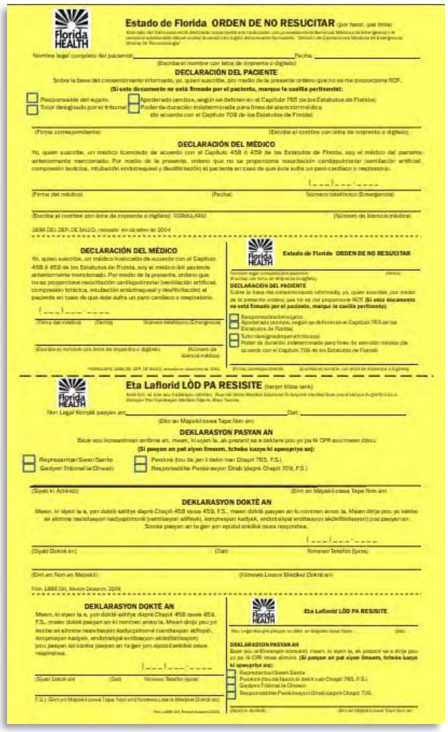
(Print or Type Name) (Physician's Medical License Number)



Estado de Florida ORDEN DE NO RESUCITAR

DECLARACIÓN DEL PACIENTE

DECLARACIÓN DEL MÉDICO

Eta Laflorid LÒD PA RESISITE

DEKLARASYON PASYAN AN

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1.9 Patient Determination & Declination of Care

PATIENT DETERMINATION

- Fire Rescue personnel may encounter persons on emergency scenes that do not appear to be ill or injured or are without any complaints.

- A patient is defined as any one of the following:
  - Any individual who activates EMS for themselves.
  - A person familiar with the patient advises of a change in behavior or suspected medical issue.
  - Any individual with an actual or suspected illness or injury.
  - Any individual with a medical or traumatic complaint.
  - Any individual with a new altered level of consciousness.
  - Any individual where the EMT/paramedic suspects injury due to mechanism.

- **Follow Department SOG/SOP for non-patient encounters**
  - **BSO SOG/SOP: E- 146**
  - **SRFR SOG/SOP: Pending**
  - **FLFR SOG/SOP: Pending**

- Anytime an assessment or procedure is performed, the individual is classified as a patient.
  - This includes falls without injuries/lift assists, as a certain degree of medical questioning and assessment is required to ensure there are no injuries or medical conditions resulting in the fall.
  - An exemption from this rule would include any public service programs offered such as routine vital sign screening. However, if the individual has abnormal vitals that would lead to consideration for treatment, the individual would then be classified as a patient as you have identified a medical need.
- Fire Rescue personnel should exercise due diligence to ensure that the person does not appear to be injured or ill in any obvious way.
- Any person on the emergency scene that was involved and shows any signs of illness or injury shall be a patient.
  - Example: A person involved in an MVC that has an abrasion on their knee and says they are OK is still a patient and shall be treated as such.

1.9 Patient Determination & Declination of Care

DEFINITIONS

- Decisional Capacity: The patient demonstrates the ability to fully understand the benefits, risks and options regarding their medical treatment. It is the duty of the paramedic to determine that the patient has the capacity to make informed decisions regarding their care.
- Competency: This is a legal term (not medical) and is determined by a judge, not EMS. A legal declaration of incompetence may be global or limited to specific situations (financial, personal care or medical). In these situations, a surrogate should be named and have approved paperwork.
- Expressed Consent: Verbal, non-verbal, or written communication by a patient that they want to receive medical care.
- Implied Consent: The granting of permission for health care without a formal agreement between the patient and health care provider (e.g., an unconscious patient is reasonably assumed to want medical assistance as they cannot provide Expressed Consent).
- Patients ABLE to Refuse Care: A person can refuse medical care based on the following guidelines:
    - Those determined to have decisional capacity.
    - Adult - eighteen (18) years of age or older.

    OR
    - Emancipated minors, self-sufficient minors or minors in the military.
- Patients NOT ABLE to Refuse Care:
    - Minors (less than 18 years of age).
    - Altered level of consciousness (e.g., head injury or under the influence of alcohol and/or drugs).
    - Suicidal or homicidal (attempt or verbal threat).
    - Cognitive deficiency (e.g., mental retardation, dementia, acute psychiatric episodes).
    - Any other situation where the severity of their medical condition would cause the patient to not have decisional capacity (e.g., shock, severely altered vital signs that may impair reasoning).

1.9 Patient Determination & Declination of Care

PRINCIPLES

- Our intent is to transport all patients with expressed or implied consent, regardless of the actual or perceived urgency of their complaints.
- **Fire Rescue personnel shall not encourage a patient to decline transport nor persuade an alternate means of transport other than via Fire Rescue.**
- An adult patient that is determined to have decisional capacity has the right to decide their course of actions even if this may result in harm **(does not apply to suicidal patients).**
- Fire Rescue personnel will not threaten or coerce a patient that has the right to decline care with unrealistic consequences to obtain consent for transport (e.g. "If you don't go, you'll be arrested or Baker Acted), unless the patient is actually going to be Baker Acted by law enforcement.
- Fire Rescue personnel should avoid allowing a refusal process to become a confrontation or "battle of wills" with a cooperative patient who has the right to make their own decision; instead, provide the necessary information for an informed choice, share your concerns, and respect their decision to ensure trust in EMS is maintained.

PROCEDURE

The following procedure applies to all situations in which a patient does not consent to assessment, all or a portion of necessary treatment and/or transport for themselves; or a parent or legal guardian declines care on the patient's behalf (e.g. minors or incapacitated adults).

1.9 Patient Determination & Declination of Care

1) If the patient is initiating a declination of assessment, treatment or transport, determine that they are an adult that has **decisional capacity:**
   - AAOx 4 (person, place, time, situation) and GCS of 15.
   - Not under the influence of drugs or alcohol.
   - Not suicidal or homicidal.
   - Has no chronic or acute medical conditions that would prevent them from making an informed decision regarding their care.
2) Determine why the patient/legal guardian is declining assessment, treatment or transport and try to alleviate any concerns they may have.
3) Clearly explain possible benefits of receiving treatment and transport and the possible risks of delaying treatment or transport. Avoid medical terminology that may be confusing and confirm the patient/legal guardian understands these benefits and risks.
   - The best way to ensure that the patient/legal guardian understands what has been explained to them is to have them repeat it back to the crew.
4) Allow the patient/legal guardian the opportunity to ask any questions.
5) **Explain that Fire Rescue personnel are not trained nor equipped to definitively diagnose or "Medically Clear" any patient of any condition.**
6) **ASK THE PATTIENT TO ARTICULATE TO YOU THE RISK OF REFUSAL AND RATIONAL FOR REFUSING. (CAPACITY)**
7) Explain to the patient/legal guardian that they always have the option of calling 911 to request EMS at any time if their condition worsens, does not resolve or if they change their mind for any reason, and ensure they have the means to call 911 if needed.

- When a parent or legal guardian is declining assessment, treatment or transport on the patient's behalf, ensure the following:
  - The patient is not able to make the decision themselves (minor or lacks decisional capacity).
  - Abuse of the patient from the caregiver or guardian is not suspected.
  - Parent or legal guardian is not under the influence of drugs or alcohol or suffering from any chronic or acute medical conditions that would prevent them for making an informed decision regarding the patient's care or calling 911 if needed.

1.9 Patient Determination & Declination of Care

- Explain the refusal text and have the patient or legal guardian sign the refusal. If a third-party witness is present (family member, trusted friend, law enforcement) ask if they are willing to sign as a witness to the refusal.
- If the patient or legal guardian refuses to sign, clearly document the reasons why and if available, have a third-party witness sign the refusal witness signature section.
- **Fire Rescue members should be the last resort.**

DECLINATION OF ASSESSMENT, TREATMENT OR TRANSPORT PROCEDURE continued

- If the patient or legal guardian insists on arranging their own transportation instead of ambulance transport, document what those means are. If the Fire Rescue crew has safety concerns regarding the patient driving themselves, request law enforcement and contact EMS Supervision.
- If a specific treatment modality is refused but transport is agreed to, a refusal should be signed and noted as being for that specific treatment(s) after the above benefits and risks have been explained.

DECLINATION OF TRANSPORT AFTER TREATMENT BY FIRE RESCUE

In addition to the above procedure, the following steps shall be taken AND DOCUMENTED:

- Ensure that the patient has a history of the condition that initiated the call (e.g. diabetes, seizures).
- Ensure the patient has regained full baseline mental status and has decisional capacity.
- Perform a full assessment and obtain an additional full set of vitals after treatment.
- Whenever possible, have a family member or friend of the patient remain with them in case a recall to 911 is needed.

1.9 Patient Determination & Declination of Care

Patients CANNOT refuse transport if they received any medications that would affect mental status or respiratory drive (e.g. narcotics, benzodiazepines), medications that have cardiovascular effects (e.g. Epinephrine, anti-arrhythmics, anti-hypertensives) or Naloxone for a suspected overdose (administered by bystander, law enforcement or Fire Rescue).

- Contact EMS Supervisor, online medical control or law enforcement for assistance whenever needed.

PATIENTS WITHOUT DECISIONAL CAPACITY (IMPAIRED/INCAPACITATED)

- Always ensure crew member and patient safety. Request law enforcement early if an uncooperative or combative patient is anticipated.
- These patients may present under the influence of alcohol, drugs or may have mental or medical deficiencies that affect their thought process and are less likely to be cooperative.
- All efforts should be made to have the patient transported voluntarily.
- If the patient is in need of emergency medical care, pursuant to Florida State Statute, Chapter 401.455, the patient may be transported without their actual consent, using **reasonable** force. Provide detailed documentation of the event in the report.
- If a patient has a life-threatening condition and is unable to make an informed decision, they will be treated and transported. A family member does not have the ability to refuse on behalf of a patient who would reasonably accept care if they were able to themselves. Request law enforcement, EMS Supervision and online medical control in these situations. (Does not apply to hospice patients.)

1.9 Patient Determination & Declination of Care

REFUSALS INVOLVING MINORS (Under 18 years of age)

- A refusal signature is required for all minor patients who are not treated and/or transported. Persons authorized to decline care and sign on the minor's behalf are:
  - Parent or legal guardian of a minor, or
  - A Law Enforcement Officer

- If a parent or legal guardian is not on scene:
  - Render all necessary care and transport to the minor when delay in obtaining consent may compromise the medical condition or injury.
  - If a delay in care would not compromise the medical condition or injury, every reasonable effort will be made to contact a parent or guardian for consent.
  - If the declination of treatment and/or transport is obtained over a telephone or other means in which a signature cannot be captured, the conversation must be documented in the patient care report and a witness from a law enforcement agency must sign the patient refusal as a witness.

Emancipated minors can refuse care on their own behalf:
Examples of Emancipated Minors (Florida)

- **Minimum Age Restriction:** No person under **16 years of age** can be legally emancipated in Florida.
- **Legally Emancipated Minor:** A person **at least 16 years old** who is **married, enlisted in the U.S. military, or declared emancipated by a court order** may consent to **all medical care** for themselves.
- **Pregnant Minor:** Pregnancy **does not confer legal emancipation**, but a pregnant minor **may consent to medical care related to her pregnancy** and **may make decisions for her unborn or born child.**

1.9 Patient Determination & Declination of Care

PATIENTS IN LAW ENFORCEMENT CUSTODY

- **There may be occasions where a law enforcement officer (LEO) requests Fire Rescue to medically evaluate a person in their custody. In this situation, LEO is assuming responsibility for that person's wellbeing.**
- The same criteria for patients able to decline care apply in these situations. If the patient has capacity to decline care, they may not be able to sign a refusal due to being restrained (e.g. handcuffs), in which case the LEO is able to sign on their behalf.
- Both the patient and LEO should be advised of the risks of refusal as with any other refusal process.
- Advise the law enforcement officer that Fire Rescue personnel cannot medically clear a patient, and this can only be done by a physician at a hospital.
- **FLFR: FOLLOW SOP 1103**

LANGUAGE BARRIERS

- All reasonable attempts must be made to locate an interpreter or translator.
- Refusals / Releases involving these patients must have full assessments completed with documentation of findings.
- If the patient refuses treatment or transport, it must be documented that all attempts were made to secure a translator and that the patient understands the events taking place.
- As always, obtain the patient's signature.
- If there is any question as to the patient's condition - transport.

1.9 Patient Determination & Declination of Care

AT&T LANGUAGE LINE: 1-877-287-6794

- **Language line services may be utilized to assist in communicating with patients in several languages. Use of this service does not violate HIPPA as long as the conversation does not occur in public.**
- **The operator will ask for the language requested and an ID number- Use 911 as the ID number.**
- **At the end of the call, the translator will provide a reference number that will be documented in the PCR.**

DOCUMENTATION

- Simply obtaining a signature of refusal does not automatically eliminate the inherent liabilities associated with cases where a patient/guardian declines or refuses care.
- The best way to mitigate this liability is with thorough documentation of the following:
  - Documentation of subjective and objective information.
  - The patient was assessed and found to have decisional capacity or,
  - They were left in the care of a capable adult/guardian.
  - Why the patient/guardian declined care or transport and any information provided by Fire Rescue to alleviate those concerns.
  - The risks of declining care and the benefits of receiving care.
  - The patient/guardian understands those risks and benefits.
  - They were advised that Fire Rescue personnel are not trained nor equipped to definitively diagnose or “Medically Clear” any patient of any condition.
  - They were advised that they always have the option of calling 911 to request EMS at any time if their condition worsens, does not resolve or if they change their mind for any reason, and they have the means to call 911 if needed.
  - Third-party witness signatures are helpful in documenting that others heard the conversation between Fire Rescue personnel regarding their decision.

1.10 Volunteer Ambulance Services

- **FL H0805202: 6(b)**

"A county or municipal government may not limit, prohibit, or prevent a volunteer ambulance service from responding to an emergency or from providing emergency medical services or transport within its jurisdiction. However, an emergency medical services provider or fire rescue services provider operated by a county, municipality, or special district is responsible for the care and transport of an unresponsive patient if a volunteer ambulance service arrives at the scene of an emergency simultaneously with such a provider and a person authorized to consent to the medical treatment of the unresponsive patient is not present."

- In the event there is a patient with capacity or a family member or representative with legal capacity they may refuse care from Fire Rescue Personnel. In this case, Fire Rescue should obtain refusal and allow the volunteer ambulance personnel to assume care.
- In the event the volunteer ambulance service has already assumed care, then Fire Rescue will obtain refusal from patient and/or family member.
- In the event Fire Rescue initiates care and the patient or family request a volunteer service to assume care then Fire Rescue personnel should document the name of the volunteer ambulance service and the individual assuming care. Document "All care will be transitioned" and state the specific person and time. **Once we initiate lifesaving interventions then care cannot be transferred. Example: intubation, whole blood, CPR, defibrillation, cardioversion, or cardiac medications.**
- **If the patient is unconscious and / or does not have capacity and a family member is not present to provide consent, then Fire Rescue has the jurisdiction and must assume care of the patient and provide transport.**

1.11 Event Medicine

- **Information:** An event is defined as a scheduled activity that the agency has agreed to offer services to treat minor complaints and minimize transports. Any patient requiring medical attention, needs a chart to document the history, physical exam, and care given.
- **Patient Identification:** The patient should have an ID to establish their identity and confirm age. It is helpful to obtain the patient's contact information including the patient's cell phone number.
- **Pediatric Patients:** All pediatric patients need parental consent unless they are an emancipated minor. Document the patient's parents' full name and cell phone number. Explain exactly what the child is experiencing and the requested therapy proposed. Example: "Mr. Smith your son James is severely dehydrated secondary to the given, and we would like to provide a liter of normal saline and allow James to cool down in our tent. We can call you back once this is accomplished".
- **Refusal for non-transport:** In every case, when therapy is given, we should obtain a refusal for transport and obtain informed consent for non-transport. We must document the patient's ability to consent by stating if appropriate, **"Patient has capacity to refuse and understands the risk of non-transport".**
- **Defining a Patient:** For the purposes of Event Medicine, a patient is defined as any individual who requires medical evaluation and/or therapeutic intervention. Individuals who present to the medical tent solely requesting a minor item—such as a bandage or an over-the-counter medication (e.g., Tylenol)—and who do not request or require a clinical evaluation, are not considered patients for documentation purposes. In these instances, a patient care chart is not required.
- **Authority of care:** The Protocol has jurisdiction, and the paramedics are responsible for all care. Any medical professional (including nurses and physicians) have no authority to direct care. These professionals can be very helpful, and we should consider their advice, but the final authority and direction of care resides with FLFR.

1.11 Event Medicine

- Emergency Conditions: Any emergency conditions such as complaints involving severe headache, chest pain, abdominal pain, pelvic pain, neurological complaints, and shortness of breath must be transported with standing protocols followed. We should not delay care of these individuals.
- All physical assaults at the event requiring medical attention must be transported or refusal required as per protocol.
- Nausea and Vomiting: Zofran 4 mg po or IV and repeat once
- Dehydration: 1 Liter NS or LR
- Minor pain: Tylenol 1000 mg or Motrin 600 mg one dose
- Minor wound care: Irrigation and topical antibacterial ointment
- Minor Allergic reaction: Benadryl 25-50 mg one dose. If patient requires epinephrine or solumedrol the patient must be transported.
- Vital Signs: If you perform vital signs and any abnormalities are found, the patient should be notified of these abnormalities and transported to the ED for evaluation if appropriate.
- DO NOT MEDICALLY CLEAR anyone to return to the event. The patient must make the decision for transport or refusal.
- Event Escalations: Escalations involving MCI, Terrorist activity etc. In these emergency situations the “Event Emergency Plan” will be referenced.

1.12 Firefighter Rehabilitation

INFORMATION

To establish standardized procedures for the physical and medical rehabilitation of fire personnel during emergency operations and training events.
Applies to all fire personnel engaged in operations involving strenuous activity, environmental exposure, or extended operational time.

Agency SOG: If there any discrepancies between this protocol and the Agency SOG, then the Agency SOG will be followed.
BSO: B-114
FLFR: SOP Article 519

- **Rehab Triggers**
  - Rehab must be initiated when any of the following occur:
  - Operation > 30 minutes of heavy exertion (e.g., IDLH environment, high-rise fires).
  - Multiple SCBA cylinder use (typically 2 or more).
  - Environmental extremes (heat index > 90°F).
  - Personnel show signs of heat stress, exhaustion, injury, or medical complaint.
  - Command determines rehab is necessary (e.g., prolonged incident, mass casualty).

- **Rehab Sector Setup**
  - Ensure proper lighting.
  - Be in a safe, shaded, or climate-controlled area.
  - Be upwind and away from the operational scene.
  - Have seating, hydration, shade, cooling/warming tools (misters, fans, blankets).
  - Be staffed with EMS personnel (ALS level preferred).
  - Be marked clearly for visibility and accountability.

1.12 Rehabilitation Protocol

Rehab Process Steps

- **Entry and Triage**
  - Personnel report to Rehab after assignment completion or at IC direction.
  - Triage by EMS: look for signs of dehydration, confusion, dizziness, chest pain, abnormal vitals.

- **Rest and Recovery**
  - Minimum of 10–20 minutes rest.
  - Remove PPE to allow cooling.
  - Passive or active cooling depending on heat exposure (cold towels, fans, ice vests)
  - In cold conditions, provide blankets and heated shelter.

- **Therapeutic Interventions**
  - **Hydration and Nutrition**
    -Provide water and electrolyte solutions (e.g., Gatorade).
    -Light snacks if needed (energy bars, fruit).
    -Avoid caffeine and carbonated beverages.
    -IVF NS, 1-2 Liters
  - **Medical Monitoring**
    Conduct medical evaluation including:
    -Vital signs: BP, HR, RR, SpO_2, temperature every 10 minutes
    -Blood glucose (if altered mental status or diabetic history)
    -Cardiac monitoring for symptomatic individuals
    -Temperature check (core if feasible; oral or tympanic otherwise)
    -Carbon Monoxide oximetry (if smoke exposure) (SpCO2)

1.12 Firefighter Rehabilitation

- **Documentation and Accountability**
  - (2) Two means of patient identification: Example Name and DOB
  - Rehab Officer logs all personnel entering and exiting.
  - ePCR not required, documentation can be in any form that is comprehensive and efficient.
  - Patient/member HPI, vitals and treatments.
  - Any refusal of care or transport must be documented and signed.
  - Notify Incident Command of any personnel removed from duty.

- **Return-to-Work Criteria (per NFPA 1584): Must meet ALL criteria**
  - HR < 100 bpm
  - Systolic BP < 160 mmHg
  - DBP < 100 mmHg
  - Temperature < 100.4°F (38°C)
  - Alert and oriented ×4

- **Any firefighter exhibiting any of the following conditions shall be transported to an appropriate medical facility for further evaluation and treatment**
  - Chest pain or arrhythmia
  - Abnormal vital signs not resolving after (2) rest cycles
  - Heat stroke (AMS, temp > 104°F)
  - Any trauma or suspected injury

- **Post-Incident Debrief**
  - Debriefing should occur after extended or high-stress incidents.
  - Includes review of health and safety concerns, behavioral wellness, and lessons learned.
  - All cases of FF Rehab should be reviewed with the medical director within one (1) month of the incident.

1.12 Firefighter Rehabilitation

Documentation and Accountability

- Two Identifiers: Name, Employee #, DOB, etc..
- Trigger for entry into Rehab area
- HPI/Complaint time in Fire, etc..
- Vital Signs
- Therapy given: IVF, Oral Hydration, Fruit: Document exactly what was given and amount
- Pre-rehabilitation vital signs and post-rehab vital signs
- Disposition: Return to work or Transported to the ED
- How member was transported, destination transported
- Family notified if transported

Intentionally Blank

MEDICAL EMERGENCIES

SECTION 2

Medical Emergencies

2.1 Abdominal Pain

INFORMATION

Abdominal pain can range from mild discomfort to severe, life-threatening emergencies. GI (gastrointestinal) complaints may include nausea, vomiting, diarrhea, constipation, GI bleeding, or distention. Causes may be medical, surgical, or traumatic in nature.

ADULT

- Maintain airway and oxygen as needed to maintain SpO_2 ≥ 95% (or 90% for COPD/asthma).
- **Obtain 12-lead ECG** (ischemia can present as epigastric pain).
- Obtain BGL (hypoglycemia can mimic abdominal complaints).
- Orthostatic Vital Signs.
- NORMAL SALINE: 500ml IV/IO bolus if hypotensive (SBP < 90 mmHg). May repeat x1.
- FENTANYL: 50-100mcg IV/IO Slow Push. May repeat. Max 200mcg.
- ZOFAN: 4 mg IV/IO/IM

GI Bleed

- Avoid NSAIDs and aspirin.
- If signs of shock, treat per **Shock Protocol**.
- Do **not** insert NG tube or give anything by mouth.

PEDIATRIC

NORMAL SALINE: 20ml/kg bolus IV/IO, may repeat 2x prn.
FENTANYL: See MED TOOL.
ZOFRAN: 0.1mg/kg IV/IO. Max dose 4mg. See MED TOOL.

Special Considerations

•AAA suspicion: Severe back/abdominal pain, hypotension, pulsatile mass — DO NOT palpate repeatedly or delay transport.

•Females: Consider pregnancy-related causes. Treat as OB emergency.

•Sepsis suspicion: Fever, tachycardia, hypotension, or altered mental status. Treat per Sepsis Protocol.

2.2 Allergic Reaction

INFORMATION

S/S: Allergic reactions are characterized by any of the following: urticaria, mild respiratory distress, difficulty swallowing, or swelling of the tongue and/or face.

ADULT

MILD ALLERGIC REACTION:

BENADRYL: 50mg IV/IO/IM. Administer over 2 minutes for IV/IO usage.

MODERATE/SEVERE ANAPHYLATIC REACTION:

FOR AIRWAY SWELLING / RESPIRATORY DISTRESS / BRONCHOSPASM / TONGUE AND/OR FACIAL SWELLING

- EPINEPHRINE: (1:1,000) 0.5mg (0.5mL) (IM LATERAL THIGH PREFERRED). May repeat prn every 3 minutes.
- ALBUTEROL: For bronchospasm, 2.5mg via nebulizer, repeat prn.
- BENADRYL: 50mg IV/IO/IM. Administer over 2 minutes for IV/IO usage.
- SOLUMEDROL: 125mg IV/IO/IM one dose.

ANAPHYLACTIC SHOCK: CHARACTERIZED BY THE SIGNS AND SYMPTOMS OF AN ALLERGIC REACTION, IN ADDITION TO THE LOSS OF A RADIAL PULSE AND/OR SBP OF LESS THAN 100mmHg, AMS, signs of shock.

- **EPINEPHRINE: (1:1,000) 0.5mg (0.5mL) IM LATERAL THIGH, THEN IMMEDIATELY**
- Push Dose EPINEPHRINE: IO RECOMMENDED
- NORMAL SALINE: 1L. Assess lung sounds and BP every 500mL.
- **Administer BENADRYL, SOLUMEDROL, and ALBUTEROL as noted above for MODERATE/SEVERE.**
- **Patients in severe shock will have limited blood flow in large muscle groups and difficult IV placement, therefore will likely need push dose epinephrine and IO.**

2.2 Allergic Reaction

PEDIATRIC

MILD REACTION:

BENADRYL: 1mg/kg IV/IO or IM(**diluted**) , if unable to obtain IV access. Max total dose 50mg. Administer over 2 minutes for IV/IO usage.

ANAPHYLACTIC REACTION:

FOR AIRWAY SWELLING / RESPIRATORY DISTRESS / BRONCHOSPASM / TONGUE AND/OR FACIAL SWELLING

- EPINEPHRINE IM: (1:1,000) 0.01mg/kg (0.01mL/kg). Max single dose 0.5mg. May repeat prn, in 3-minute intervals.
- BENADRYL: 1mg/kg IV/IO (**diluted**).
- Max total dose 50mg. Administer over 2 minutes for IV/IO usage OR give IM.
- ALBUTEROL: For bronchospasm, 2.5mg via nebulizer, repeat prn.
- SOLUMEDROL: 2mg/kg as per MED TOOL.

ANAPHYLACTIC SHOCK: CHARACTERIZED BY THE SIGNS AND SYMPTOMS OF AN ALLERGIC REACTION, IN ADDITION TO THE LOSS OF DISTAL PULSES.

- Establish an IO/IV but do not delay treatment.
- **EPINEPHRINE IM: (1:1,000) 0.01mg/kg (0.01mL/kg). Max single dose 0.5mg. May repeat prn, in 3-minute intervals.**
- Push Dose EPINEPHRINE
- NORMAL SALINE: 20mL/kg bolus IV/IO, may repeat 2x prn for hypotension. Check lung sounds often.
- Administer BENADRYL(**Diluted**), SOLUMEDROL, and ALBUTEROL as noted above.
- **Patients in severe shock will have limited blood flow in large muscle groups and difficult IV placement, therefore will likely need push dose epinephrine and IO.**

2.3 Altered Mental Status

INFORMATION

Consider the possible causes: AEIOU-TIPS, meningitis, and/or dehydration.

ADULT & PEDIATRIC

MENTAL STATUS (AVPU)

- Alert: to person, place, time, and event (AAOX4)
- Verbal: responds only to verbal stimuli
- Pain: responds only to painful stimuli
- Unresponsive

ALTERED MENTAL STATUS

- BLS Standard Requirements.
- Check and record BGL, if less than 60 mg/dL, follow the hypoglycemia protocol.
- Identify possible causes: stroke, seizures, shock, diabetic problem, drugs, EtOH, CO poisoning.
- Place unresponsive patients in the recovery position (if no suspected spinal cord injury), and suction as needed.
- Paramedic assist: Vitals, glucose, IV, ECG.

AEIOU-TIPS

A	**Alcohol**
E	**Epilepsy (Seizures)**
I	**Insulin (Hyper/Hypoglycemic)**
O	**Overdose**
U	**Uremia (Kidney Failure)**
T	**Trauma (consider Trauma Alert)**
I	**Infection (consider Sepsis Alert)**
P	**Psychiatric**
S	**Stroke (consider Stroke Alert)**

2.4 Behavioral Emergencies

INFORMATION

A **behavioral emergency** is a situation in which a patient's **behavior is abnormal, unsafe, or poses a risk of harm** to themselves or others. This may include acute emotional distress, psychiatric conditions, altered mental status, substance intoxication, or medical causes that impair judgment or self-control. The priority is to ensure **scene safety**, **protect life**, and **identify any underlying medical causes** (such as hypoxia, hypoglycemia, head injury, or drug effects). Behavioral emergencies should be approached with **calm communication, de-escalation techniques**, and, when necessary, **physical or chemical restraint** in accordance with protocol to prevent harm.

ADULT

See Physical Restraint or Chemical Restraint Protocol.

PEDIATRICS

See Physical Restraint or Chemical Restraint Protocol.

2.4 Behavioral Emergencies

INFORMATION

HYPERACTIVE DELIRIUM:

Hyperactive delirium is an acute and potentially life-threatening condition characterized by **sudden onset of confusion, agitation, restlessness, and aggressive or combative behavior**. It often results from an underlying **medical cause** such as hypoxia, hypoglycemia, head injury, infection, drug intoxication, or withdrawal. Patients may exhibit **disorientation, hallucinations, tachycardia, hyperthermia, and increased respiratory rate**. They may appear extremely strong and resistant to pain or restraint. This is a **medical emergency** requiring rapid identification and management of reversible causes while ensuring **crew and patient safety**. Allow the patient to **self-regulate respirations** (avoid forced restraint that worsens acidosis), provide **high-flow oxygen**, and if necessary, use **chemical restraint per protocol** to prevent injury and facilitate care.

Administering **IV fluids** in patients with hyperactive delirium is important because these patients are often **dehydrated, acidotic, and hypermetabolic** due to extreme agitation, increased muscle activity, and elevated body temperature. The combination of **excessive movement, sweating, and poor fluid intake** can rapidly lead to **metabolic acidosis, rhabdomyolysis, and renal failure** if not corrected.

ADULT

- Chemical Restraint Protocol
- SODIUM BICARB: 50mEq in 100ml NS IV/IO.
- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.
- **If temperature is >104° BEGIN RAPID COOLING.**

PEDIATRICS

- Chemical Restraint Protocol
- SODIUM BICARB: See MED TOOL
- **NORMAL SALINE: 20ml/kg bolus IV/IO, may repeat 2x prn.**
- **If temperature is >104° BEGIN RAPID COOLING.**

2.5 Diabetic Emergencies

INFORMATION

- Symptoms of DKA include: nausea/vomiting, abdominal pain, general weakness, Kussmaul Respirations, AMS, hypotension, or tachycardia with an acetone smell on the patient's breath.
- Symptoms of Hypoglycemia: AMS, FOCAL NEURO DEFICITS, ABNORMAL BREATHING, DIAPHORESIS.

Patients taking oral hypoglycemic mediations should be transported to the ED regardless of post treatment glucose levels.
(i.e. Glyburide, Glimepiride, and Glipizide)

ADULT

Consider: Hypoglycemia in many cases is a result of severe systemic illness.

HYPOGLYCEMIA: GLUCOSE LEVELS ARE LESS THAN 60mg/dL

- ORAL GLUCOSE: (15g) May be given if patient is able to swallow and follow commands. Repeat as needed for blood glucose less than 60mg/dL.
- IV/IO: D10: 100mL IV, retest glucose. If patient remains less than 60mg/dL, administer another 100mL of D10. Repeat as needed for blood glucose less than 60.
- **IF UNABLE TO PROVIDE ABOVE TREATMENT FOR HYPOGLYCEMIA.**

GLUCAGON: 1mg IM if available. (Glucagon may cause nausea/vomiting).
ZOFRAN: 4mg IV/IM/PO for nausea/vomiting.

HYPERGLYCEMIA: GLUCOSE LEVELS ARE GREATER THAN 300mg/dL with S/S of DKA.

NORMAL SALINE: 1L Bolus IV/IO. Assess lung sounds and blood pressure often.
ZOFRAN: 4mg IV/IO/PO/IM for nausea/vomiting.

2.5 Diabetic Emergencies

PEDIATRIC

HYPOGLYCEMIA: GLUCOSE LEVELS ARE LESS THAN 60mg/dL

- ORAL GLUCOSE: (15g) may be given to conscious patients with an intact gag reflex. Not recommended for patients less than 2 years old.
- D10: 5ml/kg IV/IO (max of 100mL), retest glucose. May repeat 1x prn. See MED TOOL.

IF UNABLE TO PROVIDE ABOVE TREATMENT for HYPOGLYCEMIA

- **GLUCAGON: Less than 20kg (0.5mg IM), greater than 20kg (1mg IM)**
- (Glucagon may cause nausea/vomiting)
- **ZOFRAN:** 0.1mg/kg IM or slow IV/IO/PO for nausea/vomiting. See MED TOOL.

HYPERGLYCEMIA: GLUCOSE LEVELS ARE GREATER THAN 300mg/dL with S/S of DKA

- NORMAL SALINE: 20mL/kg IV/IO. Assess lung sounds and blood pressure often.
- ZOFRAN: 0.1mg/kg IM or slow IV/IO/PO for nausea/vomiting. See MED TOOL.

2.6 Dystonic Reaction

INFORMATION

Dystonic reactions are characterized by intermittent spasmodic or sustained involuntary contractions of muscles in the face, neck, trunk, pelvis, extremities, and even the larynx. Typically, antipsychotic (Haldol, Lithium, etc.), antiemetic (Compazine, Reglan, etc.) or antidepressant (Prozac, Paxil etc.) medications are responsible. A dystonic reaction can occur immediately or be delayed for hours to days.

ADULT

BENADRYL : 50mg IV/IO/IM. Administer over 2 minutes for IV/IO usage.

PEDIATRIC

- BENADRYL: 1mg/kg IV/IO/IM (**diluted**).
- Max total dose 50mg. Administer over 2 minutes for IV/IO usage OR give IM.
- See MED TOOL.

2.7 Fluid Resuscitation/Dehydration

INFORMATION

For dehydration secondary to prolonged vomiting and/or diarrhea, DKA, heat illness, pneumonia, non-traumatic bleeding (vaginal or GI), suspected Rhabdomyolysis, hypotension secondary to overdose/poisoning, or Paramedic discretion.

ADULT

NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500mL.

* Precaution for patients with history of CHF and/or Renal Failure.

PEDIATRIC

NORMAL SALINE: 20mL/kg bolus IV/IO, may repeat 2x prn for continued hypotension. Assess lung sounds and blood pressure often.

NOTES
Consider sepsis for all dehydrated patients.
Patients with a history of renal failure/dialysis or CHF are at increased risk for fluid overload. Monitor these patients carefully.

2.8 Hyperkalemia

INFORMATION

In patients with a history of renal failure or dialysis who are pre-dialysis, hyperkalemia should be strongly considered when clinical findings include generalized weakness, hypotension, or paresthesia. The most prominent early sign is the presence of tall, peaked T-waves on the ECG. More advanced manifestations may include arrhythmias such as sine wave patterns, wide-complex QRS, ventricular tachycardia with a rate below 120 bpm, severe bradycardia, or high-degree atrioventricular blocks.

ADULT

FOR PATIENTS PRESENTING WITH ANY OF THE ABOVE ARRHYTHMIAS administer as a "bundle of care" and give ALL medications.

- **CALCIUM CHLORIDE: 1gm, slow IV/IO over 2 minutes. (First to be given)**
- ALBUTEROL: 10mg via nebulizer, (4 * 2.5mg) continuous treatments.
- If patient is intubated, administer Albuterol via inline nebulization.
- SODIUM BICARBONATE: 50mEq, slow IV/IO over 2 minutes.

IF PATIENT IS HYPOTENSIVE

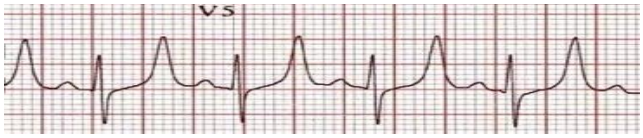
Administer NORMAL SALINE: 500mL, may repeat 1x prn. Check lung sounds after each fluid bolus.

Do not administer Calcium Chloride and Sodium Bicarbonate in the same IV line without thoroughly flushing the IV.

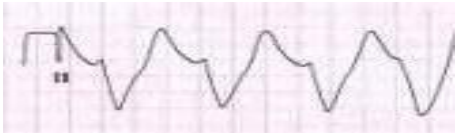
PEDIATRIC

FOR PATIENTS PRESENTING WITH ANY OF THE ABOVE ARRHYTHMIAS administer as a "bundle of care" and give ALL medications.

- **CALCIUM CHLORIDE: 20mg/kg, slow IV/IO over 2 minutes. (First to be given)**
- **ALBUTEROL: 10 mg via nebulizer, (4 * 2.5mg) continuous treatments.**
- **SODIUM BICARBONATE: SEE MED TOOL.**



Peaked T wave



Sine Wave

2.9 Nausea/Vomiting

INFORMATION

Consider differential diagnosis: MI, Stroke, Diabetic, Head Injury, heat illness, G.I., etc.

- Perform 12 LEAD EKG
- Consider 15 LEAD EKG

ADULT

- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500mL.
- ZOFRAN: 4mg IM or slow IV/IO/PO. **Liquid Zofran can be given PO.**
- Can be administered prn.

PEDIATRIC

- NORMAL SALINE: 20mL/kg bolus. Assess lung sounds often. May repeat 2x prn
- ZOFRAN: 0.1mg/kg IM or slow IV/IO/PO.
- **Zofran liquid can be given po.**
- Can be administered prn. Max dose 4mg.

ZOFRAN ADMINISTRATION:

If IV access is unobtainable, it is acceptable to administer the IV formulation of Zofran via the PO route to the patient.

2.10 Seizures

INFORMATION

Consider the possible causes: meningitis, head trauma, hemorrhagic stroke, diabetic, drugs, alcohol, poisoning, fever, and eclampsia.

ADULT

SEIZURE: (**IF ACTIVELY SEIZING OR POSTICTAL**)

- VERSED: 5mg IV/IO/IN/IM. May repeat 1x prn.
    - If no effect with Versed after 2 doses, then add Ketamine *be prepared to manage the airway*!
- KETAMINE: 100mg IV/IO/IM (**Diluted**)
    - IF THE PATIENT NEEDS INTUBATION GIVE ADDITIONAL 100mg.

PEDIATRIC SEIZURES

- **Actively cool the patient by removing the clothing and fanning, being careful not to induce shivering.**
- **DO NOT cover patient with a wet towel/sheet.**
- **DO NOT apply ice/cold packs to the patient's body.**

IF NOT ACTIVELY SEIZING AND FEBRILE (ABLE TO TOLERATE PO):

- **ACETAMINOPHEN/TYLENOL SUSPENSION:** 15mg/kg PO single dose.
- See MED TOOL.

IF ACTIVELY SEIZING, FEBRILE OR NON-FEBRILE:

- **VERSED:** (May repeat 1x prn).
    - 0.1 mg/kg IV/IO
    - 0.2mg/kg IN/IM
- If no effect with Versed after 2 doses, then add Ketamine *be prepared to manage the airway!
- **KETAMINE**: 1mg/kg IV/IO (**Diluted**), if Versed is not effective after 2 doses

ZOFRAN ADMINISTRATION:

If IV access is unobtainable, it is acceptable to administer the IV formulation of Zofran via the PO route to the patient.

2.11 Sepsis

INFORMATION

Recognition and treatment of sepsis is the key to the successful management of sepsis. It is imperative that once sepsis is identified the patient is kept from becoming hypotensive, as an episode of hypotension significantly increases morbidity and mortality. Sepsis is most common in the elderly, very young, patients confined to bed (bed sores, abscesses, cellulitis, or immobile) and patients with a recent history of surgery or invasive medical procedure.

SOURCES AND SIGNS

- **FEVER: Temp >100.4 or < 96.8**
- Urinary Frequency, Dysuria, Cloudy or Bloody Urine
- Cough
- Skin Wounds
- Abdominal Pain
- Vomiting/Diarrhea
- AMS
- Medical Equipment: Dialysis ports/fistulas, foley catheters. nephrostomy tubes, biliary tubes,
- Hx of IV Drug Abuse

SEPSIS ALERT CRITERIA: **USE THE QSOFA MODULE!!**

- Adult with suspected or confirmed infection

AND

- **At least 2/3: CRITERIA FOR SEVERE OR SEPTIC SHOCK**
  - **Hypotension SBP < 100mmHg or MAP < 65**
  - **Altered Mental Status**
  - **Tachypnea: respirations greater than 22 and/or ETCO2 <25**

qSOFA (quick Sequential [Sepsis-related] Organ Failure Assessment) is a simplified bedside tool used to help identify patients with suspected infection who are at greater risk of poor outcomes, such as sepsis.

2.11 Sepsis

ADULT

Adult or <18 showing signs of puberty.

QSOFA POSITIVE PATIENTS (SEVERE SEPSIS TREATMENT):

- Call a Sepsis Alert and limit on-scene time. (Less than 10 min)
- **Monitor EtCO2**
- BGL
- Maintain SpO2 at 95% or 90% for COPD and asthma patients.
- **N.S. FLUID BOLUS: 1L NS regardless of blood pressure**. Assess lung sounds every 500mL.
- **Cefepime 2gm reconstitute in NS 10ml then add to NS 100ml bag. Infuse in 10 drop set at 1 drop per second (approximately 16 minutes).**
- Push Dose EPINEPHRINE: for Septic Shock NOT RESPONDING TO FLUIDS.

Patients with a history of renal failure or CHF may not tolerate fluids. These patients should be monitored carefully for the development of rales.

PEDIATRIC: No evidence of puberty

- **FLUID BOLUS:** NS 20ml/kg IV/IO. Assess lung sounds and blood pressure often. May Repeat 2X.
- **Push Dose EPINEPHRINE:** For Septic Shock NOT RESPONDING TO FLUIDS.

2.12 Sickle Cell

INFORMATION

Sickle Cell Disease (SCD) is a **genetic blood disorder** in which red blood cells are abnormally shaped like crescents or "sickles." These misshapen cells become rigid and sticky, causing **blockages in small blood vessels** that lead to poor oxygen delivery, severe pain, and organ damage. During a **sickle cell crisis**, patients often experience intense pain (commonly in the back, chest, abdomen, or extremities), and may develop complications such as **acute chest syndrome**, **stroke**, or **infection**. This is a **medical emergency** — all patients experiencing a sickle cell crisis **should be transported** to an appropriate medical facility for further evaluation and management.

ADULT

NORMAL SALINE: 500ml IV/IO. May repeat. Assess lung sounds and blood pressure every 500mL.
Pain management: See Pain Management Protocol
Consider ZOFRAN 4mg IV/IO for nausea.

PEDIATRIC

NORMAL SALINE: 20mL/kg bolus IV/IO, may repeat 2x.
Pain Management: See Pain Management Protocol
Consider ZOFRAN 0.1mg/kg for nausea. See MED TOOL.

2.13 Stroke

INFORMATION

Call a Stroke Alert and limit on-scene time (< 10 min)

Be sure to check the patient's blood glucose level (BGL) **prior to activating a Stroke Alert**. If the BGL is **less than 60 mg/dL**, treat the patient according to the **Hypoglycemia Protocol**.

CRITERIA FOR STROKE ALERT: 1 OR MORE

1) **SAH: Sudden Onset of Severe Headache**
2) **USE BE-FAST TO FACILITATE STROKE RECOGNITION: 1 of the following**
   - **B: Sudden loss of balance, dizziness or unsteadiness**
   - **E: Sudden vision changes- blurred, double, or loss of vision**
   - **F: Facial Droop**
   - **A: Arm Drift or AMS**
   - **S: Slurred Speech**
   - **T: Onset < 24 hours**

CALCULATE APHASIA FOR RIGHT SIDED DEFICIT AND NEGLECT FOR LEFT SIDED DEFICIT. TOTAL MAXIMUM SCORE IS 9

3) Quantify Stroke for LVO via RACE

RACE: Rapid Arterial Occlusion Evaluation

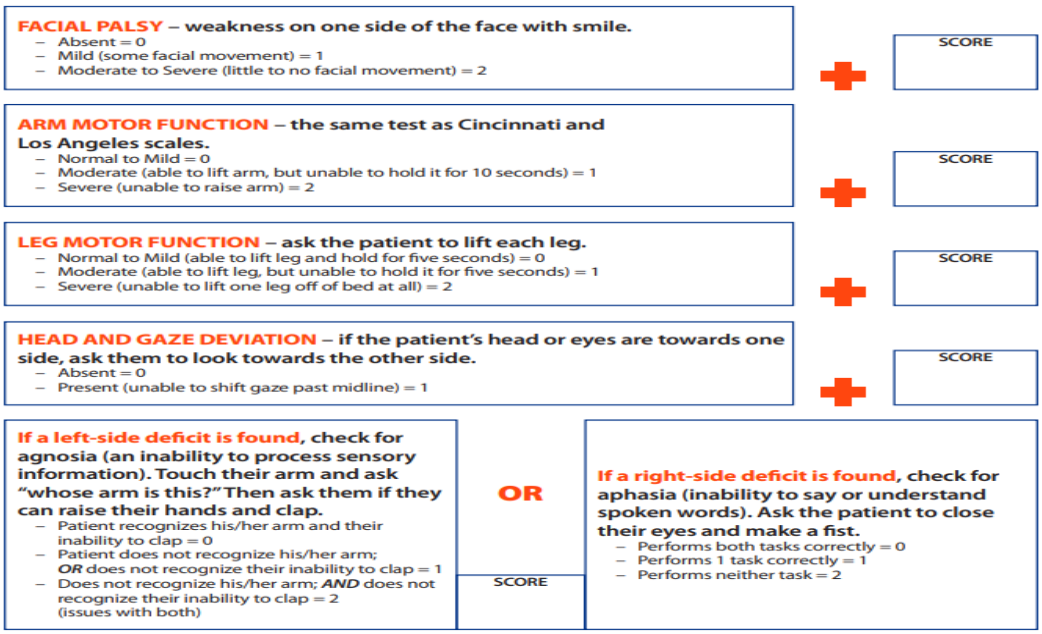
	ITEM	INSTRUCTION	R.A.C.E SCORE
MOTOR SIGNS	Facial Palsy	Ask the patient to show their teeth: "Smile"	0 – Absent (symmetrical movement) 1 – Mild (slightly asymmetrical) 2 – Moderate to severe (completely asymmetrical)
	Arm Motor Function	Extend the arm of the patient 90 degrees (if sitting) or 45 degrees (if supine), palms up	0 – Normal to mild (arm upheld more than 10 seconds) 1 – Moderate (arm upheld less than 10 seconds) 2 – Severe (patient unable to raise arm against gravity)
	Leg Motor Function	Extend the leg of the patient 30 degrees (if supine) one leg at a time	0 – Normal to mild (leg upheld more than 5 seconds) 1 – Moderate (leg upheld less than 5 seconds) 2 – Severe (patient unable to raise leg against gravity)
CORTICAL SIGNS	Head and Gaze Deviation	Eyes Deviated or Head Turning to one side	0 – Absent (eye movements to both sides/no head deviation observed) 1 – Present (eyes and/or head deviation to one side was observed)
	Aphasia	Ask patient to follow two verbal orders: - Close your eyes - Make a fist Difficulty talking: - Name two objects: (watch, pen) - Repeat phrase: "today is a sunny day" Note: Do not count slurring of words	0 – Normal (no difficulty following commands or talking) 1 – Moderate (difficulty following commands OR talking) 2 – Severe (cannot follow commands AND unable to talk)
	Agnosia (Neglect)	Inability to recognize arm and/or unaware of impairment. When showing the weak arm, ask: - "Who's arm is this?" - "Can you move your arm?	0 – Normal (recognizes arm, aware of impairment) 1 – Moderate (does not recognize arm OR denies impairment) 2 – Severe (does not recognize arm AND denies impairment)
If any of the CORTICAL SIGNS are present, put a "+" next to the total score			R.A.C.E. SCALE TOTAL: _____

2.13 Stroke

ADULT

- Transport the patient with the head of the stretcher elevated to **30 degrees**, unless a **supine position** provides improvement in neurologic symptoms. If placing the patient supine does **not relieve or improve symptoms**, immediately return the patient to a 30-degree elevated position.
- 2 Lpm NC for O2 sat < 95%. Increase oxygen therapy as needed.
- An 18g catheter in the antecubital is preferred.
- All Stroke Alerts shall be transported as per Hospital Matrix.
- The time of onset is determined to be the time that the patient was last seen to be normal (without stroke signs and symptoms).
- Any patient who awakens with stroke symptoms or when not able to be determined when stroke symptoms began shall be transported to Stroke Center as a Stroke Alert.

- Communication TO HOSPITAL - facilitate THROMBOLYTIC THERAPY administration at the hospital
  1) LKW: Last Known Well.
  2) RACE SCORE and Neurologic Deficits.
  3) MEDICATIONS: Coumadin, Xarelto, Eliquis, or Pradaxa.
  4) Blood Pressure.
  5) Blood Sugar.
  6) ETA.



2.13 Stroke

PEDIATRIC

DEFINITIONS OF A PEDIATRIC STROKE (Less than 18 years of age)

- All Pediatric Stroke Alerts shall be transported to a Pediatric Comprehensive ED/Comprehensive Stroke Center (BHMC or JDCH)
- Transport the patient with the head of the stretcher elevated to **30 degrees**, unless a **supine position** provides improvement in neurologic symptoms. If placing the patient supine does **not relieve or improve symptoms**, immediately return the patient to a 30-degree elevated position.
- 2 Lpm NC for O2 sat <95%. Increase oxygen therapy as needed.
- An appropriately sized IV catheter. Antecubital preferred.
- The time of onset is determined to be the time that the patient was last seen to be normal (without stroke signs and symptoms).

COMMUNICATION TO HOSPITAL - facilitate Fibrinolytic medication administration at the hospital

1) LKW: Last Known Well.
2) RACE SCORE and Neurologic Deficits.
3) MEDICATIONS: Coumadin, Xarelto, Eliquis, or Pradaxa.
4) Blood Pressure.
5) Blood Sugar.
6) ETA.

RESPIRATORY EMERGENCIES

SECTION 3

Section 3

Respiratory Emergencies

3.1 Respiratory Distress

INFORMATION

AUTO-PEEP

Patients with COPD & Asthma have prolonged exhalation secondary to bronchospasm, which causes air trapping resulting in hypercapnia (high levels of CO2). Therefore, EtCO2 guidelines should be disregarded for these patients, as it is more important to maintain SpO2 levels at 90%. Trying to maintain normal EtCO2 levels in these patients puts them at risk for developing Auto PEEP, which can result in a pneumothorax or hypotension. Auto PEEP occurs during assisted ventilations when air goes in before the patient is allowed to fully exhale. This causes the lungs to expand like a balloon, putting the patient at risk for a pneumothorax. In addition, increasing intrathoracic pressure decreases venous return to the heart which can result in hypotension. COPD or Asthma patients who develop poor bag compliance or hypotension during positive pressure ventilations should have positive pressure ventilations discontinued (if intubated, disconnect BVM from ETT) for 20-40 seconds (10-20 seconds for pediatrics) to allow the patient to completely exhale before resuming positive pressure ventilations.

RESPIRATORY DISTRESS

- Position of comfort is preferred.
- Apply oxygen, maintain SpO2 at 95% or 90% for COPD and asthma patients, “blow by” Oxygen for pediatrics.
- Adult: Assist ventilations with a BVM and an airway adjunct (NPA/OPA) for a respiratory rate of less than 10 or greater than 29 with shallow respirations. If ventilation is required for more than 2 minutes and the patient is unconscious with no gag reflex, insert an advanced airway.
- Consider differential diagnosis (i.e., CHF, allergic reaction, etc.).
- Monitor EtCO2.
- CPAP (10 cm H2O) is indicated for moderate/severe respiratory distress, including: COPD, asthma and pneumonia patients.
    - Contraindicated for patients without spontaneous respirations.
    - Contraindicated for patients with a decreased LOC (lethargic).
    - Relative Contraindication for SBP< 90.

3.1 Respiratory Distress

ADULT

BRONCHOSPASM SECONDARY TO COPD

- ALBUTEROL: 2.5mg via nebulizer. Repeat prn for bronchospasm. (Pure B Agonist)
- CPAP: (10cm/H2O) Remove immediately if symptoms worsen. (May be administered simultaneously).
    - May give 2mg VERSED IV/IO if not tolerating
- SOLUMEDROL: 125mg IV/IM one dose.

BRONCHOSPASM SECONDARY TO ASTHMA

Initial Treatment- 1ST BUNDLE

- ALBUTEROL: 2.5mg via nebulizer. Repeat prn for bronchospasm.
- SOLUMEDROL: 125mg IV/IM one dose.

FOR SEVERE ASTHMA – 2ND BUNDLE

- CPAP: (10cm/H2O) Remove immediately if symptoms worsen.
    - May give 2mg VERSED IV/IO if not tolerating
- ALBUTEROL: 2.5mg via nebulizer. Repeat prn for bronchospasm.
- EPINEPHRINE: (1:1,000) 0.5mg IM. May repeat 2x given EVERY five minutes.
- MAG SULFATE: Infusion Protocol
- SOLUMEDROL: 125mg IV/IM one dose.

IMMEDIATELY REMOVE THE CPAP FOR THE ASTHMATIC PATIENT WHOSE CONDITION WORSENS AFTER APPLYING THE CPAP.

ADMINISTER IN-LINE NEBULIZED ALBUTEROL TO ALL INTUBATED ASTHMA PATIENTS WITH BRONCHOSPASM.

3.1 Respiratory Distress

PEDIATRIC

ASTHMA/ BRONCHOSPASM:

1ST BUNDLE – MILD ASTHMA

- Oxygenate and/or ventilate prn to maintain SpO2 at 95% and EtCO2 levels between 35-45 mmHg.
- ALBUTEROL: 2.5mg via nebulizer. Repeat prn for bronchospasm.
- Solumedrol: 2mg/kg over 2 minutes.

2nd BUNDLE – MODERATE/SEVERE ASTHMA

- Oxygenate and/or ventilate prn to maintain SpO2 at 95% and EtCO2 levels between 35-45 mmHg. Treatment for asthma patients is based on maintaining an SpO2 of 90%.
- ASSIST VENTILATIONS via BVM prn with appropriate airway adjunct.
- **CPAP: over 6 years old**
- ALBUTEROL: 2.5mg via nebulizer. Repeat prn for bronchospasm.
- EPINEPHRINE: (1:1,000) 0.01mg/kg (0.01mL/kg) IM. Max single dose 0.3mg. May repeat 2x prn, in five-minute intervals.
- MAGNESIUM SULFATE: Infusion Protocol
- Solumedrol: 2mg/kg over 2 minutes

FOR CROUP/EPIGLOTTITIS

- EPINEPHRINE: (1:1,000) 3mL (3mg total) delivered via nebulizer.
- (Yes, 3ml is the dose!)
- DO NOT STRESS THE PATIENT!
- DO NOT ATTEMPT INTUBATION OR PLACE AN OPA OR NPA. VENTILATE VIA BVM AS NEEDED.
- Expedite transport to closest approved Pediatric EMERGENCY DEPARTMENT.

*** Both will have stridor and/or a “barky” cough.***

CROUP
Usually less than 3 y/o
“Sick” for a couple of days
Low grade fever
Not “toxic” appearing

EPIGLOTTITIS
Usually 3-6 y/o
Sudden Onset
Tripod Position
High grade fever
Poor general impression
Drooling

3.2 Advanced Airway

INFORMATION

Once paralytics are administered, the designated EMS OFFICER shall be responsible for ensuring an airway is obtained & accompany the patient to the emergency department (excluding air rescue transport).

ALL PATIENTS SHALL RECEIVE HIGH FLOW O2 VIA NASAL CANNULA PRIOR TO AND DURING THE PROCEDURE.

VIDEO LARYNGOSCOPY IS PREFERRED AND SHOULD ALWAYS BE USED FIRST IF AVAILABLE TO MAXIMIZE FIRST PASS SUCCESS

FACILITATED LARYNGOSCOPY/ SUPRAGLOTTIC AIRWAY

ADULT

- ETOMIDATE: 0.3mg/kg Max 30mg IV/IO **SLOW** PUSH one dose OR
- KETAMINE: 200mg (**Diluted**) IV one dose

ADULT AIRWAY MEDICATIONS:

INDUCTION FOR AIRWAY CONTROL

- ETOMIDATE: 0.3mg/kg Max 30mg or IV/IO **RAPID** PUSH. May repeat 1x prn.
- **OR**
- KETAMINE: 2mg/kg (**Diluted**) MAX 200mg IV/IO. **RAPID** PUSH. May repeat 1x prn.

PARALYTIC

- Rocuronium 50-100mg IV/IO (1.0 mg/Kg).

POST INTUBATION SEDATION/PARALYSIS ADULTS:

- KETAMINE: 100-200mg (**Diluted**) IV/IO as needed to maintain sedation. May repeat 1x prn. Max single dose 200mg. To be given immediately after confirmation of intubation when Etomidate was given as induction agent.
- FENTANYL: 100mcg SLOW PUSH IV/IO REPEAT IN 20 MINUTES X1 FOR TOTAL DOSE 200mcg. To be given post intubation for patients needing additional pain medications above Ketamine.
- ROCURONIUM: (1mg/kg) MINIMUM DOSE 50mg, MAX DOSE 100mg IV/IO repeat 1x as needed. To be given for post intubation patients needing repeat paralytic medications (EMS OFFICER).

FAILED AIRWAY:

If a patient cannot be effectively oxygenated or ventilated, all options with bag-valve-mask ventilation and supraglottic airway placement must first be exhausted. If these measures are unsuccessful and the airway cannot be secured by any other means, a surgical airway should be performed. In adult patients, this should be accomplished by cricothyrotomy, while in pediatric patients (≤10 years old) a needle cricothyrotomy is indicated.

3.2 Advanced Airway

INFORMATION
Once paralytics are administered; the designated EMS OFFICER shall be responsible for ensuring an airway is obtained & accompany the patient to the emergency department (excluding air rescue transport).

ALL PATIENTS SHALL RECEIVE HIGH FLOW O2 VIA NASAL CANNULA PRIOR TO AND DURING THE PROCEDURE.

VIDEO LARYNGOSCOPY IS PREFERRED AND SHOULD ALWAYS BE USED FIRST IF AVAILABLE TO MAXIMIZE FIRST PASS SUCCESS

FACILITATED LARYNGOSCOPY/ SUPRAGLOTTIC AIRWAY

PEDIATRIC

- ETOMIDATE: 0.3 mg/kg Max 30mg IV/IO **SLOW** PUSH Max 30 mg OR
- KETAMINE: 1mg/kg (**Diluted**)

PEDIATRIC AIRWAY MEDICATIONS:

SEE MED TOOL FOR DOSING

INDUCTION FOR AIRWAY CONTROL

- ETOMIDATE: 0.3mg/kg Max 30mg IV/IO **RAPID** PUSH
- **OR**
- KETAMINE: 1mg/kg (**Diluted**) IV/IO **RAPID** PUSH

PARALYTIC FOR PARALYSIS

ROCURONIUM: 1mg/kg IV/IO.

- DO NOT GIVE ROCURONIUM WITHOUT INDUCTION AGENT.

PEDIATRIC POST INTUBATION SEDATION and PARALYSIS:

- Once successfully intubated: These medications are PRN when needed.
- SEDATION KETAMINE: 1mg/kg (**Diluted**) IV/IO, when ETOMIDATE used for induction.
- **FENTANYL: 1mcg/kg** (**Diluted**) IV/IO **SLOW** PUSH OVER 2 MIN. May repeat every 5 mins prn. Max single dose 100mcg. Max total dose 200mcg. Indicated when pain medications are needed above KETAMINE.
- **AND (IF NECESSARY)-** PARALYSIS: Rocuronium: 1mg/kg IV/IO

FAILED AIRWAY:
If a patient cannot be effectively oxygenated or ventilated, all options with bag-valve-mask ventilation and supraglottic airway placement must first be exhausted. If these measures are unsuccessful and the airway cannot be secured by any other means, a surgical airway should be performed. In adult patients, this should be accomplished by cricothyrotomy, while in pediatric patients a needle cricothyrotomy is indicated.

3.3 RSI and DSI

EXAMPLE INDICATIONS FOR PARALYTICS: Status Epilepticus, Multi-System Trauma, Head Injury / GCS 8 or Less, Trismus (Lock-Jaw) or Clenched Teeth, Burn Injuries to the upper airway, Traumatic Shock, Respiratory Failure.

FEATURE	RSI	DSI
PRIMARY PURPOSE	QUICK AIRWAY CONTROL	OXYGENATION AND/OR HEMODYNAMIC INSTABILITY
IDEAL PATIENT	COOPERATIVE	UNCOOPERATIVE
INDUCTION/PARALYTIC TIMIMG	INDUCTION BOLUS THEN PARALYTIC BOLUS IMMEDIATELY FOLLOWING	PARALYTIC 3 MINUTE DELAY AFTER INDUCTION
OXYGENATION STRATEGY	PT TOLERATES PREOXYGENATION	SEDATION FACILITATES PREOXYGENATION AND /OR HEMODYNAMIC STABILIZATION
COMMON USE CASES	TBI, CARDIAC ARREST, AIRWAY BURN	AGITATED HYPOXIC, TRAUMA HD UNSTABLE, PNEUMONIA OR COPD

For delayed sequence intubation (DSI), always provide high-flow oxygen before and throughout the procedure. An induction agent should be administered first, followed by approximately three minutes of support to optimize physiological parameters such as blood pressure and respiratory status. After stabilization, a paralytic agent should be given to facilitate intubation. Ketamine is the first-line induction agent for DSI due to its hemodynamic stability and its ability to provide both sedation and pain control.

ALL PATIENTS SHALL RECEIVE HIGH FLOW O2 VIA NASAL CANNULA PRIOR TO AND DURING THE PROCEDURE.

VIDEO LARYNGOSCOPY IS PREFERRED AND SHOULD ALWAYS BE USED FIRST IF AVAILABLE TO MAXIMIZE FIRST PASS SUCCESS.

3.4 VENTILATOR MANAGEMENT

INFORMATION

The agency utilizes an intelligent transport ventilator designed for use in prehospital, transport and in hospital settings, offering full-featured ventilatory support for both adult and pediatric patients. It provides volume-targeted and pressure-controlled ventilation modes, adaptive ventilation ASV® and non-invasive ventilation. Monitoring parameters include real-time waveforms and advanced monitoring . Compact and battery-powered, it ensures high-performance ventilation even in challenging environments like ambulances and helicopters.

Intubated or SGA

Indications

- Cardiac Arrest
- Managing a patient in respiratory failure

Contraindications

- Inability to constantly monitor the patient
- Weight < 6K

TARGET ETCO2
NORMAL = 35-45 COPD/CHF = 45-55
*PATIENT REASSESSMENT SHOULD BE PERFORMED EVERY 5 MINUTES OR IMMEDIATELY FOR VENTILATOR ALARMS.

Procedure: (VENTILATOR SETTINGS)

Cardiac Arrest

Mode: CPR Mode/PCV+

Default Settings: (RR 10, PS 15cmH20, PEEP 5, FiO2 100%)

Troubleshooting: If low Minute Volume or Vt low alarm is present, increase Pcontrol to 20cmH2O for intubated pts or 25cmH20 for pts with SGA.

Post ROSC

Mode: PCV+ Mode

Default Settings: (RR 12, PS 15cmH20, PEEP 5, Fi02 100%)

Troubleshooting: If pt has ROSC and is having ventilator desynchrony, transition to ASV mode.

Respiratory Failure

Mode: ASV

Default Settings (100% MinVol, PEEP 5cmH20, Fi02 100%)

Troubleshooting: If EtCo2 is greater than target Increase MV in 20% increments until target achieved (Max 150%). If pt is apneic and EtC02 is less than target decrease MV in 10% increments (limit to 90%)

***If EtC02 = Target, but Sp02 is >94% - increase PEEP in 2cmH20 to a max of 12cmH20

3.4 VENTILATOR MANAGEMENT

Non Invasive

Indications

- Retractions
- Accessory muscle use
- Hypoxia, dyspnea secondary to obstructive or restrictive disease

Contraindications

- Relative Contraindication: (Systolic BP < 100 mmHg)
- Unable to protect airway or follow commands
- Vomit, upper GI Bleed, Trauma, Pneumothorax
- Anatomy prevents adequate mask seal
- Patient unable to protect airway or follow commands

Consider SGA or Intubation

TARGET ETCO2
NORMAL = 35-45 COPD/CHF = 45-55 *PATIENT REASSESSMENT SHOULD BE PERFORMED EVERY 5 MINUTES OR IMMEDIATELY FOR VENTILATOR ALARMS.

Procedure:

Obstructive Lung Disease (COPD, Asthma, Bronchiolitis, etc.)

Mode: NIV-ST

Default Settings: (PS 8cmH20, PEEP 6cmH20, Fi02 100%) (**Max:** PS 14, PEEP 6)

Restrictive Lung Disease (CHF, Interstitial Lung Disease "Pulmonary Fibrosis", ARDS, Pneumoconiosis, Pneumonitis, Neuromuscular Diseases, Obesity)

Mode: NIV-ST

Default Settings: (PS 5cmH20, PEEP 5cmH20, Fi02 100%) (**Max:** PS 10, PEEP 10)

Procedure:

1. Choose appropriate mode from above.
2. Apply capnography.
3. Ventilate pt for 3-5 min, then titrate according to the guidelines below:

- Increase Inspiratory Pressure (Top#), in 2cmH20 increments to improve ventilation status.
- Increase PEEP (bottom #) in 2cmH20 increments until improved oxygen status.
- Do Not exceed Peak Pressure of 25cmH20 unless pt has a nasogastric tube in place.
- Assure continual SpO2 and EtCO2 readings throughout the call.
- Signs of deterioration or failure to respond to CPAP; Decreased LOC, sustained and increased HR/RR/ BP, sustained low or decreasing SpO2, rising EtCO2, diminished tidal volume or other evidence of respiratory failure.
- For any worsening on ventilator, then switch to BVM.

CARDIAC EMERGENCIES

SECTION 4

Section 4

Cardiac Emergencies

4.1 Chest Pain

Patients without pain/discomfort who have ST segment elevation are treated with aspirin only. Fentanyl is only given to relieve ischemic pain/discomfort.

INFORMATION

For STEMI alerts or suspected STEMI alerts, avoid using the right hand and wrist for IV access due to anticipated catheterization requirements. If possible, establish IV access in the right antecubital vein or in any suitable site on the left arm.

- **DO NOT GIVE KETAMINE FOR SUSPECTED CARDIAC CHEST PAIN**
- **DO NOT GIVE TORADOL FOR SUSPECTED CARDIAC CHEST PAIN**

ADULT

- **IMMEDIATE** 12 lead ECG and **TRANSMIT** to Hospital.
- ASPIRIN: Four 81mg baby aspirin (324mg total) chewed and swallowed.
  - Contraindications: allergy, active GI bleeding.
  - Withhold if patient self-administered 324mg of aspirin within 24 hours. If patient self- administered less than 324mg of aspirin within 24 hours, administer full 324mg dose.
- FENTANYL: 50mcg slow IV/IO/IM OR 100mcg IN. May repeat PRN in 5 minute. Max total dose 200mcg IV/IO/IM/IN.
- In rare occasions, Fentanyl may cause hypotension.
- If hypotension occurs, NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500mL.

PEDIATRIC

CALL FOR ORDERS

4.2 STEMI Alert

INFORMATION

Call a STEMI Alert and limit on-scene time.

STEMI Symptoms can be variable and include discomfort of the chest, arm, neck, back, shoulder or jaw, and can also be painless with syncope/near syncope (lightheadedness), general weakness/fatigue, unexplained diaphoresis, SOB, or nausea/vomiting.

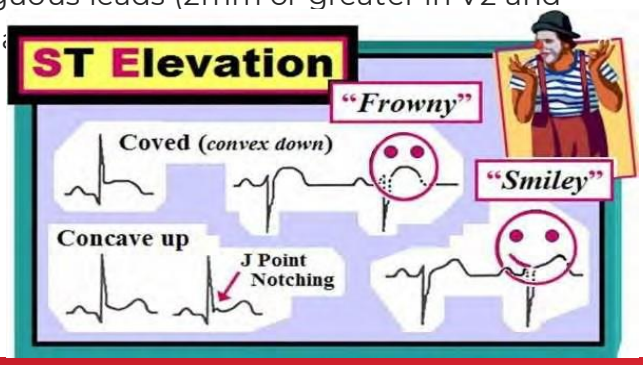
- **DO NOT GIVE KETAMINE FOR SUSPECTED CARDIAC CHEST PAIN**
- **DO NOT GIVE TORADOL FOR SUSPECTED CARDIAC CHEST PAIN**

ADULT

- **IMMEDIATE 12 LEAD ECG WITH IMMEDIATE ECG TRANSMISSION.**
- **ASPIRIN:** (4) 81mg baby aspirin (324mg total) chewed and swallowed, if not already administered.
  - Contraindications: allergy, active GI bleeding
  - Withhold if patient self-administered 324mg of aspirin within 24 hours. If patient self- administered less than 324mg of aspirin within 24 hours, administer full 324mg dose.
- **FENTANYL**: **50mcg slow IV/IO/IM OR 100mcg IN. May repeat 3X EVERY 5 MIN Max total dose 200mcg IV/IO/IM/IN.**
- In rare occasions, Fentanyl may cause hypotension.
- If hypotension occurs, NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500mL.
- **DO NOT GIVE NTG IN STEMI**
- **IF CHF ASSOCIATED WITH STEMI THEN OK TO GIVE NTG PASTE**

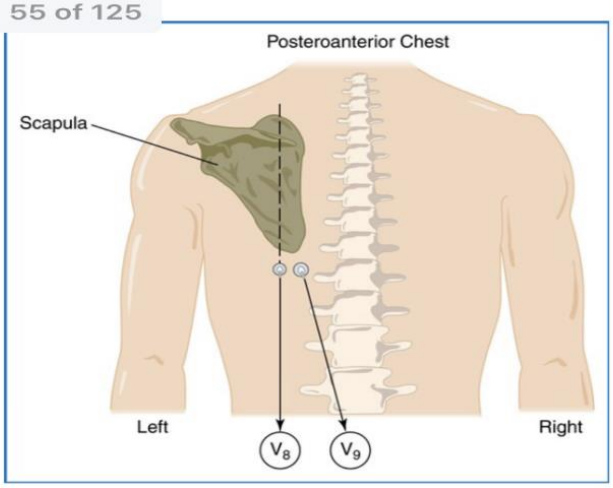
STEMI ALERT CRITERIA

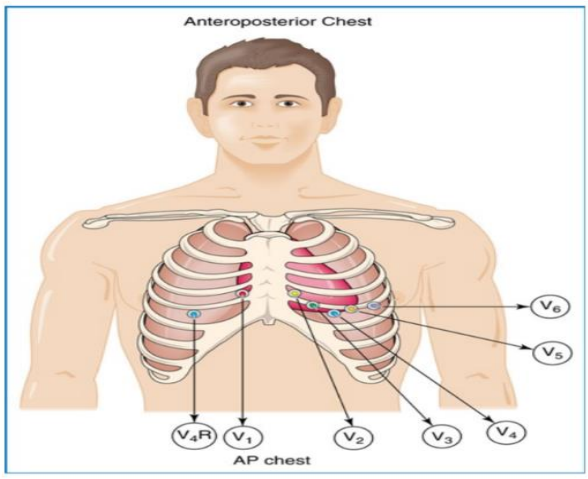
- ST-Segment Elevation in two or more contiguous leads (2mm or greater in V2 and V3 or 1mm or greater in all other leads) with a morphology.
- ST-Segment Elevation in two or more contiguous leads of 2mm or greater in any lead with a “concave” (smiley face).
- Consider 15 LEAD EKG



4.2 STEMI Alert

15 LEAD EKG: Standard 12 lead EKG then second 12 lead EKG with leads placed as per diagram. Label Each EKG. PRINT BOTH EKGS TO OBTAIN 15 LEAD.
V4 GOES TO RIGHT AS INDICATED AND BECOME V7
V5 GOES TO POSTERIOR AS INDICATED AND BECOMES V8
V6 GOES TO POSTERIOR AS INDICATED AND BECOMES V9





STEMI ALERT DISQUALIFIERS
The following are STEMI mimics:

- QRS complexes greater than 0.12 (LBBB, Pacemaker, etc.).
- Left Ventricular Hypertrophy (LVH).
- Pericarditis.
- Early Repolarization.
- Less than 2mm of elevation with a Concave ST Segment (Smiley Face) Morphology.

** Patient presentations indicative of myocardial ischemia that do not meet "STEMI Alert Criteria" should still be transported a STEMI facility as a CARDIAC ALERT.**

Left Ventricular Hypertrophy (LVH)

Take the largest negative deflection from the isoelectric line of VI and V2 ("S" wave), whichever is larger, and count the small boxes. Then take the largest positive deflection of V5 or V6 ("R" wave), whichever is larger, and add it to the total from VI or V2. If the result is greater than 35, your suspicion for LVH should be high.

4.3 CHF (Pulmonary Edema)

INFORMATION

S/S: Hypertension, Tachycardia, Orthopnea, Rales, Pedal Edema

ADULT

- 12 LEAD ECG.
- CPAP (10cmH2O).
- LASIX: 40mg IV times one dose.
- ASPIRIN: (4) 81mg baby aspirin (324mg total) chewed and swallowed
- NITRO-PASTE: Apply 1" to the anterior upper chest.

CONTRAINDICATIONS: CPAP

- SBP less than 90mmHg.
- AMS (Lethargic).
- Apnea: You shouldn't even consider.

CONTRAINDICATIONS: NTG

- SBP less than 90mmHg.
- EDD (Sildenafil, and Levitra within 24 hours and Cialis within 48 hours).
- Right Ventricular Infarction.

- Place an advanced airway for patients with a decreasing level of consciousness.

PEDIATRIC

CALL FOR ORDERS

Caution:

If patient is febrile (Temp > 100.4 or < 96.8) or from a nursing home and pneumonia is suspected withhold nitrates.

4.4 Cardiogenic Shock

INFORMATION

Cardiogenic shock is a condition in which the heart suddenly can't pump enough blood to meet the body's needs. This condition is most often caused by a severe heart attack. Cardiogenic shock is rare, but often fatal if not treated immediately.

ADULT

HEART FAILURE: PULMONARY EDEMA AND HYPOTENSION

- Follow CHF Protocol
- Hypotension: Push Dose EPINEPHRINE

Once SBP is 100 mmHg or greater, treat CHF/Pulmonary Edema and/or Chest Pain as applicable.

PEDIATRIC

CALL FOR ORDERS

4.5 Ventricular Assist Devices

INFORMATION

Ventricular Assist Devices (VADs), also known as Heart Pumps, are surgically implanted circulatory support devices designed to assist the pumping action of the heart. Caring for these patients is complicated and every effort should be made to contact the patient's primary caretaker (spouse, guardian etc.) and the VAD coordinator during your evaluation. Patients with a properly functioning VAD may NOT have a detectable pulse, measurable blood pressure or accurate oxygen saturation.

ADULT AND PEDS

- **LVAD PATIENTS MUST GO TO LVAD CENTERS REGARDLESS OF COMPLAINT. EVEN TOE PAIN!!!!**
- Contact the VAD coordinator immediately; the phone number will be on the device and the equipment carrying bag. Take all equipment associated with the VAD system to the ED.
- Locate patient's emergency "bag" with backup equipment and bring with patient.
- Treat Non–VAD associated conditions in accordance with the appropriate protocol.
- Determine the type of device, assess alarms, auscultate for pump sounds. If needed, assist patient (caretaker) in replacing the device's batteries or cables.
- Locate the driveline site on the patient's abdomen. BE CAREFUL not to cause any trauma to the site or driveline (wires).
- If signs of hypo-perfusion, administer NORMAL SALINE: **No more than 500ml bolus.**
- If there is bleeding at the site, apply direct pressure.
- **Rhythm on your monitor IS the patient's actual rhythm.**
- **Give monitor 30 seconds to "read" rhythm.**
- **V-Fib → SHOCK Patient!**
- **NEVER USE MECHANICAL CPR, MANUAL COMPRESSIONS ONLY!**
- Use $EtCO_2$ monitoring as SpO_2 readings are often unreliable in LVAD patients due to low pulsatility.

4.5 Ventricular Assist Devices

UNRESPONSIVE PATIENTS

- EVALUATE UNRESPONSIVE PATIENTS CAREFULLY FOR REVERSIBLE CAUSES!
- Perform a blood glucose level, if blood glucose is less than 60mg/dl administer D10 100ml. Refer to the hypoglycemia protocol.
- ONLY perform chest compressions when the patient's VAD has no hand pump, the pump is not working, and no other options exist to restart the VAD and the patient is in cardiac arrest.

Hypotension:

- Consider manual Blood Pressure with Doppler: MAP and SBP may be equal and should be 60-100mmHg. (Ask patient what their normal MAP is).
- Consider Trendelenburg.

TRANSPORT

Transport to the closest appropriate facility based on the patient's chief complaint. There are two VAD centers in Broward County.

- **Cleveland Clinic 954-226-9196**
- **Memorial Regional Adult: 954-329-8908, Pediatric: 754-226-8454**

AUSCULTATION FOR PUMP FUNCTION:

Auscultate chest and upper abdominal quadrants – Continuous humming sound = pump is working.

PACKAGING AN VAD PATIENT:

Be aware of the cables, controller, and batteries. It may be best to place the stretcher straps under the LVAD cables, so you are not creating any torque on the device. At a minimum, be aware of this extra hardware.

4.6 Bradycardia

INFORMATION

S/S: Bradycardia is defined as a heart rate less than 60 BPM.

ADULT

STABLE

Monitor and transport.

UNSTABLE: (HYPOTENSION) SBP < 100, AMS, SHOCK

- Obtain a 12 LEAD ECG to rule out an MI.
- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500mL.
- **ATROPINE: 1mg IV/IO.** Repeat prn every 3-5 minutes. Max dose 3mg.
- Push Dose EPINEPHRINE
- TRANSCUTANEOUS PACING: Initial rate of **60 BPM** and then increase milliamps until electrical and mechanical capture is gained. **Rate can be increased as needed.**

IN THE PRESENCE OF CHEST PAIN OR A HIGH DEGREE AV BLOCKS WITH HYPOTENSION

- Go directly to transcutaneous pacing.
- Immediate transcutaneous pacing is acceptable when IV access is not immediately available.

SEDATION OF TRANSCUTANEOUS PACING

- **ETOMIDATE: 10mg IV/IO SLOW PUSH. May repeat 1x prn.**
- If unable to establish IV/IO access, begin pacing until an acceptable blood pressure is obtained.

4.6 Bradycardia

PEDIATRIC

PEDIATRIC HEART RATES

- Newborn to 3 months: 85-205, mean = 140 beats/minute
- 3 months to 2 years: 100-190, mean = 130 beats/minute
- 2 years to 10 years: 60-140, mean = 80 beats/minute
- Greater than 10 years old: 60-100, mean = 75 beats/minute

STABLE: Monitor and transport.

UNSTABLE: (DEFINED AS A CHILD WITH CHANGE IN MENTAL STATUS AND WORSENING PERFUSION).

- **OXYGENATION & VENTILATION:** Ensure adequate oxygenation and ventilation first, as hypoxia is most likely to be the cause of the bradycardia.
- **Push Dose EPINEPHRINE:** HR greater than 60 and POOR perfusion with WORSENING mental status.
- If no response to Push Dose EPINEPHRINE, begin **TRANSCUTANEOUS PACING**. Begin pacing at **80 BPM** and increase the rate as needed until the patient is hemodynamically stable. Increase milliamps until electrical and mechanical capture is achieved. **Rate can be increased as needed.**
- After oxygenation and ventilation of 1 minute for infants/children and 30 seconds for neonates (birth to 1 month), if the heart rate DROPS below 60 BPM with signs of poor perfusion (AMS) **BEGIN CHEST COMPRESSIONS** and proceed to cardiac arrest algorithm.

SEDATION FOR TRANSCUTANEOUS PACING

- **ETOMIDATE: 0.15mg/kg IV/IO SLOW PUSH. See MED TOOL.**

If unable to obtain IV/IO access, begin pacing until an acceptable blood pressure is obtained, then administer ETOMIDATE 0.15mg/kg IV/IO. Max single dose 20mg. May repeat 1x in 3 minutes prn.

- Contraindicated in hypotension.
- Monitor for respiratory depression.

4.7 Rapid A-Fib & A-Flutter

INFORMATION

Rapid atrial fibrillation and atrial flutter are defined as **ventricular rates greater than 120 BPM**.

CARDIZEM:

- **Contraindication for wide complex QRS, history of WPW or Sick Sinus Syndrome.**
- Use with caution for patients taking beta blockers.
- Relative contraindication for hypotension.

ADULT

NORMOTENSION SBP > 90 mmHg

CARDIZEM:

1. 10mg IV/IO over 2 minutes. If HR > 120 after 5 minutes, repeat with
2. 15mg IV/IO over 2 minutes.

- IF HYPOTENSION DEVELOPES WITH CARDIZEM:

1. NORMAL SALINE: 1L. Assess lung sounds every 500mL.
2. CALCIUM CHLORIDE: 1gm IV/IO (slow push).

HYPOTENSION SBP< 90mmHg

1. NORMAL SALINE: 1L. Assess lung sounds every 500mL.
2. CALCIUM CHLORIDE: 1gm IV/IO (slow push).
3. If patient improves and SBP>80mmHg then start CARDIZEM: 10mg IV/IO over 2 minutes.
4. If patient does not improve and/or SBP<70mmHg then call Medical Director for orders: 954-494-8866

DO NOT cardiovert A-Fib/A-Flutter.

*** Cardioversion of A-Fib or A-Flutter carries a high risk of embolic stroke.***

PEDIATRIC

CALL FOR ORDERS

4.8 Supraventricular Tachycardia

INFORMATION

SVT is defined as a regular, narrow complex tachycardia of 150 BPM or greater without discernible P-waves and/or flutter waves.

ADULT

12 LEAD ECG

CAUTION:

DO NOT administer Adenosine OR Cardizem to patients with history of WPW

STABLE

- VAGAL MANEUVERS **(The REVERT Trial-Lancet - see next page)**
- ADENOSINE: 12mg rapid IVP, with a simultaneous 10mL Normal Saline flush. **OR**
- CARDIZEM: 10mg IVP over 2 minutes. If HR > 120 after 5 minutes, administer CARDIZEM: 15mg IVP over 2 minutes.
  - Contraindicated for hypotension, wide complex QRS, patients with a history of WPW. SEE DIAGRAM BELOW for example of WPW.
- If hypotension develops after Cardizem administration, NORMAL SALINE: 1L then CALCIUM CHLORIDE : 1gm IV/IO over 2 min.

UNSTABLE (HYPOTENSION, AMS, SHOCK)

- Consider sedation prior to cardioversion.
- ETOMIDATE: 10mg SLOW PUSH IV/IO.
- SYNCHRONIZED CARDIOVERSION

ZOLL: 150J then all subsequent 200J

Lifepack: 300J then all subsequent 360J

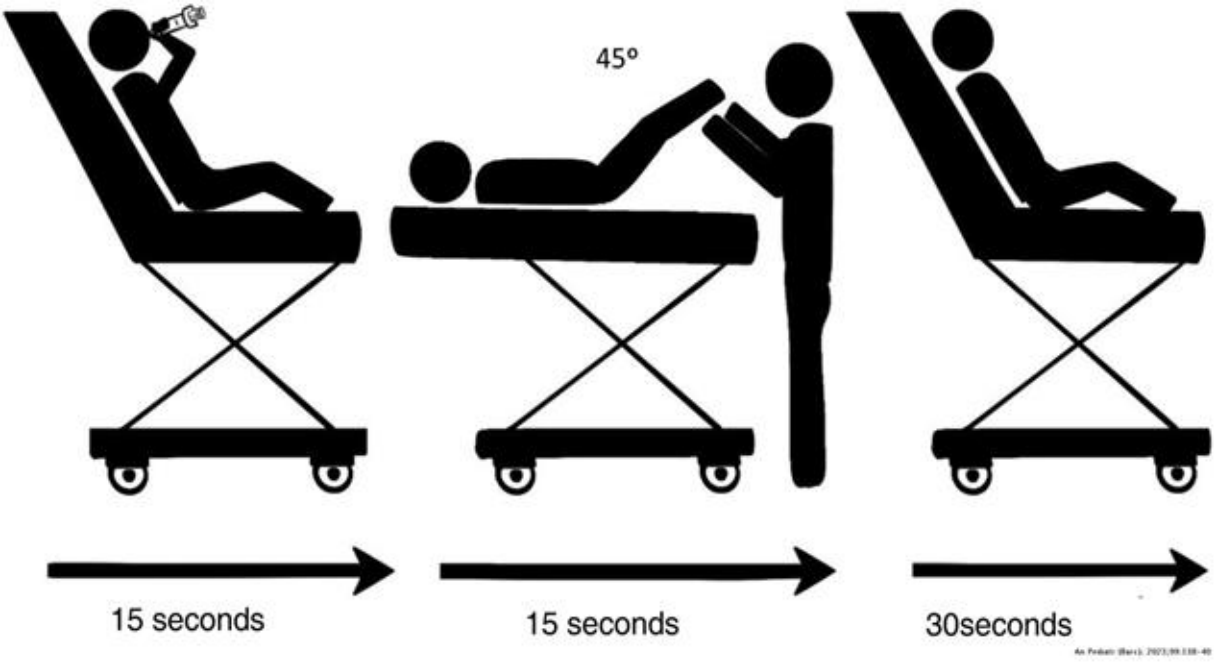
REVERT Trial: Valsalva Maneuverer

This procedure has one of the highest success rate of all vagal maneuvers

STEP 1: Have patient blow into 10cc syringe for 15 seconds while sitting up (this is effort dependent).

STEP 2: After initial 15 seconds, instruct the patient to stop blowing. Have one person at the head of the stretcher lay the back of the stretcher down flat while simultaneously another person at the foot of the stretcher lifts the patient's feet to a 45-degree angle and hold for 15 seconds.

STEP 3: After the patient has been placed flat with their legs lifted for 15 seconds, lower their legs and bring the head of the stretcher back up and monitor for 30 seconds.



4.8 Supraventricular Tachycardia

SVT in children is considered greater than 180 BPM.
SVT in infants is considered greater than 220 BPM.

PEDIATRIC

STABLE

- VAGAL MANEUVERS: For young children, place a bag of ice water on the child's face completely obstructing their nose and mouth for 15 seconds.
- ADENOSINE: 0.1mg/kg RAPID IV/IO, with a simultaneous 10ml flush. Max dose 6mg.
- If no change in one minute, ADENOSINE: 0.2mg/kg RAPID IV/IO, with a simultaneous 10ml flush. Max dose 12mg

UNSTABLE: (AGE-APPROPRIATE HYPOTENSION, AMS, SHOCK)

- Consider sedation prior to cardioversion.
- ETOMIDATE: 0.15mg/kg IV/IO over 15-30 seconds. Max single dose of 10mg. May repeat 1x prn.
- SYNCHRONIZED CARDIOVERSION: **1j/kg. If no response, increase to 2j/kg, then increase to 4J/KG**
- See MED TOOL. For electrical Therapy doses

4.9 WPW

INFORMATION

Wolff-Parkinson-White (WPW) syndrome is a cardiac conduction disorder in which an extra electrical pathway, known as the accessory pathway, allows impulses to bypass the normal AV node conduction. This can lead to episodes of tachyarrhythmias due to rapid conduction between the atria and ventricles. On ECG, WPW is characterized by a short PR interval, a widened QRS complex, and the presence of a delta wave.

CAUTION:
DO NOT administer Adenosine OR Cardizem to patients with history of WPW.

ADULT and PEDIATRICS:

STABLE: MONITOR AND TRANSPORT.

ADULT: (Consider sedation prior to cardioversion)
UNSTABLE: (Hypotension, AMA, Shock)
TREAT WITH CARDIOVERSION:

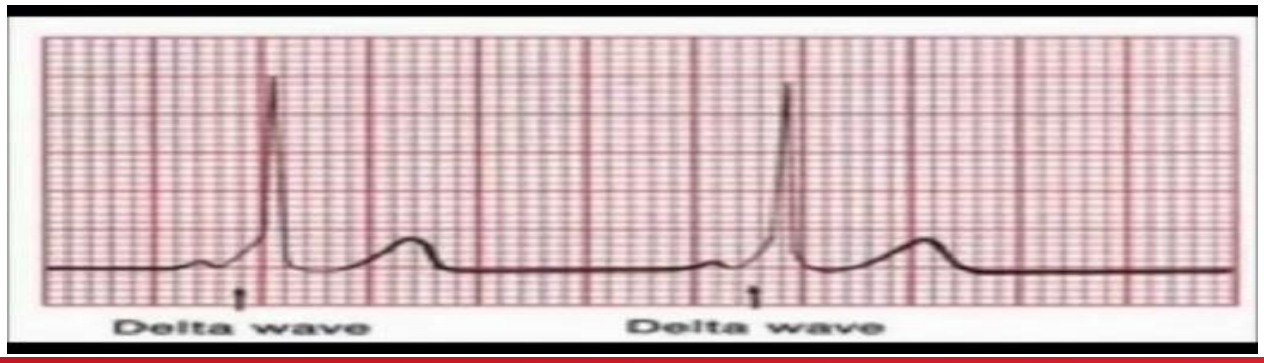
- ETOMIDATE: 10mg IV/IO slow push 15-30 seconds. May repeat once.
- **SYNCHRONIZED CARDIOVERSION WPW with regular or irregular rhythm**

ZOLL: 150J then all subsequent 200J
Lifepack: 300J then all subsequent 360J

PEDIATRIC: (Consider sedation prior to cardioversion)
UNSTABLE: (Hypotension, AMA, Shock)

- ETOMIDATE: 0.15mg/kg IV/IO over 15-30 seconds. Max single dose of 10mg. May repeat once.
- **SYNCHRONIZED CARDIOVERSION: WPW with regular or irregular rhythm**
- **1j/kg. If no response, increase to 2j/kg, then increase to 4J/KG**

WPW: SEE DIAGRAM BELOW



4.10 Really Wide Complex Tachycardia

REALLY WIDE COMPLEX TACHYCARDIA not VT

INFORMATION

Very Wide Complex Tachycardia (WCT) with a QRS greater than 0.200 and a heart rate approx. 100 -120 BPM without discernible P waves is likely HYPERKALEMIA and NOT V-TACH.

ADULT

REALLY WIDE COMPLEX TACYCARDIA STABLE:

- QRS IS greater than 200 ms
- Rate less than 120 bpm

TREATMENT:

- **DO NOT GIVE AMIODARONE!!!**
- CALCIUM CHLORIDE : 1gm IV/IO over 2 min
- SODIUM BICARBONATE: 50mEq, slow IV/IO over 2 minutes.

REALLY WIDE COMPLEX TACYCARDIA UNSTABLE RELATED TO HYPERKALEMIA

- **DO NOT GIVE AMIODARONE!!!**
- CALCIUM CHLORIDE : 1gm IV/IO over 2 min
- FOLLOW HYPERKALEMIA PROTOCOL
- Fluid Bolus:
    - **ADULT:** N.S. 500ml IV/IO. May repeat.
    - **PEDIATRICS:** Fluid boluses are 20ml/kg and may be repeated 2x prn for hypotension; maximum 60ml/kg (for non-trauma related hypotension).
- PUSH DOSE Epi: **If confirmed Not to be VT**
- **If wide complex and uncertain etiology with hypotension and unstable- cardiovert the patient**

4.11 VT-Wide Complex Tachycardia

INFORMATION

Wide complex tachycardia (WCT) has a QRS greater than or equal to 0.12 (0.09 for pediatrics) and a heart rate greater than 120 BPM without discernible P waves.

CAUTION: **DO NOT** cardiovert wide complex tachycardias that are irregularly irregular, as they are most likely to be A-Fib/A-Flutter with an aberrancy and would put the patient at risk for an embolic stroke.

ECG features that favor a diagnosis of Ventricular Tachycardia

- Precordial concordance – all chest leads point in the same direction (either positive OR negative).
- Presence of capture beats or fusion beats.
- Absence of RS in all precordial leads.
- R to S >100ms in one precordial lead.

ECG features that favor a diagnosis of supraventricular origin:

- Normal R wave progression in the chest leads.
- Left bundle branch block or right bundle branch block pattern.
- Only slight widening of the QRS.
- Irregularly-irregular rhythm.

ALL REGULAR WCTs SHOULD BE TREATED AS V-TACH UNLESS PROVEN TO BE SUPRAVENTRICULAR!

4.11 VT-Wide Complex Tachycardia

ADULT

STABLE WCT:

- AMIODARONE INFUSION: 150mg IV/IO (150mg into 100ml of Normal Saline) over 10 minutes. May repeat 1x prn. Administer all 150mg, even if the VT terminates.
- If Amiodarone is not available, then use Lidocaine 100mg IV/IO push. Repeat once after 5 minutes if no effect
- **Amiodarone is contraindicated in pregnancy- Use Lidocaine**

UNSTABLE WCT: (HYPOTENSION)

- DO NOT DELAY CARDIOVERSION TO ESTABLISH IV ACCESS!
- Consider sedation prior to cardioversion.
    - ETOMIDATE: 10mg IV/IO. May repeat 1x prn.
- SYNCHRONIZED CARDIOVERSION:

ZOLL: 150J then all subsequent 200J
Lifepack: 300J then all subsequent 360J

- If unstable WCT fails to convert:
    - AMIODARONE INFUSION: 150mg IV (150mg into 50mL of Normal Saline) infuse over 10 minutes. After the 150mg has been infused if the patient remains unstable, cardiovert with 200j (ZOLL) 360j (LP) every 2 minutes prn.

SPECIAL CONSIDERATIONS AFTER CARDIOVERSION:
For patient's who convert after two cardioversions OR after two or more shocks by their Implantable Cardioverter (ICD) administer:

- AMIODARONE INFUSION: 150mg IV/IO (150mg into 100ml of Normal Saline) over 10 minutes (if Amiodarone has not already been administered).

4.11 VT-Wide Complex Tachycardia

PEDIATRIC: Ventricular Tachycardia

STABLE:

AMIODARONE INFUSION: SEE MED TOOL

Ok To substitute Lidocaine when Amiodarone is not available

*Lidocaine 1 mg/kg IV/IO push (max dose 100 mg). Repeat once after 5 minutes if no effect.

UNSTABLE: (AGE-APPROPRIATE HYPOTENSION)

- DO NOT DELAY CARDIOVERSION TO ESTABLISH IV ACCESS!
- Consider sedation prior to cardioversion.
- ETOMIDATE: 0.15mg/kg IV/IO over 15-30 seconds. Max single dose of 10mg. May repeat once.

SYNCHRONIZED CARDIOVERSION: 1j/kg. If no response, increase to 2j/kg, then increase to 4J/KG

See MED TOOL. For electrical Therapy doses

For patient's who convert after two cardioversions OR after two or more shocks by their Implantable Cardioverter (ICD), administer:

- AMIODARONE INFUSION. See MED TOOL.

4.12 Polymorphic Ventricular Tachycardia (Torsades de Pointes)

INFORMATION

Torsades de Pointes is an uncommon form of V-Tach characterized by a changing in amplitude or “twisting” of the QRS complexes.

ADULT

12 LEAD ECG

STABLE PVT

MAG SULFATE: 2g IV/IO, in 100 mL of Normal Saline - **10 drop set wide open**

UNSTABLE PVT

- **DO NOT DELAY DEFIBRILLATION TO ESTABLISH IV ACCESS!**
- DEFIBRILLATION:

ZOLL: 200J

Lifepack: 300J then all subsequent 360J

- **Magnesium Sulfate: 2gm in 100 ml 10 drop set, wide open**

CAUTION:

DO NOT cardiovert wide complex tachycardias that are irregularly irregular, as they are most likely to be A-Fib/A-Flutter with an aberrancy and would put the patient at risk for an embolic stroke.

4.12 Polymorphic Ventricular Tachycardia

PEDIATRIC

STABLE PVT

MAG SULFATE: 40mg/kg IV/IO in 100ml 10 drop set, wide open. See MED TOOL..

UNSTABLE PVT

- **DO NOT DELAY DEFIBRILLATION TO ESTABLISH IV ACCESS!**
- DEFIBRILLATION: 2J/kg, 4J/kg, 10J/kg: SEE MED TOOL
- MAG SULFATE: 40mg/kg IV/IO in 100ml 10 drop set, wide open. See MED TOOL.

CAUTION:

DO NOT cardiovert wide complex tachycardias that are irregularly irregular, as they are most likely to be A-Fib/A-Flutter with an aberrancy and would put the patient at risk for an embolic stroke.

CARDIAC ARREST

SECTION 5

Section 5

Cardiac Arrest

5.1 Cardiac Arrest Standing Orders

INFORMATION

Consideration should be given to NOT starting resuscitation efforts in these cases.

- **DO NOT RESUSCITATE CRITERIA:**

Decision NOT to Resuscitate: Pt must be in asystole and apneic	
If ONE of the following **conclusive** signs are present	If ALL of the following **presumptive** signs are present
❑ **Lividity/Liver Mortis**	❑ **Known Downtime >20 mins with no CPR**
❑ **Rigor Mortis**	❑ **Asystole**
❑ **Tissue Decomposition**	❑ **Pupils Fixed and Dilated**
❑ **A Valid DNR is in Place (yellow paper)**	❑ **Apneic**
❑ **Injury Incompatible with Life**	❑ **No Hypothermia**

ADULT TERMINATION of RESUSCITATION of MEDICAL CODES:

- **FLFR Only: Consider terminating efforts when a "Battalion Chief" determines appropriate and ALL the following are present.**
- **SCENE AND CREW SAFETY IS UTMOST PRIORITY.**
- **OPERATIONAL SUPPORT AVAILABLE.**
- **NOT A PEDIATRIC PATIENT (AGE >18 Y/O).**
- **Total Resuscitation Time (Asystole or PEA RATE< 20) of at least > 20 minutes.**
- **ETCO2 < 10 mmHg.**
- **Reversible causes have been addressed (H's and T's).**
- **Temperature >90F.**
- **If Shockable rhythm PRESENT AT ANY TIME, DO NOT TERMINATE ON SCENE.**
- **ALL WITNESSED CARDIAC ARREST PATIENTS MUST BE TRANSPORTED.**

5.1 Cardiac Arrest Standing Orders

Transport Destination

- **Adult cardiac arrest** patients will be transported to the closest approved STEMI Center.
- **Pediatric cardiac or respiratory arrest** shall be transported to a **comprehensive pediatric emergency** department regardless of ROSC.

MICCR –MINIMALLY INTERRUPTED CARDIO-CEREBRAL RESUSCITATION

- **ELIMINATE ANY PAUSE IN CHEST COMPRESSIONS.**
- Epinephrine should be given < 3 MINUTES of patient contact.
- APPLY PADS AND DEFIBRILATE < 3 MINUTES - FOR SHOCKABLE RHYTHMS.
- Perform all assignments in Pit Crew fashion and make all efforts to obtain ROSC prior to leaving the scene.
- **REMAIN ON SCENE WORKING CODE FOR MINIMUM OF 20 MINUTES.**

High Performance CPR /PIT CREW

- Perform cycles of 220 compressions in two minutes.
- < 5 second pause for rhythm check and defibrillation. A 10 second pause = 40 second pause to account for blood perfusion to the brain.
- Asynchronous breaths with compressions.
- **Insert SGA with capnography**. Ventilate 1 breath every 6 seconds.
- Apply mechanical CPR device after MINIMUM 3 rounds of 220 compressions. **Use paramedic discretion on very "small or frail patients".**
- **If a significant drop in EtCO2 is seen after mechanical CPR is initiated, discontinue and resume manual compressions.**
- Epi drip immediately: 2mg Epi in 100ml bag, 10 drop set, 1 drop per second. **Never put more than 2mg EPI in any sized fluid bag**.
- Defibrillate after 220 compression **(Use highest energy level).**
- **VF Arrest**: Defibrillate, **Epi Drip only**, Amiodarone 1st dose 300mg IV/IO Push, 2nd dose 150mg IV/IO Push.
- **Torsades:** Defibrillate, Magnesium 2gm IV/IO slow push.
- **PEA/Asystole**: Epinephrine Drip- 2mg (20ml of 1:10,000 or 2ml of 1:1000) mixed in 100ml Normal Saline, 1 drop per second in 10gtts set to deliver over approximately 16 minutes.
- If patient does not convert after ONE defibrillation, give antiarrhythmic.
- **Substitute Lidocaine FOR Amiodarone IF AMIO NOT AVAILABLE.**
- **Lidocaine 1mg/kg IV/IO push (max dose 100 mg). Repeat once after 5 minutes if no effect.**

5.1 Cardiac Arrest Standing Orders

ETCO2

- EtCO2 less than 10mmHg increase effectiveness of compressions.
- EtCO2 above 20mmHg is ideal FOR RESUSCITATION.

REVERSIBLE CAUSES IN CARDIAC ARREST:

H's

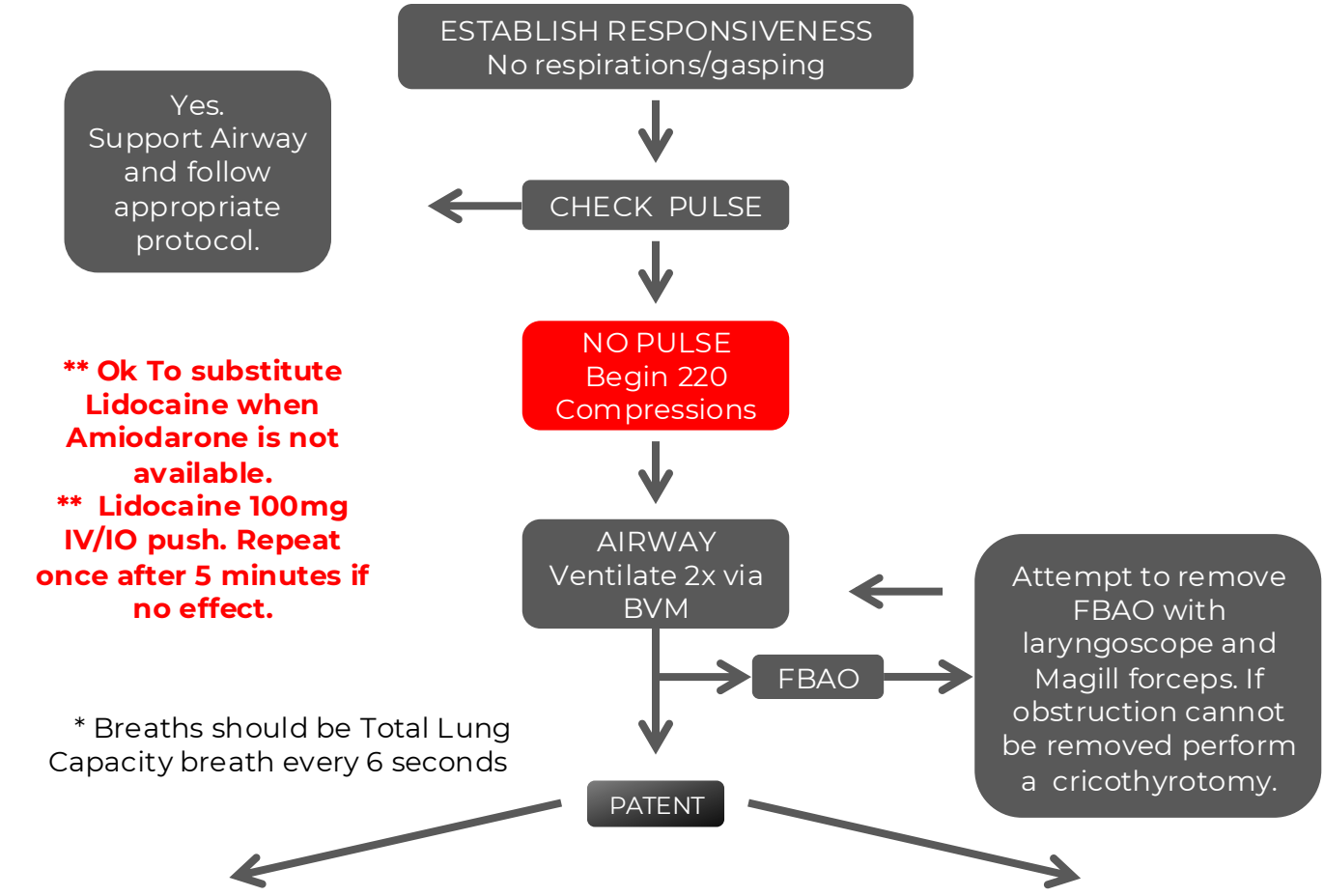
- Hydrogen Ion (Acidosis): **Ventilation**
- Hyperkalemia (Renal Failure): **Follow protocol**
- Hypoglycemia: **D10 Dextrose 250 ml (cardiac arrest)**
- Hypoxia: **Oxygen & Ventilate as per protocol**
- Hypovolemia: **500ml Fluid Bolus**
- Hypothermia: **Warming**

T's

- Tamponade (Cardiac)
- Thrombosis (coronary and pulmonary)
- Trauma
- Toxins or Tablets (OD):
    - Opiates (Narcan)
    - Beta Blockers (Glucagon)
    - Tricyclic Antidepressants (Sodium Bicarb)
    - Calcium Channel Blocker (Calcium Chloride)
- Tension Pneumothorax
    - Chest Needle Decompression
    - Finger Thoracostomy

* When the patient deteriorates into cardiac arrest secondary to opiate overdose the patient primarily needs cardiac resuscitation. When you find a patient in cardiac arrest follow the PIT Crew process and HP CPR.

5.2 Adult Cardiac Arrest



High Performance CPR /PIT CREW

Perform cycles of 220 compressions in two minutes, < 5 second pause for rhythm check, and defibrillate.
Asynchronous breaths with compressions.
1 breath every 6 seconds.
Apply Mechanical Compression after 3 rounds of 220 compressions.

Asystole/PEA

- Epinephrine drip (If EPI drip is not readily available ok to bolus one dose).

Torsades
- Mag Sulfate – 2g IV/IO Slow IVP
- Defibrillate

V-FIB/V-TACH

- Defibrillate (200L Zoll, 360J LP)
- Epinephrine drip only, (no bolus)
- Amiodarone
  1st Dose – 300mg IV/IO
  2nd Dose – 150mg IV/IO

***After 3 unsuccessful defibrillations (Refectory V-Fib / Pulseless V-Tach) , See Dual Sequential Defibrillation (DSD) (ZOLL)**

5.3 Pediatric Cardiac Arrest

SEE MED TOOL FOR MED DOSING AND ELECTRICAL THERAPY JOULES

ESTABLISH RESPONSIVENESS
No respirations/gasping

CHECK PULSE

NO PULSE
Begin 220 Compressions

PIT CREW HP CPR

Ok To substitute Lidocaine when Amiodarone is not available
* Lidocaine 1 mg/KG IV/IO push (max dose 100 mg). Repeat once after 5 minutes if no effect

AIRWAY
Ventilate 2x via BVM

PATENT

Place a SGA and ventilate at a rate of 1 breath every 6 seconds, asynchronized with cycles of 220 compressions.

* Breaths should be Total Lung Capacity breath every 6 seconds

FBAO

Attempt to remove FBAO with laryngoscope and Magill forceps.

High Performance PIT CREW CPR.
Perform cycles of 220 compressions in two minutes, 5 second pause for rhythm check and Defibrillate.

Asystole & PEA

Epinephrine: Weight based dose bolus, then drip- (weight-based dose * 2) in 100 ml bag over 16 min. (Use 1:10,000 for dosing).

Consider reversible causes.

V-FIB/V-TACH

Defib: 2j/kg first, then 4j/kg, then 10J/KG or max on all subsequent.
Epinephrine: Weight based dose bolus, then drip- (weight-based dose * 2) in 100 ml bag over 16 min. (Use 1:10,000 for dosing).
Amiodarone 5mg/kg every 5 min. Max single dose 300mg. May repeat 1x.

Torsades
Mag Sulfate - 40mg/kg IV/IO. Slow IVP. Defibrillate.

5.4 REFRACTORY V-FIB/V-TACH

- Persistent V-FIB/V-TACH (with no transient interruption of V-FIB/V-TACH) that is NOT CONVERTED by standard defibrillation (3 shocks).
- Initially managed by treating any applicable CORRECTABLE CAUSES (H's & T's) and appropriate antiarrhythmic medications: AMIODARONE: 300mg IV/IO, repeat at 150mg IV/IO after 3-5 minutes.
- If standard defibrillation attempts and 450mg of Amiodarone have failed to convert persistent V-FIB/V-TACH, **CHANGING PADS and PLACEMENT after 3 shocks** is recommended AND/OR **DOUBLE SEQUENTIAL DEFIBRILLATION**
- For refractory VF Patients, complete at least three rounds of 220 compressions and connect the mechanical CPR Device and transport to ECMO Facility with continued resuscitation in progress.

ECMO ALERT

INDICATIONS

- AGE <65 Y/O
- WITNESSED
- CPR INITIATED IN < 5 MIN
- SHOCKABLE RHYTHM (V Fib or V Tach)
- **Distance < 20 miles and/or total transport time < 30 minutes**

EXCLUSIONS

- INITIAL RHYTHM ASYSTOLE
- UNKNOWN DOWNTIME
- POOR BASELINE NUEROLOGICAL FUNCTION AT BASELINE OR DNR
- ROSC OBTAINED AND SUSTAINED AFTER 20 minutes C-CPR
- **Distance > 20 miles and/or total transport time > 30 minutes**

PROTOCOL

- CALL ECMO ALERT: 954-265-2633 (CODE)
- CONTINUE WITH MECHANICAL CPR
- **TRANSPORT TO MEMORIAL REGIONAL AS ECMO ALERT**
- **CURRENTLY NO OTHER HOSPITAL IN BROWARD COUNTY CAN DO REFRACTORY VF ECMO ALERT**

5.4 REFRACTORY V-FIB/V-TACH

ZOLL MONITOR ONLY

DOUBLE SEQUENTIAL DEFIBRILLATION

Emphasis is placed on minimizing interruptions in compressions during this procedure

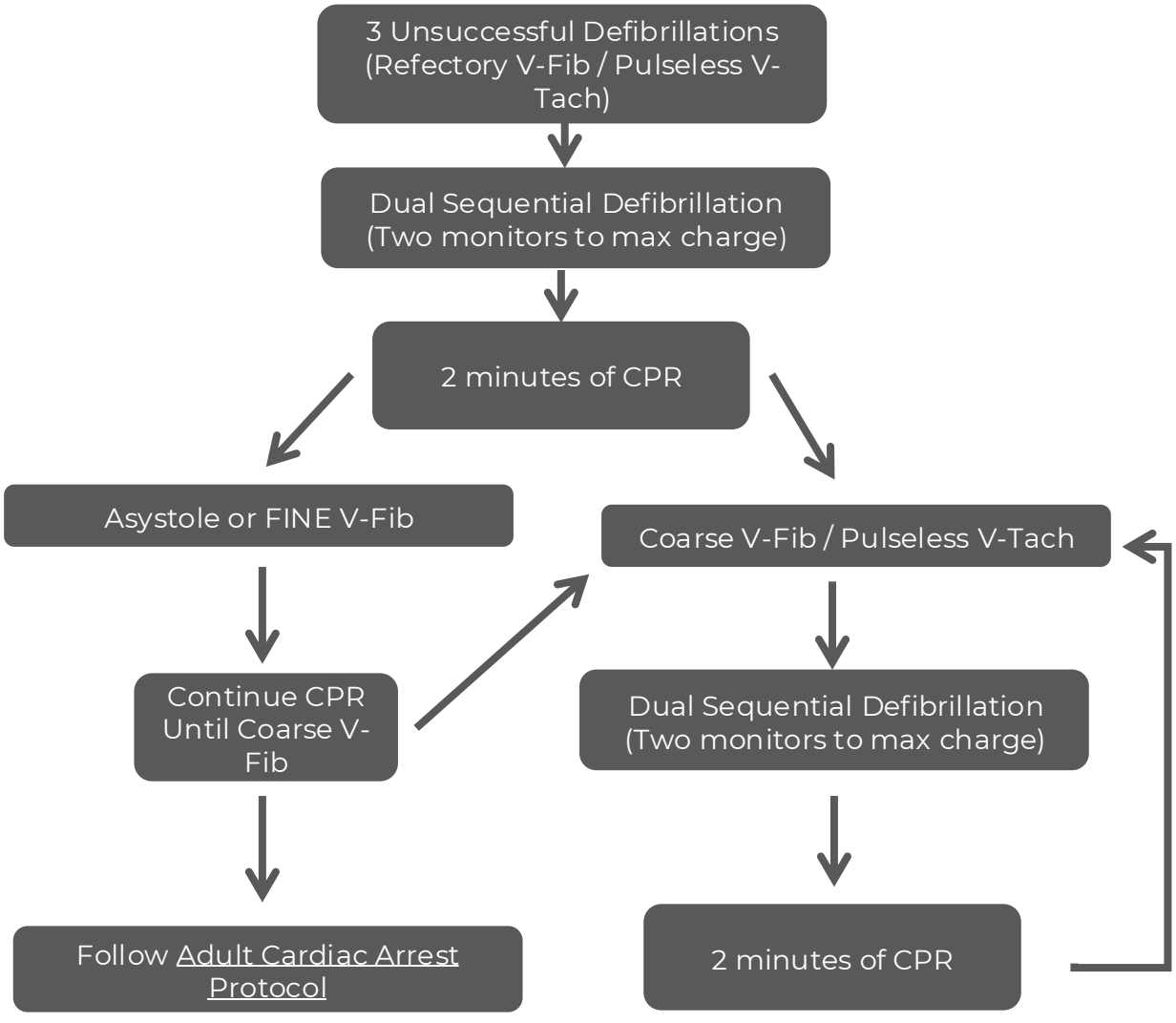
Apply an additional set of external defibrillations pads

Verify both monitors/defibrillators are attached and confirm V-FIB/V-TACH rhythm.

Charge both monitors to the maximum energy setting and ensure all team members are clear of the patient.

Defibrillate by pressing both shock button as synchronously as possible.

Follow defibrillation with immediate chest compressions.



5.5 Cardiac Arrest Special Considerations

INFORMATION

The below treatments are in additions to standard therapy.

ADULT

HYPOGLYCEMIC PATIENTS
Administer D10: 250ml IV/IO.

HYPERKALEMIA
CALCIUM CHLORIDE: 1gm, SLOW IV/IO over 2 minutes.
Once intubated, ALBUTEROL: 10mg via nebulizer, 4 * 2.5mg continuous treatments
SODIUM BICARBONATE: 50mEq IV/IO, administered slow over 2 minutes.

CPR INDUCED CONSCIOUSNESS
Defined as patients without a spontaneous heartbeat who gain consciousness while receiving CPR. **Etomidate 10mg SLOW PUSH IV/IO. May repeat x1 prn.**

AGITATED DELIRIUM
SODIUM BICARBONATE: 50mEq IV/IO, amp administered slow over 2 minutes.
NS Maximum of 1L. Assess lung sounds every 500ml.

DROWNING
Immediate VENTILATION. These patients should have an ETT inserted using the S.A.L.A.D. technique if necessary.

ELECTROCUTION / LIGHTNING STRIKE
Immediate DEFIBRILLATION as applicable.
Consider Spinal Motion Restriction.

THIRD TRIMESTER CARDIAC ARREST
Manually DISPLACE the uterus to the left, rather than tilting the patient to the left.

HANGING
Consider spinal motion restriction.
Transport to closest facility.

5.6 Post Resuscitation

INFORMATION

SEE POST RESUSCITATION CHECKLIST

ADULT

POST ARREST CHECKLIST

- POST ROSC should be managed in the order of:
  - RATE (reference specific protocol)
  - RHYTHM (reference specific protocol)
  - BLOOD PRESSURE (Goal is to maintain a SBP of 100mmHg)
  - 12-LEAD
- NORMAL SALINE 1L bolus if the patient is hypotensive

POST ROSC HYPOTENSION

- DECREASE EPINEPHRINE DRIP TO 1 DROP EVERY 4 SECONDS (30mcg/min) **OR**
- Push Dose Epinephrine and fluid bolus for post ROSC hypotension (20mcg/min)
- **Ideal Post ROSC MAP = 65-70**

POST V-FIB/V-TACH CONSIDERATIONS

- Administer AMIODARONE INFUSION: (150mg into 100mL of Normal Saline, infused over 10 minutes) **for patients who converted after AMIODIRONE BOLUS AND DEFIBRILLATION.**
- If patient converts after initial defibrillation, no antiarrhythmic should be given.

POST TORSADES CONSIDERATIONS

Administer MAG SULFATE: **Magnesium Sulfate: 2gm in 100 ml 10 drop set, wide open**

TRANSPORT OF CARDIAC ARREST

All patients in cardiac arrest will be transported to a STEMI facility.

All other patients will be transported to the closest appropriate facility excluding free standing ED's.

5.6 Post Resuscitation

PEDIATRIC

- Maintain adequate oxygenation and ventilation.
- Patients with a ROSC should be managed in the order of:

RATE

- Provide Oxygenation and Ventilation if heart rate is less than 60 BPM.
- Begin CPR If heart rate remains less than 60 BPM with S/S of poor perfusion (Altered Mental Status) despite oxygenation and ventilation for 60 seconds (30 seconds for a neonate).
- Push Dose EPINEPHRINE: If after one minute of CPR the heart rate remains less than 60 BPM.

RHYTHM

- Reference specific protocol.

POST ROSC HYPOTENSION

- DECREASE EPINEPHRINE DRIP TO 1 DROP EVERY 4 SECONDS (1.5ml/min) EXAMPLE AT THIS RATE A 2Y/O WOULD GET APPROXIMATELY 5mcg/min, 9Y/O ABOUT 9mcg/min.
- **OR**
- Push Dose Epinephrine and fluid bolus for post ROSC hypotension (20mcg/min)
- Minimum Pediatric Systolic Blood Pressure Values
  - Neonates: 60mmHg
  - Infants: 70mmHg
  - Children 1-10 years old: 70 + (age in years x 2) mmHg
  - Children greater than 10 years old: 90mmHg

NORMAL SALINE

- Fluid boluses are 20ml/kg and may be repeated 2x prn for hypotension; maximum 60ml/kg (for non-trauma related hypotension).
- Assess lung sounds and blood pressure often.

5.7 Pit Crew CPR

PURPOSE

- The primary goal of “Pit Crew CPR” is to improve patient outcomes by defining and standardizing roles and responsibilities in adult and pediatric cardiac arrest.
- The Pit Crew approach will ensure that necessary tasks are prioritized and not overlooked during treatment. It also defines a “Lead Medic” who will function as the team leader and coordinate the overall care of the patient.
- The Pit Crew model is scalable based on the number of personnel on scene at a given time. This is based on typical unit staffing.

GENERAL GUIDELINES

The following guidelines do not apply to cases where a patient is expected to be pronounced dead without resuscitation efforts. However, if there is a delay in making this decision then resuscitation shall begin until such determination can be made.

- Initial priorities of first arriving personnel should be addressing the CABs with high-quality CPR and early defibrillation, followed by timely ALS care.
- Once assigned a designated role, continue with that role until all associated tasks are complete or you are relieved/reassigned.
- Unless the patient is in a hazardous or cramped condition that would hinder safe and appropriate care, resuscitation efforts should be begin as soon as the patient is encountered. If such conditions are encountered, quickly move the patient to the closest safe area that provides enough room for the crew to efficiently work.
- **Unless a traumatic cardiac arrest, crews are expected to remain on scene for approximately 20 minutes to ensure all interventions and medications are delivered, giving the best chance of ROSC.**
- It may be helpful to stage equipment in the same location on every cardiac arrest. The crew and equipment positions in the following graphics attempt to mimic the seating and equipment positions inside a rescue.

5.7 Pit Crew CPR

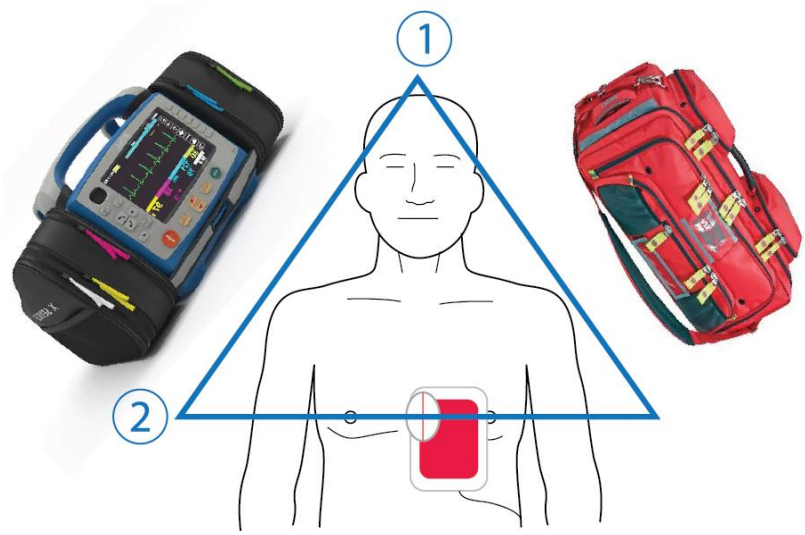
2 PERSON CREW

Position 1

- ❑ Code Management
- ❑ BVM, I-Gel, EtCO2, Suction

Position 2

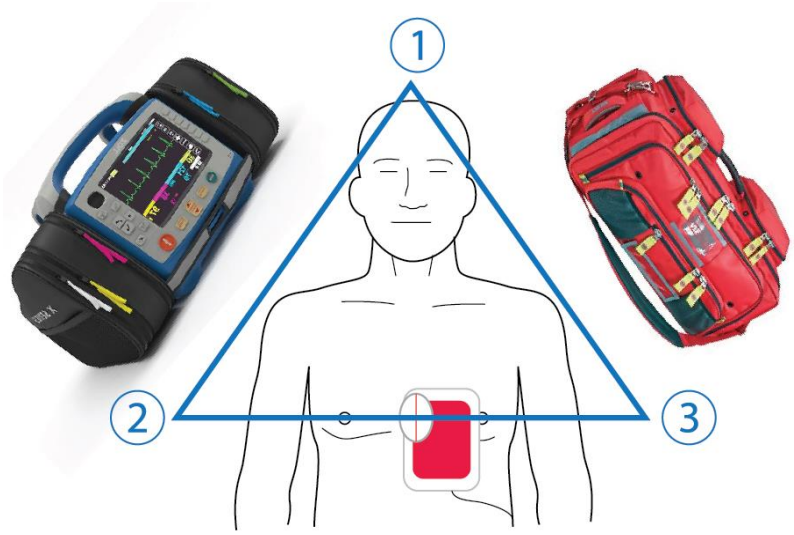
- ❑ Connect Monitor
- ❑ CPR (Continuous)
- ❑ Defibrillation After 2mins CPR



Note:
Mechanical CPR to be placed only after 3 cycles of CPR (6 mins) once additional crew members arrive.

5.7 Pit Crew CPR

3 PERSON CREW



Position 1

- ❑ Code Management
- ❑ BVM, I-Gel, EtCO2, Suction

Position 2

- ❑ Connect Monitor
- ❑ Prepare EZ-IO
- ❑ Defibrillation After 2mins CPR
- ❑ Resume CPR (2 mins)
- ❑ Start Epi Drip

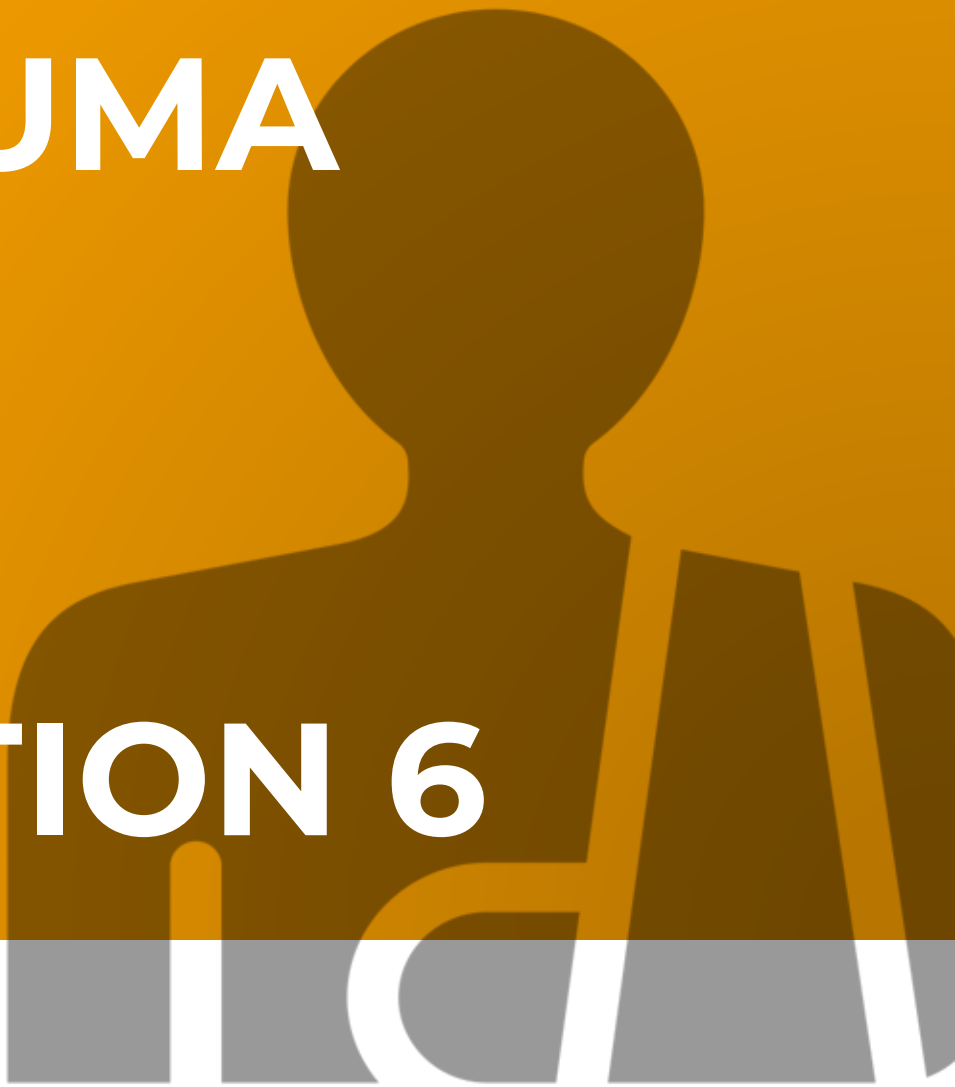
Position 3

- ❑ CPR (2 mins)
- ❑ Establish IO
- ❑ Epi 1:10,000 bolus (1ST)
- ❑ Resume CPR (2 mins)

Note:
Mechanical Compression to be placed only after 3 cycles of CPR (6 mins) **once additional crew members arrive.**

TRAUMA

SECTION 6



Section 6

Trauma

Trauma

6.1 General Trauma Guidelines

INFORMATION

SCENE MANAGEMENT

- START or JumpStart (ages 1-8) Triage System to triage patients.
- LEVEL ONE TRAUMA patients shall be transported to closest Trauma Center.
- On-scene times for LEVEL ONE TRAUMA patients should be **10 minutes** or less. On-scene times greater than 10 minutes shall have the reason for the delay documented in the ePCR report.
- **IV attempts shall not delay transport.** IV and IO are appropriate.
- Unless otherwise noted, IV fluids should be withheld to allow permissive hypotension unless patients' mental status deteriorates and SBP less than 80.
- A minimum of 2 paramedics LEVEL ONE TRAUMA patient in the back of the rescue, provided it does not cause a significant delay in transport.
- The only things that can cause the treating paramedic to interrupt the primary survey are an unsafe scene or airway obstruction. Respiratory arrest, dyspnea, or bleeding control should be delegated to a crew member so that the treating paramedic does not have to interrupt the primary survey.

MCI LEVEL

- LEVEL I = 5-10
- LEVEL II = 11-20
- LEVEL III = 21-100
- LEVEL IV = 101-1000
- LEVEL V = >1000

6.2 START Triage (Adult)

INTRODUCTION

This procedure will be based on the Simple Triage and Rapid Treatment or START method. The START method of triage is designed to assess a large number of victims rapidly and can be used by personnel with limited medical training effectively.

PROCEDURE

- Initial Triage (Using the START Method)
  - Locate and remove all of the walking wounded into one location away from the incident, if possible. Assign someone to keep them together (eg. PD, FD, or initially a bystander) and notify COMMAND of their location. Do not forget these victims. Someone should triage them as soon as possible.
  - Begin assessing all non-ambulatory victims where they lay, if possible. Each victim should be triaged in 60 seconds or less. Remember the pneumonic RPM (Respirations, Perfusion, and Mental Status).
  - Utilize the Triage Ribbons (color-coded plastic strips). One should be tied to an upper extremity in a VISIBLE location (wrist if possible).
    - ✓ **RED** – Immediate.
    - ✓ **Yellow** – Delayed.
    - ✓ **Green** – Ambulatory (minor).
    - ✓ **Black** – Deceased (non-salvageable).
    - ✓ **Blue** – HAZMAT Exposure
  - Independent decisions should be made for each victim. Do not base triage decisions on the perception of too many REDs, not enough GREENs, etc.
  - If borderline decisions are encountered, always triage to the most urgent priority (eg. GREEN/YELLOW patient, tag YELLOW).
  - The first assessment that produces a RED tag stops further assessment.
  - Only correction of life-threatening problems (e.g. airway obstruction or severe hemorrhage) should be managed during triage.

6.2 START Triage (Adult)

- Secondary Triage.
  - Will be performed on all victims during the Treatment Phase. If a victim is identified in the initial triage phase as a RED and transport is available, do not delay transport to perform a secondary assessment.
  - Utilize the Triage Tags (METTAGs) and attempt to assess for and complete all information required on the tag (time permitting). Affix the tag to the victim and remove ribbon.
  - The Triage priority determined in the Treatment Phase should be the priority used for transport.

- The Trauma Transport Protocol (Special Treatment Protocol 1.11) will be used for trauma patients during the secondary triage at the treatment area and before the transport decision is made. Every effort will be made to transport trauma alert and high index trauma patients to the appropriate trauma center.

6.2 START Triage

START TRIAGE

1) Assess RESPIRATIONS:
    - If respiratory rate is 30/min. or less go to PERFUSION assessment.
    - If respiratory rate is over 30/min, tag RED.
    - If victim is not breathing, **open the airway**, remove obstructions, if seen, and assess for respirations.
    - If victim is still not breathing, tag BLACK.
    - If victim is now breathing, go to PERFUSION assessment.

2) Assess PERFUSION:
    - Performed by palpating a radial pulse or assessing capillary refill (CR) time.
    - If radial pulse is present or CR is 2 seconds or less, go to MENTAL STATUS assessment.
    - No radial pulse or CR is greater than 2 seconds, tag RED.
    - NOTE: In addition, any major external bleeding should also be controlled.

3) Assess MENTAL STATUS:
    - Assess the victim's ability to follow simple commands and their orientation to time, place, and person.
    - If the victim follows commands, oriented X3, tag GREEN. NOTE: Depending on injuries (e.g. burns, fractures, bleeding) it may be necessary to tag YELLOW.
    - If the victim does not follow commands, is unconscious, or appears disoriented, tag as RED.

6.2 Jump START Triage (PEDS)

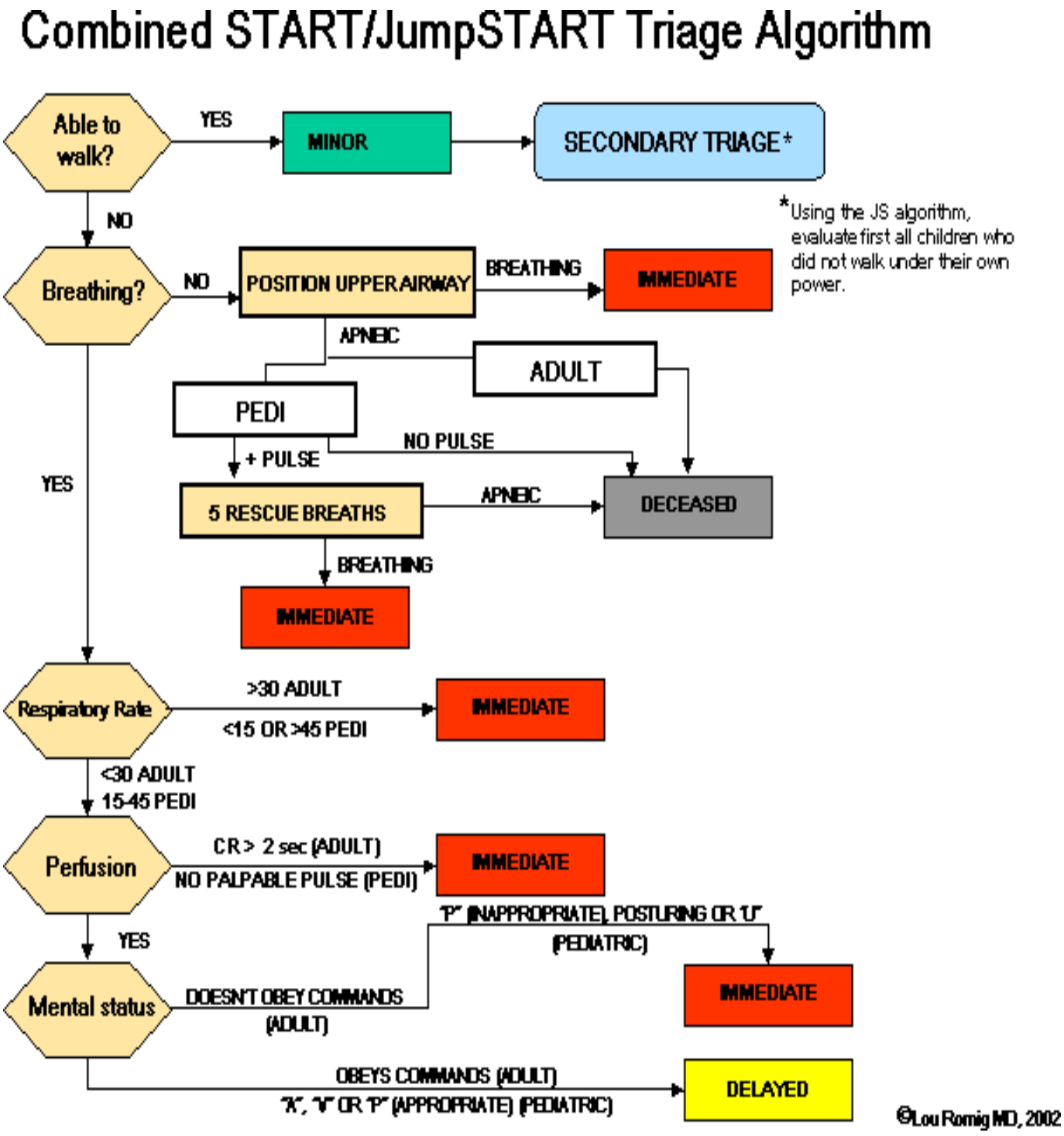
JUMP START TRIAGE (AGE 1-8)

1) Assess **RESPIRATIONS**:
   - If respiratory rate is in between 15/min and 45/min, go to PERFUSION assessment.
   - If respiratory rate is less than 15/min or over 45/min, tag RED.
   - If victim is not breathing, **open the airway, remove obstructions, if seen, give 5 rescue breaths, and assess for respirations.**
   - If victim is still not breathing, tag BLACK.
   - If victim is now breathing, go to PERFUSION assessment.

2) Assess **PERFUSION**:
   - Check for palpable pulse.
   - If pulse is present, go to MENTAL STATUS assessment
   - If no pulse is present, tag RED.
   - NOTE: In addition, any major external bleeding should be also be controlled.

3) Assess **MENTAL STATUS**:
   - Assess by checking pediatric pain stimulus response.
   - If victim responds to “painful stimuli” inappropriately, is posturing, or unresponsive, tag RED.
   - If victim response is within normal limits, tag YELLOW.

6.2 START Triage



6.2 Start Triage (Adult)

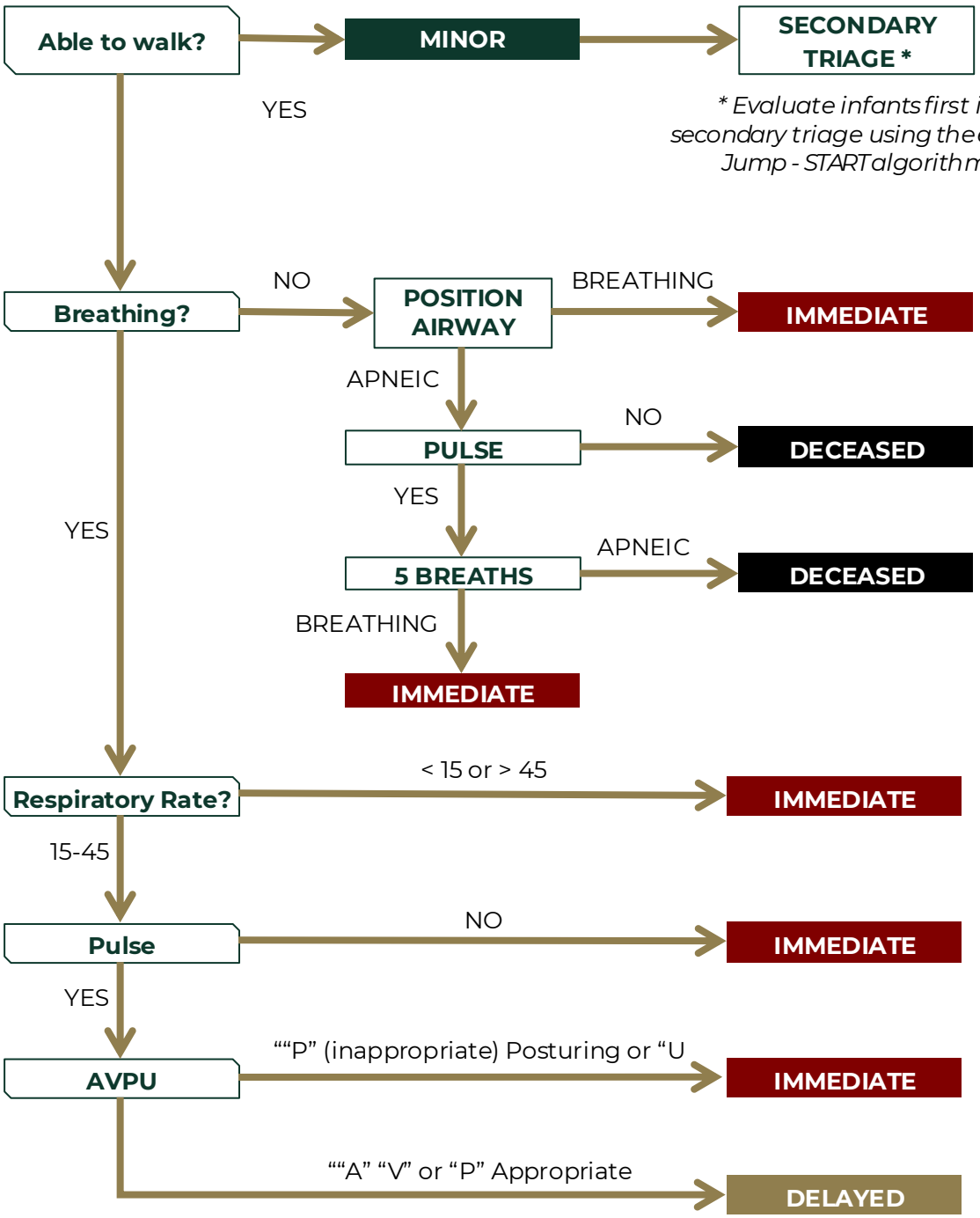
Move the walking wounded	MINOR
No respirations after head tilt	DEAD
Respirations > 30/min.	IMMEDIATE
Perfusion No radial pulse Cap refill > 2 sec (Control Bleeding)	IMMEDIATE
Mental Status Unable to follow simple commands	IMMEDIATE
Otherwise	DELAYED

CONTAMINATED

The goal of the START program is to provide the "greatest good for the greatest number of patients."

Asystole is often the most common rhythm following an electrical insult. Perform CPR on all electrocution/lightning strike victims in cardiac arrest.

6.3 Jump Start Triage (Ages 1-8)



6.4 Trauma Telemetry Report

Broward County Unified Trauma Telemetry Report

Rescue Unit #:_____ Trauma Alert Type: Adult _____ OB >20weeks_____ Pediatric ≤15 YOA_____
Mode of Transportation: Ground_____ Air_____ ETA_____
Meets Color Criteria: Red_____ Blue_____ (1 red or 2 blue = Trauma Alert)
Meets Level 2 Criteria: _____

Adult Trauma Alert Criteria		
	Red Criteria (1 Required)	**Blue Criteria (2 Required)**
Airway	_____ Active airway assistance required	_____ Sustained respiratory rate ≥ 30
Circulation	_____ No radial pulse with sustained HR ≥ 120 or BP < 90 systolic	_____ Sustained HR ≥ 120
Fractures	_____ Multiple long bone FX sites	_____ Single long bone FX sites due to MVA or single long bone FX site due to fall ≥ 10 feet.
Cutaneous	_____ 2° or 3° burns > 15% BSA, electrical burns (high voltage/direct lightning) regardless of surface area, amputation proximal to wrist or ankle, penetrating injury to head, neck, or torso	_____ Major degloving, flap avulsion > 5 inches, or GSW to extremities
Best Motor Response (BMR)	_____ BMR ≤ 4, or exhibits presence of paralysis, suspicion of spinal cord injury, or loss of sensation	_____ BMR = 5
Mechanism of Injury		_____ Ejection from vehicle (excluding open vehicles) or deformed steering wheel
Age		_____ Anticoagulated Older Adult >55
Misc.	_____ Paramedic Judgment (Comment Below) _____ Glasgow Coma Score ≤ 12	_____ Blunt Abdominal Injury
Pediatric Trauma Alert Criteria		
	Red Criteria (1 Required)	**Blue Criteria (2 Required)**
Airway	_____ Assisted or Intubated	
Consciousness	_____ Altered mental status, paralysis, suspected spinal cord injury, or loss of sensation	_____ Amnesia or reliable HX of LOC
Circulation	_____ Faint or non-palpable carotid or femoral pulses, systolic BP < 50	_____ Carotid or femoral pulses palpable; no pedal pulses or systolic BP < 90
Fracture	_____ Any open long bone FX or multiple FX sites or multiple dislocations	_____ Single closed long bone FX site
Cutaneous	_____ Major soft tissue disruption, amputation proximal to wrist or ankle, 2° or 3° burns to 10% BSA, electrical burns (high voltage/direct lightning) regardless of surface area, penetrating injury to head, neck, or torso	
Misc.	_____ Paramedic Judgment	_____ Blunt Abdominal Injury
Size		_____ Red, Purple <11kg (<24 lbs.)

Level 2 Trauma Alert Criteria (Adult and Pediatric)		
_____ Falls > 12ft. Adult _____ Falls > 6ft. Pediatric	_____ Death of an occupant in the same passenger compartment	_____Any height fall adult >55 on anticoagulant/antiplatelet
_____ Extrication time > 15min.	_____ Major Intrusion into passenger compartment	_____ Paramedic Judgement
_____ Rollover motor-vehicle crash	_____ Separation from Bicycle	
_____ Burns involving the face, eyes, ears, hands, feet, or perineum that may result in functional or cosmetic impairment	_____ Pedestrian struck by vehicle not meeting the preceding automatic criteria (i.e. Adults < 15 mph and pediatrics < 5 mph)	

Paramedic Judgement Comments: _____

6.4 Trauma Telemetry Report

Broward County Unified Trauma Telemetry Report

Patient Evaluation

Age:_____ Sex: M or F Glasgow Coma Score (Adult): _____
Mechanism of Injury:_____

Initial Vital Signs: BP:_____/_____ Pulse: _____ Resp. Rate: _____ Skin: _____ Color: _____
Assessed Injuries:

Treatment Interventions: (Check all that apply)
☐ Oxygen ☐ C-Collar ☐ IV x _____ ☐ BVM ☐ Backboard ☐ ETT ☐ CPR

☐ Drug Therapy:
_____

☐ Other:
_____

Current Vital Signs: BP_____Pulse_____ Resp. Rate _____ Glasgow Coma Score _____
Additional Information: (If time permits)

Name:_____ Date of Birth: _____

Address:
_____

Past Medical History:
_____

Medications:
_____

Allergies:
_____

Glasgow Coma Score

Best Eye Response (4)
1 – No eye opening
2 – Eye opening to pain
3 – Eye opening to verbal command
4 – Eyes open spontaneously

Best Verbal Response (5)
1 – No verbal response
2 – Incomprehensible sounds
3 – Inappropriate words
4 – Confused
5 – Orientated

Best Motor Response (6)
1 - No motor response
2 – Extension to pain
3 – Flexion to pain
4 – Withdrawal from pain
5 – Localizing Pain
6 – Obeys Commands

Eye = _____ Verbal = _____ Motor = _____

Total E ( ) V (_) M ( ) = GCS _____

Note the Glasgow Coma Scale measures cognitive ability. Therefore, if injury (chronic or acute) has caused paraplegia or quadriplegia, alternate methods of assessing motor response must be used (e.g., ability to blink eyes = obeys commands).

6.5 Pediatric Trauma

PEDIATRIC TRAUMA SCORECARD METHODOLOGY

(Pediatric patients are those age 15 or younger)

Pediatric Trauma Alert patients will be transported to the nearest appropriate Pediatric Trauma Center.

1. The EMS personnel shall assess all pediatric trauma patients using the following "RED" criteria and if any of the following conditions are identified, the patient shall be considered a pediatric trauma alert patient:

- Airway: Active ventilation assistance required due to injury(ies) causing ineffective or labored breathing beyond the administration of oxygen.
- Consciousness: Patient exhibits an altered mental status that includes drowsiness; lethargy; inability to follow commands; unresponsiveness to voice or painful stimuli; or suspicion of a spinal cord injury with/without the presence of paralysis or loss of sensation.
- Circulation: Faint or non-palpable carotid or femoral pulse or the patient has a systolic blood pressure of less than 50 mmHg.
- Fracture: Evidence of an open long bone (humerus, radius/ulna, femur, or tibia/fibula) fracture or there are multiple fracture sites or multiple dislocations (except for isolated wrist or ankle fractures or dislocations).
- Cutaneous: Major soft tissue disruption, including major de-gloving injury; or major flap avulsions; or 2nd or 3rd degree burns to 10 percent or more of the total body surface area; electrical burns (high voltage/direct lightning) regardless of surface area calculations; or amputation proximal to the wrist or ankle; or any penetrating injury to the head, neck or torso (excluding superficial wounds where the depth of the wound can be determined).

6.5 Pediatric Trauma

2. In addition to the criteria listed above in (1) of this section, a trauma alert shall be called when "Blue" criteria is identified from any two of the components included below:

- Consciousness: Exhibits symptoms of amnesia, or there is loss of consciousness.
- Circulation: Carotid or femoral pulse is palpable, but the radial or pedal pulses are not palpable, or the systolic blood pressure is less than 100 mmHg.
- Fracture: Reveals signs or symptoms of a single closed long bone fracture. Long bone fractures do not include isolated wrist or ankle fractures.
- Size: Pediatric trauma patients weighing 11 kilograms or less, or the body length is equivalent to this weight on a pediatric length and weight emergency tape (the equivalent of 33 inches in measurement or less).

3. In the event none of the above criteria is identified in the assessment of the pediatric patient, the paramedic can call a Trauma Alert if, in his or her judgment, the trauma patient's condition warrants such action. Where paramedic judgment is used as the basis for calling a trauma alert, it shall be documented as required in the 64J-1.014 F.A.C., on the patient care report and the County Unified Trauma Telemetry Report (CUTT) (see 1.10.1).

6.6 Level II Trauma

ADULT AND PEDIATRIC

Non-trauma alert patients that present with a mechanism of injury suggestive of a significant injury or in the paramedic's judgment present with a non-significant injury and/or taking an anti-coagulant (i.e., Coumadin) or anti-platelet (i.e., Plavix), the EMS unit will be required to triage and transport this patient to the nearest appropriate Trauma Center. HIGH INDEX Trauma criteria are as follows:

ONE OF THE FOLLOWING:

- Falls > 12 feet (adults); falls > 6 feet (pediatrics)
- Extrication time > 15 minutes
- Rollover
- Death of occupant in the same passenger compartment
- Major intrusion into passenger compartment
- SEPARATION from a bicycle
- FALL FROM ANY HEIGHT IF ANTICOAGULATED OR ANTIPLATELET (ADULT OVER 55)
- Paramedic judgment.

ANTIPLATELET (NOT ASPIRIN)

- PLAVIX (Clopidogrel)
- BRILINTA (Ticagrelor)
- EFFIENT (Prasugrel)

ANTICOAGULATION

- COUMADIN (Warfarin)
- PRADAXA (Dabigatran)
- XARELTO (Rivaroxaban)
- ELIQUIS (Apixaban)
- LOVENOX (Enoxaparin)

6.7 Trauma Scorecards

INFORMATION

TRAUMA CRITERIA TO ASSIST IN MAKING PARAMEDIC JUDGEMENT FOR LEVEL II

Patients who do not meet “Trauma Alert” criteria, but meet one (1) or more of the following criteria may be at risk of serious injury and special consideration should be given to them, including bypass of a local hospital and transport to the nearest Trauma Center:

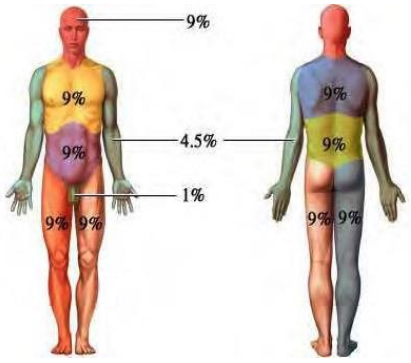
THESE ARE ONLY FOR CONSIDERATION OF POTENTIAL PATIENTS NEEDING LEVEL II ALERTS

LEVEL II ALERTS

- Blunt head, chest or abdominal trauma on blood thinners with high risk of bleeding or history of a bleeding disorder.
- 65 years or older sustaining blunt trauma exhibiting minimal symptoms or borderline criteria.
- 65 years or older with SBP <110 mmHg.
- MVC > 20 mph, with seatbelt marks on the torso.
- MVC with partial ejection from an automobile.
- End stage renal disease on dialysis.
- OB Patient: >20 weeks who does not meet other trauma criteria consider a LEVEL II as Paramedic judgment.

6.8 Burn Injuries

INFORMATION



ADULT

- Stop the burning process by irrigating with copious amounts of room temperature water or normal saline for 1-2 minutes.
- **Never apply ice directly to burns.**
- Do not attempt to remove tar, clothing, etc., if adhered to the skin.
- Monitor the airway closely and consider early intubation for patients with respiratory involvement: hoarse voice, singed nasal hairs, carbonaceous sputum in the nose or mouth, stridor or facial burns.
- Remove jewelry and watches from burned area.
- Consider Pain Management Protocol.
- Consider CO and/or Cyanide Poisoning. **Administer CYONKIT.**

1st & 2nd DEGREE BURNS LESS THAN 15% BSA or
3rd DEGREE BURNS LESS THAN 5% BSA

- Apply a dry sterile dressing or BURN SHEET.

Consider the Palmar Method. The patient's hand with fingers is approximately 1% BSA.

2nd DEGREE BURNS GREATER THAN 15% BSA or
3rd DEGREE BURNS GREATER THAN 5% BSA

- Apply a dry sterile burn sheet.
- NORMAL SALINE: 1L. Assess lung sounds and BP every 500ml.

ELECTRICAL BURNS

- Treat associated burns as indicated.
- If patient is in cardiac arrest, follow appropriate protocol.

CHEMICAL BURNS

- Irrigate liquid chemical burns with copious amounts of water or sterile saline. Brush off dry chemicals prior to irrigation.
- Remove patient's clothing and ensure that the patient is decontaminated prior to transport, in order to avoid contaminating personnel and equipment. Personnel shall wear protective clothing and/or respiratory protection as needed when removing chemicals.

6.8 Burn Injuries

PEDIATRIC

- Stop the burning process by irrigating with copious amounts of room temperature water or normal saline.
- Do not attempt to remove tar, clothing, etc., if adhered to the skin.
- INTUBATE EARLY FOR RESPIRATORY INVOLVEMENT
  - Tripod position/drooling, singed nasal hairs, hoarse voice/stridor and carbonaceous sputum are all indications for early airway intervention. Consider RSI (it may be necessary to use an ETT 0.5 -1.0 mm smaller to accommodate for swelling).
- Consider Pain Management Protocol.
- Consider CO and/or Cyanide Poisoning. **Administer CYNOKIT.**

1st and 2nd DEGREE LESS THAN 15% of BSA or 3rd DEGREE BURNS LESS THAN 5% BSA

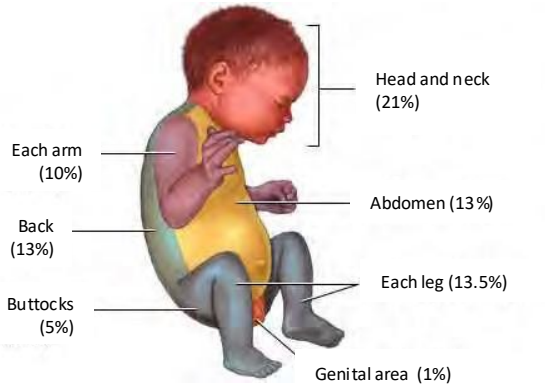
- Apply a dry sterile dressing.
- Do not apply ice directly to burns.

2nd DEGREE BURNS GREATER THAN 15% BSA or 3rd DEGREE BURNS GREATER THAN 5% BSA

- Apply a dry sterile burn sheet and keep the patient warm.
- NORMAL SALINE: 20ml/kg bolus.

ELECTRICAL

- Treat associated burns as indicated.
- If patient is in cardiac arrest, follow appropriate protocol.



Consider the Palmar Method. The patient's hand with fingers is approximately 1% BSA.

6.9 Head Injuries

INFORMATION

Assess GCS, pupillary response to light, and BGL.

ADULT

MANAGEMENT

- Head injury patients are at increased risk for vomiting and seizures.
- Ensure adequate oxygenation and ventilation.
- Administer high flow oxygen 15L NRB.
- Ventilatory rate for adults: 10 breaths/min, for patients with no evidence of herniation.
- **Head injury patients with a GCS of 8 or less should be INTUBATED OR OTHER ADVANCED AIRWAY.**
- CERVICAL Spinal Motion Restriction. If patient is combative, administer KETAMINE as per the "Chemical Restraint" Protocol AND **AGGRESSIVELY MANAGE AIRWAY.**
- Bleeding from scalp lacerations can usually be controlled by applying a pressure dressing or by applying direct pressure along the wound edges.
    - Pressure dressings should not be applied to depressed or open skull fractures unless there is significant hemorrhage present, as this can cause an increase in ICP.

6.9 Head Injuries

FLUID RESUSCITATION

Titrate fluids to maintain SBP of 110-120 should be maintained for patients with a severe head injury (GCS of 8 or less), even if the patient has associated penetrating trauma with hemorrhage.

INCREASED ICP AND/OR HERNIATION

Signs of increased ICP and herniation include:

- A decline in the GCS of two or more points.
- Development of a sluggish or nonreactive pupil.
- Paralysis or weakness on one side of the body.
- Cushing's Triad: A widening pulse pressure (increasing systolic, decreasing diastolic), change in respiratory pattern (irregular respirations), and bradycardia.
- **MILD HYPERVENTILATION: Maintain EtCO2 at 35 mmHg for increased ICP.**
- Consider Advanced Airway Management.
- Head of Bed to 30 Degrees.
- **TXA CRITERIA**

A single instance of hypotension in an adult with a brain injury may increase the mortality rate by 150%. The increase in mortality rate for hypotension and a severe TBI is even worse in children.

6.9 Head Injuries

PEDIATRIC ASSESSMENT

Infants with a bulging fontanelle are considered to have a more severe head injury.

MANAGEMENT

- Head injury patients are at increased risk for vomiting and seizures.
- Maintain an SpO_2 of 95% and $EtCO_2$ levels between 35-45 mmHg.
- Head injury patients with a GCS of 8 or less should be **INTUBATED OR ADVANCED AIRWAY**, avoid prolonged attempts.
- Cervical Spinal Motion Restriction.
- Bleeding from scalp lacerations can usually be controlled by applying a pressure dressing or by applying direct pressure along the wound edges.
    - Pressure dressings should not be applied to depressed or open skull fractures unless there is significant hemorrhage present, as this can cause an increase in ICP.

FLUID RESUSCITATION

- Children with severe TBI should have their SBP maintained at the normal range for their age. Administer fluid boluses of 20ml/kg of NS and repeat prn to maintain systolic blood pressure normal for age.
- If patient is normotensive, administer NS at a KVO rate.

Age	Normal Systolic BP	
	Female	Male
1 day	60-76	60-74
4 days	67-83	68-84
1 month	73-91	74-94
3 months	78-100	81-103
6 months	82-102	87-105
1 year	68-104	67-103
2 years	71-105	70-106
7 years	79-113	79-115
15 years	93-127	95-131

INCREASED ICP AND/OR HERNIATION INCLUDE

- Signs of increased ICP and herniation include:
    - Hypertension for patient's age
    - Development of a sluggish or non-reactive pupil
    - Bradycardia
    - Abnormal breathing patterns
    - Paralysis or weakness on one side of the body
- **Provide controlled hyperventilation maintain EtCO2 at 35 mmHg for increased ICP.**
- **Consider Advanced Airway Management.**
- **Patients with increased ICP and/or herniation shall be transported with the head of the stretcher at a 30-degree incline.**

6.10 Spinal Motion Restriction

INFORMATION

Move the patient in the safest, most anatomically neutral position possible.
Scoop stretcher is the recommended device; **backboards are not recommended.**
REMOVE SCOOP STRETCHER IMMEDIATELY AFTER PLACED ON STRETCHER
Patient must be secured to stretcher with manufacturer approved stretcher straps.

ADULT & PEDIATRIC

- Perform manual Spinal Motion Restriction by providing manual cervical stabilization and apply an appropriately sized cervical collar as appropriate if the patient meets any of the following criteria:

- **HAVE A LOW THRESHOLD TO PLACE C-COLLAR or Spinal Motion Restriction.**
  - ANY EVIDENCE OF HEAD TRAUMA - Both by history or physical exam
  - Mechanism of Injury
  - Complaint or finding of focal neurologic deficit on motor or sensory exam.
  - Complaint or finding of pain to the neck or back.
  - Presence of a distracting injury.
  - Altered level of consciousness with an MOI (Mechanism of Injury).
  - Intoxication with an MOI present. The cervical collar should not cause the patient discomfort such that they are compelled to move.

- **<u>Spinal Motion Restriction</u>: If an appropriately sized collar is not available or if the collar compels the patient to move, remove the collar and provide Spinal Motion Restriction by placing rolled towels on the sides of the patient's head and neck, secured with tape or other similar devices to allow for comfortable cervical stabilization/immobilization.**

6.10 Spinal Motion Restriction

LIFTING OR MOVING OF PATIENTS

- Manual cervical and spinal stabilization/immobilization must be performed for all patient movement as appropriate.
- A scoop-type stretcher may be employed to facilitate the lifting or movement of a patient for transit to or from the stretcher.
- **Once the patient has been placed on the stretcher, the scoop-type stretcher is to be removed.**
- In a combative patient, the same principles as above apply.
- All obtunded patients must be considered to have a spinal injury. Position patient in the most anatomically neutral position possible while providing emergency medical care.
- **Placing patients in the prone position is contraindicated due to the risks of asphyxiation**. However, impalement or other situations may mandate the prone position. In these instances, clear documentation of justification and attention to airway maintenance is mandatory.
- Patients that are transported in the prone position must have continuous SpO2 monitoring, EtCO2 monitoring if available, and be under constant surveillance by EMS personnel at all times.
- **ALWAYS HAVE MINIMUM OF TWO PEOPLE WHEN MOVING PATIENTS.**

HELMET REMOVAL

- **Helmets should be removed for all patients.**
- If applicable, protective pads should also be removed.
- Athletic trainers should be consulted in the helmet/protective pad removal process if applicable.
- **C-SPINE should be manually stabilized during the removal process.**

6.11 Eye Injuries

ADULT & PEDIATRIC

CHEMICAL EXPOSURES

- Remove contact lens if present.
- Irrigate the affected eye(s) with Normal Saline.
  - Be careful not to contaminate the unaffected eye with runoff.
  - IF AVAILABLE - Sudecone wipes to remove pepper spray or tear gas near eyes
- Consider Pain Management Protocol.

PENETRATING EYE INJURIES

- Stabilize any penetrating object.
- Cover both eyes with gauze and an eye shield.
- Consider Pain Management Protocol.

6.12 Dental Injuries

ADULT

AVULSED TEETH

- WASH OFF THE TOOTH WITH NORMAL SALINE.
- KEEP TOOTH MOIST IN **SUITABLE MEDIUM.**
- REPLACE TOOTH (If completely intact) WITHIN 30-60 MINUTES.

MEDIUM: ANY OF THE BELOW

- HANK'S BALANCED SALT SOLUTION (This is informational, we do not carry this solution).
- COLD MILK (WHOLE MILK OR 2%).
- Normal Saline.

6.13 Chest Trauma

INFORMATION

ADULT & PEDIATRIC

- Ensure adequate oxygenation and ventilation. Maintain an SpO2 of 95% and EtCO2 levels between 35-45 mmHg.
- If the patient's systolic blood pressure drops below age-appropriate level, with signs of shock, administer IV fluids at a rate sufficient to maintain peripheral pulses, (which is typically SBP of 80-90 mmHg) once a tension pneumothorax is ruled out.
- Stabilize penetrating objects with a bulky dressing.

FLAIL CHEST

Stabilize flail segment with a bulky dressing.

OPEN PNEUMOTHORAX (SUCKING CHEST WOUND)

Apply a vented chest seal or occlusive dressing to all open chest wounds and monitor for signs & symptoms of a tension pneumothorax. Apply during exhalation if possible.

6.13 Chest Trauma

TENSION PNEUMOTHORAX

Patients with a tension pneumothorax present with diminished or absent breath sounds on the affected side with any or all of the following associated signs and symptoms:

- Shortness of breath
- Pleuritic chest pain
- Tracheal deviation (not always present)
- Hyperresonance on the affected side
- Distended neck veins (may not be present if there is severe blood loss)
- Poor compliance when attempting to ventilate with a BVM
- Hypotension

NEEDLE DECOMPRESSION OR FINGER THORACOSTOMY (ACCORDING TO LEVEL OF TRAINING) The indication for performing an emergency needle decompression is the presence of a tension pneumothorax as indicated above accompanied by more than one of the following:

- Respiratory distress and cyanosis
- Decreasing level of consciousness
- Loss of radial pulse (late sign)

The anterior approach **2ND or 3RD INTERCOASTAL SPACE** , midclavicular line is the preferred site when performing a needle decompression.

FINGER THORACOSTOMY IS PERFORMED IN THE **3RD INTERCOASTAL SPACE** MID AXILLARY LINE.

PENETRATING JUNCTIONAL TRAUMA: If clotting agent is available, severe junctional hemorrhage (e.g., neck, axillary, thoracic, abdominal, pelvis and groin) that is not able to be easily controlled using direct pressure shall be controlled using clotting agent or XSTAT.

Impaled objects shall be stabilized to prevent movement and subsequent further damage. DO NOT REMOVE THE OBJECT.

6.14 Crush Syndrome

Crush Injury / Crush Syndrome:
Isolated extremity trauma only; not recommended for multi-system injuries. A crush injury involves localized tissue damage with systemic effects from muscle breakdown and release of toxic cell contents and electrolytes. **Crush syndrome** typically develops within 1–4 hours after injury. Treatment should begin **prior to release of compression** to manage hypovolemia and dilute circulating toxins.

ADULT & PEDIATRIC

Initiate treatment *prior* to release of compression.

- Manage ABC's/ Hemorrhage control. Consider CAT device to effected limbs.
- Monitor cardiac rhythm for dysrhythmias related to hyperkalemia.
- Establish large-bore IV/IO access; begin aggressive isotonic fluid resuscitation (e.g., Normal Saline 500ml - 1L bolus, to prevent renal failure and dilute toxins.
    - Pediatrics 20ml/kg Normal Saline.
- Sodium Bicarbonate (1mEq/kg IV) to alkalinize urine and reduce myoglobin toxicity if signs of crush syndrome are present.

- See hyperkalemia protocol for peaked T-waves or wide QRS.
    - **CALCIUM CHLORIDE: 1gm, slow IV/IO over 2 minutes.**
    - ALBUTEROL: 10mg via nebulizer, (4 * 2.5mg) continuous treatments.
    - See MED TOOL for pediatrics.

- Administer pain management as indicated.
- Consider Whole Blood and TXA protocols.
- Avoid potassium-containing fluids (e.g., Lactated Ringer's).
- Continuously monitor $EtCO_2$, ECG, and vital signs.
- Rapid transport to an appropriate facility; notify early for suspected crush syndrome.

6.14 Abdominal Trauma

ADULT & PEDIATRIC

IMPLED OBJECTS

- **Impaled objects shall be stabilized to prevent movement and subsequent further damage. DO NOT REMOVE THE OBJECT.**
- If bleeding occurs around the impaled object, it should be controlled by holding direct pressure, avoid excessive pressure.
- Do not palpate the abdomen, as it may cause further organ injury from the distal tip of the object.
- If the patient's systolic blood pressure drops below 100 mmHg with signs of shock, administer IV fluids at a rate sufficient to maintain peripheral pulses (which is typically a SBP of 80-90 mmHg).
- CONSIDER WHOLE BLOOD ADMINISTRATION IF AVAILABLE BASED ON CRITERIA.

EVISCERATION

- Do not attempt to replace or move the protruding tissue.
- Protect the tissue from further damage.
- Cover the protruding tissue with a moist sterile dressing and cover with a dry sterile dressing.
- Keep the patient calm, as crying, screaming or coughing can force more of the tissue outward.

PREGNANCY

See Trauma in Pregnancy

PENETRATING JUNCTIONAL TRAUMA

If clotting agent is available, severe junctional hemorrhage (e.g., neck, axillary, pelvis and groin) that is not able to be easily controlled using direct pressure shall be controlled using clotting agent (XSTAT/QuikClot).

6.15 Pelvic Fracture

INFORMATION

Avoid rough handling

ADULT

- Assess and treat for shock.
- **DO NOT PERFORM A PELVIC ROCK.** Assess the pelvis by applying gentle pressure anterior to posterior and from the sides to identify crepitus or instability. Do not repeat.
- **Stabilize pelvis by T-POD, SAM PELVIC Sling OR sheet wrapped around pelvic girdle.** A scoop stretcher should be used whenever possible to move patients with suspected pelvic fracture.
- Remove the scoop once the patient is placed on the stretcher.
- Splint in position of comfort with pillow and blankets.
- Consider Pain Management Protocol.

PENETRATING JUNCTIONAL TRAUMA: If clotting agent is available, severe junctional hemorrhage (e.g., neck, axillary, thoracic, abdominal, pelvis and groin) that is not able to be easily controlled using direct pressure shall be controlled using clotting agent or QuikClot.

PEDIATRIC:

T-POD FOR AGE>1 YOA AND WEIGHT >50 POUNDS

SAM PELVIC SLING FOR AGE > 7 or >56in(4'8") Tall

6.16 Hip Fracture/Dislocation

INFORMATION

Avoid rough handling

ADULT & PEDIATRIC

HIP FRACTURES/DISLOCATIONS

- Consider hip fractures in any elderly patient with a fall that complains of pain in the knee, hip or pelvis.
- A scoop stretcher should be used whenever possible to move patients with a suspected hip fracture/dislocation.
    - Splint in position of comfort with pillows and blankets.
- Traction splints should not be used on suspected hip fractures/dislocations.
- Assess and treat for pelvic fractures and shock prn.
- Consider Pain Management Protocol.
- Patients with posterior hip dislocations most often present with the leg flexed and internally rotated and will not tolerate having the extremity straightened. Anterior dislocations present with lateral rotation and shortening of the affected leg.

6.17 Extremity Trauma

INFORMATION

Avoid rough handling

ADULT and PEDIATRIC

DETERMINE MECHANISM OF INJURY (MOI) AND EVALUATE
PMS, color, temperature, capillary refill, crepitus.

TREATMENT

- Gross contamination such as leaves, or gravel should be removed if possible.
- Control external severe extremity hemorrhage (direct pressure, Combat Application Tourniquet (C.A.T.), apply to the most proximal anatomical position of extremity until the bleeding stops). Never apply C.A.T. directly over injury site or joint.
- If clotting agent is available, severe junctional hemorrhage (e.g., neck, axillary, thoracic, abdominal, pelvis and groin) and any other severe external hemorrhage that is not able to be easily controlled using C.A.T). Shall be controlled using clotting agent . Pack wound with clotting agent and maintain pressure for a minimum of one minute. IF APPROPRIATE/AVAILABLE USE ISRAELI BANDAGE FOR JUNCTIONAL WOUNDS.
- Treat and assess for shock for suspected femur fractures.
- Immobilize the entire limb for all suspected extremity fractures or dislocations (document PMS before and after splinting). For critical patients, splinting can be accomplished via backboard.
- Fractures should be splinted in the position found, unless there is no pulse present, or the patient cannot be transported due to the extremity's unusual position. No more than two attempts can be made to place the injured extremity in a normal anatomical position. Discontinue attempts if the patient C/O severe pain or if there is resistance to movement felt.
- Elevate extremity and apply ice packs.
- Consider Pain Management Protocol.
- Remove jewelry or watches from the affected extremity.

6.17 Extremity Trauma

- Open wounds, exposed bone ends or amputations should be covered with a moist sterile dressing.
- Small amputated parts should be rinsed off, wrapped in sterile gauze and placed in a plastic bag. If ice is available, place the sealed bag in a larger container with ice & water or chilled saline. Label the bag with the patient's name, date, and time of the amputation, and the time the part was wrapped and cooled.

ADULTS ONLY

- **ANTIBIOTICS IN TRAUMATIC OPEN FRACTURES IS FOR ADULTS ONLY.**
- **A PATIENT < 18 WITH EVIDENCE OF PUBERTY IS TREATED AS AN ADULT FOR EMS PROTOCOLS.**
- **OPEN FRACTURE: CEFEPIME: 2gm reconstitute in NS 10ml then add to NS 100ml bag. Infuse in 10 drop set at 1 drop per second (approximately 16 minutes).**

6.18 Femur Fractures

INFORMATION

Avoid rough handling

ADULT & PEDIATRIC

TREATMENT

- Assess and treat for shock.
- Cover open femur fractures with a moist sterile dressing.
- Consider Pain Management Protocol.
- Apply a Traction Splint for mid-shaft femur fractures unless:
  - Patient has additional life-threatening injuries.
  - There is also a suspected pelvic fracture.
  - There is an open femur fracture with exposed bone. If there is an open fracture where there is no visible bone, you MAY use a traction splint.
  - There is also a suspected hip fracture.
  - There is an avulsion/amputation of the ankle or foot.
  - Suspected fracture distal to mid shaft femur
- Document neurovascular exam before and after application of the Traction Splint.

ADULTS ONLY

- **ANTIBIOTICS IN TRAUMATIC OPEN FRACTURES IS FOR ADULTS ONLY.**
- **A PATIENT < 18 WITH EVIDENCE OF PUBERTY IS TREATED AS AN ADULT FOR EMS PROTOCOLS.**
- **OPEN FRACTURE: CEFEPIME: 2gm reconstitute in NS 10ml then add to NS 100ml bag. Infuse in 10 drop set at 1 drop per second (approximately 16 minutes).**

6.19 Trauma in Pregnancy

INFORMATION

Remember, there are two (or more) patients. The condition of the fetus often depends on the condition of the mother. Trauma patients > 20 weeks pregnant in cardiac arrest should be transported to closest Trauma/OB Center (Broward Health Medical Center or Memorial Regional).

Begin MICCR and manually displace uterus to the left during transport.

MATERNAL PHYSIOLOGICAL CHANGES DURING PREGNANCY

Due to the following physiological changes in pregnancy, it is often difficult to assess for shock:

- Maternal Heart Rate increases throughout the pregnancy. By the third trimester, the HR can be 15- 20 BPM above normal.
- Blood Pressure: Both the systolic and diastolic blood pressures drop 5-15 mmHg during the second trimester but may return to normal at term (36 weeks).
- Cardiac Output: The mother's cardiac output and blood volume increases. Therefore, the pregnant patient may lose 30-35% of her blood volume before the signs & symptoms of shock become apparent.

SUPINE HYPOTENSION

Usually occurs in the third trimester.

Pregnant patients not requiring spinal motion restriction shall be transported on their left side.

If a pregnant patient requires spinal motion restriction, place 4-6 inches of **padding under the right side** of the patient while maintaining normal anatomical alignment as much as possible.

6.19 Trauma in Pregnancy

MANAGEMENT

- Assess for vaginal bleeding and a rigid abdomen. In the third trimester, this could indicate abruptio placenta or a ruptured uterus.
- Ensure adequate oxygenation and ventilation. Maintain an SpO2 of 95% or greater and EtCO2 levels between 35-45 mmHg.
- Anticipate vomiting. Have suction readily available.
- Assess and treat for shock.
- **All 3rd trimester pregnancy trauma patients shall receive 15 Lpm of oxygen via NRB.**
- **CONSIDER TRAUMA CRITERIA BASED ON HISTORY AND PHYSICAL EXAM.**

If patient remains hypotensive after the uterus has been displaced to the left, consider the patient to have a significant amount blood loss:
CONSIDER CRITERIA FOR WHOLE BLOOD TRANSFUSION

6.20 Inter-Facility Trauma Transfer Protocol

Inter-Facility Trauma Transfer Protocol

Head
- GCS ≤ 12 or a decrease of 2 or more points from time of injury
- Open or depressed skull fracture
- Basilar skull fracture
- Brain hemorrhage
- Meningeal hemorrhage
- Presentation of new neurological deficits

Thoracic Injury
- Complex pneumothorax, hemothorax, flail chest or pulmonary contusion with respiratory insufficiency after initial decompression
- Persistent hemorrhage after appropriate thoracostomy tube placement
- Aortic disruption
- Diaphragmatic hernia
- Tracheobronchial tree injury
- Esophageal trauma

Extremity Injuries
- Complex pelvic fractures
- Two or more long bone fractures
- Major vascular injuries documented by arteriogram or loss of distal pulses
- Amputation of extremity proximal to wrist or ankle
- Major degloving injury proximal to wrist or ankle

Spine
- Fractures, unstable or potentially unstable
- Subluxations
- Neurogenic Shock
- Open spinal wounds

Abdominal Injuries
- Conditions requiring celiotomy with concomitant trauma
- Positive diagnostic test demonstrating intra-abdominal injury
- Penetrating wound of the abdomen with suspicion of penetration of the peritoneum
- Ruptured hollow viscus
- Solid organ injury

Burns
- Partial thickness burns greater than 10% total body surface area (TBSA)
- Burns that involved the face, hands, feet, genitalia, perineum, or major joints
- Third degree burns in any age group
- Electrical burns, including lightning injury
- Chemical burns
- Inhalation injury
- Burns in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality

General Instructions
- Identify patients exhibiting the above conditions and immediately initiate the emergency transfer process upon discovery as it is expected that these conditions/diagnosis will be discovered in a timely manner.
- Pediatric trauma patients are defined as 15 years or younger and should be transferred to the closest Level 1 Pediatric Trauma Center.
- Sending Emergency Physician should not postpone the transfer to perform in-depth work-ups (i.e. imaging, consultation) in hospitals with no surgical capability if this could delay the patient from receiving the benefits of appropriate medical treatment at a trauma center.
- Questions or concerns - please contact Trauma Management Agency (954) 357-5234. Disputes and resolutions will be handled through the Trauma Management Agency and all parties involved.

911

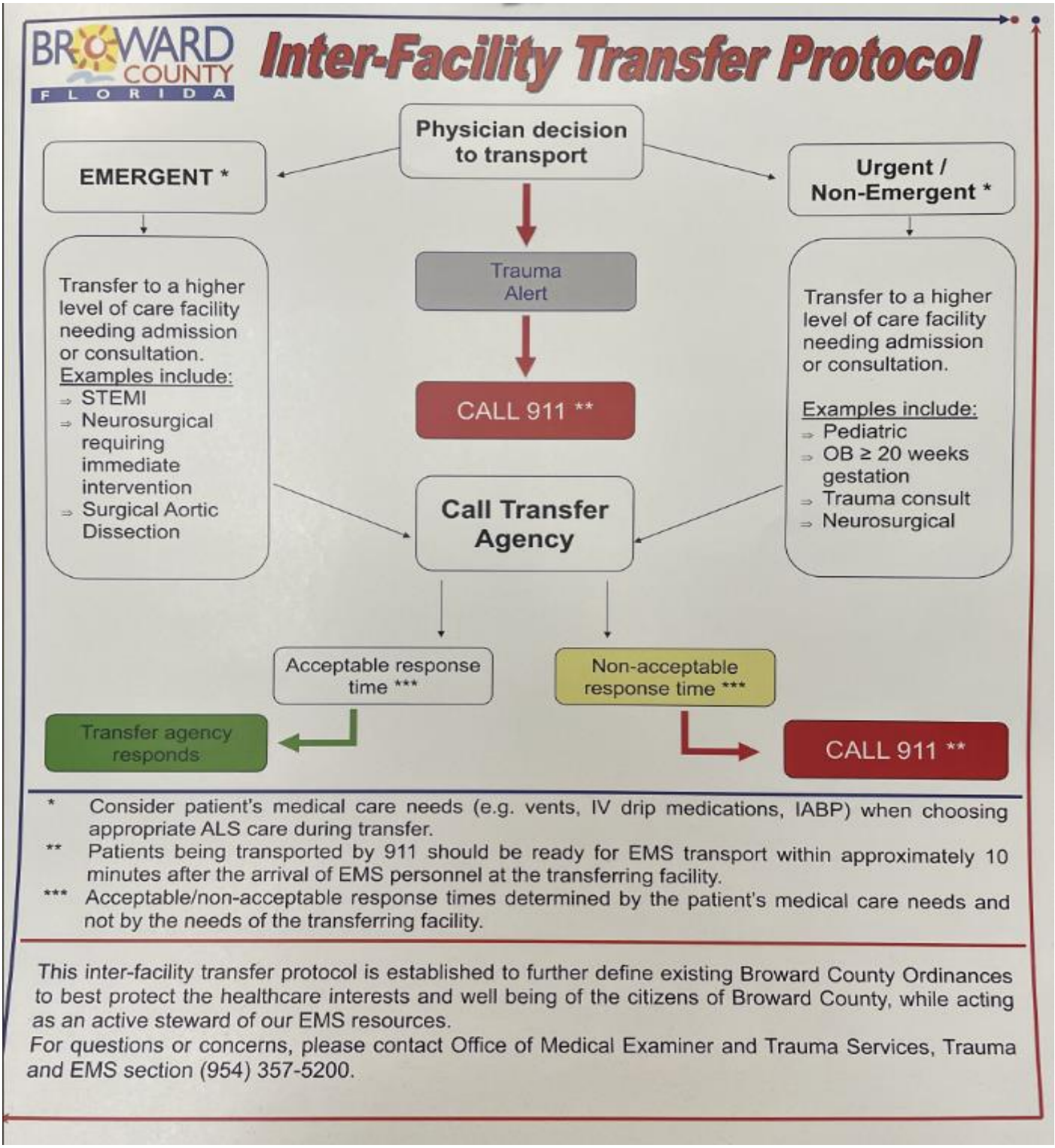
Remember 911 should always be called to initiate transport of these patients

Adult Trauma Center
Broward Health North
(954) 786-6967

Adult and Pediatric Trauma Centers
Broward Health Medical Center
(954) 355-5804
Memorial Regional Hospital
(954) 265-6338

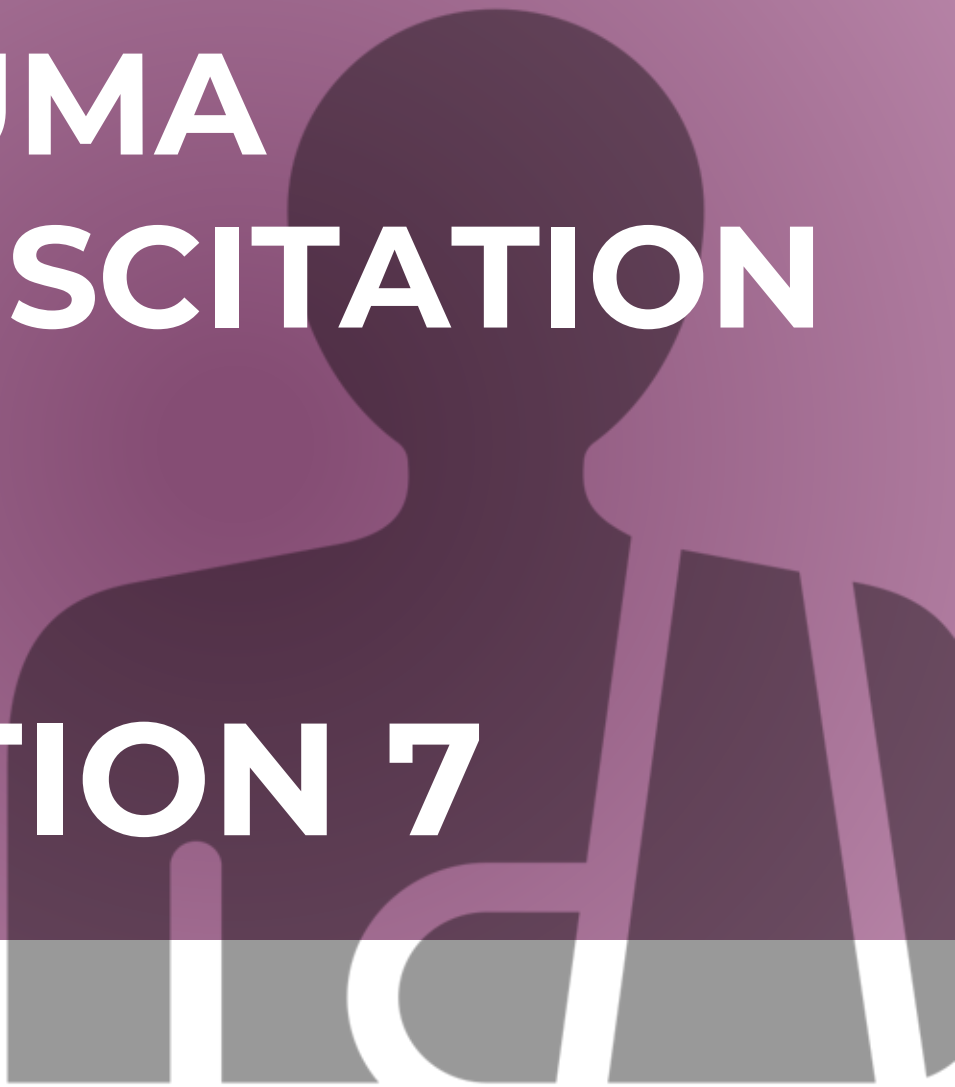
Broward County's Trauma System - Saving lives through cooperative care and professionalism

6.20 Inter-Facility Trauma Transfer Protocol



TRAUMA RESUSCITATION

SECTION 7



Section 7

Trauma Resuscitation

SIGNS & SYMPTOMS OF COMPENSATED SHOCK

Anxiety, Agitation, Restlessness, Normotensive, Capillary Refill Normal to Delayed, and Tachycardia (a weak rapid pulse greater than 130 beats/min is usually a sign of shock in children of all ages except neonates).

SIGNS & SYMPTOMS OF DECOMPENSATED SHOCK

Decreased LOC, Hypotension, Peripheral Cyanosis, Delayed Capillary Refill, Inequality of Central/Distal Pulses, and Tachycardia (later progressing to bradycardia).

7.1 Traumatic Arrest

INFORMATION

Any patient that is in cardiac arrest because of electrocution or lightning injury should receive immediate defibrillation, if applicable.

DO NOT ATTEMPT RESUSCITATION OF TRAUMA PATIENTS IF ALL OF THE FOLLOWING PRESUMPTIVE SIGNS OF DEATH ARE PRESENT UPON ARRIVAL:

1) **Apneic**
2) **Pulseless (Asystole)**
3) **Fixed and Dilated Pupils**

WHEN ANY OF ABOVE ARE ABSCENT, RESUSCITATION SHOULD OCCUR IN ROUTE TO TRAUMA CENTER

*** DO NOT USE MECHANICAL CPR IN TRAUMA PATIENTS ***

ADULT AND PEDIATRIC STANDING ORDERS

- Rapid transport, keep on-scene times less than 10 minutes.
- Provide Oxygen Therapy
- Massive bleeding control
- Airway – NPA/OPA/Advanced Airway
- Respiratory – decompress chest if tension pneumothorax, occlusive dressing for open pneumothorax.
- Circulation- IV/IO, tourniquet, pelvic binder, wound packing
- Hypothermia care
- Eye injuries – cover with rigid shield and no pressure on the eye
- Spinal motion restriction if indicated

7.2 Neurogenic Shock

INFORMATION

- Skin – Warm/Dry
- Hypotension with bradycardia - Distributive shock affecting autonomic function and blood pressure.
- Paralysis - Injury present above the **T6 spinal cord level** and associated shock.

ADULT

MANAGEMENT

- Rapid transport, keep on-scene times less than 10 minutes.
- Maintain an SpO2 of 95% and EtCO2 levels between 35-45 mmHg.
- Cervical Spinal Motion Restriction if indicated.
- Maintain body temperature with blankets and consider increasing the temperature in the patient compartment.

FLUID RESUSCITATION

- Establish two large bore IVs while enroute. NEVER delay transport to start IVs on scene.
- Give enough normal saline up to 1L to maintain a blood pressure high enough for adequate peripheral perfusion (radial pulse). The presence of a radial pulse equates to a SBP of 90 mmHg, which is the goal of fluid resuscitation for a patient with suspected internal hemorrhage.
- Bolus of Normal Saline 500mL, reassess blood pressure and lung sounds prior to each bolus. Maximum 1L.
- Push Dose Epinephrine: If patient remains hypotensive despite IVF.

- **SPINE SHOCK:** is a neurological injury affecting the side of injury resulting in loss of motor tone and areflexia.

7.3 Hemorrhagic Shock

ADULT and PEDIATRIC MANAGEMENT

- Rapid transport, keep on-scene times less than 10 minutes.
- Provide Oxygen Therapy

MARCHES PROTOCOL

- Massive bleeding control
- Airway – NPA/OPA/Advanced Airway
- Respiratory – decompress chest if tension pneumothorax, occlusive dressing for open pneumothorax.
- Circulation- IV/IO, tourniquet, pelvic binder, wound packing
- Hypothermia care
- Eye injuries – cover with rigid shield and no pressure on the eye
- Spinal motion restriction if indicated

FLUID RESUSCITATION

- Establish large bore IV/IO while enroute. NEVER delay transport to start IVs on scene.
- Internal hemorrhage: Permissive Hypotension in trauma
  - Give only enough normal saline to maintain a blood pressure high enough for adequate peripheral perfusion (radial pulse). The presence of a radial pulse equates to a SBP of 90 mmHg, which is the goal of fluid resuscitation for a patient with suspected internal hemorrhage. An SBP of around **90 mmHg** (or MAP ~65 mmHg) is generally enough to maintain perfusion to vital organs (brain, heart, kidneys) without being so high that it worsens bleeding.
  - Adult Bolus of Normal Saline 500mL, reassess blood pressure and lung sounds prior to each bolus. Maximum 1L.-
  - BLOOD TRANSFUSION: See Protocol

7.3 Hemorrhagic Shock

PEDIATRIC FLUID RESUSCITATION FOR SUSPECTED INTRATHORACIC, INTRA-ABDOMINAL OR RETROPERITONEAL HEMORRHAGE OR ISOLATED EXTERNAL HEMORRHAGE

- Permissive Hypotension in trauma
- NORMAL SALINE: 20ml/kg bolus, titrated to maintain a SBP as listed below. May repeat 1x prn for hypotension.

Assess lung sounds and blood pressure often.
Minimum Pediatric Systolic Blood Pressure Values

- Neonates: 60mmHg
- Infants: 70mmHg
- Children 1-10 years old: 70 + (age in years x 2) mmHg
- Children greater than 10 years old: 90mmHg

MANAGEMENT

- Rapid transport, keep on-scene times less than 10 minutes.
- Provide Oxygen.
- Control external severe extremity hemorrhage (direct pressure, Combat Application Tourniquet (C.A.T.). Apply at **the most proximal anatomical location** of extremity until the bleeding stops). **Never apply C.A.T. directly over injury site or joint.**
- If a clotting agent is available, use it to control severe junctional hemorrhage (e.g., neck, axillary, thoracic, abdominal, pelvic, and groin) or any other severe external hemorrhage that cannot be effectively controlled with a C.A.T. Pack the wound with the clotting agent and maintain pressure for a minimum of two minutes.
- Spinal Motion Restriction if indicated.
- Maintain body temperature with blankets.

7.4 Transfusion Protocol

INFORMATION

In general, one-unit 500mL (1 unit) of Low Titer O+ Whole Blood (LTO+WB) will be available per patient.

Of Note: Currently the LTO+WB does not have volume markings on the bag.

If Whole Blood is not available, Low Titer Liquid Plasma or O+ PRBC may be given as a substitute for hemodynamic instability. Repeat PRN x 1.

Confirmation Procedure

1) Confirm patent administration site if any question exists utilize a new site.
2) Identify the patient meets criteria below.
3) Record baseline vitals.
4) Two EMS personnel must confirm the tag and the blood product match including number, blood type, Rh factor, expiration date and fluid amount.
5) Both confirming personnel must sign the accompanying blood component tag.

Administration

1) Place flat thermometer on patient's forehead.
2) Whole Blood 1 unit IV/IO via blood Y-tubing. Flow through blood warmer to completion and/or hemodynamic stability. Repeat PRN x 1. Utilize low titer O+ for most patients.
3) **Adult**: 1-2 units of Whole Blood, repeat as needed
4) **Pediatric** > 5 years of age (No evidence of Puberty): 15ml/kg of Whole Blood, repeat as needed.
5) In the event Whole Blood is not available, Low Titer Liquid Plasma or O+ PRBC may be given as a substitute for hemodynamic instability. Repeat PRN x 1.

ePCR Documentation: Document administration in the flowchart section. Currently, the only option available is "blood"; please indicate the type and volume administered. In the narrative, include the reason for blood administration, the specific products used, the patient's temperature before, during, and after administration, the patient's response to blood products, whether a Qin Flow warmer was used, any adverse reactions, whether the patient or family was consulted about blood products, and whether contact with the Medical Director was made.

7.4 Transfusion Protocol

Contraindications

- Religious objection to receiving blood products.

Relative Contraindications

- **Woman of Childbearing Age should have confirmed Hemorrhagic Shock.**
- Patient < 5 years old

Consult Medical Direction if patient is in hemorrhagic shock and < 5 y/o.

For Patients in HEMORRHAGIC SHOCK: Blunt or Penetrating.
Administer Whole Blood with signs of acute hemorrhagic shock as evidenced by:

Indications - 1 of the following

1) Systolic Blood Pressure < 70 mmHg OR
2) Systolic Blood Pressure < 90 mmHg with Heart Rate ≥ 110 beats per min OR
3) Age ≥ 65 y/o and SBP ≤ 100 AND HR ≥ 100 beats per minute (Shock Index ≥ 1) OR
4) EtCO2 < 25 (Consider as early shock indicator).
5) Witnessed traumatic arrest BY EMS PERSONNEL.
6) Paramedic Judgment.

Shock Index = Heart Rate/SBP

	SHOCK INDEX	MORTALITY RATE	BLOOD PRODUCTS
No Shock	<0.6	Approximately 10%	1 unit
Mild Shock	≥0.6 to <1.0		3 units
Moderate Shock	≥1.0 to <1.4		10 units
Severe Shock	≥1.4	Approximately 35%+	20+ units

7.5 Transfusion SOG/SOP

Purpose

To maintain blood products for EMS delivery.

Scope

Describes the storage and maintenance of blood products for use in the field

Definitions

1) Blood Refrigerator – Approved refrigeration device to store blood products long term.
2) Blood Cooler – Approved cooler used to store blood outside of the blood refrigerator and deliver products to the field.
3) Freezer- Separately maintained freezer to hold the cooler inserts
4) LTOWB- (Low titer Group O Whole Blood)

Guide

1) Procurement – Blood products are distributed to the Broward County Air Rescue Station 85 , through ONE BLOOD, via regular or PRN delivery
    * O -/+ Whole Blood
    * LTOWB, titer should be < 256

2) Maintenance - Upon receipt the blood products will be logged on form, triage tag added and then placed in the refrigerator at Station 85. Blood log receipt and paperwork will be scanned, placed on H Drive, and emailed to admin personnel.
    - BSO: Tamara_Clifford@sheriff.org
    - SRFD: Carbos@sunriseFl.gov
    - FLFR: Cdavis-Partridge@Fortlauderdale.gov

3) Temperature Controls - The blood product refrigerator will be temperature checked daily at 7am and 7pm and recorded in the log.

7.5 Transfusion SOG/SOP

If at anytime the temperature is below or above normal range, remove the units and place in the station blood cooler, contact EMS Chief for storage options

1) Check and log freezer Temp Daily.
2) Each Thursday, change the temp graph in the blood refrigerator and scan and send a copy to the blood Bank along with fridge and freezer logs.
3) Monthly copy all logs and send to EMS Chief's office for filing.
4) Cooler Usage - At shift change the insert should be removed from the freezer and allow to thaw for 20 minutes. The insert should be loaded in the cooler and the blood products container from the blood refrigerator placed in it, assuring temperature controls are in place. The routine time for products in this cooler is to be 12 hours, with a maximum time of 24 hours. The products from the previous shift should be rotated back to the blood refrigerator. Be sure the temp probe is maintained in the cooler and monitored throughout the shift.

5. Rotation- LTOWB has a 21-day shelf life

At 72 hours out, be sure to contact ONE BLOOD to re-order.

6) 6. Usage- When the blood products are used, maintain the blood paperwork, attach copy to EMS Report, and place on H Drive(BSO).

Be sure the usage card is filled out, sticker both copies and attach copy to EMS Report.

Contact onebloodairmedicalteam@oneblood.org (954) 777-2677 for replacement units.

FLFR- Follow SOP

7.5 Transfusion SOG/SOP

7) ePCR Documentation - Document administration in the flow chart section, currently the only option is blood, please indicate the type, titer and volume. In the narrative, please describe the reason for blood, what products where used, Patients Temperature Before, During and After administration, response to blood products, Qin Flow warmer was used, any adverse reactions, patient or family consulted about blood products and if medical director contact was made

8) UNCROSSED BLOOD TRANSFUSION ATTESTATION FROM MEDICAL DIRECTOR

9) Scene Delays - In the event the storage window is getting close, and the supervisor can not make it back to the office to exchange blood products, contact the EMS Chief to arrange the swap. In the event the Chief is not available request an EMS crew to do the exchange. In the event the product is out past 24 hours maximum time, monitor temp, if at anytime the temp is out of range, alert the blood bank and request immediate exchange of blood products

10) Adverse Reaction - Immediately STOP, maintain alternate fluids and follow appropriate protocol. Any transfusion reaction, will need to be reported to the receiving facility. The blood products should also be packaged up in appropriate material and returned with all tubing to the blood bank.

11) Religious Observations - Some religions will refuse to accept blood products. In this instance follow EMS protocol and document the refusal in the ePCR.

12) Out of Temperature - If any product is discovered out of temperature , range notify the EMS Chief and generate and incident report. Take the blood out of service in the fridge, the blood bank will be contacted, and an incident investigation will be done to prevent reoccurrence.

7.6 Tranexamic Acid TXA Protocol

Universal Patient Guideline

- Primary Survey / Control Severe Traumatic Bleeding
- Shock Index = HR/SBP

PHARMACOLOGY

Tranexamic Acid is an antifibrinolytic medicine that stabilizes fibrinogen and decreases plasmin formation.

ADMINISTRATION

Can be given through IO or IV.

1) SBP < 70
2) SBP < 90 with HR > 110
3) Shock Index ≥ 1, Age greater than 65
4) ETCO2 < 25

INDICATIONS:

- **TRAUMATIC HEMORRHAGIC SHOCK: Whole Blood Criteria above.**
- **TRAUMATIC BRAIN INJURY with GCS less than 13.**
- **Postpartum Hemorrhage with associated Hemorrhagic shock.**

Contraindications

- Injuries greater than 3 hours
- Age less than 5: Consult Medical Direction if patient is in hemorrhagic shock and < 5 y/o
- Non-Traumatic bleeding

Adult Dosage (Appearance of Puberty)

TXA: 2 Grams/100ml

- Infusion to be completed in a 10-drop set, 3 drops per second to provide 100 ml over approximately 5 minutes.
- TXA can be given concurrently with Whole Blood

Pediatrics (No Evidence of Puberty)

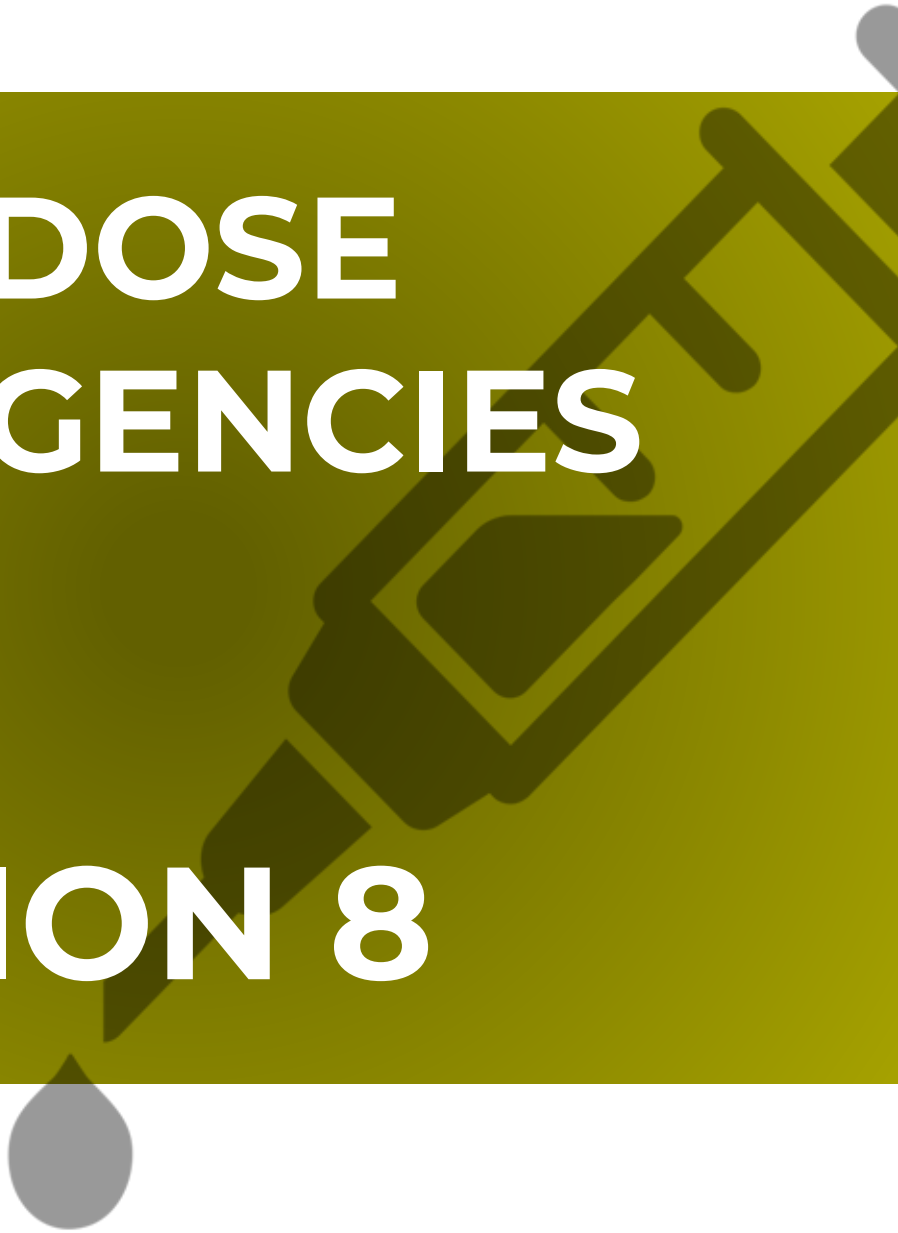
- 5-11 years of age use weight-based dosing

15mg/kg as per the Med Tool amount added to 100 ml NS and run in a 10 drop set at 3 drops per second over approximately 5 min (Max dose = adult dose)

- **Consult Medical Direction if patient is in hemorrhagic shock and < 5 y/o**

OVERDOSE EMERGENCIES

SECTION 8



Section 8

Overdose Emergencies

8.1 Overdose Standing Orders

INFORMATION

The goal for effectively managing patients with an overdose/poisoning is to support the ABCs, terminate seizures, and reverse the toxic effects of the poison/medication with a specific antidote. The treating paramedic should consider contacting the Florida Poison Control Center at **1-800-222-1222** as soon as possible for treatment recommendations. These recommendations are based on the type and severity of the poisoning/overdose and the clinical condition of the patient.

The Poison Control Center representative will ask for the patient's name, the zip code where the call occurred and a contact number. Document the treatment and the name of the representative on the ePCR Report.

Resuscitation of cardiac arrest patients should follow BLS and ACLS algorithms.

MEDICAL CONTROL

Treatment recommendations from Florida Poison Control must be followed and documented whenever possible provided the recommended treatment/medications are available.

1-800-222-1222

OVERDOSE/POISONING

- BLS Standard Requirements.
- Try to identify source of the overdose/poisoning.
- Suction as needed.
- If a patient is unresponsive and spinal cord injury is not suspected, place the patient in the recovery position.
- Check BGL. If less than 60mg/dL with an altered mental status, and patient is able to protect their airway/swallow, give oral Glucose 15g. Not recommended for patients less than 2 years old.

8.1 Overdose Standing Orders

INITIAL MANAGEMENT FOR POISONING/OVERDOSE

- Check GLUCOSE and administer D10 as indicated for a BGL less than 60mg/dL.
- If patient is seizing, see “SEIZURE PROTOCOL”.
- AIRWAY
  - Positioning, suction, NPA/OPA, intubate or insert a SGA prn.
- OXYGENATE/VENTILATE
  - Maintain an SpO2 of 95% and EtCO2 levels between 35-45 mmHg, unless otherwise noted.
  - Ventilate/Intubate as needed.
- CIRCULATION
  - Support blood pressure initially with fluids. Many medications depress myocardial contractility and heart rate, which predispose the patient to heart failure even with boluses as little as 500mL. Assess lung sounds and blood pressure after each 500mL bolus.

8.2 Beta Blocker Overdose

INFORMATION

Common Beta Blockers include: Atenolol, Carvedilol, Metoprolol, and Propranolol. In addition to the treatment listed below, the Florida Poison Information Center may be contacted at: 1 (800) 222-1222 for further assistance and/or medical control. **Patients with BB overdose can also present with hypoglycemia and altered mental status.**

ADULT

IF PATIENT IS HYPOTENSIVE:

- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.
- Consult with Poison Control for further orders.
- GLUCAGON: **1mg/min IV/IO for refractory hypotension. Max dose of 10mg (if available).**
- For nausea/vomiting, ZOFRAN: 4mg IM or slow IV/IO, can be administered prn.
- ETOMIDATE: **10mg SLOW PUSH** IV/IO one dose for sedation prior to Pacing.
- TRANSCUTANEOUS PACING: For refractory bradycardia and heart blocks, start rate at 60 BPM and increase prn to maintain B/P.
- Push Dose EPINEPHRINE

PEDIATRIC

IF PATIENT IS HYPOTENSIVE:

- NORMAL SALINE: 20mL/kg bolus IV/IO. May repeat 2x prn for continued hypotension.
- Consult with Poison Control for further orders.
- GLUCAGON: 1mg IV/IO every minute until hypotension resolves (0.5mg for patients less than 20kg, if available) **Max dose 5mg.**
- For nausea/vomiting, ZOFRAN: 0.1mg/kg IM or slow IV/IO can be administered prn. Max dose 4mg.
- ETOMIDATE: 0.15mg/kg **SLOW PUSH** IV/IO for sedation prior to Pacing.
- TRANSCUTANEOUS PACING: For refractory bradycardia, start rate at 80 BPM and increase prn to maintain B/P.
- Push Dose EPINEPHRINE

8.3 Calcium Channel Blocker Overdose

INFORMATION

Common Calcium Channel Blockers include: Norvasc, Cardizem, Cardene, and Procardia.

In addition to the treatment listed below, the Florida Poison Information Center may be contacted at: (1-800-222-1222) for further assistance and/or medical control.

ADULT

IF PATIENT IS HYPOTENSIVE: SBP < 100

- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.
- CALCIUM CHLORIDE: 1g slow IV/IO over 2 min.
- ETOMIDATE: 10mg **SLOW PUSH** IV/IO one dose for sedation prior to Pacing.
- TRANSCUTANEOUS PACING: For refractory bradycardia and heart blocks, start rate at 60 BPM and increase prn to maintain B/P.
- PUSH DOSE EPINEPHRINE: for SBP < 100, unresponsive to above.

PEDIATRIC

IF PATIENT IS HYPOTENSIVE:

- NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn for continued hypotension.
- Consult with Poison Control for further orders.
- CALCIUM CHLORIDE: 20mg/kg slow IV/IO over 2 min repeat every 5-10 minutes until symptoms resolve. Max dose 1gm.
- Etomidate: 0.15mg/kg **SLOW PUSH** IV/IO for sedation prior to Pacing.
- TRANSCUTANEOUS PACING: For refractory bradycardia, start rate at 80 BPM and increase prn to maintain B/P.
- PUSH DOSE EPINEPHRINE : for age-appropriate hypotension not responsive to above.

8.4 Cocaine Overdose

INFORMATION

Signs of Cocaine overdose include: Tachycardia, Supraventricular and Ventricular arrhythmias, CP/MI, HTN, Seizures, Excited Delirium, and Hyperpyrexia. In addition to the treatment listed below, the Florida Poison Information Center may be contacted at: 1-(800)-222-1222 for further assistance and/or medical control.

ADULT

PATIENTS PRESENTING WITH SVT, WCT, HTN, SZ:

- **VERSED: 5mg IV/IO/IN/IM. May repeat either route 1x prn.**
- Contraindicated in hypotension.
- Monitor for respiratory depression.

SEVERLY AGITATED PATIENTS:

- CONSIDER Chemical Restraint Protocols.
- **KETAMINE: 4mg/kg IM. May repeat 1x prn. Max single dose 400mg and total dose 800mg per patient.**
- PLACE PATIENT ON CARDIAC MONITOR AND EtCO2.
- DO NOT RESTRAIN OR PLACE IN PRONE POSITION.
- **BE PREPARED TO MANAGE THE AIRWAY.**

FOR PATIENTS PRESENTING WITH CHEST PAIN

- Administer Versed as noted above.
- If no response, refer to "Chest Pain Protocol."

PEDIATRIC

Consult with Poison Control for orders.

8.5 TCA Overdose

INFORMATION

Common Tricyclic Antidepressants include Amitriptyline, Desipramine, and Doxepin.

Signs of significant TCA overdose include Coma, Convulsions (seizures), Cardiac arrhythmias & Acidosis. In addition to the treatment listed below, the Florida Poison Information Center may be contacted at: 1-(800)-222-1222 for further assistance and/or medical control.

COMMON SIGNS OF TCA OVERDOSE:

MAD	as a	HATTER
RED	as a	BEET
HOT	as	HELL
DRY	as a	BONE
BLIND	as a	BAT

ADULT

IF PATIENT IS HYPOTENSIVE:

- NORMAL SALINE: 1L, may repeat 1x prn. Assess lung sounds and BP every 500ml.
- **FOR PATIENT WITH A QRS COMPLEX GREATER THAN 0.10 SECONDS (2.5 SMALL BOXES)**
- **SODIUM BICARBONATE: 50mEq slow IV/IO every 5 minutes until ECG changes are resolved. Maximum 150mEq.**
- Consult with Poison Control for further orders.

8.5 TCA Overdose

PEDIATRIC

IF PATIENT IS HYPOTENSIVE:

- NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn for continued hypotension.
- **For patients with a QRS complex greater than 0.08 seconds (2 small boxes) or for patients who remain hypotensive after 20ml/kg fluid bolus.**
- **SODIUM BICARBONATE 4.2% OR 8.4%: 1mEq/kg slow IV/IO.**
- Consult with Poison Control for further orders.

WIDE QRS COMPLEX

TCAs cause death primarily through lethal arrhythmias. A wide QRS is an ominous sign and must be treated with Sodium Bicarbonate. Sodium Bicarbonate may be administered as indicated above, while simultaneously contacting Poison Control for further orders.

8.6 Narcotic Overdose

INFORMATION

Common narcotics include Codeine, Dilaudid, Heroin, Methadone, Oxycontin, Vicodin, Lorcet and Lortab. In addition to the treatment listed below, the Florida Poison Information Center may be contacted at: 1-(800)-222-1222 for further assistance and/or medical control.

Consider restraints prior to giving NARCAN

GOAL

The goal for managing a narcotic overdose is to maintain adequate respirations, not to fully reverse the sedative effects of the narcotics. Full reversal can cause non-cardiogenic pulmonary edema and violent behavior.

ADULT

- Maintain an SpO2 of 95% and EtCO2 levels between 35-45 mmHg.
- BVM SUPPORT- Aggressive ventilation can drastically improve patient outcomes.
- NARCAN: 0.5-2.0mg IV/IO/IM/IN. Repeat every 1-minute prn for a respiratory rate less than 12 BPM up to 10mg.

PEDIATRIC

- Maintain an SpO2 of 95% and an EtCO2 between 35-45 mmHg.
- NARCAN: 0.5mg IV/IO or 1mg IN/IM. Repeat every 2-3 minutes prn for decreased respirations (less than 20 breaths/minute for children and less than 40 breaths/minute for neonates). Max single dose 0.5mg IV/IO or 1mg IN/IM. Max total dose 10mg.
  - For suspected MULTIPLE DRUG OD nonresponsive to Narcan, consider an advanced airway.

CHEMICAL CONTROL

SECTION 9

Section 9

Chemical Control

9.1 Physical Restraints

INFORMATION

Restrain patients only if necessary to protect the patient or personnel from harm. Restrained patients shall be positioned in a supine.

PURPOSE

- Establish the circumstances under which restraints may be applied by EMS personnel.
- Identify the types of restraints and adjuncts that may be used.
- Establish the requirements for monitoring restrained patients and documentation.

POLICY

- The need for EMS personnel to maintain his/her personal safety comes first and foremost in their duties.
- Physical restraints are permitted for patients who are at immediate risk for harming themselves or others because of impaired judgment due to but not limited to any combination of the following:
  - Drugs and/or alcohol
  - Psychiatric illness
  - Head injury
  - Metabolic causes (CNS infection, Hypoglycemia, etc.)
  - Dementia
  - Hypoxic patients requiring intubation and at risk for self-extubation.
- If appropriate, EMS personnel shall follow the Altered LOC/Syncope protocol (or other appropriate protocols) after the patient is physically restrained.
- EMS personnel, understanding the impact of restraints upon one's dignity, shall apply the restraints in a professional manner and conduct themselves in such a way as to not appear disrespectful when treating the patient.

9.1 Physical Restraints

- EMS personnel shall restrain patients in such a way as to protect the patient's airway, breathing, and circulation, and to facilitate evaluation and treatment of the patient's medical condition.
  - EMS personnel shall frequently assess the patient to ensure that the restrained patient's airway is patent, distal limb circulation is adequate, and that restraints can be released quickly should the patient require cardiopulmonary resuscitation.
  - Airway and suction equipment shall always be available for the restrained patient. EMS personnel shall never leave the restrained patient unattended.
- EMS personnel shall always seek assistance from the appropriate public safety agency to assist with securing the scene.
- If a combative patient aggressively breaks away (escapes) from EMS personnel, the patient shall not be pursued or subdued if they do not represent an immediate threat to the EMS provider.
- Law Enforcement is the appropriate public safety agency to secure the scene and assure safety in the field.

COMBATIVE PATIENTS SHALL NOT BE RESTRAINED IN THE PRONE POSITION

Placing patients in the prone position is contraindicated due to the risks of asphyxiation. However, impalement or other situations may mandate the prone position. In these instances, clear documentation of justification and attention to airway maintenance is mandatory.

9.1 Physical Restraints

- Approved Restraints:
  - Soft restraints: The primary physical restraint device used in the pre-hospital setting. Following FDA recommendations.
  - Stretcher or spine board straps (Velcro, Buckle): Should be used to supplement the soft restraints. The strap across the chest shall never be over tightened. This allows adequate motion of the chest wall muscles and diaphragm, during respiratory process.
  - Long back board: The patient should be secured to a long back board then placed on a stretcher for transport.
  - C-collar: To maintain C-spine protection and minimizes flexion of the neck to prevent a patient from biting an EMS provider.
  - A non-rebreather mask with appropriate oxygen flow may be used for a spitting patient.
  - Any method of restraint used must allow for monitoring of the patient's vital signs and airway control.
- EMS personnel are not authorized to place a patient in hard plastic ties (temporary or riot handcuffs) or any form of restraint requiring a key to remove. These devices shall be placed by law enforcement only.
- Restraint equipment placed by law enforcement (handcuffs, plastic ties, or "hobble" restraints) on an individual in an Extremely Agitated State that requires Advanced Life Support transport should be packaged to maximize IV and airway access and transported without delay. See Restraint Procedure below.

- A LEO should accompany the patient to the hospital. The paramedic may request the LEO to ride in the back during transport; however, this will ultimately be at the discretion of the LEO and they may choose to follow the rescue to the hospital.
- ***FLFR: "The Police Department will maintain custody of the patient/prisoner and will be required to accompany the patient during transport." SOP Article 1103***
- This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment that is approved by their respective agency to establish scene management control.
- EMS personnel are not authorized to use any other form of physical restraint not specifically authorized by this policy.

9.1 Physical Restraints

PROCEDURE

- All combative patients requiring EMS transport to the Receiving Hospital shall have all four of their extremities placed in approved soft restraints and secured to a long back board or stretcher by an appropriate number of qualified personnel.
- When the extremities have been secured to a long back board, there will be at least three straps with quick release buckles placed approximately at the patient's torso, hips, and knees.
- Additional adjuncts listed above may be used if the patient is spitting and/or biting.
- One EMS provider will be assigned to maintain control of the patients' head preventing movement and/or biting. This EMS provider will also attempt verbal de-escalation and monitor the patient's airway and level of consciousness.
- EMS personnel shall document the following information on the PCR:
  - The patient's behavior that necessitated restraint usage;
  - Restraints and adjuncts used;
  - The time the restraint was applied;
  - Assessment of the patient's condition after restraints were applied (e.g., airway patency, distal extremity circulation) and every 3-minutes after the initial application.

9.2 Chemical Restraint

INFORMATION

HYPERACTIVE DELIRIUM
Patient presents as bizarre, aggressive behavior which may be associated with cocaine or "crack", PCP or "angel dust", MDMA, methamphetamine or amphetamine, and FLAKKA use.

VIOLENT PATIENTS
Indicated for violent, agitated patients who place themselves and/or crew in danger.

When Ketamine is not available for adult violent patients: substitute Haldol 5 mg IM one dose and Benadryl 50mg IM one dose – These can be given in the same syringe with retractable needle.

ADULT PROCEDURE

- The decision to use Ketamine is the sole discretion of Fire Rescue personnel based on strict adherence to protocol.
- **KETAMINE: 4mg/kg IM. May repeat 1x prn. Max single dose 400mg and total dose 800mg per patient.**
- **Allow the patient to hyperventilate** as this is the body's natural mechanism to compensate for severe acidosis and helps prevent rapid decompensation.
- Do not hold the patient in a prone position or allow the patient to be handcuffed with hands behind back.
- Once calm, physical restraints may be unnecessary but may be used as an added precaution.

AFTER KETAMINE ADMINISTRATION

- Continuously monitor and maintain patient's SpO2 at 95% OR GREATER and EtCO2 between 35-45mmHg.
- Obtain IV/IO access.
- Repeat DOSE OF KETAMINE as needed to treat Excited Delerium
- *BE PREPARED FOR RESPIRATORY DEPRESSION AND HYPOTENSION.*
- Obtain and document a temperature early into treatment and monitor the temperature throughout transfer of care.

9.2 Chemical Restraint

ADVERSE REACTION TO KETAMINE

- Hypersalivation: **ATROPINE: 1mg IV/IM/IO.**
- Laryngospasm (Stridor): Try the following interventions in the order of:

1. High flow O2
2. BVM
3. Rapid Sequence Intubation

AFTER KETAMINE ADMINISTRATION

- Continuously monitor and maintain patient's SpO2 at 95% and EtCO2 between 35-45mmHg.
- Obtain IV access.

HIGHER RISK FOR RESPIRATORY DEPRESSION and/or AMS

- Over 65 years of age
- Head trauma
- <50 kg
- Other sedatives on board (Benzodiazepines or alcohol)

PEDIATRIC PROCEDURE FOR SEVERE AGITATION

- The decision to use Ketamine is the sole discretion of Fire Rescue personnel based on strict adherence to protocol.
- **KETAMINE: 1mg/kg IV/IO/IM (DILUTED) May repeat 3x prn. SEE MED TOOL**
- **ALL PEDIATRIC KETAMINE MUST BE DILUTED**
- **MAXIMUM IM KETAMINE IS 4ML**
- **Allow the patient to hyperventilate**, as this is the body's natural mechanism to compensate for severe acidosis and helps prevent rapid decompensation.
- Do not hold the patient in a prone position or allow the patient to be handcuffed with hands behind back.
- Once calm, physical restraints may be unnecessary but may be used as an added precaution.
- Cardiac Monitoring and ETCO2 is mandatory.

9.3 Pain Management

INFORMATION

When administering pain medications continuously monitor the ECG. Maintain the SpO2 at 95 % and the EtCO2 between 35-45 mmHg. Monitor patient's blood pressure and respirations prior to and after administering Fentanyl and/or Ketamine. Pain management can be administered to all patients complaining of pain. Pain medications shall not be administered to pregnant patients who are ≥32 weeks gestation and in active labor, as we do not treat "labor-related" pain. However, if the patient has a pain complaint unrelated to labor, it should be treated appropriately.

ADULT

Fentanyl is the front-line medication for MODERATE TO SEVERE pain:

- 50mcg slow IV/IO/ IM/IN. May repeat AFTER 5 minutes prn. Max total dose 200mcg.
- Monitor patient for respiratory depression.
- NARCAN: To reverse respiratory depression or chest wall rigidity:
- ZOFRAN 4mg for treatment of nausea and vomiting secondary to Fentanyl.

Ketamine: FOR CONTINUED SEVERE PAIN MANAGEMENT

- Ketamine should be given after Fentanyl max dose for severe pain.
- **Ketamine is first line for hypotensive patients or patients who have opiate contraindications (allergy, history of abuse, etc.)**
- 25mg IV/IO/IM. May repeat 2x every 5 minutes prn. Max total dose 75mg..
- Do not give Ketamine for non-traumatic chest pain.

Toradol: FIRST LINE FOR Minor to moderate pain

- **15mg IV/IO, 30mg IM - MAXIMUM ONE DOSE**
- **DO NOT GIVE IN PEDIATRIC PATIENTS <18**
- **DO NOT GIVE FOR SUSPECTED CARDIAC CHEST PAIN**
- **DO NOT GIVE FOR TBI**
- **DO NOT GIVE IF PATIENT IS OVER 20 WEEKS OF PREGNANCY**
- **EXCELLENT FOR SUSPECTED MUSCULOSKELETAL INJURY & KIDNEY STONE**

IO INFUSION PAIN MANAGEMENT:

- (1% = 10mg/ml or 2% lidocaine = 20mg/ml)

LIDOCAINE: 40mg IO over one minute (FOR PT GREATER THAN 20KG). Allow Lidocaine to dwell in IO space for one minute and flush with NORMAL SALINE 10ml. May administer additional LIDOCAINE: 40mg (4ml of 1% or 2ml of 2%))

9.3 Pain Management

PEDIATRIC

- **KETAMINE AND FENTANYL MUST BE DILUTED WHEN GIVEN IV/IO**

- **FENTANYL: 1 mcg/kg (Diluted) slow** IV/IO OVER 2 MIN May repeat every 5 mins prn. Max single dose 100mcg. Max total dose 200mcg.

- **FENTANYL**: **1.5 mcg/kg (Diluted) IN/IM.** May repeat every 5 mins prn. Max single dose 100mcg. Max total dose 200mcg.
  - Monitor patient for respiratory depression.
  - Discontinue if patient becomes drowsy.
  - Contraindicated in age-appropriate hypotension.
  - To reverse respiratory depression or chest wall rigidity, administer **NARCAN 0.5mg IV/IO/IM or 1mg IN every 2-3 minutes prn. Max total dose 2mg.**

FOR CONTINUED **SEVERE** PAIN MANAGEMENT (>12 YEARS OLD): **KETAMINE** should be given after Fentanyl max dose has already been given.

- **KETAMINE:** 25mg given. 0.25ml = 25 mg IM non-diluted.
- If **KETAMINE** diluted (10mg/ml) then give 2.5ml IM

IO INFUSION PAIN MANAGEMENT: (1% = 10mg/ml or 2% = 20mg/ml)
LIDOCAINE: **1 mg/kg per dose up to 40 mg max**

ZOFRAN ADMINISTRATION: If IV access is unobtainable, it is acceptable to administer the IV formulation of Zofran via the PO route to the patient.

CHEST WALL RIGIDITY

Fentanyl administration can cause rigidity in the chest wall which can result in difficulty ventilating the patient and respiratory failure. Although rare, it can occur at any age. Administering Fentanyl too fast can increase the risk. If chest wall rigidity occurs after the administration of Fentanyl, it can be reversed with Narcan.

9.4 Opioid Addiction: (Future Protocol)

ADULT

The following procedure is authorized for a patient that has recently used opioids and is experiencing withdrawal symptoms on the Clinical Opiate Withdrawal Scale (COWS).

Exclusion Criteria

- AMS
- Patient does have mental capacity
- Unwilling to provide name, DOB, and phone number
- Unwilling to be transported
- Pregnant
- Taken Methadone in past 48 hours
- Hypersensitivity to BUPRENORPHINE or NALOXONE

Common Opiate Narcotics:

- Fentanyl (Duragesic)
- Codeine
- Dilaudid (Hydromorphone)
- Heroin (Diamorphine)
- Methadone (Methadose)
- Lorcet, Lortab, Vicodin (Hydrocodone)
- Oxycontin (Oxycodone)
- Percocet
- Morphine (MS Contin)
- Dilaudid (Meperidine)

Indications

- Suspected Narcotic Overdose (Opiate)
- Spontaneous Respirations $\geq$ 10
- SPO2 > 93%
- EtCO2 < 45 mmHG
- COWS > 5

Procedure

- Obtain Verbal Consent for administration of SUBOXONE
- Suboxone: 16 mg SL
- If no response in 15 minutes, repeat with 8mg SL

9.4 Opioid Addiction: (Future Protocol)

INFORMATION

The following procedure is authorized for a patient that has recently used opioids and is experiencing withdrawal symptoms on the Clinical Opiate Withdrawal Scale (COWS).

- Assess patient for any of the following exclusion criteria:
    - Altered mental status/no capacity
    - Unwilling to give name and DOB and phone number for follow up
    - Unwilling to be transported to the hospital
    - Pregnant
    - Taken methadone within the past 48 hours
    - ADULT
- Calculate a Clinical Opiate Withdrawal Scale (COWS) score · Score < 5
- Monitor and transport · Score ≥ 5
- Attempt to obtain verbal consent for administration of SUBOXONE
- If patient declines, patient is NOT eligible for SUBOXONE

SUBOXONE SUBLINGUAL

- 16mg SL
- If no response in 15 minutes, repeat with 8mg SL
- Contraindications - Hypersensitivity/Allergy to BUPRENORPHINE OR NALOXONE

9.4 Opioid Withdraw Assessment Protocol: (Future Protocol)

Clinical Opiate Withdrawal Scale (COWS)		
RESTING PULSE RATE: Measured as patient is siting or lying for one minute 0 - pulse rate 80 or below 1 - pulse rate 81-100 2 - pulse rate 101-120 4 - pulse rate greater than 120	SWEATING: Over past 1/2 hour not secondary to room temp. 0 - no report of chills or ushing 1 - chills or Flushing 2 - moistness skin on face 3 - beads of sweat on brow or face 4 –Sweat streaming off face	RESTLESSNESS: Observaon during assessment 0 - able to sit still 1 - reports difficulty sitting still, but can 3 - frequent shifting or extraneous movements of legs/arms 5 - Unable to sit still for more than a few seconds
PUPIL SIZE 0 - normal size 1 - pupils possibly larger than normal for room light 2 - pupils moderately dilated 5 - pupils so dilated that only the rim of the iris is visible	BONE OR JOINT ACHES 0 - not present 1 - mild discomfort 2 - severe diffuse aching of joints/ muscles 4 -unable to sit because of discomfort	RUNNY NOSE OR TEARING 0 - not present 1 - nasal drip or unusually moist eyes 2 - nose running or tearing 4 - nose constantly running or tears streaming down cheeks
GI UPSET: Over last 1/2 hour 0 - no GI symptoms 1 - stomach cramps 2 - nausea or loose stool 3 - vomiting or diarrhea 5- multiple episodes of diarrhea or vomiting	TREMOR: Observaon of outstretched hands 0 - No tremor 1 - tremor can be felt, but not observed 2 - slight tremor observable 4 - gross tremor or muscle twitching	YAWNING: Observaon during assessment 0 - no yawning 1 - yawning once or twice during assessment 2 - yawning three or more times during assessment 4- yawning several times/minute
ANXIETY/IRRITABILITY: 0 - none 1 - increasing irritability or anxiousness 2 - irritable anxious constantly 4- irritable or anxious unable to participate	SKIN: (Gooseflesh) 0 - skin is smooth 3 - piloerection of skin can be felt or hairs standing up on arms 5 – piloerection of skin	Total COWS Score:_____
5 - 12 = Mild Withdrawal	13 - 24 = Moderate Withdrawal	25 - 36 = Moderately Severe Withdrawal
> 36 = Severe Withdrawal		

ENVIRONMENTAL EMERGENCIES

SECTION 10

Section 10

Environmental Emergencies

10.1 Decompression Sickness

INFORMATION

Signs and symptoms of decompression sickness include stroke-like signs and symptoms such as visual disturbances, AMS, paralysis or weakness, numbness/tingling, bowel/bladder dysfunction. Any patient with these signs and symptoms who has used SCUBA gear or compressed air within a 48-hour period shall be considered a dive emergency, unless it is certain that the patient has had an unrelated trauma. Divers in cardiac arrest should be transported to the closet ED.

ADULT & PEDIATRIC

- Apply high flow oxygen.
- Maintain the EtCO2 between 35-45 mmHg.
- If patient is apneic or obtunded, assist respirations and intubate prn.
- Place the patient in a supine position.
- Treat arrhythmias as per appropriate protocol.
- Consider a tension pneumothorax.
- NORMAL SALINE: 1L bolus
- If patient has SOB, decreased breath sounds or hemoptysis, fluids should be decreased to a KVO rate.
- **Transport all patients with suspected decompression sickness to the nearest emergency department with helipad.**
- **Contact DAN (Diver Alert Network) Emergency Hotline 1-(800)-662-3637**
- **Hyperbaric Chamber: MERCY HOSPITAL MIAMI OR ST. MARY'S PALM BEACH**
- Consider Air Rescue transport (Max 500 ft.)
- **Use of Helipad is excluded from EMTALA**

DIVE HISTORY

Try to obtain an accurate history of the dive; i.e., number of dives, depth of dives, interval between dives and type of air mixture in tanks. Obtaining the dive computer is extremely helpful but should not delay transport.

10.2 Fatal Drowning / Non-fatal Drowning

INFORMATION

Spinal Motion Restriction: Routine stabilization of the cervical spine is not required in the absence of circumstances suggesting a spinal injury, such as diving, rough surf, or a vehicle accident with subsequent submersion, etc.

ADULT

FATAL DROWNING: Cardiac Arrest resulting from drowning

- Follow appropriate cardiac arrest protocol.
- **Immediate VENTILATION is a priority. ETT intubation is the Gold Standard. Consider the S.A.L.A.D. technique to aid in intubation.**
- Remove patient's wet clothes, dry, and cover with blankets.
- **Drowning victim is to be pronounced dead at the scene, only if the patient's temperature is >90F (32C)**

NON-FATAL DROWNING

- **All non-fatal drowning patients must be transported to the hospital.**
- Follow appropriate cardiac arrhythmia protocol prn.
- CPAP: (10cm H2O) for pulmonary edema secondary to near drowning (For patients greater than 30 kg).

If Ventilator available: See Protocol

IF PATIENT IS HYPOTENSIVE WITH CLEAR LUNG SOUNDS

- NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.

IF PATIENT IS HYPOTENSIVE WITH PULMONARY EDEMA

- Cardiogenic Shock protocol

10.2 Fatal Drowning / Non-fatal Drowning

PEDIATRIC

FATAL DROWNING: Cardiac Arrest resulting from drowning

- Follow appropriate cardiac arrest protocol.
- Remove patient's wet clothes, dry, and cover with blankets.
- Cardiac Resuscitation.
- **Drowning victim is to be pronounced dead at the scene, only if the patient's temperature is >90F (32C)**

NON-FATAL DROWNING

- All non-fatal drowning patients must be transported to the hospital.
- Follow appropriate cardiac arrhythmia protocol prn.

IF PATIENT IS HYPOTENSIVE WITH CLEAR LUNG SOUNDS

NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn. Assess lung sounds and blood pressure frequently.

IF PATIENT IS HYPOTENSIVE WITH PULMONARY EDEMA

- Cardiogenic Shock protocol

10.3 Heat Emergencies

INFORMATION

Signs & Symptoms of heat stroke include AMS, Seizures, Hypotension, Tachycardia, and Red, Hot, Flushed Skin. Sweating may be absent.

ADULT

HEAT CRAMPS & HEAT EXHAUSTION

- Move patient into a shaded or air-conditioned area. Remove excessive clothing.
- Provide ORAL HYDRATION (preferably water) if available.
- Monitor patient for an altered mental status, which may indicate a heat stroke.
- NORMAL SALINE: 1L IV/IO. Assess lung sounds and blood pressure every 500ml.

HEAT STROKE

- Patients with a heat-related illness associated with an altered mental status should be considered to have heat stroke once all the other possibilities for the AMS have been ruled out (hypoglycemia, drugs/alcohol, trauma, etc.).
- Move patient into the back of the rescue as soon as possible. Decrease the air-conditioning temperature in the patient compartment.
- **Mist the patient with cold water and use fan or manual fan patient (Convection) .**
- Obtain a temperature.

IF TEMPERATURE LESS THAN 103° F

NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.

IF THE PATIENT HAS A TEMPERATURE OF GREATER THAN 103° F BEGIN RAPID COOLING

- Apply ICE PACKS to axilla and groin area. Do not cool to the point of shivering.
- CHILLED NORMAL SALINE: (if available) 1L IV/IO, assess lung sounds and blood pressure every 500ml. You may “tape” ICE PACKS to Saline Bag.
- **Mist the patient with cold water and use fan or manual fan patient (Convection) .**

IF PATIENT IS SEIZING: Follow Seizure protocol

10.3 Heat Emergencies

PEDIATRIC

HEAT CRAMPS & HEAT EXHAUSTION

- **Obtain a temperature.**
- Move patient into a shaded or air-conditioned area. Remove excessive clothing.
- Provide ORAL HYDRATION (preferably water) if available.
- Monitor patient for an altered mental status, which may indicate a heat stroke.
- NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn. Assess lung sounds frequently.

HEAT STROKE

- **Obtain a temperature.**
- Patients with a heat-related illness associated with an altered mental status should be considered to have heat stroke once all the other possibilities for the AMS have been ruled out (hypoglycemia, drugs/alcohol, trauma, etc.).
- Move patient into the back of the rescue as soon as possible. Decrease the air-conditioning temperature in the patient compartment.
- **BEGIN RAPID COOLING**

IF THE PATIENT IS HYPOTENSIVE WITH A TEMPERATURE LESS THAN 103° F

- BEGIN RAPID COOLING
- Apply ICE PACKS to axilla and groin area. Do not cool to the point of shivering.
- CHILLED NORMAL SALINE: (If available) 20ml/kg IV/IO. May repeat 2x prn for hypotension. Assess lung sounds and blood pressure frequently. You may “tape” ICE PACKS to Saline Bag.
- Assess lung sounds and blood pressure frequently.
- **Spray them with water and use fan for convection**

IF THE PATIENT HAS A TEMPERATURE OF GREATER THAN 103° F BEGIN RAPID COOLING

- NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn. Assess lung sounds and blood pressure frequently. You may “tape” ICE PACKS to Saline Bag.

IF PATIENT IS SEIZING

Follow Seizure Protocol

10.4 Bites and Stings

INFORMATION

This protocol includes treatment for snake bites, dog and cat bites, insect stings, marine animal envenomations and stings, and human bites. Florida Poison Information Center may be contacted at 1-800-222-1222.

ADULT & PEDIATRIC

SNAKE BITES

- Mark area of edema or redness with a pen.
- DO NOT apply ice packs, tourniquets or constrictive bands.
- Remove any constrictive jewelry or clothing.
- **If the DEAD snake is on scene, take a picture of the body and head including the eyes with the ePCR device if possible.**
- **ADULT**: If patient is hypotensive, NORMAL SALINE: 1L. Assess lung sounds and blood pressure every 500ml.
- **Benadryl: 50mg IV/IO/IM** and **Solu-Medrol: 125mg IV/IO/IM**
- **PEDIATRIC:** If patient is hypotensive, NORMAL SALINE: 20ml/kg bolus IV/IO. May repeat 2x prn. Assess lung sounds and blood pressure frequently.
- **Benadryl: 1mg/kg IV/IO/IM,** and **Solu-Medrol: 2mg/kg IV/IO/IM**
- Splint any extremity that has received a bite and ensure it remains below the heart.
- **Contact VENOM ONE: 786-229-0736**

DOG, CAT AND WILD ANIMAL BITES

- Wound care as appropriate (DO NOT use hydrogen peroxide on deep puncture wounds or wounds exposing fat).
- Clean the wound area with soap and water or sterile water.
- Advise dispatch to contact animal control and the police department for identification and quarantine of the animal if necessary.
- Consider Pain Management Protocol.

10.4 Bites and Stings

ADULT & PEDIATRIC

INSECT STINGS

- Consider the need for Allergic Reaction Protocol if appropriate.
- Remove the stinger by scraping the patient's skin with the edge of a flat surface (i.e. a credit card). DO NOT attempt to pull the stinger out, as this action may release more venom.
- Clean the wound area with soap and water or sterile water.
- Consider Pain Management Protocol.
- Apply Zerym Spray IF AVAILABLE.

MARINE ANIMAL ENVENOMATIONS: STINGRAY, SCORPIONFISH, LIONFISH, ZEBRAFISH, STONEFISH, CATFISH, WEEVERFISH, STARFISH, SEA URCHIN

- Consider the need for Allergic Reaction Protocol if appropriate.
- Immerse the punctures in non-scalding hot water (if available) to achieve pain relief.
- Gently wash the wound with soap and water and then irrigate it vigorously with sterile water (avoid scrubbing).
- Apply Zerym Spray IF AVAILABLE.
- Consider Pain Management Protocol.

MARINE ANIMAL STINGS: JELLYFISH, MAN-OF-WAR, SEA NETTLE, IRUKANDJI, ANEMONE, HYDROID, FIRE CORAL

- Consider the need for Allergic Reaction Protocol if appropriate.
- Rinse the skin with sea water (if available). (DO NOT use fresh or sterile water; DO NOT apply ice; DO NOT rub the skin.)
- Apply Zerym Spray IF AVAILABLE.
- Remove large tentacle fragments using forceps. Make sure to have proper PPE on and be standing upwind when performing this procedure.
- Consider Pain Management Protocol.

HUMAN BITES

- Clean the wound area with soap and water or sterile water. (DO NOT use hydrogen peroxide on deep puncture wounds or wounds exposing fat).
- Consider contacting the police department for investigation if appropriate.
- Consider Pain Management Protocol.

10.5 Carbon Monoxide Exposure

INFORMATION

Carbon Monoxide (CO) is a chemical asphyxiate, it is a colorless, odorless and tasteless gas that is slightly less dense than air. It is toxic to humans when encountered in concentrations above 35 parts per million (ppm). Lower doses of CO can also be harmful due to a cumulative effect. Patients exposed to carbon monoxide (smoke inhalation, etc.) require a full head to toe patient examination with SpCO monitoring with the rainbow sensor if available.

Consider CO Exposure when multiple patients unconscious near a combustible engine.

ADULT & PEDIATRIC

REMOVE FROM HAZARDOUS ATMOSPHERE PRIOR TO TREATMENT

- All rescuing crew members shall wear their SCBA if the patient is in a hazardous environment.
- **OXYGEN: NRB @ 15 liters/min CONTINUOUS.**
- **Consider Cyanide Toxicity for closed space fire.**

MEASURE SpCO LEVELS (THIS REQUIRES THE RAINBOW SENSOR)

FOR ANY SUSPECTED CARBON MONOXIDE EXPOSURE -Administer high flow oxygen and transport to CLOSEST EMERGENCY DEPARTMENT WITH HELIPAD.

COMMON SYMPTOMS:

- Headache
- Nausea/Vomiting
- Dizziness
- Altered Mental Status
- Chest pain
- Dyspnea
- Visual Disturbances
- Seizures
- Syncope

Patients with CO poisoning can have normal pulse oximetry readings and still be hypoxic. Strong consideration for hyperbaric treatment should be given to all pediatric and obstetrical patients with confirmed CO exposure due to their higher susceptibility to the effects of CO poisoning regardless of SpCO level or symptoms.

10.6 Cyanide Exposure

INFORMATION

AMS and/or Pupil Dilation are highly suggestive of a true cyanide poisoning. Other symptoms may include General Weakness, Confusion, Bizarre Behavior, Excessive Sleepiness, Coma, Shortness of Breath, Headache, Dizziness and Seizures.

ADULT

CONFIRMED OR SUSPECTED CYANIDE POISONING SEE HAZMAT PROTOCOL

- OXYGEN: NRB @ 15 liters/min
- ALERT BATTALION CHIEF
- **CYANOKIT: 5g IV/IO** infused over 10-15 minutes. May repeat 1x prn for a max total dose of 10g for severe cases. (If available or contact EMS 17)
- The CYANOKIT should be administered through a separate/dedicated IV/IO line.

PEDIATRIC

CONFIRMED OR SUSPECTED CYANIDE POISONING SEE HAZMAT PROTOCOL

- OXYGEN: NRB @15 L/min
- **CYANOKIT: 70mg/kg** max single dose 5g. May repeat 1x prn
- The CYANOKIT should be administered through a separate/dedicated IV/IO line.

CARDIAC ARREST: All patients that are suspected to be in cardiac arrest secondary to cyanide poisoning should be administered the CYANOKIT.

Cyanide poisoning may result from inhalation, ingestion or absorption from various cyanide containing compounds, including exposure to fire or smoke in an enclosed space.

Direct cyanide exposure (non-smoke inhalation) is a Hazardous Materials Incident.

OBSTETRICAL EMERGENCIES

SECTION 11

Section 11

Obstetrical Emergencies

11.1 Obstetrical Standing Orders

ASSESSMENT

- Perform Initial Assessment
- Obtain Focused History
  - Number of previous pregnancies (GRAVIDA)
  - Number of previous viable births (PARA)
  - Last Menstrual Cycle
  - Show of blood: document time, amount, etc.
  - Water broke: document time, color of water, etc.
  - Documented multiple births
  - Gestational Diabetes
  - Narcotic use
  - Due date
  - Frequency and length of contractions
  - Feeling of having to push or have a bowel movement
  - If crowning, prepare for a field delivery, but do not delay transport to the closest appropriate hospital.
  - Transport patients in their third trimester not in active labor on their left side.

OBSTETRICAL PATIENTS (DEFINED AS PREGNANCY 20 WEEKS OR GREATER)

- Patients less than 20 weeks are GYN cases and can be transported to closest ED.
- Over 20 weeks with any abdominal/pelvic pain transport to the closest OB hospital.
- Over 20 weeks with a minor concern can go to the closest ED.
  (IF PATIENT IS OVER 20 WEEKS WITH ANY CONSTITUTIONAL SYMPTOMS TRANSPORT TO OB HOSPITAL)
- Stable patients over 20 weeks may go to the OB hospital of their choice within 40 minutes.
- **Over 20 week and in cardiac arrest transport to closest OB Hospital.**
- **Over 20 weeks with trauma transport to Trauma/OB Hospital.**

11.2 Complications of Pregnancy

COMPLICATIONS OF EARLY PREGNANCY

- **ECTOPIC PREGNANCY**
  - Ectopic pregnancies usually occur in the first trimester and may present with sudden onset of severe lower abdominal pain and/or vaginal bleeding.
  - Patients with amenorrhea, vaginal bleeding and abdominal pain are highly suspicious for an ectopic pregnancy.
  - Other signs & symptoms of an ectopic pregnancy include: referred pain to the left shoulder, Cullen's Sign (periumbilical ecchymosis) or Grey Turner's sign (ecchymosis of the flanks), abdominal distention and tenderness.

- **SPONTANEOUS ABORTION**
  - Spontaneous abortions usually occur before 20 weeks of gestation. Signs and symptoms include abdominal cramping, vaginal bleeding and the passage of tissue or fetus.
  - **IF Gestational Age is GREATER THAN 22 WEEKS and Fetus is NOT out of the Amniotic sac, open the sac, cut the umbilical cord and start neonatal resuscitation.**

- **TREATMENT FOR COMPLICATIONS OF EARLY PREGNANCY**
  - Assess and treat for shock.
  - Rapid transport to any approved OB/GYN facility.

11.2 Complications of Pregnancy

COMPLICATIONS OF LATE PREGNANCY

PLACENTA ABRUPTIO

- Sudden onset of severe abdominal pain and tenderness
- Painful uterine contractions
- Vaginal bleeding with dark red blood
- Patient may present in shock

PLACENTA PREVIA

Characterized by painless vaginal bleeding (bright red blood).

UTERINE RUPTURE

- Sudden, intense abdominal pain and vaginal bleeding.
- Consider abnormalities of the abdominal wall, which are abnormal contour of the abdomen, uterus may lose round shape, palpable fetal parts, asymmetry.

TREATMENT FOR THIRD TRIMESTER COMPLICATIONS

- Treatment for third trimester bleeding is aimed at the prevention or treatment of shock.
- Transport patients in their third trimester on left side by elevating the right side of their body 4-6 inches with towels or pillows or by manually displacing the uterus to the left.
- All patients with third trimester bleeding shall be transported to approved OB facility.
- If it is necessary to perform MICCR on a pregnant patient in their third trimester, manually displace the uterus to the left rather that tilting the patient to the left.

11.3 Pre-Eclampsia and Eclampsia

INFORMATION

Severe pre-eclampsia occurs and is characterized by HTN, AMS, Visual Disturbances, HA, and/or Pulmonary Edema. **Eclampsia is characterized by any of the severe pre-eclampsia signs/symptoms associated with seizures or coma.** Either condition can occur for up to 45 days postpartum.

Check Blood Glucose

SEVERE PRE-ECLAMPSIA and ECLAMPSIA: (Gestational Age over 20 weeks) Defined as a SBP greater than **140 mmHg OR a DBP of greater than 90 mmHg on** two consecutive blood pressures, 5 minutes apart, **with one of the following**:

Signs/Symptoms:

- AMS
- Headache
- Visual Disturbances
- Peripheral and Pulmonary Edema
- **Clonus: Patient should rapidly dorsiflex the foot at the ankle and hold. Positive test is indicated by rhythmic involuntary oscillating contractions resembling a "flickering". This indicates CNS hyperexcitability and imminent seizure.**

Pre-Eclampsia

- **MAGNESIUM SULFATE: 2g** in 100ml with 10 drop set and run wide open
- **Labetalol: 20mg IV Push; 1 dose max**

Eclampsia: Actively Seizing

The following is a "Bundle of Care" and may be administered in whatever fashion is quickest:

- **MAGNESIUM SULFATE: 4g IV/IO** in 100ml with 10 drop set and run wide open
- **AND MAGNESIUM SULFATE: 2gm IM** - 4ml (Lateral Thigh)
- If IV/IO access is not available it is acceptable to give MAG SULFATE 6gm IM in 3 different sites.
- **Labetalol: 20mg IV Push; 1 dose max**
- SEIZURE: Seizure Protocol

11.4 Normal Delivery

NORMAL DELIVERY

- Position patient on her back with knees flexed and feet flat on the floor.
- Control delivery of the head, with gentle perineal pressure.
- Do not apply **manual pressure to the uterine fundus prior** to the birth of the child.
- Do not pull or push on the fetus.
- Do not allow sudden hyperextension of the newborn's head.
- Support the newborn's head as it rotates to align with the shoulders, gently guide the newborn's head downward to deliver the anterior shoulder.
- Once the anterior shoulder delivers, gently guide the newborn's head upward to deliver the posterior shoulder and the rest of the body.

UPON DELIVERY OF THE NEWBORN

- Dry, warm, and stimulate the newborn.
- Wait until the cord stops pulsating and turns white before clamping the cord (usually 3-5 minutes).
- **DO NOT PULL ON THE UMBILICAL CORD TO ATTEMPT DELIVERY OF THE PLACENTA. SPONTANEOUS DELIVERY WILL OCCUR IN 5-30 MIN.**
- **Clamp the umbilical cord in the following fashion:**
  - Place the first **clamp 6" away** from the newborn's body.
  - Milk the cord away from the newborn and towards the mother (this will minimize splatter).
  - Place the second **clamp 2" away** from the first, towards the mother.
  - Cut the cord between the two clamps.

Meconium Delivery

- Meconium aspirators are rarely needed, however if newborn is in respiratory distress, or airway is obstructed by meconium that cannot be cleared by simpler methods then use meconium aspirator.
- **Picture and proper setup of device**

11.4 Normal Delivery

- **IF THE BABY IS BORN BUT REMAINS WITHIN THE AMNIOTIC SAC, GENTLY OPEN THE AMNIOTIC SAC WITH YOUR FINGERS TO RELEASE THE BABY.**
- The newborn can be placed on the mother's chest or abdomen. This will keep the newborn's umbilical cord at about the level of the placenta.
- Record an APGAR score at 1 and 5 minutes and document the delivery time.
- Apply firm continuous downward pressure, manually massaging the uterine fundus after the placenta delivers. Preserve the placenta in the bag provided with the OB Kit or a "Red Bio-Hazard bag" for inspection by the receiving hospital.
- **It is common for initial (1min) APGAR to be 8**

APGAR SCORE	0	1	2
Appearance	Blue/Pale	Body pink extremities blue	Completely Pink
Pulse	Absent	Below 100	Above 100
Grimace	No Response	Grimaces	Cries
Activity	Limp	Some flexion of extremities	Active Motion
Respirations	Absent	Slow/Irregular	Good Strong Cry

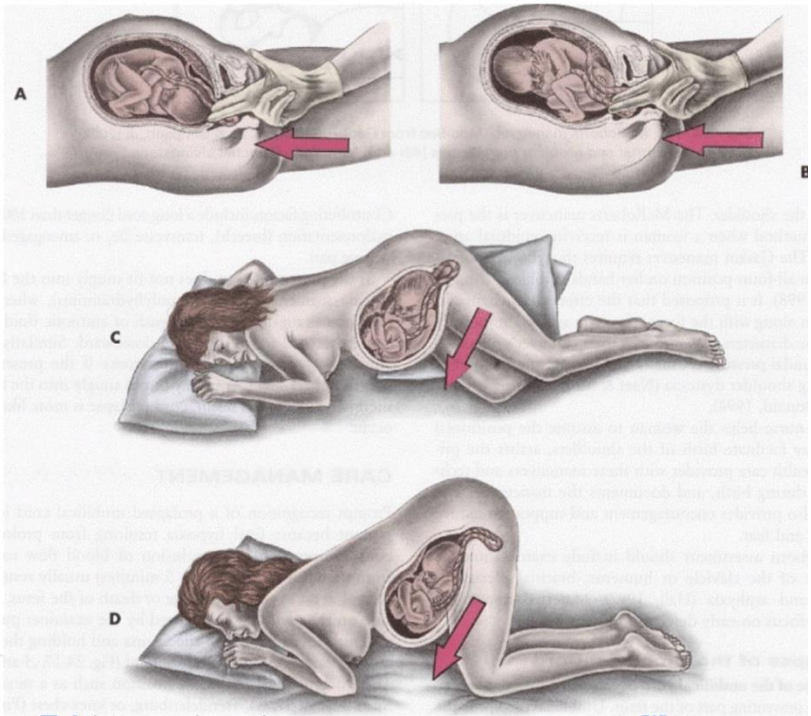
11.5 Breech Birth

INFORMATION

A breech birth occurs when a baby is positioned to deliver buttocks or feet first instead of the normal head-first position. This can happen in several forms, including frank breech, where the baby's buttocks present with legs extended upward; complete breech, where the baby's buttocks present with legs folded; or footling breech, where one or both feet come first. A breech presentation is a true obstetric emergency due to the risk of cord prolapse, head entrapment, and asphyxia. Field management includes avoiding traction on the baby, supporting the body once delivered to the umbilicus, and ensuring a patent airway once the head is delivered. Rapid transport to an obstetric-capable facility with early notification is essential.

BREECH BIRTH (FEET OR BUTTOCKS PRESENTATION)

- If the head does not deliver within 3 minutes of the body, elevate the mother's hips (knee to chest position) and insert a gloved hand into the vagina and push the vaginal wall away from the baby's nose and mouth.
- Expedite transport while maintaining the knee to chest position and the baby's airway.
- **Administer blow by oxygen to the newborn.**



11.6 Shoulder Dystocia

INFORMATION

Shoulder dystocia is an obstetric emergency where, after the delivery of the fetal head, the anterior shoulder becomes impacted behind the maternal pubic symphysis, preventing delivery of the body.

Signs of Shoulder Dystocia:

- Fetal head delivers but retracts against the perineum ("turtle sign")
- Failure of the shoulders to deliver with normal gentle traction
- Head-to-body delivery time >60 seconds

Instruct the Mother:

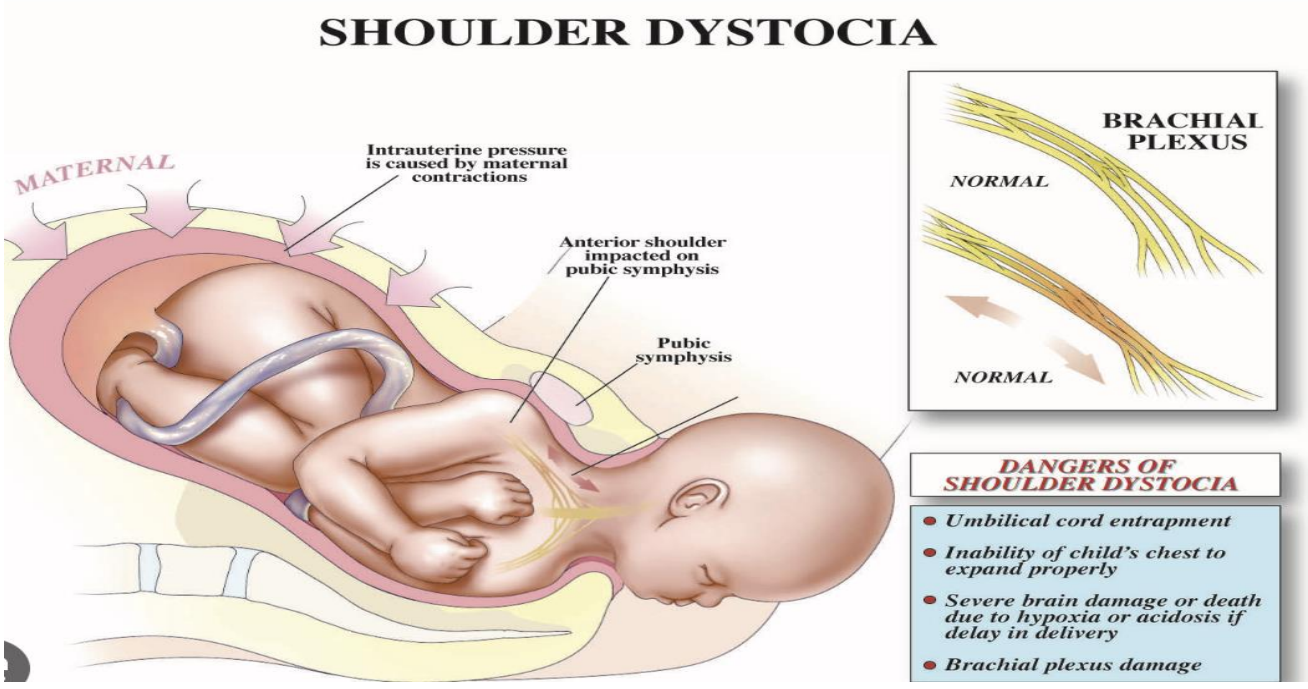
- **Do not push** until instructed.
- Remain **calm** and explain procedures clearly.

McRoberts Maneuver (First-Line):

- Position mother supine with knees hyper flexed tightly to chest.
- This flattens the sacral promontory and increases the pelvic diameter.
- Apply **suprapubic pressure** (NOT fundal pressure) to dislodge the anterior shoulder.

Suprapubic Pressure:

- Continuous or rocking pressure just above pubic bone, aimed downward and laterally.
- Never apply **fundal pressure**—this may worsen impaction or cause uterine rupture.



11.7 Nuchal Cord

INFORMATION

A **nuchal cord** occurs when the umbilical cord becomes wrapped around a baby's neck one or more times, either loosely or tightly. This is a relatively common finding, occurring in approximately 20–30% of pregnancies, and in many cases it does not cause harm because the umbilical cord is well protected by Wharton's jelly, which helps maintain blood and oxygen flow. However, complications can arise if the cord is tightly wrapped or looped multiple times, as this may restrict blood flow and oxygen delivery to the baby. Nuchal cords are often discovered on ultrasound or during delivery. If the cord is loose, it can usually be slipped over the baby's head without difficulty. If it is too tight, the provider may need to clamp and cut the cord before delivering the shoulders to ensure the baby's safety.

NUCHAL CORD

- Check for the presence of a nuchal cord after delivery of the head.
- If the cord is around the neck, gently hook your finger under the loop and pull it over the newborns head.
- You may have to repeat this if there is more than one loop present.
- If you are unable to free the cord, clamp the cord in two places and cut the cord between the clamps.

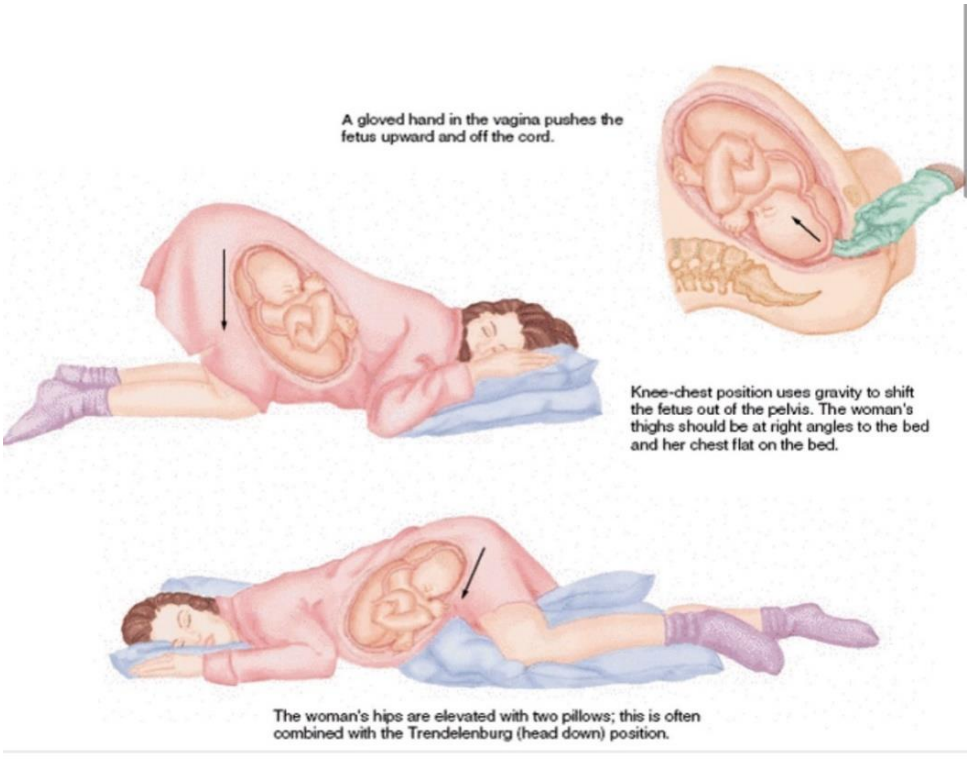
11.8 Prolapsed Umbilical Cord

INFORMATION

A **prolapsed umbilical cord** occurs when the umbilical cord slips through the cervix into the vagina ahead of the baby during labor. This is an obstetric emergency because the cord can become compressed between the baby and the birth canal, cutting off blood flow and oxygen. It requires immediate recognition and rapid intervention, often including relieving pressure from the cord and expedited delivery, typically by emergency cesarean section.

PROLAPSED UMBILICAL CORD

- Place mother in the knee to chest position and manually displace the uterus to the left.
- Insert a gloved hand into the vagina, pushing the newborn up and away from the umbilical cord regardless if there is a pulse present or not.
- Maintain this position during transport and frequently reassess the umbilical cord for the presence of a pulse, as contractions are likely to compress the umbilical cord.
- Wrap the exposed cord in a moist sterile dressing and expedite transport to closest OB facility.



11.9 Postpartum Hemorrhage

INFORMATION

Postpartum hemorrhage (PPH) is a life-threatening obstetric emergency defined as blood loss greater than 500ml after vaginal delivery.

Common causes include uterine atony, retained placental fragments, trauma to the genital tract, and coagulopathy.

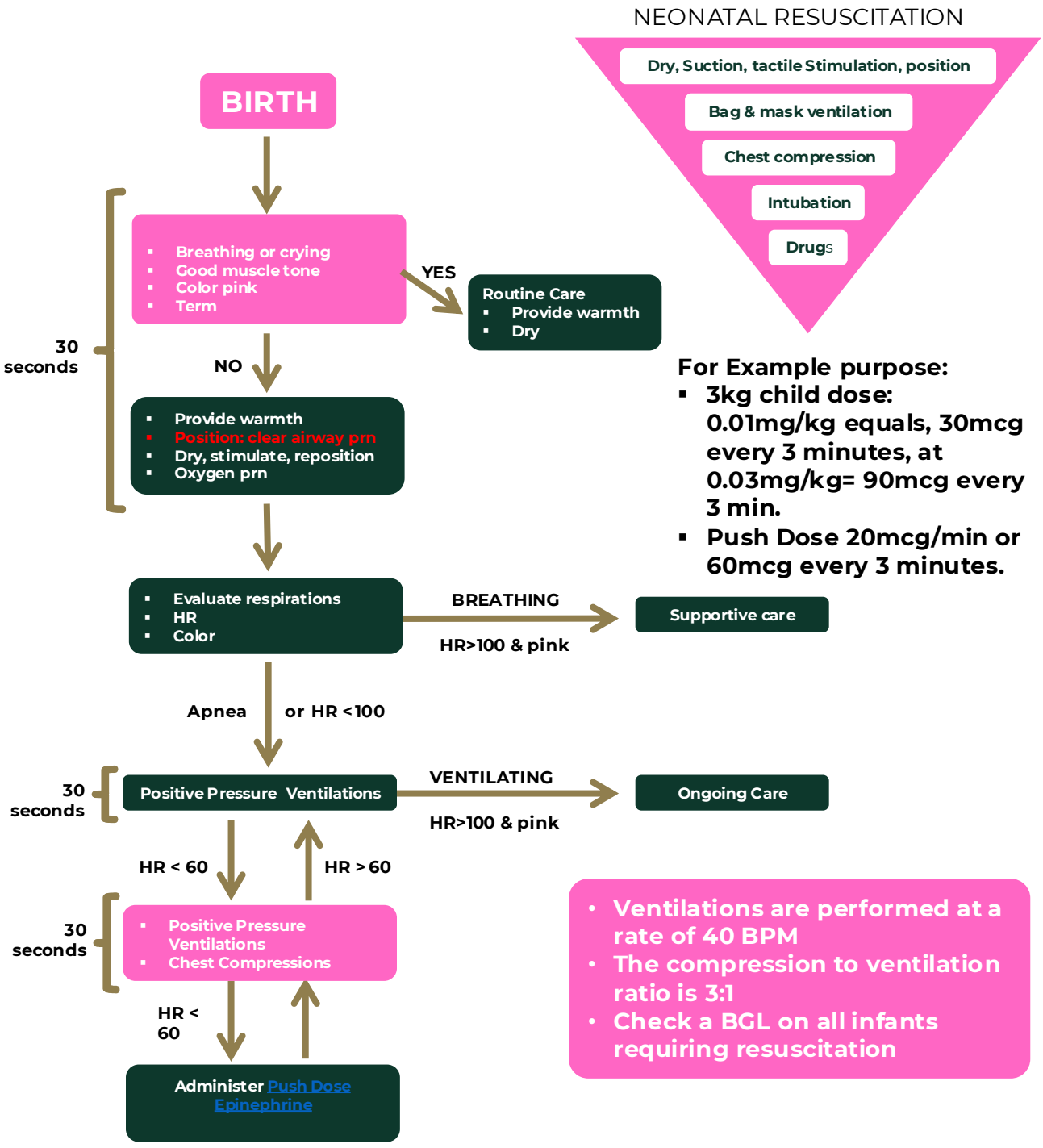
CAUSES OF POST PARTUM HEMORRHAGE

1. TONE: UTERINE ATONY
2. TRAUMA: INJURIES RELATED TO DELIVERY
3. TISSUE: RETAINED PLACENTAL
4. THROMBIN: PRIMARY AND SECONDAY HEMOSTASIS PATHOLOGY - EXAMPLE DIC

EMS Management:

1. **High-flow oxygen**
2. **Whole blood as per protocol if available**
3. **TXA** for bleeding control **as per protocol**
4. **Pitocin(Uterotonic Agent): 10 U IM Lateral Thigh one dose (Ok to give Pitocin even if patient does not meet hemorrhagic shock criteria).**
5. Uterine Massage
6. Rapid transport to an obstetric-capable facility with pre-notification.
7. Continuous assessment of vital signs, estimated blood loss, mental status, and signs of hypoperfusion is key.
8. Proper positioning (left lateral or supine with legs elevated) can aid in perfusion.

11.10 Neonatal Resuscitation



For Example purpose:

- **3kg child dose: 0.01mg/kg equals, 30mcg every 3 minutes, at 0.03mg/kg= 90mcg every 3 min.**
- **Push Dose 20mcg/min or 60mcg every 3 minutes.**

- **Ventilations are performed at a rate of 40 BPM**
- **The compression to ventilation ratio is 3:1**
- **Check a BGL on all infants requiring resuscitation**

11.10 Neonatal Resuscitation

Delayed Cord Clamping (DCC)

- **Recommended for all vigorous term and preterm infants** for at least **30–60 seconds**, when no immediate resuscitation is required.
- If immediate resuscitation is needed, **cord milking is not recommended for infants <28 weeks** gestation due to possible harm.

Initial Oxygen Use

- For preterm infants <35 weeks: Start resuscitation with **3L NC** and titrate using **pulse oximetry**.
- For term infants: **21% oxygen (room air)** remains the standard starting point.
- Emphasis on **avoiding hyperoxia** through careful titration.

Positive Pressure Ventilation (PPV)

- Focus on **effective ventilation**: "**Every baby who does not breathe should receive PPV within 60 seconds (the Golden Minute)**."
- **PEEP of 5cmH20** is encouraged for more controlled pressures with ventilator or BVM device.
- Emphasis on **early correction of ineffective ventilation:** monitor chest rise and heart rate.

4. **Use of ECG for Heart Rate Monitoring - 4-lead ECG** is now the **preferred method** for rapid and accurate heart rate assessment during resuscitation.

- Pulse oximetry is still used to guide oxygen titration, but not for real-time HR monitoring.

5. **Sustained Inflation is not recommended**

- Brief **sustained inflations (>5 seconds)** are no longer supported due to evidence of **potential harm** in extremely preterm infants.

11.10 Neonatal Resuscitation

6. Laryngeal Mask Airway (LMA)

- Now **recommended earlier** in the algorithm: for newborns ≥ 34 weeks or ≥ 2000 g **if mask ventilation is ineffective and intubation is unsuccessful or not feasible**.

7. Epinephrine

- IV EPINEPHRINE remains the preferred route.
- USE MED TOOL FOR DOSING

8. Thermal Management

- Reinforced strategies to prevent hypothermia, especially in **preterm infants <32 weeks**:

  Use of plastic wrap, radiant warmers, heated mattresses, and pre-warmed delivery rooms.

MEDICAL PROCEDURES

SECTION 12

Section 12

Medical Procedures

Medical Procedures

Medical Procedures

12.1 12-Lead ECG

INDICATIONS

Refer to individual protocols

CAUTION

- Treatment of life-threatening problems such as dysrhythmias, acute pulmonary edema, shock, etc. should be initiated prior to obtaining a 12 lead ECG.
- Obtaining a 12 lead ECG should not delay transport of critically ill patients.
- If 12 lead already obtained by another health care provider; do not delay transport. Monitor 12 lead enroute to the ER.

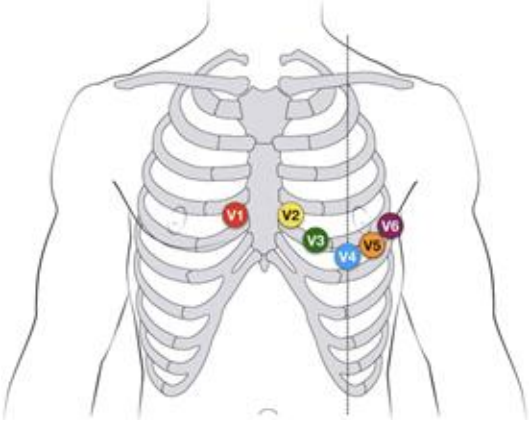
PROCEDURE

- **Lead placement is paramount in obtaining an accurate 12 lead.**
- Clean area for electrode placement with antiseptic swabs.
- Shave area if needed being careful not to cause lacerations.
- The midclavicular line may be found by dropping an imaginary line from the middle of the clavicle down.
- The mid-axillary line can be found by dropping an imaginary line from the armpit down.
- Leads V4 through V6 must be in a straight line and this may not always be in the intercostal space.
- Run a V4R if ST changes seen in leads II, III or aVF. Move the V4 lead to the V4R position; manually print V4R.
- Running a second 12 lead with the V4 lead in the V4R position could result in a false impression or diagnosis advisory from the 12 lead monitor analyses.

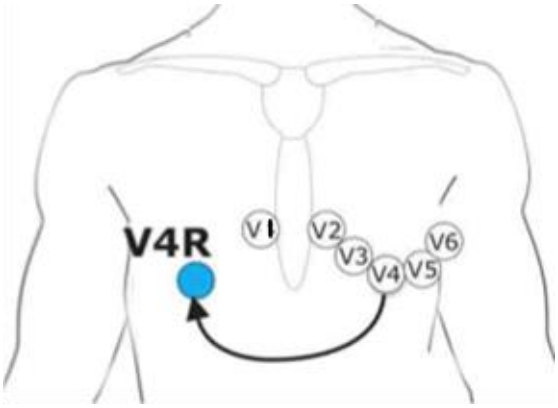
12.1 12-Lead ECG

- Place electrodes as per diagram:
  - RA–right arm, upper arm/shoulder
  - LA–left arm, upper arm/shoulder
  - RL–right leg, upper leg (quad area) or lower leg (calf area)
  - LL–left leg, upper leg (quad area) or lower leg (calf area)
  - V1–4th intercostal space, immediately to the right of the sternum
  - V2–4th intercostal space, immediately to the left of the sternum
  - V4–5th intercostal space, midclavicular line
  - V3–placed diagonally between V2 and V4
  - V5–5th intercostal space, anterior axillary
  - V6–5th intercostal space, mid-axillary line

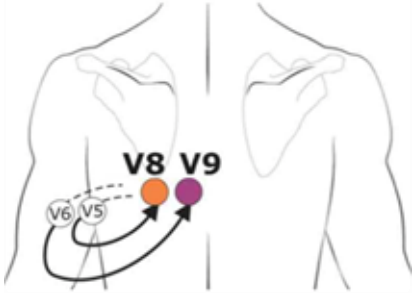
  - V4R–5th intercostal space, right midclavicular line



Standard 12 lead placement



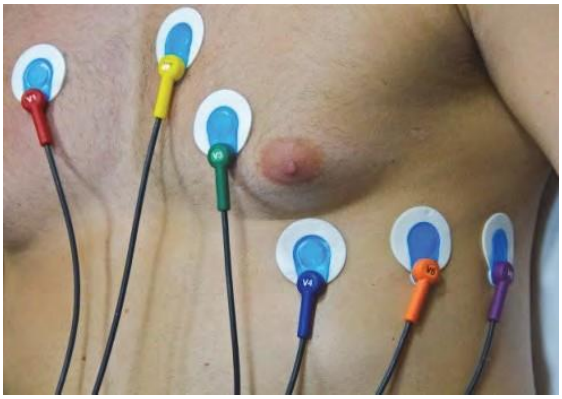
V4 moved to V4r

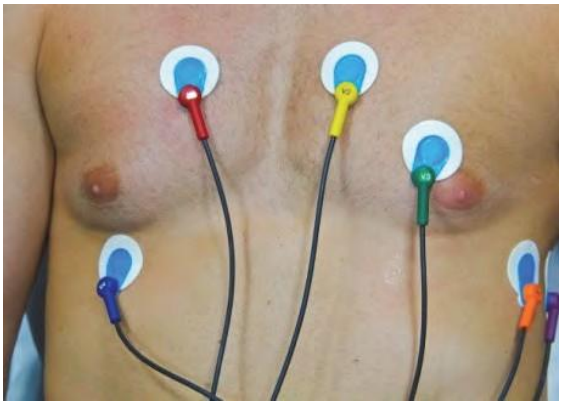


V5/V6 moved posterior to become V8/V9

12.1 12-Lead ECG

- Place electrodes as per diagram:
  - RA–right arm, upper arm or upper chest near the shoulder
  - LA–left arm, upper arm or upper chest near the shoulder
  - RL–right leg, upper leg or lower abdomen near the hip
  - LL–left leg, upper leg or lower abdomen near the hip
  - V1–4th intercostal space, immediately to the right of the sternum
  - V2–4th intercostal space, immediately to the left of the sternum
  - V3–placed between V2 and V4
  - V4–5th intercostal space, midclavicular line
  - V5–5th intercostal space, between V4 and V6
  - V6–5th intercostal space, mid-axillary line
  - V4R–5th intercostal space, right midclavicular line





12.2 Blood Alcohol Sampling

Blood Specimen Requests from Law Enforcement
BSO: SOG E-158
SFRD:
FLFR: SPO 1108

LEGAL INTERPRETATION

FS Chapter 316.1932

"Only a physician, certified paramedic, …acting at the request of a law enforcement officer, may withdraw blood for the purpose of determining the alcohol content thereof or the presence of chemical substances or controlled substances therein…"

CAUTION

Drawing a blood alcohol sample SHOULD NOT DELAY TRANSPORT of the critical patient!

PROCEDURE

- The procedure must be done in the back of the rescue.
- Use only the supplies provided in the Blood Draw Kit that is supplied by law enforcement.
- **Never use alcohol prep to clean the skin.**
- The EMS run report shall contain the following information:
  - A blood sampling kit was used.
  - Name of the law enforcement officer requesting blood sample
  - Time of draw.
  - Document BGL
- EMS providers shall not provide "clearance" for any patient involved in a blood specimen case for law enforcement.
- All blood samples taken shall be surrendered to the requesting law enforcement officer.

12.3 Blood Glucose Monitoring

INDICATIONS

Refer to Individual protocols

GLUCOSE METER APPLICATION/USE

- Daily equipment check and weekly calibration as required.
- Cleanse site and allow to dry.
- Insert test strip into glucose meter until unit turns on.
- Perform finger stick with lancet device and dispose of device in sharps container.
- Perform heel stick on infants(See below).
- Alternate sites are approved by manufacturer: Forearm, upper arm, proximal base of thumb.
- Venous blood sampling is not approved by manufacturer, do not obtain sample from I.V. site
- Touch the tip of the strip to the blood.
- Blood is drawn automatically into the strip. Continue to maintain contact with blood until unit beeps and five (5) second countdown begins.
- After five (5) seconds display will show results (20 – 500 mg/dl):

Common Glucometer Error Codes

LO.....BGL < 20 mg/dl

KETONES.....BGL > 300 mg/dl

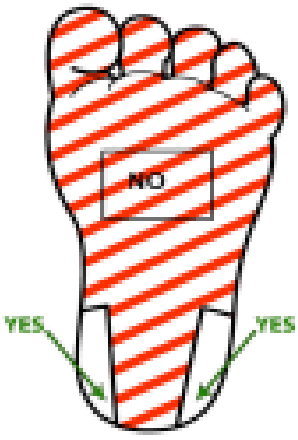
HI.....BGL > 500 mg/dl

E-3.....Test strip error or BGL too low to read

E-4.....Test strip error or BGL too high to read

E-5 – E-9.....Test strip or monitor error

Any abnormal test result should be repeated with a new test strip.



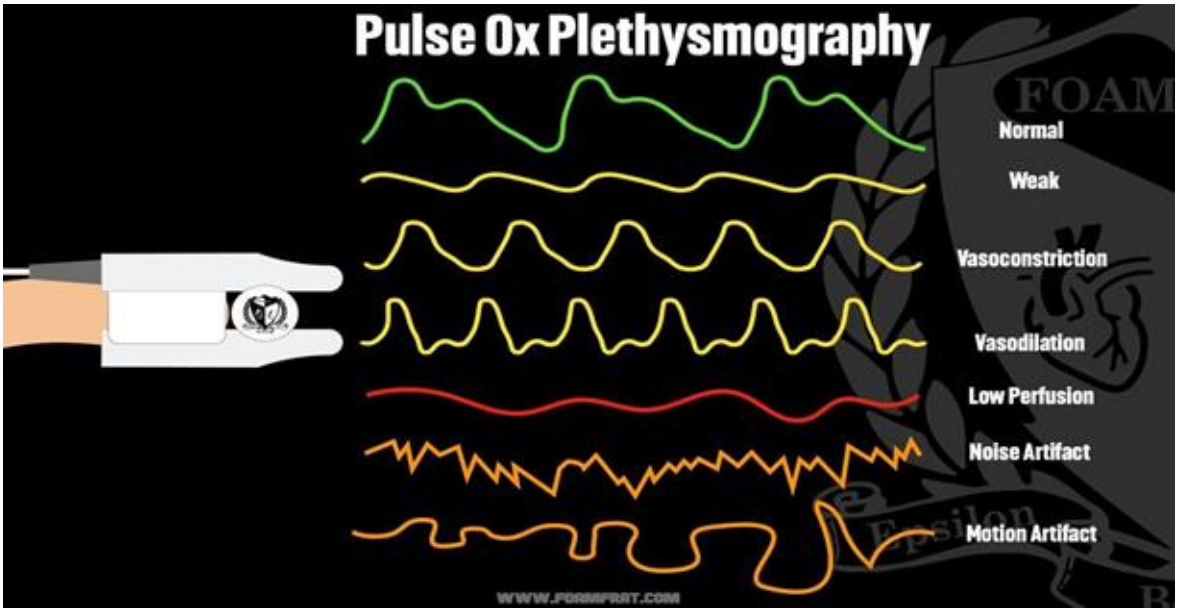
12.4 Pulse CO Oximetry (SpCO)

INDICATIONS

- Known or suspected carbon monoxide exposure
- Smoke inhalation
- During rehab operations for any firefighter in the hot or warm zone of an IDLH

PROCEDURE

- Select site in the following order of preference:
- 1st - Ring finger
- 2nd - Middle finger
- 3rd - Index finger
- Ok to utilize ear lobe or forehead
- Place SpCO sensor on patient's finger
- Ambient light may interfere with obtaining an accurate reading. Place the included light shield over the probe and finger. If a light shield is not available, any item capable of blocking ambient light will suffice (e.g. a folded towel).
- Observe pulse indicator waveform for synchronization with pulse
- Record SpCO prior to oxygen administration if possible
- Record SpCO after oxygen administration
- Refer to Carbon Monoxide protocol for clinical significance of readings.



12.5 Pulse Oximetry (SpO2)

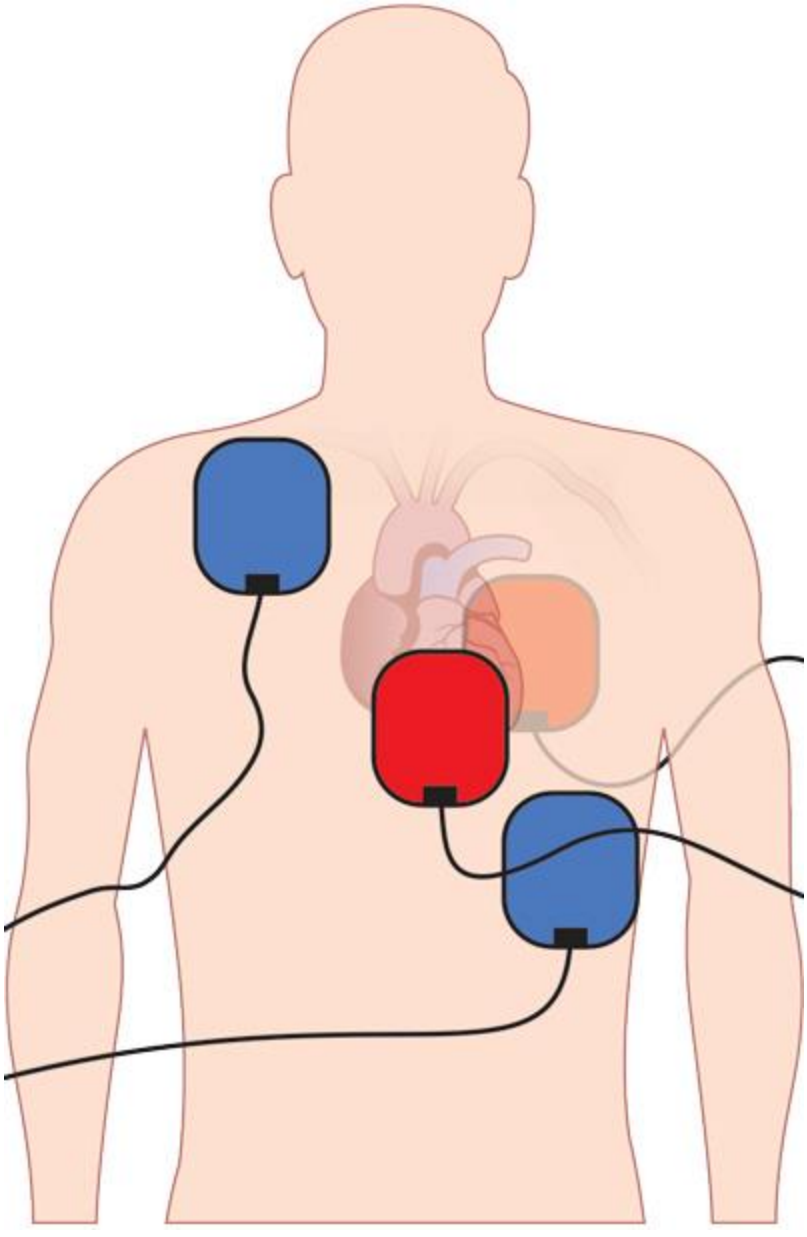
INDICATIONS

- **All transported patients**
- To obtain a baseline during treatment of respiratory distressed patients

PROCEDURE

- Select site
- Place SpO2 sensor on patient's finger, earlobe, or toe as indicated
- Observe pulse indicator for synchronization with pulse
- Record oxygen saturation prior to oxygen administration if possible
- Record oxygen saturation after oxygen administration
- A reading below 90% may call for aggressive oxygenation and/or respiratory assistance
- Monitor for changes

12.6 DSD Pad Placement (Zoll)



12.7 Bougie

INDICATIONS

When endotracheal intubation is considered difficult due to unfavorable anatomy or known or suspected neck trauma limiting neck mobility.

CONTRAINDICATIONS

Should not be used for nasal intubations.

SIZING

Adult Bougie will fit ETTs down to 6.0

PROCEDURE

- Apply appropriate PPE.
- Assess airway and need for a Bougie.
- Prepare equipment needed for endotracheal intubation as indicated.
- Pre-oxygenate the patient.
- Perform laryngoscopy and when anatomy is identified, pass the Bougie into the trachea or anteriorly toward the presumed opening of the trachea. Tracheal placement of the Bougie is noted by a clicking feel/sound as the flexed tip of the Bougie passes over the tracheal rings.
- If clicking is felt from the tracheal rings, advance the Bougie into the trachea. If the Bougie is in the trachea, you will find that that is will meet resistance. This means you are in the lower airway.
- If the Bougie continues to advance with no resistance and no clicking is heard/felt, you are in the esophagus.
- Leave the laryngoscope in place as your partner threads the proper size ET tube over the bougie. Once the ET tube clears the end of the bougie, advance it through the cords while your partner stabilizes the top of the bougie.

12.7 Bougie

- If resistance is encountered at the vocal cords, withdraw the tracheal tube 1-2 cm, rotate it 90 Degrees counterclockwise and then re-advance the tracheal tube.
- When the tracheal tube is clearly in the trachea, remove the Bougie and inflate the cuff.
- Confirm proper endotracheal tube placement.
- Ventilate the patient with 100% oxygen.
- Secure the ETT.

12.8 Continuous Positive Airway Pressure (CPAP)

INDICATIONS

To provide CPAP to spontaneously breathing adult (>30kg) patients in the hospital and pre-hospital (EMS) environment. **A setting of 10cmHg is optimal and recommended.**

CONTRAINDICATIONS

- Absolute Contraindications:
  - SBP less than 90mmHg
  - Patients without spontaneous respirations
  - Decreased LOC (lethargic) or lack of gag reflex
  - Chest barotrauma with suspected pneumothorax
  - Facial fractures with instability or facial deformity
  - Laryngeal trauma
  - Patients < 30kg
  - If patient condition worsens (suspect increasing EtCO2) discontinue CPAP for RSI

- Relative Contraindications evaluate patient for risk vs benefit.
  - Recent tracheal or esophageal anastomosis or surgery
  - Gastrointestinal bleeding or ileus – at risk for aspiration
  - Recent gastric surgery – gastric distention may cause complications
  - Basilar skull fracture suspected
  - Nausea and vomiting – at risk for aspiration
  - Emphysematous Bulla – risk of pneumothorax
  - Hypovolemia - low blood volume at risk for hypotension

Flow (LPM)	CPAP Pressure ($cm H_2O$) Nebulizer Off	CPAP Pressure ($cm H_2O$) Nebulizer On
6	2.0 - 3.0	1.0 - 2.0
10	6.0 - 7.0	2.0 - 3.0
12	8.0 - 9.0	3.0 - 4.0
15	11.0 - 12.0	4.0 - 5.0

CPAP Pressure ($cm H_2O$)	Flow (LPM) Nebulizer Off	Flow (LPM) Nebulizer On
5.0	8 - 9	15 - 16
7.5	10 - 12	19 - 20
10.0	13 - 14	24 - 25
13.0 (Max)	FLUSH	28 - 30

CAUTION:

CPAP pressure will decrease when nebulizer is activated and increase when nebulizer is deactivated. Verify CPAP pressure with manometer and adjust flowmeter as needed.

12.9 Cricothyrotomy

INDICATIONS

Needle and surgical (scalpel) cricothyrotomy may be performed if more conventional techniques of controlling the airway are either unsuccessful or unobtainable as a result of edema, severe oropharyngeal hemorrhage, severe facial trauma, anaphylaxis, inhalation injury, or other severe airway complication. Both procedures are temporary stabilizing techniques and are relatively easy to perform.

CAUTION

The following are common complications:

- Hemorrhage at the insertion site
- Subcutaneous emphysema
- Aspiration of blood into the lungs
- Perforation/laceration of the thyroid cartilage, thyroid gland or esophagus
- Laceration of carotid arteries or jugular veins

Needle Cricothyrotomy

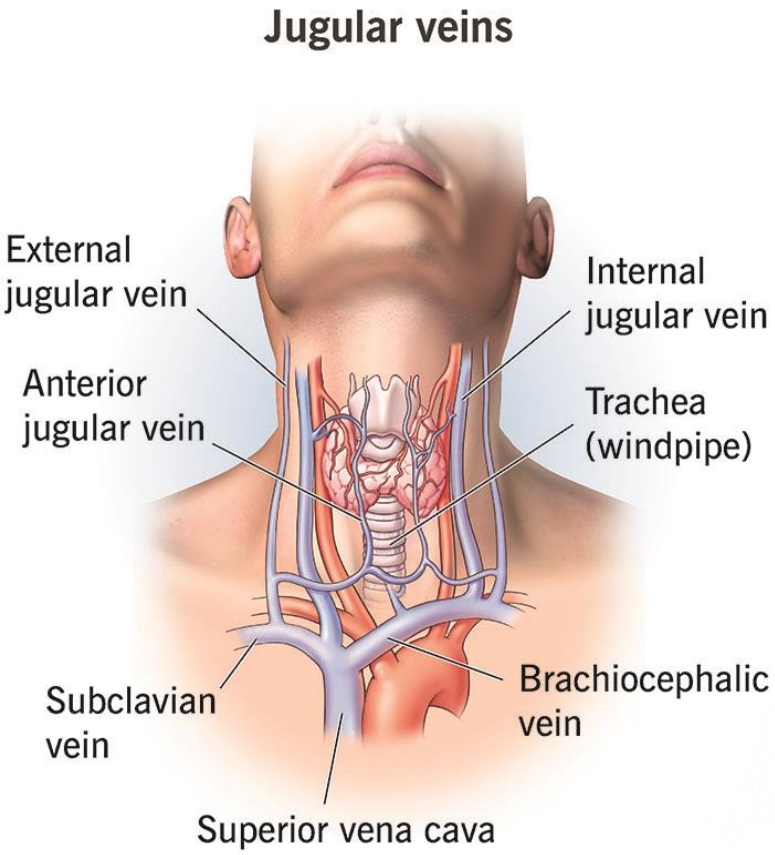
INDICATIONS

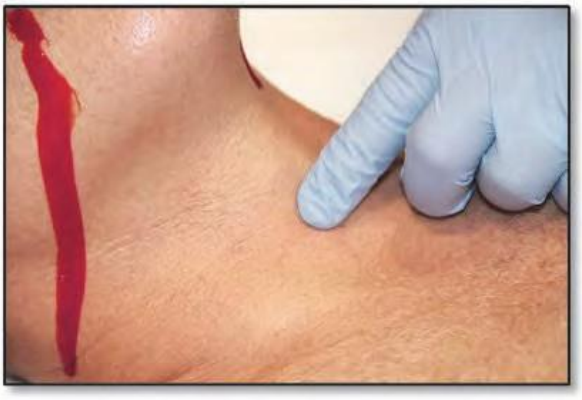
Patient 10 years old and younger

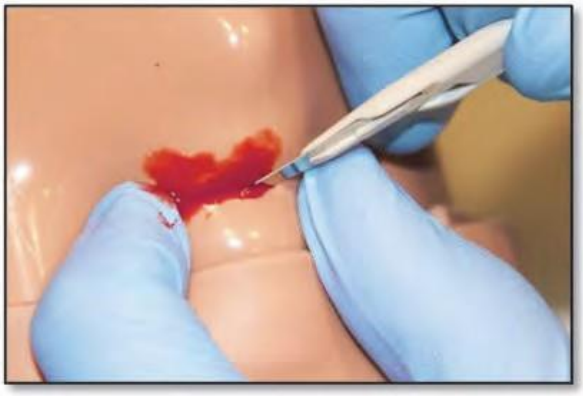
CAUTION

This procedure does not provide airway protection or elimination of carbon dioxide.

12.9 Cricothyrotomy







12.10 Needle Cricothyrotomy

PROCEDURE

- Patient should be placed supine (ensure cervical spine immobilization if trauma is suspected).
- With non-dominant hand, stabilize the trachea between the thumb and middle finger and locate the cricothyroid membrane with the index finger.
- Find the landmark by palpating the patient's neck from the top:
  - The first prominence felt is the thyroid cartilage; the second prominence is the cricoid cartilage.
  - The space between the two, characterized by a small depression, is the cricothyroid membrane.
- Cleanse the site using antiseptic swab.
- Attach a 10ml syringe to the needle of a 14 g catheter over needle set. Flash chamber cap must be removed.
- Insert needle through the cricothyroid membrane at a 45 – 60 degree angle caudally while applying negative pressure to the syringe. Aspiration of air into the syringe indicates entry into the trachea.
- Advance catheter over the needle until the hub makes contact with skin.
- Attach BVM to luer-lock adaptor to 14g catheter.
- Insert OPA or NPA (unless contraindicated) to facilitate passive exhalation.
- Ventilate patient using the appropriate BVM.
- Although it may be difficult to hear, auscultate lung sounds.
- Constantly maintain catheter placement with your hand only.
- Ventilate at a 1:3 IE (inspiration to expiration) ratio, a breath delivered at 1 second with a 3 second exhalation period.

12.11 Surgical Cricothyrotomy

CONTRAINDICATIONS

Children 10 years old and under

PROCEDURE

- Patient should be placed supine (ensure cervical spine immobilization if trauma is suspected).
- With non-dominant hand, stabilize the trachea between the thumb and middle finger and locate the cricothyroid membrane with the index finger.
- Find the landmark by palpating the patient's neck from the top.
- The first prominence felt is the thyroid cartilage; the second prominence is the cricoid cartilage. The space between the two, characterized by a small depression, is the cricothyroid membrane.
- Cleanse the site using antiseptic swab.
- Make a 2cm horizontal incision with a scalpel through the membrane.
    - If needed, a 2-4cm vertical incision may be utilized prior to the horizontal incision to aid in exposing anatomical landmarks in patients where palpation is difficult.
- Insert hemostats into incision and rotate 90 degrees to allow placement of tracheal tube introducer or Bougie.
    - Optional, not required: A tracheal hook may be utilized to facilitate tracheal tube placement. Remove rubber cap from hook, insert hook horizontally into incision until the back curved end makes contact with the posterior of the trachea, rotate hook 90° and pull caudally at a slightly upward angle to capture the distal end of the incision and dilate opening.
    - To remove hook after tube placement, push hook downward to release from trachea, rotate hook 90° horizontally and gently withdraw from trachea, using care as to not puncture the tracheal tube cuff.
- Confirm tube placement by auscultating lung sounds, observing tube condensation and attaching waveform capnography
- Once tube placement is confirmed, secure the tube with included tie-outs by tying around the patient's neck.

12.12 Endotracheal Intubation

OROTRACHEAL INTUBATION

INDICATIONS

Any patient in need of intubation who cannot protect and maintain their own airway.

CAUTION

- Do not use the teeth as a fulcrum
- Remove loose dentures

PROCEDURE

- Use universal precautions
- Select the appropriate size ET tube
- Insert appropriate size stylet (unless using Bougie).
- Inflate and test cuff
- Deflate the cuff (leave syringe attached)
- Check laryngoscope light
- Pre-oxygenate the patient
- Place the patient in the sniffing position if not contraindicated
- Hold laryngoscope with the left hand
- Insert the laryngoscope blade in the mouth, sweeping the tongue to the left
- Visualize the vocal cords
- Insert the ET tube
- Maintain visualization as tube is passed
- Remove the laryngoscope blade
- Inflate the cuff with air and remove the syringe
- Ventilate the patient observing chest rise, auscultate epigastric and lung sounds
- Note the depth of the tube
- **Confirm proper tube placement with waveform capnography**, absence of bowel sounds, auscultation of lung sounds and tube condensation.
- Secure the tube with a restraint device

12.12 Endotracheal Intubation

NASOTRACHEAL INTUBATION

INDICATIONS

- Any patient in need of intubation who cannot protect and maintain their own airway and who has spontaneous respirations
- Age: Puberty and above

CONTRAINDICATIONS

- Apnea
- Airway obstruction caused by foreign body obstruction
- Severe head injury or possible basilar skull fracture
- Bleeding disorders

PROCEDURE

- Select appropriately sized endotracheal tube; this will **usually be 0.5 mm smaller** than that used for orotracheal intubation. Once selected insert the distal end of the tube into the 15mm adapter, forming a circle. This ensures anterior curvature of the tube making it easier to enter the trachea.
- Anesthetize the nostrils and pharynx with topical anesthetic if time permits
- Pick up the tube and release the previously formed circle, lubricate the tube generously with Xylocaine jelly or a water-based jelly and apply BAAM device.
- Keeping the bevel next to the nostril, gently insert the tube into the biggest nostril. With gentle and even pressure, advance the tube through the nostril into the pharynx. Listen down the tube for breath sounds and look for vapor condensation in the tube.
- Advancing the tube as the patient inhales while occluding 15 mm adapter will greatly enhance the chance of success
- When the 15 mm adapter is 1-2cm from the nostril, confirm tube placement by auscultation of the epigastrium and lung fields. If the tube is in the esophagus, withdraw it back until the tip is in the pharynx and advance it again on the patient's inspiratory breath.
- **Attach and monitor EtCO2**
- Once tube placement is confirmed, inflate cuff, secure the tube and ventilate patient using an appropriately sized BVM.

12.13 Supraglottic Airway

INFORMATION

- I-Gel mirrors the anatomy. The shape, softness and contours accurately mirror the peri laryngeal anatomy to create the perfect fit. This innovative concept means that no cuff inflation is required. The SGA works in harmony with the patient's anatomy so that compression and displacement trauma are significantly reduced or eliminated.
- Size Chart:

Description	Size	Weight (kg)
Large Adult	5	90+
Medium Adult	4	50 – 90
Small Adult & Pediatric ≥ 7 YO	3	30 – 60
Pediatric: 2 – 6 YO	2.5	25 – 35
Pediatric: 1 YO	2	10 – 25
Infant < 1 YO	1.5	5 – 12
Neonate	1	2 – 5

INDICATIONS

- Cardiac arrest.
- Respiratory arrest.
- Unconscious patient with inadequate respirations and no gag reflex.
- Use by the ambulance crew in difficult or unexpectedly difficult intubations in a pre-hospital setting in order to quickly establish and maintain a clear airway.

CONTRAINDICATIONS

- Intact gag reflex.
- Trismus, limited mouth opening, pharyngo-peri laryngeal abscess, trauma or mass.
- As with all supraglottic airway devices, particular care should be taken with patients who have fragile and vulnerable dental work, in accordance with recognized airway management.

12.13 Supraglottic Airway

PREPARATION PROCEDURE

- Open the I-Gel packaging and remove device from the protective cradle or cage (pediatric sizes).
- Place a small bolus of lubricant, such as KY Jelly, onto the middle of the smooth surface of the protective cradle or cage (pediatric sizes).
- Grasp the I-Gel by the integral bite block and lubricate the front, back and sides of the cuff with a thin layer of lubricant.
- Inspect the device carefully and confirm there are no foreign bodies or a bolus of lubricant obstructing the distal opening.
- Place the I-Gel back into the protective cradle until ready for insertion.

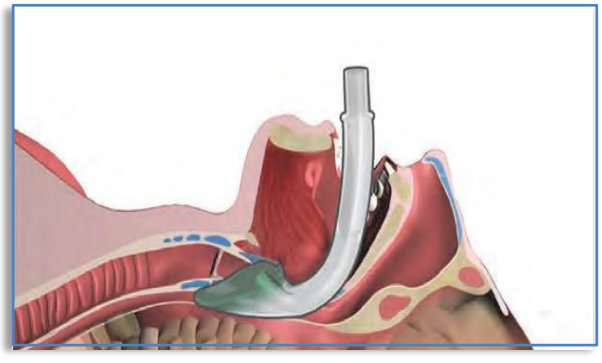
ADULT PREPARATION (Sizes 3 – 5)

PEDIATRIC PREPARATION (Sizes 1 – 2.5)

12.13 Supraglottic Airway

INSERTION PROCEDURE

- Pre-oxygenate the patient.
- Choose the correct size I-Gel and prepare as shown above.
- Grasp the lubricated I-Gel firmly along the integral bite block.
- Position the device so that the I-Gel cuff outlet is facing towards the chin of the patient.
- The patient should be in the 'sniffing' position with head extended and neck flexed.
- The chin should be pressed down before proceeding.
- Introduce the leading soft tip into the mouth of the patient in direction towards the hard palate.
- Glide the device downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt.
- Do not apply excessive force on the device on insertion.
- It is not necessary to insert fingers or thumbs into the patient's mouth during the process of insertion.
- The incisors should be resting on the integral bite block.
- The I-Gel has a horizontal line on the integral bite block to indicate the optimal position of the teeth.
- Ventilate the patient and confirm that lungs sounds are present.
- **Attach EtCO2 waveform capnography.**
- Secure the I-Gel.
- If needed, insert a lubricated soft suction catheter in the gastric port to suction the patient.
- If needed, insert a lubricated NG tube in the gastric port and advance into the stomach to perform gastric decompression.



Suraglottic Airway

Air –Q

In development

12.14 Gastric Tube

INDICATIONS

- As an adjunct in gastric emptying for non-particulate overdoses (ingestions).
- To decompress the stomach after intubation (ET, SGA) to reduce the possibility of vomiting.

CONTRAINDICATIONS / PRECAUTIONS

- Patient who has ingested caustic substances
- Esophageal tumors / esophageal varices
- Significant facial trauma
- Pediatric patients
- Basilar skull fractures

EQUIPMENT NEEDED

- Double – Lumen Levin tube (proper size)
- Water-soluble lubricant
- Tape
- 50ml irrigation syringe
- Emesis basin
- Suction unit

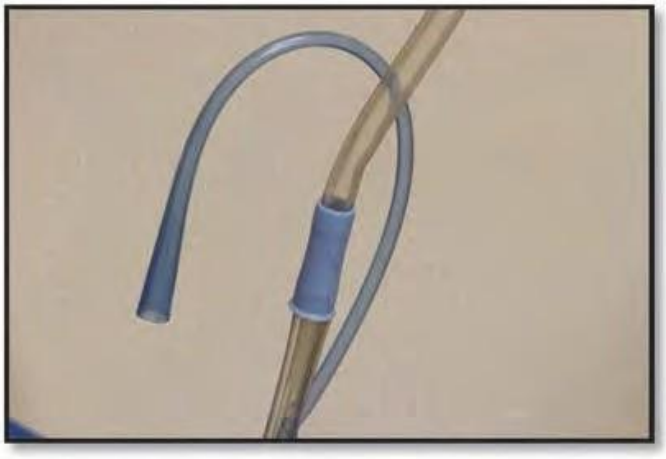
PROCEDURE

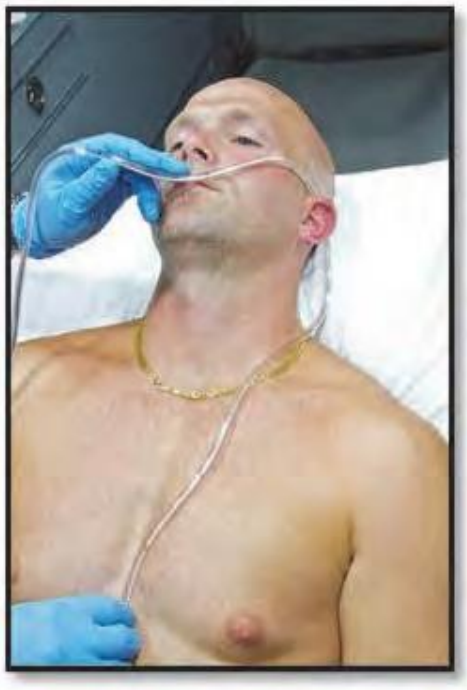
- Explain procedure to patient (if conscious).
- Measure tube from patient's stomach to ear to the tip of the nose.
- Lubricate tip and first 2 to 3 inches of tube.
- Place patient in high Fowler's position with neck flexed forward.
- Instruct the patient to swallow on command during procedure to assist in passage of the tube.
- Insert the tube along the floor of an unobstructed nostril, choose nostril with the most open channel.
- Gently and slowly advance the tube while patient continues to swallow until the tube is at the desired level noted by the marks on tube.
- If patient begins to cough or choke stop and allow the patient to rest, if problem persists remove tube and start again.

12.14 Gastric Tube

- After tube insertion is complete, verify placement by injecting 20 to 30ml of air into the tube while auscultating the epigastric region for sounds of air movement, leave syringe attached until aspiration of stomach contents is initiated.
- Secure the tube with tape to the nose and cheek.
- Lavage stomach contents by injecting 100ml to 150ml bolus of normal saline into the tube and allow the return of gastric contents by aspiration.
- Document amount of fluid infused and returned by lavage.

12.14 Gastric Tube





12.15 Suctioning

SSCOR Quickdraw

INDICATIONS

It is intended for intermittent operation to remove secretions, blood, or vomit from a patient's airway to allow ventilation. Higher vacuum levels are generally selected for oropharyngeal suctioning, and lower vacuum levels are usually selected for tracheal suctioning and the suctioning of children and infants.

CONTRAINDICATIONS

Not for use in suctioning of neonates. The minimum suction range of this unit exceeds recommended levels for neonatal suctioning.

SPECIFICATIONS

- Maximum negative pressure >500mmHg; Low negative pressure setting approximately 80 - 100mmHg
- Approx. 3 hours of suction time
- Weight: 2.6 lbs.

REPLACING THE CANISTER

- Canister must be replaced after each patient use
- Be sure to connect suction hose from unit to canister
- Test unit to make sure there is no leaking air

12.15 Suctioning

MECONIUM SUCTIONING

CAUTION

- Routine tracheal suctioning of meconium is not indicated unless respiratory compromise persists.
- The presence of meconium alone is not an indication for tracheal suctioning or intubation.
- When the infant's condition is unstable, it may be possible to clear the trachea of all meconium before positive pressure ventilation must be initiated.
- This intervention should not be delayed while infant is being dried.
- Mechanical suction should be set no higher than 100 mm/Hg.

PROCEDURE

- Visualize hypopharynx with a laryngoscope and remove any residual meconium with suctioning.
- Intubate the trachea and suction the lower airway utilizing a meconium aspirator connected to the ET Tube.
- Repeat as necessary (suctioning should be done for no more than 5 seconds at a time).
- After initial stabilization is achieved, and orogastric tube should be placed into empty newborn's stomach since it may contain meconium that could later be regurgitated and aspirated.

12.16 S.A.L.A.D. Technique

PURPOSE:
The Suction-Assisted Laryngoscopy and Airway Decontamination (S.A.L.A.D.) technique is used to manage airways contaminated with blood, vomitus, or other fluids. This method improves visualization of the glottic opening during laryngoscopy and prevents aspiration by continuous suctioning.

INDICATIONS:
Active oropharyngeal contamination with blood, vomit, or secretions.
Anticipated or known high risk of airway contamination during intubation.
Failed attempts at endotracheal intubation due to obscured glottic view.

CONTRAINDICATIONS:
None absolute.
Relative: situations where rapid airway control is required and setup time would critically delay ventilation.

REQUIRED EQUIPMENT:
Rigid suction catheter (e.g., Yankauer or DuCanto catheter preferred).
Suction tubing with continuous high-flow suction.
Video or direct laryngoscope.
Endotracheal tube with stylet.
Bougie (Optional but recommended)
Bag-valve mask with appropriate adjuncts.

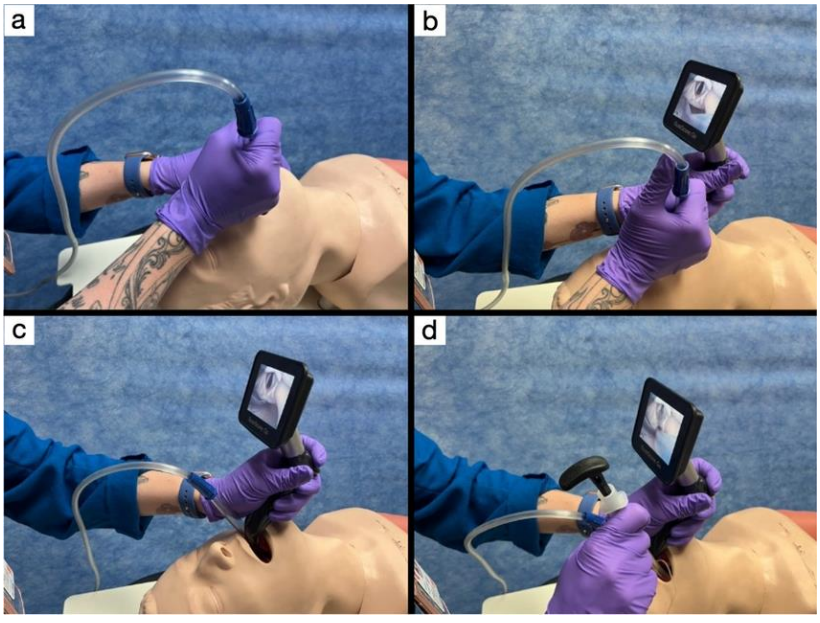
PROCEDURE STEPS:

- **PREPARATION:**
  - Assemble suction equipment and ensure continuous high-flow suction is functioning.
  - Position patient in optimal airway alignment (sniffing or ramped position).
  - Pre-oxygenate with 100% oxygen when possible.
- **INITIAL SUCTIONING:**
  - Insert the rigid suction catheter into the oropharynx.
  - Clear secretions and fluid while advancing toward the glottic opening.

12.16 S.A.L.A.D. Technique

- **Park the Suction Catheter:**
  - Advance the suction catheter into the esophagus, maintaining continuous suction.
  - Leave it “parked” to provide ongoing evacuation of fluids during the procedure.
- **Laryngoscopy:**
  - Insert the laryngoscope blade alongside the suction catheter.
  - Use the laryngoscope to visualize the glottis while the catheter continues to evacuate fluid.
- **Intubation:**
  - Pass the endotracheal tube through the vocal cords under direct visualization.
  - Remove the stylet and confirm placement with waveform capnography and auscultation.
- **Final Management:**
  - Remove the suction catheter after successful intubation and stabilization.
  - Secure the tube and continue mechanical ventilation or manual ventilation as appropriate.

S.A.L.A.D. intubation technique by Dr. Jim Du Canto



12.17 Cardioversion- Synchronized

INDICATIONS

Perfusing tachyarrhythmias with serious signs and symptoms related to the rhythm.

PRECAUTIONS

- Cardioversion is generally unnecessary for heart rates <150 bpm.
- If delays in cardioversion occur and clinical conditions are critical, proceed with immediate unsynchronized defibrillation.

EQUIPMENT NEEDED

- BSI
- EKG monitor / defibrillator
- Electrode pads
- Peripheral IV supplies

PROCEDURE

- Take B.S.I. precautions
- Obtain vital signs and assess patient condition.
- Place patient on high flow oxygen.
- Identify rhythm on the cardiac monitor.
- Insert peripheral IV as soon as possible **(do not delay cardioversion in an unstable patient).**
- Identify and treat underlying causes of tachycardia prior to cardioversion.
- Pre-medicate whenever possible (Refer to Procedural Sedation Protocol).
- Turn on the synchronizer switch and verify that the monitor is detecting the R waves.
- Press and hold the discharge buttons until the defibrillator discharges on the next R wave.
- Cardiovert (synchronized)

Ensure synchronizer is enabled prior to EACH shock.

12.18 Transcutaneous Pacing

INDICATIONS
Symptomatic Bradycardia

CONTRAINDICATIONS
Overdrive pacing

CAUTION
Muscle twitch will make carotid pulse assessment difficult at best; assess femoral, brachial, or radial pulses.

PROCEDURE
- Leads applied, monitor set to Lead II
- Pad placement:
  - Anterior – Posterior is preferred
  - Anterior–lateral should be used in spinal immobilization and when defibrillation is also being performed.

ADULT
- Set RATE to 60 beats per minute.
- For symptomatic bradycardia set OUTPUT (“CURRENT” LP15) to minimum.
- Increase or decrease OUTPUT (“CURRENT” LP15) as needed to establish and maintain electrical capture and mechanical pulses.

PEDIATRIC
- Set RATE to 80 beats per minute.
- For symptomatic bradycardia set OUTPUT (“CURRENT” LP15) to minimum.
- Increase or decrease OUTPUT (“CURRENT” LP15) as needed to establish and maintain electrical capture and mechanical pulses.
- Increase RATE as needed to improve perfusion status after mechanical capture has been confirmed

12.19 Intraosseous Infusion

IO

INDICATIONS

For adults and pediatrics anytime in which vascular access is difficult to obtain in emergent, urgent or medically necessary cases.

CONTRAINDICATIONS- CONSIDER ALTERNATE SITES

- Fracture of the bone selected for IO infusion.
- Excessive tissue at insertion site with the absence of anatomical landmarks.
- Previous significant orthopedic procedures in selected bone (IO within 24 – 48 hours, prosthesis, total joint replacement).
- Infection at the site selected for insertion.

APPROVED SITES

- Proximal Humerus
- Tibial Tuberosity
- Medial Malleolus
- Distal Femur

NEEDLE SIZES

- 15mm (Pink): 3 – 39 kg
- 25mm (Blue): 3 kg and greater
- 45mm (Yellow): 40 kg and greater

CONSIDERATIONS

- Flow Rate
  - Ensure the administration of a rapid and vigorous 10mL flush with normal saline prior to infusion “NO FLUSH = NO FLOW”.
  - Repeat syringe bolus (flush) as needed.

12.19 Intraosseous Infusion

EQUIPMENT NEEDED

- Personal Protective Equipment
- EZ-IO or BD IO Power Driver
- Appropriate size needle set with included extension set and wristband
- Antiseptic agent (iodine preferred)
- EZ-IO or BD IO Stabilizer
- 2- Normal Saline 10 mL flushes
- Lidocaine PRN for pain control (Conscious Patients)
- Normal Saline 1L bag and 10 gtt IV drip set
- IV Pressure infuser PRN

IO SYSTEM continued:

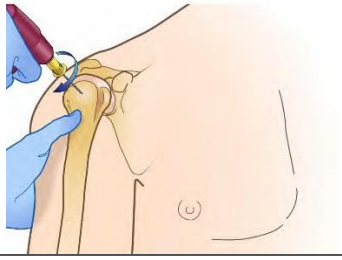
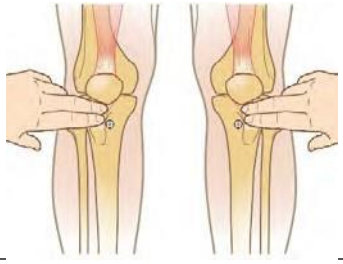
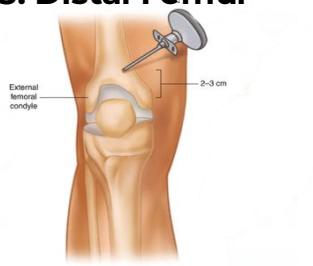
PROCEDURE

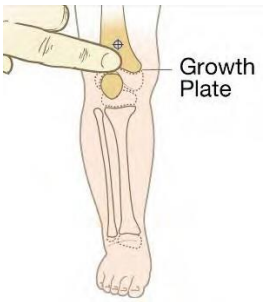
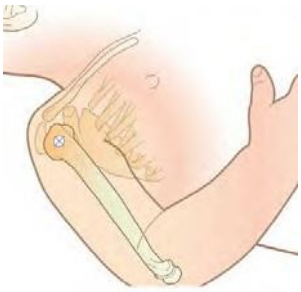
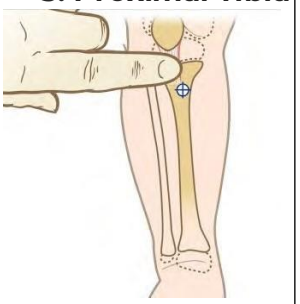
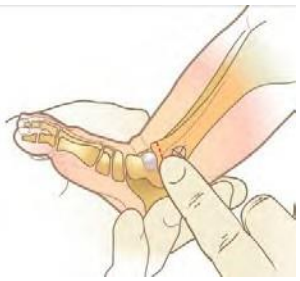
- Cleanse site using antiseptic agent (Iodine preferred)
- Allow to air dry thoroughly
- Connect appropriate Needle Set to driver
- Remove needle cap
- Stabilize site and maintain tension on skin
- Insert EZ-IO (BD) needle into the selected site. IMPORTANT: Keep hand and fingers away from Needle Set
- Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface.
- Gently pierce the skin with the Needle Set until the Needle Set tip touches the bone.
- Ensure visualization of at least one black line is visible.
- Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, steady, downward pressure (allow the driver to do the work).
    - *Do not use excessive force. In some patients, insertion may take greater than 10 seconds, if the driver sounds like it is slowing down during insertion; reduce pressure on the driver to allow the RPMs of the needle tip to do the work.

12.19 Intraosseous Infusion

  - *In the unlikely event that the battery on the Driver fails clinicians may manually finish inserting the IO Needle Set. Grasp the Needle Set and, rotate arm, while pushing the needle into the intraosseous space. This may take several minutes.
- On adult patients when accessing the tibia use the 25mm Needle Set. If distal femur or proximal humerus is selected use a 45mm Needle Set. You may stop by releasing the trigger when the hub is almost flush with the skin.
- On pediatric patients when you feel a decrease in resistance indicating the Needle Set has entered the medullary space, release the trigger.
- Remove EZ-IO (BD) Power Driver from Needle Set while stabilizing the catheter hub.
- Remove stylet from catheter by turning counter-clockwise and immediately dispose of stylet in appropriate biohazard sharps container.
  - *NEVER return used stylet to the EZ-IO (BD) kit.
- Secure site with EZ (BD)Stabilizer.
- Connect primed EZ- (BD)Connect to exposed Luer-lock hub.
- Draw back on syringe until marrow is seen.
  - **The absence of marrow is not necessarily an indication of an unsuccessful insertion.**
- Vigorously flush with 10 – 20 ml Normal Saline
- Assess for potential IO complications.
- Connect primed EZ- (BD)Connect extension set to primed IV tubing.
- Begin infusion utilizing a pressure delivery system.
- Continue to monitor extremity for complications.
- Place EZ-IO armband on patient, document time and date.

12.20 Intraosseous Infusion- Site Selection

ADULT INSERTION SITES IN ORDER OF PREFERFENCE		
1. Proximal Humerus	**2. Proximal Tibia**	**3. Distal Femur**
		
With arm rotated inward, the most prominent aspect of the humeral head, 1 – 2 cm above the "surgical neck" (where the shaft of the Humerus and humeral head meet.	Approximately 2 cm (two finger widths) below patella and 2 cm medial along the flat aspect of the tibia.	Approximately 2 cm (2 finger widths) above the patella and in the midline of the bone.

INFANT & PEDIATRIC INSERTION SITES IN ORDER OF PREFERENCE			
1. Distal Femur	**2. Proximal**	**3. Proximal Tibia**	**4. Distal Tibia**
			
With leg fully extended, approximately 1 cm (one finger width) above the superior border of the patella and 1 – 2 cm medial to midline.	With arm rotated inward, the most prominent aspect of the humeral head, above the "surgical neck" (where the shaft of the Humerus and humeral head meet.	Approximately 1 cm (one finger width) below patella and 1 cm medial along the flat aspect of the tibia	Approximately 1 – 2 cm (1 – 2 finger widths) above the most prominent aspect of the medial malleolus on the flat center aspect of the bone.
**Distal Femur- preferred in infants and small children **Proximal Humerus- must be able to palpate humeral head; typically not preferred in infants and small children.			

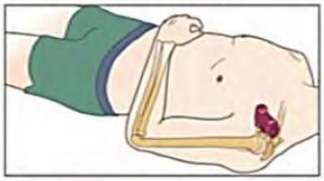
12.20 Intraosseous Infusion- Site Selection

Arrow®
EZ-IO®
Intraosseous Vascular Access System

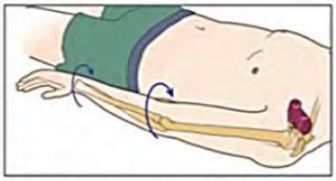
Proximal Humerus

Arm Positioning

Using either method below, adduct elbow, rotate humerus internally.

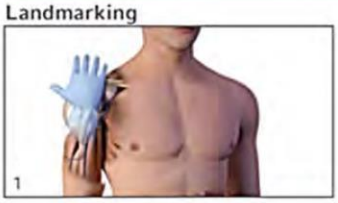


Place the patient's hand over the abdomen with arm tight to the body.



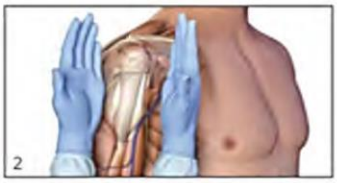
Place the arm tight against the body, rotate the hand so the palm is facing outward, thumb pointing down.

Landmarking

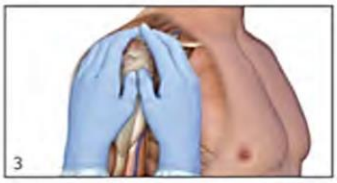


Place your palm on the patient's shoulder anteriorly.

- The area that feels like a "ball" under your palm is the general target area
- You should be able to feel this ball, even on obese patients, by pushing deeply

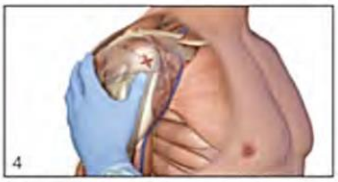


Place the ulnar aspect of one hand vertically over the axilla. Place the ulnar aspect of the opposite hand along the midline of the upper arm laterally.



Place your thumbs together over the arm.

- This identifies the vertical line of insertion on the proximal humerus

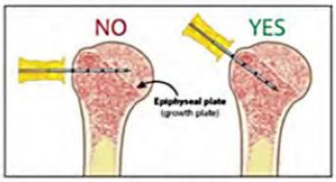


Palpate deeply as you climb up the humerus to the surgical neck.

- It will feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck

The insertion site is on the most prominent aspect of the greater tubercle, 1 to 2 cm above the surgical neck.

Point the needle tip at a 45-degree angle to the anterior plane and posteromedial.



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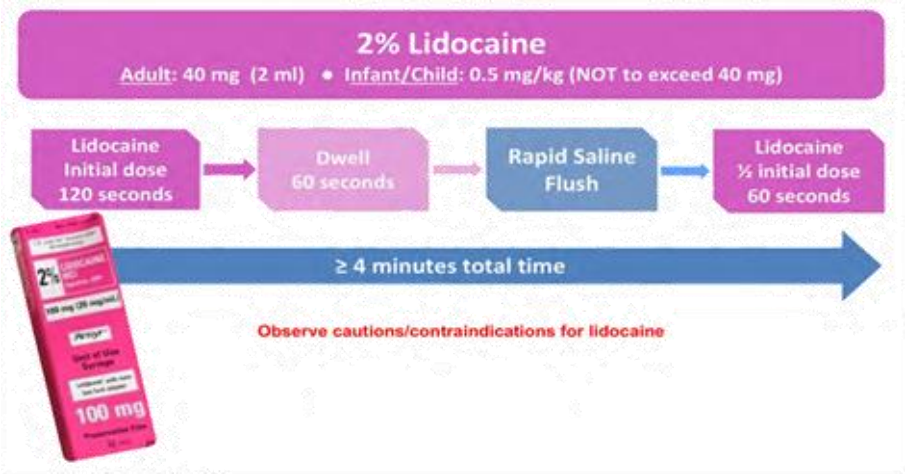
12.21 Intraosseous Infusion- Pain Management



ADULT

- Slowly infuse 40mg over 2 minutes.
- Allow Lidocaine to dwell in IO space for 60 seconds.
- Flush with 5 to 10ml of Normal Saline flush.
- Slowly administer an additional 20mg of Lidocaine over 60 seconds. May repeat PRN.
- Consider systemic pain control for patients not responding to IO Lidocaine.

PEDIATRIC

- Slowly infuse Lidocaine
- Allow 60 seconds for the Lidocaine to dwell in IO space for 60 seconds.
- Flush with 2ml to 5ml of Normal Saline flush.
- Follow up with half the initial Lidocaine dose over 60 seconds.

IO NEEDLE REMOVAL

- The catheter must be removed within 24 hours from the time of insertion.
- Remove any extension set and dressing and attach a luer-lock syringe to the hub.
- While maintaining axial alignment, twist the syringe and catheter clockwise while pulling straight out. Do not rock or bend during removal.
- Place the catheter into a designated sharps container.
- Apply gentle pressure as needed and apply a clean dressing to site.
- There are no activity restrictions after catheter removal.

12.22 Nebulizer Therapy

INDICATIONS

Refer to Individual Protocols.

CONTRAINDICATIONS / PRECAUTIONS

Severely hypoxic patients should be intubated and the “IN-LINE ETT Application” should be used.

EQUIPMENT NEEDED

- Proper medication per protocol
- Nebulizer device
- Oxygen
- CPAP Circuit (for IN-LINE CPAP Application)

PROCEDURE

STANDARD APPLICATION

- Assemble nebulizer per manufacturer’s instructions.
- Place medication in bowl of nebulizer.
- Attach to oxygen with tubing and place at 6 LPM.
- Have patient begin treatment when mist is visible.
- Instruct patient to inhale slowly and deeply and hold breath for 3 to 5 seconds before exhaling.
- Continue until medication is depleted.
- Repeat treatment as necessary per protocol.

IN-LINE CPAP APPLICATION

- FlowSafe II CPAP in-place securely on patients face.
- Assemble the pre-connected nebulizer attachment on the FlowSafe II CPAP mask.
- Place medication in container of nebulizer.
- Follow CPAP procedure (with nebulizer) flowrate chart listed on manufacturer label.

12.23 Nerve Agent Auto Injectors

INDICATIONS

The Paramedic may administer the prescribed nerve agent antidotes via an auto-injector for rescuers or patients who are exhibiting signs of organophosphate poisoning. These signs include pinpoint pupils, salivation, lacrimation, urination, defecation, gastro-intestinal discomfort, emesis, respiratory difficulty, seizures, coma, or death. The Nerve Agent Auto Injectors include the Mark I, Atropine, and the CANA Kit. These kits should be used as indicated in the "Hazmat" Section. Only the Atropine is available in pediatric dosages. EMTs may self- administer.

PROCEDURE

- Primary Assessment
- Verify the appropriate dosage auto-injector based on age and weight, check expiration date.
- Ensure patient is exhibiting signs of organophosphate poisoning as described above.
- Remove auto-injector safety cap.
- Select appropriate injection site.
- Thigh – lateral portion of thigh, midway between waist and knee.
- Buttock – upper outer quadrant.
- Push auto-injector firmly against site until injector activates.
- Hold in place until medication is fully injected (minimum of 10 seconds).
- Record time.
- Dispose of injector in biohazard container.
- Reassess patient.

12.24 Chest Seal-Venting

INDICATIONS

- Patient with open chest, neck or abdominal injury that cannot be determined to be of superficial depth.
- Signs and symptoms of tension pneumothorax include:
  - Severe or significant dyspnea
  - Abnormal chest rise or fall
  - Frothing or bubbling from wound
  - Sucking or hissing sound from wound
  - Absent or diminished lung sounds
  - Hyper or hypo-resonance
  - Signs of shock
  - Anxiety or altered LOC
  - Chest pain
  - Subcutaneous Emphysema
  - JVD
  - Tracheal shift towards unaffected side (late sign)

PROCEDURE

- Proactively place chest seals- DO NOT wait for signs of pneumothorax to develop!
- Open and expose site of wound.
- Apply direct pressure with gloved hand until chest seal can be performed.
- If time allows, remove excess bleeding around wound area. Although chest seals will typically adhere over blood and body hair, doing so will ensure that the adhesive will adhere to the patient's skin to maintain the seal.
- Peel the backing from chest seal and apply the seal so that the valve is directly over the wound.
- Once chest seal is in place auscultate lung sounds and reassess patient.
- Continually monitor the patient's SaO2, ease of breathing, heart rate, capnography and lung sounds.
- If patient's SpO2 does not increase, no symmetric rise and fall of chest, and patient is having hard time breathing or ventilating, consider hemothorax or tension pneumothorax. See: Chest Decompression Procedure.

12.25 Helmet Removal

INDICATIONS

- ALL motorcycle helmets shall be removed.
- For patients wearing football helmets:
  - Patient's airway cannot be adequately accessed or secured.
  - If shoulder pads need to be removed for any reason, helmet must also be removed.
  - Helmet is not form fitted and head is loose inside helmet

CONTRAINDICATIONS / PRECAUTIONS

- Shoulder pads could further compromise the C-spine if only the helmet is removed
- No respiratory distress and no need to access the airway.
- If removal of face guard can facilitate airway maintenance.

EQUIPMENT NEEDED

- Two rescuers
- Scissors or shears
- Screwdriver (for football helmet face guard removal)

12.25 Helmet Removal

PROCEDURE

- Rescuer 1 maintains inline immobilization
- Rescuer 2 cuts or loosens the chin strap
- Rescuer 2 takes over inline immobilization
- Rescuer 1 removes the helmet
- Rescuer 1 takes over inline immobilization
- Rescuer 2 applies an extrication collar

12.26 Kendrick Extraction Device (KED)

INDICATIONS

Used as a tool to help extricate patients that is in a sitting position during difficult extrications. The KED is not a mandatory product to be used for all patients, rather a means to assist crews as an adjunct device during such difficult extrications when needed.

CONTRAINDICATIONS / PRECAUTIONS

- If another immobilization device is more appropriate for the situation.
- If patient meets criteria for “Rapid Extrication” and another method or device is preferred.
- If patient is too large for the device, consider other options.
- Only use head pad if patient has a natural anterior curve to C-spine due to physical limitations, or if patient complains of pain when rolling shoulders back into device.

EQUIPMENT NEEDED

- KED
- Head straps
- Long backboard
- Three backboard straps

PROCEDURE

- Rescuer 1 applies manual inline immobilization.
- Rescuer 2 applies appropriate extrication collar.
- Rescuer 2 grasps upper torso and together with Rescuer 1, leans patient forward as a unit allowing placement of the KED.
- Rescuer 2 places KED behind patient and centers the device with leg straps in stored position and all chest straps folded away.
- Both rescuers lean patient back into the KED as a unit.
- Remove leg straps from stored position and pull down and out of the way.
- Wrap torso section of KED around patient and assure that device is snug under the patient’s armpits.

12.26 Kendrick Extraction Device (KED)

- Connect the middle chest strap and make snug.
- Connect the lower chest strap and make snug.
- See-Saw the leg straps under the buttocks and bring through legs and cross over to other side for fastening (For isolated groin injury only, attach to same side).
- Place head strap around extrication collar and attach to head flap catching lower corner.
- Open head strap and place non-slip side against forehead just catching the eyebrows and attach to head flap catching upper corner.
- Connect the upper chest strap and make snug.
- *Head pad is to be used only with certain criteria (If used, place appropriate thickness behind head and place excess over top of head flap).

12.27 Morgan Medi-Flow Lens

INDICATIONS

- Anytime a non-penetrating eye injury needs to be irrigated.
- ADULT Only

CONTRINDICATIONS

- Pediatric patients
- Impaled objects in the eye

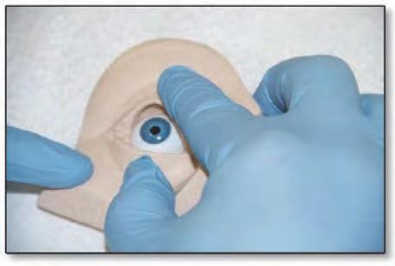
PROCEDURE

Insertion

- Remove contact lenses prior to starting procedure
- Apply topical anesthetic to eye, if available.
- Attach IV set or Morgan delivery set.
- Begin flow.
- Have patient look down, insert lens under upper eyelid. Have the patient look up, retract lower lid, and drop lens in place.
- Absorb outflow with towels or other cloth device.

Removal

- Have patient look up, retract lower lid.
- Slide lens out.



12.28 Pelvic Splinting / Immobilization

PELVIC CIRCUMFERENTIAL COMPRESSION BINDER THERAPEUTIC GOAL

- To provide circumferential compression to reduce and stabilize a suspected fractured pelvis.
- Potential benefits of pelvic binder:
    - Lower mortality rate
    - Reduce blood loss
    - Aid in pain management

EQUIPMENT

- Standard bed sheet

OR

- Appropriately sized Commercial Pelvic Sling

INDICATIONS

Suspected or proven pelvic fracture, suggested by:

- Abrasions and contusions around the pelvic area
- Superficial hematoma above inguinal ligament, scrotum, and thigh
- Limb length discrepancy and deformity

CONTRAINDICATIONS

There are no reported contraindications to using a pelvic circumferential compression binder on any suspected pelvic fracture or injury.

12.28 Pelvic Splinting / Immobilization

PROCEDURES

If Using Sheet (Commercial Device not Available)

- Fold the sheet smoothly (do not roll the sheet); place the sheet under the patient's pelvis so it is centered over the greater trochanters, where the head of the femur attaches to the pelvis. On exam, you can palpate the bony prominence of the femur. In the supine position, the patient's greater trochanter is often even with the space between his distal wrist and the base of the thumb.
- Wrap and twist the two running ends of the sheet around the patient's pelvis.
- Once tightened, cross the running ends and tie or clamp them to maintain tension.
- Reassesses distal circulation, sensation, and motor function after splint application.

PROCEDURES continued

TPOD Pelvic Binder:

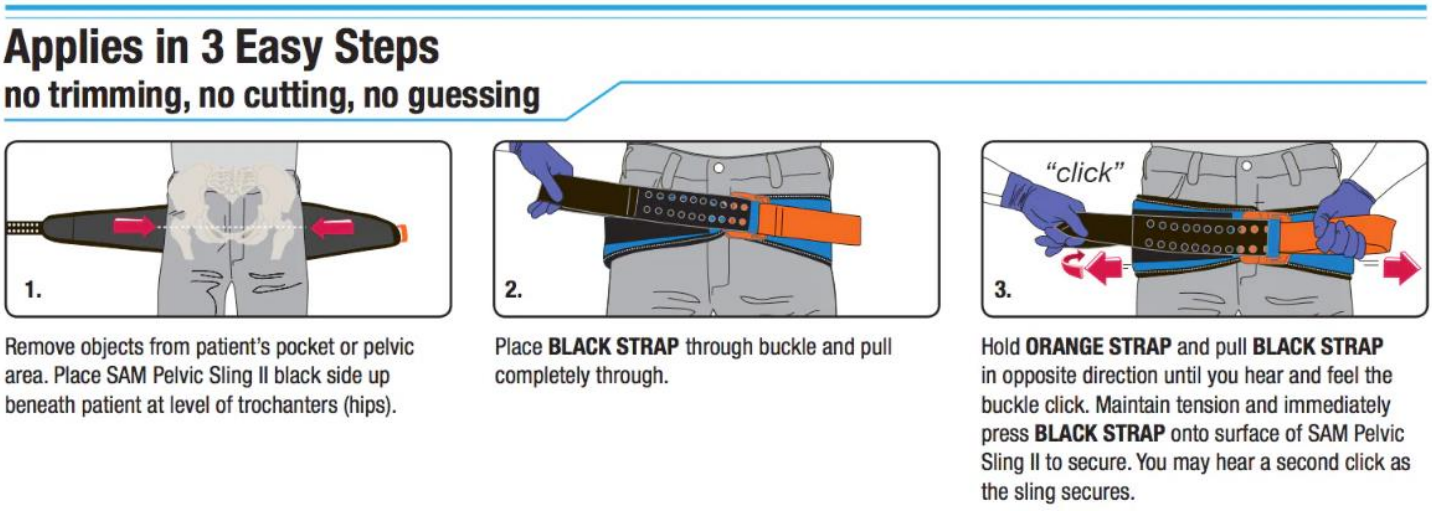
- Gather equipment and supplies, as needed. Anticipate need for complete spinal immobilization.
- Assess pelvic area, distal circulation, sensation, and motor function of lower extremities.
- Remove objects from patient's pockets or pelvic area. In male patients, make certain genitalia are elevated out of groin area.
- Slide Belt under supine patient and into position under the pelvis.
- Trim the Belt, leaving a 6-8" gap over the center of the pelvis.
- Apply Velcro-backed Mechanical Advantage Pulley System to each side of the trimmed Belt.
- Slowly draw tension on the Pull Tab, creating simultaneous, circumferential compression.
- Secure the Velcro-backed Pull Tab to the Belt.
- Record the date and time of application on the space provided.

12.28 Pelvic Splinting / Immobilization

PROCEDURES continued

SAM Pelvic Sling:

- Ensure spinal precautions and control of life-threatening hemorrhage first (airway, breathing, circulation).
- Expose the patient's pelvis/hips enough to allow accurate sling placement
- Place the sling beneath the patient by using a **log roll** or sliding technique while maintaining spinal precautions.
- Position the sling so that the **belt is centered over the greater trochanters** (not the iliac crests or abdomen).
- Wrap the sling around the pelvis and secure the Velcro ends.
- Pull the tightening strap until the **mechanical buckle clicks** (this ensures standardized compression—avoid overtightening).
- Confirm that the sling is **low and snug over the greater trochanters**.
- Ensure it is not riding too high over the abdomen or too low on the thighs.
- Reassess distal pulses, skin color, and sensation in the lower extremities after application



12.29 Finger Thoracostomy

INDICATIONS

- Tension pneumothorax
- Suspected hemothorax causing hypotension or inability to ventilate
- Traumatic cardiac arrest

CONTRAINDICATIONS

- No absolute contraindications for emergent thoracostomy.
- Use caution to prevent finger laceration to provider when patient has multiple rib fractures.

EQUIPMENT NEEDED

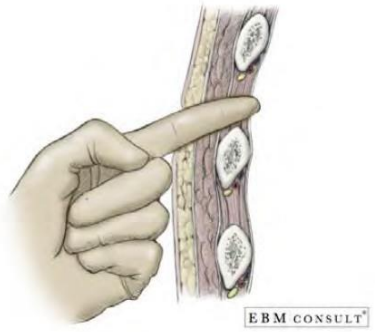
- Scalpel
- Finger or Kelly clamp

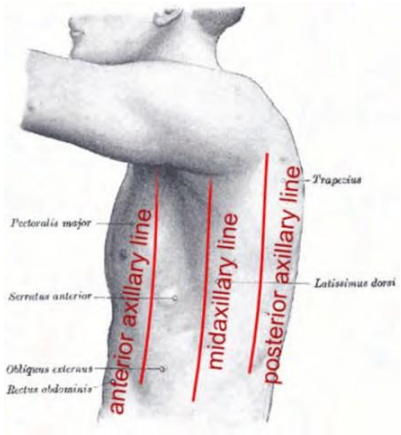
PROCEDURE

- Prepare equipment.
- Place patient into supine position with ipsilateral arm abducted and externally rotated (so that hand is under or above the head).
- Clean area with sterilizing prep, time permitting.
- Identify the **3rd intercostal space**, between the anterior axillary and midaxillary line.
- Using a #10 blade (or available scalpel), make a 3-4 cm transverse incision on the forth rib – in the direction from the anterior axillary line to the midaxillary line.
- Using a finger (or Kelly clamp if available) bluntly dissect down to the **3RD INTERCOASTAL SPACE.**

12.29 Finger Thoracostomy

- Using a finger (or Kelly clamp) push your finger (or clamp) over the top of the 4th rib, into the **3RD INTERCOASTAL SPACE** into the pleural cavity. You will feel a definitive pop once you have entered the space and there may be a rush of air or fluid from the cavity.
- If a finger is used, confirm correct position and sweep between the lung and pleural wall to remove any adhesions. Take care not to damage the lung during this process.
- If a Kelly clamp is used, place your index finger over the curve of the clamp to stabilize and prevent the clamp from damaging the lung. Once the clamp is in the pleural cavity, open the clamp to increase the incision. Then insert a finger to confirm correct position and sweep between the lung and pleural wall to remove any adhesions. Take care not to damage the lung.





12.30 Traction Splint

INDICATIONS

Closed Femur fracture

CONTRAINDICATIONS / PRECAUTIONS

- Fractures to lower extremity of same leg
- Fracture to foot or ankle of same leg
- Hip, pelvic and/or knee fractures or dislocations

EQUIPMENT NEEDED

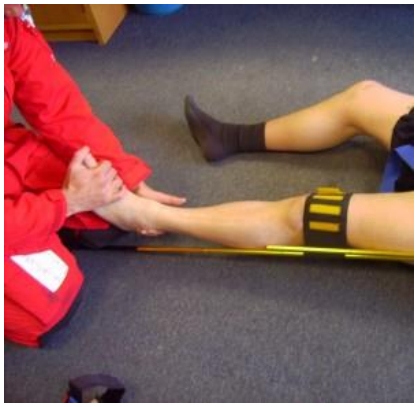
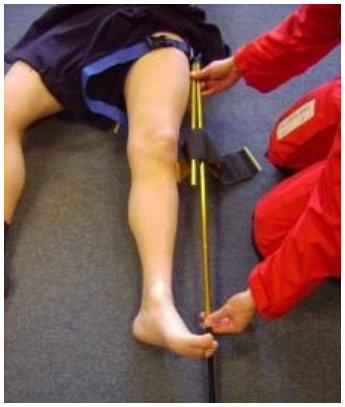
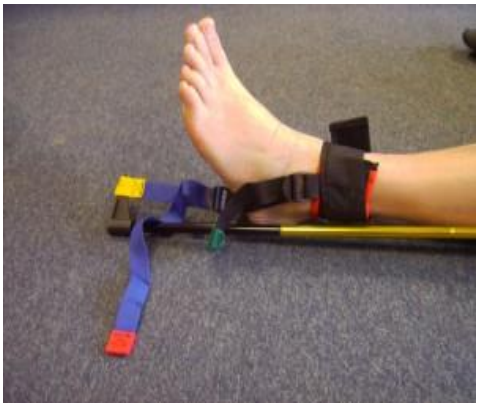
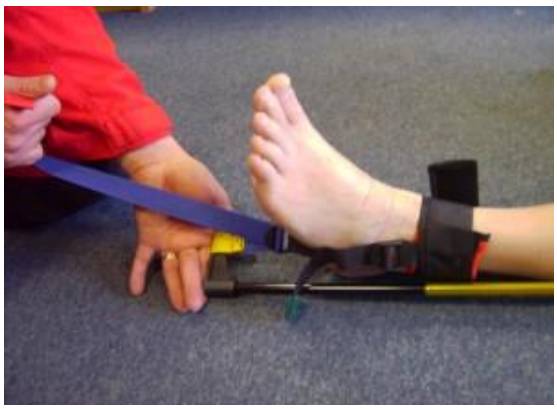
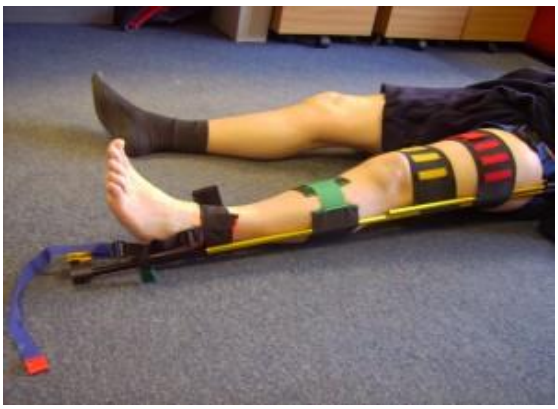
Kendrick Traction Splint

PROCEDURE

- Apply manual stabilization to the injured leg and assess pulse, motor, and sensation distally.
- Place upper thigh strap high into groin with the pole holes on the outside of the leg. This strap must sit as high as possible.
- Measure out the length of the pole against the leg.
  The bottom of the pole should extend approximately one section length below the foot. The pole can be shortened and lengthened, folding in a similar manner to a tent pole.
- Prior to the ankle strap being positioned, the yellow Velcro strap can be applied just above the knee. This may need tightening after traction has been applied.
- Apply ankle strap. The padded part of the strap sits behind the ankle. Tighten using the green strap. The yellow strap fits over the pole end (black part) and traction can be applied gently by tightening the red strap. Traction should be applied until the leg is comfortably under traction and in anatomical alignment. Check distal perfusion.
- While pulling the red strap, a small amount of counter traction needs to be applied to the Kendrick Traction Device.
- Apply the two other Velcro straps. The red strap at the top of the thigh, the green on the lower leg.
- Manual in-line traction can now be released.

12.31 Traction Splint

Kendrick

Sager Traction Splint:

12.32 BLEEDING CONTROL

Trauma Tourniquet (CAT)

INDICATIONS

- Life-threatening limb hemorrhage that is not controllable with direct pressure or other simple measures, as may occur with a severely injured extremity.
- Traumatic amputation has occurred.

TOURNIQUET PLACEMENT

- Expose the extremity by removing clothing in proximity to the injury. Although it is ideal to expose the extremity before application, in situations of severe life-threatening hemorrhage, it is acceptable to place the tourniquet over the clothing, then expose when time permits.
- Place tourniquet at least 2-3 inches proximal to the visualized injury. Only apply a Tourniquet above or below a joint.
- In the event where the actual wound site cannot be rapidly located or in the case of a severely damaged extremity the tourniquet should be placed as proximal as possible on the extremity ("high and tight").
- Never apply tourniquet directly over injury site or joint.

SOFT-T WIDE TACTICAL TOURNIQUET APPLICATION

- Loop the tourniquet over the extremity or undo the buckle and wrap the tourniquet around the extremity.
- Pull Strap until the tourniquet is tight on the injured extremity.
- Twist Aluminum windless until the hemorrhage is controlled.
- Secure the windless in the Tri-ring.
- Document the time the tourniquet was applied by writing it on the tag on the distal end of the strap.
- If the bleeding still does not stop, place a second tourniquet proximal to the first.

12.32 Trauma Tourniquet (CAT)

EVALUATION

- The tourniquet is effectively applied when there is cessation of bleeding from the injured extremity, indicating total occlusion of arterial blood flow.
- Any preexisting distal pulse should be absent at this time as well.
- If bleeding does not stop place a second tourniquet proximal to the first tourniquet.

TOURNIQUET TIME AND REMOVAL

- Tourniquet removal in the field is generally not necessary and can be accomplished once the patient reaches definitive care. Tourniquet time in excess of 6 hours is associated with distal tissue loss.
- Time of tourniquet placement must be communicated in patient reports for all pre-hospital to hospital and interhospital transfer.

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QUICK CLOT

12.33 Meconium Aspirator

INFORMATION

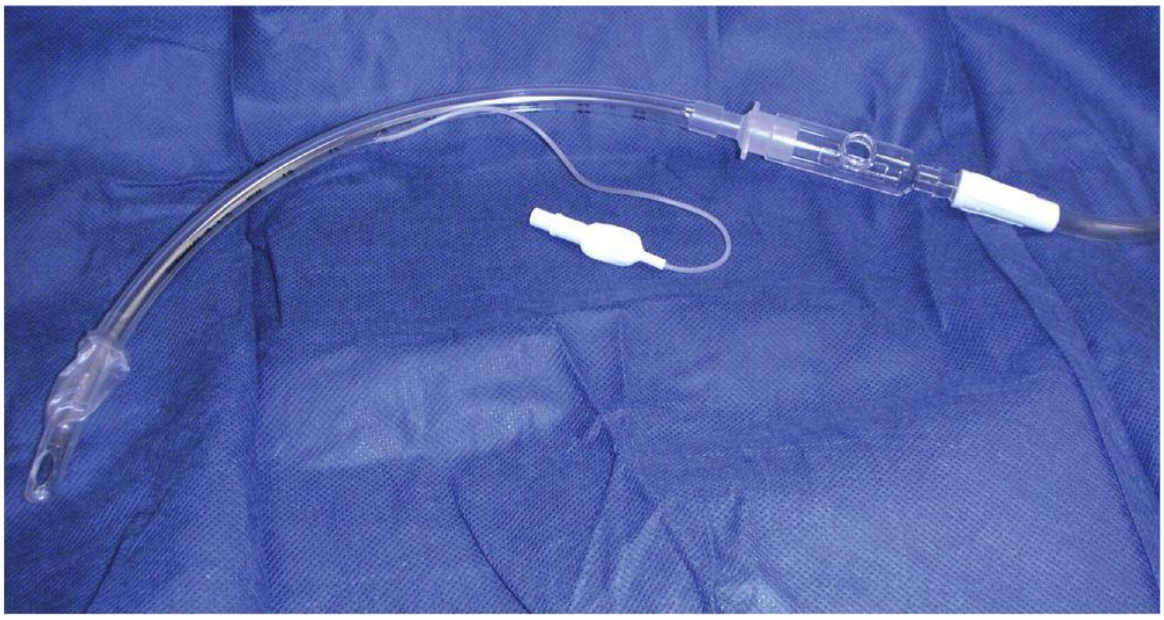
A **meconium aspirator** is a small suction device that connects to the end of an endotracheal tube (ETT) and a suction source. It is used to remove meconium-stained amniotic fluid from a newborn's airway to prevent obstruction and reduce the risk of meconium aspiration syndrome.

Indications:

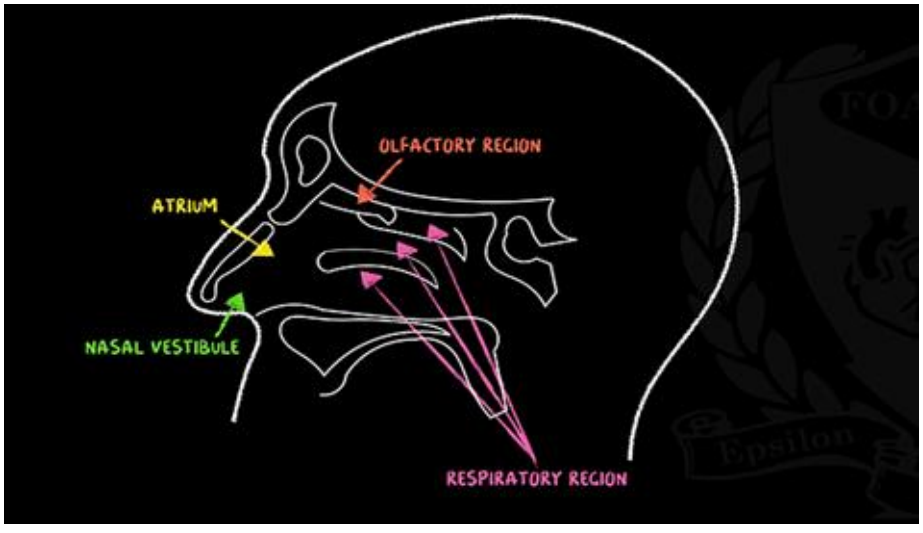
Presence of thick meconium-stained amniotic fluid at delivery.
Newborn is depressed (poor tone, inadequate respiratory effort, or heart rate <100 bpm).
Evidence of airway obstruction from meconium.

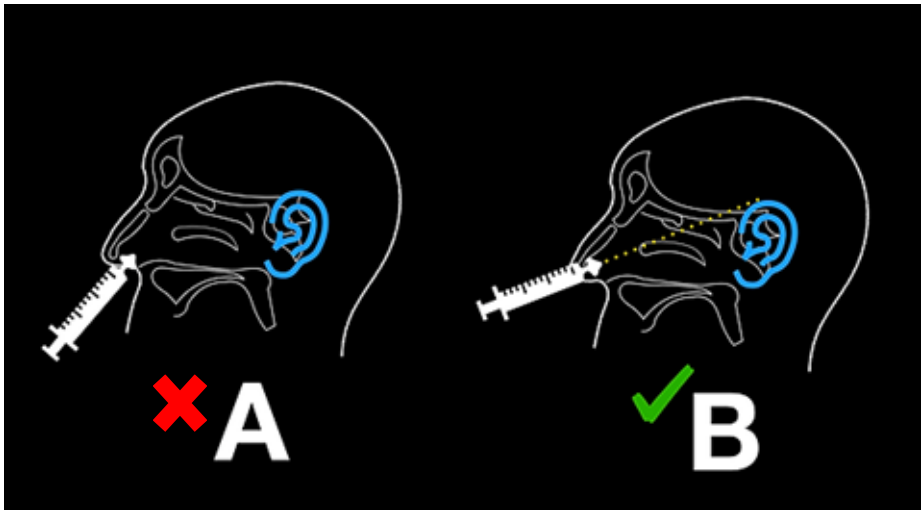
Procedure:

- Intubate the newborn with the appropriate-sized ETT.
- Attach the meconium aspirator to the proximal end of the ETT and connect it to suction.
- Apply suction while slowly withdrawing the ETT to clear meconium from the trachea.
- **Repeat the process with re-intubation as needed** until little or no meconium is aspirated and the airway is clear.



12.34 Intranasal Administration





Don't have them sniff. The act of sniffing generates negative pressure generated by inspiration.

You want the medication to stay in the nose and not go down the throat.

In addition, you want to aim at the helix (top) of the ear.

The recommended volume is 0.2–0.3 mL per nostril (maximum 0.5 mL) for optimal absorption.

12.34 PEEP Valve

Purpose:
A Positive End-Expiratory Pressure (PEEP) valve is used in conjunction with a bag-valve mask (BVM) or advanced airway device to maintain positive pressure in the lungs at the end of exhalation. This helps improve oxygenation, recruit alveoli, and prevent atelectasis in patients with respiratory distress or hypoxemia.

Indications:
- Acute pulmonary edema/CHF with hypoxemia.
- Severe pneumonia or ARDS.
- Persistent hypoxemia despite supplemental oxygen and adequate ventilation.
- Post-intubation to improve oxygenation and prevent alveolar collapse.
- Anytime you are ventilation with a BVM or mechanical Ventilator!

Contraindications:
- Suspected or confirmed pneumothorax without chest decompression.
- Hypotension or hypovolemic shock (PEEP may worsen preload and blood pressure).
- Severe obstructive lung disease with concern for air trapping.

Equipment Required:
- Bag-valve mask (BVM) with oxygen supply or advanced airway device.
- PEEP valve (adjustable or fixed, typically 5–20 cmH_2O).
- Capnography (if available).
- Monitoring equipment (pulse oximetry, cardiac monitor).

12.34 PEEP Valve

Procedure Steps:

Preparation:

- Ensure the patient is receiving high-flow oxygen via BVM or advanced airway.
- Select the appropriate PEEP valve (commonly set at **5 cmH_2O** to start).

Attachment:

- Connect the PEEP valve to the exhalation port of the BVM or ventilatory circuit.
- Confirm a secure fit to avoid leaks.

Application:

- Begin ventilations with the BVM, ensuring a proper mask seal or secure advanced airway.
- Monitor chest rise, oxygen saturation, and patient response.

Adjustment:

- Adjust PEEP in small increments (2.5–5 cmH_2O) as needed.
- Typical EMS setting: **5 cmH_2O**.
- Use the **lowest effective PEEP** that improves oxygenation without causing hypotension.

Monitoring:

- Continuously monitor SpO_2, $EtCO_2$ (if available), and vital signs.
- Watch for signs of barotrauma (diminished breath sounds, hypotension, tracheal deviation).
- If hypotension develops, consider lowering or removing PEEP.

⚠ **Key Point:** PEEP improves oxygenation but can reduce venous return and cardiac output. Always monitor blood pressure closely when applying or adjusting PEEP.

- PEEP Valve Video

Pharmacology

SECTION 13

Section 13

Pharmacology

13.1 Medication Administration

PUSH DOSE EPINEPHRINE (Adult and Pediatrics)

(Patients with a pulse and in shock)

- Mix 9ml of Normal Saline with 1ml of Epi 1:10,000 = Epi (1:100,000)10ml solution (10mcg/ml)
- Titrate slowly 1ml every 30 seconds IV/IO (titrate to SBP over 100). May repeat 2x - Max total dose 0.3mg

(Titrate to age-appropriate blood pressure)

Cardiac Arrest Epinephrine Drip

- **Adult:** Mix 2mg of Epinephrine in 100ml of NS and run over 16 minutes.
  NEVER PUT MORE THAN 2MG IN ANY SIZED BAG
- **Pediatric:** Cardiac weight-based dose and double the amount, then mix into 100ml and run over 16 minutes.

BENADRYL for Pediatrics

BENADRYL ADMINISTRATION IV/IO: Dilute with 9ml of Normal Saline to make a 5mg/ml solution

Ketamine

All IV Ketamine must be diluted 500mg in 50ml NS to make a **10mg/ml solution**
Or
Pain Management IV Ketamine: Remove 1ml Saline from a 10ml saline syringe and then, pull 1ml of 100mg/ml of Ketamine. This creates a concentration of **10 mg/ml.**

Fentanyl

Diluted for pediatrics patients when given IV/IO, 2ml (or 100mcg) in 8ml NS to make a 10mcg/ml solution.

Sodium Bicarbonate: PEDIATRIC PATIENTS UNDER 5 YOA

Diluted for infants and neonates- 8.4% - 25ml and mix with 25ml NS to make a 4.2% sodium bicarbonate solution

13.2 Infusions

ADULT DRUG INFUSION	MIXTURE	DOSE	ADMINISTRATION
Amiodarone	150mg in 100mL NS	150mg over 16min	60 gtts/min with a 10gtt set, 1gtts every sec = 6ml/min = 16 min
Magnesium Sulfate	4ml or 2g in 100ml NS	2g over 16 min	60 gtts/min with a 10gtt set, 1gtts every sec =6ml/min =16 min
Cardiac Epinephrine	2mg (1:1,000 or 1:10,000) epinephrine per 100ml NS **NEVER PUT MORE THAN 2mg IN ANY SIZED BAG**	2mg in 100ml NS over 16 minutes **NEVER PUT MORE THAN 2mg IN ANY SIZED BAG**	60gtts/min with a 10gtt set, 1 gtt/sec =6ml/min 100ml infusion in approx. 16 minutes

PEDIATRIC DRUG INFUSION	MIXTURE	DOSE	ADMINISTRATION
Amiodarone	# ml (as per Ped Med Tool) in 100ml NS	5mg/kg- as per Ped Med Tool (max of 3ml or 150mg)	10gtt set at 1 gtt every secs = 60gtts/min 100ml infusion in approx. 16 minutes
Magnesium	# ml (as per Ped Med Tool) in 100ml NS	40mg/kg as per Ped Med Tool (Max of 2g or 4ml)	10gtt set at 1 gtt/sec = 60gtts/min 100ml infusion in approx. 16 minutes
Cardiac Epinephrine	# ml (as per Ped Med Tool) is **per** 50ml NS (i.e. 2 doses per 100mls NS)	Use Epinephrine dose then multiply by 2. Place that volume in 100ml	10gtt set at 1 gtt/sec = 60gtts/min 100ml infusion in approx. 16 minutes

13.3 Pediatric Vital Signs

PEDIATRIC

RESPIRATORY RATES

- Neonate: Birth to I month (40-60 breaths/min)
- Infants: 1 month to 1 year (30-60 breaths/minute)
- Toddlers: 1-3 y/o (24-40 breaths/minute)
- Preschooler: 4-5 y/o (22-34 breaths/minute)
- School age: 6-12 y/o (18-30 breaths/minute)
- Adolescent ages: 13-18 y/o (12-16 breaths/minute)

HEART RATES

- Newborn to 3 months: 85-205, mean 140 beats/minute
- 3 months to 2 years: 100-190, mean 130 beats/minute
- 2 years to 10 years: 60-140, mean 80 beats/minute
- Greater than 10 years old: 60-100, mean 75 beats/minute

HYPOTENSION

- Neonates: SBP less than 60
- Infants: SBP less than 70
- Children 1-10 years: SBP less than 70 + (age in years x 2)
- Children greater than 10 years: SBP less than 90

Acetaminophen (Tylenol, APAP)

CLASS
Non-Narcotic Analgesic/Antipyretic

ACTIONS
- Reduces fever
- May block pain impulses peripherally

INDICATIONS
- Pain Management
- Sepsis
- Fever
- Febrile Seizure protocol when LOC permits

CONTRAINDICATIONS
- Inability to tolerate PO
- Allergy
- History of hypersensitivity
- Intolerance to:
  - Tartrazine
  - Alcohol
  - Table sugar
  - Saccharine

PRECAUTIONS
Verify all fevers when assuming patient care prior to administering medication

ADVERSE REACTIONS
- Anemia
- Rash
- Hives

ROUTE: PO tablet, PO liquid suspension

Adenosine (Adenocard)

CLASS
Nucleoside, Antiarrhythmic

ACTIONS
An endogenous nucleoside from human body cells, it slows conduction time through the AV-node restoring patients to a normal sinus rhythm.

INDICATIONS
SVT with ventricular rates greater than 150 bpm

CONTRAINDICATIONS
- Patients with a history of second or third degree AV block (except in patients with a functioning artificial pacemaker)
- Sick Sinus Syndrome without cardiac pacemaker in place
- Persons taking Carbamazepine (Tegretol)
- Active bronchospasm
- Patients with a heart transplant.

PRECAUTIONS
- Wide Complex Tachycardia
- Atrial Fibrillation and Atrial Flutter with a rapid ventricular response
- Patients with Asthma or COPD
- Patients known or suspected of taking Theodur, Persantine or any product containing Dipyridamole

ADVERSE REACTIONS
- Flushing, headache, chest pain, and dyspnea are transient and will abate in 1-2 minutes after administration.
- Transient periods of sinus bradycardia and ventricular ectopy are common after the termination of SVT.

CONCENTRATION
12mg (3mg/ml) 4ml Vial

ROUTE: IV/IO

NOTE: Adenosine must reach central circulation rapidly. Use an 18g IV in the AC when possible. Attach Adenosine to the port closest to the IV site and use an extension set if needed. Begin ECG recording, then push Adenosine and a 20 mL Normal Saline flush rapidly (over 1–2 seconds).

Albuterol Sulfate (Proventil)

CLASS
Adrenergic Bronchodilator

ACTIONS
A selective beta-2 adrenergic receptor agonist. The pharmacologic effects of Albuterol Sulfate are attributable to activation of beta-2 adrenergic receptors on airway smooth muscle.

INDICATIONS
- Allergic Reactions
- Hyperkalemia (Dialysis, Adrenal Insufficiency)
- Respiratory Distress
- Adult Cardiac Arrest Special Considerations – Hyperkalemia
- Pediatric Cardiac Arrest Special Considerations – Hyperkalemia
- Regular Really Wide Complex Tachycardia
- Toxic Chemical Inhalation

CONTRAINDICATIONS: Known hypersensitivity to Proventil

PRECAUTIONS
- Concern should be given in patients with a history of cardiovascular disease due to the beta-2 effect Albuterol has on the heart
- Hypertension
- Sensitivity to the drug

ADVERSE REACTIONS
- Tachycardia
- Palpitations
- Paradoxical bronchospasms
- Exacerbation of angina
- Anxiety
- Hypertension

ROUTE: Inhalation / nebulizer

Amiodarone (Cordarone)

CLASS
Antiarrhythmic

ACTIONS
Anti-dysrhythmic drug with multi channel blocking, and anti-sympathetic nervous system properties, resulting in negative dromotropic effect on the heart. Prolonged administration results in a lengthening of the cardiac action potential. Amiodarone possesses negative chronotropic effects slowing conduction and prolonging the refractory period. Amiodarone administration prolongs intranodal conduction and refractoriness of the atrioventricular node but has no effect on the sinus node. Used in a wide variety of atrial and ventricular tachydysrhythmias and for rate control of rapid atrial arrhythmias in patients with impaired LV function.

INDICATIONS
- Ventricular Fibrillation/Pulseless V-Tach
- Ventricular Tachycardia

CONTRAINDICATIONS
- Torsade de Pointes
- Cardiogenic Shock
- Hypotension
- Marked sinus bradycardia and second- or third-degree AV blocks
- Pregnancy

PRECAUTIONS
- Used in conjunction with beta and calcium channel blockers could increase the risk of hypotension and bradycardia.
- Do not shake the vial as the solution will foam up and will not be able to be drawn up.
- Use with caution in renal failure, half-life can last up to 40 days

ADVERSE REACTIONS
- Hypotension
- Bradycardia
- AV conduction abnormalities
- Flushing

ROUTE: IV, IO

CONCENTRATION
150mg/3ml, 50mg/ml

Aspirin (Acetylsalicylic Acid, ASA)

CLASS

Salicylate, Platelet Aggregation Inhibitor (Anti-Clotting)

ACTIONS

- Aspirin blocks pain impulses in the CNS, dilates peripheral vessels, and inhibits platelet aggregation.
- Prevention of platelet aggregations in ischemia and thromboembolism in chest pain protocol.

INDICATIONS

- Chest Pain
- AMI
- STEMI Alert protocol

CONTRAINDICATIONS

- Allergy
- Hypersensitivity to salicylates
- GI bleeding
- Active ulcer disease
- Hemorrhagic stroke
- Bleeding disorders
- Children under 16 years of age

PRECAUTIONS: None

ADVERSE REACTIONS

- Stomach irritation
- Indigestion
- Nausea or vomiting
- Allergic reaction

ROUTE: PO

Atropine Sulfate

CLASS
Anticholinergic

ACTIONS
Atropine is a Parasympatholytic (Anticholinergic) that acts to block acetylcholine receptors, thus inhibiting parasympathetic stimulation and reduces vagal tone. Atropine is used in RSI to mitigate reflex bradycardia and suppress oral/nasal secretions.

INDICATIONS
- Symptomatic Bradycardia
- Organophosphate
- Adverse Reaction to Ketamine
- RSI

CONTRAINDICATIONS
- Tachycardias
- Second Degree Type II and Third-Degree heart blocks

PRECAUTIONS
Do not administer less than 0.5mg to an adult or 0.1mg to a pediatric.
If pushed too slowly, Atropine may initially cause the heart rate to decrease.

ADVERSE REACTIONS
- Increased heart rate may worsen ischemia and increase the size of a myocardial infarction.
- Dryness of the mouth and nose, blurred vision, dilated pupils, tachycardia, headache and restlessness.

CONCENTRATION: 0.5mg/ml

ROUTE: IV, IO

Benadryl (Diphenhydramine HCl)

CLASS
Antihistamine

ACTION
Benadryl is an antihistamine with anticholinergic (drying) and sedative side effects. Antihistamines will compete for cell receptor sites with histamines released during allergic reactions.

INDICATIONS
- Allergic Reaction
- Anaphylaxis
- Dystonic Reaction

CONTRAINDICATIONS
- Newborn infants
- Use in nursing mothers
- Hypersensitivity

PRECAUTIONS
- Use with caution in patients with a history of asthma, cardiovascular disease, and hypertension.
- Sedative effects are more pronounced when patient has ingested alcohol or other CNS depressants (Barbiturates, phenothiazine, antidepressants, or narcotics).

ADVERSE REACTIONS
- Tachycardia
- Hypotension
- Central Nervous System depression
- Nausea and vomiting

CONCENTRATION: 50mg/ml

Note: BENADRYL ADMINISTRATION IV/IO: Dilute with 9ml of Normal Saline.

ROUTE: IV, IO, IM

Calcium Chloride

CLASS

Electrolyte, antidote, cardioprotective agent

ACTION

- Increases serum calcium levels.
- Stabilizes cardiac cell membranes, restoring the threshold potential in hyperkalemia.
- Counteracts myocardial depressant effects of calcium channel blockers.
- Increases myocardial contractility and vascular tone.

INDICATIONS

- Calcium Channel Blocker overdose (verapamil, diltiazem, amlodipine, etc.).
- Hyperkalemia (peaked T waves, widened QRS, sine wave).
- Cardizem-induced hypotension

CONTRAINDICATIONS

V-Fib, not associated with hyperkalemia (Patients with a history of renal failure/dialysis), Digitalis toxicity or hypercalcemia.

PRECAUTIONS

Calcium Chloride should not be administered in the same infusion with Sodium Bicarbonate without thoroughly flushing the IV line.

ADVERSE REACTIONS

Hypotension, bradycardia, heart block, asystole, tissue necrosis

CONCENTRATION: 1gram/10ml

ROUTE: IV/IO

Cardizem (Diltiazem)

CLASS
Calcium Channel Blocking Agent / Group IV Antiarrhythmic

ACTION
Cardizem is a calcium channel blocker. Cardizem inhibits the influx of extra cellular calcium across both the myocardial and vascular smooth muscle cell membranes. The end result decreases the contractility of the myocardial smooth muscle, dilation of the coronary and systemic arteries.

INDICATIONS
- Narrow Complex Tachycardia
- Atrial Fibrillation & Atrial Flutter with a rapid ventricular response
- Stable SVT when vagal maneuvers and Adenosine fail to convert the rhythm

CONTRAINDICATIONS
- Hypotension
- Wide complex QRS
- Heart Blocks
- WPW
- Sick Sinus Syndrome

PRECAUTIONS
- Use with caution in patients with ventricular dysfunction, severe bradycardia or with previous conduction abnormalities
- It should not be used in obstetric patients
- Must be refrigerated in MDV

ADVERSE REACTION
- Systemic hypotension
- Nausea / Vomiting
- Bradycardias
- Heart blocks
- Asystole

ROUTE: IV, IO

NOTE
Hypotension: If hypotension develops, administer 500mg of Calcium Chloride and 500ml of Normal Saline.

Cefepime

CLASS

4th Generation Cephalosporin Antibiotic

ACTION

Its primary action is to **inhibit bacterial cell wall synthesis** by binding to penicillin-binding proteins (PBPs). This prevents the cross-linking of peptidoglycan in the bacterial cell wall, leading to weakening of the wall, cell lysis, and ultimately bacterial death.

- **Bactericidal** (kills bacteria rather than just inhibiting growth).
- Has a **broad spectrum of activity** against many **Gram-positive and Gram-negative organisms**, including *Pseudomonas aeruginosa*.
- Resistant to many **β-lactamases**, which makes it more effective against bacteria that break down earlier-generation cephalosporins.

INDICATIONS

- Sepsis with 2 criteria from QSOFA
- Open Fracture

CONTRAINDICATIONS

- Hypersensitivity to Cephalosporins (NOT PCN)

PRECAUTIONS

- In prehospital setting with one dose there are no precautions

ADVERSE REACTIONS

- None

ROUTE: IV, IO

Cyanokit (Hydroxocobalamin)

CLASS
Vitamin

ACTION
- Cyanokit (hydroxocobalamin) has a high affinity for cyanide ions and is converted to cyanocobalamin (Vitamin B12).
- B12 is a water soluble vitamin that is then removed from the circulation and is readily excreted in the urine.

INDICATIONS
- Smoke Inhalation / Cyanide Toxicity protocol
- Hazardous Materials Medical (Cyanide toxicity) protocols
- Carried on EMS Supervisor and HazMat units only

CONTRAINDICATIONS
Known anaphylactic reactions to hydroxocobalamin or cyanocobalamin

SIDE EFFECTS
Allergic reaction, increased blood pressure

PRECAUTIONS
- Do not administer Cyanokit simultaneously through the same IV line as: Valium, Dopamine or NTG.
- If the reconstitution solution is not dark red, or if particulate matter is seen after it has been appropriately mixed, the solution should be discarded.
- The CYANNOKIT should be administered through a separate/dedicated IV/IO line.
- Transient increases in blood pressure during the infusion.
- A pre-treatment purple-top vacutainer should be drawn, if possible, because Cyanokit interferes with colorimetric determined lab parameters.

Cyanokit (Hydroxocobalamin)

ADVERSE REACTIONS

- Chromaturia (red urine)
- Erythema (skin redness), rash
- Increased blood pressure, headache
- Nausea/vomiting, diarrhea

ROUTE

- Dedicated IV, IO
- Reconstitute in 200 ml Normal Saline or D5W

PREPARATION

- Reconstitute 5g vial by adding 200 ml of normal saline to the vial using the transfer spike. With the vial in the upright position, fill to the “fill line”. Mix by rocking or rotating the vial for 30 seconds. DO NOT SHAKE.
- Infuse the first vial: Use vented IV tubing and infuse as indicated below.

- **Note: CARDIAC ARREST: All patients that are suspected to be in cardiac arrest secondary to cyanide poisoning should be treated as a SECONDARY cardiac arrest and administered the CYANOKIT.**

Dextrose 10%

CLASS
Carbohydrate

ACTION
Dextrose in water supplies supplemental glucose in cases of hypoglycemia. D10% is a hypertonic solution primarily used to elevate the blood sugar.
D10 = 10Grams Dextrose per 100ml, 25 grams in 250 ml
D50 = 25 grams in one amp

INDICATIONS
Diabetic (Hypoglycemia) protocol

RELATIVE CONTRAINDICATION
Patients with intracranial hemorrhage and hypoglycemia should still be treated.

PRECAUTIONS
Localized venous irritation and tissue necrosis may result from infiltrated line.

ADVERSE REACTIONS
- Hyperglycemia
- Thrombophlebitis

ROUTE
IV, IO

Epinephrine (Adrenalin)

CLASS
Catecholamine / Vasopressor

ACTION
Alpha and beta adrenergic agonist that stimulates all the effects of the sympathetic nervous system except those affecting the arteries of the face and sweat glands; major sympathetic effects include: Positive chronotropic effect, positive inotropic effect, increased systemic vascular resistance, bronchodilation, assist in the conversion of ventricular fibrillation, and increased cerebral blood flow in cardiac arrest.

INDICATIONS
- Allergic Reaction / Anaphylaxis
- Medical Shock
- Respiratory Distress (Asthma)
- Cardiogenic Shock
- Bradycardia
- Adult Cardiac Arrest
- Pediatric Cardiac Arrest

CONTRAINDICATIONS
Hypovolemic Shock

PRECAUTIONS
Give cautiously in patients >50 y/o with hypertension, tachycardia, or who are pregnant

ADVERSE REACTIONS
- Tachycardia, palpitations, anxiety and headache
- Increased myocardial oxygen demand

ROUTE
IV, IO, IM, ETT

Etomidate (Amidate)

CLASS
Non-Barbiturate Aesthetic / Sedative / Hypnotic

ACTION
Following rapid administration, the onset of action will produce a loss of conscious of within 60 seconds. The exact mechanism of action has not been fully determined yet. Etomidate is capable of producing all levels of CNS depression, from light sleep to deep coma. Effects are dependent upon dosage, rate and route of administration. Its duration is 3-15 minutes.

INDICATIONS
- Procedural Sedation (for: Cardioversion/Pacing, Ventilatory Management, ICE)
- RSI

CONTRAINDICATIONS
Known hypersensitivity to Etomidate

PRECAUTIONS
- May cause respiratory arrest. Continuously monitor ventilatory status.
- Use with caution in patients with severe hypotension, severe asthma or severe cardiovascular disease.

SIDE EFFECTS
Apnea, hypoventilation, laryngospasm, N/V, tachycardia, muscle jerking

ADVERSE REACTIONS
- Nausea / Vomiting
- Projectile vomiting
- Pain at the injection site
- Hyper / hypoventilation
- Snoring
- Apnea
- Hypo / hypertension
- Laryngospasm
- Bradycardia
- Tachycardia
- Myoclonic activity
- Adrenocortical steroid suppression
- Trismus: may occur with rapid push. Only rapid push in RSI

CONCENTRATION: 20mg/10ml, 2mg/ml

ROUTE IV, IO

Fentanyl (Sublimaze)

CLASS
Narcotic Analgesic

ACTION
The principal actions of therapeutic value are analgesia and sedation. A dose of 100mcg is approximately equivalent to 10 mg of Morphine. Fentanyl has less emetic activity than Morphine and significantly less histamine release than Morphine, which preserves cardiac stability. The onset of action is almost immediate when given IV, however, the maximal analgesic and respiratory depressant effect may not be noted for several minutes. The usual duration of the analgesic effect is 30-60 minutes after a single IV dose. Fentanyl, like all narcotics, is a respiratory depressant and all patients receiving Fentanyl should have pulse oximetry and EtCO2 monitored. Virtually all patients complaining of moderate to severe pain, regardless of etiology, may be a candidate for pain management with Fentanyl. Narcan does antagonize Fentanyl, but usually requires much higher doses, 2-10 mgs.

INDICATIONS
Pain Management Protocol

CONTRAINDICATIONS
- Hypovolemia (uncorrected)
- Hypotension (relative)
- Head Injury (relative)
- Drug Hypersensitivity

PRECAUTIONS
- Fentanyl should be given slowly when administered IV
- Elderly and debilitated patients may not tolerate usual dosing

ADVERSE REACTIONS
- Rapid IV administration may cause
  - Hypotension
  - Nausea / Vomiting
  - Bradycardia
  - Rigid Chest Wall Syndrome

CONCENTRATION: 50mcg/ml

ROUTE: IV, IO, IN, IM

Glucagon (GlucaGen)

CLASS
Polypeptide Hormone

ACTIONS
Assists with the breakdown of glycogen into glucose.

INDICATIONS
Diabetic Emergencies protocol when IV/IO access is not obtainable.

CONTRAINDICATIONS
Hyperglycemia

PRECAUTIONS
Effectiveness is dependent on glycogen stores within the liver.

ADVERSE REACTIONS
Hyperglycemia

ROUTE
- IM
- Reconstitute 1 ml of included dilution solution with 1 mg Glucagon powder.

WARNING: The needle that comes with the Glucagon is NOT for IM use. Draw up the medication in a syringe and attach the appropriate size needle for an IM injection.

Haldol (Haloperidol)

CLASS
Antipsychotic

ACTIONS
Haloperidol is a long-acting antipsychotic that blocks dopamine activity. It reduces nausea and agitation but may cause muscle stiffness or tremors, with minimal sedation or blood pressure effects.

INDICATIONS
- Treatment of both hyperactive delirium and chronic psychoses.
- Used for management in violent patients

CONTRAINDICATIONS
- Combativeness from Trauma
- Patients with a history of hypersensitivity
- Parkinson's Disease, Coma, Severe Mental Depression, Thyrotoxicosis, Seizure Disorders, Alcoholism, CNS Depression, Cocaine Overdose
- Should not be used in the management of dysphoria caused by Talwin/Pentazocine.

PRECAUTIONS
- May cause orthostatic hypotension.
- Use caution in patients with severe cardiovascular disorders (may cause transient hypotension and/or precipitation of angina pain).
- Use with caution in patients receiving anticonvulsant medication(may lower the effectiveness).

ADVERSE REACTIONS
- Parkinson-like mimics, restlessness, lethargy, headache, exacerbation of psychotic symptoms.
- Nausea and/or Vomiting.
- Tachycardia, Hypotension, Hypertension (seen with overdose).
- Bronchospasm, Laryngospasm, Respiratory Depression, Dry Mouth, Hypersalivation, Drooling,

ROUTE
IV/IO

Ketamine (100mg/ml)

CLASS
Dissociative Anesthetic

ACTION
Ketamine is a rapid-acting general anesthetic producing a dissociative state characterized by profound analgesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, cardiovascular and respiratory stimulation, and occasionally a transient and minimal respiratory depression.

INDICATIONS
- Violent Agitated Patient
- Suspected Excited Delirium
- Advanced Airway Management
- Post Intubation Sedation
- CPR Induced Consciousness
- Pain Control

CONTRAINDICATIONS
- Allergy
- Penetrating Eye Injury

ADVERSE REACTIONS
- Hypertension and tachycardia, generally self limited
- Laryngospasm may produce mild stridor. Correct in the order of:
    1) High Flow O2
    2) Ventilation with a BVM
    3) Advanced Airway (RSI)
- Hypersalivation
- Nausea and vomiting
- Tonic and clonic muscle movements
- Transient respiratory depression occasionally occurs
- Roving eye movements and nystagmus

PSYCHOLOGICAL ADVERSE REACTIONS
- Visual Hallucinations
- Emergence Delirium
- Sensation of detachment from the body

Lasix (Furosemide)

CLASS
Loop diuretic

ACTIONS
Furosemide is a potent diuretic that inhibits the reabsorption of sodium and chloride in the proximal tubule, distal tubule, and the loop of Henle. It is also a venous dilator that decreases preload.

INDICATIONS
Cardiogenic Pulmonary Edema (ADULTS ONLY)

CONTRAINDICATIONS
- Hypersensitivity
- Allergies to SULFA prepared medications (Sulfonamides)
- Pregnancy
- Dehydration or Hypovolemic Shock
- Anuria (Lack of urine production due to shock, severe blood loss or heart/kidney failure)
- **SEPSIS, Pneumonia or Fever**

PRECAUTIONS
Rapid administration may cause auditory problems including tinnitus/hearing loss.

ADVERSE REACTIONS
- Headache or Dizziness
- Respiratory Depression, Bronchoconstriction, or Decreased Cough Reflex
- Dehydration, Dry Mouth, Tinnitus
- Hypotension (Secondary to Hypovolemia)
- Nausea and Vomiting
- Electrolyte Disturbances that include Hyponatremia (Low Sodium), Hypokalemia (Low Potassium), Hypochloremia (Low Chlorine), and Hyperglycemia.

ROUTE
IV/IO

Lidocaine (Xylocaine) 1% or 2%

CLASS
Antiarrhythmic

ACTIONS
Antiarrhythmic that decreases phase 4 depolarization inhibiting impulse transmission in the myocardial action potential. Lidocaine stabilizes the neuronal membrane by inhibiting the ionic fluxes required for the initiation and conduction of impulses, thereby effecting local anesthetic action. Lidocaine also works by **blocking sodium channels** in the nerve cell membrane, which **prevents the initiation and transmission of nerve impulses**. This action results in **local anesthesia** by stopping pain signals from reaching the brain.

INDICATIONS
IO Pain Management

PRECAUTIONS
- Hypersensitivity to the “caine” family of drugs
- Prophylactic use in MI’s is not indicated
- Reduce dose (maintenance, not loading) with liver impairment or LV dysfunction
- Discontinue infusion at first sign of toxicity

ADVERSE REACTIONS
- SIGNS OF LIDOCAINE TOXICITY (rare in IO Pain Management use due to reduced dosages):
  - Light headiness
  - Dizziness
  - Blurred Vision
  - Nausea / Vomiting
  - Seizures
  - Hypotension
  - Bradycardia
  - Central Nervous System Depression

ROUTE
IO

Labetalol

EMS Protocol Use for Pre-eclampsia in Pregnancy ONLY

CLASS Mixed alpha- and beta-adrenergic blocker

ACTION

Labetalol is a **combined alpha- and beta-adrenergic blocker** that lowers blood pressure by **reducing systemic vascular resistance (alpha blockade)** and **decreasing heart rate and cardiac output (beta blockade)**. Its balanced effects make it effective for treating **hypertensive emergencies**, **pre-eclampsia**, or **acute hypertension** without causing significant reflex tachycardia. When given intravenously, the onset of action occurs within 2 to 5 minutes, peaks at 5 to 15 minutes, and lasts for approximately 2 to 6 hours.

INDICATIONS

- Severe pre-eclampsia or eclampsia

CONTRAINDICATIONS

- Bradycardia
- Hypotension
- Heart block >1st degree
- Asthma or bronchospasm (relative)
- Do **not** use labetalol if patient is hypotensive or has symptoms of shock

PRECAUTIONS

- Monitor for hypotension and bradycardia
- Use cautiously in patients with asthma/COPD
- Avoid in patients with suspected CHF or heart block
- Ensure fetal monitoring if available (usually in-hospital)

Notes for EMS:

- **If eclampsia (seizures):** Magnesium sulfate is typically first-line for seizure control; labetalol is for BP management.

ROUTE

- 20mg IV/IO over 2 min

Magnesium Sulfate

CLASS
Electrolyte

ACTION
Magnesium is an intracellular electrolyte that is vital to many body functions. It acts as a physiological calcium channel blocker and blocks neuromuscular transmission. Hypomagnesemia will greatly affect the neuromuscular, gastrointestinal and cardiovascular systems. Hypomagnesemia is associated with cardiac arrhythmias, symptoms of cardiac insufficiency, and sudden death. Hypomagnesemia can cause refractory ventricular fibrillation. Administration of magnesium sulfate in the emergency setting appears to reduce the incidence of ventricular arrhythmias that follow an acute myocardial infarction. Magnesium sulfate is a central nervous system depressant effective in the management of seizures associated with eclampsia. It is used for the initial therapy of convulsions associated with pregnancy. If Magnesium fails to control seizures, proceed with other anticonvulsant agents.

INDICATIONS
- Pre-Eclampsia
- Eclampsia
- Torsades de Pointes
- Severe Asthma

CONTRAINDICATIONS
2nd and 3rd Degree Heart Blocks

PRECAUTIONS
- Magnesium should be administered slowly to minimize side effects
- Maintain continuous cardiac monitoring
- Use with caution in renal failure

Magnesium Sulfate

ADVERSE REACTIONS

- Flushing of the skin, sweating
- Central Nervous System depression
- Respiratory depression
- Hypotension, bradycardias and cardiac arrhythmias

SIDE EFFECTS ROUTE

Circulatory Collapse, Respiratory Paralysis, Heart Block

ROUTE

IV, IO, IM (In life-threatening circumstances)

Narcan (Naloxone)

CLASS
Narcotic Antagonist

ACTION
Narcotic antagonist reverses the central nervous system and respiratory depression effects of narcotics; reverses the cardiovascular effects to a lesser extent. Naloxone competes for narcotic receptor sites in the brain and displaces narcotic molecules from the opiate receptors.

INDICATIONS
- Opiate Overdose protocol
- Adult Cardiac Arrest protocol- H's & T's
- Pediatric Cardiac Arrest protocol- H's & T's

CONTRAINDICATIONS
- Hypersensitivity reaction
- Patients that have advanced airways in place

PRECAUTIONS
- Narcan should be administered cautiously, if at all, to patients who are known or suspected to be physically dependent on narcotics. Abrupt and complete reversal of narcotic effects by Naloxone can cause withdrawal-type effects.
- Opiate reversal in the prehospital setting should be titrated to ADEQUATE RESPIRATORY DRIVE as indicated by EtCO2 and SpO2 monitoring.
- Patients that have advanced airways in place, as self-extubation may follow.
- Expect vomiting and combativeness following reversal and be prepared with suction and definitive airway adjuncts as indicated.

Narcan (Naloxone)

ADVERSE REACTIONS

- Aspiration
- Hypotension / Hypertension
- Nausea / Vomiting
- Acute narcotic withdrawal syndrome (nausea, vomiting, sweating, tachycardia, hypertension, tremor, agitation, diarrhea, abdominal cramps, seizures, and cardiac arrest).

PRECAUTIONS

- Administered cautiously to patients who are known or suspected to be physically dependent on opiates as Narcan administration can cause withdrawals in these patients, including newborns of addicted mothers.
- Use caution during administration, as patient may become violent as level of consciousness increases.

ROUTE

IV, IO, IM, IN

NOTE: Methadone, Darvon, Talwin and Fentanyl may require higher doses of Narcan, contact medical control.

Nitro-glycerine Paste

CLASS
Nitrate/Vasodilator

ACTIONS
Nitroglycerin is a **vasodilator** that relaxes smooth muscle in blood vessels, causing **venous pooling and arterial dilation**. This reduces **myocardial oxygen demand** by lowering preload and afterload while improving **coronary blood flow**.

INDICATIONS
Pulmonary edema

CONTRAINDICATIONS
- Hypotension
- Erectile Dysfunction Drugs (Male Enhancement Drugs Sildenafil, Levitra within 24 hours and Cialis within 48 hours)
- Right Ventricular Infarction
- No IV/IO access

SIDE EFFECTS
- Headache, nausea and vomiting, hypotension, reflex tachycardia
- For NTG-induced hypotension, place patient in a supine position and administer a 500ml fluid bolus of Normal Saline and remove the NTG paste.

Nitrous Oxide

Nitrous Oxide 50% Blended in Oxygen
(Nitronox®)

CLASS
Anesthetic

ACTIONS
Nitrous oxide is a colorless gas, which acts on the central nervous system. When mixed with 50% oxygen and inhaled, it produces an effect similar to a mild intoxicant. The patient laughs and talks but does not go to sleep. When inhaled, nitrous oxide has potent analgesic effects, which dissipate within 2-5 minutes after stopping administration.

INDICATIONS
Moderate to severe pain as in trauma, acute MI, burns, renal colic and labor.

CONTRAINDICATIONS
Nitrous oxide is contraindicated in any altered state of consciousness, (eg. head injury, alcohol ingestion, drug OD). It is also contraindicated in COPD patients, acute pulmonary edema, pneumothorax, decompression sickness, air embolus, and abdominal pain with distention or suspicion of obstruction, pregnancy **(except during delivery)**, and patients that are unable to self-administer Nitronox.

WARNINGS
Since nitrous oxide is heavier than air, it may accumulate on the floor of ambulance. During transits of more than 15 minutes, nitrous oxide may effect ambulance personnel.

SIDE EFFECTS
Light-headedness, confusion, drowsiness, nausea and vomiting.

Normal Saline (0.9% Sodium Chloride)

CLASS

Solution/Electrolyte

ACTION

Normal saline is an isotonic crystalloid solution, used for fluid and electrolyte replacement. 0.9% normal saline contains 154mEq of sodium ions (Na+) and 154mEq of chloride (Cl-) ions per liter, thus making it an isotonic solution in relation to the extracellular fluid. It has a pH of 5.0 and contains 900mg of sodium per 100ml.

INDICATIONS

This is the IV used for medication administration, to keep vein open and for fluid replacement

PRECAUTIONS

- Circulatory overload
- Renal disease

ADVERSE REACTIONS

- Febrile response
- Infection at the injection site
- Venous thrombosis

ROUTE

IV, IO

Oral Glucose (Insta-Glucose)

CLASS
Simple Sugar, Glucose

ACTIONS
Increase blood sugar when the level falls too low (hypoglycemia)

INDICATIONS
For documented hypoglycemia (less than 60 mg/dL), before unconsciousness occurs.

CONTRAINDICATIONS
- Hyperglycemia
- Hypersensitivity
- Patient who can't protect their own airway
- Patient who have a diminished gag reflex or unable to swallow

PRECAUTIONS
- Assure gag reflex is present
- Patient must be conscious enough to be able to swallow.

ADVERSE REACTIONS
- Aspiration
- Nausea and vomiting

ROUTE
PO

Oxygen

CLASS
Gas

ACTION
Supplemental oxygen increases the saturation levels of the hemoglobin molecule within the red blood cell. This results in an increased oxygen delivery level at the tissue. Oxygen is required for the efficient breakdown of glucose into a usable energy form.

INDICATIONS
- Oxygen should be used in any type of patient that has or may have a condition in which an increased oxygen level will decrease tissue hypoxia.
- Advanced Airway Management protocol (Nitrogen washout / preoxygenation)

PRECAUTIONS
- Possible decreased respiratory drive in the chronic oxygen deprived patient. i.e. COPD or emphysema patients.
- Never deprive the hypoxic patient of oxygen for fear of respiratory depression.
- Stroke patients with SpO2 > 94%

ROUTE
Blow by, nasal cannulas, face masks, CPAP, BVM, advanced airways

Oxytocin (Pitocin)

CLASS
Pituitary Hormone

ACTION
Pitocin is a uterine stimulant. It works by causing uterine contractions by changing calcium concentrations in the uterine muscle cells.

INDICATIONS
OB/GYN- Postpartum Hemorrhage Protocol - Postpartum hemorrhage after all fetus and placental delivery and refractory to uterine massage and suckling of the infant

CONTRAINDICATIONS
- Hypersensitivity
- Presence of unborn fetus
- Undelivered placenta
- Unfavourable Fetal position
- Complications that require medical intervention for birth

PRECAUTIONS
Other Vasopressors may potentiate hypertension

ADVERSE REACTIONS
- Coma
- Seizure
- Hypertension
- Tachycardia
- Pain Contractions
- Uterine rupture
- Nausea and vomiting

ROUTE
IV, IO, IM

Rocuronium

CLASS
Non-depolarizing neuromuscular blocker

ACTIONS
Rocuronium is a **non-depolarizing neuromuscular blocker** used to induce skeletal muscle paralysis for **rapid sequence intubation (RSI)** or mechanical ventilation. It works by **competitively blocking acetylcholine** at the neuromuscular junction, preventing depolarization of the muscle fiber. Onset occurs within **1–2 minutes**, with a duration of **30–60 minutes**.

INDICATIONS
- RSI
- POST INTUBATION

CONTRAINDICATIONS
None

PRECAUTIONS Cardiovascular disease or advanced age may slow onset time.
- Use with caution and even consider using a lower dose for patients with renal failure.
- Reconstitute with 10mL of Normal Saline.

ROUTE
IV/IO

CONCENTRATION
10mg/ml

Sodium Bicarbonate

CLASS: Alkalinizing; Minerals and Electrolyte

ACTION: Alkalinizing agent used in the treatment of metabolic acidosis

INDICATIONS

- Hyperkalemia protocol
- Behavioral Emergencies protocol- Agitated Delirium
- Adult Cardiac Arrest protocol / Special Considerations / ROSC
- Pediatric Cardiac Arrest protocol / Special Considerations / ROSC
- Digitalis Toxicity protocol
- TCA Overdose protocol
- Crush Injury protocol
- HAZ-MAT Toxidrome Protocols: Corrosives / Hydrocarbons / Special Hydrocarbons

CONTRAINDICATIONS

- Hypersensitivity to drug class
- Hypercalcemia

PRECAUTIONS

- CHF: may induce fluid overload in patients with a history of heart failure
- Precipitates calcium chloride
- Inactivates catecholamines

ADVERSE REACTIONS

- Metabolic alkalosis
- Tissue necrosis if the IV infiltrates

ROUTE

IV, IO

SODIUM BICARBONATE 4.2%: Discard 25mL of 8.4% and draw up 25mL of Normal Saline.

Solu-Medrol (Methylprednisolone)

CLASS
Corticosteroid

ACTIONS
A corticosteroid that is similar in nature to natural hormones produced by the adrenal glands in the body. Solu-Medrol's primary action is to reduce swelling and the body's natural immune system response.

INDICATIONS
- Allergic Reaction protocol
- Respiratory Distress protocol

CONTRAINDICATIONS
Known hypersensitivity and patients with systemic fungal infections

PRECAUTIONS
Use with caution in patients with GI Bleeding or diabetes will cause hyperglycemia

ADVERSE REACTIONS
- Cardiovascular: Fluid Retention, hypertension, hypotension, dysrhythmia, CHF, electrolyte imbalance
- CNS: Seizures, vertigo, headache
- GI: Nausea / vomiting, GI bleeding, abdominal distention
- General: Urticaria, anaphylactic Reaction

ROUTE
IV, IO, IM

Tetracaine (Pontocaine)

CLASS: Topical Local Anesthetic

ACTIONS

Tetracaine works by interfering with entry of sodium ions into the nerve cell. This reduces the ability of nerves to generate impulse and send pain sensation.

INDICATIONS

Eye Injury protocol

CONTRAINDICATIONS

Hypersensitivity to the “caine” family of drugs

PRECAUTIONS

- Protect the eye from injury while it is numb
- Do not rub the eye while it is numb

ADVERSE REACTIONS

- Stinging
- Burning
- Redness
- Blurred Vision

ROUTE

Ophthalmic administration

Toradol (Ketorolac Tromethamine)

CLASS
NSAID

ACTIONS
NSAIDs work by inhibiting prostaglandin synthesis through the blockade of COX-1 and COX-2 enzymes, which reduces inflammation, pain, and fever. They provide effective non-opioid analgesia without sedative or narcotic effects.

INDICATIONS
•Moderate to severe **acute pain** (especially musculoskeletal or renal colic)
•Pain management **alternative to opioids**

CONTRAINDICATIONS
•**Allergy** to NSAIDs or aspirin
•Active **GI bleeding**, peptic ulcers
•History of **renal impairment**
•Recent **surgery** (risk of bleeding)
•**Pregnancy** in 3rd trimester)
•Suspected **bleeding disorders**
•**Pediatric patients**: Do not give in patient <18 years of age

ADVERSE REACTIONS
•Nausea, vomiting
•Dizziness, headache
•GI irritation or bleeding
•Renal dysfunction

Onset / Duration:
•**Onset**: ~10 minutes IV / 30–60 minutes IM
•**Duration**: 4–6 hours

Route:
IV/IO/IM

Versed (Midazolam)

CLASS
Benzodiazepine

ACTION
Versed is a potent, short-acting Benzodiazepine with strong anti-seizure, hypnotic and amnesic properties. The onset of action is 1-5 minutes when administered intravenously and 15 minutes when administered intramuscularly. Like all Benzodiazepine class drugs, Versed is a central nervous system depressant and may cause hypotension.

INDICATIONS
- Seizure protocol
- Respiratory Distress (CPAP) protocol
- Cocaine Overdose protocol

CONTRAINDICATIONS
- Hypersensitivity to the drug
- Narrow-angle glaucoma

PRECAUTIONS
- A slight to moderate decrease in mean arterial pressure, cardiac output, systemic vascular resistance and heart rate may be seen
- Lower dosages should be considered in patients that are debilitated or chronically ill
- Caution in OB/GYN patients close to delivery for neonatal sedation

ADVERSE REACTIONS
- Hypotension
- Respiratory depression

ROUTE
IV, IO, IM, IN

Concentration: 5mg/2ml, 2.5mg/ml

Zofran (Ondansetron)

CLASS
Antiemetic Agent

ACTION
Selectively blocks serotonin from binding to 5-HT3 receptors located in the CNS at the chemoreceptor trigger zone and in the peripheral nervous system on nerve-terminals of the Vagus nerve.

INDICATIONS
Nausea / Vomiting protocol

CONTRAINDICATIONS
- Hypersensitivity
- Use with caution in patients with hepatic impairment
- Pregnancy
- Prolonged QTc > 500 ms

PRECAUTIONS
Inducers or inhibitors of P450 drug metabolizing enzymes may alter the clearance of Ondansetron. No dosage adjustment is recommended

ADVERSE REACTIONS
- CNS: Headache, malaise, fatigue, dizziness, fever, sedation, extrapyramidal syndrome
- Cardiovascular: Chest pain, arrhythmias
- Respiratory: Hypoxia
- GI & Hepatic: Diarrhea, constipation, abdominal pain, Xerostomia, decreased appetite
- Skin: Rash

ROUTE
IV, IO, IM, PO

13.4 MEDICATION TOOL

Dilutions

Infusions

Grey
3-5 KG

Pink
6-7 KG

Red
8-9 KG

Purple
10-11 KG
1 Year

Yellow
12-14 KG

White
15-18 KG
3 Year

Blue
19-23 KG
5 Year

Orange
24-29 KG
7 Year

Green
30-36 KG
9 Year

Green
45 KG

Green
55 KG

Grey
3-5 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Grey 3-5 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.14 ml 0.28 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	0.4 ml *Bolus
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	1ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	1ml
D10 D: 5ml/kg IV/IO Max = adult dose	25 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	1ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.1ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	0.5ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.1ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Grey 3-5 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 0.6ml Sedation 0.3 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	0.5ml 5 mcg
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.1ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	0.5ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	0.3ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	0.4ml

Medications(ml) D: Dose C: Conc. Estimated Age	Grey 3-5 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	8 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.1ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	0.5ml 2mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	0.5ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.1ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.2ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.2ml

Equipment and Non Medication Therapy Estimated Age	Grey 3-5 KG
IO	Pink/ Blue
Lidocaine 1% for IO **D: 0.5 mg/kg** **C: 10mg/ml**	**0.5 ml**
I-Gel	**1**
Joules **1 J/KG**	**5**
2 J/KG	**10**
4J/KG	**20**
I GEL	**1**
AIR Q	
NP	**12 FR**
OP	**40MM**
ET	**2.5-3.0**
PADS	**PED**

Normal Vital Signs Hyperlink

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	1 ml

Pink
6-7 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Pink 6-7 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.2 ml 0.4 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	0.6 ml
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	1.2 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	1.2 ml
D10 D: 5ml/kg IV/IO Max = adult dose	35 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	1.5 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.2ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	0.8 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.1 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Pink 6-7 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 0.9ml Sedation 0.4 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	0.7ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.2ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	0.7ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	0.5ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	6-7 KG
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	0.5ml IV 1ml IN

Medications(ml) D: Dose C: Conc. Estimated Age	Pink 6-7 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	14 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.2 ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	0.7ml 2mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	0.7ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.15ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.3ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.3ml

Equipment and Non Medication Therapy Estimated Age	Pink 6-7 KG
IO	Pink/ Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	1 ml
I-Gel	1.5
Joules 1 J/KG	7
2 J/KG	15
4J/KG	30
I GEL	**1**
AIR Q	
NP	**12 FR**
OP	**40MM**
ET	**2.5-3.0**
PADS	**PED**

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	1 ml

Red
8-9 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Red 8-9 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.24 ml 0.5 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	0.8 ml
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	1.6 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	1.6 ml
D10 D: 5ml/kg IV/IO Max = adult dose	46 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	2 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.25ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	1 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.1 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Red 8-9 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 1.2ml Sedation 0.6 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	.9ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.3ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	0.9ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	0.6ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	8-9 KG
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	0.5ml IV 1ml IN

Medications(ml) D: Dose C: Conc. Estimated Age	Red 8-9 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	18 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.3ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1ml 2mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	0.9ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.2ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.4ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.4ml

Equipment and Non Medication Therapy Estimated Age	Red 8-9 KG
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	1ml
I-Gel	1.5
Joules 1 J/KG	10
2 J/KG	20
4J/KG	40
I GEL	1.5
AIR Q	
NP	14FR
OP	50MM
ET	3.0
PADS	PED

Normal Vital Signs Hyperlink

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	1.30 ml

Purple
10-11 KG
1 Year

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Purple 10-11 KG 1 Year
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.36 ml 0.7 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	1 ml (50 mg)
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	2 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	2 ml
D10 D: 5ml/kg IV/IO Max = adult dose	56 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	2.5 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.25ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	1 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.12 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Purple 10-11 KG 1 Year
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 1.5ml Sedation 0.8 ml
Fentanyl IV/IO (Diluted)****** D:1mcg/kg C: 10mcg/ml Max = adult dose	1ml (10 mcg)
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.3 ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	1ml (10 mg)
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	0.8ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1 ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	1ml

Medications(ml) D: Dose C: Conc. Estimated Age	Purple 10-11 KG 1 Year
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	22 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.4ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1ml 2mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	1.2ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.22ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.5ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.5ml

Equipment and Non Medication Therapy Estimated Age	Purple 10-11 KG 1 Year
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	1 ml
I-Gel	2
Joules 1 J/KG	10
2 J/KG	20
4J/KG	40
IGEL	2
AIR Q	
NP	18FR
OP	60MM
ET	4.0
PADS	PED

Normal Vital Signs Hyperlink

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	1.5 ml

Yellow
12-14 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Yellow 12-14 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.4 ml 0.8 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	1.4 ml
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	2.4 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	2.4 ml
D10 D: 5ml/kg IV/IO Max = adult dose	70 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	3 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.3 ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	1.6 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.14 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Yellow 12-14 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 1.8ml Sedation 1 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	1.4ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.4ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	1.4ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	1ml (500 mg)
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1 ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	1.2ml

Medications(ml) D: Dose C: Conc. Estimated Age	Yellow 12-14 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	26 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.5ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1ml 2mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	1.4ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.26ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.6ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.6ml

Equipment and Non Medication Therapy Estimated Age	Yellow 12-14 KG
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	1.5 ml
I-Gel	2
Joules 1 J/KG	15
2 J/KG	30
4J/KG	60
I GEL	2
AIR Q	
NP	20FR
OP	60MM
ET	4.0-5.0
PADS	PED

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	2 ml

White
15-18 KG
3 Year

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	White 15-18 KG 3 Year
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.6 ml 1.2 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	1.8 ml For
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	3.4 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	3.4 ml
D10 D: 5ml/kg IV/IO Max = adult dose	90 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	4 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.4ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	1.8 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.16ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	White 15-18 KG 3 Year
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 2.2ml Sedation 1.2 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	1.8ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.5ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	1.8ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	1.2ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	1.6ml

Medications(ml) D: Dose C: Conc. Estimated Age	White 15-18 KG 3 Year
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	34 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	Dilute as above
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.6ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1ml 1mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	1.8ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.35ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.7ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	0.8ml

Equipment and Non Medication Therapy Estimated Age	White 15-18 KG 3 Year
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	2 ml
I-Gel	2
Joules 1 J/KG	20
2 J/KG	40
4J/KG	80
I GEL	2
NP	20FR
OP	60MM
ET	4.0-5.0
PADS	ADULT

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	2.5 ml

Blue
19-23 KG
5 Year

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Blue 19-23 KG 5 Year
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.7 ml 1.4 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	2 ml Cardiac (100 mg)
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	4 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	4.4 ml
D10 D: 5ml/kg IV/IO Max = adult dose	100 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	5 ml (25 mg)
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.5ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	2 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.2ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Blue 19-23 KG 5 Year
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 2.6ml Sedation 1.6 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	2.2ml (22 mcg)
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.7ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	2.2ml (20 mg)
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	1.4ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	2.2ml

Medications(ml) D: Dose C: Conc. Estimated Age	Blue 19-23 KG 5 Year
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	44 ml
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	20 ML
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.7ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1.2ml 1mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	2.ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.45ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	0.9ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	1.0ml (2mg)

Equipment and Non Medication Therapy Estimated Age	Blue 19-23 KG 5 Year
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	2.5 ml
I-Gel	2
Joules 1 J/KG	30
2 J/KG	60
4J/KG	120
I GEL	2
NP	20FR
OP	60MM
ET	4.0-5.0
PADS	ADULT

Normal Vital Signs Hyperlink

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	3 ml

Orange
24-29 KG
7 Year

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Orange 24-29 KG 7 Year
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	0.8 ml 1.6 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	2.4 ml Arrest
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	5 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	5.4 ml
D10 D: 5ml/kg IV/IO Max = adult dose	100 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	6 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.6ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	2.5 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.3ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Orange 24-29 KG 7 Year
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 3.8ml Sedation 1.9 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	2.6ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	0.9ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	2.6 ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	2ml (1 gram)
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	2.8ml

Medications(ml) D: Dose C: Conc. Estimated Age	Orange 24-29 KG 7 Year
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	50 ml (25 Meq)
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	25 ML
Solumedrol D: 2mg/kg C: 62.5mg/ml	0.8ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	1.5ml 1mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	2.6ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.5ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	1ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	1.5ml

Equipment and Non Medication Therapy Estimated Age	Orange 24-29 KG 7 Year
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	3 ml
I-Gel	2.5
Joules 1 J/KG	30
2 J/KG	60
4J/KG	120
I GEL	2.5
AIR Q	
NP	26FR
OP	80MM
ET	6.0
PADS	ADULT

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	4 ml

Green
30-36 KG
9 Year

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Green 30-36 KG 9 Year
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	1 ml (3 mg) 2ml (6 mg)
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	3 ml (150 mg)
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	5 ml (0.5 mg)
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	6 ml
D10 D: 5ml/kg IV/IO Max = adult dose	100 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	7 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	0.7mlml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	3 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.3 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Green 30-36 KG 9 Year
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 4.5ml Sedation 2.4 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	3.5ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	1ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	3.5ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	2.4ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5ml IV 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	3.5ml

Medications(ml) D: Dose C: Conc. Estimated Age	Green 30-36 KG 9 Year
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	XXXX
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	35 ml
Solumedrol D: 2mg/kg C: 62.5mg/ml	1ml (62.5 mg)
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	2ml 1mg/kg (40 mg)
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	3.6ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.6ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	1ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	2 ml

Equipment and Non Medication Therapy Estimated Age	Green 30-36 KG 9 Year
IO	Pink/Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	3.5 ml
I-Gel	2.5
Joules 1 J/KG	30
2 J/KG	60
4J/kg	120
I GEL	2.5
NP	26FR
OP	80MM
ET	6.0
PADS	ADULT

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	5 ml

Green
40 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Green 45 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	1.5 ml 3 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	4.5 ml
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	5 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	9 ml
D10 D: 5ml/kg IV/IO Max = adult dose	100 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	9 ml
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	1ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	4.5 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.3 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Green 45 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 6.6 ml Sedation 3.5 ml
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	4.5 ml
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	1.35 ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	4.5 ml
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	3.6 ml With 50 ml NS for infusion
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5 ml 1ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	4.5 ml

Medications(ml) D: Dose C: Conc. Estimated Age	Green 45 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	XXXX
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	45 ml
Solumedrol D: 2mg/kg C: 62.5mg/ml	1.5 ml
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	2.25 ml 1mg/kg
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	4.5 ml
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	0.8 ml
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	1 ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	2 ml

Equipment and Non Medication Therapy Estimated Age	Green 45 KG
IO	Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	4 ml
I-Gel	3
Joules 1 J/KG	50
2 J/KG	100
4J/KG	200
I GEL	3
AIR Q	
NP	28FR
OP	90MM
ET	6.0
PADS	ADULT

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	6.75 ml

Green
50 KG

MEDICATION TOOL

Medications(ml) D: Dose C: Conc. Estimated Age	Green 55 KG
Adenosine IV D: 0.1/0.2 mg/kg C: 3mg/ml Max = adult dose	1.8 ml 3.6 ml
Amiodarone D: 5mg/kg IV C: 50mg/ml Max = adult dose	5.5 ml (275 mg)
Atropine D: 0.02mg/kg IV/IO C: 0.1mg/ml Max = adult dose	5 ml
Calcium Chloride D: 20mg/kg IV/IO C: 100mg/ml Max = adult dose	10 ml (1 gram)
D10 D: 5ml/kg IV/IO Max = adult dose	100 ml
Diphenhydramine: (Diluted) D: 1mg/kg IV/IO/IM C: 5mg/ml	10 ml (50 mg)
Diphenhydramine (Not Diluted) D: 1mg/kg IM Conc: 50mg/ml	1ml
Epinephrine 1:10,000 D: 0.01mg/kg IV/IO C: 0.1mg/ml	5.5 ml
Epinephrine 1:1000 Anaphylaxis IM D: 0.01mg/kg C: 1mg/ml Max = adult dose	0.3 ml IM

Medications(ml) D: Dose C: Conc. Estimated Age	Green 55 KG
Etomidate IV/IO C: 2mg/ml RSI:0.3mg/kg Sedation: D: 0.15 mg/kg	RSI 8 ml Sedation 4 ml (8 mg)
Fentanyl IV/IO (Diluted)**** D:1mcg/kg C: 10mcg/ml Max = adult dose	5.5 ml (55 mcg)
Fentanyl (Intranasal) 1.5mcg/kg IN/IM C: 50mcg/ml	1.65 ml IN
Ketamine (Diluted) *D:1mg/kg IV/IO/IM C: 10mg/ml Max = adult dose	5.5 ml (55 mg)
Mag Sulfate D:40mg/kg IV/IO C: 1gm/2ml (Asthma and Torsades)	4 ml (2grams)
Narcan D: 0.1mg/kg IV C: 1mg/ml Max = adult dose	0.5 ml 1 ml IN
Rocuronium IV D: 1mg/kg C: 10mg/ml Max = adult dose	5 ml (50 mg)

Medications(ml) D: Dose C: Conc. Estimated Age	Green 55 KG
Sodium Bicarb 4.2% D: 1meq/kg IV/IO C: 0.5 meq/ml Max = adult dose	XXXX
Sodium Bicarb 8.4% D: 1 Meq/Kg IV/IO C: 1Meq/ml Max = adult dose	50 ml
Solumedrol D: 2mg/kg C: 62.5mg/ml	2 ml (125 mg)
Succinylcholine D: 1mg/kg OR 2mg/kg C: 20mg/ml Max = adult dose	2.75 ml 1mg/kg (55 mg)
Vecuronium IV/IO D: 0.1mg/kg C: 1mg/ml Max = adult dose	5.5 ml (5.5 mg)
Versed IV/IO D: 0.1mg kg C: 5mg/ml Max = adult dose	1 ml (5mg)
Versed IN/IM D: 0.2 mg/kg C: 5mg/ml Max = adult dose	1 ml IN
Zofran D: 0.1mg/kg IM or Slow IV/IO/PO C: 4mg/2ml Max = adult dose	2 ml (4mg)

Equipment and Non Medication Therapy Estimated Age	Green 55 KG
IO	Blue
Lidocaine 1% for IO D: 0.5 mg/kg C: 10mg/ml	4 ml
I-Gel	3
Joules 1 J/KG	50
2 J/KG	100
4J/KG	200
I GEL	3
AIR Q	
NP	28FR
OP	90MM
ET	6.0-7.0
PADS	ADULT

[Normal Vital Signs Hyperlink]

TXA (Tranexamic Acid D: 15mg/kg C: 100mg/1ml Max = adult dose	8 ml

MEDICATION TOOL

Medication Concentrations

Acetaminophen:
160mg/5ml, 4oz bottle

Adenosine:
12 mg (3mg/ml), 4ml single dose

Albuterol:
2.5mg, 0.83mg/ml, 3mg single dose

Amiodarone:
150mg/3ml Vial

Atropine:
21ga 1-1/2" needle, 0.1mg/ml

Calcium Chloride:
1gm/10ml, 100mg/ml

Diphenhydramine:
50mg/1ml = 1 vial

Epi:
1:1000, (0.1%) 30 ml Multi-dose vial

Epi:
1:10,000, 0.1mg/ml (0.01%)

Epi: Push Dose

1:100,000, 0.01mg/ml (0.001%)

Etomidate:
20mg/10ml= 2mg/ml

Fentanyl:
50mcg/ml-2ml vial

Ketamine:
100mg/1ml- 5ml vial

Magnesium Sulfate:
1GM/2ml, 50%=500mg/ml

Naloxone:
1mg/ml, 2ml prefilled syringe

Rocuronium Bromide:
10 mg/ml, multi-dose vial

Sodium Bicarb:
8.4% , 84mg/ml NaHCO3, 1 meq/ml-50 ml vial

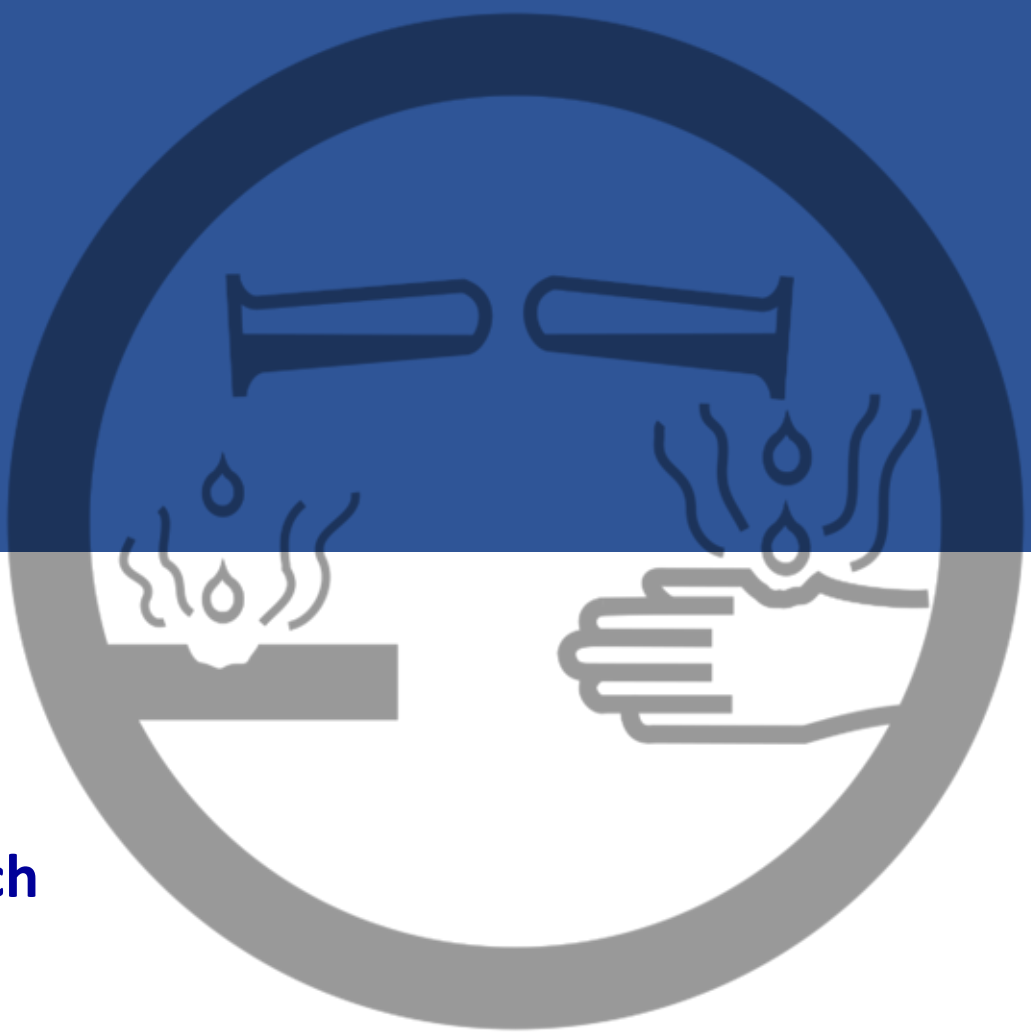
Versed:
5mg/ml

Zofran:
4mg/2ml

PUSH DOSE EPI:

To make push-dose epinephrine, draw **1 mL of epinephrine 1:10,000 (0.1 mg)** and add it to **9 mL of normal saline**, creating a **1:100,000 (10 mcg/mL)** concentration. Administer **1ml** IV/IO every **30 seconds as needed** to maintain systolic BP above 100 mmHg while definitive therapy is initiated. Clearly label the syringe "**Epinephrine - Push Dose**" and monitor ECG and blood pressure continuously. MAX DOSE is 30ml or 0.3mg.

Broward County Regional HAZMAT Protocols



Dr. James Roach
Dr. Randy Katz

MAIN MENU

Section 14

HAZMAT Protocols

Supportive Care Procedures

HP-1
Published: 3/1/21
Reviewed:
Updated: 9/22/2023

1. Remove the patient from the hazardous area.
2. If the patient was exposed externally, remove his/her clothing and jewelry and decontaminate with copious amounts of water. Provide ocular irrigation with normal saline (do not attempt to neutralize with another solution).
3. If the patient has external burns, see Burn Injuries.
4. Contact the Poison Information Center (1-800-222-1222).
5. If the patient has pulmonary edema, maintain adequate ventilation and oxygenation, and provide pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should be treated with positive end expiratory pressure (PEEP) or a CPAP mask.

Decontamination Procedures & Reference Guides

Mass Decon: Large numbers of people, in the event of industrial, accidental, or intentional contamination by toxic, infective, caustic, polluted, or otherwise unhealthful or damaging substances. Fire engines, ladder trucks and fire hydrants are ideal for this procedure. Attaching multiple fog nozzles (set on wide fog) are attached enables a large number of victims can walk through the curtain of water and begin the decon process.

Emergency Decon: This procedure is used on first responders or civilians that have life threatening symptoms during or after a chemical exposure and need immediate medical attention. These victims take decon priority over everyone else.

Technical Decon: This type of decon usually occurs when a designated hazmat team arrives and begins setting up large scale decon which may include male and female decon line showers, decon tent, contaminated water catchment, etc.

Initial Decontamination Procedures

- Remove patient clothing (this will help remove 80%-90% of the contaminant).
- Copious amounts of water should be used for initial decontamination unless the substance exposed is a powder or otherwise indicated.
- Assist patient with decontamination of themselves (using soap (if indicated) & water bucket and brush), with extra attention to decontamination of the hands, feet, armpits, groin, and any skin folds.
- Once decon is complete, issue the patient post decontamination scrubs or gown to put on and direct them to proper triage treatment area.
- Patients need to be quarantined, and rapid transport implemented for critically ill patients only after emergency decon has been performed.

NOTE: Chemical Solubility per NIOSH Chemical Guidebook

- Chemicals with 1% solubility or less: Only require water for decontamination.
- Chemicals with 1% solubility and more: Require soap and clothing removal, issue decon scrubs post.

HAZMAT Toxidrome & Traditional Syndromes

Toxidromes are clinical syndromes that a patient may present with. These patterns of signs and symptoms are essential for the successful recognition of chemical exposure. The toxidromes identified in this protocol are chemical exposure based while others such as the opioids are found within general medical protocol. Each can present as a clinical manifestation of the chemical/poisoning involved with some cross-over between toxidromes.

Additional Notes:

Acid pH: < 7

Base pH: > 7

Neutral pH: 7

Coagulative Necrosis: Pathological change produced when acid contacts tissue. Cell death with scab-like formations.

Liquefactive necrosis: Cell death without scab-like formation. Produced by alkaline (base) burns.

HazMat Toxidrome	NFPA 473 Correlation	HazMat Protocol
Cholinergic	▪ Pesticides ▪ Nerve Agents	▪ Organophosphate ▪ Carbamate
Corrosive	▪ Corrosives ▪ Vesicants	▪ Hydrofluoric Acid (HF) ▪ Chemical burns to the eye.
Asphyxiant	▪ Chemical Asphyxiants ▪ Simple Asphyxiants ▪ Blood Agents	▪ Cyanide & Hydrogen Sulfide ▪ Closed Space Fires
Methemoglobin - Forming Compound	▪ Carbon Methemoglobin Formers	▪ Aniline Dyes ▪ Nitrobenzene ▪ Nitrites, Nitrates ▪ Dinitrobenzene (DNB) ▪ Nitrogen Dioxide
Miscellaneous	▪ Toxic Alcohols	▪ Ethylene Glycol/Methanol
Irritant Gas	▪ Irritants	▪ Bronchospasm ▪ OC Pepper spray & Lacrimators ▪ Chloramine and Chlorine • Acidic & Alkaline Gas Inhalation
Hydrocarbon & Halogenated HC	▪ Organic Solvents ▪ Phenolic Compounds	▪ Phenol ▪ Halogenated Hydrocarbons ▪ Carbon Monoxide

HP-3
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Poisonings & Corresponding Treatments

Poisoning	Antidote	Adult Dose	Pediatric Dose
Organophosphates, Carbamates, and Nerve Agents	Atropine Sulfate	2-6mg IV Bolus Repeat until atropinization occurs.	0.02-0.04mg/kg IV Bolus Never less than 0.1mg administration. Repeat until atropinization occurs.
	Protopam Chloride (2-Pam)	1-2g IV Infusion over 10 mins, then 500mg/hr. continuous IV Infusion.	20-40mg/kg IV Infusion over 10 mins, then 5-10 mg/kg/hr. continuous IV Infusion.
Nerve Agents	ATNAA Kit/Duodote	Injection – (2.1 MG Atropine/600 MG 2-PAM)	Injection – (2.1 MG Atropine/600 MG 2-PAM) ***(9 Y/O and over)***
Hydrofluoric Acid (skin burns)	Calcium Gluconate 2.5%-10% Topical Gel	Topical Application	Topical Application
Systemic Hydrofluoric Acid or Fluoride Poisoning	Calcium Gluconate 10%	10-20ml Bolus Repeat PRN	0.2-0.3ml/kg Repeat PRN
Cyanides, Nitriles and Sulfides	Sodium Nitrite	10ml (1amp) IV Infusion over 5 mins	0.12-0.33ml/kg IV Infusion over 5 mins (max 10ml)
Cyanides/Smoke Inhalation	Hydroxocobalamin (CyanoKit)	5grams reconstitute in 100ml NS administered over 15 mins (Adult = 1 Bottle)	TOUCH HERE FOR PEDIATRIC DOSE CHART
Ethylene Glycol, Methanol	Sodium Bicarbonate	1 mEq/kg 8.4%	1 mEq/kg 8.4
Chlorine, Ammonia, Acids/Mists, etc.	Sodium Bicarbonate	3ml of 8.4% Nebulized Repeat PRN	3ml of 4.2% Nebulized Repeat PRN
Phenol and Halogenated Hydrocarbons	Large copious amounts of water. Followed by soap and water.	Irrigate burn area with PEG 300	Irrigate burn area with PEG 300
Carbon Monoxide	Oxygen *Consider Hyperbaric Chamber*	100% O2 via appropriate delivery device depending on patient severity.	100% O2 via appropriate delivery device depending on patient severity.

Organophosphate and Carbamate Insecticides

Green

Protocol

Example Materials

- **Malathion, parathion, ethion, bendiocarb, aldicarb, sarin nerve agent, VX nerve agent**

DESCRIPTION: Pesticide can be inhaled, ingested, or absorbed. Once in the body, it binds with the acetylcholinesterase, initially causing excitation of nervous conduction then paralysis. These agents can be lethal in a dose less than 5 mg. Common seen signs are:

Signs of Organophosphate & Nerve Agents	
D - Diarrhea	**S** – Salivation
U - Urination	**L** – Lacrimation
M - Miosis	**U** – Urination
B - Bronchospasm, Bradycardia, Bronchorrhea	**D** – Diarrhea
E - Emesis	**G** – Gastro-intestinal pain & hyperactivity
L - Lacrimation	**E** – Emesis
S- Salivation	**M** - Miosis

TREATMENTS:

1) Decontaminate and remove clothing.
2) Immediately give 100% oxygen.
3) Start IV with normal saline and give:
4) **Atropine 2-6 mg IVP** and at 5-minute intervals until Atropinization (drying or respiratory secretions) occurs. There is not a maximum dose. Use extreme caution in a hypoxic patient (giving atropine to hypoxic heart may stimulate ventricular fibrillation).

- **2MG: Mild (Pinpoint pupils, Bradycardia, NO Bronchorrhea)**
- **4MG: Moderate: (Salivation, Wheezing, Bronchorrhea, Dyspnea)**
- **6MG: Severe Symptoms (Apnea, Massive Bronchorrhea, Hypotension, Seizures)**

5) **Pralidoxime (2-PAM, Protopam) IVP 1Gm** over 2 minutes. (Not used in known Carbamate Poisonings.)

a) Seizures controlled according to protocol.

Hydrofluoric Acid

Orange

Protocol

Examples:

- **Vikane (Sulfuryl Fluoride)**

DESCRIPTION: Injury is twofold in that the compound causes corrosive burning of the skin and deep underlying tissue, also binds with calcium and magnesium from the nerve pathways, bone, and blood stream. Systemic effects may be delayed. The results are spontaneous depolarization producing excruciating pain, and hypocalcemia, resulting in tetany and cardiac dysrhythmias, which may degenerate to cardiac arrest. Skin may look deceptively normal at the surface. Pain is an indication for treatment, and that it's managed through the administration of calcium not analgesic.

TREATMENT:
In all cases Contact Medical Control/Director immediately for when indications of symptoms shows systemic involvement:
• Cardiac dysrhythmias
• Conduction disturbances
• ST Segment abnormalities on EKG
• Tetany
• Seizures

Skin Burns:

a) Immediately flush exposed area with large amounts of water

b) Apply **Calcium Gluconate Gel** to burned area (mix 10 ml of a 10% calcium gluconate solution into a 2 ounce tube of sterile water soluble jelly)

If pain continues:

c) **Calcium Gluconate** in a 5% solution is injected subcutaneously in a volume of **0.5 ml / cm2 every ¼ inch** into burned area and is also injected subcutaneously ½ inch around the circumference of the burned area.

Hydrofluoric Acid

Orange

Protocol

Examples:

- **Vikane (Sulfuryl Fluoride)**

Eye Injuries:

a) Immediately flush eyes with any means possible
b) Administer **1 – 2 drops of tetracaine** in each eye
c) Connect saline bag and tubing to a Morgan Irrigation Lens and run wide-open
d) If possible remove contact lens (morgan lens can not be used with contacts or trauma to the eye)
e) Irrigate the eyes

Inhalation Injury:

a) Mix 6 ml of sterile water into **3 ml of 10% Calcium Gluconate**
b) Place solution in nebulizer and connect to oxygen to provide effective fog

Systemic Reactions: Must be considered for all inhalation/ingestion injuries

a) Administer **Calcium Gluconate (10%) adult dose 1-2g (10-20 mL) slow IV** over 5 minutes.
b) Pediatric dose **– 0.2-0.3 mL/kg slow IV over 5 minutes.**

Closed Space Fire

Smoke Inhalation

RED

Protocol

DESCRIPTION: Closed space fires produce many toxic substances, including cyanide, carbon monoxide, and numerous respiratory irritating gases. CYANIDE is one of the most rapidly acting poisons which can be found in the productions of combustion. Increasingly, cyanide has been recognized as a threat at the scene of a closed space fire and hazardous materials incidents. CO in combination with Cyanide rapidly removes the ability of the blood to transport oxygen. This combined with the severe swelling of the bronchioles and bronchospasms related to the exposure to respiratory irritants creates a patient that will rapidly decompensate.

The mechanism of injury during a fire is three fold: Thermal damage, pulmonary irritation, and chemical asphyxiation (HCN, CO).

Anyone exposed from a close space fire should be considered to have inhalation chemical asphyxiation.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.

c) Preferably, perform endotracheal intubation and monitor end tidal CO2 (ETCO2).

d) Start IV of 1000 cc normal saline, age appropriate maintenance rate.

e) Treat unconscious patients per the General Medical Considerations Protocol by evaluating glucose levels, correcting hypoglycemia, administering naloxone (Narcan ®) as called for by local medical protocols.

Closed Space Fire

Smoke Inhalation

RED

Protocol

TREATMENT:

f) Hydroxocobalamin (CyanoKit) 5 grams

1) Start a dedicated IV line
2) Reconstitute each **5 gram vial with 200 ml sodium chloride**
3) Invert or rock the vial. Do not shake.
4) **Administer 5 grams at 15 ml/min.**
5) Repeat doses can be administered over 15 – 120 minutes

Note for ingested or absorbed cyanide additional doses of hydroxocobalamin may be required and may be infused at a rate of 5 grams over 15 to 120 minutes.

Age Group (Years)	Hydroxocobalamin (Cyanokit)		20 Drop Set (w/kit)
0-2	¼ bottle	1,250 MG	1 gtt/2 secs
3-5	¼ bottle	1,250 MG	1 gtt/2 secs
6-14	½ bottle	2,500 MG	1 gtt/1 sec
15>	Full bottle	5 Grams	2 gtts/1 sec

Cyanide Poisoning

RED
Protocol

Example Materials

- **Hydrogen Cyanide, Cyanogen chloride, potassium cyanide, sodium cyanide**

DESCRIPTION: CYANIDE is one of the most rapidly acting poisons. It is reported to smell like "bitter almonds" to those that are genetically capable of detecting the odor. Pulse oximetry will accurately indicate an unusually high saturation due to the cell's inability to pick up oxygen from the blood stream.

TREATMENT:

Hydroxocobalamin (CyanoKit) 5 grams over 15 - 120 minutes.

a) Decontaminate patient and remove clothing.

b) Start a dedicated IV line.

c) Reconstitute each 5 gram vial with 200 ml sodium chloride.

d) Administer 5 grams at 15 ml/min.

Note: For ingested or absorbed cyanide, additional doses of hydroxocobalamin may be required and may be infused at a rate of 5 grams over 15 to 120 minutes.

Age Group (Years)	Hydroxocobalamin (Cyanokit)		20 Drop Set (w/kit)
0-2	¼ bottle	1,250 MG	1 gtt/2 secs
3-5	¼ bottle	1,250 MG	1 gtt/2 secs
6-14	½ bottle	2,500 MG	1 gtt/1 sec
15>	Full bottle	5 Grams	2 gtts/1 sec

Hydrogen Sulfide

RED

Protocol

Example Materials

- **Hydrogen Sulfide, Thioethers**

DESCRIPTION: With much the same clinical effects as cyanide, it is a rapid acting poison. Also known as Sewer Gas. It has a distinctive smell of rotten eggs, but may quickly exceed its odor threshold losing its warning properties. Formed naturally by the decomposition of organic substances. Heavier than air. Interferes with cellular respiration.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.

c) **Sodium nitrite 10ml of a 3% solution IV/IO** over 2 minutes (300mg). Monitor BP, as hypotension may occur. (Sodium nitrite converts approximately 20% of the circulating hemoglobin to methemoglobin). Additional doses of sodium nitrite should only be done once methemoglobin blood analysis is completed.

Pediatric Dosage - Administer **Sodium Nitrite 0.33 ml / kg** of a 3% solution over 10 minutes.

Carbon Monoxide Poisoning

RED

Protocol

NOTE: Usually symptoms can begin in the 10 to 20% range, including nausea and headache. It is difficult to correlate a level of carboxyhemoglobin with unconsciousness, because the presence of other gases and the lack of oxygen are all involved. Other medical conditions also impact how the exposure presents. Serious neurologic and cardiac toxicity has been seen at levels in the 30% to 40% range. Unconsciousness in the setting of smoke inhalation is probably due to mixed exposures including cyanide, carbon monoxide, and acid gases as well as many other toxic products of combustion, consider use of closed space fire protocol.

DESCRIPTION: Colorless, odorless, tasteless, non-irritating gas. Converts hemoglobin into carboxyhemoglobin, a non-oxygen carrying compound causing chemical asphyxiation. Pulse oximetry can indicate an incorrect, false high oxygen saturation. Pulse oximetry should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin. Units that do not have this capability may give falsely high PaO2 readings.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen

c) Preferably endotracheal intubation and monitor End Tidal CO2 (ETCO2)

d) Start IV 1000cc Normal Saline, age appropriate maintenance rate

e) Treat unconscious patients per the General Medical Considerations Protocol in the Standing Medical Protocols to include evaluation of Glucose levels, correction of hypoglycemia, administration of naloxone (Narcan).

f) Patients should be transported to the closest appropriate medical facility to maintain the “golden hour”.

Methemoglobin Formers

Gray

Protocol

Example Materials:

- **Aniline dyes, nitrites, nitrates, nitrobenzene & nitrogen dioxide**

DESCRIPTION: Commonly found in fertilizers, paints, inks, and dyes. Changes hemoglobin into a non-oxygen carrying compound, methemoglobin. Blood color changes from red to a chocolate brown. Pulse oximetry will indicate an inaccurately low reading due to the opaqueness of the compound. Pulse oximetry should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin levels.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.

c) Start IV of 1000cc normal saline, age appropriate maintenance rate.

Ethylene Glycol
Methanol

Pink

Protocol

CLINICAL MANIFESTATIONS OF ETHYLENE GLYCOL POISONING:

Stage 1: Symptoms include central nervous system (CNS) depression, intoxication, and hyperosmolarity. This stage occurs within 12 hours of exposure.

Stage 2: Symptoms include cardiopulmonary syndrome, such as tachycardia, tachypnea, and congestive heart failure. This stage occurs within 48 hours of exposure.

Stage 3: Symptoms include acute renal failure, which can occur within 72 hours of exposure.

METHANOL EXPOSURE:

Methanol's toxicity is due to its metabolic products. The by-products of methanol metabolism cause an accumulation of acid in the blood (metabolic acidosis), blindness, and death. Initial adverse health effects due to methanol poisoning include drowsiness, a reduced level of consciousness (CNS depression), confusion, headache, dizziness, and the inability to coordinate muscle movement (ataxia). Other adverse health effects may include nausea, vomiting (emesis), and heart and respiratory (cardiopulmonary) failure. Prognosis is poor in patient/victims with coma or seizure and severe metabolic acidosis (pH <7). Early on after methanol exposure, there may be a relative absence of adverse health effects. This does not imply insignificant toxicity. Methanol toxicity worsens as the degree of metabolic acidosis increases, and thus, becomes more severe as the time between exposure and treatment increases.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.

c) Start IV/IO of 1000cc normal saline, age appropriate maintenance rate.

d) If patient's respiratory rate is twice the normal rate, administer **Sodium Bicarbonate 8.4% 1 meq/kg IV/IO**.

Corrosive Inhalations

Yellow

Protocol

EXAMPLE MATERIALS:

- **Chlorine, Ammonia, Chloramine, Industrial Respiratory Irritants**

DESCRIPTION: Wheezing due to exposure of the respiratory system to an irritant. The condition of wheezing may be caused by both bronchospasms and bronchial swelling because of the inhalation of an irritating gas or vapor. To adequately treat this condition both bronchodilation and anti-inflammation pharmaceuticals must be considered.

CHLORAMINE GAS EXPOSURE: Chloramine gas is produced by the mixture of household bleach and household ammonia. Chloramine and Chlorine is an irritant that converts to hydrochloric acid in the lining of upper airway. Chloramine is toxic and flammable. The patient will typically complain of a burning sensation to the upper respiratory system, coughing, wheezing and hoarseness.

TREATMENT:

a) Decontaminate and remove clothing.

b) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.

c) Administer **Albuterol via nebulizer 2.5 mg** pre-mixed with 3mL normal saline. If less than (1) year old, use ½ the dose **Albuterol 1.25 mg** in 3mL normal saline. May repeat up to (2) two times PRN.

d) Consider high levels of steroids **Solu-Medrol 125 MG** IV/IO to decrease respiratory swelling.

e) Nebulize **Sodium Bicarbonate** as follows:

- Adult – **3mL of 8.4%** (Repeat PRN)
- Pediatric – **3mL of 4.2%** (Repeat PRN)

Aromatic Compounds (Phenols)

Blue

Protocol

DESCRIPTION: Also known as Carbolic Acid. Found in many household items and is commonly used as a disinfectant, germicide, antiseptic, and as a wood preservative. It causes injury much the same as other acids by causing coagulating necrosis. Systemic effects are seen throughout the central nervous system. Evidence of CNS depression including respiratory arrest.

TREATMENT:

a) Decontaminate initially with large volumes of water then irrigate burned area with **Polyethylene Glycol 300 (PEG 300)**. Alternate washes of mild soap and water and oil (or PEG) a minimum of two times each before transport.

Note: Small volumes of water increase absorption by expanding the surface area of Exposure

b) Support respiration, control seizures, and ventricular ectopy with recognized means of treatment.

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Pediatric WMD/HAZMAT Dosage Guide

WEAPONS OF MASS DESTRUCTION (WMD) PROTOCOL												
Call Poison Control 800-222-1222		NB	4MO	6 MO	1 YR	3 YR	5 YR	7 YR	9 YR	10 YR	≥11 YR	
ANTIDOTE	POISONING	4 KG	6 KG	8 KG	10 KG	15 KG	20 KG	25 KG	30 KG	35 KG	≥40 KG	NOTES
Atropine *0.4 mg/mL*	Organophosphates Carbamates Nerve Agents	0.5 mL	0.75 mL	1 mL	1.3 mL	1.9 mL	2.5 mL	3.1 mL	3.8 mL	4.4 mL	5 mL	0.05 mg/kg IV/IO bolus Repeat Q 2-5 min
AtroPen® Auto-injector	Same as Atropine Indication	N/A	0.25 mg	0.5 mg	0.5 mg	0.5 mg	1 mg	1 mg	1 mg	1 mg	2 mg	IM only
Calcium Chloride 10% slow IV bolus	Systemic Hydrofluoric Acid Systemic Fluoride Poison	0.8 mL	1.2 mL	1.6 mL	2 mL	3 mL	4mL	5 mL	6 mL	7 mL	10 mL	Repeat doses may be required
Calcium Gluconate 10% slow IV bolus	Systemic Hydrofluoric Acid Systemic Fluoride Poison	0.8 mL	1.2 mL	1.6 mL	2 mL	3 mL	4mL	5 mL	6 mL	7 mL	10 mL	Repeat doses may be required
Calcium Gluconate Gel	Hydrofluoric Acid Skin Burn	Apply topically using gel or solution										2.5%-10% topical
DuoDote™ Auto-injector (Atropine + 2-PAM)	Organophosphates Nerve Agents	N/A	N/A	N/A	N/A	N/A	N/A	N/A	YES	YES	YES	9 years and over
Methylene Blue	Methemoglobin Forming Compounds	0.4 mL	0.6 mL	0.8 mL	1 mL	1.5 mL	2 mL	2.5 mL	3 mL	3.5 mL	5 mL	IV/IO slow (5 min)
Pralidoxime (2-PAM)	Organophosphates Nerve Agents	2 mL	3 mL	4 mL	5 mL	7.5 mL	10 mL	12.5 mL	15 mL	17.5 mL	20 mL	IV/IO over 10 min then continuous @5-10 mg/kg/hr
Sodium Nitrite	Cyanide / Nitriles Hydrogen Sulfide	0.8 mL	1.2 mL	1.6 mL	2 mL	3 mL	4 mL	5 mL	6 mL	7 mL	8 mL *(max 10 mL)*	3% solution IV/IO over 5 minutes
Sodium Thiosulfate	Cyanide Nitriles	5 mL	8 mL	10 mL	12 mL	18 mL	24 mL	30 mL	36mL	42 mL	50 mL *(max)*	Infuse IV/IO over 10-20 min 25% solution
1. CYANOKIT INSTRUCTIONS		**AMOUNT TO REMOVE FROM VIAL (Use Syringe)**									Cyanide / Nitriles / Sulfides	
Use these instructions to reconstitute 1 vial. Each vial = 5 g of Hydroxycobalamin	1. Draw one (1) tiger top tube 2. Add 200 mL D5W to 5 g vial 3. Rock/Rotate (60 seconds) 4. Remove desired vol. w/ syringe 5. Reinsert into empty D5W bag 6. Attach macro/maxi tubing	11 mL	17 mL	22 mL	28 mL	42 mL	56 mL	70 mL	84 mL	98 mL	Administer directly from vial over 15 minutes	Can also reconstitute with Normal Saline or Lactated Ringers
2. SELECT ONE (Based on Preference)		**INFUSION INSTRUCTIONS**										VALUES
If using macro/maxi tubing	Drops per minute (gtt/min)	7	11	15	19	28	37	47	56	65	N/A	gtt/min
If using Cyanokit tubing	Drops per minute (gtt/min)	15	23	30	37	56	75	93	112	130	260	gtt/min
If using an infusion pump	Infusion volume (over 15 min)	11 mL	17 mL	22 mL	28 mL	42 mL	56 mL	70 mL	84 mL	98 mL	Entire Volume	Give over 15 min

Quality Assurance and Improvement

SECTION 15

Section 15

Quality Assurance and Improvement

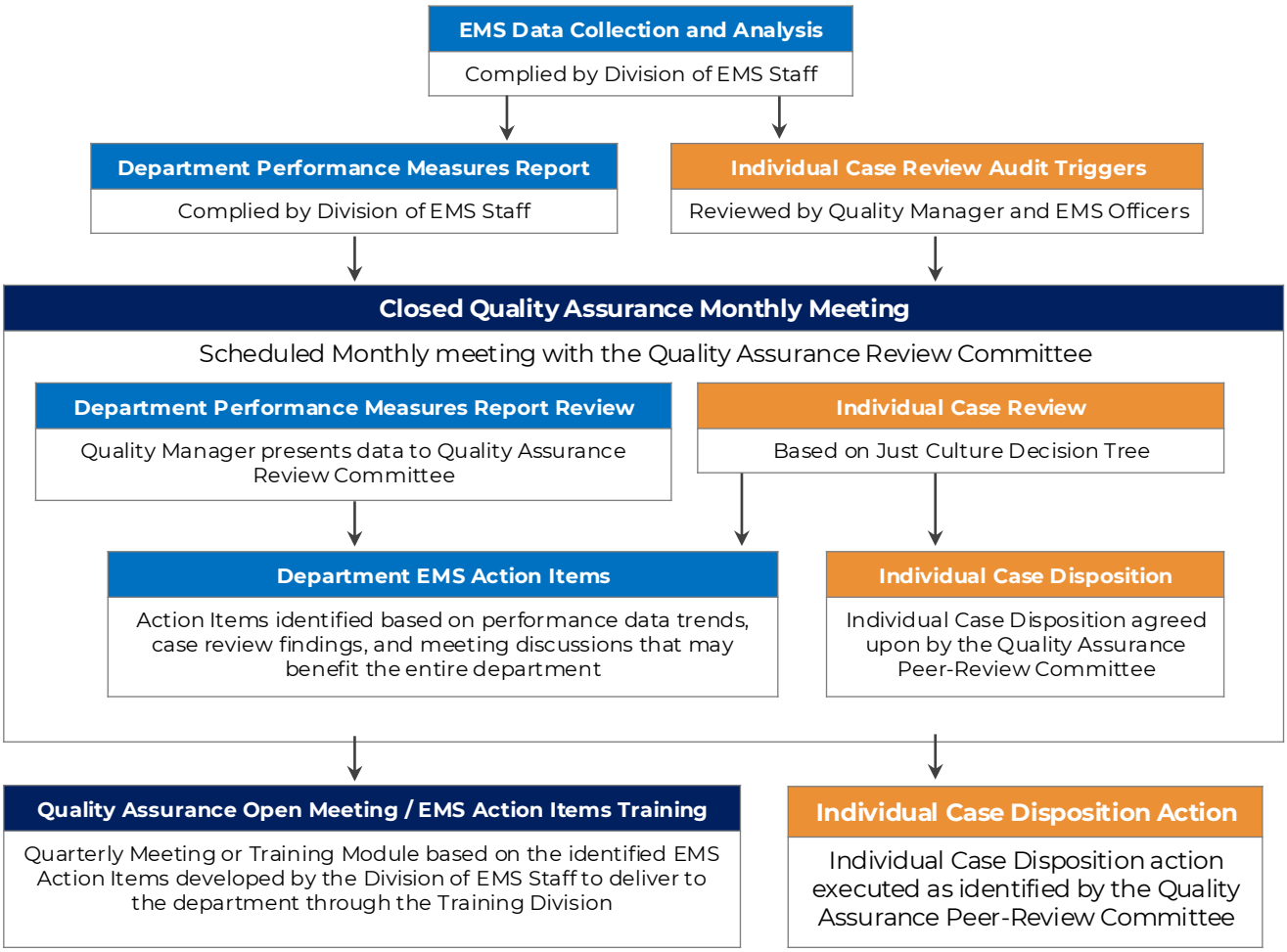
15.1 Introduction

The mission of EMS is to provide high quality, emergency medical care to patients with a broad spectrum of healthcare needs. Consistent evaluation of clinical quality is therefore essential for ensuring that the system is operating effectively and efficiently in service of this purpose. The Medical Director is tasked with performing individual and system-based Quality Assurance (QA) to ensure high-quality clinical care consistent with evidence-based best-practices and standards of care. System improvement should be continuous, patient-centered, data-driven, and utilize a scientific approach based on quantitative methods and organizational development principles.

15.1.1 Principles of Quality Assurance

1) Build quality into the EMS system
2) Clearly define expectations before holding individuals accountable
3) Examine the system as well as the individual when a problem occurs
4) Use positive instead of negative reinforcement of EMS personnel
5) Expect but limit variations in the EMS system
6) Continuously strive to collect data that measures the expected outcomes and constantly change our practice to maximize best practice result

15.1.1 Quality Assurance Process



15.2 Performance Review Process

The mission of EMS is to provide high quality, emergency medical care to patients with a broad spectrum of healthcare needs. Consistent evaluation of clinical quality is therefore essential for ensuring that the system is operating effectively and efficiently in service of this purpose.

15.2.1 Data collection and Review

1) General Data
2) Quality/Performance
3) Medication usage
4) Air Rescue Stats

15.2.2 Monthly Performance Measures

The mission of EMS is to provide high quality, emergency medical care to patients with a broad spectrum of healthcare needs. Consistent evaluation of clinical quality is therefore essential for ensuring that the system is operating effectively and efficiently in service of this purpose.

1) EMS Response Summary
    - 1.1 EMS Demand for Service
    - 1.2 Non-Transport Rates
    - 1.3 High Acuity Incident Demand for Service
2) Patient Satisfaction
3) EMS Response Times
4) Sepsis
5) Trauma
    - 5.1 Whole Blood
6) Stroke
7) Advanced Airway
8) Chest Pain
9) Cardiac Arrest
    - 9.1 Dispatch
    - 9.2 EMS Response
    - 9.3 Hospitals

15.3 Multi-Tier Case Review

1) Station Captain Review – The Shift Captain will review all charts for 24-hour period. See SOG E-128 for specific direction.

2) EMS Officer Review/EMS Quality Supervisor – Audit Triggers/ High Risk cases will be sent to the EMS Captain.

3) Medical director– Cases determined to be concerning will be sent to Quality Assurance Committee for review. See SOG E-126 for specific direction.

4) Quality Closed Meeting – Meeting conducted to review the performance measures and applicable cases. A case disposition will be determined by the Quality Committee during the meeting.

5) Quality Open Meeting or EMS Action Items Training – Based on findings from the QA process, EMS Action Items will be identified and disseminated to the service members through an open meeting or training module.

15.3.1 Quality Committee Composition

Chair:
Medical Director

Co-Chair:
EMS Chief

Co-Chair:
President of the Union

Quality Management Officer

Quality Management Staff

EMS Captains

15.3.2 Operational Considerations

A. System Peer-Review

To ensure a high-standard of clinical care across the system the System Peer-Review Committee will hold regular meetings.

B. Anonymous Fashion

All information collected during QA process are confidential and protected and will not be shared. The processes described above are non-disciplinary and non-punitive. All cases are subject to independent operational review for evaluation of non-clinical concerns. During CQI the names of all staff will be removed.

15.3.3 Audit Triggers

The mission of EMS is to provide high quality, emergency medical care to patients with a broad spectrum of healthcare needs. Consistent evaluation of clinical quality is therefore essential for ensuring that the system is operating effectively and efficiently in service of this purpose.

Individual (Practice Patterns)

Case Review

Audit triggers

- Protocol Deviation
- Clinical Practice Concern
- Advanced Procedures
- Refusals of Care
- Extended Response times
- Extended on scene times
- All Unanticipated Deaths
- All ALERTS

15.3.4 Sentinel Event

A sentinel event is defined by American healthcare accreditation organization The Joint Commission (TJC) as any unanticipated event in a healthcare setting resulting in death or serious physical or psychological injury to a patient or patients, not related to the natural course of the patient's illness.

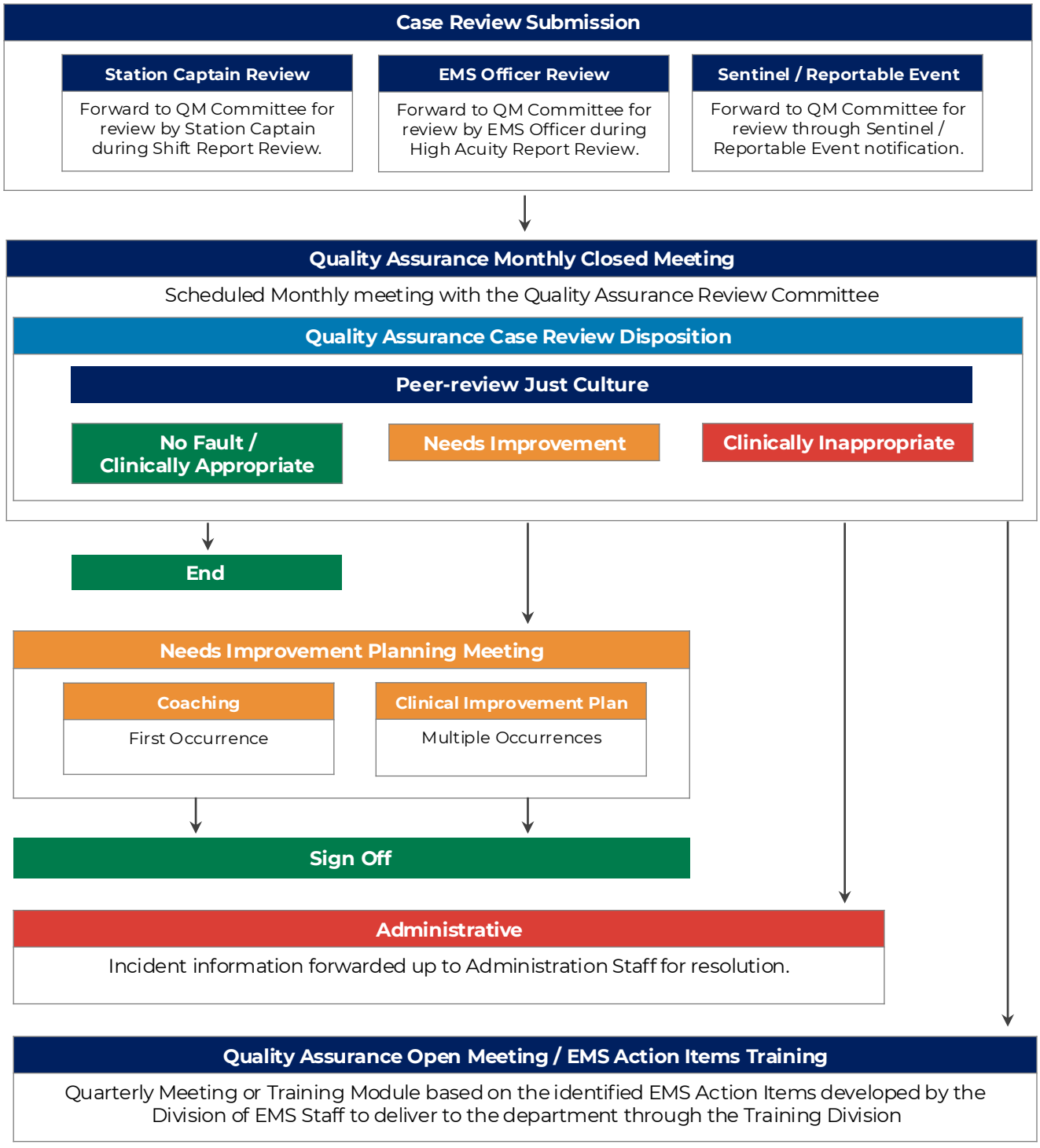
An urgent meeting will be arranged to discuss the case. These cases will be brought to the immediate attention of the Battalion Chief, EMS Division Chief, and Medical Director. A direct clinical review will be scheduled as soon as possible with the investigating EMS Chief and the Medical Director.

Examples:

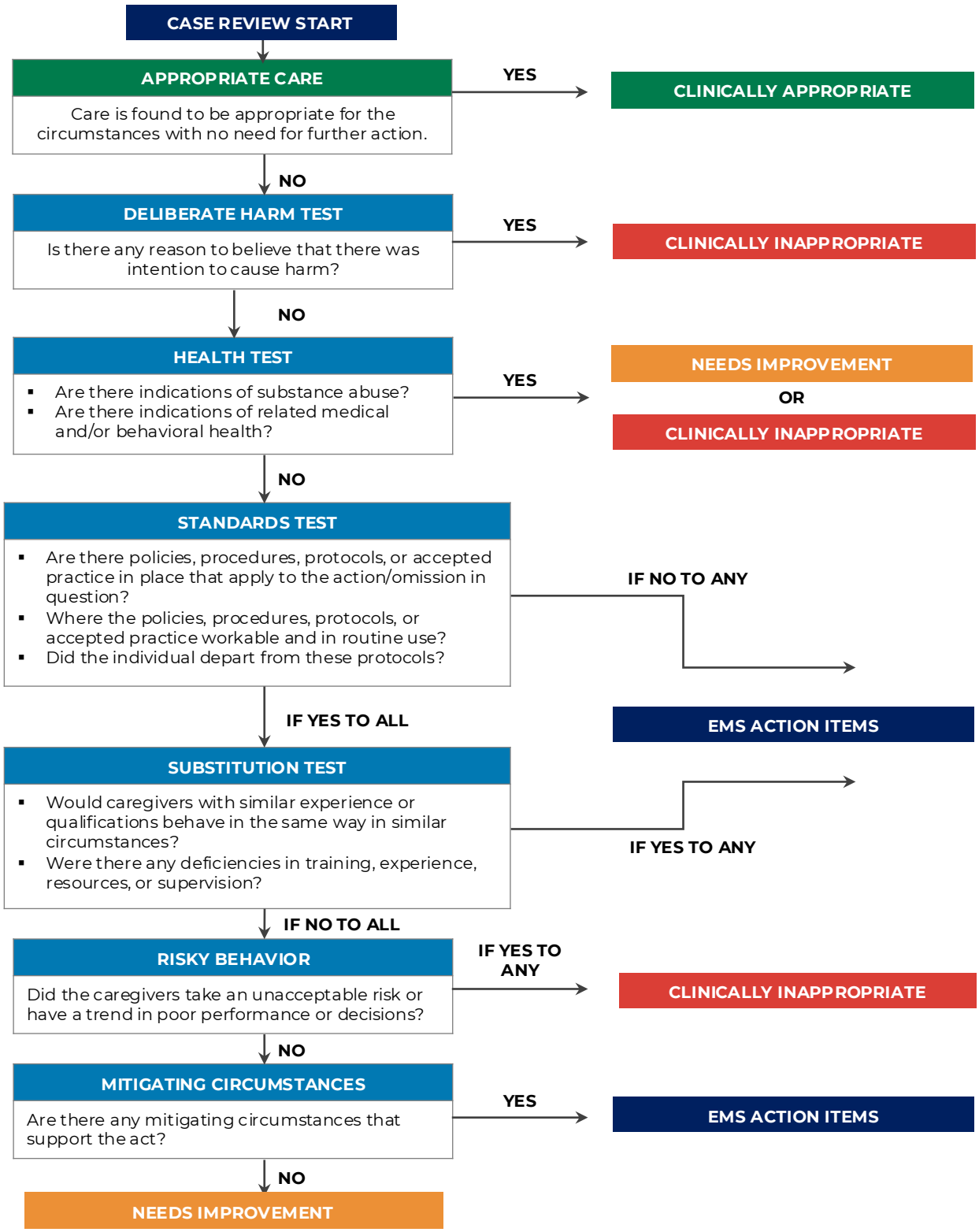
- Unrecognized failed airway
- Failure to appropriately treat symptomatic dysrhythmias
- Cases of neglect/abandonment
- Unanticipated Death
- Medication Errors
- Equipment Failure resulting in patient harm
- Suspected or Confirmed Controlled Substance Diversion
- Criminal Event: Assault on EMS Personnel
- EMS Personnel Severe Injury or Significant Exposure
- Mass Casualty

See SOG E-126 for specific directions related to Sentinel Events.
FLFR: SOP Article 1121

15.3.5 Case Review Flowchart



15.3.6 Peer-Review Just Culture



15.3.7 Dispositions

Based on findings from the QA process, the case will be given a final disposition and logged into the database. The final dispositions are as follows:

1) NO-FAULT – These cases include those where no deviation from protocol or clinical care was found, and where the care provided did not pose a substantial risk for an adverse outcome.
2) CLINICALLY APPROPRIATE – These cases include those where deviations from protocol or clinical care were found, but which did not pose a substantial risk for an adverse outcome and may have resulted in improved clinical course or outcome.
3) NEEDS IMPROVEMENT – These cases include those where deviations from protocol or clinical care were found and may have posed potential risk for an adverse outcome.
   Examples:
   - Medication errors with potential for adverse outcome
   - Protocol variance with potential for adverse outcome (i.e., under or over treating)
   - Inadequate documentation
   - Unsuccessful application of clinically appropriate skill
4) CLINICALLY INAPPROPRIATE – These cases include those where a critical lapse in clinical care was identified, and where significant concern for further lapses exists in the absence of appropriate remediation or retraining. These cases may also include those where a potential or actual deleterious patient outcome may have resulted from inadequate assessment or inadequate/inappropriate application of protocol or skill.

All Clinically Inappropriate cases will be referred to Administration for Administrative Action.

15.3.8 Clinical Improvement Plan

A Clinical Improvement Plan (CIP) consists of clinical objectives which must be completed prior to case closure and, in some cases, prior to restoring provider to full credentialed status. The clinical improvement plan formed must include:

- Objectives and process for completion
- Timeline
- Expectations for feedback throughout the CIP

COACHING – Provided on the first occurrence of topic.
CLINICAL IMPROVEMENT PLAN – Provided for an individual with more than one occurrence on the same or similar topic.

The CIP may include remediation, designed to correct identified deficits. This focuses on patterns of practice rather than individual deviations from protocol, with an emphasis on education and retraining.

Examples include:

- Educational tool
- Placement with a Field Training Officer for real-time remediation
- Scenario based education
- Clinical knowledge discussion

FOLLOW-UP EVALUATION

To determine if concerns identified during the QA process have been adequately addressed and corrected, regular follow-up evaluation will occur. This may consist of, but is not limited to:

- Chart audit for a predetermined period of time
- Scene evaluations
- Follow-up Interview with QA staff, and/or Medical Director, as appropriate

OUTCOMES

It is the goal and expectation that the clinical provider will meet the objectives of the CIP and complete the process with a sign-off.

In the event that the expectations cannot be accomplished, the following will be considered:

- Extension of CIP timeframe
- Forward to Administration
- Medical Director Discretional Action: Potential restriction of clinical credentialing

15.3.9 Administrative Action

When the disposition of a case review has been determined to be Clinically Inappropriate, the case will leave the Quality Improvement process and be forwarded to Fire Rescue Administration for Administrative Action.

15.4 Department EMS Action Items

Review of all performance measures and case dispositions for the quarter will be done in such a way as to highlight EMS Action Items that will be communicated to the department through the dissemination of a training module in order to educate the entire service.

These action points will be sent out quarterly via method as per Administrative Staff.

The Battalion Chiefs will be responsible for making certain this information is communicated appropriately.

APPENDICES

SECTION 16

Section 16

Appendices

APPENDIX A

APPROVED MEDICAL ABBREVIATIONS

Approved Medical Abbreviations

[Aa]

@	At
AAA	Abdominal Aortic Aneurysm
ABD	Abdomen
ABC	Airway, Breathing, Circulation
AC	Antecubital
ACLS	Advanced Cardiac Life Support
A & D	Admission and Discharge
AED	Automated External Defibrillator
A-fib	Atrial Fibrillation
AIDS	Acquired Immune Deficiency Syndrome
ALS	Advanced Life Support
AKA	Also Known As or Above the Knee Amputation
AMA	Against Medical Advice
AMI	Acute Myocardial Infarction
AMT	Amount
AOS	Arrived on Scene
APAP	Acetaminophen
APAGAR	Infant Assessment Scale
APPROX	Approximately
ASA	Aspirin
ASHD	Arteriosclerotic Heart Disease

[Bb]

BB	Backboard or Bundle Branch
BBB	Bundle Branch Block
BBS	Bilateral Breath Sounds
Bilat	Bilateral
BKA	Below the Knee Amputation
BLS	Basic Life Support
BM	Bowel Movement
BP	Blood Pressure
BGL	Blood Glucose Level
BVM	Bag Valve Mask

[Cc]

CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CAOx 4	Conscious, Alert and Oriented to Person, Place, Time and Situation
CA	Cancer
Cath	Catheter
CC	Chief Complaint
CCU	Coronary Care Unit or Critical Care Unit
CHF	Congestive Heart Failure
CNS	Central Nervous System
C/O	Complains of
CO	Carbon Monoxide
CO2	Carbon Dioxide
COD	Cause of Death
COPD	Chronic Obstructive Pulmonary Disease
CP	Chest Pain
CPR	Cardiopulmonary Resuscitation
CQI	Continuous Quality Improvement
CSF	Cerebral Spinal Fluid
CT Scan	Computerized Axial Tomography
CVA	Cerebral Vascular Accident (Stroke)

[Dd]

DA	Drug Abuse
D/C	Discontinue or Discharge
DCAP-BTLS	Deformities, Contusions, Abrasions, Punctures, Burns, Tenderness, Lacerations, Swelling
DNRO	Do Not Resuscitate Order
DOA	Dead on Arrival
DOS	Dead on Scene
DTs	Delirium Tremens
DVT	Deep Vein Thrombosis
DOS	Dead on Scene
D5W	Dextrose 5% in Water
D10W	Dextrose 10% in Water
D50	Dextrose 50% in Water
Dx	Diagnosis

Approved Medical Abbreviations

[Ee]

ECG	Electrocardiogram
EEG	Electroencephalogram
EENT	Eyes, Ears, Nose, Throat
EJ	External Jugular
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EPS	Extra Pyramidal Symptoms
ETA	Estimated Time of Arrival
ETOH	Ethyl Alcohol
ET or ETT	Endotracheal Tube
EXT	Extremities

[Ff]

F	Female
FB / FO	Foreign Body / Object
FBAO	Foreign Body Airway Obstruction
FLEX	Flexion
FROM	Full Range of Motion
Fx	Fracture

[Gg]

g	Grams
GCS	Glasgow Coma Scale
GI	Gastrointestinal
GOA	Gone on Arrival
GSW	Gunshot Wound
gtts	Drops
GU	Genitourinary
GYN	Gynecology

[Hh]

H/A	Headache
HEENT	Head, Eyes, Ears, Nose, Throat
HIV	Human Immune Deficiency Virus
HR	Heart Rate
H/A	Headache
HEENT	Head, Eyes, Ears, Nose, Throat
HIV	Human Immune Deficiency Virus
HR	Heart Rate
HTN	Hypertension
Hx	History
Hyper	High or above
Hypo	Low or Below
HTN	Hypertension
Hx	History
Hyper	High or above
Hypo	Low or Below

[Ii]

ICF	Intracellular Fluid
ICP	Intracranial Pressure
ICS	Intercostal Space
ICU	Intensive Care Unit
IM	Intramuscular
IN	Intranasal
IO	Intraosseous
IV	Intravenous
IVP	Intravenous Push
IVPB	Intravenous Piggyback

[Jj]

J	Joules
JVD	Jugular Vein Distension

[Kk]

kg	Kilogram
KO	Keep Open
KVO	Keep Vein Open

Approved Medical Abbreviations

[Ll]

(L)	Left
L&D	Labor and Delivery
LAT	Lateral
LBBB	Left Bundle Branch Block
lb.	Pound
LEO	Law Enforcement Officer
LLQ	Left Lower Quadrant
LMP	Last Menstrual Period
LOC	Loss of Consciousness
LR	Lactated Ringers
L-Spine	Lumbar Spine
LSB	Long Spine Board
LUQ	Left Upper Quadrant

[Mm]

MAE	Moves All Extremities
MAST	Military Anti-Shock Trousers
mcg	Microgram
MCI	Mass Casualty Incident
MDI	Metered Dose Inhaler
ME	Medical Examiner
mEq	Milliequivalent
MED	Medication or Medium
mg	Milligram
MICU	Mobile Intensive Care Unit
MI	Myocardial Infarction
MO	Months Old
MOI	Mechanism of Injury
MRI	Magnetic Resonance Imaging
MS	Morphine Sulfate or Multiple Sclerosis
MVA, MVC	Motor Vehicle Accident / Crash

[Nn]

NaCl	Sodium Chloride
NAD	No Acute Distress
NC	Nasal Cannula
NEB	Nebulizer
NKA, NKDA	No Known Allergies, No Known Drug Allergies
NOI	Nature of Illness
NPA	Nasopharyngeal Airway
NRB, NRBM	Non-Rebreather Mask
NS	Normal Saline
NSR	Normal Sinus Rhythm
NT	Non-Tender
NTI	Nasotracheal Intubation
NTG	Nitroglycerine
N/V	Nausea and Vomiting
N/V/D	Nausea, Vomiting and Diarrhea

[Oo]

O_2	Oxygen
O_2Sat	Oxygen Saturation by Pulse Oximetry
OB	Obstetrics
OD	Overdose
OPA	Oropharyngeal Airway
OPQRST	Onset, Provocation, Quality, Radiation, Severity, Time
OTC	Over the Counter
(OU)	Both Eyes

Approved Medical Abbreviations

[Pp]

P	Pulse
PAC	Premature Atrial Contraction
PALP	Palpation
PALS	Pediatric Advanced Life Support
PASG	Pneumatic Anti-Shock Garment
PCN	Penicillin
PE	Pulmonary Embolism or Pulmonary Edema or Physical Exam
PEA	Pulseless Electrical Activity
PEEP	Positive End Expiratory Pressure
PEARL	Pupils Equal and Reactive to Light
PJC	Premature Junctional Contraction
PMH	Past Medical History
PO	Orally
POV	Privately Owned Vehicle
PRN	As Needed
Pt	Patient
PTA	Prior to Arrival
PVC	Premature Ventricular Contraction

[Qq]

q	Every
QAM	Every Morning
qd	Every Day
qh	Every Hour
q2h	Every Two Hours
q3h	Every Three Hours
q4h	Every Four Hours
QHS	Every Night at Bedtime
QID	Four Times a Day
QOD	Every Other Day

[Rr]

R/O	Rule Out
ROM	Range of Motion
(R)	Right
RLQ	Right Lower Quadrant
RUQ	Right Upper Quadrant
RRWCT	Regular Really Wide Complex Tachycardia
Rx	Prescription Therapy

[Ss]

SaO_2	Systemic Arterial Oxygen Saturation (%)
SIDS	Sudden Infant Death Syndrome
SL	Sublingual
SOB	Shortness of Breath
SpCO	Carbon Monoxide Saturation by Meter (%)
SpO_2	Oxygen Saturation by Pulse Oximeter
S/S	Signs and Symptoms
ST	Sinus Tachycardia
STAT	At once, immediately
STD	Sexually Transmitted Disease
SQ	Subcutaneous
SR	Sinus Rhythm
START	Simple Triage and Rapid Treatment
SVT	Supraventricular Tachycardia
SZ	Seizure
SX	Symptom

[Tt]

T	Temperature
TCP	Transcutaneous Pacing
TIA	Transient Ischemic Attack
TKO	To Keep Open
Tx	Treatment

Approved Medical Abbreviations

[Uu]

UOA Upon Our Arrival
URI Upper Respiratory Infection
UTI Urinary Tract Infection
UTL Unable to Locate

[Vv]

VF, V-Fib Ventricular Fibrillation
VS Vital Signs
VT, V-Tach Ventricular Tachycardia

[Ww]

W/D Warm and Dry
WNL Within Normal Limits
WPW Wolff-Parkinson-White Syndrome

[Xx]

None

[Yy]

YO, YOA Years Old, Years of Age
YTD Year to Date

[Zz]

None

APPENDIX B
PROTOCL CHANGES

Protocol Revisions

2026 Protocol Updates

- Non-Protocol updated wording and operational change pg. 27
- Free Standing pg. 35
- Oxygen supplementation **pg. 32**
- **Patients with decompression sickness or carbon monoxide poisoning shall be transported to closet ED WITH HELIPAD. Pg 38**
- **Emancipated Minors pg 51**
- Police custody: pg 52
- FF Rehab Protocol section **pg. 57**
- **Abdominal Pain**
- **Behavior Emergencies**
- **Sickle Cell**
- Anaphylaxis epinephrine IM and IO/IV dose **pg. 64**
- Sepsis and Antibiotics **pg. 71**
- Stroke clarification INDICATION **pg. 72**
- POST INTUBATION: ADD FENTANYL **pg. 84**
- VIDEO LARYNGOSCOPY FIRST LINE FOR ALL INTUBATIONS TO MAXIMIZE FIRST PASS SUCCESS **pg. 85**
- Ventilator **pg. 87**
- RSI vs DSI **pg. 86**
- Atropine in Symptomatic Bradycardia **pg. 98**
- REMOVE VERSED FOR PROCEDURE SEDATION –ETOMIDATE ONLY **pg. 98**
- Unstable SVT Cardioversion **pg. 101**
- Added WPW Protocol **pg. 104**
- Stable VT: AMIODARONE IS CONTRAINDICATED IN PREGNANCY **pg. 107**
- Temp > 90F for hypothermia and criteria to call TOR **pg. 113**
- Added ECMO Alert for refractory VF **pg. 114**
- Post ROSC Hypotension: EPI drip or push dose epi **pg. 121**
- Added hyperlink for cyanokit to burn section **pg. 143**
- Dental Injuries **pg. 150**
- OPEN FRACTURE ADDED CEFEPIME **pg. 156**
- Termination Of Resuscitation- Trauma **pg. 165**
- TXA Protocol **pg. 171**

Protocol Revisions

2026 Protocol Updates

- PAIN MEDICATION DOSES CHANGED FOR FENTANYL, AND WE ADDED TORADOL . **pg. 188**
- KETAMINE KIDS **pg. 189**
- KETAMINE DOSE DECREASED . **pg. 189**
- LIDOCAINE PEDIATRIC DOSE FOR IO . **pg. 190**
- Opioid Addiction **pg. 192**
- Heat Stroke: Add convection **pg. 201**
- Clonus defined for Preeclampsia **pg. 207**
- IF THE BABY IS BORN BUT REMAINS WITHIN THE AMNIOTIC SAC, GENTLY OPEN THE AMNIOTIC SAC WITH YOUR FINGERS TO RELEASE THE BABY. **pg 209**
- Added Shoulder Dystocia protocol **pg. 215**
- Added Post partum Hemorrhage protocol **pg. 218**
- Neonatal Resuscitation **pg. 219**
- S.A.L.A.D. Technique **pg.258**
- Intraosseous Infusion- Pain Management **pg. 267**
- Finger Thoracostomy **pg. 279**
- Meconium Aspirator **pg. 285**
- Intranasal Administration **pg. 286**
- PEEP Valve **pg. 287**
- Pelvic Splinting/Immobilizer **pg. 276**

Protocol Revisions

2026 June Protocol Updates

- Pg 125 Set criteria for POST ROSC MAP to 65-70
- Pg 105 Clarified use of push dose epi in hyperkalemia hypotension
- Pg 112 Cardioversion in peds VT, also added EMTAP link to electrical doses
- Pg 116 Update Adult Cardiac Arrest
- Pg 222 Example of EPI cardiac dosing vs epi push dose in a 3kg child
- Pg 302 Dextrose fixed
- Removed MED TOOL from Protocol because APP is primary
- Pad Placement for DSD fixed:
- Pg: Need Protocol for Air Q 253
- Cefepime RECONSTITUTE 10ml vs 20ml
- OK to give NTG paste in setting of CHF and STEMI
- WPW clarify when associated with unstable condition if regular or irregular