

REVISED 2016



REGION ONE PROTOCOL EFFORT

REGION

THESE PROTOCOLS REFLECT THE STANDARD OF CARE FOR ALL EMS PROVIDERS OF REGION ONE



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Region One Protocol Effort

Allow the following protocols to serve as a guide while treating patients in the Parishes of Jefferson, Orleans, Plaquemines, and St. Bernard (Region One); protocols should not overshadow sound clinical judgment of paramedics. Any EMT certified to provide pre-hospital care in the parishes of Region One MUST and will adhere to the following protocols. These protocols reflect the Standard of Care for all EMS pre-hospital providers of Region One. In accordance with State Law,¹ these revised 2016 protocols shall supersede all protocols that are currently in use within any EMS system, public or private, licensed to operate in Region One. The use of any other protocols specifically developed for an individual EMS system (public or private) is strictly prohibited. To evaluate the effectiveness of patient care and these protocols, random run reports will be reviewed as part of a Continuous Quality Improvement (CQI) program.

Standing orders are designed for paramedics to initiate advanced care without having to contact Medical Control. Standing orders are listed in green text boxes within each protocol. Treatments options found in gray shaded boxes containing red text are only to be performed with the approval of Medical Control. Listed below are several reasons for which Medical Control **MUST** be contacted:

- as clinically indicated and in accordance with the operating procedures of your employer
- as indicated in the On-Scene Physician policy
- at any point within these protocols as it may be indicated
- for patients suspected of having an ST elevation myocardial infarction (STEMI) and for patients suspected of having new focal neurologic deficits. Contacting Medical Control will facilitate notification of the receiving hospital's appropriate team.
- if a line of treatment is in question or becomes unclear
- prior to administration of medications which are not standing orders
- prior to performance of any advanced skill(s) as specifically stated in the appropriate protocol
- to confirm a patients' death (medical or traumatic) and for field termination of cardiac arrests

As a courtesy, when contacting Medical Control by radio or telephone, begin the report with the reason for which you are calling. Medical Control reports should then follow the format found in the appendix.

¹ Louisiana State Law RS 33:4791.1 and RS 40:1234

General Administrative Policy

1. EMS practitioners will provide care under the direction of the highest skilled level EMS practitioner and Medical Control.
2. The following protocols reflect the standard of care for all pre-hospital providers within Region One.
3. Patients in need of transport to a hospital will be transported in an ambulance or an approved vehicle that meets the requirements of the regulatory agencies of Region One and the State of Louisiana.

Medical Control Policy

1. In the event primary Medical Control cannot be reached, Medical Control will become the responsibility of the receiving facility or the EMS Medical Director.
2. The Medical Control Physician is expected to be familiar with these protocols and use them as a guide for patient care in the pre-hospital setting.
3. The physicians who serve in the capacity of Medical Control shall notify the appropriate Region One Medical Society in writing or E-mail with protocol revisions they feel are needed to meet the standard of care.
4. The Medical Control Physician shall notify the EMS service director in writing or by E-mail whenever care has been rendered which they believe does not comply with the established protocols.
5. Medical Control should be contacted for orders as it is indicated within the protocols or when medical direction is desired by the EMT.

Selection of Hospital

1. When patient condition and EMS unit status allows, patients or the authorized guardian of such, will be allowed to select the hospital Emergency Department of choice within the EMS service area. Hospital selection by patients or guardians will not be honored in cases of major trauma or critically ill patients.
2. If, in the opinion of Medical Control or the highest skilled level EMS practitioner, the patient's condition is unstable the patient will be transported to the closest appropriate hospital Emergency Department.
3. Patients who have sustained rabid animal bites, venomous snake bites or any other poisonous bites / stings should be transported to an ED that has antivenin and rabies treatment. Contact Medical Control for the appropriate receiving Emergency Department.

Minimal Requirements

In addition to state requirements, Region One mandates all EMS services and systems licensed to operate in the Parishes of Region One to carry the following equipment:

- 12-lead EKG
- AED (Automatic External Defibrillator); biphasic (for BLS units)
- All medications listed within these protocols
- Biphasic defibrillation
- Quantitative End Tidal CO₂ (ETCO₂) Capnography
- Glucometer
- Intraosseous vascular access (adult and pediatric)
- SpO₂
- Transcutaneous pacing
- Continuous Positive Airway Pressure (CPAP)

Operating without the above equipment violates certain parish ordinances and could jeopardize licensure. In order to provide the patients of Region One with the highest level of pre-hospital care, the availability of continuous ETCO₂ monitoring and Continuous Positive Airway Pressure (CPAP) are required.

EMR / EMT / Advanced EMT Medication Administration

In the event of a basic level ambulance response to an emergency within Region One (prohibited in Orleans Parish, excluding MCI), EMRs, EMTs and Advanced EMTs are permitted administer the medications as specified within this document and in accordance with the Louisiana Bureau of EMS approved scope of practice matrix for licensed EMS practitioners.

EMR and EMT intranasal naloxone administration shall follow Louisiana Bureau of EMS guidelines set forth in the August 1, 2014 official memorandum, *"Enhancement of EMR and EMT scope of practice to include use of intranasal naloxone for suspected opioid overdose with severe respiratory depression"*

Optional Louisiana BEMS Scope of Practice Procedures

EMS practitioners are authorized to perform optional skills / procedures / Interventions / medications as authorized by ROPE as well as the Louisiana BEMS scope of practice matrix guidelines. EMS agencies are responsible for optional module education and documentation of skill proficiency/education. All skills / procedures / interventions / medications must be included in agency protocols approved by the medical director.

Advanced Practice Protocols / Medications / Procedures

Protocols, medications, or procedures that are listed in **ORANGE** throughout ROPE are authorized as paramedic skills if approved by the service Medical Director. Appropriate education, training, and medical oversight shall be the responsibility of the service medical director.

Special Response Protocols

Protocols in **YELLOW** in ROPE to be utilized at the discretion of the EMS service and Medical Director. These protocols are optional. Appropriate education, training, and medical oversight shall be the responsibility of the service medical director.

Multi Agency Response

Region One Lead EMS Agencies (primary 911 providers) by parish:

Jefferson:

East and West Jefferson EMS; respectively.
Westwego EMS and Gretna EMS within their incorporated boundaries.

Orleans:

New Orleans EMS

Plaquemines:

Plaquemines Parish EMS

St. Bernard:

Acadian Ambulance Service of New Orleans

Listed above are the lead agencies for each parish within Region One. In the event of a **non-**lead EMS agency on scene, they will relinquish control of that scene to a representative of equal or higher skill level of the lead EMS agency in the parish which the incident is occurring. The non-lead EMS agency will assist the lead agency as needed. It is the responsibility of the highest skilled medic of the lead agency to request additional resources as needed.

Mass Casualty Incident (MCI)

Upon arrival on an MCI within Region One, the primary 911 provider for the parish in which the incident is taking place assumes and maintains control of the scene. The National Incident Management System will be utilized for all MCI's. Assistance from other Region One EMS agencies and mutual-aid services will be delegated by the Incident Commander. The START Triage guide is depicted below, this should guide triaging in the event of an MCI.

START Triage – **Assess, Treat**
Find color, STOP, TAG, MOVE ON

M I N O R S E D	D E C E A S E D	I M E D I A T E	D E L A Y E D	<i>Move Walking Wounded</i>
			No Resp after head tilt	
			Breathing but Unconscious	
			Resp <10 or > 30	
			Perfusion Cap refill > 2 sec or No Radial Pulse <i>Control bleeding</i>	
			Mental Status – Can't follow simple commands	
			Otherwise	
			Remember Resp <30 Perfusion < 2 Mental status = Can do	

*See the Region One MCI Plan

Call Disposition Policy

Purpose:

In an effort to deliver the highest level of pre-hospital care to our patients, all 911 calls received will be given one of the following dispositions:

1. Patient transported to an appropriate ED.

2. Patient Refusal

- this is reserved for a low acuity call in which neither the patient/guardian nor the medic feels that the patient's condition warrants transport via an ambulance. A patient refusal on a patient care report will be signed by the patient/guardian and witnessed by another party on the scene and/or the medic's partner if no unbiased third party is present (fire department, law enforcement agency, etc).

3. Patient Refusal AMA

- this is reserved for a more acute call in which the medic feels the patient needs EMS treatment and transport and the patient/guardian is declining EMS treatment and transport
- This requires consultation with online Medical Control or the Medical Director of the responding agency.

4. Cancelled prior to arrival on scene

- this is done by the Communications Center (Dispatch)
- A name of the canceling party must be documented on a recorded line and relayed to the EMS crew for proper documentation on their Daily Trip Sheet or Cancellation Form.

5. Cancelled on scene

- this is reserved for when an EMS unit arrives on the scene of a 911 call and finds **no patient, no injuries or medical complaints, and a request for medical assistance no longer exists**. This is most likely to occur on MVA's, but may occur in other circumstances. A unit cannot be on scene for an extended period of time and must give the name of the canceling party (whether it is law enforcement, fire department or the people involved in the incident). Should the medic render ANY type of assessment or treatment, this disposition cannot be utilized. Upon arriving on scene of an MVA with significant mechanism of injury (MOI), it is in the best interest of the medics to obtain refusals / AMA's.

6. Patient Deceased on Scene

- this may be from medical or traumatic causes and warrants notification of law enforcement and the Parish Coroner's Office
- Medical Control must be contacted for a DNR order and/or time of death.

7. Patient "gone on arrival" (GOA)

- this is reserved for an instance when an EMS crew arrives on a scene and the patient has left the scene. Every effort should be made to obtain information regarding how and when the patient left and the party relaying that the patient is gone should be documented over the radio.

8. Unfounded

- this is reserved for instances when an EMS crew or first responding agency arrives at a location and is unable to locate a patient. Every attempt will be made by the responding crew to locate the patient.

9. EMNAT “emergency medical necessary action taken”

- this is reserved for instances when an EMS crew evaluates and treats a patient according to protocol at an event or mobile integrated healthcare encounter. The patient is evaluated, treated, and released with appropriate follow up instructions. (road race medical tent, community paramedicine visit)

Hospital Diversion Policy

The dispatch centers of all Region One EMS providers will monitor ESF 8 Portal. Region One EMS crews will make every attempt to honor diversions and acknowledge off-load times of hospitals. Each provider should attempt to honor limited diversion notices and extended off-load time notices of each facility listed on the website. However, patient preference and informed decisions by patients may be honored.

Each provider will access the website and update on-duty crews periodically throughout the shift. Posting current and updated information will be the hospital's responsibility. Facility diversion information will be passed on to the EMS crews.

Hospital's approximate off-load times correspond to the colors listed on the website.

- Green** → **off-load times less than 15 minutes;**
- Yellow** → **off-load times of 15 – 30 minutes;**
- Red** → **off-load times of 30 – 60 minutes;**
- Black** → **off-load times of greater than 60 minutes,**
- Purple** → **off load times greater than 120 minutes.**

Limited Diversion Status – This notice is issued by hospitals to inform Region One EMS providers that an area(s) (department) of the hospital is without further available resources. In the diversion status/notice, a list of certain departments on diversion will be provided. This may include "**Emergency Department Saturation.**" EMS providers should make every effort possible to avoid transporting to hospitals on ED saturation. This Limited Diversion Status does not apply to patients who are critically ill requiring immediate stabilization.

Full Hospital Diversion is only honored in cases of level three closures (per Metro Hospital Council) within the hospital's infrastructure; these diversions will be honored without exceptions. Hospitals requesting full diversion status **for reasons other than level three closures**, must notify the primary 911 providers of Region One via ESF 8 Portal. It will be the director, or highest ranking authority of each primary provider to decide whether or not a hospital's request for full diversion will be honored.

Physician on Scene

A. Physician is first to arrive at the scene of emergency:

1. The Good Samaritan Statute applies in this situation. The Physician on-scene can choose to treat the patient with all the protection from liability as stated in the law.
2. Upon arrival of the EMS practitioner, the physician has three options:
 - a. to allow the EMS practitioner to assume full authority for directing the care of the patient – the physician will not have any risks of liability for abandonment in this situation.
 - b. to assist the EMS practitioner in the care of the patient without assuming authority for directing patient care.
 - c. can express his/her desire to assume full authority for directing patient care – the physician must agree to follow the criteria in section B

B. Protocol for Physicians Assuming Care of Patient at the Scene of a Medical Emergency

Indications: When a physician is at the scene of a medical emergency and wishes to assume authority for directing patient care.

Policy: Patient care is established by parish protocol and on-line Medical Control physicians. It is not however meant to interfere with an established physician-patient relationship. By law, the EMS practitioners are providing pre-hospital care under the license of a medical director and/or according to the protocols approved by a parish medical society. They may additionally receive direction via on-line Medical Control from an Emergency Department physician. If responsibility for patient care is transferred to a physician at the scene, that physician becomes responsible for any care given and must accompany the patient to the hospital. Furthermore, the physician accepting these responsibilities must sign an agreement to assume care for the patient and the patient's pre-hospital medical record.

Procedure:

1. EMS practitioners shall treat all on-scene physicians with respect and shall endeavor to work in cooperation with an on-scene physician for the patient's best interest.
2. If a physician desires to help assist the EMS practitioner in the care of the patient without assuming authority over patient care, the EMS practitioner should explain to the physician that their assistance is appreciated, but the State Law requires EMS personnel to comply with local protocol and/or established Medical Control with the base hospital physician.
3. If on-scene physician wishes to assume responsibility for the direction of patient care, the EMS practitioner should ask the physician to show his/her Louisiana State Board of Medical Examiners license as verification of his/her identity as a physician.
4. The EMS practitioner should establish contact with Medical Control. After advising the Medical Control Physician (MCP) of useful patient information, the EMS practitioner should inform the MCP that a physician is present and identify the physician. The EMS practitioner will then place the physician in contact with the on-line MCP and the two physicians will discuss patient treatment and who will have authority over patient care.

5. On-scene physicians who accept Medical Control and the responsibility for the direction of patient care must:
 - a. agree to full medical - legal responsibility
 - b. accompany the patient to the hospital, and
 - c. sign the EMS run sheet indicating that they have accepted responsibility for patient care and any medical orders given
6. EMS personnel shall only accept orders from the on-line MCP, unless informed by the MCP that Medical Control is being transferred to the on-scene physician. The EMS practitioners should make their services, equipment, supplies and ambulance available to the on-scene physician for patient care. If Medical Control is transferred to the on-scene physician, EMS practitioners may follow only those orders that are within their scope or practice.
7. If at any time the on-scene physician's orders become questionable, or are contrary to established Region One protocols, or if interference with patient care occurs, the EMS practitioner should immediately re-establish contact with the on-line MCP for guidance before any further action is taken. In any case of conflict, the MCP's orders shall prevail.
8. A patient who is lucid and understands the medical risks and consequences of their decisions (or in the case of a minor, their guardian/parent), has the legal right to refuse care by the EMS and/or on-scene physician after such risks and consequences have been explained to him/her.
9. In the event that the patient refused the care of the on-scene physician even when MCP is willing to transfer care to the on-scene physician, but accepts the care of the EMS practitioner, the MCP will be responsible for directing the EMS practitioner's care of the patient.
10. In the event that the patient wishes the on-scene physician to assume their care, but the MCP does not feel that transfer of patient care to the on-scene physician may be in the patient's best interest, the EMS team should attempt to have the patient sign a refusal of service form, as is standard practice, before leaving the scene. The on-scene physician is then responsible for further patient care and for arranging transport of the patient to an appropriate hospital or facility.

TASER / ECD Policy

- A. **Law enforcement agencies** may utilize an electronic control device (ECD) as a non-lethal method to incapacitate individuals. Under certain circumstances EMS should be summoned to evaluate and treat the victim. Typically, it is not an "ECD" itself that leads to the need for transport to a hospital; it is rather the events that have lead up to the officer deploying the ECD on an individual, such as in cases of "Excited Delirium."
- B. **Excited Delirium** - a condition in which a person is in a psychotic state and/or extremely agitated state. Mentally, the subject is unable to focus his/her attention on any one thing and is often distracted by his surroundings. The subjects' inability to process rational thought precludes normal de-escalation procedures alone. Physically, the organs within the subject are responding to the inciting factor, be it a drug stimulant or the exacerbation of an underlying psychiatric condition. These two factors occurring at the same time cause a person to act erratically enough that they become a danger to themselves and to the public. This is typically where law enforcement comes into contact with the person.

Possible causes of excited delirium, may include, but are not limited to:

- Overdose on stimulants (cocaine or methamphetamine) or hallucinogenic drugs (PCP). NOTE: this is the cause in the majority of cases where an ECD is deployed
- brain tumor
- dementia
- drug withdrawal
- head trauma
- hyperthyroidism "thyroid storm"
- hypoxia
- low blood sugar
- psychiatric pt off meds
- psychosis

Signs of excited delirium include:

- bizarre & aggressive behavior
- dilated pupils
- fear and panic
- high body temperature *
- incoherent speech
- inconsistent breathing patterns
- insensitive to pain
- nakedness
- paranoia
- profuse sweating; **absent** in extreme hyperthermia
- shivering
- superhuman strength
- violence directed at objects

*** High body temperature** is a key finding in predicting a high risk of sudden death. Another key symptom to the onset of death while experiencing excited delirium is "instant tranquility." This is when the suspect had been very violent and vocal and suddenly becomes quiet and docile while in the car or sitting at the scene.

C. **Monitoring** of the subject must take place regardless of whether EMS was called or not until the subject is released to a receiving facility. Care must be taken to avoid **positional and / or compression asphyxia**. No person should be restrained and left in any position that may restrict the airway for an extended period of time.

D. **Procedure**

Under certain circumstances EMS should be summoned to evaluate and treat the victim. Police officers must provide EMS personnel with as much information as possible (i.e. history of the original incident, behavior observed, symptoms, etc.)

These instances include but are not limited to:

1. probe embedded above the clavicles (especially eyeball, mouth or neck)
2. probe embedded in the groin
3. unconscious, even for short period
4. visible seizure when ECD is NOT being discharged
5. if the patient displays signs consistent with excited delirium
6. obvious significant injury from fall or take-down
7. person volunteers that they are having chest pain or trouble breathing
8. persistent confusion or altered mental status for more than one minute after application of ECD
9. victim of ECD used by a member of the public (i.e. non-police use)
10. if the victim requests EMS
11. if an officer has any doubt as to the health of the person based on:
 - a. the officer's training
 - b. the officer's previous use of an ECD
 - c. the subject exhibits any of the conditions and/or symptoms above
 - d. the subject exhibits any unusual behavior

Law enforcement officers should accompany patients in custody or handcuffed patients to the hospital in the transporting unit when appropriate.

E. **Probe Removal**

TASER device barb removal is now authorized as per the ROPE protocol included in this document. Law enforcement then must sign a guardian refusal or the patient **MUST** be transported to an appropriate ED after EMS evaluation. If the barbs/probes are removed prior to arrival documentation must reflect such and EMS can provide wound care (ie. cleaning and bandaging the area).

Adult Protocol Preambles

To have a guideline or protocol to follow for every possible pre-hospital scenario is **unrealistic**. Therefore, when presented with a clinical situation not specifically addressed in a protocol paramedics should refer back to the basics of patient care and sound clinical judgment. The entire existence of Medical Control is to facilitate treatment in the pre-hospital setting. Medical Control should be used as a resource whenever needed.

Listed below are generalized guidelines to be followed while operating within Region One. These guidelines are additional references that are to coincide with each protocol.

- All patients must have their vital signs assessed upon patient contact or as soon as reasonably possible. Region One recognizes vital signs as:
 - blood pressure
 - capillary refill in pediatrics
 - GCS
 - heart rate
 - pain scale
 - respiratory rate
 - SpO₂
 - temperature (where indicated)
- As scene safety and scene conditions allow, all routine medical care and initial treatment should be completed **prior to moving the patient to the ambulance**.
- Upon administration of any medication, patients will ideally have O₂, IV access, EKG and pulse oximetry monitored.
- All medications given IV / IO to a pulseless patient will be followed by a 20 ml bolus, elevation of extremity & effective chest compressions.
- When a fluid bolus is not required or anticipated, saline locks may be used at the paramedic's discretion.
- Endotracheal tube medication administration is discouraged.
- All **MEDICAL** patients in cardiac arrest must be treated on scene where found for no less than 30 minutes. **Patient care including adequate, aggressive CPR / BLS** is the focus in cardiac arrest, not patient packaging and transport. If a scene becomes unsafe where patient care cannot be delivered properly, law enforcement must be requested. The patient must then be transported to the closest, appropriate ED.
- For trauma calls 10 minutes on scene is an industry standard however, you should never stay on scene for 10 minutes because you are allotted the time. Documentation must be provided on the pre-hospital run report when on scene times exceed ten minutes.
- A copy of the pre-hospital patient care report, **paper or electronic**, MUST be made available to the Emergency Department.

Notations and References

Cardiac Risk Factors

Major risk factors

1. Diabetes Mellitus (type I or II)
2. Use of tobacco products (packs per day / years)
3. Hypertension
4. High cholesterol
5. Family history ¹ of myocardial infarction before the age of 45 or any significant cardiovascular event ²

Minor cardiac risk factors (not limited to)

1. Obesity
2. Sedentary lifestyle
3. Cocaine use
4. ≥ 50 years of age

SAMPLE History

S	signs and symptoms including pain
A	allergies
M	medications prescribed and medications taken prior to arrival
P	past medical history
L	last intake and output
E	events leading to injury or illness {Mechanism of Injury, (MOI)}

Pain Assessment (OPQRST)

O	Onset	when did the pain first start
P	Provocation	what causes the pain; what makes it better or worse
Q	Quality	description of pain (sharp, dull, stabbing, pressure, etc)
R	Radiation	is the pain localized in one area or does it spread
S	Severity	1 – 10 scale
T	Time	pain constant or intermittent; has the pain occurred before

Wong-Baker FACES Pain Rating Scale³



¹ Mother, father, brother, sister ONLY

² Examples: coronary artery grafting (CABG); previous MI; stenting procedures

³ Hockenberry MJ, Wilson D, Winkelstein ML. *Wong's Essentials of Pediatric Nursing*, (7th ed), St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

Glasgow Coma Scale (GCS)

GCS is a component of vital signs. GCS should be repeated 5 minutes after the first score is obtained.

	Adult	Score
Eye Opening	Spontaneous	4
	To Speech	3
	To pain only	2
	No response	1
Best Verbal Response	Oriented appropriate	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best Motor Response	Follows commands	6
	Localizes pain	5
	Withdraws in response to pain	4
	Flexion in response to pain	3
	Extension in response to pain	2
	No response	1

Miami Emergency Neurological Deficit (MEND) Exam⁴

The emerging standard of care in the recognition and treatment of strokes includes the MEND exam. The initial assessment tool of the MEND exam involves the Cincinnati Pre-hospital Stroke Scale assessment, which should be done while on scene. Any one abnormal finding in the patient's level of consciousness, speech, ability to symmetrically move the face and/or inability to successfully complete the arm drift test calls for a complete MEND exam (time permitting), as the EMS unit is enroute to an ED. Hospital notification is also a priority treatment when new onset focal neurological symptoms are noted,

Cincinnati Stroke Scale⁵

If any one of these 3 signs is abnormal the probability of a stroke is 72 %. Time permitting a complete MEND exam should be completed in transit to the ED.

Speech- (have patients say "you can't teach an old dog new tricks")

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

Facial Droop- (have patients show their teeth or smile)

- *Normal:* both sides of face move equally
- *Abnormal:* one side of the face does not move at all

Arm Drift- (have patients close their eyes and hold both arms out straight for 10 sec)

- *Normal:* both arms move equally or both do not move at all
- *Abnormal:* one arm does not move or one arm drifts down compared with the other

⁴ Gordon D, Gordon M, Issenberg S. *Advanced Stroke Life Support Hospital & Prehospital 9th ed.* 2005.

⁵ American Heart Association *Handbook of Emergency Cardiovascular Care for Healthcare Providers*, 2004; 33-34

12-Lead EKG Anatomy

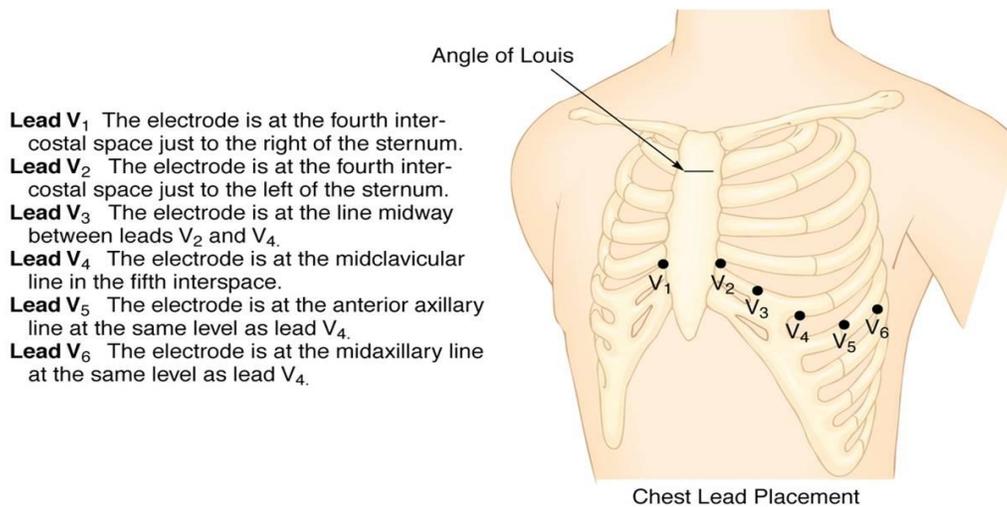
- * ST elevation measured from the "J point."
- * ST elevation indicates injury (cardiac muscle death) in a pattern consistent with an acute infarct.
- * ST or T wave depression indicates ischemia (inadequate oxygenation of cardiac muscle and/or old injury).

12-lead EKG's are now a standard of care. They should be done on a multitude of patients with varying medical complaints well beyond the classic chest pain complaint. Specific protocols call for 12-lead EKG testing; in addition clinical presentation and/or assessment findings may warrant 12-lead EKG testing as a diagnostic tool. Patients with suspected ACS should receive a second EKG while enroute to the hospital to evaluate for dynamic changes is clinically feasible.

Definition of STEMI:

- STE > 1mm in at least two contiguous leads, with the exception of leads V2-V3
- STE > 2mm in leads V2-V3 in men > 40 years of age
- STE > 2.5 mm in leads V2-V3 in men < 40 years of age
- STE > 1.5 mm in leads V2-V3 in women
- STE \geq 0.5mm in posterior leads V7-V9

Wall affected	Leads	Artery(s) involved	Reciprocal changes
Anterior	V ₂ -V ₄	Left coronary artery, Left Anterior descending (LAD)	II, III, aV _F
Anterolateral	I, aV _L , V ₃ -V ₆	LAD and diagonal branches, circumflex and marginal branches	II, III, aV _F
Anteroseptal	V ₁ -V ₄	LAD	
Inferior	II, III, aV _F	right coronary artery (RCA)	I, aV _L
Lateral	I, aV _L , V ₅ , V ₆	Circumflex branch or left coronary artery	II, III, aV _F
Posterior	V ₈ , V ₉	RCA or circumflex artery	V ₁ -V ₄ (R greater than S in V ₁ & V ₂ , ST-segment depression, elevated T wave)
Right ventricular	V _{4R} -V _{6R}	RCA	



Bledsoe B, Porter R, Cherry R. *Essentials of Paramedic Care* 2nd ed. 2007. Upper Saddle River

Advanced Airway & Capnography

- ETT verification (*documentation should also include the following*)
 - a. bilateral lung sounds
 - b. condensation in tube (not always accurate)
 - c. equal chest rise
 - d. absence of epigastric sounds
 - e. visualization of ETT passing through vocal cords
 - f. qualitative CO₂ detectors (optional)
 - g. quantitative ETCO₂ device(s) – Capnography
- An attempt at endotracheal intubation is made once the tip of the ETT passes the teeth.
- **Capnography:**
 1. Quantitative capnography – Exhaled CO₂ continuous measuring device facilitates continuous documentation of endotracheal tube placement and allows for continuous end-tidal CO₂ monitoring. The continuous ETCO₂ monitoring provides documentation of ETT placement throughout treatment and transport. This modality can be used as a diagnostic tool allowing paramedics to deliver ventilations more effectively. The continuous capnography can also be used when treating COPD patients exhibiting with signs and symptoms of moderate to severe shortness of breath.
 - a. ETCO₂ monitors may give low readings for the first few minutes in a cardiac arrest, but as CPR increases circulation & cellular perfusion ETCO₂ values should increase in a patient with a viable downtime. The presence of any ETCO₂ value and/or waveform gives evidence of airway confirmation. NOTE: ETCO₂ also often gives the first indicator of ROSC, as evidenced by an abrupt & sustained rise in ETCO₂.

2. Qualitative (colorimetric) – Exhaled CO₂ detecting device, useful diagnostic tool used to determine proper ETT placement (TubeCheck™, ETCO₂ detector). *Disadvantage:* cannot monitor effective ventilation.

Difficult Airway Adjuncts

- An ETT introducer should be considered for use in difficult airways.
- Supraglottic Airway Device (Combitube®, LMA, King LT)

Insertion of a Supraglottic Airway Device is a skill EMTs and Advanced EMTs can perform. All EMTs must be trained and prove competency on the insertion of supraglottic airway devices. Continuous ETCO₂ monitoring is required with the use of supraglottic airway devices.

Pulseless Rhythms (AHA ACLS)

- Focus is to be placed on immediate, effective, continuous, and minimally interrupted chest compressions in both the adult and pediatric patients. Compressions are to be started immediately as there is virtually no set-up time. Even basic airway equipment requires some set-up time for sizing and deployment. Therefore, the first cycle of chest compressions should be initiated without delay, while allowing time (approx. 18 sec. for first cycle) for basic airway equipment set-up/sizing. This simple logic effectively changes our focus from Airway, Breathing, & Circulation (ABC's) to Circulation/Compression, Airway, & Breathing/Ventilation (CAB's). This does not necessarily apply to obvious airway obstruction and traumatic cardiac arrest.

- Upon arriving on scene of a cardiac arrest with a down time > 5 minutes or not witnessed by EMS, 5 cycles (2 minutes) of BLS CPR must be completed before advanced life support (ALS) treatments are performed. During this time an OPA is inserted to facilitate ventilation. Defibrillation pads may be placed on the patient during the initial treatment periods, but should not delay compressions.

- Cardiac Arrest Management (compressions, vascular access & adv. airway)
 1. Chest compressions must be initiated as soon as is possible, and compressions shall be continuous and as uninterrupted as is possible to account for the highest and best chest compression fraction (CCF) possible. Chest compression fraction is the amount of time during a cardiac arrest that there are chest compressions occurring, and the goal is $\geq 80\%$ compressions. After 2 minutes, briefly pause (<10 seconds) to check the rhythm and pulse. The goal for compressions is 100-120 compressions per minute. Push hard and fast allowing for complete chest recoil (2 inches for the average adult). When shocks are indicated compressions are to be resumed while charging the defibrillator.
 2. During the second round of CPR, vascular access, IV or IO, should be attempted.
 3. Placement of an advanced airway may take place once vascular access has been established. Compressions remain continuous with brief pauses every 2 minutes to check pulse / rhythm and also to swap persons performing compressions. Compressions are not paused to ventilate. The ventilation rate is 10 per minute. It is imperative that patients not be hyperventilated as it could lead to a negative patient outcome. Ventilating with excessive tidal volume increases intrathoracic pressure and reduces venous return, which reduces cardiac output, and can also cause barotrauma. Excessive minute volume or ventilatory rate will also decrease cerebral blood flow and coronary perfusion, thereby

working against resuscitative efforts. Proper ventilation with controlled peak inspiratory pressure will also keep GI distension to a minimum, which will also reduce the risk of aspiration.

**** For every interruption in CPR (even one second), it takes at least 30 seconds to regain adequate coronary & cerebral perfusion ****

- Defibrillation and Medications

1. For witnessed adult cardiac arrest when an AED/defibrillator is immediately available, it is reasonable that the defibrillator be used as soon as possible. For adults with unmonitored cardiac arrest, or for whom defibrillation is not immediately available, it is reasonable that CPR be initiated while the defibrillator equipment is being retrieved and applied and that defibrillation, if indicated, be attempted as soon as the device is ready for use.
2. Initial defibrillation x 1 @ 200 or 360 Joules (J) biphasic (MAX Joules for the monitor). Immediately after defibrillations do NOT check for a pulse; CPR must be resumed.
3. Additional defibrillations x 1 @ 200J or 360J (monitor specific MAX) should be delivered as soon as possible after the 2 minute pauses in CPR.
4. Amiodarone may be used as an antiarrhythmic as indicated by protocol for VF/pulseless VT unresponsive to CPR, defibrillation, and vasopressor therapy. Lidocaine may be considered as an alternative to amiodarone. No antiarrhythmic drug has been shown to increase survival or neurologic outcome after cardiac arrest due to VF/pulseless VT.

- Special Resuscitation Guidelines

1. Electric Shock and Lightning Strikes

Once the scene is declared safe and smoldering clothing has been removed early aggressive CPR, defibrillation, and airway control is the focus of treatment. Because of the increased risk of tracheal edema, endotracheal intubation should be considered early even if spontaneous breathing has resumed. Defibrillation should be performed without delay. If there is any doubt in distinguishing asystole vs. "fine V-Fib" the paramedic should consider defibrillation.

An attempt at resuscitation will be made unless an extended downtime can be validated and/or injuries incompatible with life are present.

2. Hypothermic Cardiac Arrests

ACLS guidelines recommend resuscitative efforts on all pulseless and apneic hypothermic patients. In the pre-hospital setting it is difficult to determine core body temperature. Therefore, we should consider patients who are hypothermic to be classified as "severely hypothermic," with a core body temp of less than 30°C (86°F).

Resuscitation may be withheld if one or more of the following are present:

1. Chest is frozen/non-compliant
2. Victim has been submerged in water more than 1 hour
3. Obvious lethal injury is present
4. Rescuers at risk

It is recommended to take up to 60 seconds when evaluating for a pulse and respiratory effort in hypothermic patients. If unable to determine the adequacy of respiratory and cardiac function, CPR should be started. Endotracheal intubation is important in hypothermic patients as it provides a route for warm humidified oxygen to enter the central circulation.

The hypothermic patient who presents in V-Fib or pulseless V-Tach should be defibrillated. If there is no change in the rhythm after the first defibrillation, it is reasonable for routine ACLS algorithms (defibrillation, vasopressors, etc.) to be followed concurrently with rewarming strategies for up to three rounds of medications and defibrillations. Further dosing should be guided by clinical response. Once the patient has a core temperature greater than 30°C (86°F), routine ACLS algorithms should be followed.

3. Cardiac Arrest of the Pregnant Patient

An attempt at resuscitation should be made on all pregnant patients in cardiac arrest for the sake of the mother and fetus. In situations where the medic can verify a prolonged down time or injuries incompatible with life, the medic should follow the DNAR protocol. Cardiac arrest management is altered in these patients due to the physiological changes associated with pregnancy. Standard ACLS algorithms apply to pregnant women. However, some modifications in ABC's are needed.

In the case of cardiac arrest of a pregnant patient with a gestational age estimated to be >20 weeks immediately establish early compressions, defibrillation, and airway management. Transport promptly to the closest emergency department (preferably one with OB/GYN services but not required) for evaluation of a perimortem cesarean section. Do not resuscitate on scene for 30 min.

Airway – should be secured early with ETT or supraglottic airway to decrease the risk of aspiration (for late second and third trimester pregnant patients only). This risk is increased because of an insufficient lower esophageal sphincter. The size of the ETT is commonly decreased by 0.5 – 1.0 mm compared to a non-pregnant female.

Breathing - Because of the diaphragm's position, the patient's functional lung capacity has decreased while the body's demand for oxygen has increased. This is the reason for the rapid onset of hypoxia in pregnant patients. Techniques used to confirm ETT placement do not change. However, late in the third trimester ETCO₂ qualitative detectors may indicate improper placement when the ETT is really in the trachea. Ventilation volumes should also be reduced.

Circulation – Medications given IV / IO in the lower extremities may not reach the maternal heart unless, or until the fetus is delivered. Therefore, venous (including intraosseous) access in the lower extremities is strongly discouraged. Alternative sites such as the humeral head for the IO are recommended.

Manual left lateral uterine displacement should be considered to improve venous return to the heart when fundus height is at or above the level of the umbilicus during chest compressions. This maneuver may relieve aortocaval compression during high quality CPR.

- Mechanical Chest Compression Devices

Mechanical chest compression devices may be a reasonable alternative to conventional CPR. However, application time for mechanical chest compression devices should be kept to a minimum and training should reflect this goal in order to maximize compression fraction ratio.

- Support (SPRINT) Vehicle Response to Cardiac Arrests

When supervisor units or any other single paramedic response vehicle arrives on the scene of a cardiac arrest, their single responsibility is **BLS CPR** (as described above). This course of treatment shall continue until knowledgeable bystanders are able and willing to help or additional paramedics / EMT's arrive. Once additional help arrives and 2 minutes of BLS CPR is complete, ALS measures can begin.

Medication Drips

Infusion Rates / Fluid Bolus

Medication	Infusion Rate	Concentration
Amiodarone	1 mg/min	1:1 (250 mg into 250 ml D5W)
Dopamine*	5 – 20mcg	<ul style="list-style-type: none"> 400mg/250 ml of D5W 800mg/250 ml of D5W (half the drip rate of the 400mg/250 concentration)
Epinephrine or Norepinehrine	2 – 10 mcg 1 – 10 mcg	4:1 mcg/ml (1 mg/250 ml of D5W)

Peripheral Vasopressors

Intravenous administration of peripheral vasopressors can be a safe and effective way to treat prehospital shock that is non-responsive to IV fluid therapy. In emergencies, short-term administration of peripheral vasopressors is unlikely to cause tissue injury. Peripheral IV lines used for vasopressor administration should ideally be placed in large, proximal veins. The antecubital fossa is should be considered a first line site for vasopressor administration. If extravasation is suspected, the paramedic will stop the infusion immediately, obtain alternate IV access (if available), and is to notify the receiving facility of the possible extravasation.

Dopamine Drip Chart

Dopamine Drip Rates												
Patient weight in kg												
μ /kg/min	3	5	10	20	30	40	50	60	70	80	90	100
2 μ g	*	*	*	1.5	2	3	4	5	5	6	7	8
5 μ g	*	1	2	4	6	8	9	11	13	15	17	19
10 μ g	1	2	4	8	11	15	19	23	26	30	34	38
15 μ g	1.4	3	6	11	17	23	28	34	39	45	51	56
20 μ g	2	4	8	15	23	30	38	45	53	60	68	75
Microdrops per minute (or ml/hr) for 400mg/250ml												

Alternative Dopamine Calculation

(The following example will only work using the 400mg/250ml concentration of dopamine)

Take the first two numbers of the patient's weight in pounds and subtract it by 2

Example: pt weighs 182 lbs. $18 - 2 = 16$

The answer of 16 gives you drops per minute for a 5 mcg/kg/min dopamine infusion

Example: 16 gtt/s = 5 mcg/kg/min

If your order is 10 mcg/kg/min, simply double the drips per minute

Example: $16.0 \times 2 = 32$

Epinephrine & Norepinephrine (Levophed) Drip Chart

Epinephrine & Norepinephrine Drip Rates										
$\mu\text{g}/\text{min}$	1	2	3	4	5	6	7	8	9	10
μDrops	15	30	45	60	75	90	105	120	135	150
Microdrops per minute (or ml/hr) for 1mg/250ml										

Amiodarone

When Amiodarone is given to patients **with a pulse** it is administered over ten minutes. Two methods are generally used. Administer 150 mg Amiodarone directly into the IV / IO site over 10 minutes, 15 mg/min. The alternative and preferred method is to mix 150 mg of Amiodarone into a 100 ml bag of D5W or NS. If you are using a 10 gtts set run the bolus at 100 gtts/minute or ≈ 2 gtts/second. If you have a 15 gtts setup run the bolus at 150 gtts/minute or ≈ 2.5 gtts/second.

Conversion of ectopy following an Amiodarone bolus, electrical therapy and/or a restoration of a pulse should be followed by an Amiodarone maintenance infusion. Mix 150 mg of Amiodarone in a 100 cc bag of D5W or NS. Using a 60 gtts set run the infusion at 1 mg/min or 40 gtts/min.

Fluid Bolus

A fluid bolus (fluid challenge) is given at a rate of "wide open," typically through the largest IV catheter possible (14 – 18 gauge). Patients should be reassessed after each 250 – 500ml of fluid; particularly their lung sounds. This is especially the case when treating persons with cardiovascular disease and the elderly. When a fluid bolus is not going to be needed or anticipated, saline locks may be used.

Communications Center / Dispatch

Communication Centers play a vital role in the EMS system; they can begin treating patients first. Communication's *call takers* begin care with triaging, whether triaging one patient or triaging for an MCI; from there they determine what resources are needed. Another key role of Communication Centers is to facilitate street crews in whatever means realistically possible. As the EMS system evolves, Communication Centers will soon be accommodating the needs of the streets crew in several different ways.

Dispatchers and *call takers* will now be able to treat patients pharmacologically with aspirin. Through minimal training EMS *dispatchers* and *call takers* should recognize the symptoms of an *Acute Coronary Syndrome* (ACS). ACS includes unstable and stable angina and acute myocardial infarction. Patients with a chief complaint of chest pain who are NOT allergic to aspirin and do not have active or recent gastrointestinal (GI) bleeding should be instructed to chew an aspirin (160 to 325 mg). Patients who are already on a daily aspirin regimen and have taken an aspirin within the past 24 hours should not be instructed to take an aspirin.

When EMS dispatchers are aware of a "significant traumatic incident" (when scene time is critical) they should transmit a solid tone for no less than 3 -5 seconds when 8 minutes has elapsed, if available. The transmission of this tone will stand as a reminder to the crew(s) on scene that they are approaching a 10 minute scene time. After the tone is transmitted a verbal notification will be broadcasted. "Unit #" or "All units on Main St. this is your 8 minute notification," (repeat once) end the broadcast with "no notification response is needed."

Using the same concepts as previously listed; if available, the Communication Center should transmit a solid tone once scene times have reached 30 minutes on all cardiac arrests. When units arrive on scene of calls that need notification, they will advise communications "patient contact" along with "8 minute (or 30 minute) notification needed." As an example "unit 1 patient contact, 8 minute notification please."

For calls involving poisonings and/or overdoses where the substance can be verified, communication centers will contact the Poison Control Center at (800) 222-1222. The information from poison control will then be relayed to the responding crews. Hospital Emergency Departments also call the Poison Control Center for poisoning; they are the recognized authority. All calls to and from the Poison Control Center are recorded and they often will tell the pre-hospital providers patients do not need to be transported. These procedures will take place as the communication center has the manpower. Dispatching units and answering the emergency lines will always take priority.

Routine Medical Care

The following procedures will be utilized on all medical emergencies requiring Advanced Life Support (ALS).

- Ensure scene safety and BSI/PPE precautions¹.
- Bring oxygen & ALS equipment² to the patient.
- Assess ABC's and ensure proper positioning of the patient.
- Take appropriate spinal precautions³.

Patient assessment with vital signs⁴ upon patient contact.

Airway management and/or oxygen therapy⁵ as clinically indicated and in accordance with the *Airway Management* protocol.

EKG Monitor (12-Lead as needed)

IV/IO Crystalloid or Saline Lock as clinically indicated.

Continue Treatment Under Appropriate Protocol

¹ Body substance isolation i.e. eye protection, face mask, gloves etc.

² Advanced airway equipment, suction, EKG Monitor, and departmental issued ALS gear.

³ According to *Spinal Motion Restriction* protocol.

⁴ Vital Signs include: Blood pressure, heart rate, respiratory rate, pain scale, SpO₂, Temperature and GCS.

⁵ Oxygen Flow Rates:

- Low Flow 2 LPM NC
- Supplemental 4 LPM NC
- High Flow 15 LPM NRB or BVM.

Airway Management

Patient can self ventilate and is able to oxygenate

★ Proper Ventilation/Oxygenation is defined as an SpO₂ ≥ 94% ★

Administer **Oxygen** as appropriate and clinically indicated to maintain an SpO₂ of ≥ 94%

Is the patient maintaining Oxygenation?

YES

Routine Medical Care

NO

Go to "Ventilate but cannot Oxygenate"

Patient can self Ventilate, but not Oxygenate
(EX: Asthma, CHF, COPD, Generalized Hypoxia, Pulmonary Embolus)

Assist patient's ventilations via BVM (PPV as tolerated) to maintain a SpO₂ ≥ 94%. Insert NPA or OPA as tolerated. Monitor EtCO₂

YES

Is patient being Oxygenated? Respiratory Distress decreasing?

Maintain current Oxygenation techniques & return to Routine Medical Care

NO

If patient is unconscious → go to *Can't Ventilate Can Intubate Protocol*

- **Consider** Nasal Intubation (**Midazolam** 2.5 mg IV or **Diazepam** 2-5mg IV to reduce anxiety prior to intubation, **IF NEEDED**).
- Continue to assist ventilations (pre-oxygenate).
- Insert NPA if not already in place (right nare is typically larger).
- Attach BAAM® to ETT, prepare capnography.
- Briefly explain the procedure to the patient including the importance of deep inspiration.
- Advance lubricated ETT through nasopharynx and into the oropharynx.
- Upon deep inspiration listen for the change in pitch from the BAAM® and advance the ETT.

Maintain current oxygenation techniques and return to Routine Medical Care

- Confirm tube placement using traditional methods (lung & epigastric auscultation), qualitative & quantitative → maintain oxygenation.
- Initiate ETCO₂ monitoring for all intubations.
- **Post intubation sedation:** as per *Can't Ventilate / Can Intubate Airway Management Section*

Airway Management

Can't Ventilate / Can Intubate

Insert OPA or NPA pre-oxygenate for 2 min & prepare for ET intubation¹.
Consider apneic oxygenation (NC @ 15L/min) during preoxygenation and intubation.

Remove OPA and Intubate the trachea within 30 sec

- Visualize ETT passing through the vocal cords
- Auscultation of lungs with = chest rise/fall
- No epigastric sounds present

Further confirm ETT placement using

- ETCO₂ detector (qualitative) and/or
- ETCO₂ capnography (quantitative)

YES

NO

Successful Intubation?

- Secure ETT with commercial ETT restraint device.
- Reconfirm ETT placement by using continuous ETCO₂ Capnography.
- Measure and apply cervical collar to patient.

Maintain Advanced Airway Techniques

Post Intubation Sedation (if needed):
Fentanyl 25-50mcg IV/IO q 2 min. PRN to max of 200mcg⁴.
 and/or

- **Midazolam** 5mg IV/IO/IN q 2 min. PRN, max of 20mg, or
- **Lorazepam** 2mg-4mg IV/IM q 2 min. PRN, max of 10 mg, or
- **Diazepam** 5mg IV/IM q 2 min. PRN, max of 10 mg.

Return to Routine Medical/Trauma Care

- Reinsert OPA & pre-oxygenate³ patient for 1-2 mins.
- Intubate the trachea within 30 seconds while using the ETT Introducer (Bougie).
- Max of 2 intubation attempts² (One attempt on scene for trauma patients).

After 2nd unsuccessful attempt:

- Reinsert OPA & pre-oxygenate pt for 2-3 minutes.
- Proceed to Supraglottic Airway Device.

Insert Supraglottic Airway Device and secure according to the manufacture's guidelines; confirm placement with continuous EtCO₂ monitoring.

Return to Routine Medical/Trauma Care

¹ Ensure the following tools are available prior to ET intubation: syringe, ETT balloon, Stylet, EtCO₂ detector, ETT introducer (Bougie), Stethoscope, Commercial tube restraint, EtCO₂ capnography.

² An ET intubation attempt has been made once the distal tip of the ETT passes the teeth.

³ Pre-oxygenation is achieved with one ventilation every 3-4 seconds or SpO₂ near 100%.

⁴ Consider pain management post intubation prior to benzodiazepine administration

- Initiate continuous EtCO₂ monitoring for all managed airways.

- Consider **Ondansetron** 4mg IV/IO in the non-cardiac arrest intubation prior to endotracheal intubation to decrease aspiration risk

Airway Management

Can't Intubate / Can't Ventilate

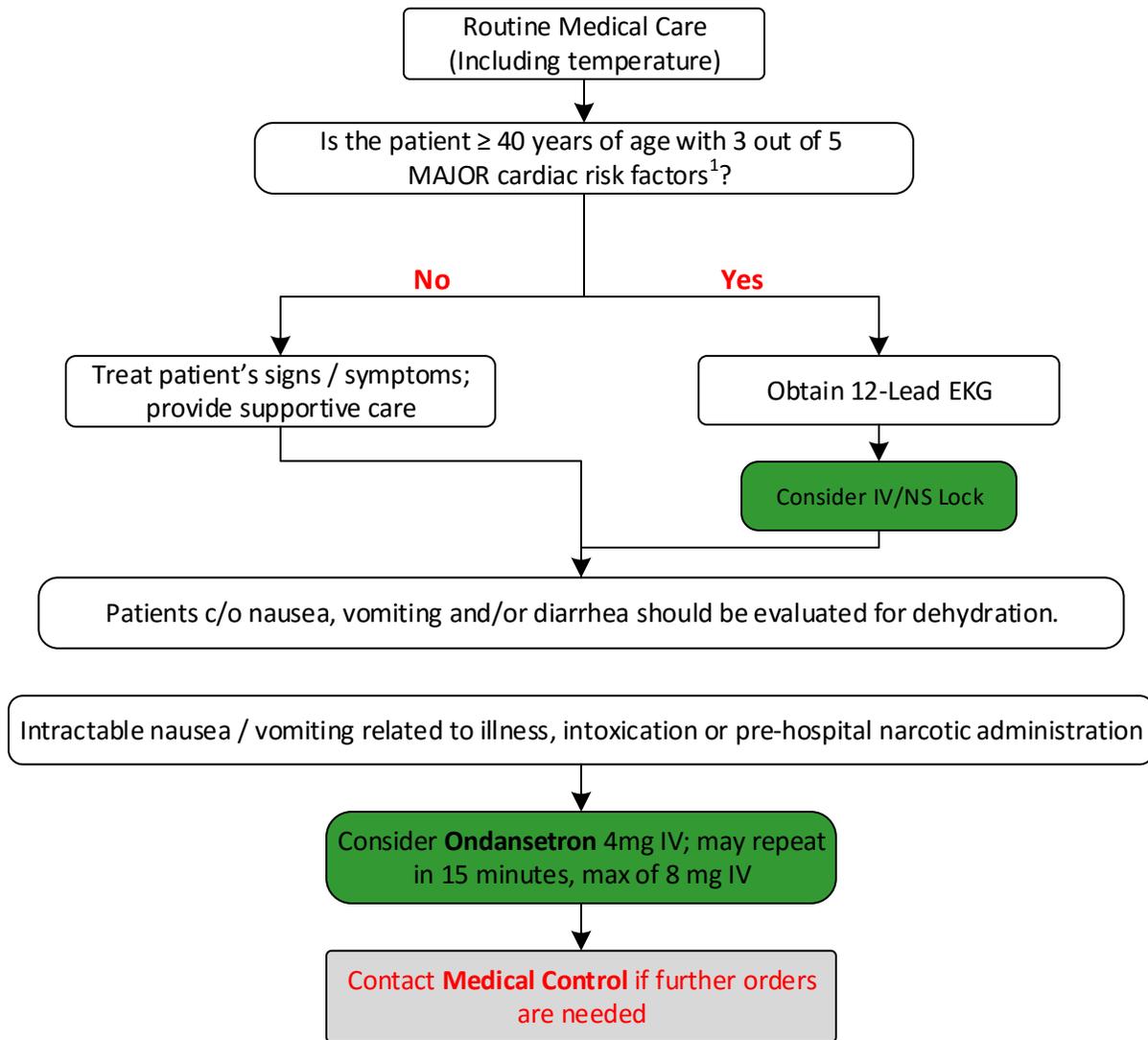
Reinsert OPA → attempt to oxygenate to $SpO_2 \geq 90-94\%$, and, if unable
Prepare for Needle Cricothyrotomy

Needle Cricothyrotomy:

- Locate the cricothyroid membrane & clean with alcohol preps or betadine if available.
- Attach a 14 ga. Jelco to a 10ml syringe.
- Insert needle through cricothyroid membrane 45° in a caudal direction (toward the feet) aspirating during insertion.
- Once air is freely aspirated (usually following a "pop" of penetrating the cricothyroid membrane) advance the catheter into place and secure manually
- Attach a 3.0mm ETT adaptor into the catheter hub
- Oxygenate with either BVM or 100% O₂ jet insufflator

Transport rapidly to the nearest Emergency Department for definitive airway management

Acute Abdominal Pain & Nausea/Vomiting

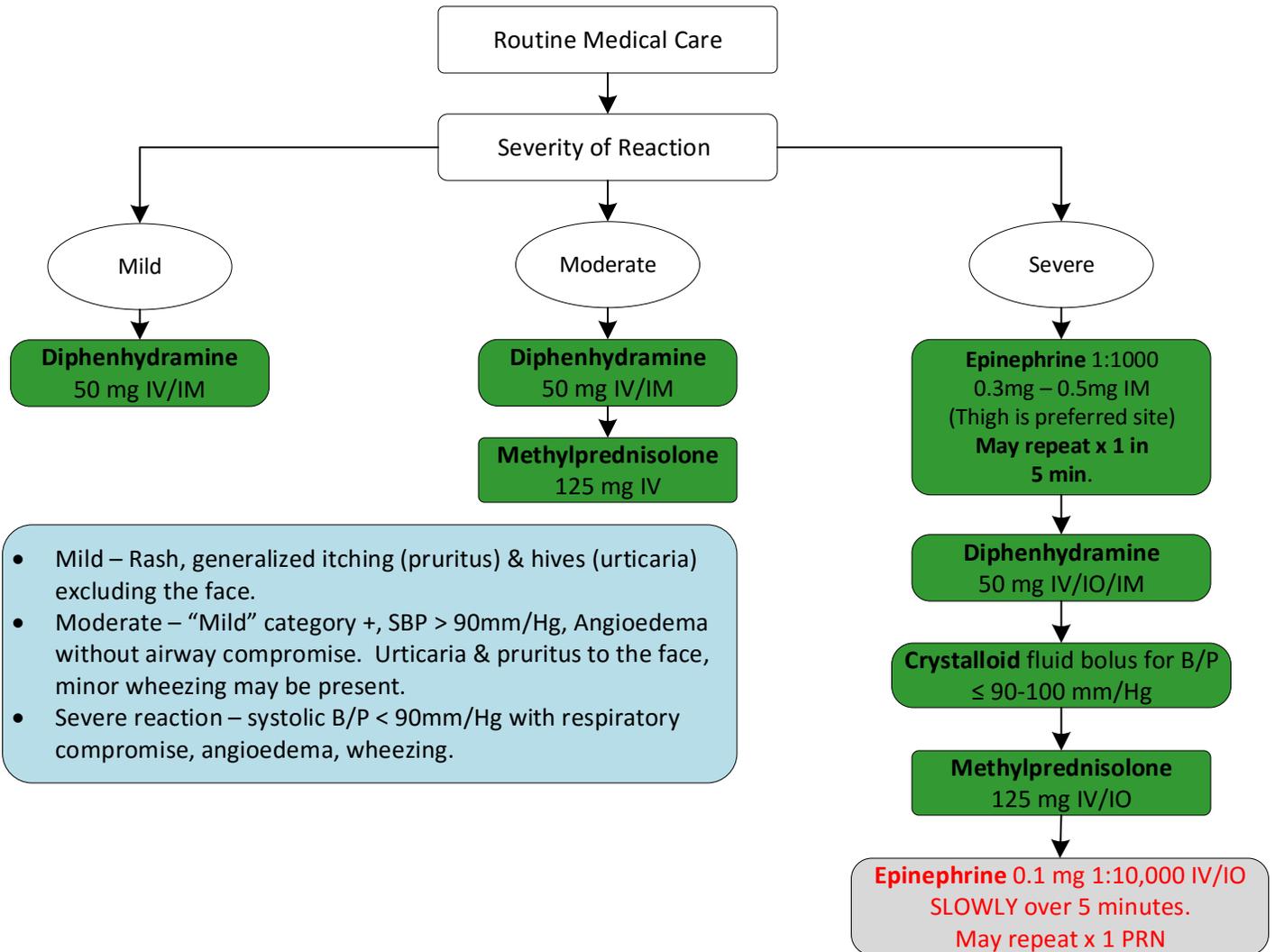


¹ Major and Minor cardiac risk factors are defined in the *Protocol Preambles*.

- Patients < 40 years of age complaining of abdominal pain who:
 - Have a soft and non-tender abdomen
 - Are without fever.
 - Have stable vital signs
 - Are not complaining of nausea, vomiting, and/or diarrhea.**Generally** will not require advanced treatment.
- Elderly patients with hypotension and/or with major cardiac risk factors should be evaluated for possible Abdominal Aortic Aneurysm (AAA) with dissection and STEMI.
- Pregnancy (including ectopic) should be considered in females of childbearing age.
- As routine Medical Care, a **detailed** OPQRST / SAMPLE (defined in the *Protocol Preambles*) history should be obtained. Examples of specific questions to include: last BM, blood in stool, frequency of urination, pain on urination, hernia etc.
- **Pain medications should NOT be administered to anyone complaining of Abdominal Pain unless ordered by Medical Control**

Allergic Reaction / Anaphylaxis

Consider anaphylaxis when responses from two or more body systems (cutaneous, respiratory, cardiovascular, neurologic or GI) are noted. Cardiovascular & respiratory systems may not always be involved in anaphylaxis.¹

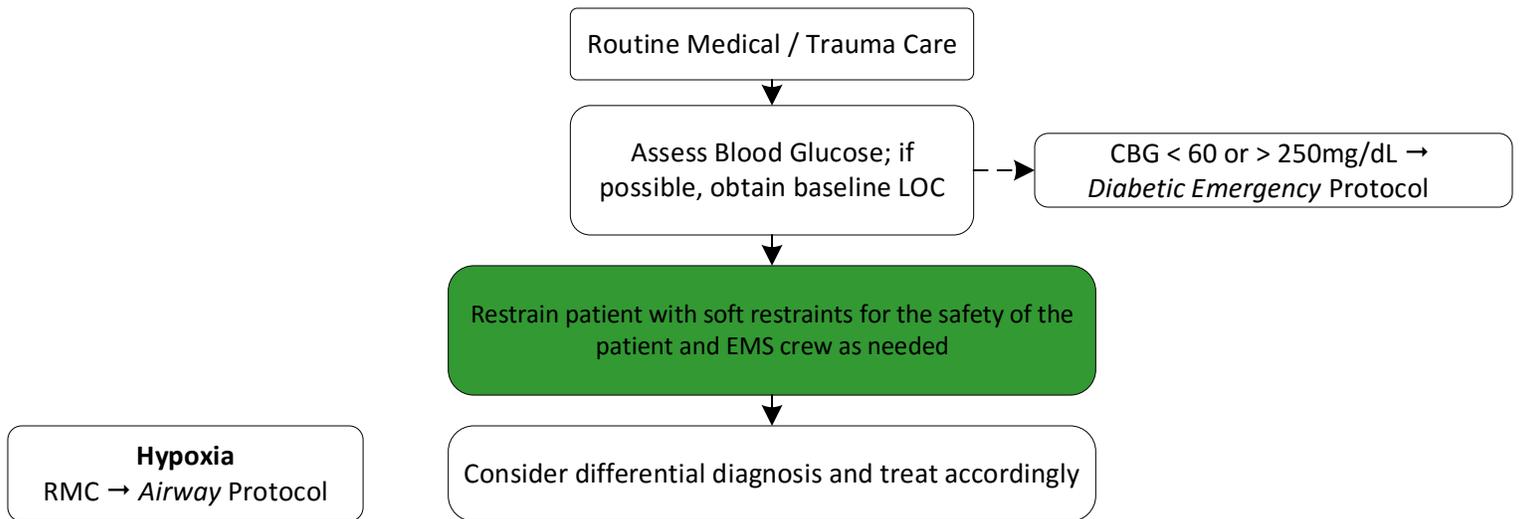


👉 Rule of thumb 👈

- Anyone c/o difficulty swallowing and/or dyspnea should receive a steroid.
- Anyone presenting with wheezing/stridor should receive Epi 1:1000 IM.

- Consider immediate **IM Epinephrine** prior to IV/IO access in critically ill patients. Administration to the thigh is the fastest IM site. Use either the vastus lateralis or the rectus femoris.
- Caution must be used in administering epinephrine to patients over the age of 50 and/or to patients with known cardiovascular disease, renal failure and/or COPD. If **Epinephrine** 1:1000 must be used, give 0.1 mg – 0.3 mg IM.
- Treat any wheezing or “Chest Tightness” as indicated in *Reactive Airway Disease* protocol.
- Patients who take β -blockers have an increased risk in the severity of reaction; it is possible for these patients to have a paradoxical response to Epi. The use of atrovent is recommended for these patients.
- A dystonic reaction (to Phenothiazines) is an adverse reaction **NOT** an allergic reaction. Patients may receive **Diphenhydramine** 50 mg IV/IM.
- Treat hypotension with fluid in the absence of pulmonary edema.

Altered Mental Status



Electrolyte/Metabolic Disturbances

- Hypercalcemia (calcium)
- Hypocalcemia
- Hyponatremia (sodium)
- Hybernatermia
- Hypomagnesemia (magnesium)
- Hepatic Failure (hepatic encephalopathy)
- Alcohol Withdrawal/Delirium Tremens

Infection
Remember BSI

- Meningitis
- S/S - ↑Fever, ↓L.O.C., stiff neck, fatigue, photosensitivity
- RMC, determine onset (usually < 2 days), temp, supportive care, place mask on patient.
- Encephalitis/Cerebritis (inflammation of brain)

Poisoning:

ABC's (RMC) → Contact Poison Control Center as needed (800-222-1222)

- Carbon Monoxide – SpO2 will NOT reflect hypoxia.
- S/S – N/V, headache, papilledema, fatigue, cyanosis and/or ↓L.O.C.
- TX: **NRB 15L/m; NS IV**; titrate to hemodynamic stability
- **SEE OVERDOSE PROTOCOL / CO PROTOCOL**

Psychiatric
RMC / RTC →

- *Excited Delirium*
- *Drug Overdose* in Suicide attempt
- Exacerbations of Bipolar Disorder (mania, profound depression); Schizophrenia
- Severe anxiety

Thyrototoxicosis – (hyperthyroidism)

- S/S → hyperactivity, weight loss, tremors, diaphoresis, myopathy, N/V, polyuria, fatigue, palpitations and/or anxiousness

- TX – RMC, **Benzodiazepine**

Trauma

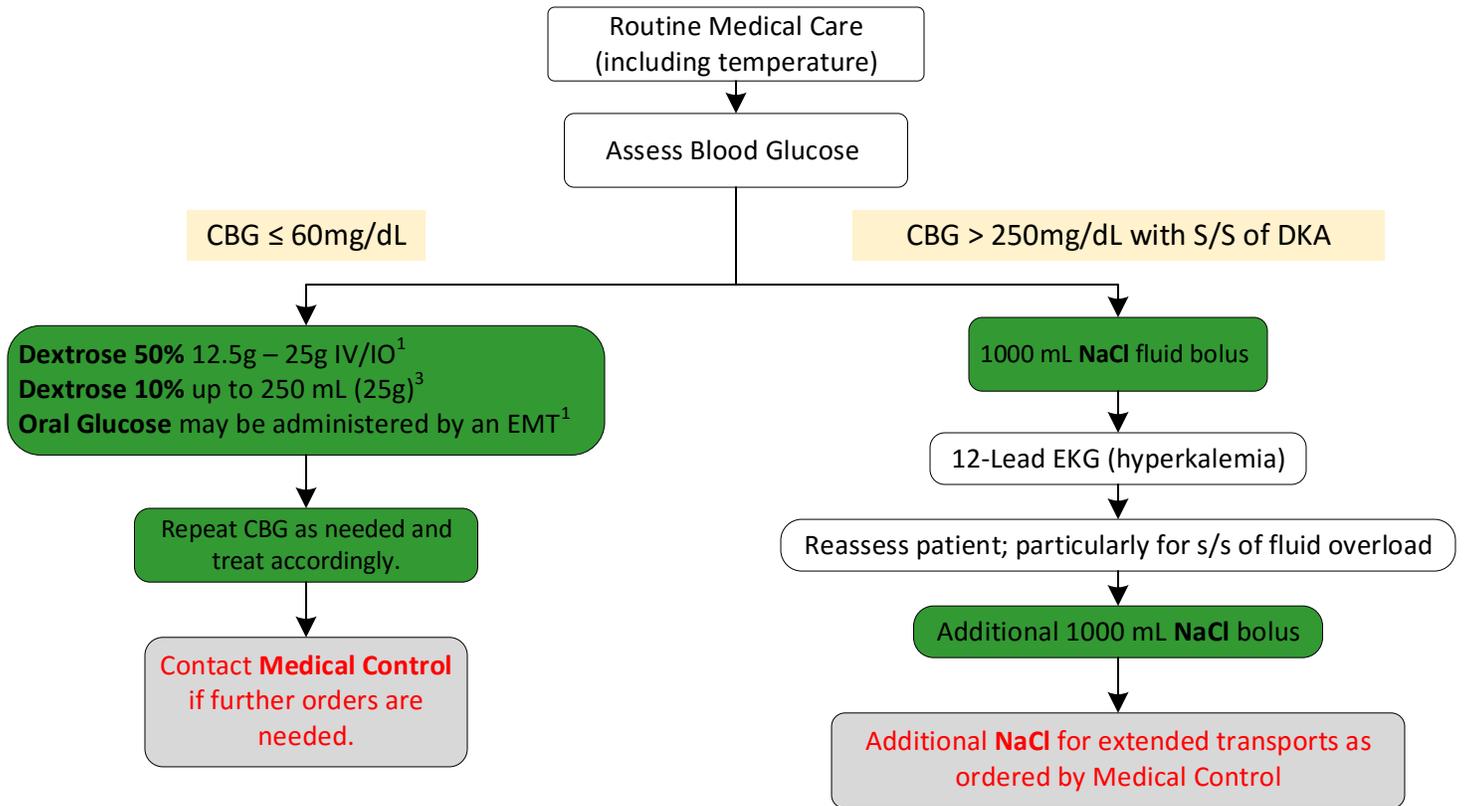
RTC → Trauma Center Criteria as needed

- Head Injury / Bleed
- Hypotension – **IVF**; consider permissive hypotension in penetrating chest and abdominal trauma (90/P)
- Hypovolemia - **IVF**

Alcohol	→ <i>Drug Overdose</i>
Epilepsy	→ <i>Seizure</i>
Insulin	→ <i>Diabetic Emergency</i>
Overdose	→ <i>Drug Overdose</i>
Uremia	
Trauma	
Infection	→ <i>Sepsis</i>
Psych	→ <i>Excited Delirium</i>
Stroke	→ <i>Stroke</i>

- SpO2 < 94%, shallow respirations, unable to maintain own airway, respiratory rate ≤ 10/min and/or symptomatic hypotension SBP < 90mm/Hg.
- When trauma is known or suspected refer to the *Spinal Motion Restriction* protocol. Patients with an altered mental status **cannot** be clinically cleared..
- Four Point restraints may be used when necessary for the safety of the patient, EMS crew and bystanders. Uncontrollable patients may be chemically sedated as per the *Excited Delirium* protocol.

Diabetic Emergency



Common S/S Associated with DKA:

- Abdominal pain or cramping
- Altered L.O.C.
- Blood Sugar > 250 mg/dL²
- Complaints of being thirsty / polydipsia
- Deep rapid respirations (Kussmaul Respirations) with or without an acetone odor.
- Dyspnea
- Flushed / dry skin, dehydration (dry mucous membranes, skin tenting, infrequent urination)
- Frequent urination
- Headache or double vision
- Ill appearing
- Muscle wasting or weight loss
- Nausea / Vomiting
- Rapid weak pulse

Common Causes of DKA:

- Acute infection
- Insufficient insulin intake
- Non compliance
- Undiagnosed type 1 Diabetes

Alcoholic Ketoacidosis:

- Chronic alcohol use results in no carbohydrate substrate.
- Glucose may be low, normal and very occasionally slightly elevated
- Patients appear ill like DKA.
- **Prehospital treatment is IV Fluids.**

¹ Provided there is no risk of aspiration or airway compromise related to the patient's mental status, oral carbohydrates along with oral glucose products may be used in the place of IV Dextrose. This includes the use of products found in the patient's home. Capillary glucose levels < 60 mg/dL in patients presenting with an altered mental status and unable to maintain their own airway can receive IV Dextrose under standing orders. An EMT may administer oral glucose according to the above guidelines.

² A blood sugar > 250 mg/dL does not mean the patient is in DKA. A CBG of 250 mg/dL alone is only indicative of hyperglycemia. Vomiting with hyperglycemia may be a relative indication of acidosis and likely significant of dehydration.

³ To make **Dextrose 10%**: Dilute 50 mL **Dextrose 50%** in 200 mL of **NaCl**. Makes 250 mL of **Dextrose 10%**. Titrate to effect.

Do Not Attempt to Resuscitate (DNAR)

Resuscitation should not be attempted in the following situations prior to contacting Medical Control:

- Lividity
- Rigor Mortis
- Body decomposition, decapitation, hemi-corpectomy or incineration
- Any reason to believe CPR is not indicated or desired, especially with known terminal illness.
- Presence of legal documents (“Physician Orders for Life Sustaining Treatment (POLST),” “Advanced Directives,” “Living Wills,” or “DNR”) stating resuscitative efforts be withheld.

EKG electrodes may be placed posteriorly or on limbs whenever necessary.
Every effort possible should be made to preserve a crime scene.

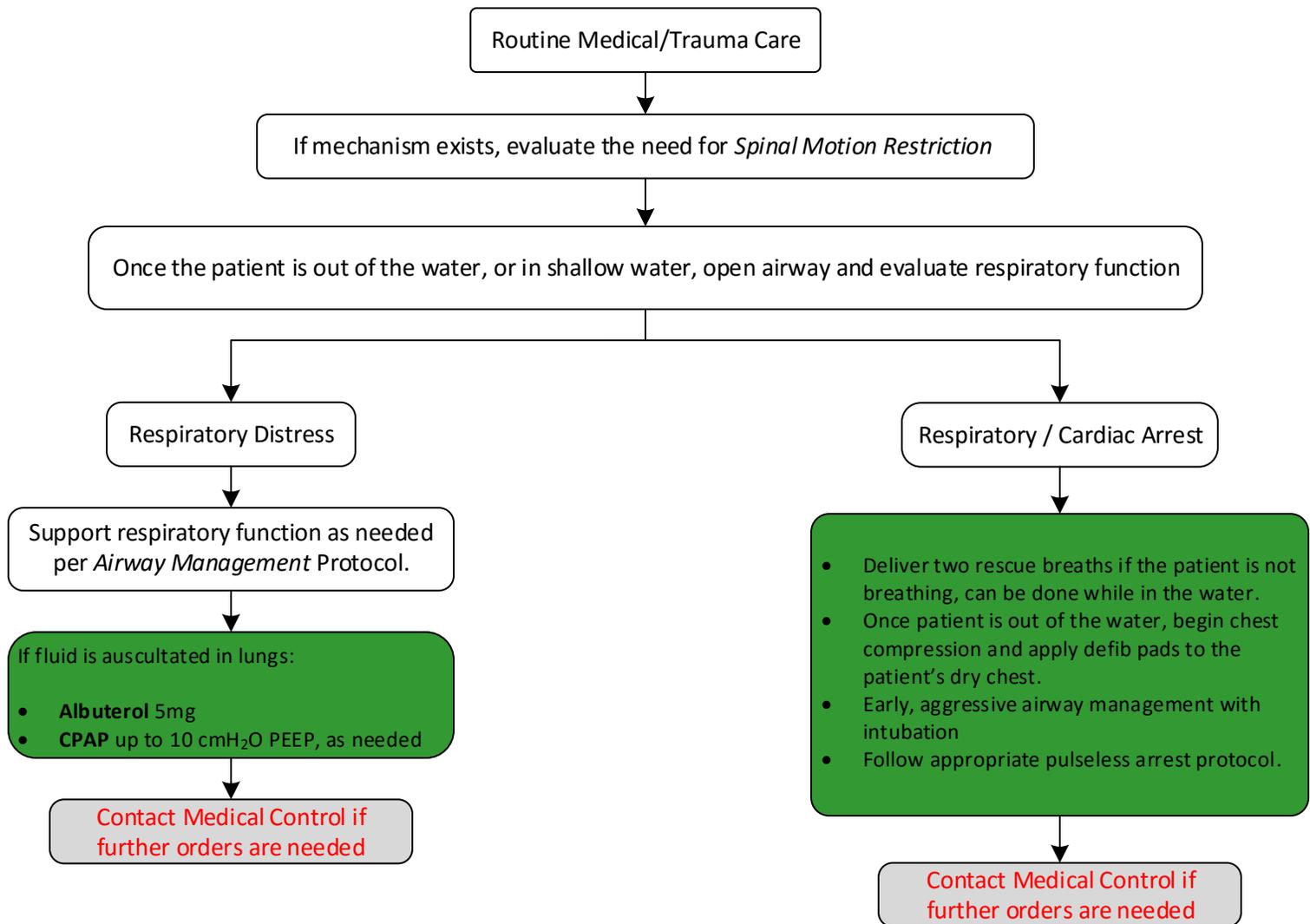
Asystole EKG strip in at least two leads should be included in the EMS Run Report along with proper documentation. Document the scene findings including: medications, medical history, last time patient was spoken to, position found, skin temp, pupils, any trauma or deformity etc.

Contact Medical Control for DNAR and/or time of Death

- If EMS arrives to find CPR in progress on a patient who is clearly deceased or a patient who meets the criteria listed above in the blue box, CPR can be stopped with orders from Medical Control.
- For traumatic DNAR, see the *Adult Traumatic Prehospital Termination of Resuscitation Protocol*.

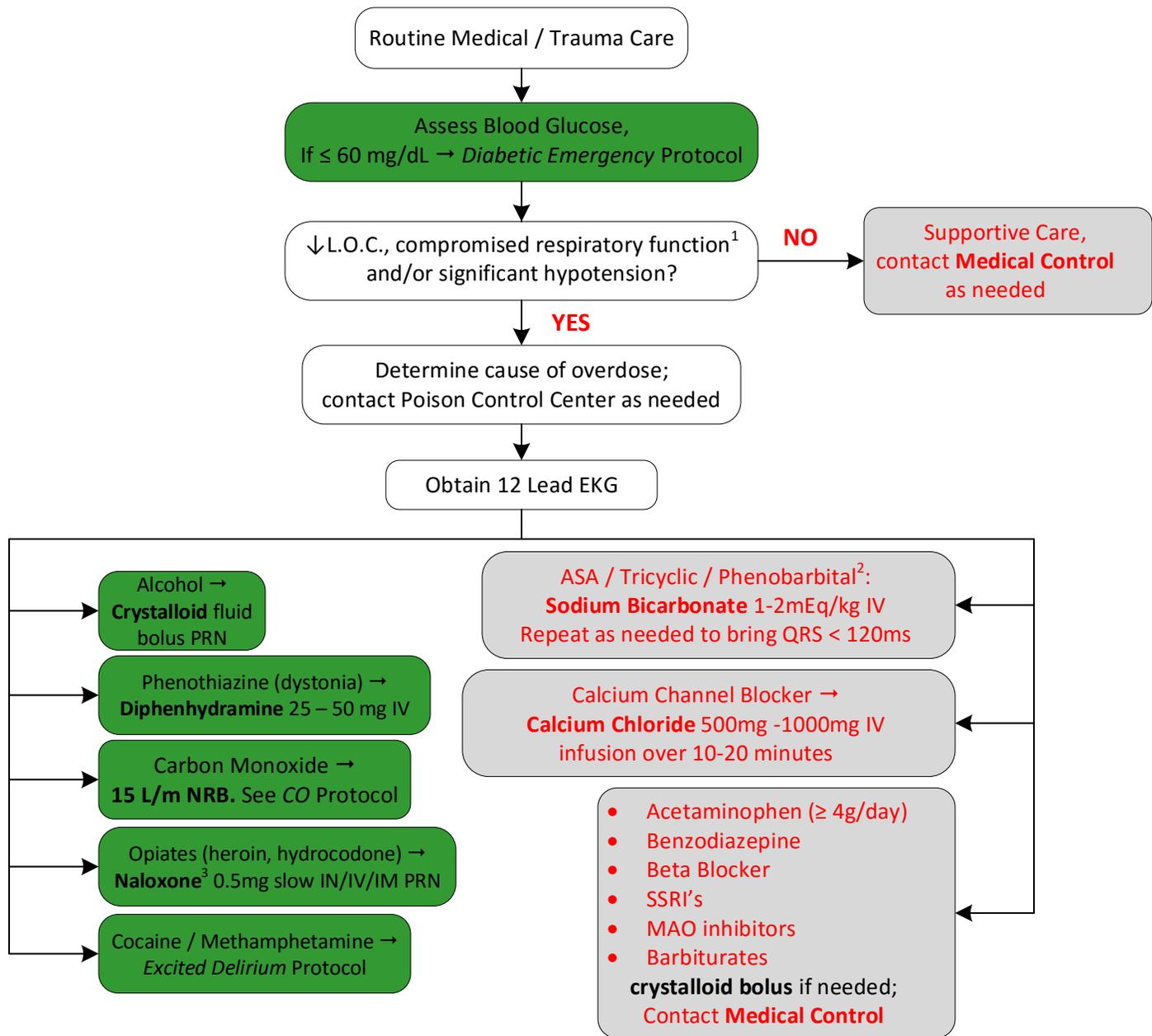
Drowning

When treating drowning victims, addressing submersion induced hypoxia remains an immediate focus in the American Heart Association's 2015 updates. Attention should be on oxygenation and ventilation; therefore, CPR for drowning victims should follow the traditional A-B-C approach to cardiac arrest care as opposed to the newer C-A-B approach.



- Initiate resuscitation in persons who have been submerged for **< 60 minutes**. Paramedics should use sound clinical judgement when deciding if resuscitation efforts should be initiated, including but not limited to water temperature, length of submersion, and any associated trauma. If there is any doubt or if the events leading to the submersion are unclear, it is recommended that resuscitation be initiated and the victim be transported to an ED unless there is obvious death (eg. Rigor mortis, decomposition, hemisection, decapitation, or lividity).
- Unnecessary spinal motion restriction can impede adequate opening of the airway and delay delivery of rescue breaths. Routine spinal motion restriction in the absence of circumstances that suggest a spinal injury is not recommended.

Drug Overdose



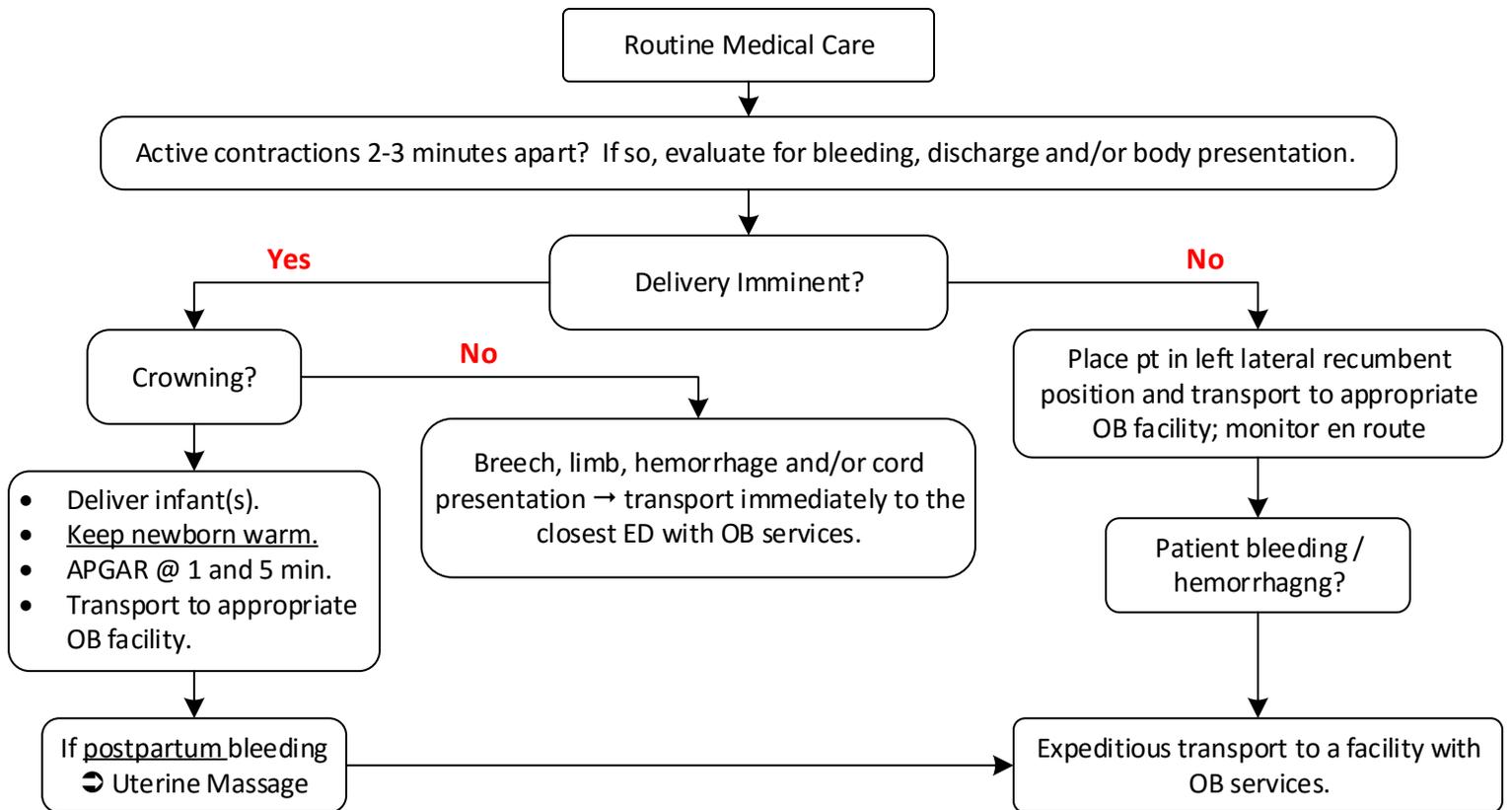
¹ SpO₂ < 94%, shallow respirations, unable to maintain own airway, respiratory rate ≤ 10/min and/or symptomatic hypotension SBP < 90mm/Hg. Monitor EtCO₂

² For known Tricyclic antidepressants, or Phenobarbital overdose (S/S include respiratory depression, QRS >120ms, focal seizures, AV blocks, ventricular arrhythmias), consider **Sodium Bicarbonate** 1-2 mEq/kg IV/IO with Medical Control orders.

³ **Naloxone** dose shall be titrated in 0.5mg increments, typically to a max of 2mg or until adequate ventilation/oxygenation is achieved as measured by pulse ox, adequate respirations, as well as patent airway (via NPA/OPA or adequate gag reflex). Doses administered in amounts larger than 0.5mg increase the risk of flash pulmonary edema. The likelihood of this incidence although rare, increases in proportion to the administered dose. Occasionally, doses larger than 2mg may be required for synthetic opiate overdoses. **Naloxone** may be administered by First Responders, EMRs, and EMTs in 2mg increments IN as per ROPE preambles.

- When trauma is known or suspected refer to the *Spinal Motion Restriction* protocol. Patients with an altered mental status **cannot** be clinically cleared.
- Uncontrollable patients may be chemically sedated / physically restrained as indicated in the *Excited Delirium* protocol.

Emergency Childbirth



- IV access may be obtained for any patient considered imminent for delivery or considered “HIGH RISK¹”
- **Lactated Ringers (LR)** is the fluid of choice

- **Do NOT delay transport awaiting placental delivery**
- All products of conception must accompany the patient to the E.D.

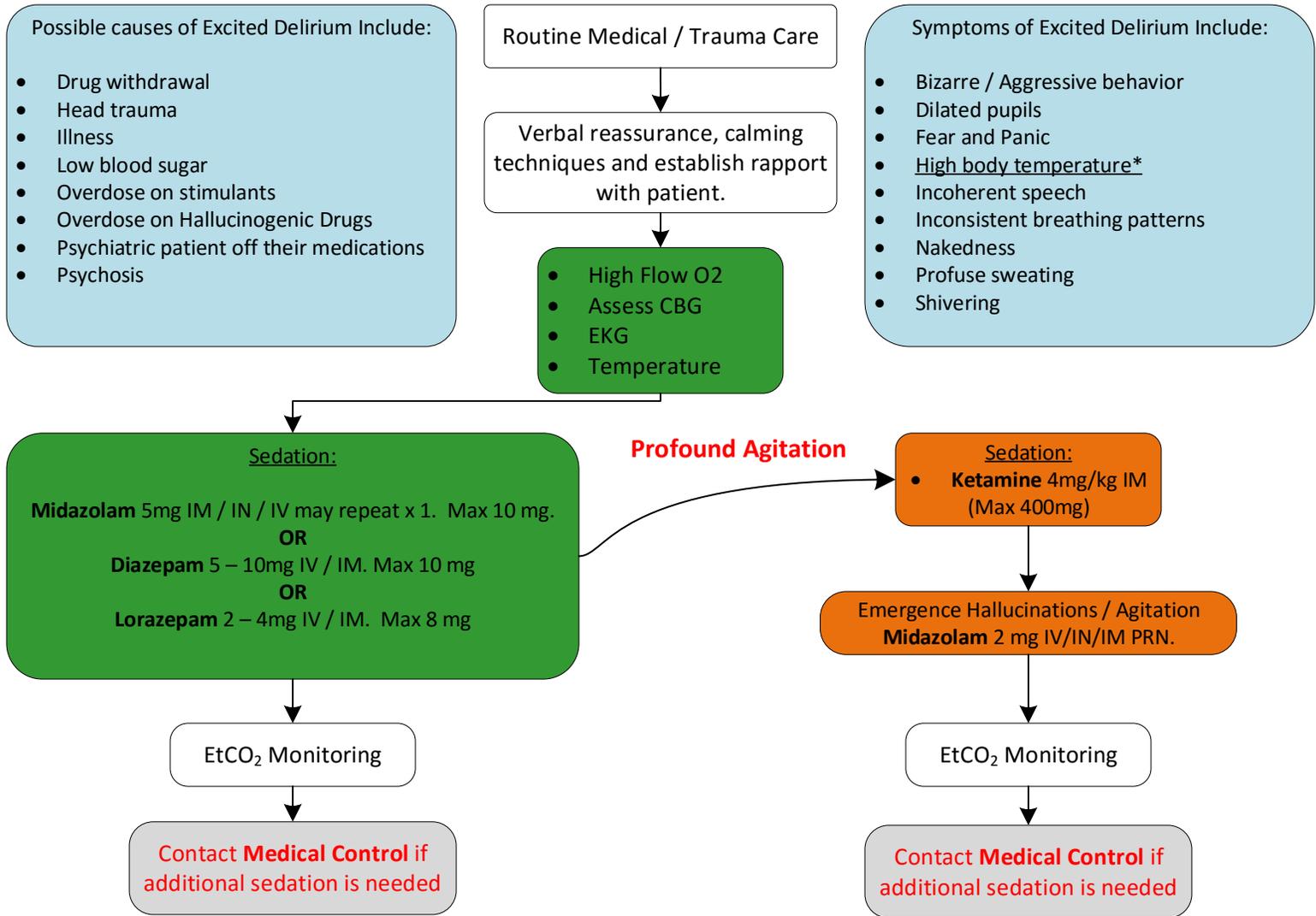
- Prolapsed Cord**
- Place patient in knee/chest position or in deep Trendelenburg
 - Elevate presenting part or retract maternal tissue to allow/increase fetal blood flow until relieved by hospital staff.

¹ **HIGH RISK** includes but is not limited to:

- Preterm Labor
- Vaginal bleeding
- Multiple gestation pregnancy
- Placental Abruption
- Placenta previa
- Pre-eclampsia
- Patient who states she is “high risk” (diabetic, HTN, etc.)
- Trauma

Excited Delirium

A condition in which a person is in a **psychotic state** or is extremely agitated state. Mentally, the subject is unable to focus his/her attention on any one thing and is often distracted by his surroundings. The subjects' inability to process rational thought precludes normal de-escalation procedures alone. Physically, the organs within the subject are responding to the inciting factor be it a drug stimulant or the exacerbation of an underlying psychiatric condition. These two factors occurring at the same time cause a person to act erratically enough that they become a danger to themselves and to the public. This is typically where law enforcement comes into contact with the person.



* High body temperature is a key finding in predicting a high risk of sudden death. Another key symptom to the onset of death while experiencing excited delirium is "Instant Tranquility." This is when the suspect who had been very violent and vocal suddenly becomes quiet and docile while in the car or sitting at the scene.

- Ensure proper positioning of the patient to avoid positional and compression asphyxia. No person should be restrained or compressed and left in any position that may restrict the airway for any extended period of time.
- Physical / Chemical restraints as needed for patient and staff safety
- Law Enforcement should accompany EMS to the hospital if available.
- Use of benzodiazepines in excited delirium should be titrated to relief of agitation and alleviation of physical symptoms including, but not limited to: combativeness, diaphoresis, tachycardia (goal for a heart rate < 110 bpm), tachypnea.
- Care should be given to post-sedation vital sign monitoring (with special attention to EKG rhythms), pulse oximetry, capnography, and maintenance of airway.
- Patients should be transported to the closest appropriate hospital for evaluation and stabilization.

Heat Related Emergency

Heat Exhaustion vs Heat Stroke

Heat Exhaustion

- Cool skin
- Decreased skin elasticity
- Delayed capillary refill
- Diaphoretic
- Dizzy
- Dry mucous membranes
- Headache
- Muscle cramps (leg & abdomen)
- Nausea
- Pallor
- Reduced urinary output
- Weakness

Heat Stroke

- Altered L.O.C.
- Hot / dry skin
- Muscle cramping
- Reduced urinary output
- Seizures
- Sweating may have stopped
- Tachypnea
- Temperature > 104°F

Routine Medical Care / Trauma Care
(including temperature & CBG)

Assess the need for *spinal motion restriction*

Apply cold packs to the armpits, groin and posterior neck
May perform passive leg raise as needed

- Encourage P.O fluids if the patient has a normal mental status.
- Large bore IV, infuse 1 L of NaCl and reassess (if A.M.S. or if not tolerating P.O. fluids)
- Consider the use of **Chilled NaCl** for patients with s/s of Heat Stroke¹
- An IO can be used in the presence of an altered L.O.C with seizure activity and/or temp > 104°F after 2 failed peripheral IV attempts.

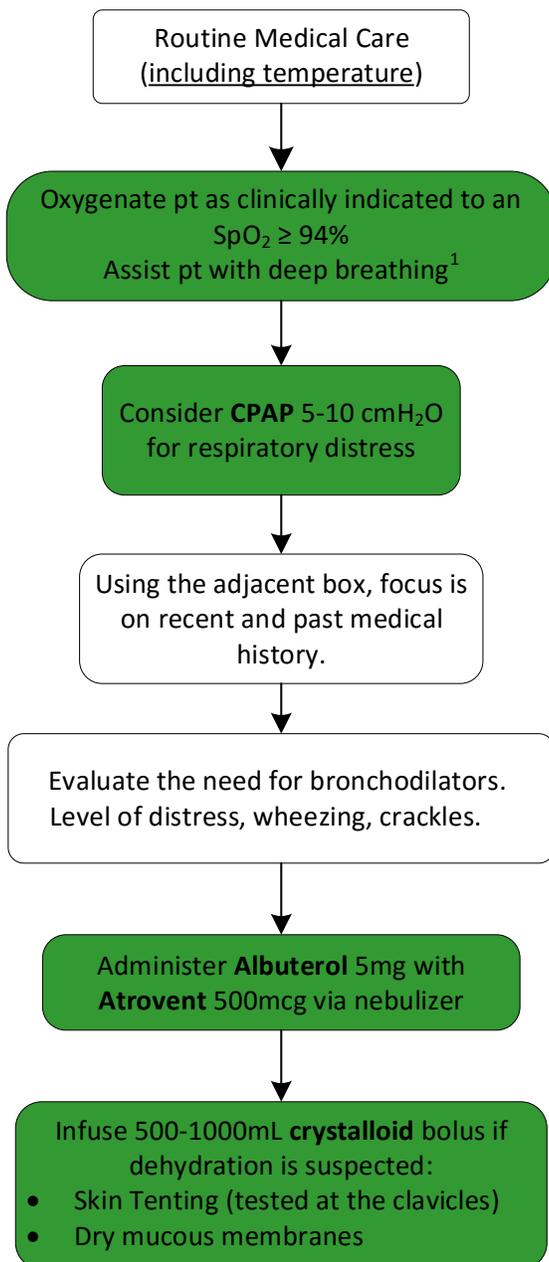
Contact Medical Control if
additional orders are needed

¹ Infuse **chilled NaCl** for Heat Stroke patients with A.M.S. to a target temperature of 101°F.

- History should include: length of exposure, any attempts at oral rehydration, last urination and alcohol or drug use in the past 24 hours.
- For tonic-clonic seizure activity, refer to the *Seizure* protocol.

Pneumonia

Pneumonia is primarily caused by a bacterial infection. This can often be mistaken for pulmonary edema and/or COPD; therefore, it is imperative to understand the presentation of pneumonia. Patients who have a history of Asthma and COPD are at a higher risk for developing pneumonia.



Signs and Symptoms Associated with Pneumonia:

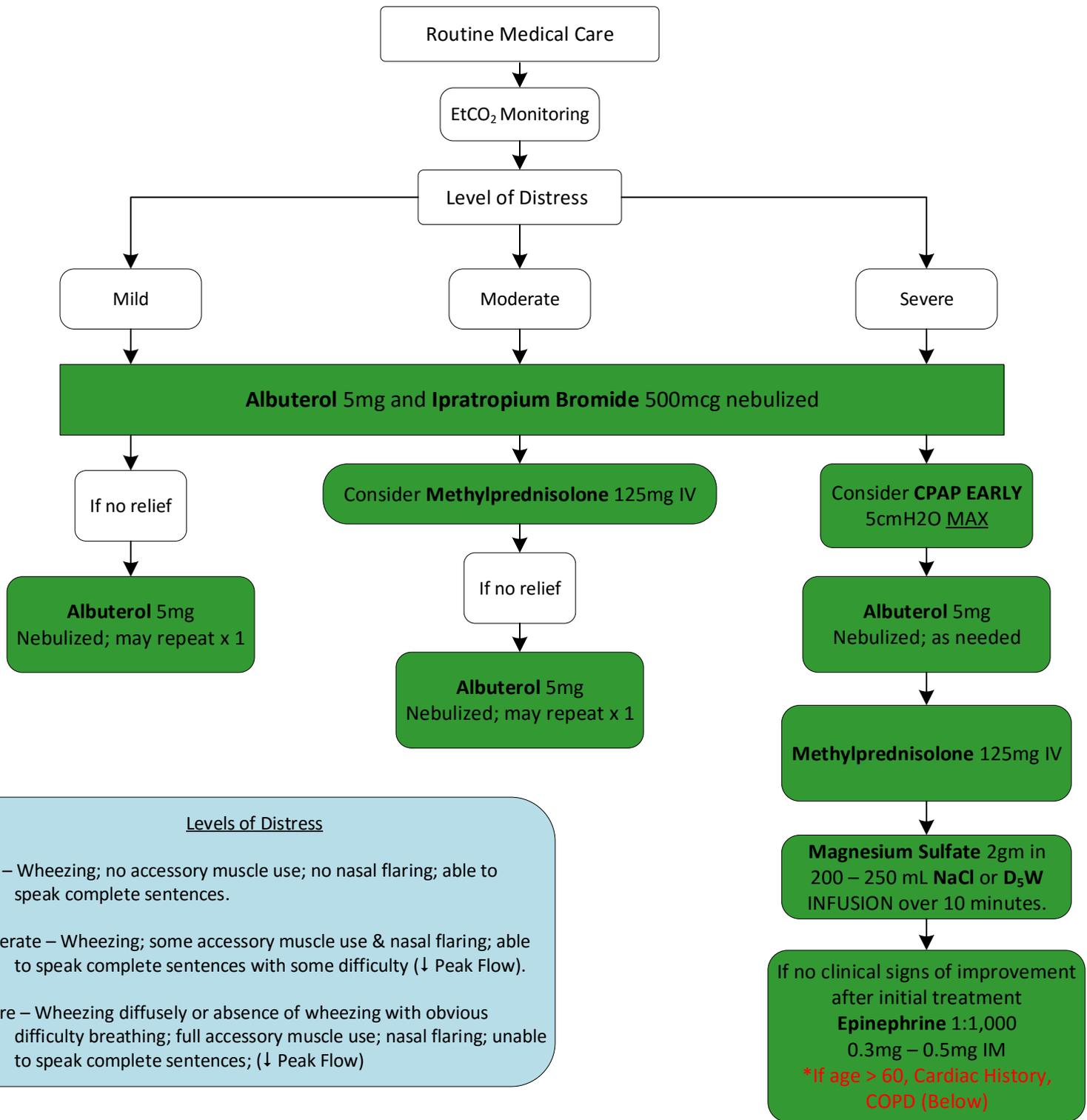
- Hypoxia
- Productive cough (mucus could be green or yellow & even contain blood)
- Fluid in pleural cavity which could cause reproducible chest wall pain especially on inspiration and commonly mistaken for rales related to pulmonary edema.
- Dehydration (administer crystalloid fluid bolus)
- Tachycardia
- Fever (not always solid indicator in aging adults)
- Tachypnea
- Chills
- Bed bound patients
- Aspiration risk
- Institutionalized² (currently or recent)
- Hemoptysis³ (coughing or spitting up blood)
- Adventitious lung sounds, such as crackles

¹ **IF TOLERATED:** deep breathing increases the surface area within the alveoli of the lungs. An increase in surface area increases the gas exchange which will increase oxygenation. This also stimulates movement or activity in the bases of the lungs which is most often the site of the bacteria causing the pneumonia.

² Institutionalized: Any of the following is considered an institution: Hospital, Nursing home, etc. This increases the risk for pneumonia due to their sedentary lifestyle.

³ P.P.E. masks should be used on anyone presenting with hemoptysis. Hemoptysis is considered T.B. until proven otherwise.

Reactive Airway Disease



Levels of Distress

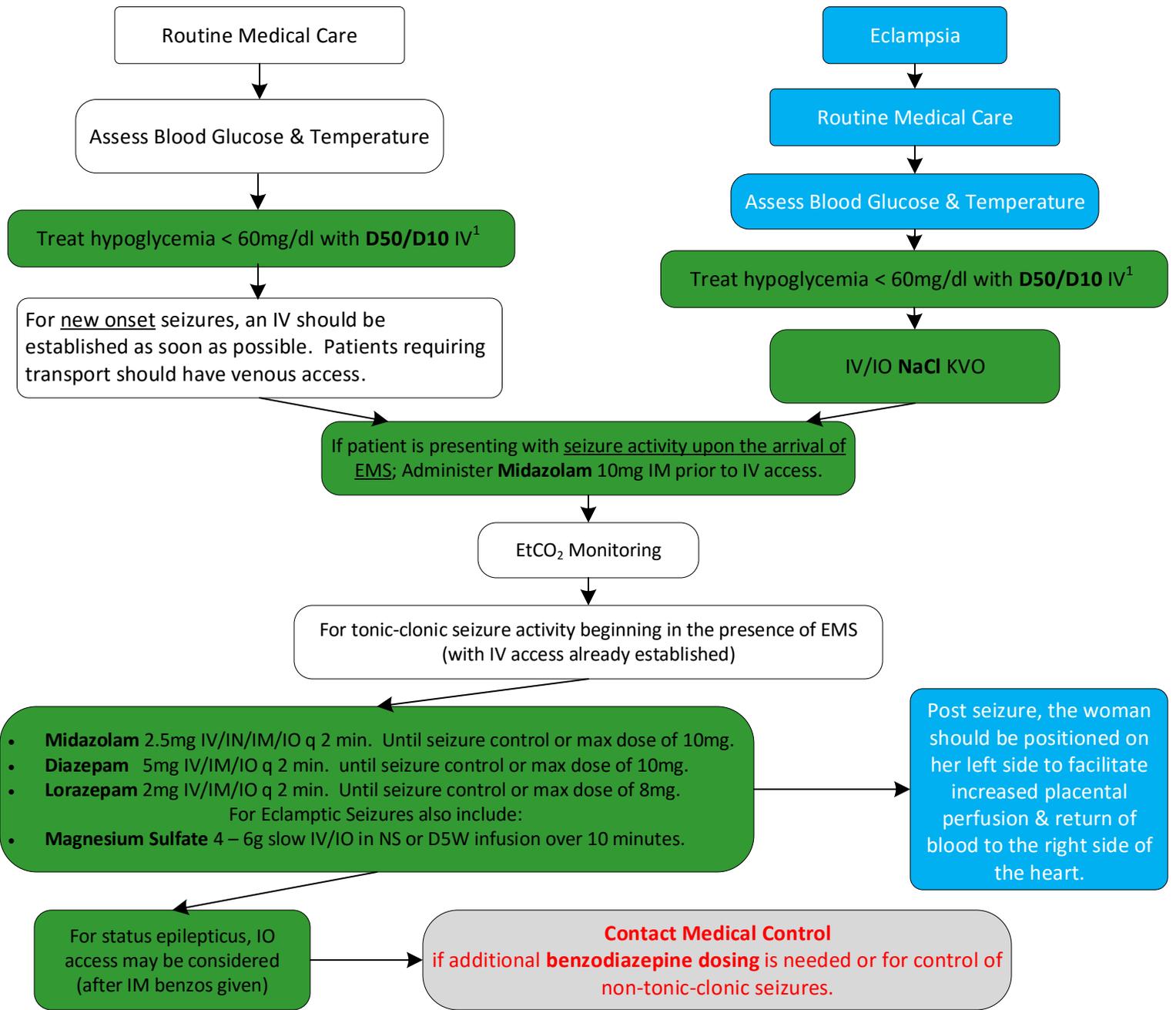
Mild – Wheezing; no accessory muscle use; no nasal flaring; able to speak complete sentences.

Moderate – Wheezing; some accessory muscle use & nasal flaring; able to speak complete sentences with some difficulty (↓ Peak Flow).

Severe – Wheezing diffusely or absence of wheezing with obvious difficulty breathing; full accessory muscle use; nasal flaring; unable to speak complete sentences; (↓ Peak Flow)

- The current dose for **Albuterol** is 5mg for patients ≥ 30kg. For patients < 30kg, administer 2.5mg nebulized.
- Determine if the patient has been intubated in the past. If so, treat aggressively.
- Patients ≥ ≈ 60 years of age with a cardiac history, COPD, and/or renal failure shall not be given **Magnesium sulfate** or **Epinephrine** without consultation from Medical Control.
- The onset of action for **Ipratropium Bromide** is ≈ 20 minutes with peak action between 60-90 minutes; therefore should be given with the first **Albuterol** treatment and with every 4th treatment thereafter.
- Corticosteroids (**Methylprednisolone**) or oral Prednisone is the only proven treatment for the inflammatory response in asthma. Early administration of these medications is vital as they aid in reducing the possibility of hospital admission. It usually takes six hours once the medication is given before it's effects are seen.
- Consider the use of qualitative EtCO₂ as a diagnostic tool by assessing for bronchospastic or "Shark Fin" waveform.

Seizure



Status Epilepticus

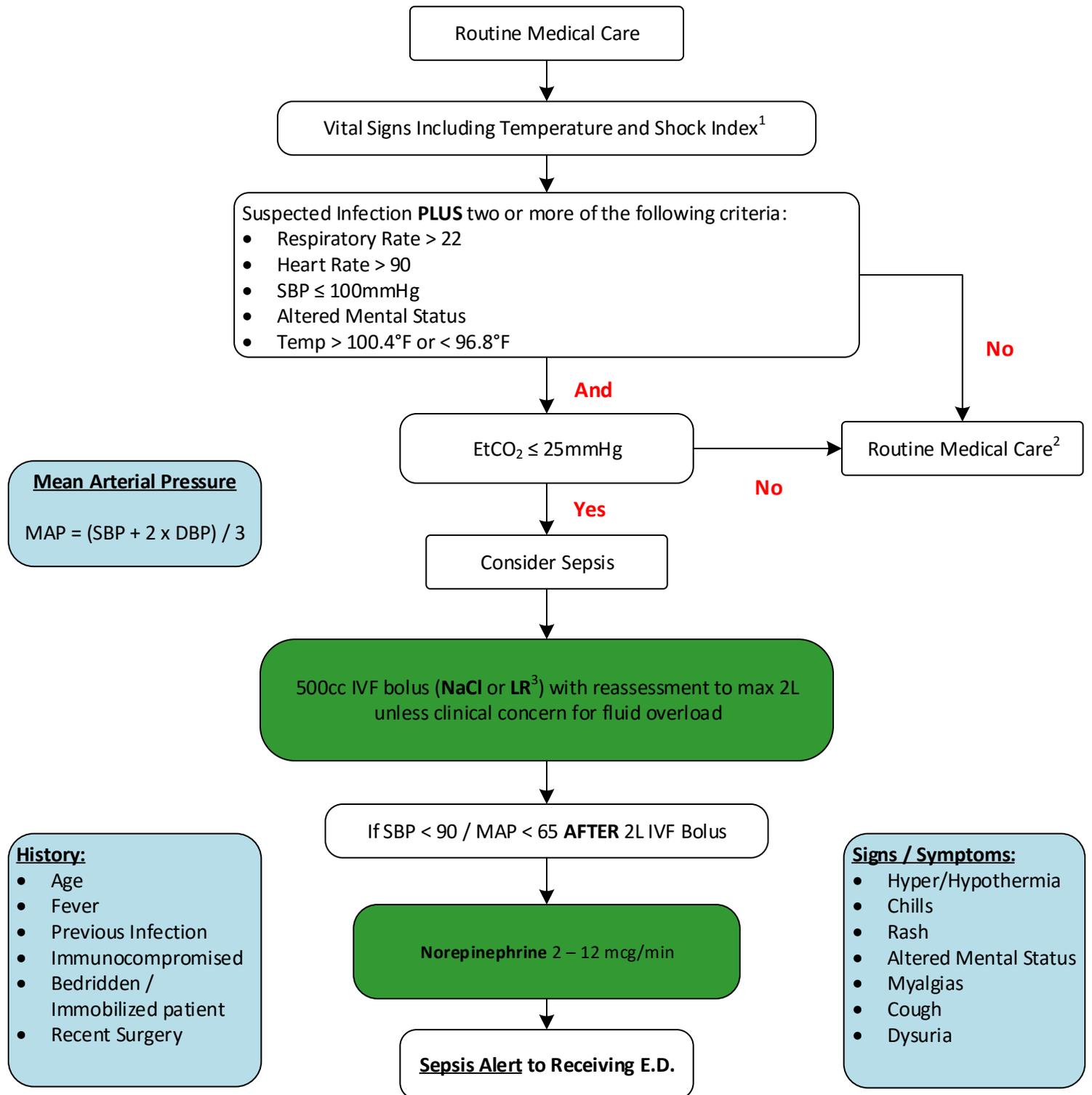
A prolonged seizure > 5 min., or a series of repeated seizures without a return to consciousness within 5 min.

Eclampsia – A severe hypertensive disorder ($\geq 140/90$) of pregnancy characterized by convulsions and coma, occurring between 20 weeks gestation and 6 to 8 weeks postpartum. Eclampsia is the most serious complication of pregnancy-induced hypertension.

Pre-eclampsia – A complication occurring in about 3% to 5% of pregnancies, characterized by increasing hypertension, proteinuria, and edema. The condition may progress rapidly from mild to severe and, if untreated, to eclampsia.

- All seizures of new onset need transport to an E.D. with a functional CT scanner. If seizure is secondary to trauma, transport to trauma center.
- Diazepam/Lorazepam CANNOT be given via intranasal route. Oil based medications cannot be atomized.
- If IN/IM Midazolam is used to control seizure activity, peripheral intravenous access is still needed.
- ¹As per *Diabetic Emergency Protocol*

Sepsis – Suspected / Septic Shock



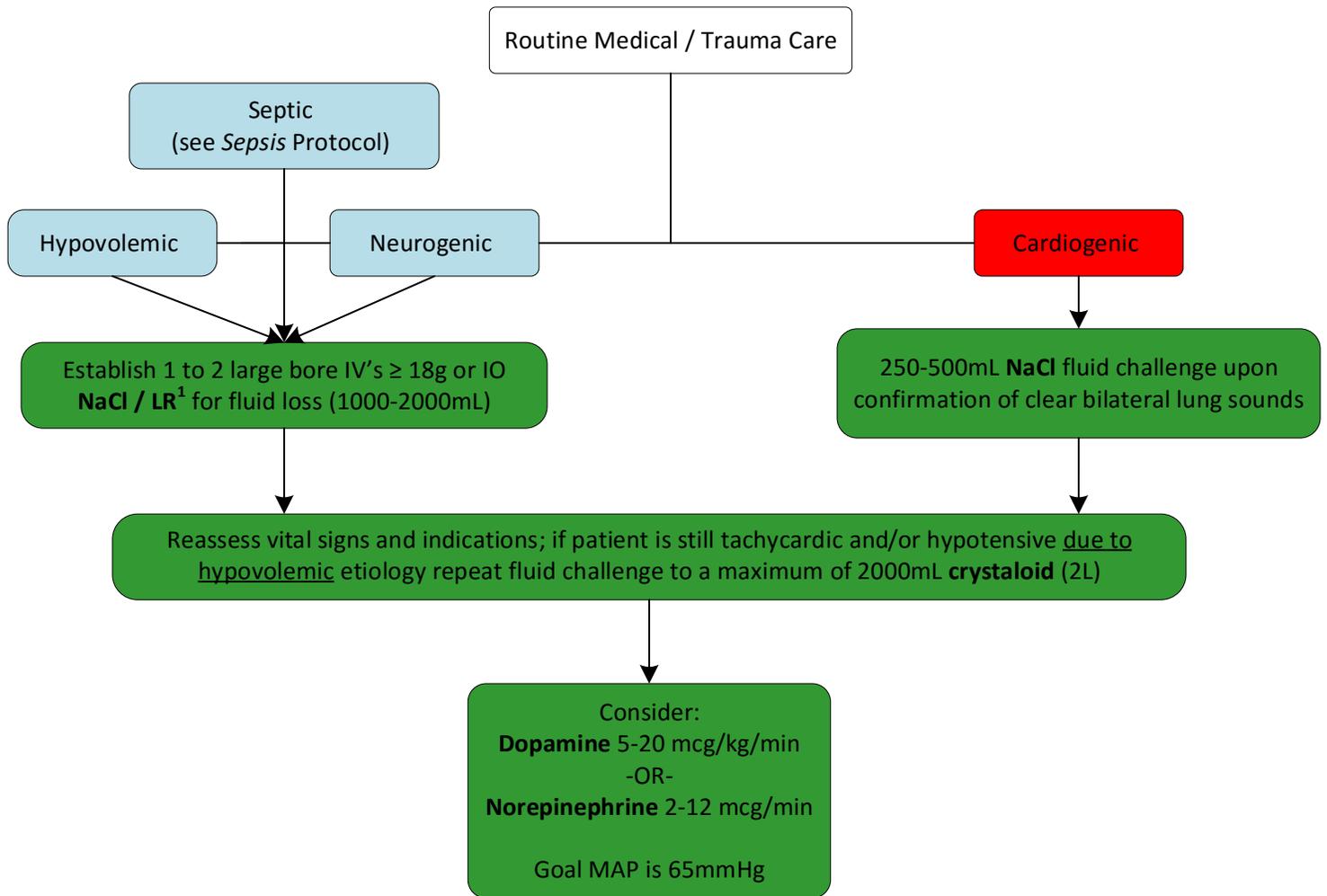
- Attempt to identify source of presumed infection and relay to receiving facility.
- Early recognition of Sepsis allows for early, aggressive treatment and initiation of antibiotics.
- Low End Tidal levels correlate with elevated lactate levels.

¹ Shock Index = HR / SBP. Normal Shock Index is between 0.5 and 0.7. A SI > 0.9 is concerning for increased mortality. HR should be < SBP.

² Patients with suspected sepsis may not have a low EtCO₂ reading. Consider sepsis based on clinical presentation.

³ Lactated Ringers are the crystalloid of choice for the resuscitation of septic patients when available.

Shock



S/S of Hypovolemic Shock:

- Altered Mental Status
- Capillary refill > 2 seconds
- Chest Pain
- Diaphoresis
- Increased Level of Anxiety
- Muscle Cramping
- N/V/D
- Pallor
- Possible hx of recent trauma
- SBP of < 90-100mm/Hg
- Dyspnea
- Tachycardia > 120 BPM

S/S of Septic Shock:

- Fever typically present
- Hypotension
- Skin appears flush
- Warm extremities

S/S of Neurogenic Shock:

- Hypotension
- Not always tachycardic
- Usually associated with a traumatic event

Mean Arterial Pressure

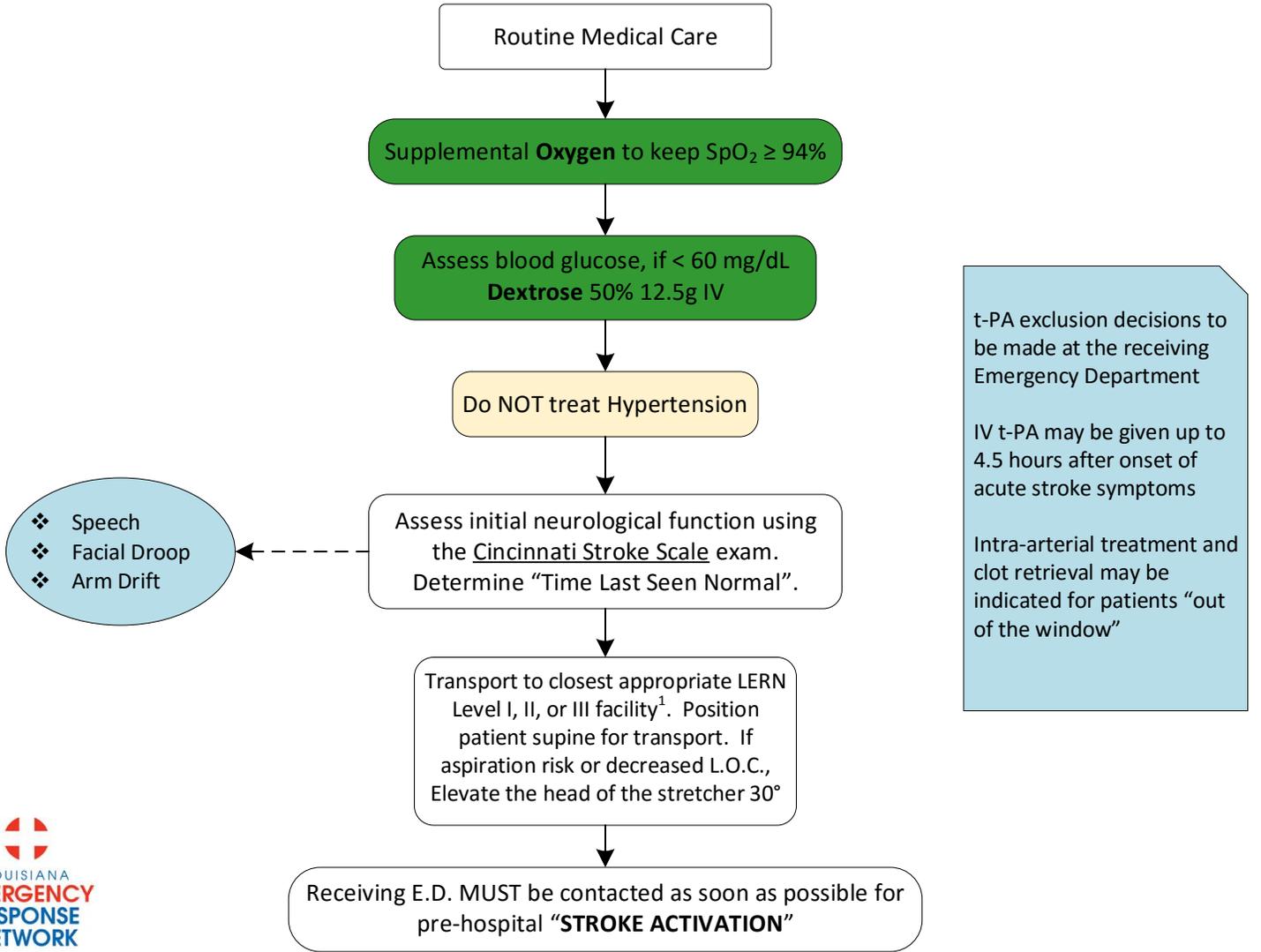
$$\text{MAP} = (\text{SBP} + 2 \times \text{DBP}) / 3$$

¹ Lactated Ringers are the crystalloid of choice in septic shock when available

Stroke

Determine Onset of Focal Neurological Symptoms "Time Last Seen Normal"

As pre-hospital providers our hands on care for stroke victims is limited. Therefore, our next crucial role in caring for stroke victims is geared toward recognition. The Cincinnati Stroke Scale shall be used as a quick stroke screening tool. The detailed testing of neurological function should be completed enroute to the E.D. If present, transport a family member or anyone who has pertinent medical information to the E.D.



¹ Prior to concluding the Medical Control radio report, identify who will be notifying the receiving ED (EMS or Medical Control).

- Transport to a hospital that has neurological services and a functional CT scanner. A neurosurgeon is not required for an ED to accept an active stroke.
- Patients who awaken from sleep with neurological deficits must still be transported to a hospital with neurological services and a functional CT scanner as a stroke activation.
- Treat hypotension as per protocol to improve perfusion.
- To assist in t-PA screening, ask "Have you been admitted to the hospital within the past 3 months?"
- Treat generalized seizure activity aggressively per protocol

*Jauch EC, Saver JL, Adams HP Jr., Bruno A, Connors JJ, Demaerschalk BM, et al., American Heart Association Stroke Council, Council on Cardiovascular Nursing, Council on Peripheral Vascular Disease, and Council on Clinical Cardiology. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44:870-947.

Termination of Resuscitation (non-traumatic)

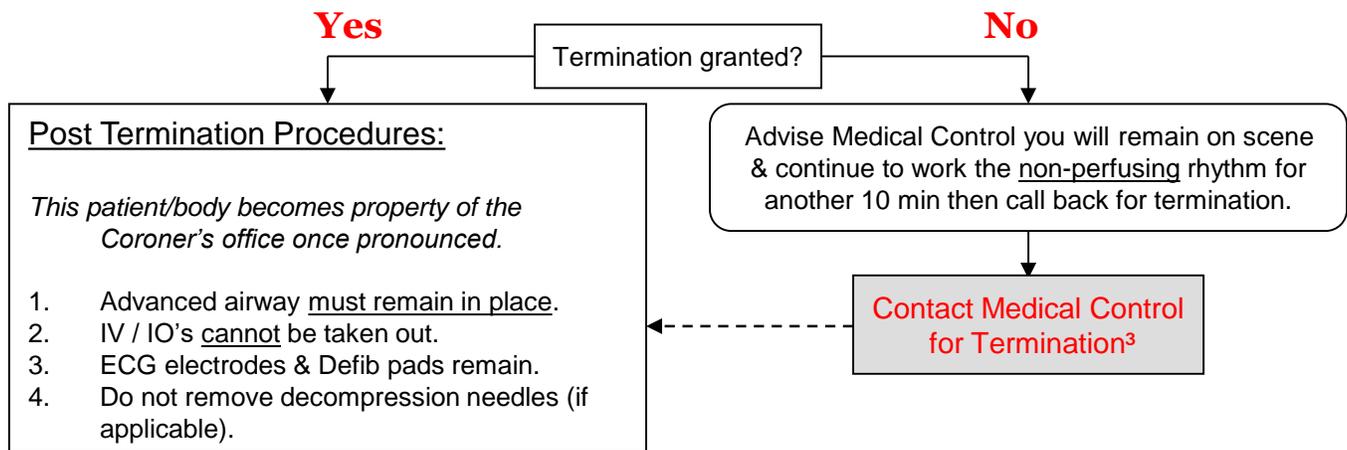
All of the following **MUST** be met to consider “*Termination of Resuscitation.*”

- Pulseless and apneic prior to EMS arrival
- **18 years of age or older**
- > 30 min resuscitation (by EMS) following appropriate pulseless protocol
- > 30 min of chest compressions with interruptions only for rhythm checks
- ETT or supraglottic airway with proper documentation of qualitative and/or quantitative¹ capnography
- Patent IV / IO line
- When system configuration allows, it is preferable to have two on-duty paramedics, one of which is at a supervisory level and/or an on-line medical director, on scene verifying proper basic and advanced treatments.
- Patient could not have been in a perfusing rhythm at anytime
- Persistent asystole or agonal rhythm, rate < 40 bpm, (not VF/VT) with no identifiable reversible causes after a minimum of 30 minutes of resuscitation
- Patient’s immediate family members must have been fully informed of situation, if on scene
- A safe environment for EMS / first responders
- Law Enforcement / Coroner on scene or already notified

If all the above are met, contact Medical Control

If ANY one of the above is not met you still **MUST** stay on scene for 30 min² prior to any movement or packaging of the patient. You may begin packaging the patient after 30 minutes and transport to the closest appropriate ED.

Contact Medical Control for Termination of Resuscitation



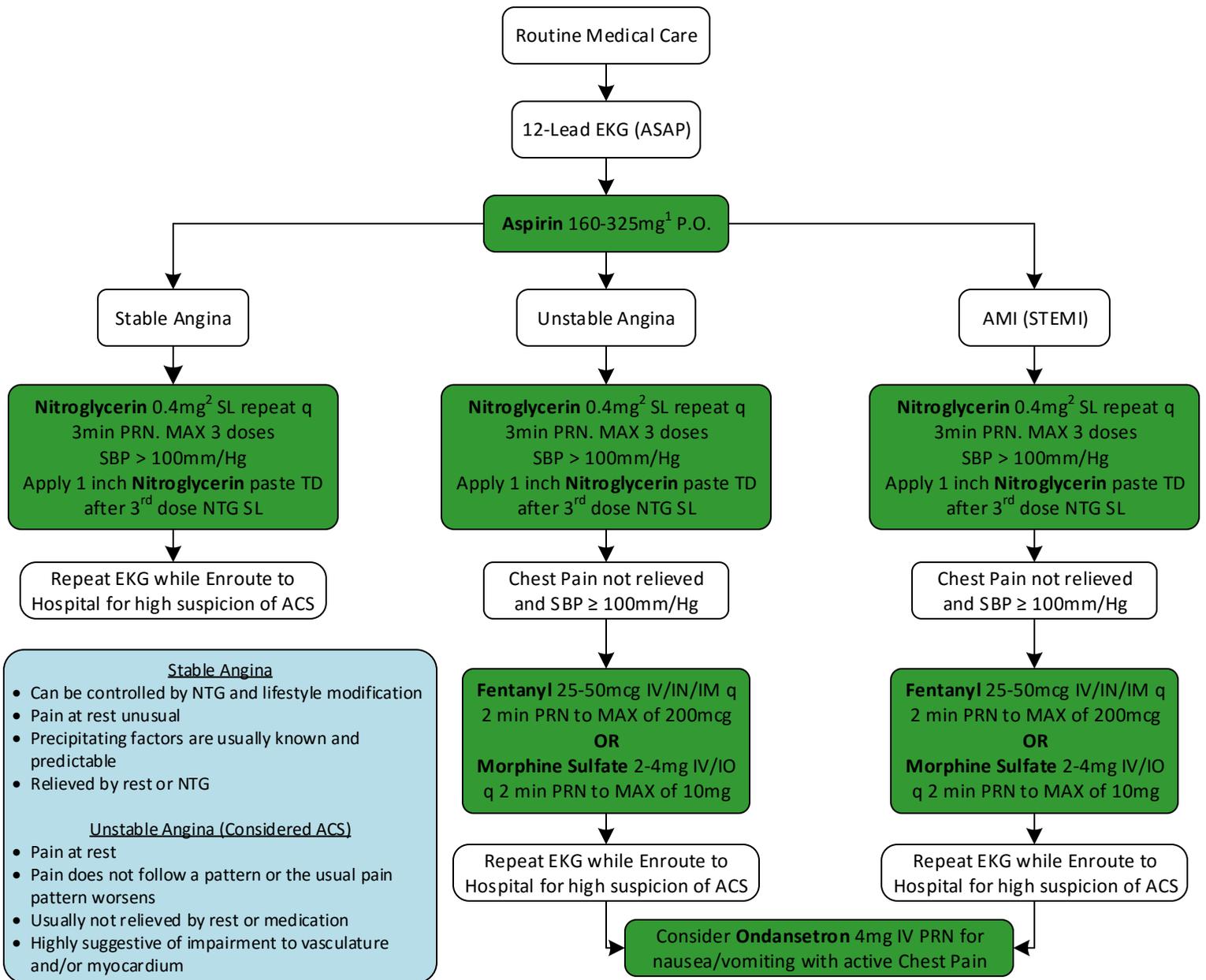
¹ Quantitative and qualitative capnography is defined in the *Protocol Preambles*.

² Deterioration of a safe scene in which the prehospital providers are in danger takes priority over scene time on cardiac arrests. If the scene has become too dangerous to provide patient care, law enforcement must be dispatched with documentation reflecting such on the run report.

³ If Medical Control does not grant “Termination” after 2 requests, transport to the closest appropriate ED.

- Termination of Resuscitation does not apply in public venues / public view or at any time the medics feel their safety is compromised.
- This protocol is not applicable to EMTs and Advanced EMTs.

Acute Coronary Syndrome (ACS)



Notifying the receiving E.D. as early as possible should take high priority when infarct is suspected. Transport to a hospital with cardiac catheterization capabilities.

¹ Aspirin (ASA) is contraindicated in patients with current or recent GI bleeding.

² Nitroglycerin (NTG) is contraindicated in patients who have taken Viagra or Levitra within the past 24 hours (Cialis in the past 48 hours).
NTG SL tablets and NTG SL spray may be used interchangeably.

- Age and cardiac risk factors (defined in the *Protocol Preambles*) are a key evaluation tool in this protocol. Major risk factors should be documented on the EMS Run Report.
- If the administration of one NTG dose results in a substantial decrease in blood pressure, discontinue NTG use; this response may be indicative of a MI involving the right ventricle. This hypotension usually responds well to a crystalloid fluid bolus. A common finding associated with a right sided inferior MI is ST elevation in V4R +/- bradycardia.
- Threat life-threatening arrhythmias per the appropriate protocol before initiating this ACS protocol.
- Consider a right sided 12-Lead EKG (V4R) for suspected Inferior STEMI (II, III, AvF).
- Ventricular ectopy typically does not require treatment unless the ectopic beats are greater than the number of regular (non-ectopic) beats and / or a patient is hemodynamically unstable.
- Paramedics treating patients within this protocol should minimize on scene time to 15 minutes for STEMI.

Asystole / P.E.A.

Effective CPR performed prior to arrival?
AED used prior to arrival?
EMS witnessed arrest?

Effective chest compressions and controlled ventilations at 10 / min takes priority over ANY OTHER TREATMENT.

Perform continuous chest compressions without stopping for ventilations.

Only pause for < 10 seconds every 2 minutes to verify EKG

Pt apneic and pulseless with down time > 4-5 minutes, begin BLS¹ CPR for 2 minutes prior to rhythm check

Attach EKG, confirm Asystole / P.E.A.

Continuous CPR

- Establish IV/IO access
- **Epinephrine 1:10,000, 1mg IV/IO repeat q 3-5 min**
- Insert advanced airway³
- Initiate continuous EtCO₂ monitoring

Search and treat for possible contributing factors⁴

< 10 second pause in CPR q 2 minutes for rhythm / pulse check

If acidosis is suspected (i.e. prolonged downtime), **Sodium Bicarbonate 1mEq/kg IV/IO**

¹ B.V.M with OPA / NPA only. If effective CPR is in progress upon arrival, A.L.S. / ACLS may be initiated after the first two minute cycle is complete

² Guidelines for CPR can be found in the *Protocol Preambles*.

³ Airway management per Advanced Airway Protocol. **Avoid prolonged (>10 sec) pauses in compressions for airway management**

⁴ **Contributing Factors:**

- Hypoglycemia – treat with **Dextrose 50%**
- Hyperkalemia – **Calcium Chloride 1000mg IV/IO** for suspected hyperkalemia
- Overdose – Tricyclic antidepressants **Sodium Bicarbonate 1-2mEq/kg** and/or **Naloxone 2mg** for opiate overdose.
- Tension Pneumothorax – **Needle Decompression**
- Hypothermia – Avoid rigorous movement of patient; especially if patient regains pulse. Excessive movement could cause V-Fib or V-Tach. This is rare but when it occurs the VF/VT is almost always refractory.
- Hypovolemia – **Fluid Bolus**

* If Wide QRS P.E.A., consider hyperkalemia or Sodium Channel Blocker toxicity.

Check for responsiveness while determining if the patient is breathing or not breathing normally (i.e. agonal)

If not responsive, not breathing or agonal →
Check for a carotid pulse, taking no longer than 10 seconds

Yes

Give 1 breath every 5-6 seconds
Recheck pulse every 2 minutes

No

Begin continuous CPR
Apply A.E.D. when available

Analyze Rhythm
Shockable?

Yes

Give 1 shock
Resume CPR immediately for 2 minutes

No

Resume CPR immediately for 2 minutes.
Check rhythm every 2 minutes until ALS
arrives or patient is ready for transport

Emphasis on High-Quality CPR

- Rate of 100-120 per minute
- Compression depth of at least 2 inches
- Allow complete recoil after each compression
- Minimize interruptions in compressions
- Avoid excessive ventilation

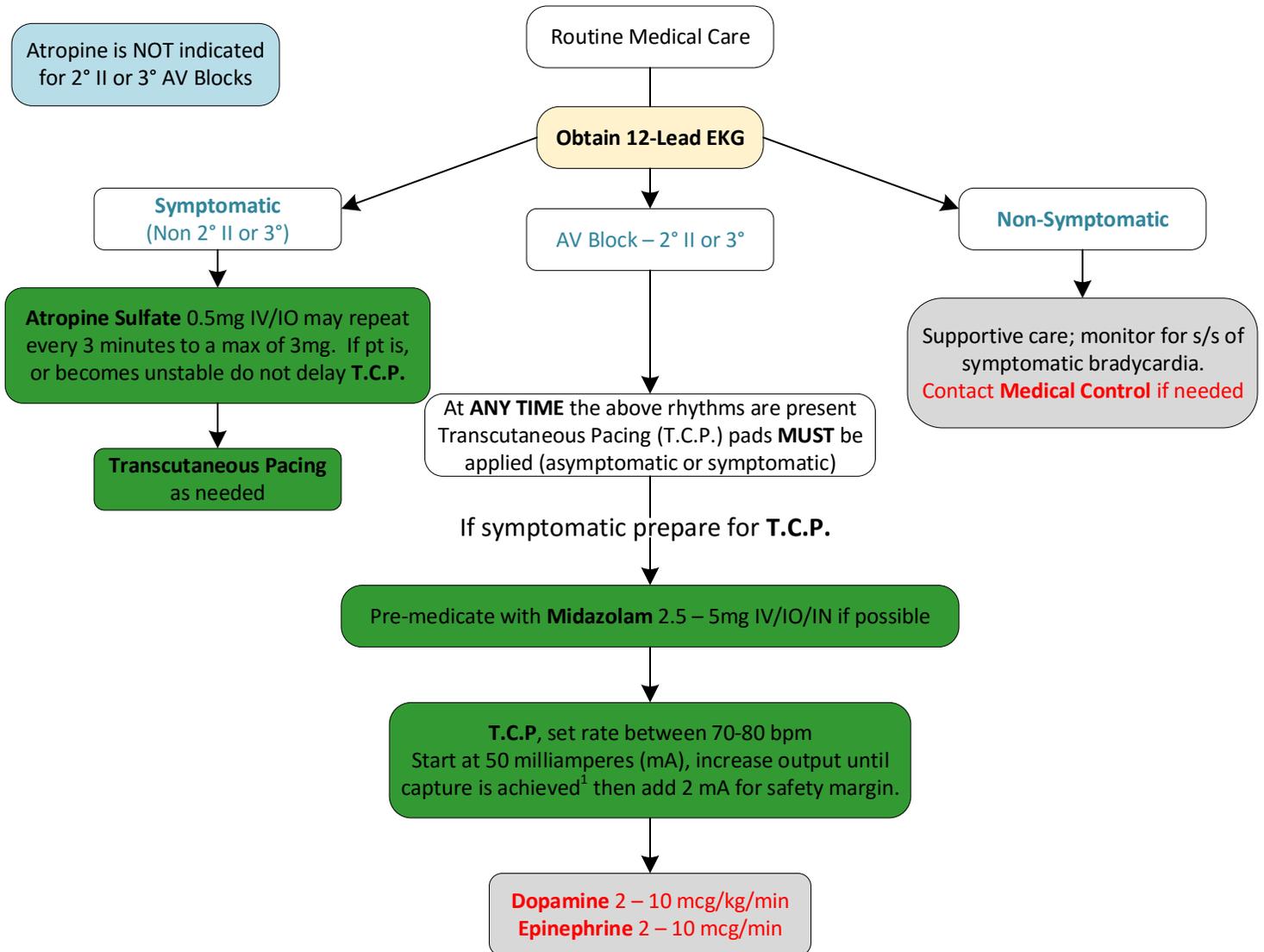
Following the initial rhythm check or defib:

- Consider the use of a mechanical compression device, if available per it's protocol.
- Consider the use of a Supraglottic Airway

¹ Do not delay compressions while preparing a B.V.M / Oral Airway or applying the A.E.D.

- Allow for early consideration of ALS backup or intercept.
- Patients must be worked on scene for a minimum of 30 minutes.

Bradycardia (Symptomatic)



Each patient will obviously present differently, therefore it is unrealistic to indicate when T.C.P. is or is not needed. Paramedics should use their clinical judgement to make that decision; if in doubt call **Medical Control**

¹ Widening of QRS and a broad T wave after each spike.

- Symptomatic bradycardia is defined as a pulse < 60 beats per minute (bpm) with a SBP < 100mm/Hg, Shortness of breath, altered mental status, and/or other signs of hypoperfusion.
- Transplanted hearts will not respond to **Atropine Sulfate**; **T.C.P.** is the treatment of choice.
- **T.C.P.** is the treatment of choice for 2nd degree type II and 3rd degree AV heart blocks with serious S/S. Contact **Medical Control** if no other serious S/S exist. Atropine Sulfate is not indicated for AV blocks at this level.

CHF / Pulmonary Edema

Recognition is Key

Medical History Indications

- Hx of CHF, MI, A-Fib, Renal Failure
- Orthopnea (# of pillows under head to facilitate breathing)
- Paroxysmal Nocturnal Dyspnea
- Prior Intubation
- Recent or increasing dyspnea upon exertion (DOE)
- Takes diuretic

Physical Exam Indications

- Dyspnea
- Hepatojugular Reflux¹
- HTN
- JVD at 30° elevation
- Pitting Edema
- Rales / Rhonchi
- Tachycardia

Routine Medical Care
(Including temperature)

**Blood Pressure
and
Early 12-Lead EKG
to assess for STEMI**

Systolic BP > 100mm/Hg with
pulmonary edema and/or R.R. ≥ 30

**Early CPAP 5-10cm H₂O for severe dyspnea
related to acute pulmonary edema**

- **Nitroglycerin (NTG) 0.4mg SL, & may repeat every 5 minutes as long as SBP > 100mm/Hg ALSO**
- **NTG Paste 1 inch TD may be used to supplement NTG SL PRN SBP > 100mmHg**

Systolic BP < 100mm/Hg with
pulmonary edema and/or R.R. ≥ 30

**Norepinephrine 2-12 mcg/min
-OR-
Dopamine 5-20 mcg/kg/min**

Contact **Medical Control** immediately after starting the infusion. Because **CPAP** has the potential to further decrease blood pressure, contact **Medical Control** for the use of **CPAP**

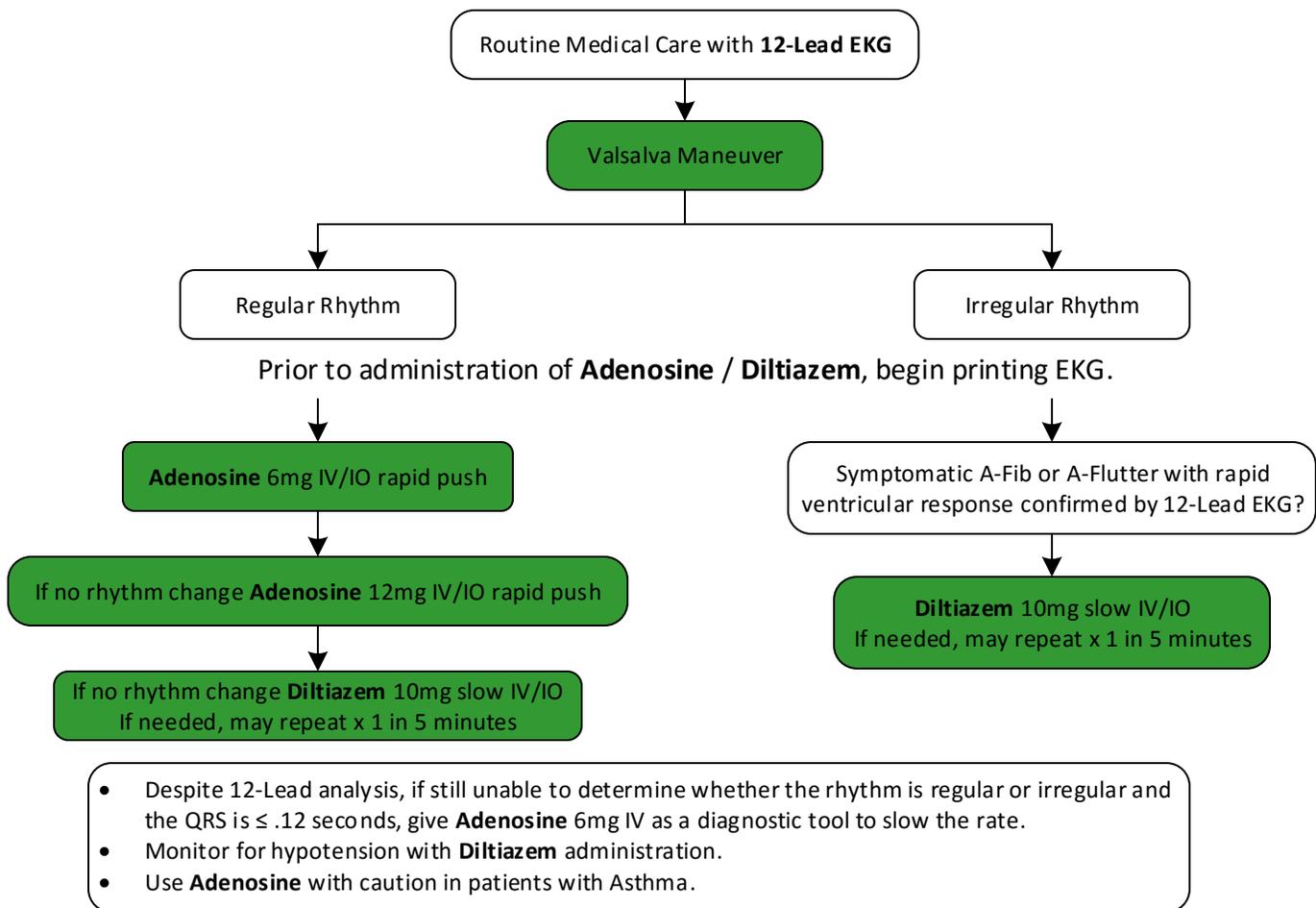
**BVM's are NOT only for apneic patients!
Positive Pressure Ventilation (PPV).**

¹ Hepatojugular reflux indicates right sided heart failure. With the patient sitting at a 30° angle, lightly palpate the abdomen over the liver. If the jugular veins rise ≈ 4cm = positive reflux.

- Consider myocardial infarction as a cause of pulmonary edema – transport to a facility with a cardiac catheterization lab.
- In the elderly and recently institutionalized patients consider pneumonia.
- Avoid NTG in patients that have taken Viagra or Levitra in the past 24 hours, or Cialis in the past 48 hours.
- Consider the use of quantitative EtCO₂ as a diagnostic tool.

Tachycardia (Narrow Complex)

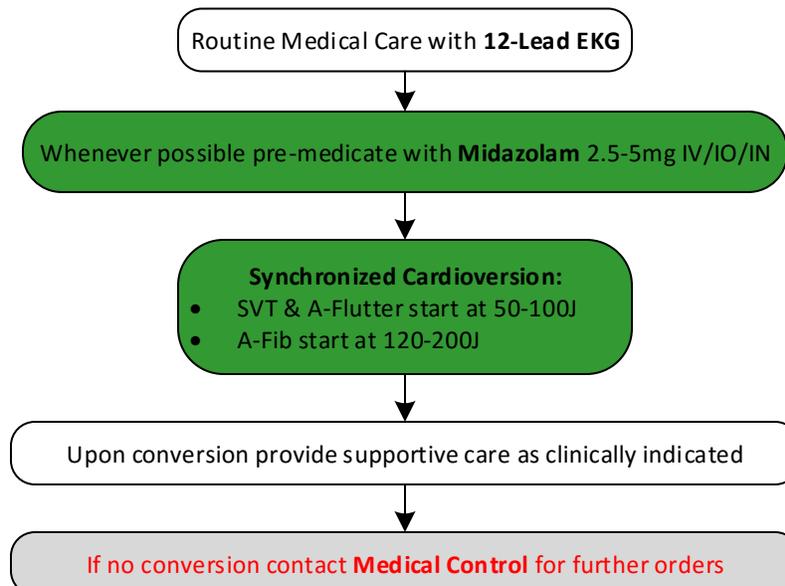
Stable Narrow Complex > 150 bpm (SVT)



Unstable Narrow Complex > 150 bpm (SVT, A-Flutter / Fib)

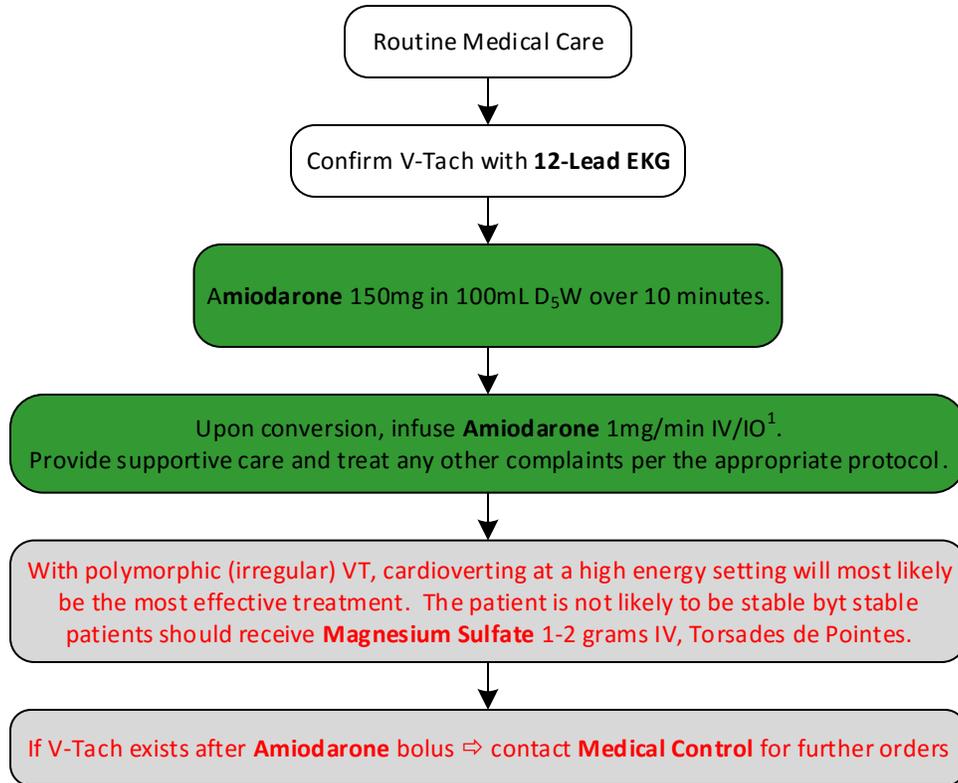
Unstable is recognized as altered mental status, severe hypotension and/or hypoxia

Cardioversion is rarely indicated for rates < 150 bpm



Tachycardia (Wide Complex)

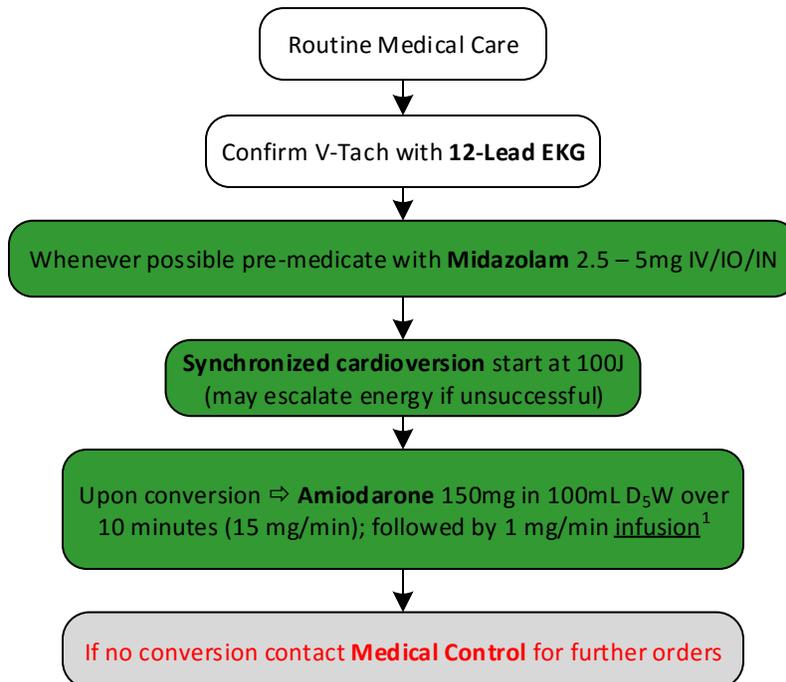
Stable Wide Complex (V-Tach) >150 bpm



Unstable Wide Complex (V-Tach) > 150 bpm

Unstable is recognized as altered mental status, severe hypotension and/or hypoxia

Cardioversion is rarely indicated for rates < 150 bpm



¹ Refer to the *Adult Protocol Preambles* for infusion information.

Ventricular Fibrillation / Tachycardia (pulseless)

Patient apneic and pulseless, begin **B.L.S.** CPR

Attach defib Pads and confirm V-Fib / V-Tach.

Defibrillate @ MAX Joules*

CPR 2 Minutes

- Establish IV/IO access

Shockable rhythm?

No

Yes

Defibrillate @ MAX Joules*

CPR 2 Minutes

- Epinephrine** 1:10,000 1mg IV/IO q 3-5 minutes.
- Insert Advanced Airway
- Initiate continuous EtCO₂

Shockable rhythm?

No

Yes

Defibrillate @ MAX Joules*

CPR 2 Minutes

- Amiodarone** 300mg IV/IO; after 4-6 minutes, second dose is 150mg IV/IO.
- Treat reversible causes

Continue 2 minute cycles of CPR with rhythm checks.

- ❖ If a pulse is present, begin post resuscitation care.
- ❖ If Asystole, go to *Asystole/P.E.A.* protocol.
- ❖ Electrical activity present? Check pulse and go to *Asystole/P.E.A.* protocol

Effective CPR performed PTA?
A.E.D. used PTA?
EMS witnessed arrest?

Highest quality CPR takes priority over any other treatment

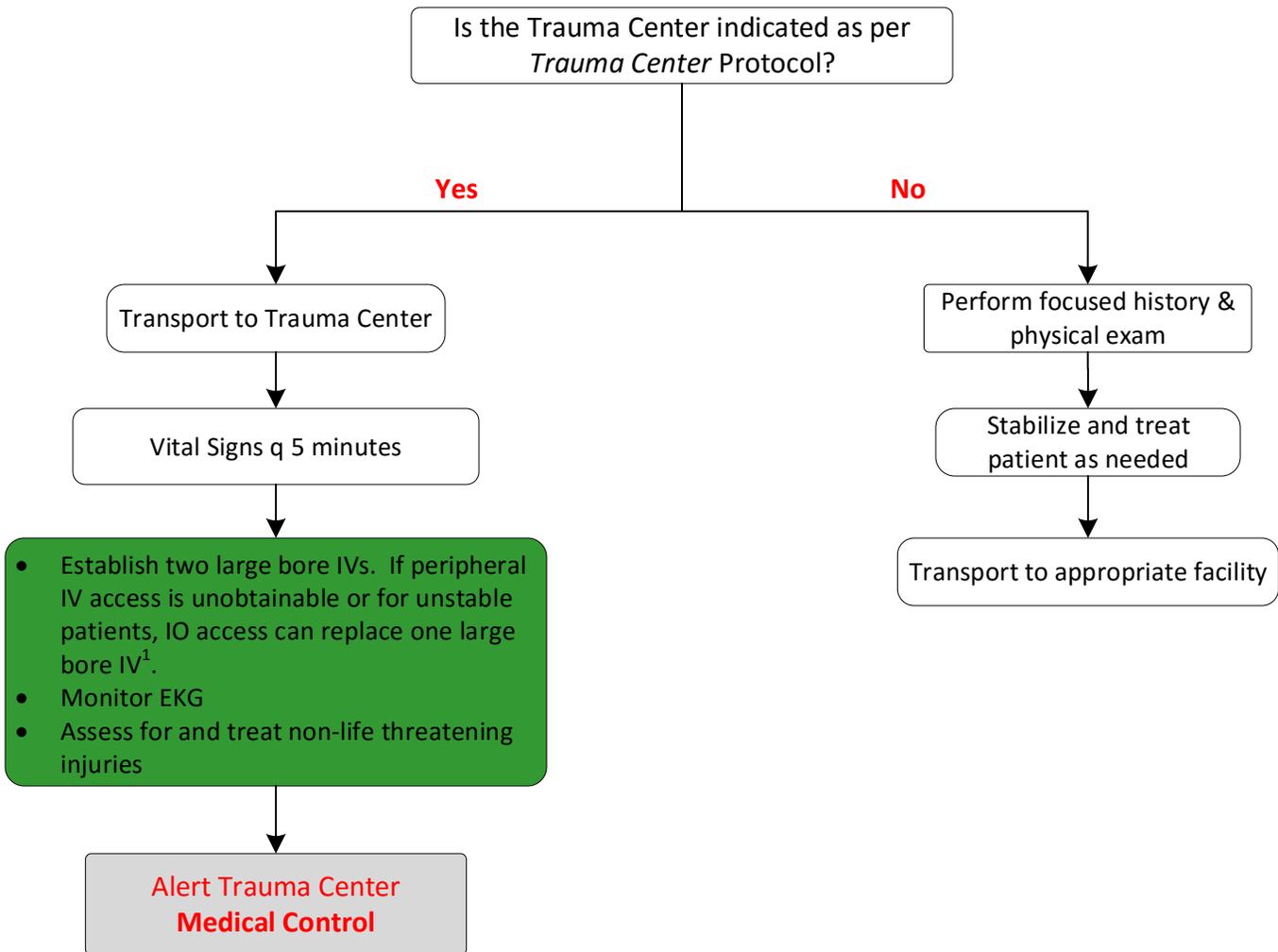
Focus on:

- ❖ Continuous compressions
- ❖ Minimize interruptions (CCF)
- ❖ Controlled ventilations
- ❖ Compress while charging
- ❖ Compress while intubating
- ❖ Compression during IV/IO
- ❖ Allow proper chest recoil
- ❖ Proper compression depth

- First line medications should be given prior to placement of any advanced airway. No longer deliver “cycles” of CPR. Give continuous chest compressions without stopping for ventilations. Ventilate 10 times/min. CPR guidelines are listed within the *Preambles*. The focus is high-quality compressions with a high (>80%) Chest Compression Fraction (CCF). Chest Compression Fraction* is simply a measurement of time spent delivering compressions versus time without compressions occurring. **Higher CCF = Higher ROSC.**
- Cardiac arrests must be worked on scene for no less than 30 minutes.
- If effective CPR is in progress upon arrival, ALS may be initiated after the first 2 minute cycle of CPR is complete.
- If acidosis (prolonged downtime) or sodium channel blocker overdose is suspected ⇒ **Sodium Bicarbonate** 1mEq/kg IV/IO
- Hyperkalemia – **Calcium Chloride** 1000mg IV/IO for suspected hyperkalemia
- If conversion occurs post **Amiodarone** administration ⇒ Infuse 1mg / minute (refer to the *Protocol Preambles* for further infusion information).
- If upon successful electrical conversion of VF / VT prior to having administered an anti-arrhythmic, give 150mg **Amiodarone** over 10 minutes. Then infuse 1mg / min (refer to *Protocol Preambles* for further information on **Amiodarone** infusions).
- **Magnesium Sulfate** 1 – 2 grams IV/IO only for Torsades de Pointes.

* Defibrillate the patient at MAX joules per the monitor manufacturer’s guidelines.

Routine Trauma Care



- Ensure scene safety & B.S.I. precautions.
- Assess the M.O.I.
- Assess ABC's and need for spinal precautions as per *Spinal Motion Restriction Protocol*
- Airway management and ventilatory assistance as needed per *Airway Management* protocol.
- Assess for and begin treating LIFE THREATENING injuries.
- If the patient is or becomes pulseless, proceed to the *Traumatic Arrest Protocol*.

Routine Trauma Care

¹Tailor all resuscitation with fluid to clinical setting and suspected etiology of hypovolemic shock

- **Uncontrolled / Internal hemorrhage** should be managed by “Balanced Resuscitation” (ATLS) ensuring that vital organs are perfused while not over fluid resuscitating the patient interfering with internal hemorrhage control. It is therefore recommended that a systolic BP of < 80mmHg, a change in mental status, or lost radial pulses be treated with 250ml incremental IV boluses while enroute to a trauma center.

- Helmets and shoulder pads are **ONLY** to be removed IF they interfere with securing an airway or the ability to perform chest compressions. Removal should be performed with the help of the onsite athletic trainers.
- Communication Center will transmit a solid tone for 3-5 seconds once scene times reach 8 minutes on appropriate calls.
- Standard of Care is an on scene time of less than 10 minutes. Make every effort possible to expedite transport to the trauma center in less than 10 minutes.
- Tension Pneumothorax – A simple pneumothorax is accompanied with decreased or absent breath sounds and is not an indication for chest decompression. **Medical Control consultation on Needle Decompression may be considered, but is not required, especially when the patient is in cardiac arrest with penetrating trauma.** The following are common signs and symptoms of Tension Pneumothorax: Deviation of trachea, tachycardia, tachypnea, J.V.D., absent breath sounds on the affected side, progressively increasing respiratory distress (harder to ventilate) and hypotension. Should clinical presentation dictate a tension pneumothorax and Medical Control is unable to be reached, proceed with the treatment.
- If a **field amputation** is needed **contact the Trauma Center** as early as possible to allow for resource mobilization.

Traumatic Cardiac Arrest

Initial management <C> ABC (but may be performed simultaneously)

- Control of external hemorrhage
- Airway Control: Bag Valve Mask , Endotracheal Intubation , Supraglottic Airway, and EtCO₂ monitoring.
- Bilateral needle thoracostomy
- Application of pelvic binder if appropriate mechanism of injury.
- ❖ External chest compressions may be delayed while treating underlying causes, including hypoxia, hypovolemia, and tension pneumothorax; however compressions should not be considered a futile measure in all cases (i.e. suspected M.I. leading to motor vehicle collision or traumatic brain injury).
- In Traumatic Brain Injury (TBI); avoid hypoxia and hypotension.
- For suspected traumatic arrest due to extremity trauma exsanguination, early application of tourniquet(s) is critical.

Burns

Routine Trauma Care

Provided the patient is no longer in contact with the burning source, treatment of life threatening injuries takes priority.

Determine the burn source and remove any clothing or jewelry that is a potential hazard

Using "The Rule of Nines," determine % of B.S.A. Burned

For critical burns¹ IV/IO LR²

SBP > 100mm/Hg & no signs of resp. distress →

- **Fentanyl** 25-50mcg IV/IO/IN/IM to MAX 200mcg
-OR-
- **Morphine Sulfate** 2-4mg IV/IO q 2 min. to MAX of 10mg

Contact **Medical Control** for additional pain control or further orders

- For minor soft tissue burns involving < 20% B.S.A., apply moist sterile dressing. All moist or wet dressings must be covered with at least a burn sheet.
- For thermal burns > 10% B.S.A. use a dry sterile dressing.

Chemical burns are uncommon but do still occur especially in the industrial settings of our region.

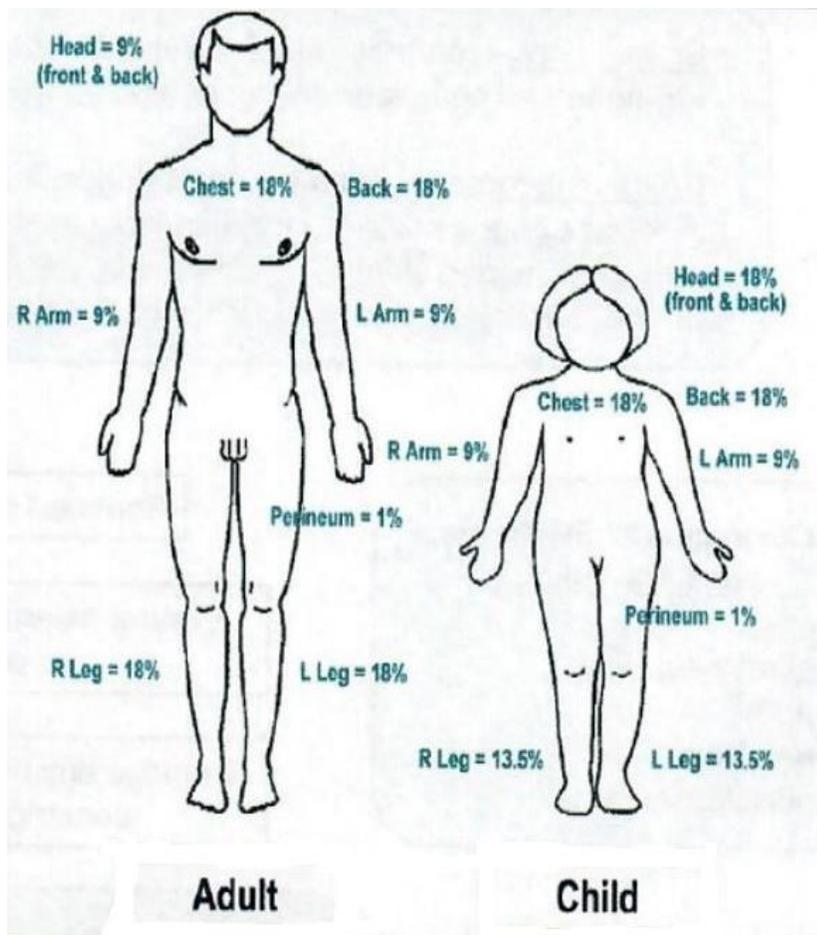
- If safety permits, remove any clothing & brush off any residue that may still be present. **REGARDLESS OF THE EXTENT OF INJURY** flush the patient with copious amounts of water for no less than 20 minutes. This will make certain the burning has stopped and aid in decontaminating the patient. Flushing should not be done in the ambulance.
- If patient care can be **SAFELY DELIVERED**, it may be done so during this time. The **SAFETY OF PREHOSPITAL PROVIDERS AND HOSPITAL STAFF TAKE PRIORITY**. Serious injury or death to the EMS crew could result from transporting improperly decontaminated patients in the confines of their ambulance. Furthermore, E.D. staff could become exposed if patients are not decontaminated prior to transport.

¹ Critical Burns > 20% Body Surface Area (B.S.A.) having any 2° and/or 3° burns; any burns to the perineum, face and/or circumferential burns.

² Fluid given in burns is done according to the Parkland Formula: 4 x patient's weight(kg) x % B.S.A. burned. 50% of that answer should be infused within the first 8 hours.

- When both arms are burned and IV access is needed, use the veins of the feet or one external jugular.

- If the incident occurs at an industrial site obtain a MSDS sheet when possible.

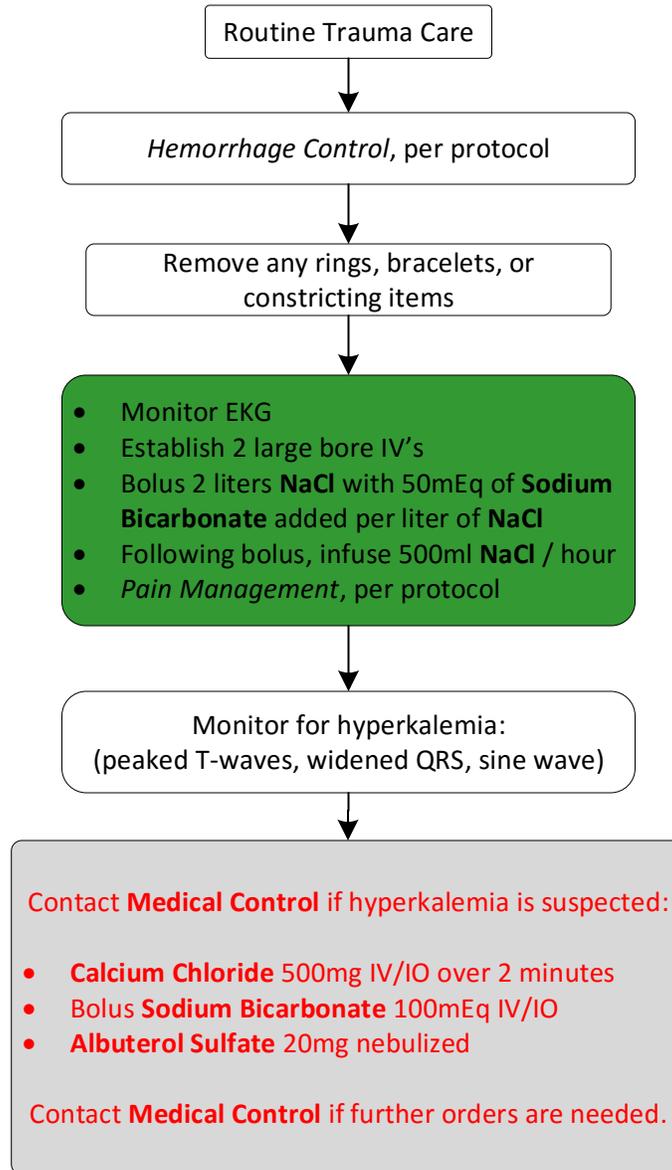


Crush Injury / Syndrome (> 2 Hours)

- **Crush Injury** – Compression of extremities or other major muscle groups causing muscle swelling and/or neurological impairment.
- **Crush Syndrome** – Systemic manifestations of crush injury due to traumatic rhabdomyolysis and the release of potentially toxic cell components and electrolytes. This may lead to lethal dysrhythmias, hyperkalemia, hypocalcemia, renal failure, local tissue injury or death. More likely with multiple crushed limbs. Crush syndrome may also lead to altered mental status and hypotension.

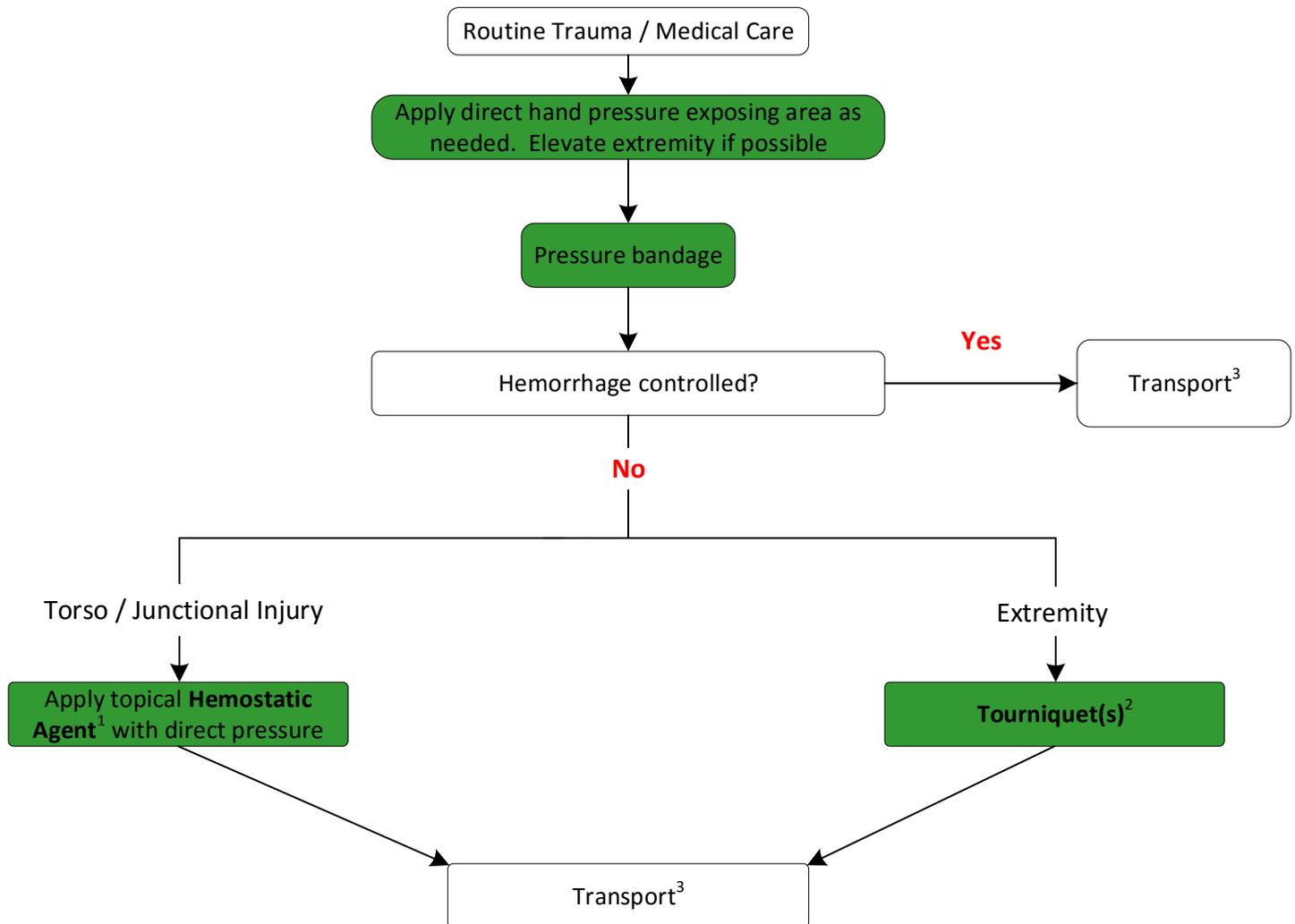
Compartment Syndrome Signs & Symptoms:

- Pain
- Paresthesia
- Pallor
- Paralysis
- Pulselessness
- Poikilothermia



- Monitor the air quality for confined space rescue.
- Monitor the patient closely during extrication.
- Large volume fluid resuscitation is critical to avoid renal failure and death.
- Do not overlook other potential injuries

Hemorrhage Control



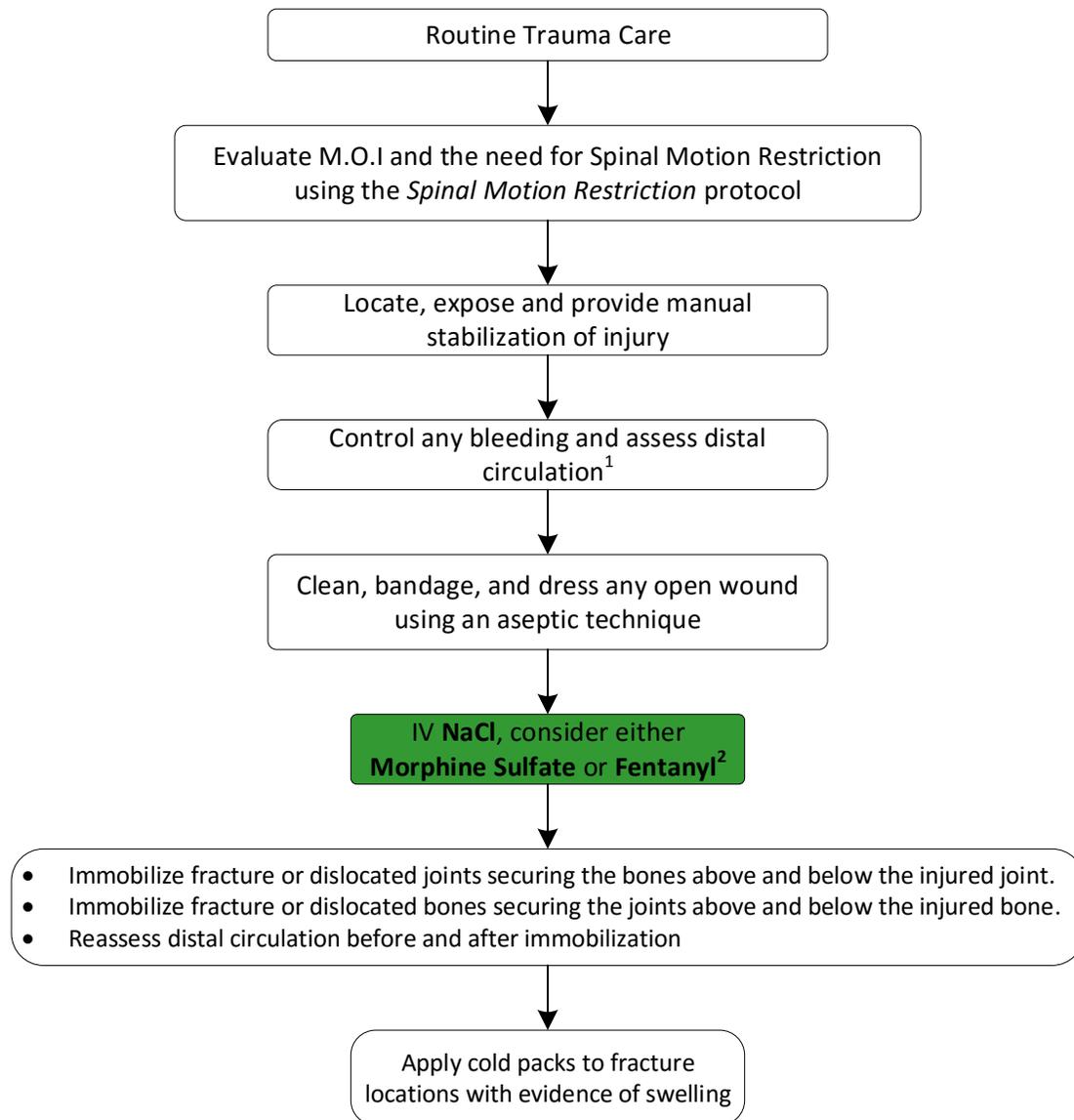
If life threatening hemorrhage, immediate use of tourniquet or topical hemostatic agent is authorized

¹ Use Hemostatic Agent per manufacturer's protocol.

² Tourniquets should be used in potentially life threatening hemorrhage when direct pressure fails to control bleeding. Apply "High and Tight" in the most accessible, proximal position. Cut away clothing prior to application so that tourniquet is visible. Mark "TK" and time of application on a piece of tape, then secure to the tourniquet. Notify receiving E.D. staff of tourniquet placement upon E.D. arrival. If hemorrhage is **not controlled** with one tourniquet, **apply a second tourniquet without overlapping the initial tourniquet**.

³ If amputation, gently wash severed part with sterile saline to remove debris. Wrap severed part in sterile gauze moistened in sterile saline and place in transport container. Place transport container on ice (if available) for transport to receiving E.D. (amputated part should not come in direct contact with ice).

Open Wound / Fracture / Dislocation



¹ If **NO** distal circulation is present (no distal pulse, no capillary refill, cyanosis) make **ONE** attempt to reposition the fracture or dislocation in hopes of restoring distal circulation.

² **Morphine Sulfate** and **Fentanyl** should be administered as indicated in the *Pain Management* protocol.

- This protocol is developed for use on stable patients with complaints of an isolated fracture or dislocation.
- Patients suspected of pelvis & femur fractures should be monitored closely for signs and symptoms related to shock.
- Never reintroduce an exposed bone (open fracture) back into the skin unless vascular compromise is present.
- For suspected hip fractures / dislocations, immobilize in the position found. Consider using the sheet papoose method of immobilization.

Pain Management (non-cardiac)

PAIN rated > level 5 is considered a distracting condition → prudent cervical spinal immobilization should be considered.

Routine Medical / Trauma Care
(including pain scale)

Use clinical judgement along with S/S to verify level of discomfort

Evaluate M.O.I., rule out the need for immobilization using the *Spinal Motion Restriction Protocol*

Administer ONE of the following:

- **Fentanyl** 25-50mcg IV/IN/IM q 2 minutes PRN to MAX of 200mcg
- OR-
- **Morphine Sulfate** 2-4mg IV q 2 minutes PRN to MAX of 10mg

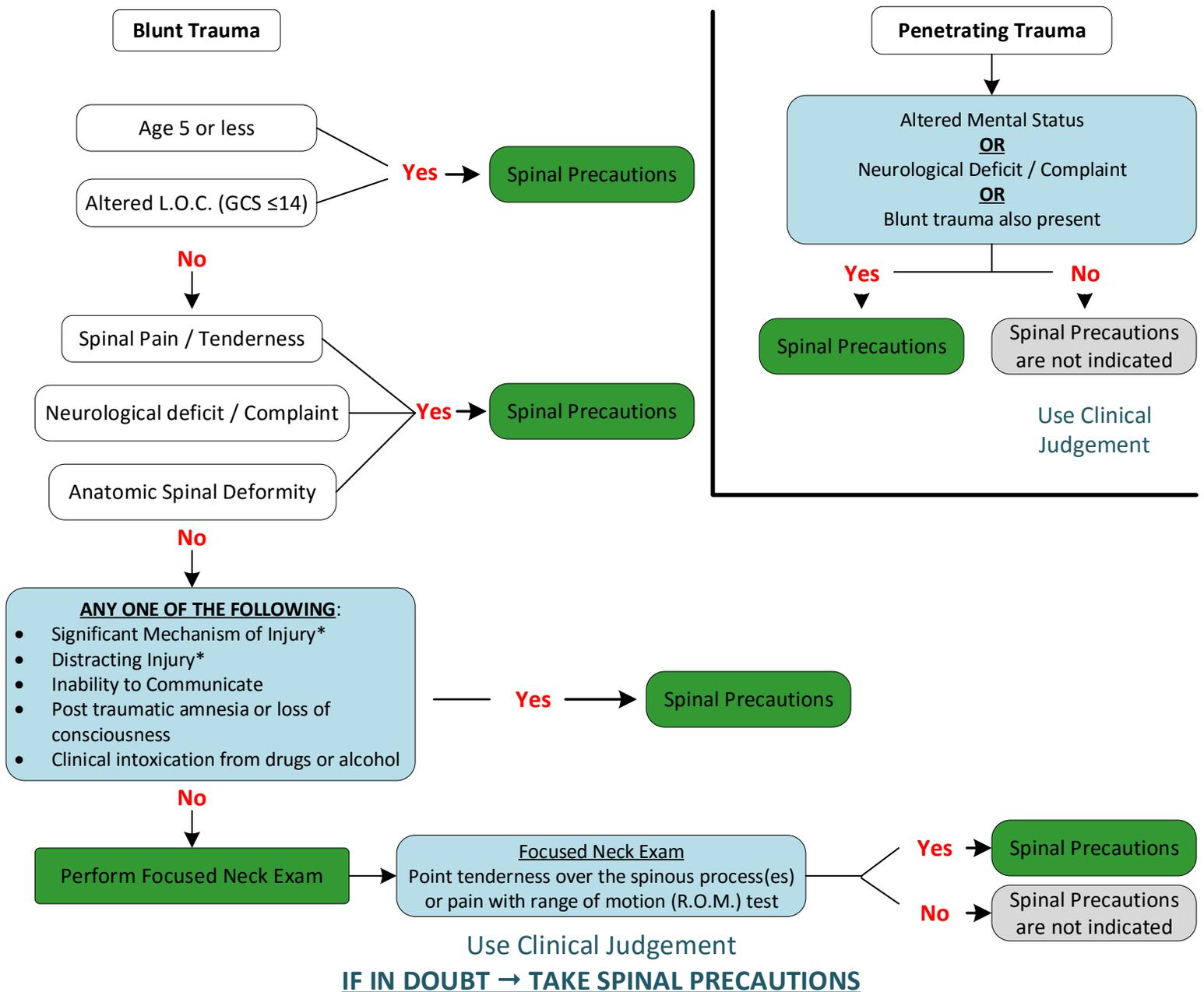
For Nausea / Vomiting related to analgesia, consider **Ondansetron** 4mg IV; may repeat an additional 4mg in 15 minutes PRN

For severe pain secondary to traumatic injury / burns that is unresponsive to narcotic administration.

- **Ketamine** 25mg IV/IO (50mg IN), may repeat x 1 in 10 minutes PRN

These patients must be transported to the E.D.

Spinal Motion Restriction



* **Distracting Injury** – any painful injury that might distract the patient from the pain of a cervical spine injury; pain > 5 is a distraction.

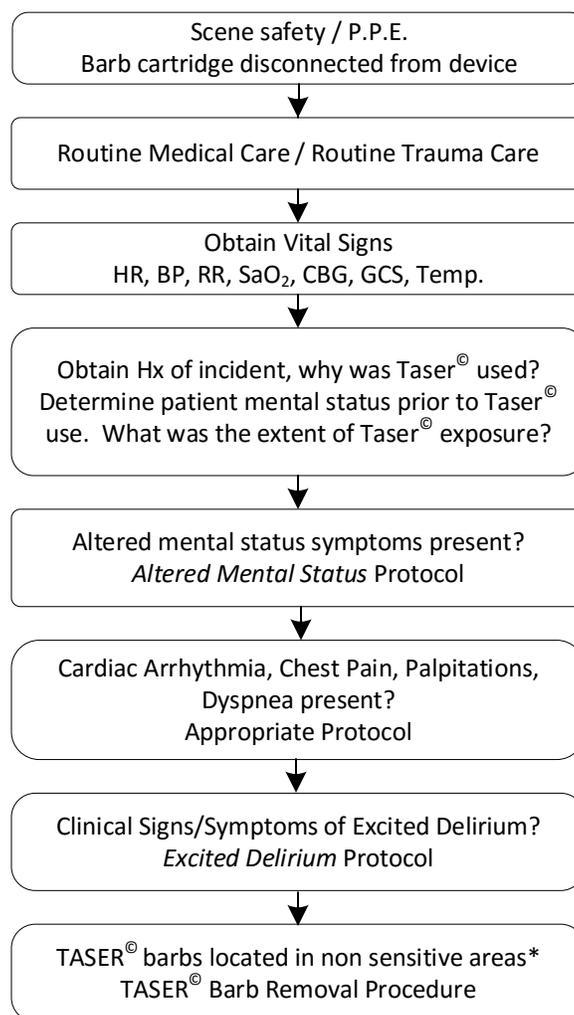
* **Significant M.O.I.** – determined by sound clinical judgement.

👉 Rule of Thumb – If you spend any length of time thinking whether or not you should take spinal precautions → then you probably should.

- Long spine boards (LSB) have both risks and benefits. They have not been shown to improve outcomes. The best use of LSBs may be for extricating an unconscious patient or providing a firm surface for chest compressions. Utilization of the LSB should follow consideration of the individual patient's risk vs. benefit, including patients with blunt trauma and distracting injury, intoxication/ altered mental status, or neurological complaint, and non-ambulatory blunt trauma patients with spinal pain, tenderness, or spinal deformity.

- **Ambulatory patients with blunt trauma but no major injuries or co-morbidities may not need to be fully immobilized – perform a focused neck exam, assessment, and use good clinical judgement. If they do not require LSB immobilization they may have a cervical collar placed and have spinal precautions taken to include ensuring minimal patient movement and being tightly secured to the stretcher, and/or manual in-line stabilization.**

TASER[®] Barb Removal



S/S Requiring Transport

- Evidence of *Excited Delirium* prior to having the Taser[®] deployed
- Persistent abnormal vital signs (HR > 115 or < 60, SBP >180mm/Hg or < 90mm/Hg)
- History or physical findings consistent with amphetamine or hallucinogenic drug use
- Cardiac history
- *Altered Mental Status* and/or *Excited Delirium*, including resistance to evaluation
- Evidence of hyperthermia
- Complaints of chest pain, shortness of breath, palpitations or headache
- Patient requests hospital transport
- ***Sensitive Areas:** Above Clavicles, Female Breast, Genitalia, Suspected Vascular Injury

- Advise patient to watch for signs of possible infection: fever, localized pain, redness, swelling, heat or purulent discharge.
- If the patient has **not** had a tetanus vaccination within the last 5 years advise patient to acquire one within 72 hours.
- If the patient is **not** being transported, make sure your **REFUSAL** documentation includes a good history of events leading up to and following the TASER[®] event as well as any/all assessments performed on patient.
- All TASER[®] probes shall be accounted for prior to removal. Removed probes should be handled as contaminated sharps and should be disposed of accordingly; however Law Enforcement may require return of probes so that the probes can be logged as evidence. **DO NOT cut wires unless authorized by Law Enforcement.**
- Complete medical documentation is required whether or not EMS transports the subject.
- If the patient requests medical treatment and transport, transport to the appropriate hospital.
- Treat all other trauma/medical conditions as per ROPE.

Trauma Center Criteria

The recognition of major trauma and the decision to be rendered by Medical Control to transport the patient to designated trauma facility will supersede patient choice without consideration of patient finances.

Anatomic Criteria

- Penetrating injuries to the head, neck torso or extremities proximal to the elbow and knee.
- Flail chest
- Two or more proximal long bone fractures
- Crushed, degloved or mangled extremity
- Amputation proximal to the wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis
- Combination of mechanism of trauma associated with burns
- Blunt abdominal injury with firm or distended abdomen or with "seatbelt sign"

Physiologic Criteria

Assess V/S & L.O.C.

- Glasgow Coma Scale < 14
- SBP < 90 mm/Hg (< 60 in peds.)
- Respiratory Rate < 10 or > 29/min or need for ventilatory support
- Respiratory Rate < 20 in infant less than 1 year or need for ventilatory support
- Revised Trauma Score < 11
- Pediatric Trauma Score < 9

Special Considerations

- SBP < 110 in adult > 65 y/o
- EMS provider judgement

Mechanism of Injury Criteria – Assess mechanism of injury and evidence of high-energy impact (TRANSPORT TO THE TRAUMA CENTER IF PATIENT MEETS ANY OF THESE CRITERIA)

- **Fall:**
 - Adults → > 20 feet (one story is equal to 10 feet)
 - Pediatric → > 10 feet or 2-3 times the height of the child
- **High Risk Auto Crash:**
 - Intrusion (including roof) → > 12 inches into occupant site; > 18 inches any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with high risk injury
- Auto vs pedestrian/bicyclist/ATV thrown, run over or with significant (> 20 mph) impact
- Motorcycle crash > 20 mph
- Head trauma on anticoagulant (exclude ASA) or history of bleeding disorder
- Blast or explosion
- High-energy electrical injury
- Hanging

Trauma Center Medical Control must be called for every trauma activation and anytime it becomes unclear whether or not a patient is a candidate for the trauma center

If the patient meets trauma criteria but has one of the below or online **Medical Control** feels it is in the patient's best interest to stop at a closer facility, **Medical Control** may direct patient transport to the closest Emergency Department for appropriate stabilization followed by expeditious transfer to the trauma center.

- Non-patent airway (can this be corrected by OPA, BVM and O₂?)
- Tension Pneumothorax
- Transport time > 50 minutes to trauma center

The patient in traumatic cardiopulmonary arrest not meeting *Adult Traumatic Prehospital Termination of Resuscitation* criteria may be transported to the closest appropriate Emergency Department for evaluation and treatment.

Traumatic Prehospital Do Not Attempt Resuscitation

Adult Traumatic Prehospital Termination of Resuscitation

If the patient meets the following criteria, **Trauma Center Medical Control** will be contacted for Traumatic DNAR.

- Age \geq 18
- Victim of blunt or penetrating trauma
- Apneic and pulseless with EKG that shows asystole or P.E.A. $<$ 40

-OR-

- Extensive traumatic injuries incompatible with life regardless of age

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Pediatric Preambles

The American Heart Association's recommended age group classifications will be adopted for use within these protocols.

- an infant is less than one year of age
- a child is one year of age to an adolescent (known by secondary sex characteristics; ≈12-14 years of age)
- adolescent is considered an adult for the purpose of treatment

Most pediatric emergencies are a result of respiratory collapse, congenital heart disease or shock. Early recognition and aggressive treatment is priority in the treatment of pediatrics. The most common cause of cardiac arrest is most often from respiratory failure or shock, known as asphyxial arrest.

PALS divides shock into 3 separate categories: compensated, inadequate end organ perfusion, and decompensated.

Compensated:

- cool extremities
- normal BP
- prolonged capillary refill
- tachycardia
- weak peripheral pulses still having central pulses

Inadequate end organ perfusion (all of the above plus...)

- decreased urine output
- depressed mental status
- metabolic acidosis
- tachypnea
- weak central pulses

Decompensated (late sign; near organ failure) both the above stages plus...

- hypotension

Vital Signs

In assessing vital signs, capillary refill, combined with another assessment tool is an adequate indicator of perfusion. The formula used to approximate blood pressure remains the same, $70 + (2 \times \text{age in years})$, and should be used for treating hypotension or shock. When fluid is needed, 20 ml/kg can be administered. This can be repeated two more times for a total of 60 ml/kg; isotonic fluids only. When treating patients for shock, a fluid bolus of 20 ml/kg (10 ml/kg for neonate) should be given even if the patient has a normal blood pressure.

Airway / Ventilation

When selecting oral airways make certain the correct size is being used. Oral airways that are too small will not keep the tongue from occluding the airway; if they are too large it can obstruct the airway. Studies show out-of-hospital use of BVM's can be as effective as, and safer than, ventilating via an ETT for short transports. As a general rule apneic patients should still be intubated. In cardiac arrest, patients tend to be over ventilated which can have paradoxical effects. Ventilating with excessive tidal volume increases intrathoracic pressure and reduces venous return, which reduces cardiac output, and can also cause barotrauma. Excessive minute volume or ventilatory rate will also decrease cerebral blood flow and coronary perfusion, thereby working against resuscitative efforts. Proper ventilation with controlled peak inspiratory pressure will also keep GI distension to a minimum, which will also reduce the risk of aspiration. Pediatric assessment tape is recommended to assist with proper tidal volumes & ventilatory rates.

If pediatric ET intubation is attempted, the size of the ETT is determined by the patient's age in years / 4 + 4 = ETT (uncuffed) size in mm; (age in years / 4 +4) -1/2 size if cuffed. It is very important that the ETT is properly sized to ensure minimal air leaking and maximal airway protection; therefore, if the tube is too small you should consider using a larger one provided it is a prudent choice to do so using sound clinical judgment. Cuffed endotracheal tubes may be used in pediatric patients.

Confirmation of ETT placement is accomplished using the same methods in adult ETT confirmation. Capnography (electronic EtCO₂ monitoring) is the "gold standard" of airway placement confirmation, monitoring, & documentation. If unable to confirm tube placement by continuous EtCO₂ measurements, or if at **ANY TIME** it is thought that the ET tube is misplaced, it should be **immediately removed and alternate means should be used to control the airway** (i.e. BVM). EtCO₂ monitors may give low readings for the first few minutes in a cardiac arrest, but as CPR increases circulation and cellular perfusion EtCO₂ values should increase in a patient with a viable downtime. The presence of any EtCO₂ value and/or waveform gives evidence of airway confirmation. **NOTE: EtCO₂ also often gives the first indicator of ROSC, as evidenced by an abrupt and sustained rise in EtCO₂.**

Suctioning is a necessary skill in airway protection, but keep in mind that it works against oxygenation efforts and can cause damage if the catheter comes in contact with tissue. Therefore, if suctioning is needed, the duration of suction efforts should be limited, and a max suction force should be between 80 and 100 mm/Hg.

Listed below are the common signs and symptoms associated with respiratory distress, failure, and arrest. This list was taken from the National Association of Emergency Medical Services Physicians. These can be referenced when assessing the respiratory status in pediatrics¹.

Respiratory distress:

- able to maintain sitting position (children older than four months)
- alert, irritable, anxious
- audible wheezing
- central cyanosis that resolves with oxygen administration
- intercostals retractions
- mild tachycardia
- nasal flaring
- neck muscle use
- respiratory rate > than normal for age
- stridor

Respiratory failure: involves the above findings with any of the following:

- central cyanosis
- decreased muscle tone
- increased respiratory effort at sternal notch
- marked tachycardia
- marked use of accessory muscles
- poor peripheral perfusion
- retractions, head bobbling, grunting
- sleepy, intermittently combative, or agitated

Respiratory arrest: involves the above findings with any of the following:

- absent breath sounds
- absent or shallow chest wall motion
- bradycardia or asystole
- limp muscle tone
- respiratory rate slower than 10 breaths per minute
- unable to maintain sitting position (> 4 yrs of age)
- unresponsive to voice or touch
- weak to absent pulses

¹ Brown K. Model Pediatric Protocols 2003 *National Association of EMS Physicians* 2003.

Chest Compressions

Focus is to be placed on immediate, effective, continuous, and minimally interrupted chest compressions in both the adult and pediatric patients. Despite the likelihood of an asphyxial origin of arrest in the pediatric patient, compressions are to be started immediately as there is virtually no set-up time. Even basic airway equipment requires some set-up time for sizing and deployment. Therefore, the first cycle of chest compressions should be initiated without delay, while allowing time (approx. 18 sec. for first cycle) for basic airway equipment set-up/sizing. This simple logic effectively changes our focus from Airway, Breathing, and Circulation (ABC's) to Circulation/Compression, Airway, and Breathing/Ventilation (CAB's).

Chest compressions should be performed at a rate of 100-120 per minute. To achieve effective chest compressions, compress at least one third of the anteroposterior diameter of the chest. This corresponds to approximately 1½ inches (about 4 cm) in most infants and about 2 inches (5 cm) in most children. Once children have reached puberty (adolescents), the recommended adult compression depth of at least 2 inches (5 cm) but no greater than 2.4 inches (6 cm) is used. Before the next compression is delivered the chest must fully recoil from the previous compression.

Continue chest compressions while the defibrillator is charging. Pause compressions just before the shock is delivered to ensure the best chance of conversion. **NOTE: The chest compression/ventilation ratio for the neonate is 3:1 to increase focus on ventilation rate, unless there is evidence of a cardiac origin where the ratio reverts back to 15:2.**

In symptomatic bradycardia, chest compressions should start when the heart rate is less than 60 beats per minute.

Vascular Access

Intraosseous access is just as effective as IV access in pediatrics. IO access should be obtained early for unstable and/or symptomatic children. Therefore, it is unacceptable to take multiple IV attempts in a critical pediatric patient. In cardiac arrests, the intraosseous (IO) access is preferred.

Medications

Adenosine	0.1 mg/kg (max 6mg) IV/IO	repeat 0.2 mg/kg (max 12mg)
Amiodarone	5 mg/kg IV/IO	repeat 15 mg/kg max 300 mg
Atropine	0.02 mg/kg IV/IO	repeat x 1 minimum dose 0.1mg Max single dose Child 0.5mg Max single dose Adolescent 1 mg
Ca Chloride	20 mg/kg IV/IO	slow IVP (not proven helpful in cardiac arrest).
Epinephrine	0.01 mg/kg (1:10,000) IV/IO	repeat q 3 – 5 minutes
Glucose	0.5-1 g/kg IV/IO	D25W : 2-4mL/kg D50W: 1-2mL/kg
Magnesium	50 mg/kg IV/IO over 10-20 min; faster in torsades	Max dose 2 g
Narcan	0.1 mg/kg IV/IO (cardiac arrest 1 - 2mg IV/IO)	
Sodium Bicarb	1 mEq/kg of 8.4 % solution IV/IO	

Defibrillator / Cardioversion Settings

Defibrillator pad placement – white pad just left of the sternum, the other (red) pad on the upper back just below the scapula.

Adult defib pads are generally used on all pediatric patients > 10 kg. However, refer to your device's guidelines.

Energy Settings

- In V-Fib / Pulseless V-Tach (no stacked shocks) the first defib is 2 J/kg; with the second shock at 4 J/kg, escalating to a maximum of 10J/kg in refractory V-fib.
- After the 2nd shock, Epi 1:10,000 0.01mg/kg q 3-5 min
- For refractory VF/VT, give Amiodarone 5 mg/kg again but give it before the next shock in sequence.

Notations and Reference

Glasgow Coma Scale

	Child	Infant	Score
Eye Opening	Spontaneous	Spontaneous	4
	To Speech	To speech	3
	To pain only	To pain only	2
	No response	No response	1
Best Verbal Response	Oriented appropriate	Coos & babbles	5
	Confused	Irritable cries	4
	Inappropriate words	Cries to pain	3
	Incomprehensible sounds	Moans to pain	2
	No response	No response	1
Best Motor Response	Obeys commands	Moves spontaneously & purposefully	6
	Localizes commands	Withdraws to touch	5
	Withdraws in response to pain	Withdraws in response to pain	4
	Flexion in response to pain	Abnormal flexion posture to pain	3
	Extension in response to pain	Abnormal extension posture to pain	2
	No response	No response	1

APGAR

An APGAR score is required at 1 and 5 minutes postpartum.

Clinical Sign	0 (zero)	1 point	2 points
Appearance	Blue or pale	Pink body with blue extremities	Completely pink
Pulse	Absent	Below 100	Over 100
Grimace	No response	Grimaces	cries
Activity	Limp	Some flexion	Active motion
Respiratory	Absent	Slow; irregular	Good, strong cry

A score of 7 – 10 is associated with coughing and crying within seconds of delivery. Newborns with this score typically do not require any further resuscitation.

A score of 4 – 6 are moderately depressed. They will typically appear pale or cyanotic and have respiratory complications and flaccid muscle tone. These newborns will require some type of resuscitation efforts.

Term Newborn Vital Signs

Heart rate 120 – 160

Respiratory rate 30 – 60

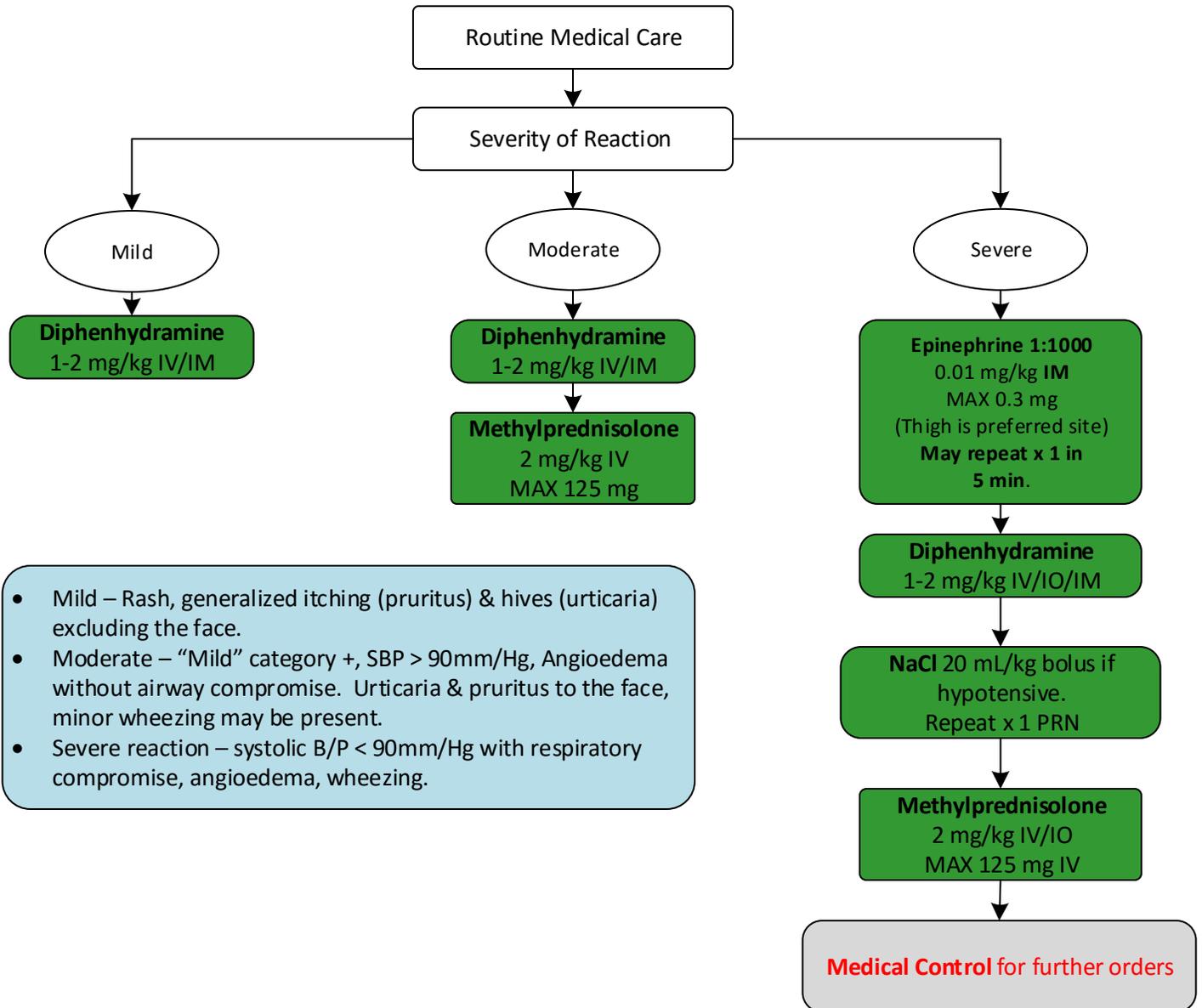
SBP 56 – 90 mm/Hg

DBP 26 – 56 mm/Hg

Glucose \geq 40 mg/dL

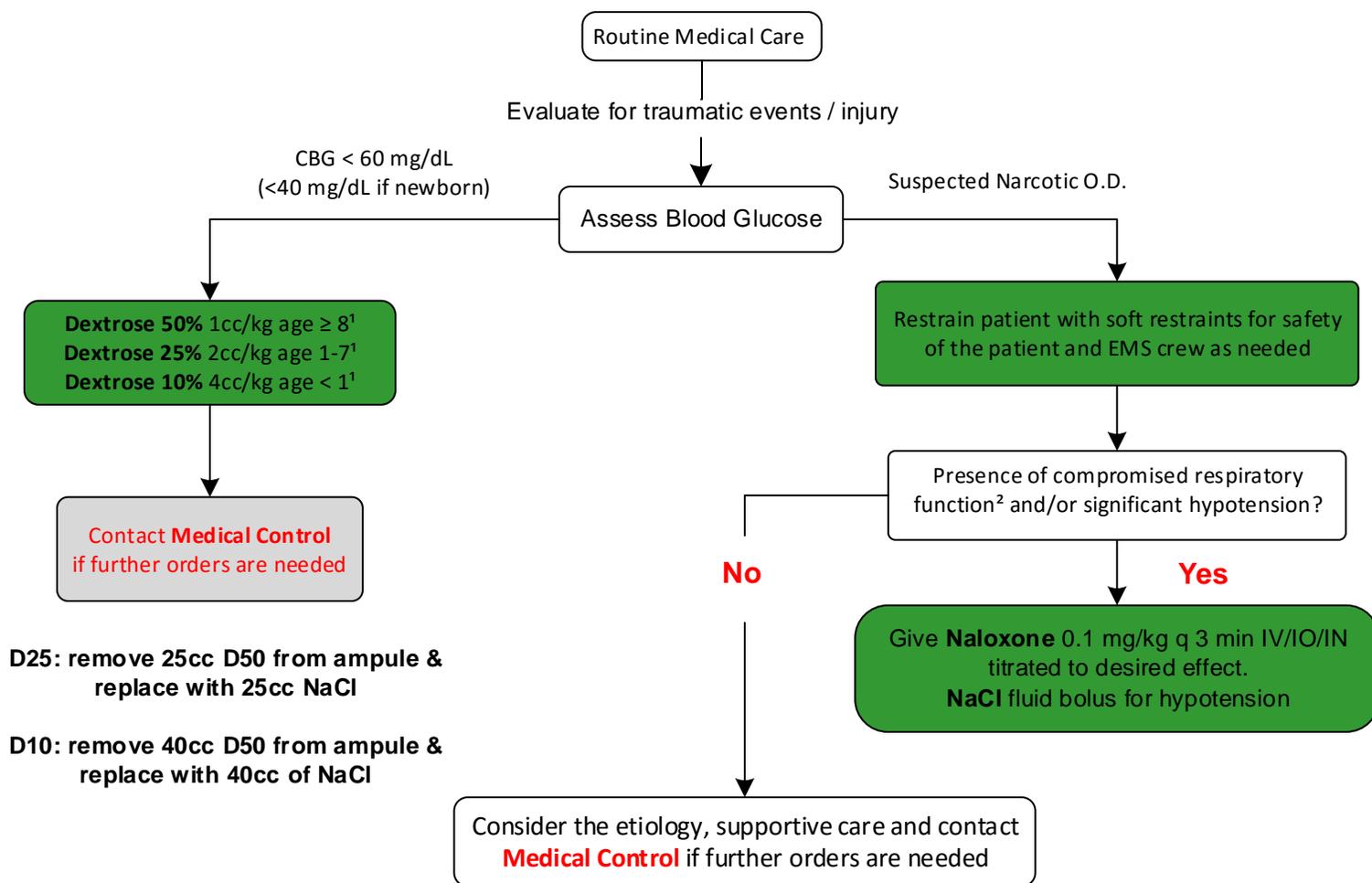
Pediatric Allergic Reaction / Anaphylaxis

Consider anaphylaxis when responses from two or more body systems (cutaneous, respiratory, cardiovascular, neurologic or GI) are noted. Cardiovascular & respiratory systems may not always be involved in anaphylaxis.



- **Epinephrine IM** should be administered prior to IV/IO access in critically ill patients. Administration to the thigh is the fastest IM site. Use either the vastus lateralis or the rectus femoris.
- Treat any wheezing or “Chest Tightness” as indicated in *Reactive Airway Disease* protocol.

Pediatric Altered Mental Status



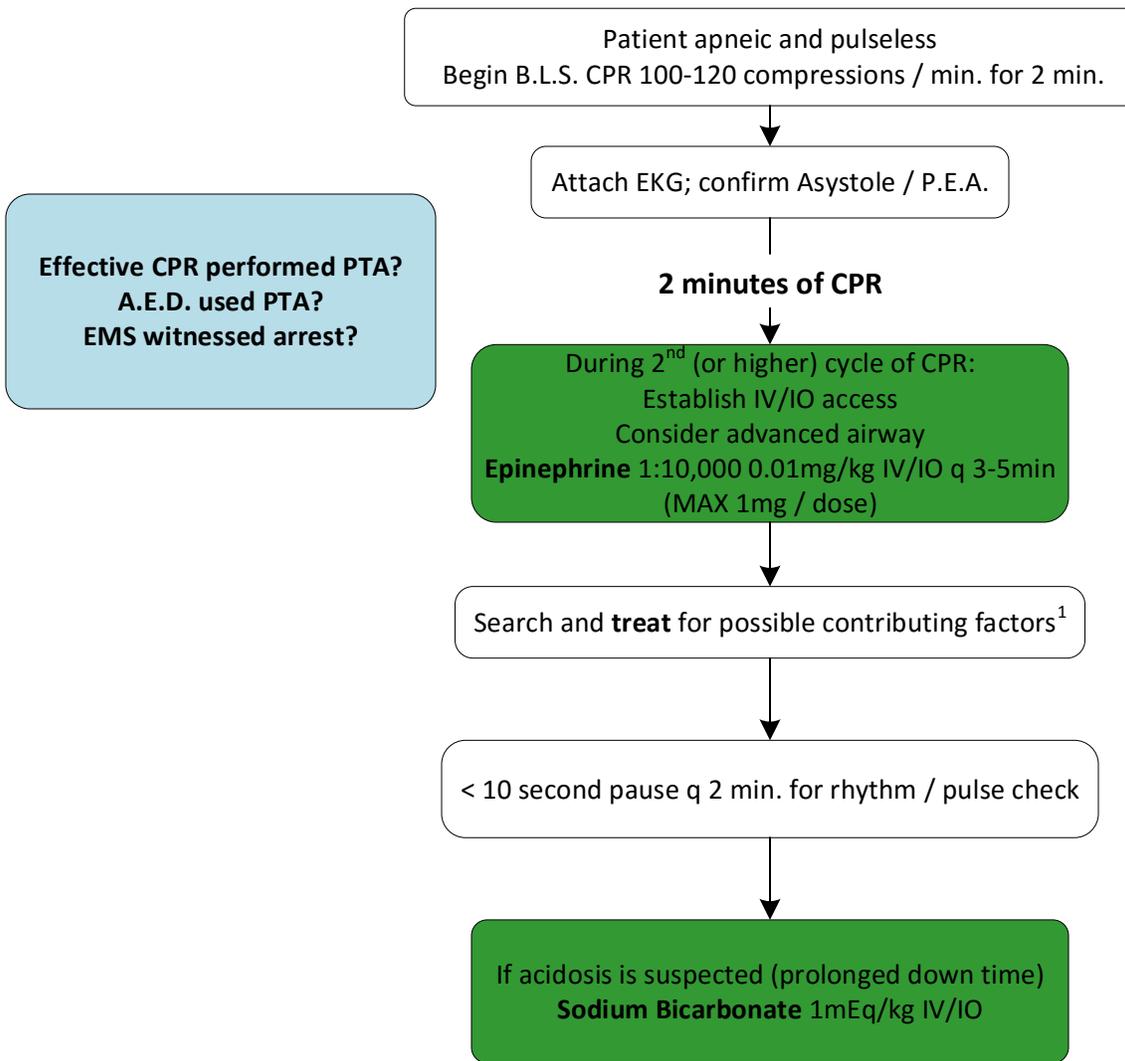
❖ Patients with traumatic injuries whose mental status remains altered following this outlined treatment should be transported to a hospital that has neurology services and a *functional CT scanner*.

¹ Providing there is no risk of aspiration or airway compromise related to the patient's mental status, oral carbohydrates along with oral glucose may be used in the place of IV/IO Dextrose. This includes the use of products found in the patient's home. Patient's with capillary glucose levels < 60 mg/dL who present with an altered mental status, or are unable to maintain their own airway, can receive IV **Dextrose** under standing order.

² SpO₂ < 94 %, shallow respiration, unable to maintain own airway, respiratory rate ≤ 10 / min and/or age appropriate symptomatic hypotension.

For known Tricyclic antidepressants (ie amitriptyline, elavil) or Phenobarbital OD (s/s include resp depression, wide QRS, focal seizures, AV blocks, vent arrhythmias), consider **Sodium Bicarbonate** 1mEq/kg IV/IO with Medical Control orders.

Pediatric Asystole / P.E.A.

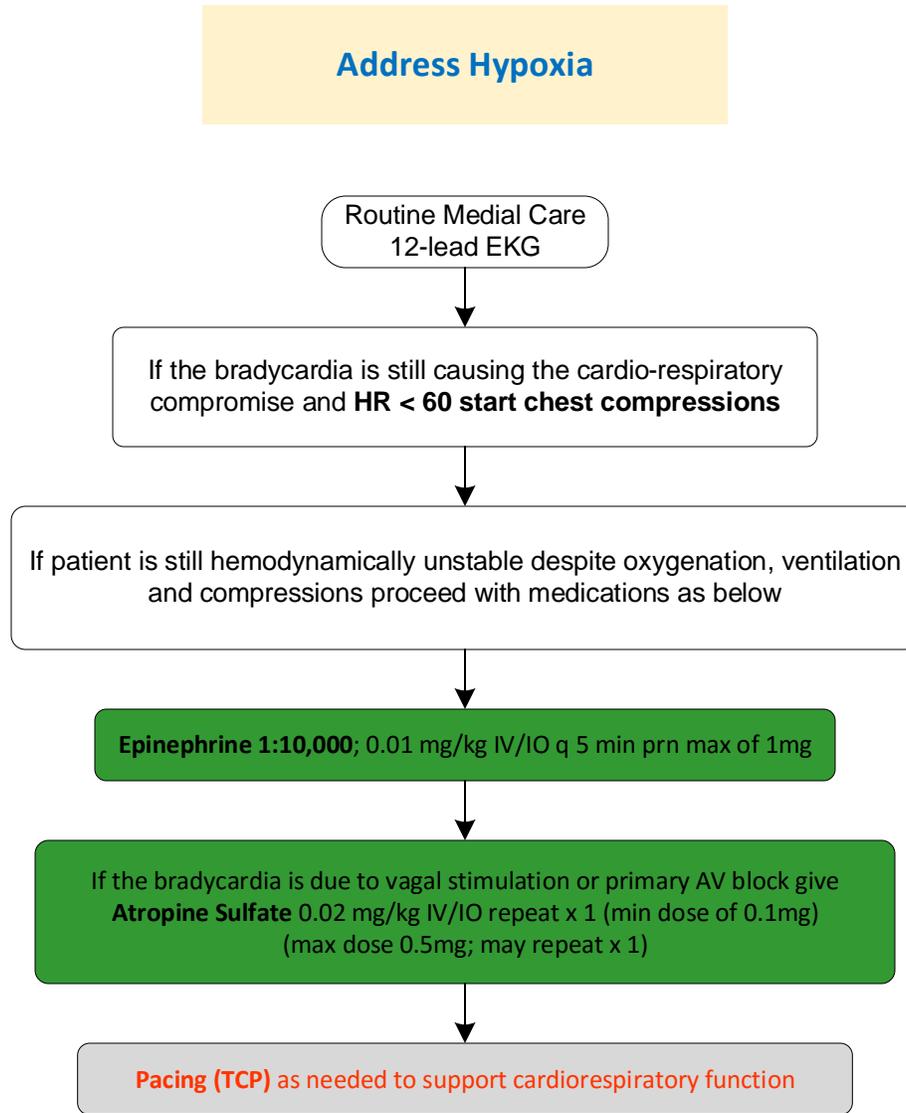


¹ Contributing factors:

- Hypoglycemia – treat with **Dextrose** 10%, 25%, or 50% (according to patient's age)
- Hyperkalemia – **Calcium Chloride** 20mg/kg IV/IO for suspected hyperkalemia
- OD - of tricyclic antidepressants **Sodium Bicarbonate** 1 mEq/kg IV/IO and/or **Naloxone** 0.1mg/kg IV for narcotic OD
- Tension Pneumothorax - **Needle Decompression**
- Hypothermia – avoid rigorous movement of patient; especially if pt regains pulse. Excessive movement could cause V-Fib or V-Tach (rare).
- Hypovolemia – **Fluid bolus** 20ml/kg repeat prn (10ml/kg neonate); max 60ml/kg
 - After advanced airway is placed (per protocol), no longer deliver “cycles” of CPR.
 - Ventilation rate is 12-20/min (10/min with advanced airway)
 - Upon arrival 2 minutes of CPR (BVM with OPA) must be completed before ANY ALS begins
 - If upon arrival effective chest compressions are being performed (100-120/min that allow time for recoil for at least 2 min) ALS can be initiated; assuming CPR does not stop. CPR guidelines are listed in the Preambles.

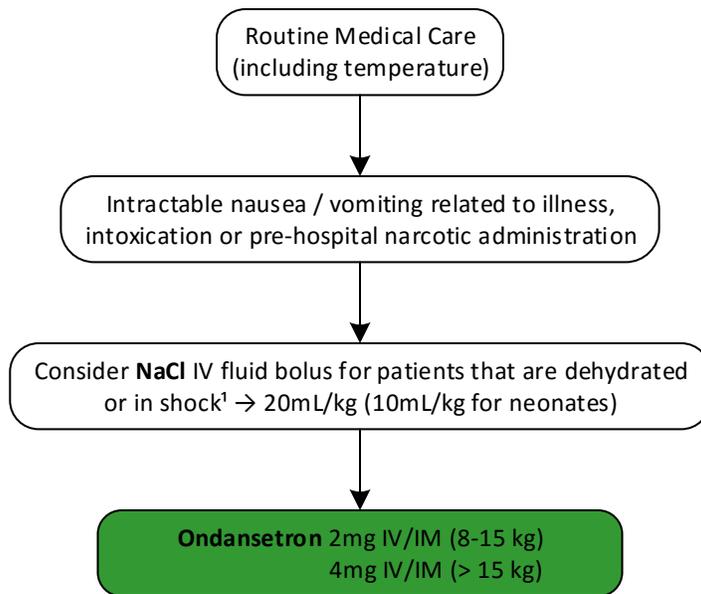
Pediatric Bradycardia

Patients with cardio-respiratory compromise related to bradycardia should be treated in this protocol. The primary determining factor guiding patient care is hemodynamic stability. Bradycardic patients who are perfusing well, and are in no respiratory compromise, usually do not require emergency treatment.



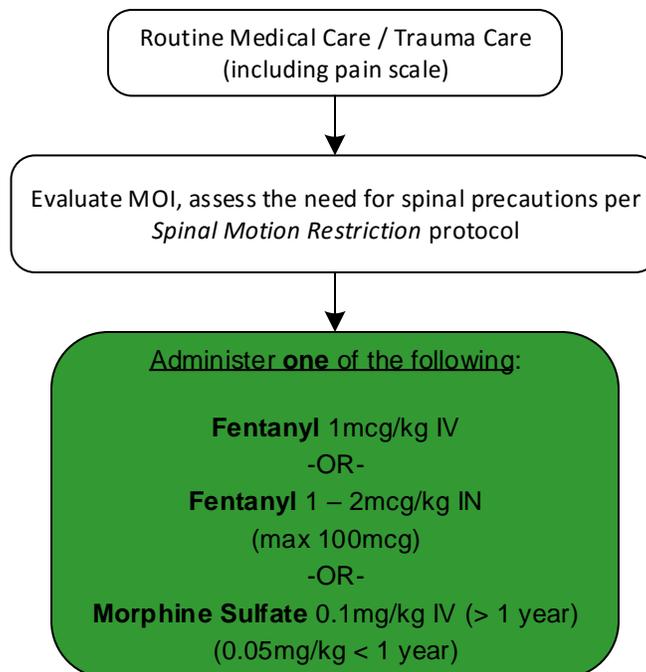
Significant bradycardia is defined in PALS as, a heart rate less than 60 bpm with poor systemic perfusion. This requires aggressive treatment as bradycardia is the most common rhythm just before cardiac arrest. Treatment needs to be geared to reversing the hypoxia and hypotension. Use caution when intubating and suctioning these patients - excessive vagal stimulation can cause further bradycardia.

Pediatric Nausea / Vomiting & Dehydration



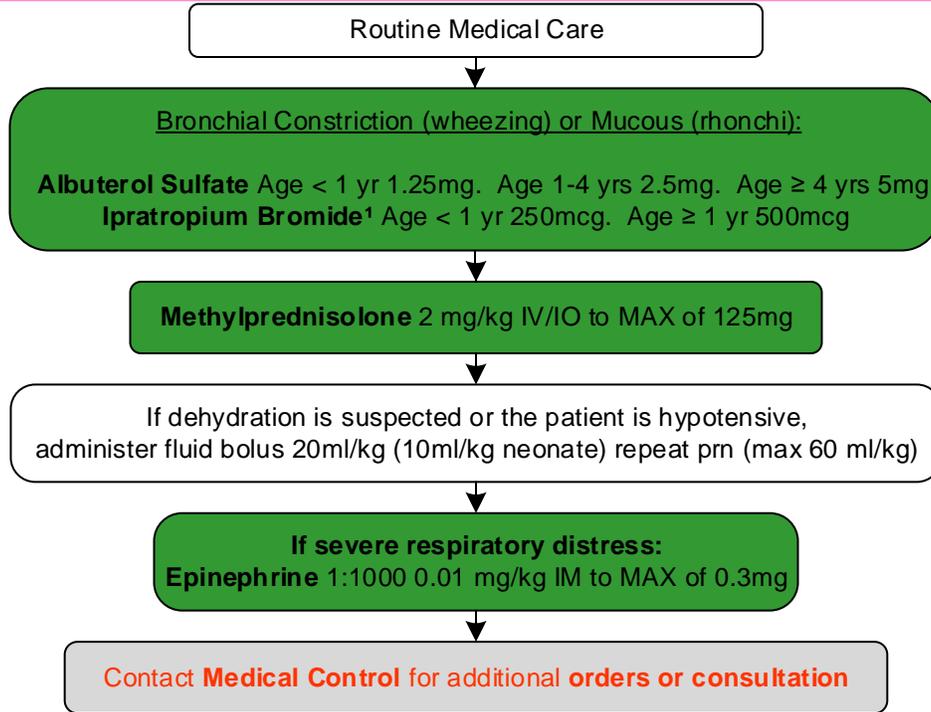
¹ Assess for signs and symptoms of dehydration: tachycardia, weak peripheral pulses, capillary refill > 2 seconds, sunken fontanel, skin turgor < 2 seconds, cool extremities, or lethargy. See *Pediatric Preambles* for further information.

Pediatric Pain Management (non-cardiac)



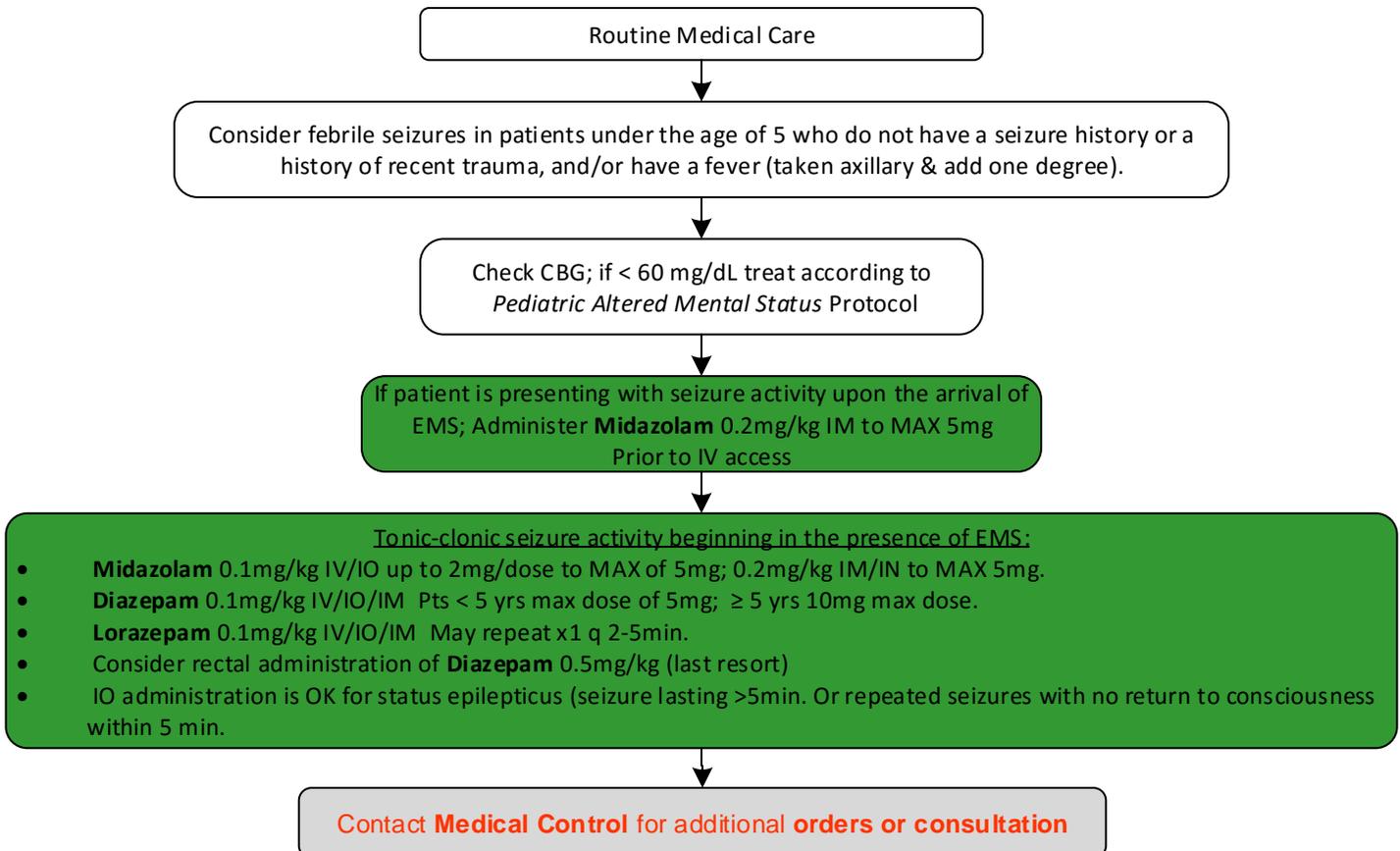
- Have **Naloxone** readily available to treat narcotic induced respiratory depression.
- Refer to Wong-Baker FACES of pain rating scale found in the *Adult Protocol Preambles*.

Pediatric Reactive Airway Disease



¹ Ipratropium Bromide is only given one time.

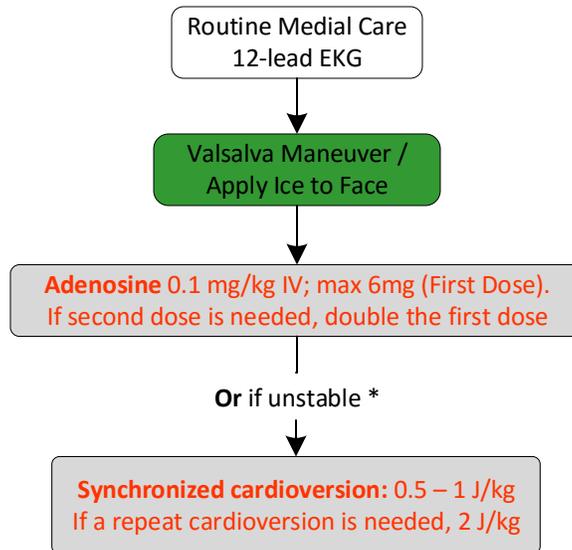
Pediatric Seizure



Febrile seizures – normally occur as result of a rapid increase in body temperature or fever. Febrile seizures occur in 2% - 3% of children between the ages of 3 months and 5 years of age. If pt has a hx of febrile seizures they often reoccur with subsequent spikes in fever.

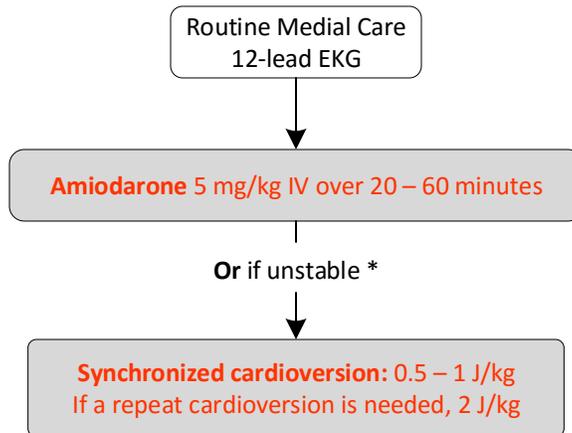
Pediatric Tachycardia

Narrow Complex Tachycardia (QRS \leq 0.08 seconds)



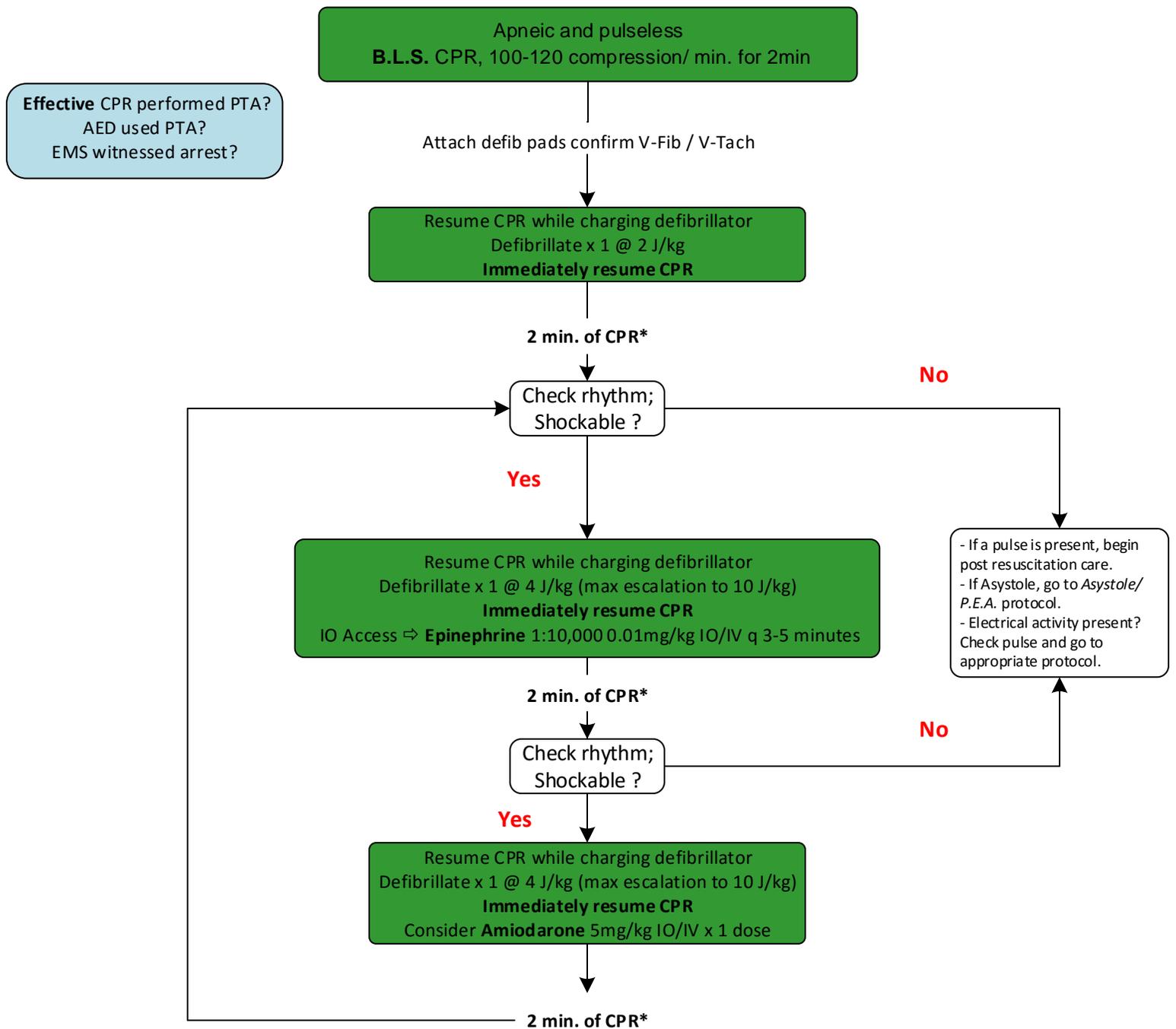
- In infants SVT is usually $> \approx 220$ bpm and usually goes undetected until the patient is critical.
- In children SVT is usually $> \approx 180$ bpm. Often complain of dizziness, chest discomfort, or become lightheaded.
- This age group will often say their heart feels as if it is racing.

Wide Complex Tachycardia (>180 bpm QRS $>$ 0.09 seconds)



- Evaluate and treat for possible contributing factors: **hypoxia**, hypovolemia, acidosis, hypo or hyperkalemia, hypoglycemia, hypothermia, toxins, cardiac tamponade, tension pneumothorax, thrombosis, trauma.
- Unstable is defined as \downarrow BP, Δ mental status, \downarrow SpO₂, \uparrow capillary refill
- **For Torsades (polymorphic VT) contact Med Control for Mag Sulfate 50% 50 mg/kg IV/IO over 20min to MAX of 2gm**

Pediatric Ventricular Fibrillation / Tachycardia (pulseless)



- *Focus on providing **continuous chest compressions with minimal interruptions** regardless of the type of airway in place. Pause for < 10 sec every 2 min to verify rhythm / pulse. Ventilate ≈ 12-20 / min (10/min with advanced airway).
- Upon arrival, 5 cycles (2 min) of CPR (BVM with OPA) must be completed before ANY ALS begins
 - If upon arrival effective chest compressions are being performed (100-120/min that allow time for recoil for at least 2 min) ALS can be initiated; assuming CPR does not stop.
 - If acidosis is suspected (prolonged down time), **Sodium Bicarbonate** 1mEq/kg IO/IV.
 - Amiodarone is the antiarrhythmic of choice. Amiodarone should only be given once.
 - CPR guidelines are listed in the *Pediatric Preambles*.
 - If **Torsades** (polymorphic VT) - **Magnesium Sulfate** 50 mg/kg IO/IV over 20 min to MAX of 2 gm.

Neonatal Resuscitation

Three Question Rapid Assessment

1. Was the baby born following a full-term gestation?
2. Presence of good muscle tone?
3. Baby breathing or crying?

Term Newborn Vital Signs

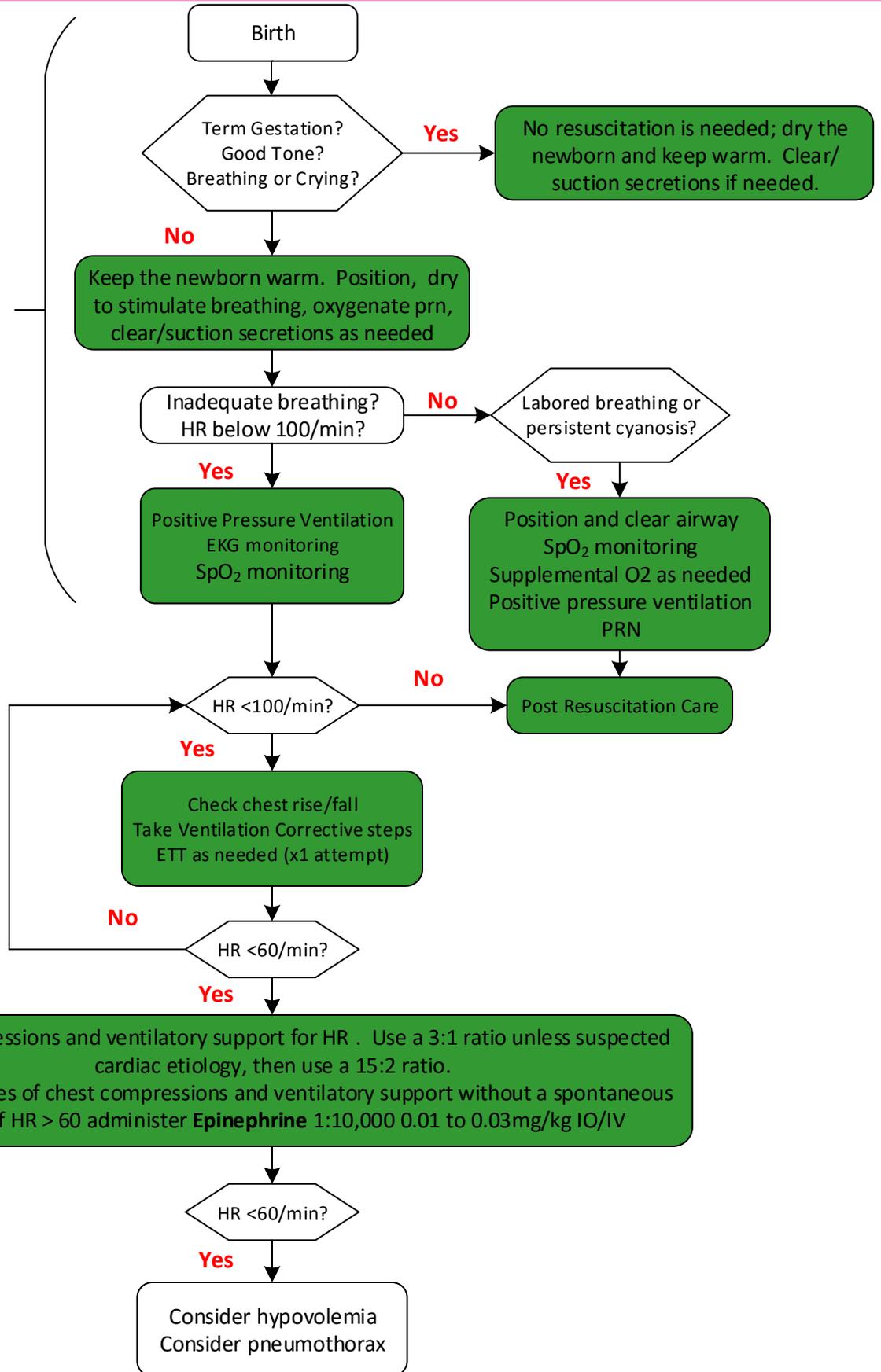
Heart rate 120 – 160
 Respiratory rate 30 – 60
 SBP 56 – 90 mm/Hg
 DBP 26 – 56 mm/Hg
 Glucose \geq 40 mg/dL

APGAR score at 1 and 5 minutes postpartum

Targeted Preductal SpO₂ After Birth

1 min 60-65%
 2 min 65-70%
 3 min 70-75%
 4 min 75-80%
 5 min 80-85%
 10 min 85-95%

1 minute



- Routine intubation for tracheal suction with presence of meconium-stained amniotic fluid is no longer suggested.

General HAZMAT Treatment Protocol

Possible HAZMAT threat identified

Scene Safety

- Stay/Move upwind and uphill of all hazards
- Communicate with dispatch to notify HAZMAT team, if not already on scene
- Identify a safe route to the scene and staging area

*If possible confirm the following information and notify dispatch (Use binoculars to maintain a safe distance).

1. Location of Incident
2. Chemical(s) involved
3. Amount & state of chemical(s)
4. Number of victims (Consider activation of MCI Plan)
5. Wind direction and speed

Once HAZMAT team has determined the chemical(s) involved confirm level of PPE required for EMS

***Only trained and department approved personnel should enter into warm zones.**

Any patient that has made contact with a hazardous material and/or showing signs or symptoms MUST be immediately decontaminated by your local HAZMAT team prior to EMS medical triage, treatment and transport.

Once a patient has been decontaminated:

- Utilize START triage and place patient into appropriate priority group
- Treat patients according to hazard, level of exposure and signs and symptoms as well as within ROPE Guidelines

Prior to being placed on the stretcher the patient:

- The patient will be wrapped in a sheet to prevent hypothermia and limit secondary contamination. The patient's head should remain exposed to maintain airway, breathing and circulation.

Prior to patient being placed into the ambulance, consider:

- The window between the patient and driving compartments may be sealed using plastic and secured with tape
- The patient compartment may be ventilated and temperature set to prevent hypothermia

Prior to transport:

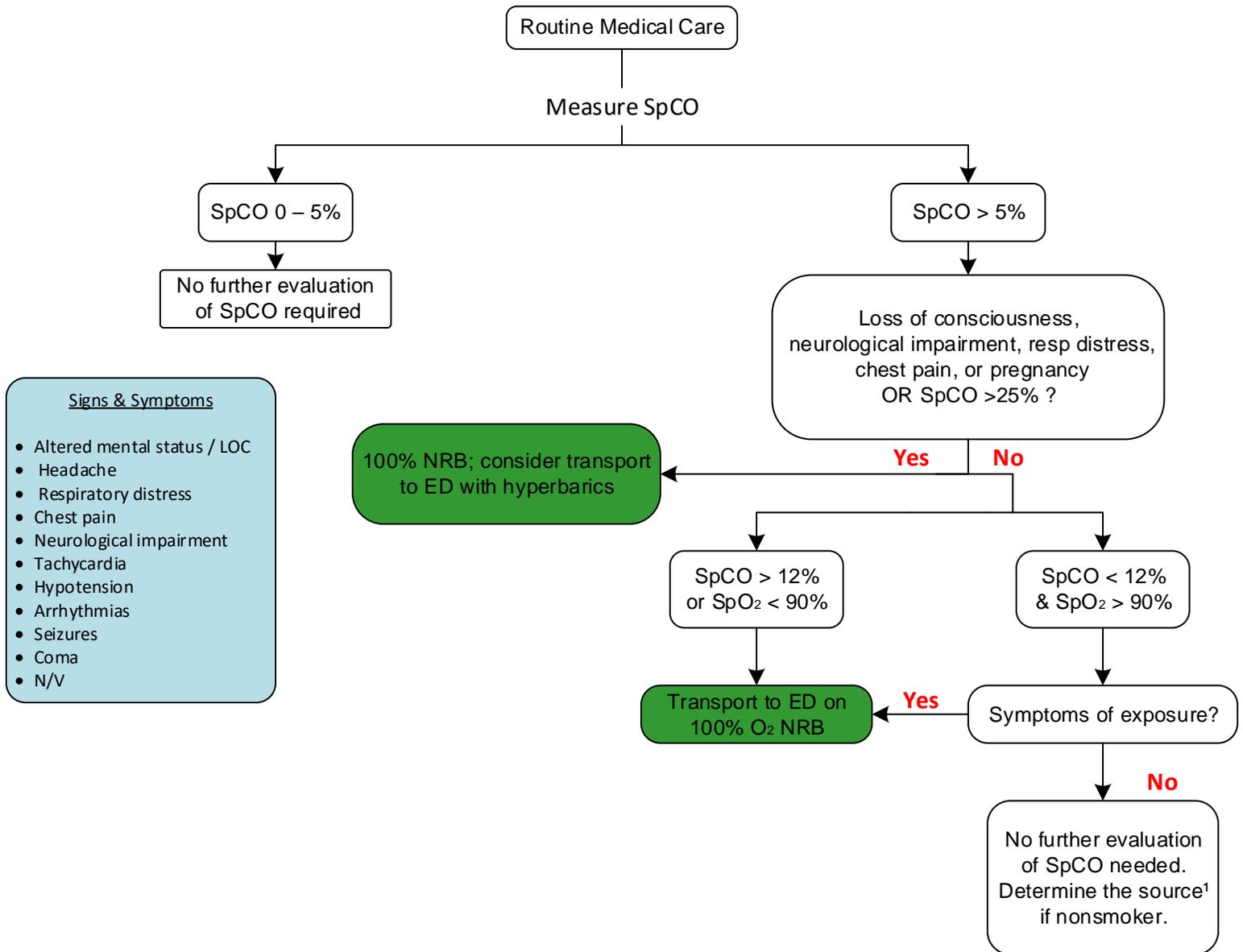
- Contact hospitals to determine decontamination capabilities and ability to receive patients

General HAZMAT Treatment Protocol Notes

- Assume that all patients are potentially contaminated and use appropriate PPE and patient packaging techniques to prevent the transmission of contaminants.
- The primary role of EMS is medical triage, treatment and transport of patients affected by a hazardous material and responder rehabilitation.

Removing clothing and gross decontaminating a patient with water can remove as much as 80% of the contaminants, most remaining contaminants are found in the patient's hair. It is important to remove the patient from the source and limit exposure; treatment and antidotes will not be effective while the patient is exposed to the hazard.

Carbon Monoxide Exposure



- Signs & Symptoms
- Altered mental status / LOC
 - Headache
 - Respiratory distress
 - Chest pain
 - Neurological impairment
 - Tachycardia
 - Hypotension
 - Arrhythmias
 - Seizures
 - Coma
 - N/V

¹ Chronic co-exposure is clinically significant; recommend smoking cessation treatment for smokers.

- Fetal hemoglobin has a much higher affinity for CO than maternal hemoglobin. All females with known or suspected pregnancy should be advised that EMS measured SpCO levels reflect adult levels and fetal COHb could be much higher. Recommend E.D. evaluation for any CO exposed pregnant female.
- The absence or low levels of COHb is not a reliable predictor of firefighter or victim exposure to other toxic fire byproducts.
- Subtle neurological findings may rapidly improve on 100% NRB but still require E.D. evaluation.
- The differential diagnosis for co-exposure is extensive; consider other causes. Other causes include but are not limited to:
 - toxic fire byproducts
 - acute cardiac event
 - acute neurological event
 - acute intoxication
 - flu-like illness
 - headache of non-toxic origin

Cyanide Exposure

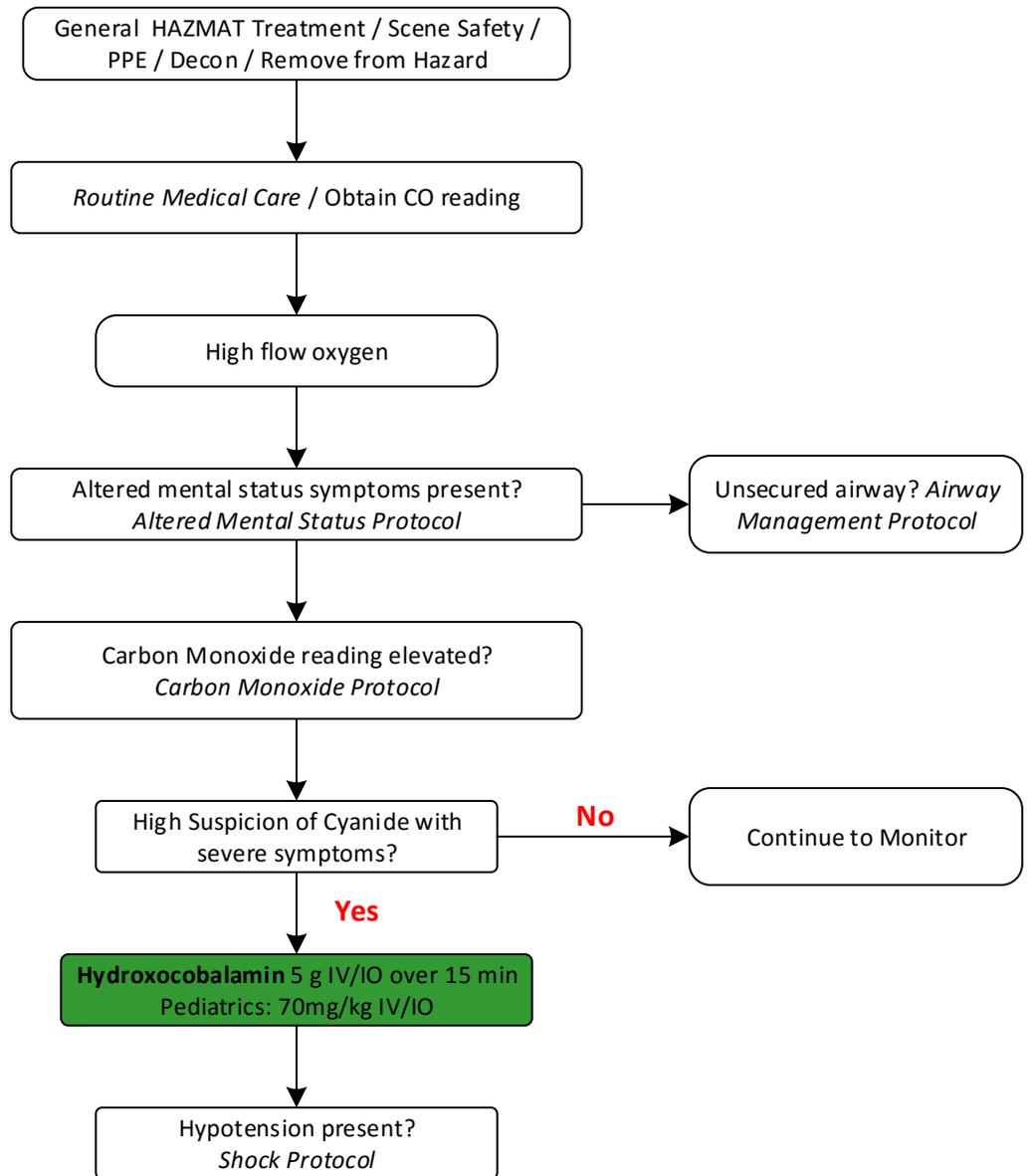
Consider treatment for any patient with altered mental status or unresponsive after smoke inhalation/fire or after known exposure to cyanide compound

Signs and Symptoms

- “Cherry Red” skin
- Malaise, flu like illness
- Dizziness
- Syncope
- Chest pain
- Dyspnea
- Nausea/Vomiting
- Tachycardia
- Headache

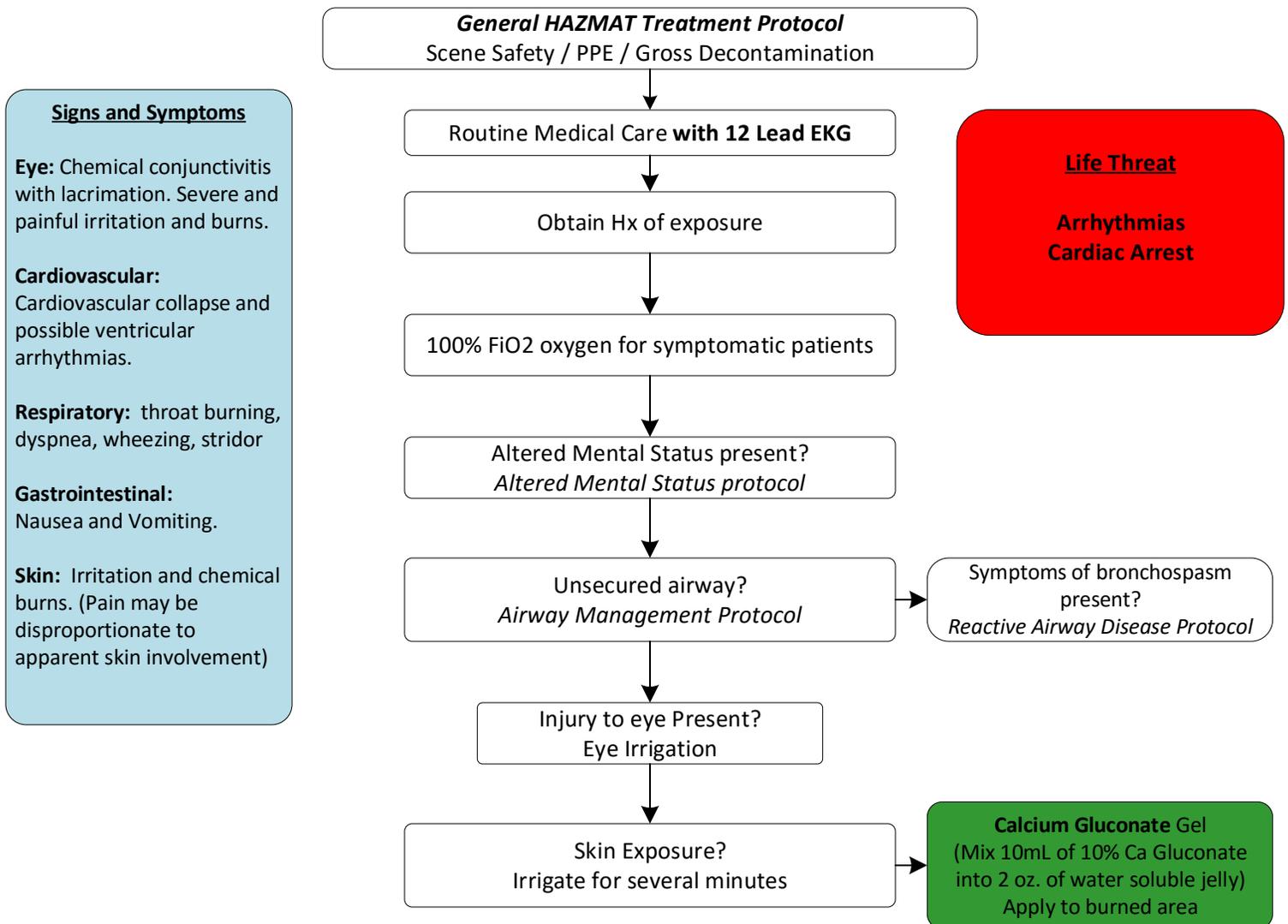
Severe:

- Cardiac Arrest
- Seizures
- Altered Mental Status



- Consider CO and CN poisoning with any product of combustion
- **Begin CPR immediately if cardiac arrest**
- Continue High Flow Oxygen regardless of SaO₂ reading
- CO and CN poisoning affects oxygen delivery to cells, both will show elevated SaO₂ readings with cellular hypoxia
- Hydroxocobalamin treatment will cause bodily fluids to have a red-tinged color.
- Early treatment with hydroxocobalamin is crucial to survival of CN poisoning patients.
- 5 g vial of hydroxocobalamin is reconstituted with 200 cc of 0.9% sodium chloride using the supplied transfer spike. The vial should be rocked, *not shaken*, for at least 60 seconds prior to infusion.

Hydrofluoric Acid



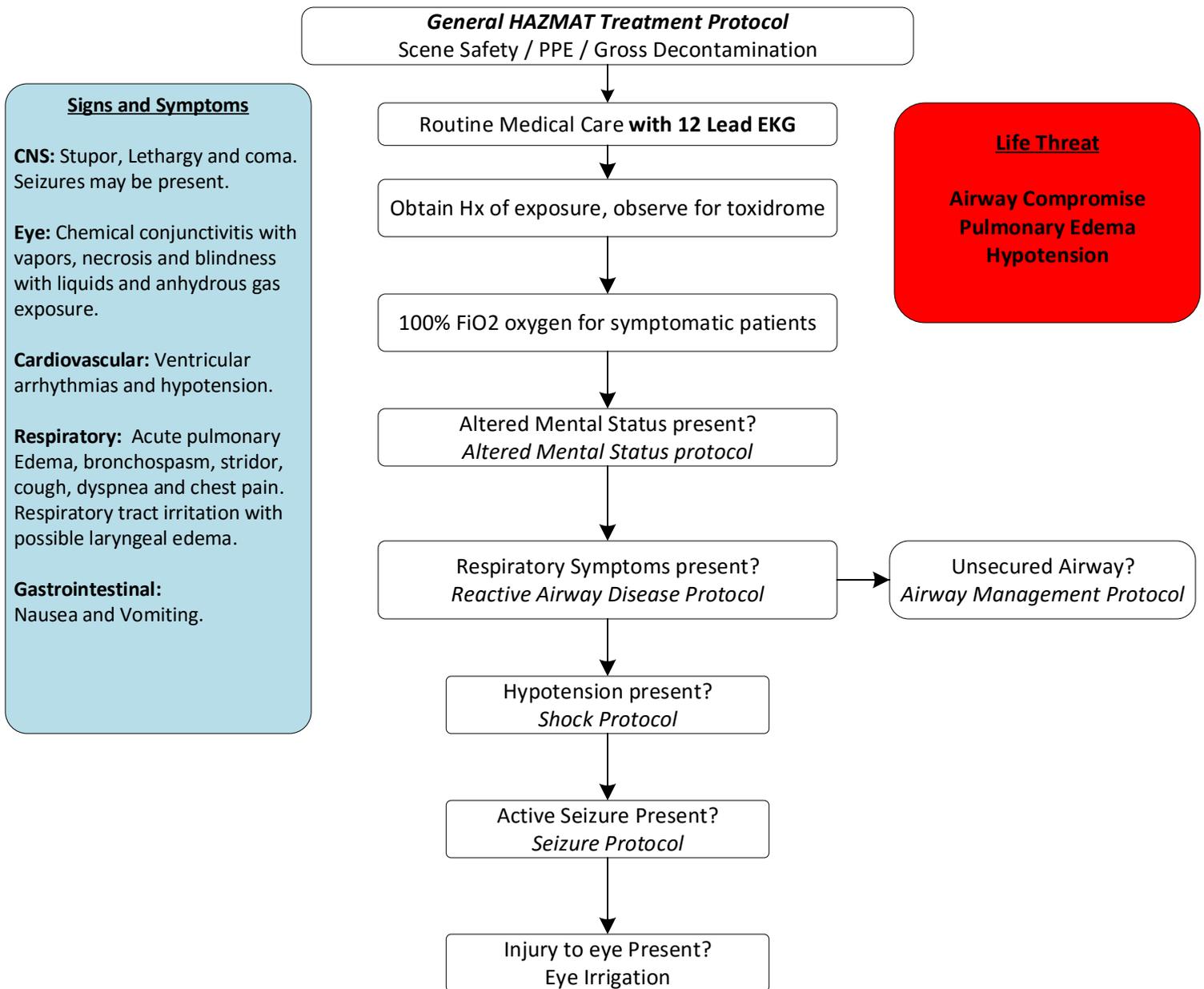
General Hazmat Treatment Protocol

Assume that all patients are potentially contaminated and use appropriate PPE and patient packaging techniques to prevent the transmission of contaminants.

Communicate to Dispatch as soon as possible.

- Name and form of chemical(s) involved.
- Amount of chemical(s).
- Route of exposure.
- Number of Patients.

Irritant Gas – Ammonia, Hydrogen Chloride, and Phosgene



General Hazmat Treatment Protocol

Assume that all patients are potentially contaminated and use appropriate PPE and patient packaging techniques to prevent the transmission of contaminants.

Communicate to Dispatch as soon as possible.

- Name and form of chemical(s) involved.
- Amount of chemical(s).
- Route of exposure.
- Number of Patients.

Phosgene exposures may have minimal initial symptoms. Patients should be transported and admitted for up to 24 hours of monitoring if exposed.

Irritant Gas – Chlorine

Signs and Symptoms

CNS: Decreased level of consciousness to coma. Headache and dizziness.

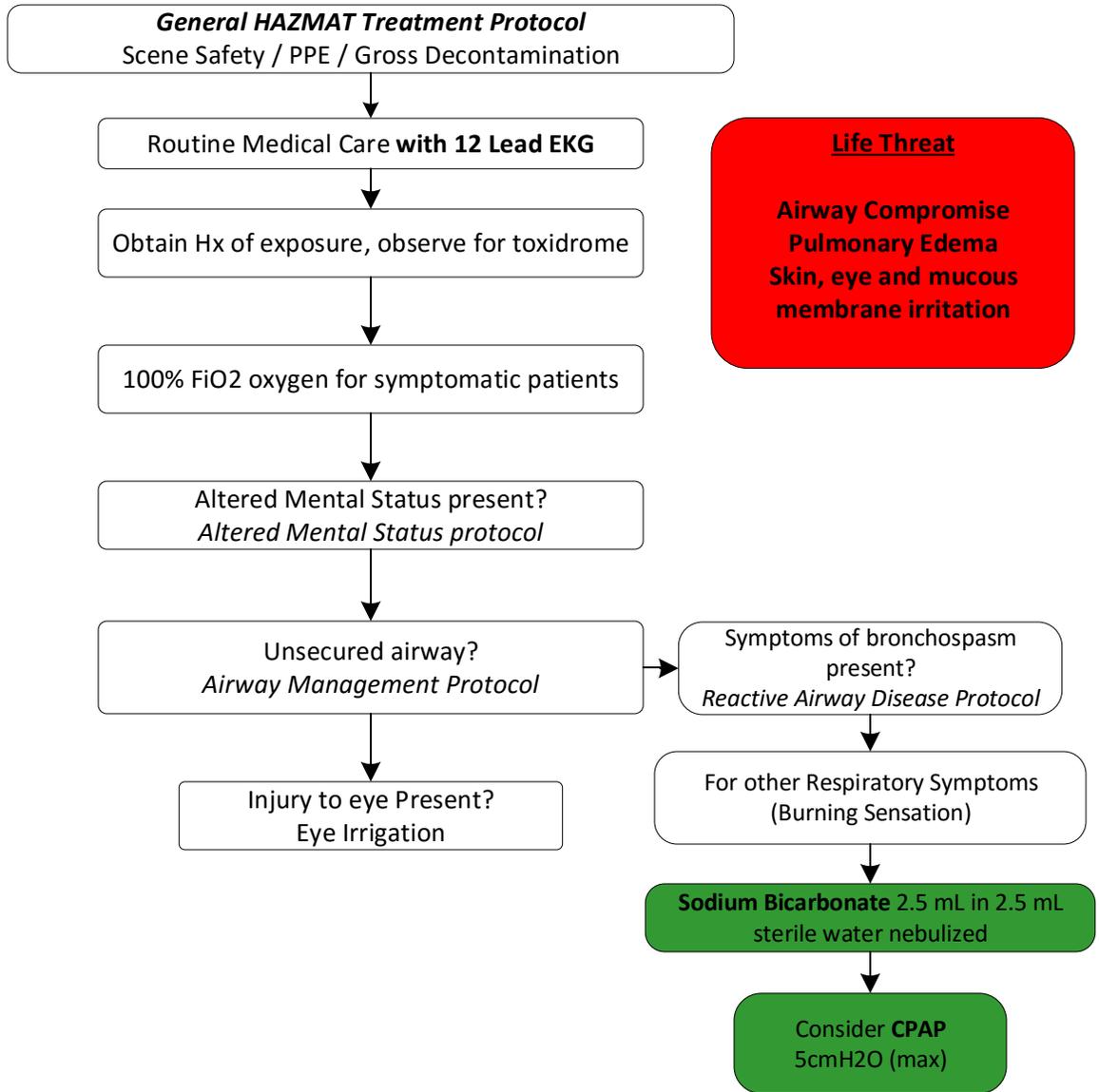
Eye: Chemical conjunctivitis with lacrimation. Severe and painful irritation and burns.

Cardiovascular: Cardiovascular collapse and possible ventricular arrhythmias.

Respiratory: Acute or delayed non cardiogenic pulmonary edema, dyspnea and tachypnea. Upper airway irritation and burns to the mucous membranes and lungs. Cough, choking or burning sensation, rhinitis, sinusitis, rhinorrhea, pneumonitis and pneumonia.

Gastrointestinal: Nausea and Vomiting.

Skin: Irritation and chemical burns. Cyanosis. Possible frostbite secondary to exposure to expanding gas.



General Hazmat Treatment Protocol

Assume that all patients are potentially contaminated and use appropriate PPE and patient packaging techniques to prevent the transmission of contaminants.

Communicate to Dispatch as soon as possible.

- Name and form of chemical(s) involved.
- Amount of chemical(s).
- Route of exposure.
- Number of Patients.

Nerve Agent / Organophosphate Poisoning

***SLUDGE**
 Salivation
 Lacrimation
 Urination
 Defecation
 Gastrointestinal
 Emesis

Scene safety / P.P.E. /
 Gross Decontamination

Routine Medical Care

Obtain Hx of exposure, observe for toxidrome
 (SLUDGE)* & START triage if indicated

MAJOR or MINOR symptoms present?

MINOR:
 Salivation, lacrimation, visual
 disturbances and / or mild wheezing

MAJOR:
 A.M.S., seizures, bradycardia,
 Respiratory distress/arrest, vomiting

Atropine Sulfate 2mg IV/IM q 5 min.
 (Peds 0.02mg/kg IV / 0.05mg/kg IM)
 Until symptoms resolve

DuoDote IM x 3 (RAPID)
 (Peds dosage, see below)

Pralidoxime 1 gram IV
 Over 30 minutes
 (Peds 15mg/kg IV)

If seizure; **Diazepam** 5-10mg IV/IM
 (Peds 0.3mg/kg IV/IM)
 Consider **Diazepam** auto-injector for adult
 dosing

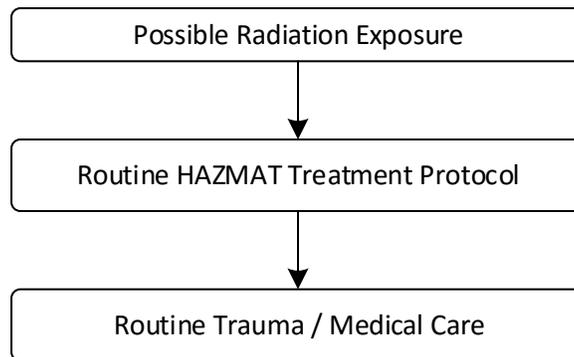
Monitor for presence of MAJOR symptoms

Atropine Sulfate 2mg IV/IM q 5 min.
 (Peds 0.02mg/kg IV / 0.05mg/kg IM)
 Until symptoms resolve

- One DuoDote = One Mark One Kit
- If MAJOR incident, notify EMS supervisor or highest ranking EMS personnel for **CHEMPACK** deployment.
- If large scale MCI, begin with 1 DuoDote if pt < 7 y/o, 2 DuoDotes if pt is 8-14 y/o and 3 DuoDotes if pt ≥ 15 y/o.
- If out of DuoDote, use pediatric **Atropens**
 Atropine 0.5mg if < 39 lbs
 Atropine 1mg if 40 – 90 lbs
 Atropine 2mg if > 90 lbs
- For patients with MAJOR symptoms, treat q 5 minutes with **Atropine** until symptoms resolve (mainly oral/respiratory secretions)
 → no max dose.
- Notify receiving E.D. of possible organophosphate poisoning prior to E.D. arrival for proper E.D. HAZMAT precautions.
- Each DuoDote contains:
 Atropine 2.1mg
 Pralidoxime 600mg

Radiation Exposure

A radiological survey conducted with specialized equipment is the only way to confirm the presence of radiation. If a terrorist event involves the use of radioactive material, both patient exposure and contamination must be assessed.



Addressing contamination issues should not delay treatment of life threatening injuries.

Exposure: Occurs when a person is near a radiation source. People exposed to a source of radiation can suffer radiation illness if their dose is high enough, but they do not become radioactive¹.

Contamination: Occurs externally when loose particles of radioactive material are deposited on surfaces, skin, or clothing. Internal contamination occurs when radioactive particles are inhaled, ingested, or lodged in an open wound¹.

Contaminated patients should be decontaminated as soon as possible, without delaying critical care. Patients that have been exposed to radiation, but are not contaminated with radioactive material, do not need to be decontaminated. It is highly unlikely that the levels of radioactivity associated with a contaminated patient would pose a significant health risk to providers¹

Standard P.P.E including surgical facemask (N95 if available), outer garment protection, and gloves should be worn by first responders if available.

Decontamination of contaminated individuals should involve brushing away of contaminants, removal of clothing, soap/water rinsing, and eye irrigation as needed¹.

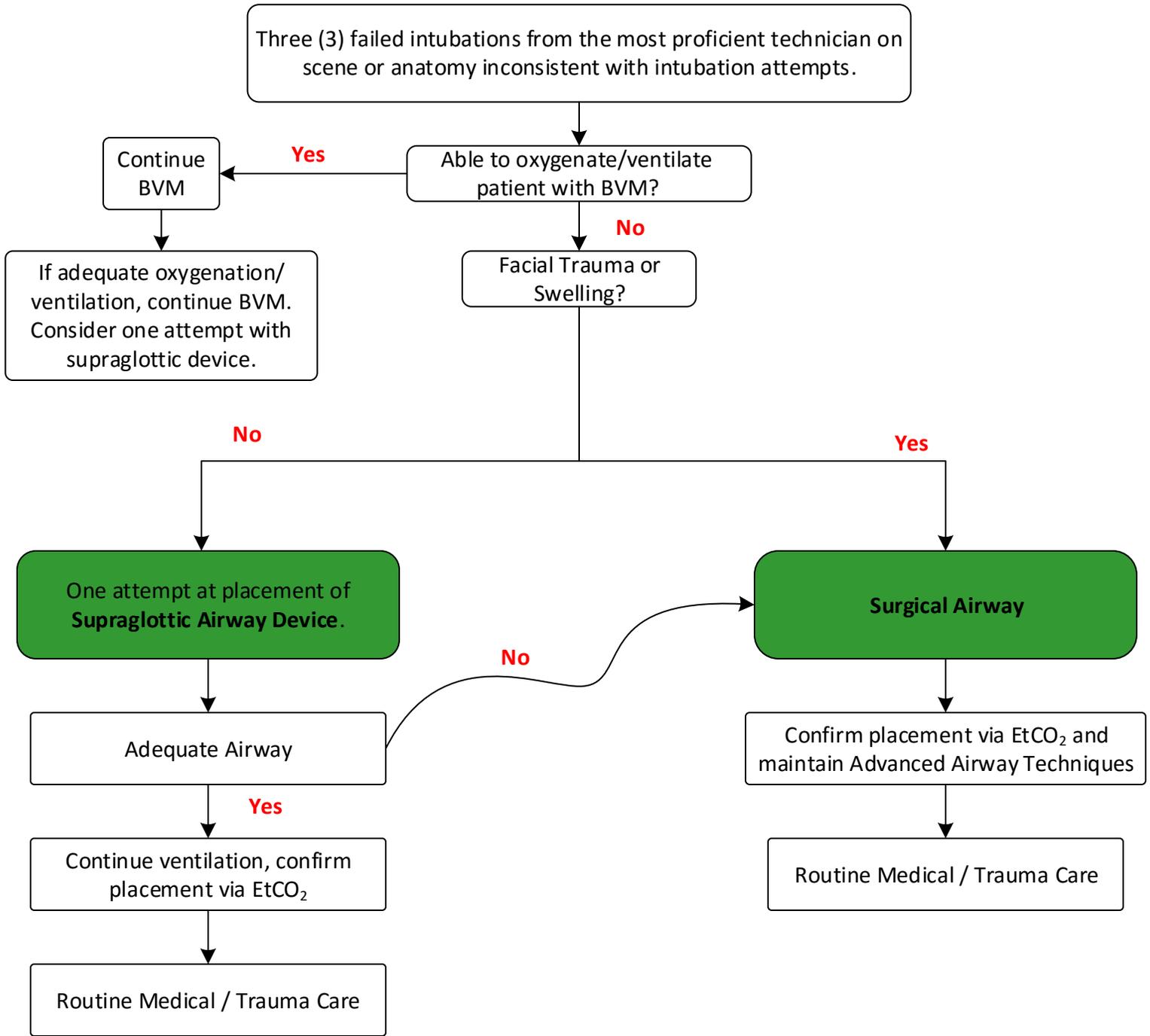
- **Acute Radiation Syndrome** is caused by high doses of radiation (less likely in the event of a dirty bomb). Symptoms (acute or delayed) may include nausea, vomiting, dizziness, loss of consciousness, hypotension/shock.
- **Cutaneous Radiation injury / Burns** with early presentation are unlikely to be seen but if present may represent a significant exposure to radiation. Most likely, burns are due to a combination of either thermal or chemical burns associated with a radiation incident.
- ²Three primary methods of protection from radiation:
 - Limit the time of exposure
 - Maximize distance from the source (even a short distance from a scene).
 - Shielding from external exposure and inhalation of radioactive material.

• ¹Radiological Terrorism Emergency Management Pocket Guide for Clinicians, CDC 2005.

• ²Radiological Attack: Dirty bombs and Other Devices. The National Academies / DHS 2004.

Failed Airway

Paramedics **MUST** have written approval from their respective EMS Medical Director before using this protocol.



- Consider Supraglottic Airway device placement early when unable to intubate a patient.
- Nasopharyngeal / Oropharyngeal Airway placement should always be considered in difficult to ventilate patients when using BVM.
- Notify Medical Control or Receiving E.D. as early as possible of patient's difficult/failed airway.
- Medical Director should be notified immediately upon completion of patient care in all surgical airway patients.

Rapid Sequence Intubation

Paramedics MUST have written approval from their respective EMS Medical Director before using this protocol.

Indications:

- Failure to protect the airway.
- Patient unable to oxygenate or ventilate.
- Impending airway compromise.

Consider:

- Bougie
- BURP
Back (posterior), up, right pressure

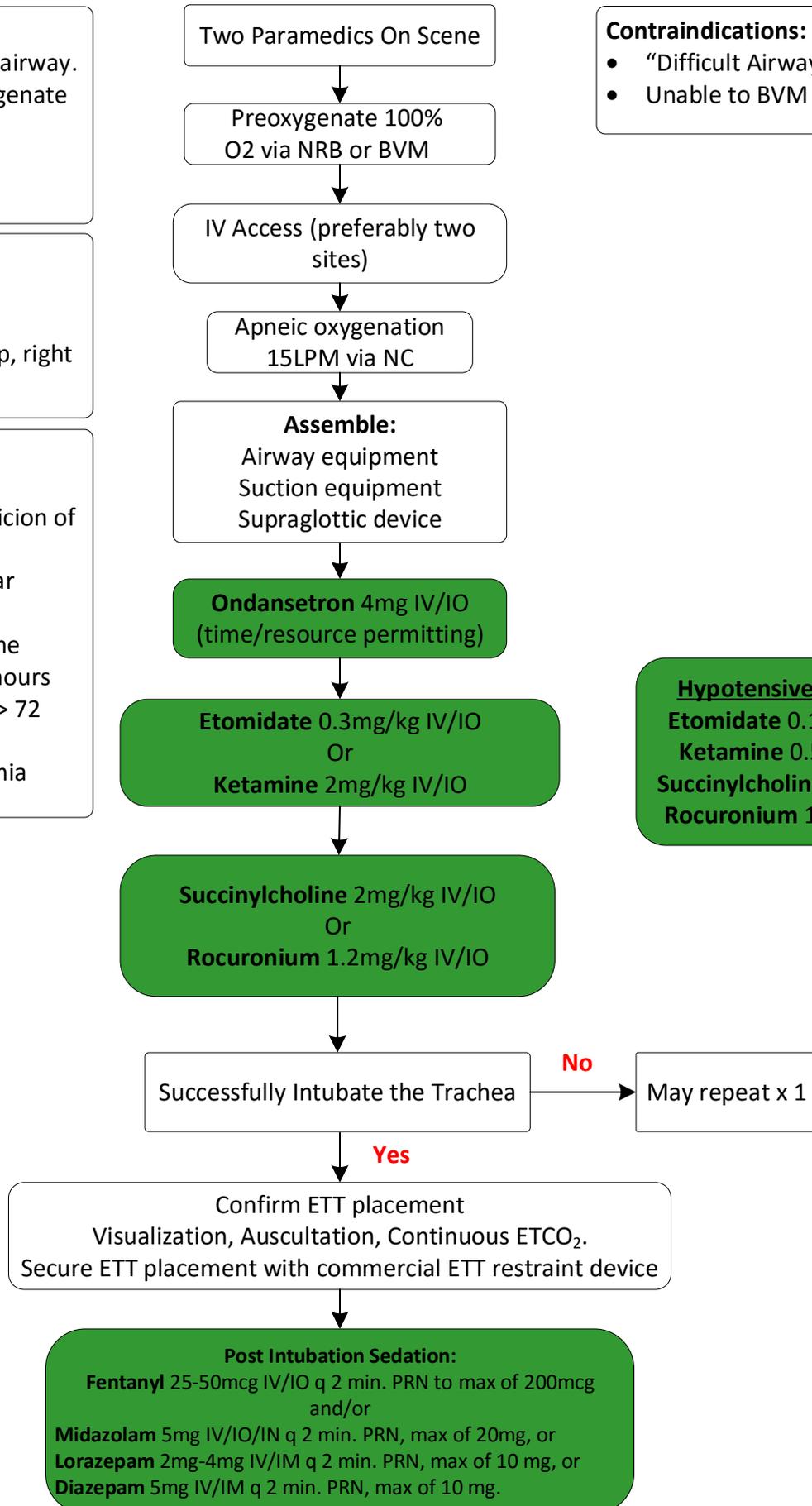
Succinylcholine

Contraindications:

- Hyperkalemia or suspicion of Hyperkalemia
- Myopathies / Muscular Dystrophies
- Guillain-Barre syndrome
- Burns / Trauma > 72 hours
- Stroke / Hemiparesis > 72 hours
- Malignant hyperthermia history

Contraindications:

- "Difficult Airway"
- Unable to BVM the patient.



Hypotensive Doses:

- Etomidate 0.15mg/kg
- Ketamine 0.5mg/kg
- Succinylcholine 2mg/kg
- Rocuronium 1.6mg/kg

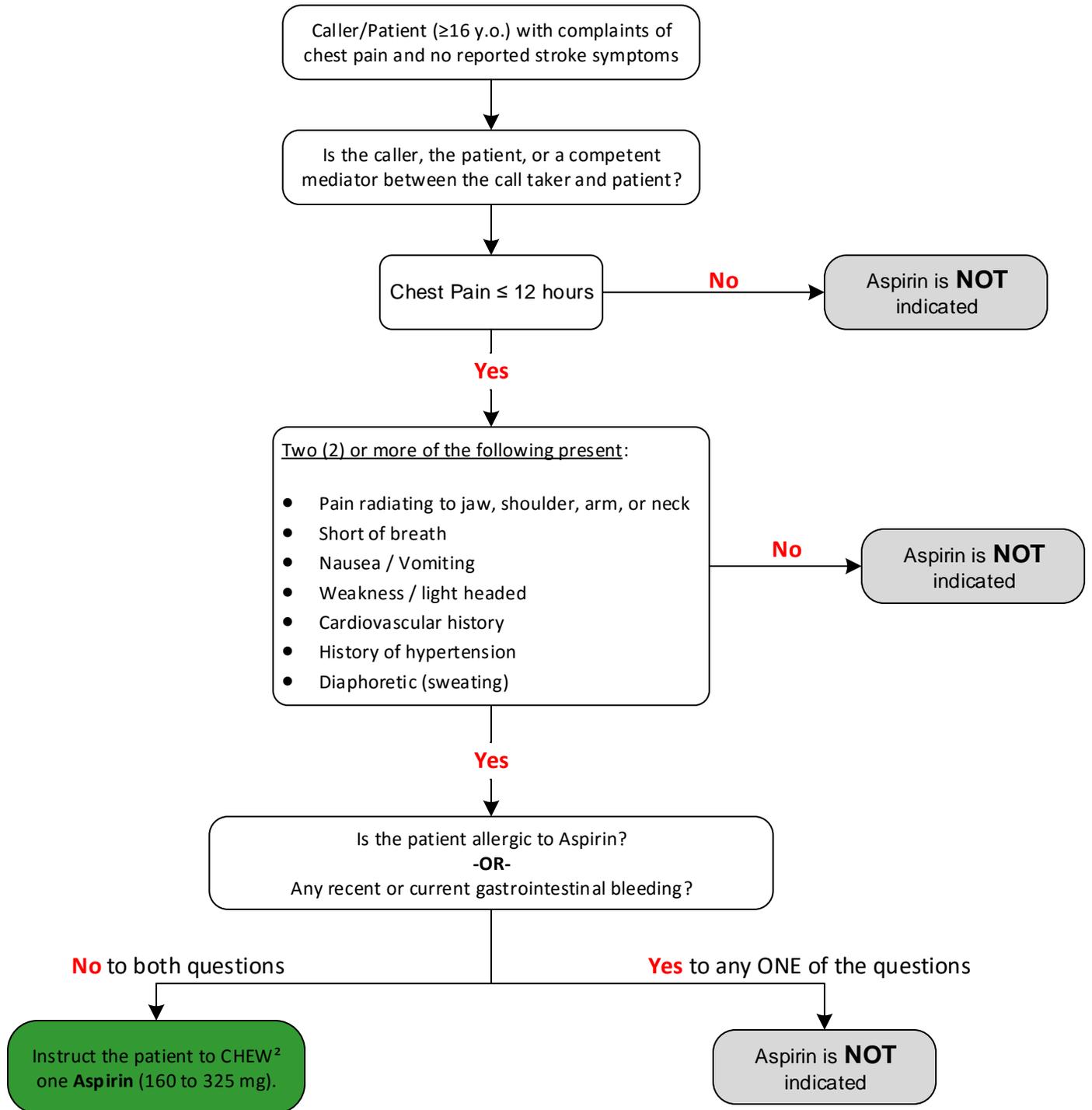
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Appendix

Communication Center Aspirin Protocol

American Heart Association guidelines in *Advanced Cardiovascular Life Support* have EMS dispatchers telling callers (patients) to take aspirin when an Acute Coronary Syndrome (ACS) is suspected. ACS includes stable and unstable angina and acute myocardial infarctions (AMI).



¹ If unable to determine if an aspirin was taken in the past 24 hours, consider the answer to be NO.

² If the patient is unable to chew, they may use water. Once the patient chews the aspirin they may follow up with a few sips of water

*Guidelines based on- Stabilization of the Patient with Acute Coronary Syndromes *Circulation*. 2005. 8:89-91

Intranasal (IN) Medication Delivery

The intranasal (IN) route for medication delivery has several advantages but is not preferred over traditional IV routes. Not all medications can be given intranasally for various reasons. **Naloxone, Midazolam Fentanyl, and Ketamine** may be given IN. The intranasal route is also useful for topical anesthetics prior to nasal intubations.



The device is designed to “mist” the medication in the nasopharynx. The nasal cavity is quite vascular which allows an almost instant route for the medication to enter central circulation. Each mL, 10-50 microns of the medication, is expelled in the nasal cavity across mucus membrane where it is absorbed into the circulation. Studies have shown serum levels of IN delivered medications to be comparable to serum level of medications given IV. Those same studies also report small amounts of the medication being absorbed by the lungs

Factors which could reduce the effectiveness of the IN delivery:

- decreased blood flow to nasal mucosa (trauma / surgery)
- dehydration (dry mucous membranes)
- epistaxis
- hypotension
- increased mucous production (common cold, cystic fibrosis)
- vasoconstrictors, topical (ie snorting cocaine)

Procedure:

(non-sterile)

- Load syringe with desired amount of medication (max 2 mL)
- Apply atomizer adapter on the syringe
- Place the tip of the atomizer 1.5 cm within the nostril
- Quickly compress the syringe, administering **MAX 1 mL per nostril**
- If needed, repeat the procedure in the other nostril

- IN medication delivery does not replace the need for IV access. This is simply another route for medication deliver when vascular access is unobtainable.
- Vascular access may be unobtainable for several reasons, including but not limited to:
 - Poor peripheral access
 - Combative / Violent Patients
 - Less frightening (pediatrics)

Intraosseous Vascular Access

Indications for using the IO are listed in the appropriate protocol. The purpose of this protocol is proper insertion techniques. Our protocol will closely reflect the manufactures guidelines.

Adult vs. Pediatric

Adult - Any pt weighing ≥ 40 kg without the below contraindications.

Pediatric – Any pt weighing ≥ 3 kg but < 40 kg without the below contraindications.

An IO is NOT for prophylactic use!

Contraindications

- Fracture of the bone selected for IO infusion (*consider alternate sites*)
- Excessive tissue at insertion site with the absence of anatomical landmarks (*consider alternate sites*)
- Previous significant orthopedic procedures (*IO within 24hours, prosthesis - consider alternate sites*)
- Infection at the site selected for insertion (*consider alternate sites*)

Considerations

Flow rate: Due to the anatomy of the IO space you will note flow rates to be slower than those achieved with IV catheters.

- Ensure the administration of an appropriate rapid syringe bolus (flush) prior to infusion.

NO FLUSH = NO FLOW

-Rapid syringe bolus (flush) the adult IO with 10 ml (pediatric IO with 5 ml) of NS. Repeat prn.

- To improve continuous infusion flow rates always use a syringe, pressure bag or infusion pump

Pain: Insertion of the adult IO & pediatric IO in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO Infusion for conscious patients has been noted to cause severe discomfort.

- Prior to IO syringe bolus (flush) or continuous infusion in alert patients, SLOWLY administer Lidocaine 2% (Preservative Free) through the IO hub.

Adult IO Slowly administer 20 – 40 mg Lidocaine 2% (Preservative Free), allow to sit in bone marrow space for 30 seconds.

Pediatric IO Slowly administer **0.5 mg /kg** Lidocaine 2% (Preservative Free), allow to sit in bone marrow space for 30 seconds.

Indications

- IV fluids or meds are needed & peripheral IV cannot be established in 2 attempts or 90 seconds, **and** the pt exhibits one or more of the following:
 - a. Altered mental status
 - b. Resp compromise (SpO2) 80% after appropriate oxygen therapy, resp rate <10 or > 40 x min.
 - c. Hemodynamic instability (SBP <90)
- Adult and Pediatric IO devices can be considered PRIOR to peripheral IV attempts in the following situations:
 - a. Cardiac arrest
 - b. Profound hypovolemia with alteration of mental status
 - c. Pt in extremis with immediate need for delivery of medication and/or fluids
 - d. Burns
 - e. Status epilepticus
 - f. Profound hypoglycemia
 - g. Narcotic OD without vascular access

EZ-IO® Insertion Procedure

PROCEDURE: *If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain informed consent*

1. Wear approved Body Substance Isolation Equipment (BSI)
2. Determine adult IO or pediatric IO indications
3. Rule out Contraindications
4. Locate appropriate insertion site (3 approved sites)
5. Prepare insertion site using aseptic technique
6. Prepare the IO driver and appropriate needle set
8. Stabilize site and insert appropriate needle set
9. Remove IO driver from needle set while stabilizing catheter hub
10. Remove stylet from catheter, place stylet in shuttle or approved sharps container
11. Confirm placement
12. Connect primed provided IO connector
13. Slowly administer appropriate dose of **Lidocaine 2%** (Preservative Free) IO to conscious patients
14. Syringe bolus (flush) the IO catheter with the appropriate amount of normal saline.
15. Utilize pressure (pressure bag or infusion pump) for continuous infusions where applicable
16. Begin infusion
17. Dress site, secure tubing and apply wristband as directed
18. Monitor IO site and patient condition



Helicopter Response Guidelines

Purpose:

Air Medical Services (AMS) are a valuable, yet limited resource in Region 1. It is important that Emergency Medical Service Personnel utilize consistent and appropriate criteria when requesting an air medical service for assistance with patient care and transport. The following evidence based criteria should be utilized when requesting Air support. While this document does not require EMS activation of air medical services, it serves as a guideline for air medical use in Region 1 when activated.

EMERGENT request for helicopter:

The first responder should determine the need for helicopter evacuation and follow his/her service's operational guidelines and protocols for making this request. The responder should also consider his/her location, if service area is left without ground ambulance service, and transport time to the appropriate hospital vs. the response time, load time and flight time to the appropriate hospital using the following approximate times:

- Request to launch time - 10 minutes
- Flight time to scene - ▲ , however, a good estimate is 2 flying miles = 1 minute
- Load time at scene - 5-10 minutes if pt is ready upon helo landing and hot loading is utilized, longer times expected if these criteria are not met.
- Flight time to hospital- ▲ , however, a good estimate is 2 flying miles = 1 minute
 - Using these times, the responder should consider the time savings before determining the need for an air ambulance.

The above are predicated on the fact that the patient reaches the closest appropriate facility reasonably faster by air than had they been transported by ground. In rural areas of Louisiana, the closest appropriate hospital will most often not be the hospital with the shortest drive time from the point of origin. Extended driving time and/or obstacles must be explained with documentation.



Helicopter Response Guidelines

The responders on scene should communicate to the air ambulance service the situation at the scene and the location where the scene is located and any recommendations for landing areas or intercept sites.

The air ambulance provider once over the scene should communicate to the responders on the scene where the helicopter will be landed and any other instructions.

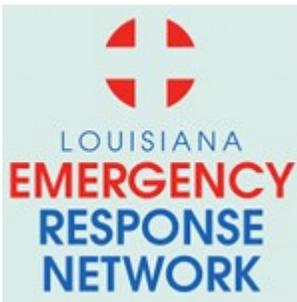
First Responders shall designate a Landing Zone Officer (LZO) and advise the 911 dispatch center of the LZO's identifier as soon as possible.

The LZO:

- Acts as the landing zone coordinator and communicator.
- Is responsible for all communications between the landing zone and the pilot.
- Advises the 911 Dispatcher of the arrival and departure of the responding Aircraft.
- The LZO should focus all attention on managing the communications, approach, departure and landing zone site area.

Intercepts

- Occasions arise where the need for a helo is only realized once the first responder arrives near the patient. Once the helicopter is activated, there is a launch time of 10 minutes, plus flight time and load times that should be considered.
- Instead of waiting for the helo to arrive on scene, the first responder should consider an enroute intercept with the helicopter. In these cases, scene time should be minimized and the patient should be rapidly packaged.
- Consideration to air support should be given when the ambulance can meet the helo on the way to the receiving hospital.
- **NOTE** – Stopping the momentum enroute to the hospital often times can delay the patients arrival at the ED. Setting up a landing zone at night can cause



Helicopter Response Guidelines

further delays. When in doubt if time will be saved, the first responders should consult with the air ambulance's dispatch center.

- Coordination of these activities should be done with the 911 center and the air ambulance dispatch center. Local, predetermined landing zones that are designated by the air ambulance and local EMS providers can help to streamline this process.
- It is recommended that the Global Positioning System (GPS) be used to give the exact location of the desired landing zone to the Aircraft pilot.

Guidelines to request air medical support (Operational and Physiologic):

OPERATIONAL

- Extended ground transport time
- Prolonged extrication
- Remote location
- Patient requires Advanced Life Support level care
- Mass Casualty
- Ground transportation will leave service area without ambulance service

CRITICAL TRAUMA CONDITIONS

Physiologic Criteria

- GCS <14 or evidence of declining mental status
- Systolic BP <90, delayed capillary refill or signs of hypoperfusion
- Respiratory compromise or requiring intubation
- Time critical intervention not available locally



Helicopter Response Guidelines

Anatomic Criteria

- Penetrating trauma to head, neck, torso, or extremities proximal to elbow or knee
- Flail chest
- Major burns including 2 or 3 degree >20%TBSA, airway burns, or circumferential extremity burns
- Combination burns with trauma
- Two or more proximal long bone fractures
- Suspected pelvic fracture
- Traumatic paralysis
- Amputation proximal to wrist or ankle
- Open or depressed skull fracture

Mechanism

- Ejection
- Death of occupant in same vehicle compartment
- Extrication >20 minutes
- Falls >20 feet
- Significant crush injuries
- Rollover or High impact collision
- Auto vs. pedestrian or cycle crash >20 mph

CRITICAL MEDICAL CONDITIONS

- Suspected acute stroke
 - Positive Pre-hospital Stroke Scale
 - Total pre-hospital time (time from when the patient's symptoms and/or signs first began to when the patient is expected to arrive at the Stroke Center) is less than two (2) hours.
- Suspected Acute Myocardial Infarction



Helicopter Response Guidelines

- Chest pain, Shortness of breath or other symptoms of an acute cardiac event AND,
- EKG findings consistent with acute myocardial infarction (STEMI)
- Known high risk obstetrical patients
- Other medical emergencies after consult with Medical Control Physician

Note that for patients with burns and coexisting trauma, the traumatic injury should be considered the first priority and the patient should be triaged to the closest appropriate trauma center for initial stabilization.

Unmanageable airway, traumatic cardiac arrest and tension pneumothorax should be taken to closest functioning ED for stabilization and transfer

Landing Zones

DESIGNATED LANDING ZONES

Landing zone safety and security is of utmost importance during helicopter landings at various designated or undesignated sites. To facilitate medical transport of patients, a set of safe designated heliports should be developed with the region's EOC, identified and recorded by global positioning system coordinates.

UNDESIGNATED LANDING ZONES

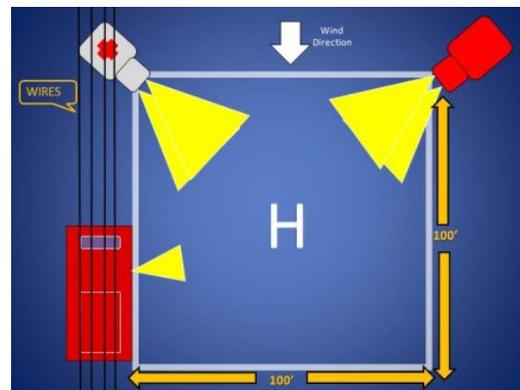
In addition to designated landing zones, the helicopter may land at an undesignated landing zone. In the event of an undesignated landing zone situation, communication must exist between the aircraft and ground personnel in order to identify the landing zone and clear the area of obstructions. Highway and open field landings are the most common undesignated landing zones.



Helicopter Response Guidelines

SAFETY REQUIREMENTS

1. Minimum 100 ft x 100 ft
2. Area should be clear of debris (trash cans, barriers, cones, etc.)
3. Obstructions should be noted and relayed to the pilot (wires, tall trees, light stanchions, antennas, etc.)
4. Crowd control should be ensured prior to the aircraft arrival
5. During a night landing:
 - No lights should be pointed toward the sky.
 - Emergency lights should be on to help locate the LZ.
 - Two vehicles should be stationed at the corners to make an "x" with their low beam lights.
 - Any obstructions should be illuminated.
 - Flight Crews routinely use night vision goggles. Emergency vehicles may be asked to shut off emergency lights.



LANDING PROCEDURE

1. Flight Crew will ask ground personnel to monitor general area around aircraft and to secure the LZ from bystanders.



Helicopter Response Guidelines

2. Aircraft engines will remain running (rotor blades may or may not be turning) while on the ground unless unusual circumstances exist.
3. No one should approach the aircraft without permission from the Flight Crew and must be accompanied by a Flight Crew member at all times.

LOADING PROCEDURE

When moving the patient from the scene to the helicopter

1. Crew will assign 4 personnel to help carry the stretcher to the aircraft – crew will brief personnel on procedure.
2. All chinstraps should be secured. Unsecured hats, such as baseball caps, are hazardous.
3. It is important to follow the instructions of the crew at all times.
4. Remember to exit in the same direction that you approached the aircraft.
5. Loading the patient in the aircraft varies with each helicopter.
6. Approach and departure from the aircraft will always occur at the 3 or 9 o'clock position.

Communications

- Parish Interoperable channels shall be used for communications with the aircraft based on geographic location
 - JEFFERSN-4
 - ORL-4
 - PLAQ-4
 - ST BRD-4

Pre-hospital Radio / Phone Report Format

- “This Is” (EMS Department / Service Name) _____
- Unit # _____
- Skill level treating the patient
- Parish or Origin
- E.T.A.
- Patient’s Age
- History of present illness (C.C.) and duration of illness
Relay major pertinent injuries
- Patient’s L.O.C and GCS
- Vital Signs
 - Blood pressure
 - Pulse
 - Respiratory Rate, Quality & Breath Sounds
 - SpO₂ (Including O₂ device and rate)
- Pertinent medical history _____
- Treatment rendered and impact of treatment (response to treatment).

Trauma Radio Report

"This Is" (Service Name) _____ (Unit #) _____ Service Level _____ Parish _____

Age _____

Mechanism of Injury / M.O.I _____

Meets Trauma Center Criteria (Anatomic, Physiologic, Mechanism) by _____

GCS _____

Vitals: Airway Status / O₂ Device _____ B/P _____ HR _____ Resp. Rate _____ SpO₂ _____

Treatment rendered and Impact of treatment (physical exam improvement) _____

Scene Delays due to extrication, traffic, Etc. _____ E.T.A. _____

Region One Trauma Center Criteria

Physiological:

- Glasgow Coma Scale <14
- SBP <90 mm/Hg (<60 in peds.)
- Respiratory Rate <10 or >29/min or need for ventilatory support
- Respiratory Rate <20 in infant less than 1 year or need for ventilatory support
- Revised Trauma Score < 11
- Pediatric Trauma Score < 9

Anatomic:

- Penetrating injuries to the head, neck torso or extremities proximal to the elbow and knee.
- Flail chest
- Two or more proximal long bone fractures
- Crushed, degloved or mangled extremity
- Amputation proximal to the wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis
- Combination of mechanism of trauma associated with burns
- Blunt abdominal injury with firm or distended abdomen or with "seatbelt sign"

Special Considerations:

- SBP <110 in adult >65 y/o
- EMS provider judgement

Mechanism of Injury Criteria:

- **Fall:**
 - Adults → > 20 feet (one story is equal to 10 feet)
 - Pediatric → > 10 feet or 2-3 times the height of the child
- **High Risk Auto Crash:**
 - Intrusion (including roof) → > 12 inches into occupant site; > 18 inches any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with high risk injury
- Auto vs pedestrian/bicyclist/ATV thrown, run over or with significant (> 20 mph) impact
- Motorcycle crash > 20 mph
- Head trauma on anticoagulant (exclude ASA) or history of bleeding disorder
- Blast or explosion
- High – energy electrical injury
- Hanging

Stroke Alert / MEND Exam Pre-hospital Checklist

DATE & TIMES						
Date:	Dispatch Time:	EMS Arrival Time:	EMS Departure Time:	ED Arrival Time:		
BASIC DATA						
Patient Name	Age		Gender			
Witness Name	Witness Phone					
Chief Complaint	BP	L /	R /			
Last Time w/o Sxs	Glucose	Pulse	Resp			
HISTORY					YES	NO
Severe Headache						
Head Trauma at Onset						
EXAMINATION <i>PERFORM ON SCENE</i>					✓ IF ABNORMAL	
Subarachnoid Hemorrhage?	Level of Consciousness (AVPU)					
	Neck Stiffness (cannot touch chin to chest)					
Cincinnati Prehospital Stroke Scale	Speech (repeat "You can't teach an old dog new tricks")					
	Facial Droop (show teeth or smile)					
	Arm Drift (close eyes and hold out both arms)					
STROKE ALERT CRITERIA					YES	NO
Time of onset < 5 hours?						
Any abnormal finding on examination?						
Deficit <u>not</u> likely due to head trauma?						
Blood glucose > 50? (if fingerstick possible)						
★★★ TRANSPORT ALL PATIENTS TO NEAREST APPROPRIATE "HOSPITAL" ★★★ IF YES TO ALL STROKE ALERT CRITERIA, CALL STROKE ALERT , TRANSPORT PATIENT URGENTLY						
DESTINATION HOSPITAL		HOSPITAL CONTACT				

PAST HISTORY / MEDICATIONS / ALLERGIES						
Past History	Recent → Surgery <input type="checkbox"/> Trauma <input type="checkbox"/> MI <input type="checkbox"/>			Medications		
Other:				Allergies		
MEND EXAM <i>PERFORM EN ROUTE IF TIME ALLOWS</i>					✓ IF ABNORMAL	
MENTAL STATUS	Level of Consciousness (AVPU)					
	Speech (repeat "You can't teach an old dog new tricks")					
	Questions (age, month)					
	Commands (close, open eyes)					
CRANIAL NERVES	Facial Droop (show teeth or smile)				R	L
	Visual Fields (four quadrants)				R	L
	Horizontal Gaze (side to side)				R	L
LIMBS	Motor—Arm Drift (close eyes and hold out both arms)				R	L
	Motor—Leg Drift (open eyes and lift each leg separately)				R	L
	Sensory—Arm and Leg (close eyes and touch, pinch)				R	L
	Coordination—Arm and Leg (finger to nose, heel to shin)				R	L
MANAGEMENT REMINDERS						
Do NOT treat hypertension		Do NOT allow aspiration → keep NPO, head up, O ₂ 2-4L		Do NOT give glucose → unless glucose < 50		
STROKE-SPECIFIC REPORT TO EMERGENCY DEPARTMENT						
BASIC DATA	SYMPTOM ONSET	SUPPLEMENTAL INFO		NEUROLOGIC EXAM		
<ul style="list-style-type: none"> • Age • Gender • Chief Complaint 	<ul style="list-style-type: none"> • Last time w/o Sxs • Head trauma • Severe headache • Seizure—staring or shaking 	<ul style="list-style-type: none"> • Recent surgery, trauma, MI • Medications, Allergies • BP, Glucose • Witness name, contact info 		<ul style="list-style-type: none"> • Consciousness • Speech / language • Visual fields • Motor strength 		

Medications

ADENOSINE (ADENOCARD):

1. **Classification:**
 - Antiarrhythmic
2. **Physiologic Effect:**
 - Depresses the activity of the SA and AV nodes; interrupts re-entry; immediate onset, duration <10 seconds.
3. **Major Indications:**
 - Narrow complex tachycardia refractory to common vagal maneuvers
4. **Primary Contraindications:**
 - Second or third degree AV block
 - Sick sinus syndrome (except in patients with functioning pacemakers)
 - Hypersensitivity
 - Symptomatic bradycardia
 - WPW
5. **Relative Contraindications:**
 - Pregnancy
 - Patients taking theophylline, dipyridamole or carbamazepine
 - Asthma
 - Decompensated Heart Failure
6. **Side Effects:**
 - Flushing
 - Dyspnea
 - Chest Pain
 - Transient periods of asystole, Sinus Bradycardia, or Ventricular Ectopy
 - Hypotension
 - Palpitations
 - Metallic Taste
 - Paresthesia (lasting approximately 2-5 minutes)
7. **Additional Information:**
 - Large gauge IV access
 - Elevate extremity
 - Administer through injection port closest to patient.
 - Follow with rapid saline flush

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

1. **Classification:**
 - Bronchodilator (Sympathomimetic), Beta Agonist
2. **Physiologic Effect:**
 - Stimulates the sympathetic beta-2 adrenergic receptors in the bronchial tree causing bronchial smooth muscle relaxation; stimulates the heart.
3. **Major Indications:**
 - relieve bronchospasms in patients with asthma, chronic bronchitis, emphysema, and acute attacks of bronchospasm
4. **Primary Contraindications:**
 - Hypersensitivity to Albuterol
5. **Relative Contraindications:**
 - Cardiovascular Disease
 - Diabetes Mellitus
 - Convulsive disorders
 - Cerebrovascular disease
 - **Beta blocker medications**
 - **Congestive Heart Failure**
6. **Side Effects:**
 - Nervousness, Tremors
 - Dizziness
 - Seizures
 - Headache
 - Tachycardia, palpitations
 - Hypertension
7. **Additional Information:**
 - Rarely occurring, but of importance are allergic reactions or paradoxical bronchospasm, urticaria, and angioedema. High doses or prolonged use may cause hypokalemia which is of concern especially in patients with renal failure, on certain diuretics and xanthine derivatives.

Medications

AMIODARONE (NEXTERONE):

1. **Classification:**
 - Anti-dysrhythmic
2. **Physiologic Effects:**
 - Increases the action potential duration (repolarization inhibition). Non competitively blocks beta-adrenergic receptors. Prolonged therapy increases the refractory period in the atria, ventricles and AV node.
3. **Major Indications:**
 - V-Fib
 - V-Tach
4. **Primary Contraindications:**
 - Cardiogenic shock
 - Severe sinus bradycardia
 - Hypersensitivity
 - AV Block without a functioning pacemaker
5. **Side Effect:**
 - May slow the heart rate
6. **Additional Information:**

Amiodarone shows beta blocker-like and calcium channel blocker-like actions on the SA and AV nodes, increases in refractory period via sodium and potassium channel effects and slows intra-cardiac conduction of the cardiac action potential via sodium-channel effects. Amiodarone resembles thyroxine (thyroid hormone) and it's binding to the nuclear thyroid receptor might contribute to some of its pharmacologic and toxic actions.

ASPIRIN (ACETYLSALICYLIC ACID)

1. **Classification:**
 - Non-Steroidal Anti-Inflammatory; Analgesic; Antipyretic; Anticoagulant
2. **Physiologic Effect:**
 - Aspirin is a weak acid, which is easily and rapidly transformed for absorption in the stomach. It is hydrolyzed into salicylate, a highly protein bound drug, which is easily transformed for excretion in the liver. Aspirin inhibits thromboxane A2 production, which is responsible for platelet aggregation. With the decrease in platelet aggregation the blood does not form clots easily.
3. **Major Indication:**
 - Cardiac Chest Pain (ACS)
 - STEMI
4. **Primary Contraindication:**
 - Anaphylaxis to NSAIDs
 - Active Peptic Ulcers
6. **Additional Information:**
 - Signs and symptoms of Aspirin Poisoning may range from mild nausea and vomiting, abdominal pain, lethargy, tinnitus, and dizziness to severe such as seizure or cerebral edema depending on the dose consumed. Toxicity is managed with a number of potential treatments including: Activated Charcoal, I.V. Dextrose and Normal Saline, Sodium Bicarbonate and Dialysis.
 - Aspirin **can** be administered to patients on anticoagulant therapy. Common anticoagulant medicines include: Coumadin, Plavix, and Lovenox.

ATROPINE SULFATE:

1. **Classification:**
 - Anticholinergic
2. **Physiologic Effect:**
 - Decreases action of the parasympathetic nervous system increasing conduction velocity (dromotrope) and heart rate (Chronotropic), enhances conduction through the AV junction. Atropine also decreases bodily secretions (Anticholinergic effect).
3. **Major Indication:**
 - Symptomatic bradycardia, bradyarrhythmias
 - Organophosphate Poisoning
 - Pre-Intubation in children requiring airway manipulation to prevent vagotropic bradycardia response
4. **Primary Contraindication:**
 - Tachycardia
 - Hypersensitivity
5. **Additional Information:**

Overdose will cause anticholinergic toxidrome ("Red as a beet, dry as a bone, blind as a bat, mad as a hatter, and hot as a dessert")

Medications

CALCIUM CHLORIDE:

1. **Classification:**
 - Calcium Replacement
2. **Physiologic Effect:**
 - Calcium is an essential component for proper functioning nervous, muscular, skeletal and endocrine systems and also includes positive inotrope and dromotrope effects
3. **Major Indication:**
 - Hypermagnesemia
 - Low Serum Calcium level
 - Overdose of calcium channel blockers
 - Cardiac Arrest secondary to suspected Hyperkalemia
4. **Primary Contraindications:**
 - Hypersensitivity
 - Digoxin Toxicity
5. **Additional Information:**
 - Irritation with extravasation (may cause tissue necrosis)
 - Rapid IV administration may cause tingling sensations, a calcium taste, and a sense of oppression or "heat waves"
 - Cardiotoxicity and local phlebitis with rapid IV Administration
 - Use caution in patients with renal insufficiency or history of cardiac disease

CALCIUM GLUCONATE:

1. **Classification:**
 - Mineral supplement
2. **Physiologic Effect:**
 - Calcium is the fifth most abundant element in the body and is essential for maintenance of the functional integrity of nervous, muscular and skeletal systems and cell membrane and capillary permeability.
3. **Major Indications:**
 - Calcium Channel Blocker Overdose
 - Hydrofluoric Acid Exposure
4. **Primary Contraindications:**
 - V-Fib
 - Hypercalcemia
 - Concomitant use of IV Calcium Gluconate
 - Ceftriaxone in Neonates
5. **Side Effects:**
 - Nausea
 - Constipation
6. **Additional Information:**
 - Take appropriate B.S.I. precautions and decontaminate the patient as needed.
 - Topical use by placing in glove to apply to hand; prepare with 10% calcium gluconate solution in three times volume of KY gel. Reapply every 15 minutes and massage the pain has abated.
 - May cause precipitation if mixed in IV fluids that contain carbonates, phosphates, sulfates and tartrates.

DIAZEPAM (VALIUM):

1. **Classification:**
 - Benzodiazepine
2. **Physiologic Effect:**
 - Benzodiazepines produce major inhibitory neurotransmitters in the CNS.
3. **Major Indication:**
 - Seizure
 - Anxiolytic/Sedative
4. **Primary Contraindication:**
 - Hypersensitivity
 - Hypoglycemic seizure activity
5. **Relative Contraindication:**
 - Patient's with a compromised respiratory status
6. **Additional Information:**
 - Not to be mixed with any other injectable medication, may precipitate when administered in a D5W IV line
 - Diazepam is an oil based sedative and cannot be atomized

Medications

DILTIAZEM (CARDIZEM):

1. **Classification:**
 - Antihypertensive, calcium channel blocker
2. **Physiologic Effect:**
 - Inhibits calcium influx into myocardial cells and arterial smooth muscle. Additionally, it lowers blood pressure by acting on the heart itself to reduce the rate, strength, and conduction speed of each beat.
3. **Major Indications:**
 - Acute hypertension
 - Angina
 - Rapid atrial fibrillation or atrial flutter
 - PSVT
4. **Primary Contraindications:**
 - Hypersensitivity
 - Heart blocks
 - Hypotension
 - Congestive Heart Failure
 - WPW
5. **Side Effects:**
 - Hypotension
 - Bradycardia
 - Headache
 - Dizziness
 - Arrhythmias
 - Nausea/vomiting
6. **Additional information:**
 - Monitor heart rate and blood pressure closely

DOPAMINE:

1. **Classification:**
 - Sympathomimetic, Inotrope, Vasopressor
2. **Physiologic Effects:**
 - Chemical precursor of norepinephrine that stimulates dopaminergic, Beta2 adrenergic, and Alpha-adrenergic receptors
3. **Major Indications:**
 - Cardiogenic shock
4. **Primary Contraindications:**
 - Hypovolemia secondary to trauma
 - Patients with Pheochromocytoma
 - Hypersensitivity
5. **Side effects:**
 - Tachydysrhythmias
6. **Additional Information:**
 - If the heart rate exceeds 140bpm – the infusion should be discontinued
 - Can cause hypertensive crisis in susceptible patients.

DIPHENHYDRAMINE (BENADRYL):

1. **Classification:**
 - Antihistamine
2. **Physiologic Effect:**
 - Blocks the cellular histamine receptors resulting in decreased capillary permeability; decreases itching, edema, bronchoconstriction, and vasodilation.
3. **Major Indication:**
 - Hypersensitivity
4. **Primary Contraindications:**
 - Pregnancy
 - Nursing mothers
 - Newborns
 - Hypersensitivity
5. **Side Effects:**
 - Drowsiness
 - Dry mouth and throat (because of its potent anticholinergic effects)

Medications

EPINEPHRINE (ADRENALINE):

1. **Classification:**
 - Sympathomimetic
2. **Physiologic Effect:**
 - Beta-1 and 2 effects, Alpha effects at higher dosages. Inhibits histamine release
3. **Major Indication:**
 - Cardiac Arrest
 - Severe Allergic Reaction
 - Severe Reactive Airway Disease
4. **Primary Contraindications:**
 - Hypersensitivity
5. **Side Effects:**
 - Palpitations
 - Respiratory difficulty
 - Restlessness, feelings of panic
 - Hypertension

ETOMIDATE (AMIDATE):

1. **Classification:**
 - General Anesthetic
 - Hypnotic
2. **Physiologic Effect:**
 - Short acting, non-barbiturate hypnotic
3. **Major Indications:**
 - To induce general anesthesia in an effort to facilitate intubation.
4. **Primary Contraindications:**
 - Hypersensitivity
5. **Side Effects**
 - Post-operative nausea
6. **Additional Information:**
 - May cause Masseter Muscle Spasm (Trismus), resulting in forceful jaw closure if pushed too fast
 - Supportive airway control must be monitored and under **direct observation at all times**.

FENTANYL (SUBLIMAZE):

1. **Classification:**
 - Synthetic opioid analgesic with rapid onset and short duration of action.
2. **Physiologic Effect:**
 - Attaches to opioid receptors and reduces the perception of pain
3. **Major Indication:**
 - Acute Pain
4. **Primary Contraindications:**
 - Hypersensitivity to Fentanyl or other opioid agonists
 - Intermittent, mild pain
 - Respiratory compromise
 - Bradycardia
5. **Additional Information:**
 - For I.V. Administration: Dilute Fentanyl 100mcg / 2mL in 8mL of normal saline to yield a concentration of 10mcg/mL
 - Do not dilute Fentanyl for intranasal (IN) or intramuscular (IM) administration

GLUCOSE (ORAL):

1. **Classification:**
 - Monosaccharide
2. **Physiologic Effect:**
 - Increases blood serum glucose level by absorption through mucous membranes
3. **Major Indication:**
 - Hypoglycemia
4. **Primary Contraindication:**
 - Inability for patient to protect their own airway or follow commands.

Medications

HYDROXOCOBALAMIN (CYANOKIT):

1. **Classification:**
 - Vitamin B₁₂ precursor
2. **Physiologic Effect:**
 - Hydroxocobalamin is made up off cyanocobalamin (vitamin B12) attached to cobalt. Hydroxocobalamin reverses the action of cyanide by binding to cyanide molecules. Each Hydroxocobalamin molecule binds to one cyanide ion. The result of the chemical reaction is inactivation of cyanide and release of cyanocobalamin which is then excreted in the urine.
3. **Major Indications**
 - Known or suspected Cyanide Poisoning
4. **Primary Contraindications:**
 - None
5. **Side Effects:**
 - Red Colored Urine (Chromaturia)
 - Erythema
 - Rash
 - Nausea
 - Headache
 - Decrease White Blood Cells
 - Infusion Site Reactions
6. **Additional Information:**
 - Substrates for cyanide frequently found in modern buildings
 - Cyanide can act independently from cyanide poisoning and synergistically

IPRATROPIUM BROMIDE (ATROVENT):

1. **Classification:**
 - Anticholinergic-parasympatholytic bronchodilator
2. **Physiologic Effect:**
 - Localized relaxation of bronchial smooth muscle.
3. **Major Indications:**
 - Relieve bronchospasm associated with asthma, emphysema and chronic bronchitis
4. **Primary Contraindications:**
 - Hypersensitivity to Ipratropium Bromide OR Atropine
5. **Additional Information:**
 - Toxic accumulation may occur in renal failure
 - Check patellar reflex to avoid intoxication
 - Calcium salts used as the antidote for intoxication

KETAMINE HYDROCHLORIDE:

1. **Classification:**
 - Dissociative Anesthetic;
2. **Physiologic Effect:**
 - Works in the brain to inhibit painful sensation.
3. **Major Indications:**
 - Pain refractory to traditional pharmacological therapies
 - Excited delirium
 - Rapid Sequence Induction
4. **Primary Contraindications:**
 - Hypersensitivity to Ketamine
 - Patient's taking Droxidopa
5. **Additional Information:**
 - May have an increase in heart rate and blood pressure
 - Can induce a state of sedation, immobility, and amnesia.

LIDOCAINE 2 %:

1. **Classification:**
 - Antiarrhythmic (Sodium Channel blocker)
2. **Physiologic Effect:**
 - Suppression of PVC's and re-entry arrhythmias, elevates VF threshold, local anesthetic
3. **Major Indications:**
 - Local anesthetic prior to IO bolus infusion in conscious patients
 - Treatment of acute ventricular tachyarrhythmias
 - Mitigates the bronchospastic reactivity of the airways to the ETT in acute severe asthma and blunts the intracranial pressure (ICP) response to intubation in cases of elevated ICP.
4. **Primary Contraindications:**
 - Hypersensitivity
 - Bradycardia related to PVC's
 - Idioventricular rhythms
5. **Additional Information:**
 - Should be used with caution in CHF, AMI, hypoperfusion states, hepatic and renal insufficiency and with the elderly. Decrease dose in half with these patients.

Medications

LORAZEPAM (ATIVAN):

1. **Classification:**
 - Benzodiazepine
2. **Physiologic Effects:**
 - Decreases cerebral irritability; sedation
3. **Major Indications:**
 - Seizures
 - Sedation for cardioversion
 - Reduction of anxiety
 - Skeletal muscle relaxant
4. **Primary Contraindications:**
 - Hypersensitivity
 - Narrow-Angle glaucoma
 - Patients with a history of sleep apnea syndrome
5. **Side Effects:**
 - Respiratory depression
6. **Additional Information:**
 - Should not be mixed with other agents, or diluted with intravenous solutions. Administer via the proximal end of the IV tubing and flush well.
 - Most likely to produce respiratory depression in patients who have taken other depressant drugs, especially alcohol and barbiturates.
 - It can cause local venous irritation. Use relatively large veins.

MAGNESIUM SULFATE:

1. **Classification:**
 - Electrolyte, CNS depressant
2. **Physiologic Effect:**
 - Magnesium sulfate reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction.
3. **Major Indications:**
 - Seizures associated with toxemia of pregnancy
 - Severe Reactive Airway Disease
 - Torsades De Pointes
4. **Primary Contraindications:**
 - Heart Block
5. **Side Effects:**
 - Hypotension
 - Respiratory paralysis
 - Cardiac depression or asystole
 - CNS depression and paralysis
 - Flushing and sweating
6. **Additional Information:**
 - Administer with caution if flushing and sweating occurs. When barbiturates, narcotics or other hypnotics (or systemic anesthetics) are to be given in conjunction with magnesium, their dosage should be adjusted with caution because of additive CNS depressant effects of magnesium.
 - Because magnesium is removed from the body solely by the kidneys, the drug should be used with caution in patients with renal impairment.
 - IV calcium gluconate or calcium chloride should be available as an antagonist to magnesium if needed.
 - Toxic accumulation may occur in renal failure
 - Check patellar reflex to avoid intoxication

METHYLPREDNISOLONE (SOLU-MEDROL):

1. **Classification:**
 - Steroid-glucocorticoid; a potent anti-inflammatory
2. **Physiologic Effect:**
 - Suppression of acute and chronic inflammation of the immune system
3. **Major Indications:**
 - Bronchodilation
 - Asthma & COPD
 - Allergic reactions
 - Anaphylaxis
4. **Contraindications:**
 - Hypersensitivity
5. **Side Effects:**
 - Increased ICP with papilledema
6. **Additional Information:**
 - Reconstituted medication must be used within 48 hours.
 - Solu-Medrol may interfere with the performance of hypoglycemic agents
 - Use with caution in patients receiving potassium-depleting agents
 - IV Methylprednisolone should be administered at a rate of 25mg per min

Medications

MIDAZOLAM HCL (VERSED):

1. **Classification:**
 - Short acting benzodiazepine-sedative
2. **Physiologic Effects:**
 - Depresses subcortical levels of CNS (e.g., limbic and reticular formation), possibly by increasing activity of GABA. Shorter-acting benzodiazepine sedative-hypnotic useful in patients requiring acute and/or short-term sedation. Also useful for its amnestic effects.
3. **Major Indications:**
 - Status epilepticus
 - Premedication before transcutaneous pacing
 - Anxiety and agitation
4. **Primary Contraindications:**
 - Hypersensitivity
 - Narrow Angle Glaucoma
5. **Side Effects:**
 - Respiratory depression
 - Respiratory arrest
 - Hypotension
 - Cardiac arrhythmias
 - Headache
 - Blurred vision
 - Nausea and vomiting
6. **Additional Information:**
 - Do not dilute for IM/IN administration

MORPHINE SULFATE:

1. **Classification:**
 - Analgesic – Opium derivative
2. **Physiologic Effects:**
 - Morphine is a narcotic analgesic, which depresses the central nervous system and sensitivity to pain. Increases venous capacitance, decreases venous return and produces mild peripheral vasodilation. Morphine also decreases myocardial oxygen demand.
3. **Major Indications:**
 - Chest pain refractory to oxygen and NTG
 - AMI
 - Isolated extremity fractures
 - Burns
 - CHF
4. **Primary Contraindications:**
 - Head Injury
 - Volume depletion
 - Undiagnosed abdominal pain
 - Hypersensitivity
5. **Side Effects:**
 - Decreased blood pressure
 - Nausea/vomiting
 - Altered L.O.C.
 - Respiratory Depression
6. **Additional Information:**
 - Morphine is detoxified by the liver. It is potentiated by alcohol, antihistamines, barbiturates, sedatives and beta blockers.

NALOXONE (NARCAN):

1. **Classification:**
 - Opioid antagonist
2. **Physiologic Effects:**
 - Causes reversal of narcotic depression induced by opioids by acting as an antagonist in the opioid receptor sites
3. **Major Indication:**
 - Narcotic induced respiratory depression
4. **Primary Contraindication:**
 - None in the emergency setting
5. **Side Effects:**
 - Withdrawal symptoms (especially in neonates)
 - Combative
 - Hyperventilation
6. **Additional Information:**
 - Naloxone is sensitive to light, steps should be taken to shield the vial from UV light until ready for usage
 - **The smallest dose should be used to reverse respiratory depression, not to fully wake the patient.**
 - Common opioids include; morphine, methadone, codeine, heroin, dilaudid, fentanyl, and hydrocodone

Medications

NITROGLYCERIN (NTG SL / NTG PASTE):

1. **Classification:**
 - vasodilator
2. **Physiologic Effects:**
 - relaxes smooth muscle producing vasodilator effects on arteries and veins in the peripheral and core circulation thus reducing preload and afterload; causes coronary artery dilation
3. **Major Indications:**
 - To increase coronary perfusion in angina and acute myocardial infarction
 - To reduce preload in acute pulmonary edema
4. **Primary Contraindications:**
 - Patients having taken Viagra, Levitra, or Cialis or other erectile dysfunction medications in the past 24 hours
 - Hypovolemia
 - Hypersensitivity
5. **Side Effects:**
 - Headache
 - Hypotension
 - Palpitations
 - SL burning
3. **Additional Information:**
 - Monitor blood pressure after each dose
 - Use gloves for application
 - Do not allow medication to come in contact with your skin or mucous membrane

NOREPINEPHRINE (LEVOPHED):

1. **Classification:**
 - Sympathomimetic
2. **Physiologic Effects**
 - Norepinephrine functions as a peripheral vasoconstrictor (alpha-adrenergic action) and as an inotropic stimulator of the heart and dilator of coronary arteries (beta-adrenergic action).
3. **Major Indications:**
 - Cardiogenic Shock
4. **Primary Contraindications:**
 - Hypovolemia
5. **Side Effects:**
 - Reflex bradycardia
 - Respiratory difficulty
6. **Additional Information:**
 - Constantly monitor the blood pressure and increase/decrease dosage according to the MAP (Post ROSC MAP > 80, Shock MAP > 65)

ONDANSETRON HCL (ZOFRAN):

1. **Classification:**
 - Antiemetic
2. **Physiologic Effects:**
 - Blocks the release of chemicals in the brain that stimulate the impulse to vomit.
3. **Major Indications:**
 - Nausea and Vomiting
4. **Primary Contraindications:**
 - Known hypersensitivity to ondansetron
5. **Side Effects:**
 - Constipation
 - Hypertension, palpitations
 - Tremors
6. **Additional Information:**
 - Onset in seconds

Medications

ROCURONIUM BROMIDE (ZEMURON®):

1. **Classification:**
 - Non-Depolarizing neuromuscular blocking agent
2. **Physiologic Effect:**
 - A non-depolarizing neuromuscular blocking agent with a rapid to intermediate onset depending on dose and intermediate duration. It acts by competing for cholinergic receptors at the motor endplate.
3. **Major Indications:**
 - Pharmacologically assisted endotracheal intubation or R.S.I.
4. **Primary Contraindications:**
 - Hypersensitivity
5. **Side Effects**
 - Abnormal Heart Rhythm
 - Bronchospasm
6. **Additional Information:**
 - While under the influence of Rocuronium Bromide, patients will not be responsive but they could still be conscious. Maintain sedation at appropriate intervals to keep the patient from noticing their temporary paralysis.

SODIUM BICARBONATE:

1. **Classification:**
 - Systemic alkalinizer, electrolyte buffer
2. **Physiologic Effect:**
 - Buffers H⁺ ions in metabolic acidosis
3. **Major Indications:**
 - Preexisting metabolic acidosis (perfusing patient)
 - Hyperkalemia
 - Tricyclic, phenobarbital, or aspirin overdoses
 - During cardiac arrest, after prolonged resuscitative efforts
4. **Primary Contraindications:**
 - Metabolic alkalosis
 - Hypokalemia
 - Simultaneously with calcium chloride
 - Simultaneously with catecholamines (Epinephrine, etc.)
5. **Side Effects:**
 - Metabolic alkalosis
 - CHF (edema secondary to sodium overload)
 - Hyponatremia
6. **Additional Information:**
 - Administration should be guided by arterial blood gas analysis in a perfusing patient
 - During cardiac arrests; should not be administered until a definitive airway is established.
 -

SUCCINYLCHOLINE: (ANECTINE, QUELIGIN):

1. **Classification:**
 - Depolarizing neuromuscular blocking agent
2. **Physiologic Effect:**
 - Succinylcholine is a short acting depolarizing skeletal muscle relaxant. Like acetylcholine, it binds to cholinergic receptors in the motor neuron end plate to cause muscle depolarization (contractions and fasciculation). However, this action is sustained and the initial contraction is followed by paralysis.
3. **Major Indications:**
 - To achieve paralysis to facilitate endotracheal intubation
4. **Primary Contraindications:**
 - Patient or family history of malignant hyperthermia
 - Penetrating eye injury
 - Hypersensitivity
 - Hyperkalemia
 - Burns / Trauma > 72 hours
 - Renal Failure
 - Stroke / Hemiparesis > 72 hours
5. **Side Effects**
 - Increased saliva
 - Muscle pain following surgery
 - Muscle twitching
 - Hyperkalemia
 - Increased Intracranial Pressure
6. **Additional Information:**
 - Succinylcholine has no pain relieving properties. Adequate sedation should be used when Succinylcholine is given to a conscious patient. Monitor sedation administration times closely and watch for signs that sedation is wearing off, i.e. signs of patient anxiety.
 - DO NOT administer a second dose.
 - Increased intracranial, intraocular and intragastric pressure especially during the fasciculation phase of paralysis.

Drug / Protocol	Adult Dosage / Special Information
Adenosine Tachycardia - Narrow Complex	Elevate extremity, 6mg IV/IO RAPID (1-3 seconds) IVPush, followed by a 10mL RAPID bolus with saline syringe in tubing port above injection port. Repeat 12mg dose in 1-2 minutes if needed.
Albuterol Sulfate Crush Injury/Syndrome Drowning Pneumonia Reactive Airway Disease	20mg nebulized if hyperkalemia is suspected. 5mg - Nebulized with CPAP. 5mg - Nebulized. 5mg - Nebulized.
Amiodarone Post-Resuscitation Care Tachycardia - Wide complex (Stable and Unstable) Ventricular Fibrillation	150mg in 100mL D5W Infusion IV/IO over 10 minutes. OR 1mg/min maintenance infusion. 150mg in 100mL D5W Infusion IV/IO over 10 minutes, then 1mg/min maintenance infusion. Initial Dose 300mg IV/IO. Second dose 150mg IV/IO 4-6 minutes after the initial dose.
Aspirin Acute Coronary Syndrome	160mg to 325mg P.O.
Atropine Sulfate Bradycardia Nerve/Organophosphate Poisoning	0.5mg IV/IO q 3 minutes with a maximum dose of 3mg. 2mg IV/IM q 5 minutes until symptoms resolve.
Calcium Chloride Asystole / P.E.A. Calcium Channel Blocker O.D. Crush Injury/Syndrome	1000mg IV/IO for known/suspected hyperkalemia or end-stage renal disease/dialysis. 500mg - 1000mg IV. 500mg IV over 2 minutes.
Calcium Gluconate Hydrofluoric Acid	Mix 10mL of 10% gluconate into 2 ounces of water soluble jelly.
Dextrose 50% Diabetic Emergency Stroke	12.5g to 25g IV/IO 12.5g IV
Diazepam Airway Management Airway Management post ETI Sedation Excited Delirium Post Intubation Sedation Rapid Sequence Intubation Seizure	2-5mg IV to reduce anxiety prior to nasal intubation IF NEEDED. 5mg IV/IM q 2 minutes PRN, max of 10mg. 5-10mg IV/IM max dose of 10mg. 2-5mg IV/IO/IM (NOT for drug facilitated intubation). 5mg IV/IM q 2minutes PRN, max of 10mg. 5mg IV/IM/IO q 2 minutes until seizures are controlled or max dose of 10mg.
Diltiazem Tachycardia (Narrow Complex)	10mg IV/IO slow over 2 minutes. Repeat 10mg dose in 5 minutes if needed. This dosage may only be repeated once. *Diltiazem is ONLY administered slow IV Push and not to be administered as an infusion.
Diphenhydramine Allergic Reaction / Anaphylaxis Drug Overdose	50mg IM/IV/IO 25-50mg IV/IM Phenothiazine (Dystonia) *Pearl in A.R. advises 50mg IV/IM
Dopamine Bradycardia (Symptomatic) CHF / Pulmonary Edema Post Resuscitation Care Shock	2-10mcg/kg/min 5-20mcg/kg/min 5-20mcg/kg/min Goal MAP > 80 / SBP > 90mm/Hg 5-20mcg/kg/min Goal MAP is 65mm/Hg
Epinephrine 1:1000 Allergic Reaction / Anaphylaxis Reactive Airway Disease	0.3mg - 0.5mg IM (if age < 50 yrs.) 0.1mg - 0.3mg IM (if age > 50 yrs.) 0.3mg - 0.5mg IM (Severe) If age ≥ 60, cardiac history, COPD, Renal Failure
Epinephrine 1:10,000 Anaphylaxis Bradycardia Cardiac Arrest	0.1mg slowly over 5 minutes. May repeat x 1 PRN. 2-10mcg/min IV infusion. Titrate to effect. Preparation: 1.0mg of 1:10,000 in 250mL D5W at a rate of 30-150 gtts/min. 1mg IV/IO q 3-5 minutes.
Etomidate Rapid Sequence Intubation	0.3mg/kg IV/IO (Normotensive) 0.15mg/kg (Hypotensive)
Fentanyl Acute Coronary Syndrome Airway Management Burns Open Wound / Fx / Dislocation Pain Management (non Cardiac) Rapid Sequence Intubation	25-50mcg IV/IN/IM q 2 minutes, PRN to MAX of 200mcg. Post Intubation Sedation (IF NEEDED) 25-50mcg IV/IN/IM q 2 minutes, PRN MAX 200mcg 25-50mcg IV/IN/IM q 2 minutes, PRN to MAX of 200mcg. 25-50mcg IV/IN/IM q 2 minutes, PRN to MAX of 200mcg. 25-50mcg IV/IN/IM q 2 minutes, PRN to MAX of 200mcg. 25-50mcg IV/IN/IM q 2 minutes, PRN to MAX of 200mcg.
Fluid-Lactated Ringers Burns Emergency Childbirth Sepsis Shock	Lactated Ringers is a solution for fluid and electrolyte replenishment. It restores fluid and electrolyte balances, produces diuresis, and acts as an alkalinizing agent.
Fluid - D5W	Crystalloid solution which usually contains glucose with water as a solvent used in intravenous therapy, where it may function both as a means of maintaining tissue hydration and a means of parenteral nutrition.
Fluid - Normal Saline	Also known as saline solution; is a solution of sodium chloride in water. For parenteral (Intravenous) application and tissue irrigation

Drug / Protocol	Adult Dosage / Special Information
Glucose (Oral) Diabetic Emergency	15g P.O
Hydroxocobalamin (Cyanokit) Cyanide Exposure	5g IV/IO over 15 minutes
Ipratropium Bromide Pneumonia Reactive Airway Disease	500mcg in nebulizer; only administered with first albuterol treatment. 500mcg in nebulizer; only administered with first albuterol treatment.
Ketamine Excited Delirium - AP Pain Management (Non-Cardiac) - AP Rapid Sequence Intubation	4mg/kg IM, MAX 400mg 25mg IV/IO (50mg IN) may repeat x 1 in 10 minutes PRN 2mg/Kg IV/IO (Normotensive) 0.5mg/kg (Hypotensive)
Lidocaine 2% Adult Intraosseous (EZ-IO)	20-40mg IO, for conscious patient receiving IO only.
Lorazepam Airway Management Excited Delirium Rapid Sequence Intubation Seizure	Post Intubation Sedation (IF NEEDED): 2mg - 4mg IV/IO/IM via standing order 2mg - 4mg IV/IM MAX 8mg. 2mg-4mg IV/IM q 2 minutes PRN, max of 10mg. 2mg IV/IM/IO q 2 minutes until termination of seizure. Maximum of 8mg via standing orders.
Magnesium Sulfate Cardiac Arrest - Torsades Reactive Airway Disease Seizure - Eclampsia Tachycardia - Wide Complex (Torsades - Stable)	1g-2g IV/IO 2g IV infusion over 10 minutes Preparation: 2g in 100mL of D5W or NaCl macro drip at 100 gtts / min. 4g-6g IV/IO infusion over 10 minutes. Preparation 4g-6g in 100mL of D5w or NaCl macro drip at approx 15 gtts / min. 1g-2g IV/IO infusion over 10 minutes. Preparation 1g-2g in 100mL of D5W or NaCl macro drip at approx 15 gtts / min.
Methylprednisolone Allergic Reaction / Anaphylaxis Reactive Airway Disease	125mg IV 125mg IV
Midazolam Bradycardia (Symptomatic) Rapid Sequence Intubation Seizure - Upon EMS arrival Seizure - After EMS arrival Tachycardia (Narrow Complex) Tachycardia (Wide Complex)	Pre-medication for TCP: 2.5mg - 5mg IV/IO/IN if possible Post Intubation Sedation: 5mg IV/IO/IN q 2 minutes PRN, MAX 20mg 10mg IM prior to IV access if the patient presents with seizure activity upon the arrival of EMS 2.5mg IV/IN/IM/IO q 2 minutes until termination of seizure activity. MAX 10mg Pre-medication for cardioversion 2.5mg - 5mg IV/IO/IN if possible. Pre-medication for cardioversion 2.5mg - 5mg IV/IO/IN if possible.
Morphine Sulfate Acute Coronary Syndrome Burns Pain Management (non Cardiac)	2mg - 4mg IV/IO q 2 minutes PRN to MAX of 10mg 2mg - 4mg IV/IO q 2 minutes PRN to MAX of 10mg 2mg - 4mg IV/IO q 2 minutes PRN to MAX of 10mg
Naloxone Drug Overdose (Opiates) Opiate Related Cardiac Arrest	0.5mg slow IN/IM/IV PRN (EMR/EMT 2mg IN) 2mg IV/IO
Nitroglycerin Acute Coronary Syndrome Respiratory Distress / CHF	0.4mg SL q 3 minutes PRN max of 2 doses with SBP > 100mm/Hg 0.4mg SL repeats q 5 minutes as long as SBP > 100mm/Hg
Norepinephrine CHF/Pulmonary Edema Post Resuscitation Care Sepsis Shock	2mcg - 12mcg/min 2mcg - 12mcg/min goal MAP > 80 / SBP > 90mm/Hg 2mcg - 12mcg/min 2mcg - 12mcg/min
Ondansetron Abdominal Pain & Nausea/Vomiting Acute Coronary Syndrome Airway Management Pain Management Rapid Sequence Intubation	4mg IV/IM. May repeat in 15 minutes if necessary. Max dose of 8mg. 4mg IV for nausea/vomiting with active chest pain. 4mg IV/IO for the non-cardiac arrest intubation to decrease aspiration risks. 4mg IV for nausea/vomiting related to analgesia. May repeat 4mg in 15 minutes PRN. 4mg IV/IO (Time/Resource permitting)
Oxygen Routine Medical Care	Low Flow 2 L/M NC Supplemental 4 L/M NC High Flow 15 L/M NRB or BVM
Rocuronium Bromide Rapid Sequence Intubation	1.2mg/kg IV/IO (Normotensive) 1.6mg/kg (Hypotensive)
Sodium Bicarbonate Cardiac Arrest (Suspected Acidosis) Crush Injury / Syndrome Crush Injury / Syndrome Irritant Gas Overdose (Tricyclics)	1-2mEq/kg IV/IO Bolus 2 liters NaCl with 50mEq of Sodium Bicarbonate added per liter of NaCl 100mEq IV/IO - If Hyperkalemia is suspected 2.5mL in 2.5mL sterile water nebulized (for respiratory symptoms - burning sensation) 1-2mEq/kg IV or in 1 L NaCl run wide open - Repeat PRN to bring QRS < 120ms
Succinylcholine Rapid Sequence Intubation	2mg/kg IV/IO (Normotensive) 2mg/kg (Hypotensive)

Drug / Protocol	Pediatric Dosage / Special Information
Adenosine Pediatric Tachycardia - Narrow Complex	0.1mg/kg IV max 6mg; may repeat x 1 by doubling first dose
Albuterol Sulfate Pediatric Reactive Airway Disease	1.25 mg (<1 year); 2.5mg (1-4 yrs); 5mg (≥4 yrs)
Amiodarone Pediatric Tachycardia - Wide complex Pediatric Ventricular Fibrillation	5mg/kg IV over 20-60 minutes Initial Dose 5mg/kg IV/IO. Second dose 5mg/kg IV/IO 4-6 minutes after the initial dose.
Atropine Sulfate Pediatric Bradycardia Nerve Agent/Organophosphate Poisoning	0.02mg/kg IV/IO to a max of 0.5mg (minimum dose 0.1mg) 0.02 mg/kg IV; 0.05 mg/kg IM
Calcium Chloride Pediatric Cardiac Arrest	20mg/kg IV/IO for known hyperkalemia
Dextrose Pediatric AMS > 8 yrs Pediatric AMS 1-7 yrs Pediatric AMS < 1 yr	50% 1cc/kg 25% 2cc/kg 10% 4cc/kg
Diazepam Pediatric Seizure Nerve Agent/Organophosphate Poisoning	0.1mg/kg IV/IO/IM over 2-5 minutes. Pts < 5 yrs max dose of 5mg; ≥ 5 yrs 10mg max dose; rectal diazepam 0.5mg/kg (last resort) 0.3mg/kg IV/IM
Diphenhydramine Pediatric Allergic Reaction / Anaphylaxis	1-2 mg/kg IV/IO/IM
Epinephrine 1:1000 Pediatric Allergic Reaction / Anaphylaxis Pediatric Reactive Airway Disease	0.01mg/kg IM max 0.3mg 0.01mg/kg IM max 0.3mg
Epinephrine 1:10,000 Pediatric Bradycardia Pediatric Cardiac Arrest Neonatal Resuscitation	0.01 mg/kg IV/IO q 5 min prn max of 1 mg 0.01mg/kg IO/IV q 3-5 minutes. max 1mg/dose 0.01 to 0.03 mg/kg IO/IV
Fentanyl Pain Management (non Cardiac)	1mcg/kg IV or 1-2mcg/kg IN (max 100mcg)
Fluid - Normal Saline	20mL/kg IV/IO (10mL/kg in neonates)
Glucose (Oral) Diabetic Emergency	15g P.O
Hydroxocobalamin (Cyanokit) Cyanide Exposure	70mg/kg IV/IO over 15 minutes
Ipratropium Bromide Pediatric Reactive Airway Disease	250mcg (<1 year); 500mcg (≥1 year); only administered with first albuterol treatment.
Lidocaine 2% Adult Intraosseous (EZ-IO)	0.5mg/kg IO, for conscious patient receiving IO only.
Lorazepam Pediatric Seizure	0.1mg/kg IV/IO/IM. May repeat x 1 q 2-5 min
Magnesium Sulfate Pediatric Cardiac Arrest - Torsades Pediatric Tachycardia - Wide Complex (Torsades - Stable)	50mg/kg IO/IV 50mg/kg IV/IO infusion over 20 minutes. Preparation in D5W or NaCl
Methylprednisolone Pediatric Allergic Reaction / Anaphylaxis Pediatric Reactive Airway Disease	2mg/kg IV/IO 2mg/kg IV
Midazolam Pediatric Seizure - Upon EMS arrival Pediatric Seizure - After EMS arrival	0.2mg/kg IM to max of 5mg prior to IV access if the patient presents with seizure activity upon the arrival of EMS 0.1mg/kg IV/IO up to 2mg/dose max of 5mg; 0.2mg/kg IN to max of 5mg
Morphine Sulfate Pediatric Pain Management (non Cardiac)	0.1 mg/kg IV (>1 year); 0.05 mg/kg (<1 year)
Naloxone Pediatric AMS Pediatric Opiate Related Cardiac Arrest	0.1 mg/kg 3 min IV/IO/IN 0.1 mg/kg IV/IO
Ondansetron Pediatric Nausea / Vomiting & Dehydration	2mg IV/IM (8-15kg); 4mg IV/IM (>15kg)
Oxygen Routine Medical Care	Low Flow 2 L/M NC Supplemental 4 L/M NC High Flow 15 L/M NRB or BVM
Pralidoxime Nerve Agent/Organophosphate Poisoning	15mg/kg IV over 30 min
Sodium Bicarbonate Pediatric Cardiac Arrest (Suspected Acidosis) Pediatric AMS (Tricyclics)	1-2mEq/kg IO/IV 1-2mEq/kg IV/IO Repeat PRN to bring QRS < 120ms

Abbreviation List

*** Individual Service Policy May Prohibit Use**

AAA	Abdominal Aortic Aneurysm	J	Joule (electrical measurement)
ABC's	Airway, breathing, circulation	KVO	Keep vein open
ACLS	Advanced Cardiac Life Support	LOC	Level of Consciousness
ALS	Advanced Life Support	Lpm	liters per minute
AMI	Acute Myocardial Infarction	mA	Milliamperes
AMS	Altered Mental Status	Max	Maximum
ASA	Aspirin	mL	Milliliter
BAAM	Beck Airway-Airflow Monitor	µg	Microgram
BP	Blood pressure	Min	Minute
B/p	Blood pressure	mm/Hg	Millimeters of mercury
Bpm	beats per minute	mEq	Millequivalent
BSA	Body Surface Area	Mg	Milligram
BVM	Bag Valve Mask	MgSO ₄	Magnesium Sulfate
CaCl	Calcium Chloride	MI	Myocardial Infarction
CBG	Capillary Blood Glucose	NPA	Nasopharyngeal Airway
cc	Cubic centimeter	NPO	Nothing per mouth
C-spine	Cervical Spine	NTG	Nitroglycerin
CHF	Congestive Heart Failure	NS	Normal Saline
Cx	Chest	MOI	Mechanism(s) of Injury
c/o	Complaining (or complaints) of	O ₂	Oxygen
COPD	Chronic Obstructive Pulmonary Disease	OB	Obstetrical
Cm	Centimeter	OPA	Oropharyngeal Airway
CPR	Cardio-Pulmonary Resuscitation	OD	Overdose
CVA	Cerebrovascular Accident	PEA	Pulseless Electrical Activity
DAM	Difficult Airway Maneuvers	PHTLS	Prehospital Trauma Life Support
DKA	Diabetic Ketoacidosis	PO	By mouth
DNR	Do Not Resuscitate	PPV	Positive Pressure Ventilations
DNAR	Do Not Attempt to Resuscitate Emergency	Prn	As needed
ED	Department	PTA	Prior to arrival
ECG	Electro-cardiogram	Pt	Patient
Epi	Epinephrine	Pts	Patients
ET	Endotracheal	q	Every
ETT	Endotracheal tube	RMC	Routine Medical Care
ETCO ₂	End-tidal Carbon Dioxide	r/o	Rule out
ETOH	Alcohol use or odor present on patient	SBP	Systolic Blood Pressure
Fx	Fracture	SpO ₂	Oxygen Saturation via Pulse Oximetry
G	Gram	SL	Sublingual
GCS	Glasgow Coma Scale	SQ	Sub-cutaneous
HTN	Hypertension	SVT	Supraventricular Tachycardia
Hx / hx	History	TCA	Tricyclic Antidepressant
IO	Intraosseous	TD	Transdermal
IM	Intramuscular	TCP	Transcutaneous pacing
IV	Intravenous	V-Fib	Ventricular Fibrillation (VF)
Kg	Kilogram	V-Tach	Ventricular Tachycardia (VT)
≥	Greater than or equal to	>	Greater than
≤	Less than or equal to	<	Less than
♂	Male	≈	Approximately
♀	Female	Δ	Change

Glossary

anaphylactic shock	rapidly developing, systemic anaphylaxis that produces life-threatening vascular collapse and acute airway obstruction within minutes after exposure to an antigen
angioedema	condition marked by the development of edematous areas of skin, mucous membranes, or internal organs. It is frequently associated with urticaria (hives). It is benign when limited to the skin but can cause respiratory distress when present in the mouth, pharynx, or larynx.
anisocoria	A condition characterized by an unequal size of the pupils
ascites	the abnormal accumulation of fluid in the peritoneal cavity
ataxia	gait marked by staggering and unsteadiness
cardiogenic shock	failure of the heart to pump an adequate supply of blood and oxygen to body tissues. The most common cause is acute myocardial infarction (AMI). Treatment usually includes volume replacement, high flow oxygen, inotropic agents
chronotropic	effects are ones that change the heart rate (i.e. the time between p waves).
clonic	alternating contracting and relaxing the muscles
contralateral	referring to the opposite side
diplopia	double vision
dysarthria	imperfect articulation of speech due to disturbances of muscular control
dry mucous membranes dysphasia	seen in fevers, chronic gastritis, some liver disturbances difficulty swallowing
dystonic	Prolonged involuntary muscular contractions that may cause twisting of body parts, repetitive movements, and increased muscular tone. This is an adverse reaction NOT an allergic reaction. Treatment is IV Benadryl.
eclampsia	a severe hypertensive disorder ($\geq 140/90$) of pregnancy characterized by convulsions and coma, occurring between 20 weeks' gestation and the end of the sixth week postpartum.
epistaxis	hemorrhage from the nose (nosebleed).
etiology	the set of factors that contributes to the occurrence of a disease or injury

gait	manner of walking
gaze	movement of both eyes together
gaze, dysconjugate hepatojugular reflux	Failure of the eyes together with the patient at 30° angle press on the abdomen over the liver lightly. If the jugular veins rise ≈ 4 cm it is a positive reflux which is a sure sign of CHF
hyperglycemia	increase in blood sugar levels without major sign and symptoms
hypovolemic shock	shock occurring when there is an insufficient amount of fluid in the circulatory system. Usually, this is due to the bleeding, diarrhea, or vomiting.
infarction	the death of tissue due to a lack of blood flow. A myocardial infarction is death of part of the heart muscle caused by an obstruction of a coronary artery.
inotropic	influencing the force of muscular contraction (increasing the force)
ischemia	reduced (isch) blood (emia). A condition of inadequate blood flow to a tissue. Ischemia to the heart can cause angina, and if present long enough, infarction.
lividity	skin discoloration, as from bruising, or venous congestion
neurogenic shock	a form of distributive shock due to decreased peripheral vascular resistance. Damage to either the brain or the spinal cord inhibits transmission of neural stimuli to the arteries and arterioles, which reduces vasomotor tone. The decreased peripheral resistance results in vasodilatation and hypotension; cardiac output diminishes due to the altered distribution of blood volume.
nystagmus	constant, involuntary, cyclical movement of the eyeball in any direction
orthopnea	breathing difficulty which occurs when laying flat; symptom of heart failure. It is measured by the number of pillows needed to prop the patient up to enable breathing.
orthostatic hypotension	fall in blood pressure upon standing, which causes symptoms such as dizziness, lightheadedness, dimming or tunnelling of vision, and pain or discomfort in the back of the head and neck.
Paroxysmal- nocturnal dyspnea	(PND) shortness of breath that usually occur when the patients are asleep laying flat. PND commonly occurs several hours after a person with heart failure has fallen asleep. PND resolves quickly once a

person awakens and sits upright. It takes longer to develop than orthopnea.

plegia	complete weakness (unable to move)
pruritus	severe itching
qualitative devices	(capnography) exhaled CO ₂ detecting device used to determine initial ETT placement. It is not used for continuous ventilation monitoring. (TubeCheck™, ETCO ₂ detector, BAAM®, etc).
quantitative capnography	exhaled CO ₂ continuous measuring/monitoring device used for initial ETT placement and allows for continuous end-tidal CO ₂ monitoring.
pallor	lack of color, paleness
rigor mortis	state of hardness and stiffness of muscles in a dead body
sepsis	a systemic inflammatory response to infection, in which there is fever or hypothermia, tachycardia, tachypnea, and evidence of inadequate blood flow to internal organs.
septic Shock	Hypotension and inadequate blood flow to organs, as the result of sepsis. S/S includes hypotension, fever, tachypnea, tachycardia, decreased urinary output. Temperature and hypoxia vary with the degree of sepsis.
supraglottic	located above the glottis
stridor	high-pitched, harsh sound occurring during inspiration, sign of an upper airway obstruction
tonic	tension or contraction especially muscular
urticaria	vascular reaction of the skin characterized by sudden eruption of pale papules/hives and itching.
Valsalva's Maneuver	an attempt to forcibly exhale with the glottis, nose, and mouth closed. This maneuver causes increased intrathoracic pressure, slowing of the pulse, decreased blood return to the heart, and increased venous pressure
vertigo	a sensation of spinning or feeling dizzy; it is a symptom not a disease.