City of Sun Prairie EMS

Prehospital Care Protocols

Medical Director:

Kacey Kronenfeld

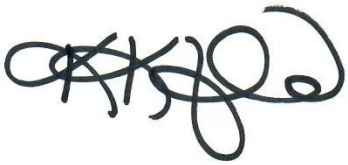
Authorized and Approved for use August 15, 2018

Mission:

Provide prompt, compassionate, clinically excellent care to all residents and visitors of the City of Sun Prairie and Town of Bristol.

AUTHORIZATION

In accordance with Wisconsin Statute 256 and Chapter 110 of the Wisconsin Administrative Code, effective August 15, 2018 the following medical treatment protocols are authorized by the Medical Director for use by the City of Sun Prairie EMS Department. Changes to these protocols can be made only with authorization of the Medical Director.



Kacey Kronenfeld, MD
Medical Director
City of Sun Prairie EMS

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GENERAL GUIDELINES: INTRODUCTION

The following protocols have been developed and approved by the City of Sun Prairie Medical Director (SPEMSMD). These protocols define the standard of care for EMS providers working for the City of Sun Prairie and delineate the expected practice, actions, and procedures to be followed.

No protocol can account for every clinical scenario encountered, and the SPEMSMD recognizes that in rare circumstances deviation from these protocols may be necessary and in a patient's best interest. Variance from protocol should always be done with the patient's best interest in mind and backed by documented clinical reasoning and judgment. Whenever possible, prior approval by direct verbal order from the base medical control physician is preferred. Additionally, all variance from protocol should be documented and submitted for review by agency Medical Director in a timely fashion.

The protocols are presented in an algorithm format. An algorithm is intended to reflect real-life decision points visually. An algorithm has certain limitations, and not every clinical scenario can be represented. Although the algorithm implies a specific sequence of actions, it may often be necessary to provide care out of sequence from that described in the algorithm if dictated by clinical needs. An algorithm provides decision-making support, but need not be rigidly adhered to and is no substitute for sound clinical judgment.

In order to keep protocols as uncluttered as possible, and to limit inconsistencies, individual drug dosing has not been included in the algorithms. It is expected the paramedics will be familiar with standard drug doses. Drug dosages are included with the medications section of the protocols as a reference.

If viewing protocol in an electronic version, it will be possible to link directly to a referenced protocol by clicking on the hyperlink, which is underlined.

PROTOCOL KEY

Contact Base Medical Control indicates that the on-duty physician at St Mary's Sun Prairie Emergency Center will act as the on-line medical control authority and can be reached at 608-229-8564.

Teaching points deemed sufficiently important to be included in the protocol and specific performance benchmarks are separated into grey-filled boxes with a double line border:

- Teaching Points
- Performance Benchmarks

PEDIATRIC PROTOCOLS

For the purposes of these clinical care protocols, pediatric patients are those who are verified to be < 12 years of age or showing signs of puberty, except where identified in a specific protocol.

When caring for pediatric patients, use the Broslow-Luten® weight/length based system to determine medication dosages and equipment sizes.

ON-SCENE TIME BENCHMARKS:

- Medical Patients = 20 minutes
- Trauma Patients = 15 minutes or fewer
- Variances from these benchmarks should be well documented in the ePCR.
- Patients suffering from a serious medical problem or major trauma require rapid assessment, treatment, and transportation to an appropriate hospital for evaluation by a physician, critical interventions, and definitive care. A shortened scene time results in rapid care at a hospital, which in turn is good for the patient because it can expedite how quickly a patient may receive critical life-saving interventions.

GENERAL GUIDELINES: CONFIDENTIALITY

A. The patient-physician relationship, the patient-registered nurse relationship, and the patient-paramedic relationship are recognized as privileged. This means that the physician, nurse, or paramedic may not testify as to confidential communications unless:
   1. The patient consents
   2. The disclosure is allowable by law (such as Medical Board or Nursing Board proceedings, or criminal or civil litigation in which the patient's medical condition is in issue)

B. The prehospital provider must keep the patient's medical information confidential. The patient likely has an expectation of privacy, and trusts that personal, medical information will not be disclosed by medical personnel to any person not directly involved in the patient's medical treatment.
   1. Exceptions
      i. The patient is not entitled to confidentiality of information that does not pertain to the medical treatment, medical condition, or is unnecessary for diagnosis or treatment.
      ii. The patient is not entitled to confidentiality for disclosures made publicly.
      iii. The patient is not entitled to confidentiality with regard to evidence of a crime.

C. Additional Considerations:
   1. Any disclosure of medical information should not be made unless necessary for the treatment, evaluation or diagnosis of the patient.
   2. Any disclosures made by any person, medical personnel, the patient, or law enforcement should be treated as limited disclosures and not authorizing further disclosures to any other person.
   3. Any discussions of prehospital care by and between the receiving hospital, the crewmembers in attendance, or at in-services or audits are done strictly for educational or performance improvement purposes. Further disclosures are not authorized.
   4. Radio communications should not include disclosure of patient names.

GENERAL GUIDELINES: CONSENT

General Principles: Adults

A. An adult in the State of Wisconsin is 18 years of age or older.
B. Every adult is presumed capable of making medical treatment decisions. This includes the right to make "bad" decisions that the prehospital provider believes are not in the best interests of the patient.
C. A person is deemed to have decision-making capacity if he/she has the ability to provide informed consent, i.e., the patient:
    1. Understands the nature of the illness/injury or risk of injury/illness
    2. Understands the possible consequences of delaying treatment and/or refusing transport
    3. Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport.
D. A call to 9-1-1 itself does not prevent a patient from refusing treatment. A patient may refuse medical treatment (IVs, oxygen, medications), but you should try to inform the patient of the need for therapies, offer again, and treat to the extent possible.
E. The odor of alcohol on a patient's breath does not, by itself, prevent a patient from refusing treatment.
F. **Implied Consent:** An unconscious adult is presumed to consent to treatment for life threatening injuries/illnesses.
G. **Involuntary Consent:** a person other than the patient in rare circumstances may authorize Consent. This may include a court order (guardianship), authorization by a law enforcement officer for prisoners in custody or detention, or for persons under a mental health hold or commitment who are a danger to themselves or others or are gravely disabled.

Procedure: Adults

A. Consent may be inferred by the patient's actions or by express statements. If you are not sure that you have consent, clarify with the patient or **CONTACT BASE MEDICAL CONTROL.** This may include consent for treatment decisions or transport/destination decisions.
B. Determining whether or not a patient has decision-making capacity to consent or refuse medical treatment in the prehospital setting can be very difficult. Every effort should be made to determine if the patient has decision-making capacity, as defined above.
C. For patients who do not have decision-making capacity, **CONTACT BASE MEDICAL CONTROL.**
D. If the patient lacks decision-making capacity and the patient's life or health is in danger, and there is no reasonable ability to obtain the patient's consent, proceed with transport and treatment of life-threatening injuries/illnesses. If you are not sure how to proceed, **CONTACT BASE MEDICAL CONTROL.**
E. For patients who refuse medical treatment, if you are unsure whether or not a situation of involuntary consent applies, **CONTACT BASE MEDICAL CONTROL.**

General Principles: Minors

A. A parent, including a parent who is a minor, may consent to medical or emergency treatment of his/her child. There are exceptions:
    1. Neither the child nor the parent may refuse medical treatment on religious grounds if the child is in imminent danger as a result of not receiving medical treatment, or when the child is in a life-threatening situation, or when the condition will result in serious handicap or disability.
    2. The consent of a parent is not necessary to authorize hospital or emergency health care when an EMT in good faith relies on a minor's consent, if the minor is at least 15 years of age and emancipated or married.
B. When in doubt, your actions should be guided by what is in the minor's best interests and base medical control contact.

Procedure: Minors

A. A parent or legal guardian may provide consent to or refuse treatment in a non-life threatening situation. When the parent is not present to consent or refuse:

1. If a minor has an injury or illness, but not a life-threatening medical emergency, you should attempt to contact the parent(s) or legal guardian. If this cannot be done promptly, transport.
2. If the child does not need transport, they can be left at the scene in the custody of a responsible adult (e.g., teacher, social worker, grandparent). It should only be in very rare circumstances that a child of any age is left at the scene if the parent is not also present.
3. If the minor has a life-threatening injury or illness, transport and treat per protocols. If the parent objects to treatment, **CONTACT BASE MEDICAL CONTROL** immediately and treat to the extent allowable, and notify police to respond and assist.

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION

Purpose

A. To provide guidelines for prehospital personnel who encounter a physician at the scene of an emergency.

General Principles

A. The prehospital provider has a duty to respond to an emergency, initiate treatment, and conduct an assessment of the patient to the extent possible.
B. A physician who voluntarily offers or renders medical assistance at an emergency scene is generally considered a "Good Samaritan." However, once a physician initiates treatment, he/she may feel a physician-patient relationship has been established.
C. Good patient care should be the focus of any interaction between prehospital care providers and the physician.

Procedure

A. See algorithm below and sample note to physician at the scene.

Special notes

A. Every situation may be different, based on the physician, the scene, and the condition of the patient.
B. **CONTACT BASE MEDICAL CONTROL** when any question(s) arise.

Physician at the Scene/Medical Direction Note

NOTE TO PHYSICIANS ON INVOLVEMENT WITH EMS PROVIDERS

The prehospital personnel at the scene of this emergency operate under standard policies, procedures, and protocols developed by their Medical Director. The drugs carried and procedures allowed are restricted by law and written protocols.

After identifying yourself by name as a physician licensed in the State of Wisconsin and providing identification, you may be asked to assist in one of the following ways:

1. Offer your assistance or suggestions, but the prehospital care providers will remain under the medical control of their **base medical control physician**, or
2. With the assistance of the prehospital care providers, talk directly to the **base medical control physician** and offer to direct patient care and accompany the patient to the receiving hospital. Prehospital care providers are required to obtain an order directly from the **base medical control physician** for this to occur.

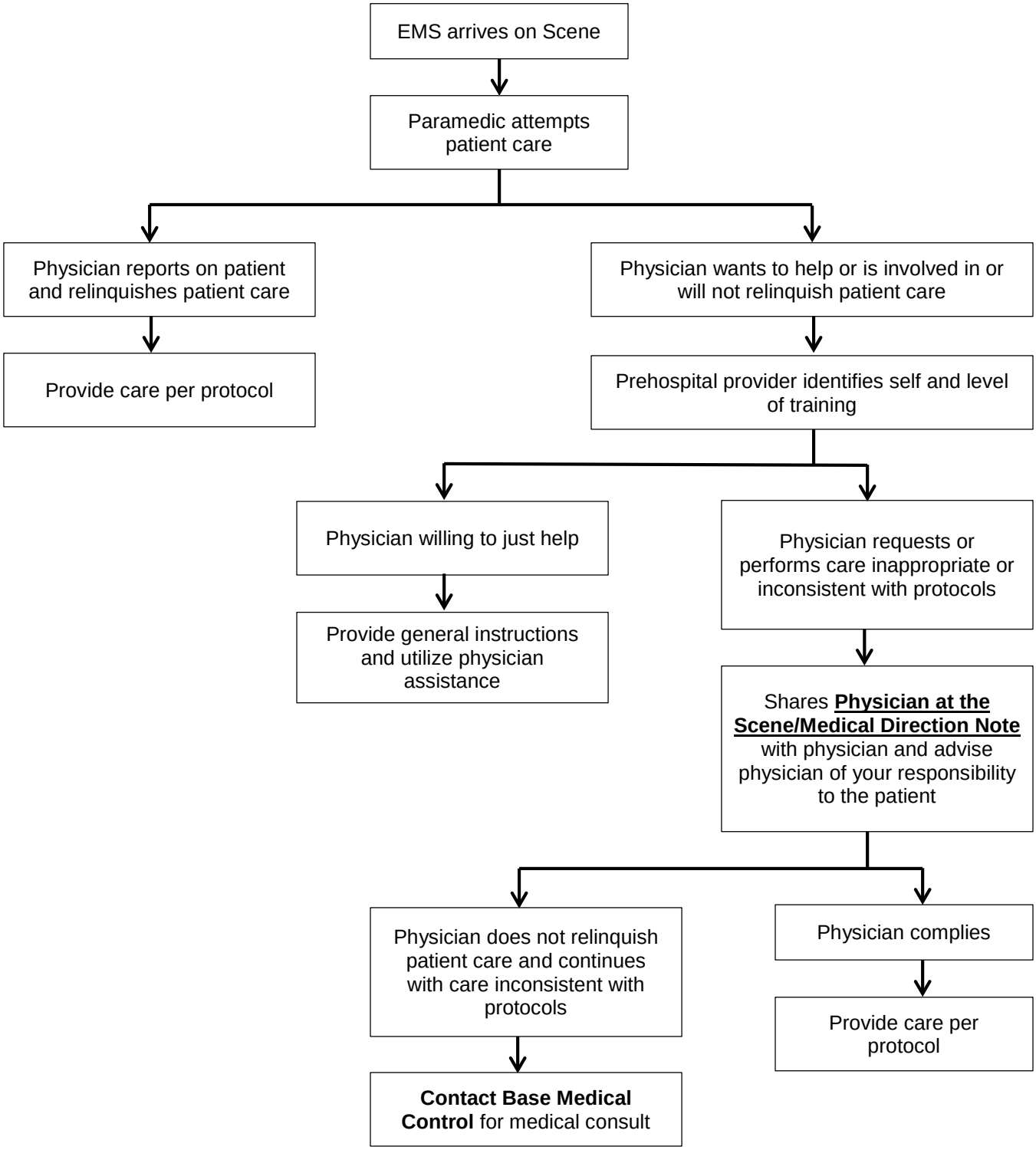
THANK YOU FOR OFFERING YOUR ASSISTANCE DURING THIS EMERGENCY.

_____ _____

Medical Director Agency

PHYSICIAN AT THE SCENE/MEDICAL DIRECTION ALGORITHM

GENERAL GUIDELINES: PHYSICIAN AT THE SCENE



GENERAL GUIDELINES: TERMINATION OF RESUSCITATION

Purpose

To provide guidelines for resuscitation of patients in cardiac arrest in the prehospital setting

General Principles

A. Attempt resuscitation for all patients found pulseless and apneic, unless any of the following are present:
   1. Valid State of Wisconsin "Do Not Resuscitate" bracelet is in place, as defined by WI Statute 154.17(2)
   2. A valid CPR directive present with the patient
   3. Dependent lividity or rigor mortis
   4. Decomposition
   5. Decapitation

B. **CONTACT BASE MEDICAL CONTROL** for patients for whom resuscitative efforts are being withheld, but have circumstances that do not meet the above criteria.

Termination of Resuscitation (TOR)

All pulseless arrest cases will require contact with a base medical control physician to approve termination of resuscitation (TOR). Follow guideline as described below:

1. **Blunt Trauma Arrest**:
   a. **CONTACT BASE MEDICAL CONTROL** for TOR if patient found apneic, pulseless and no response to BLS care including chest compressions and bag valve mask ventilations.
2. **Penetrating Trauma Arrest**:
   a. Resuscitate and transport to a trauma facility.
      i. If time of arrest suspected to be > 15 minutes, and no signs of life or response to BLS care (as above), consider **CONTACT BASE MEDICAL CONTROL** for TOR.
3. **Medical Pulseless Arrest**:
   a. Resuscitate according to **Universal Pulseless Arrest Algorithm** on scene (unless unsafe) until one of the following end-points met:
      i. Return of spontaneous circulation (ROSC).
      ii. No ROSC despite 20 minutes of ALS care. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.
      iii. **CONTACT BASE MEDICAL CONTROL** for TOR at any point if continuous asystole for at least 20 minutes in any patient despite adequate CPR with ventilation and no reversible causes have been identified.
   b. The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:
      i. Hypothermia
      ii. Drowning with hypothermia and submersion < 60 minutes
      iii. Pregnant patient with estimated gestational age ≥ 20 weeks
4. After pronouncement, do not alter condition in any way or remove equipment (lines, tubes, etc.), as the patient is now a potential coroner's case.

DO NOT TERMINATE RESUSCITATION IF PATIENT HAS BEEN MOVED TO THE AMBULANCE OR IF TRANSPORT HAS BEEN INITIATED

- When asystole is seen on the cardiac monitor, confirmation of the rhythm shall include a PRINTED rhythm strip, as well as documented interpretation of the rhythm strip in more than one lead. Low amplitude V-Fib or PEA may be difficult to distinguish from asystole when using only the cardiac monitor display for interpretation.
- The paramedic has the discretion to continue resuscitation efforts despite the above criteria being met if scene safety, location, patient's age, time of arrest, or bystander input compels this decision.

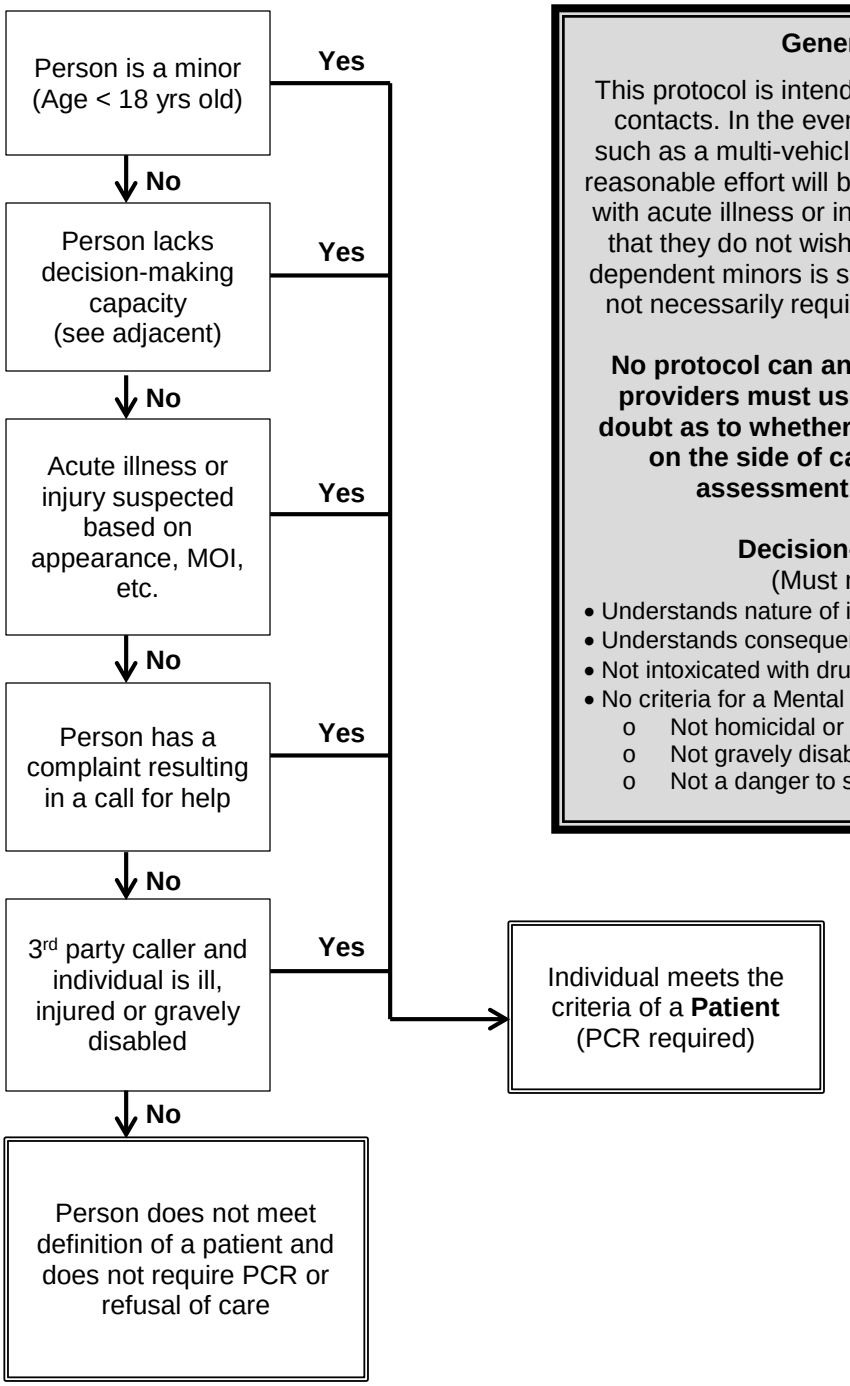
GENERAL GUIDELINES:
ADVANCED MEDICAL DIRECTIVES

A. These guidelines apply to both adult and pediatric patients.
B. There are several types of advance medical directives (documents in which a patient identifies the treatment to be withheld in the event the patient is unable to communicate or participate in medical treatment decisions).
C. Resuscitation may be withheld from, or terminated for, a patient who has a valid CPR Directive, Do Not Resuscitate Order (DNR), or other advance medical directive when:
   1. It is clear to the prehospital provider from the document that resuscitation is refused by the patient or by the patient's attending physician who has signed the document; and
   2. Base physician has approved withholding of or ceasing resuscitation.
D. Suspected suicide does not necessarily negate an otherwise valid CPR Directive, DNR order or other advanced medical directive. **CONTACT BASE MEDICAL CONTROL**
E. The **Wisconsin Do-Not-Resuscitate Order** directs EMS providers to withhold CPR in the event of cardiac or respiratory arrest or malfunction.
   1. “Cardiopulmonary Resuscitation” (CPR) means measures to restore cardiac function or to support breathing in the event of cardiac or respiratory arrest or malfunction. “CPR” includes, but is not limited to, artificial ventilation, chest compression, delivering electric shock, placing tubes in the airway to assist breathing or other basic and advanced resuscitative therapies.
   2. Approved Do-Not-Resuscitate bracelet may be used by an individual and shall be complied with in the same manner as a written CPR Directive.
   3. A signed CPR directive form that has been photocopied, scanned, faxed is valid.
F. A Living Will ("Declaration as to Medical or Surgical Treatment") requires a patient to have a terminal condition, as certified in the patient's hospital chart by two physicians.
G. Other types of advance directives may be a "Durable Medical Power of Attorney," or "Health Care Proxy". Each of these documents can be very complex and require careful review and verification of validity and application to the patient's existing circumstances. Therefore, the consensus is that resuscitation should be initiated until a physician can review the document or field personnel can discuss the patient’s situation with the base physician. **If there is disagreement at the scene about what should be done, CONTACT BASE MEDICAL CONTROL for guidance.**
H. Verbal DNR "orders" are not to be accepted by the prehospital provider. In the event family or an attending physician directs resuscitation be ceased, the prehospital provider should immediately **CONTACT BASE MEDICAL CONTROL**. The prehospital provider should accept verbal orders to cease resuscitation only from the base physician.
I. There may be times in which the prehospital provider feels compelled to perform or continue resuscitation, such as a hostile scene environment, family members adamant that "everything be done," or other highly emotional or volatile situations. In such circumstances, the prehospital provider should attempt to confer with the base for direction and if this is not possible, the prehospital provider must use his or her best judgment in deciding what is reasonable and appropriate, including transport, based on the clinical and environmental conditions, and establish base contact as soon as possible.

Additional Considerations:

- Patients with valid DNR orders or advanced medical directives should receive supportive or comfort care, e.g. medication by any route, positioning and other measures to relieve pain and suffering. Also the use of oxygen, suction and manual treatment of an airway obstruction as needed for comfort.
- Mass casualty incidents are not covered in detail by these guidelines. (See State Trauma Triage Algorithm).
- If the situation appears to be a potential crime scene, EMS providers should disturb the scene as little as possible and communicate with law enforcement regarding any items that are moved or removed from the scene.
- When there is any doubt regarding a patient’s Do-Not-Resuscitate status, perform CPR and **CONTACT BASE MEDICAL CONTROL.**

GENERAL GUIDELINES: PATIENT DETERMINATION: "PATIENT OR NO PATIENT"



General Guidelines

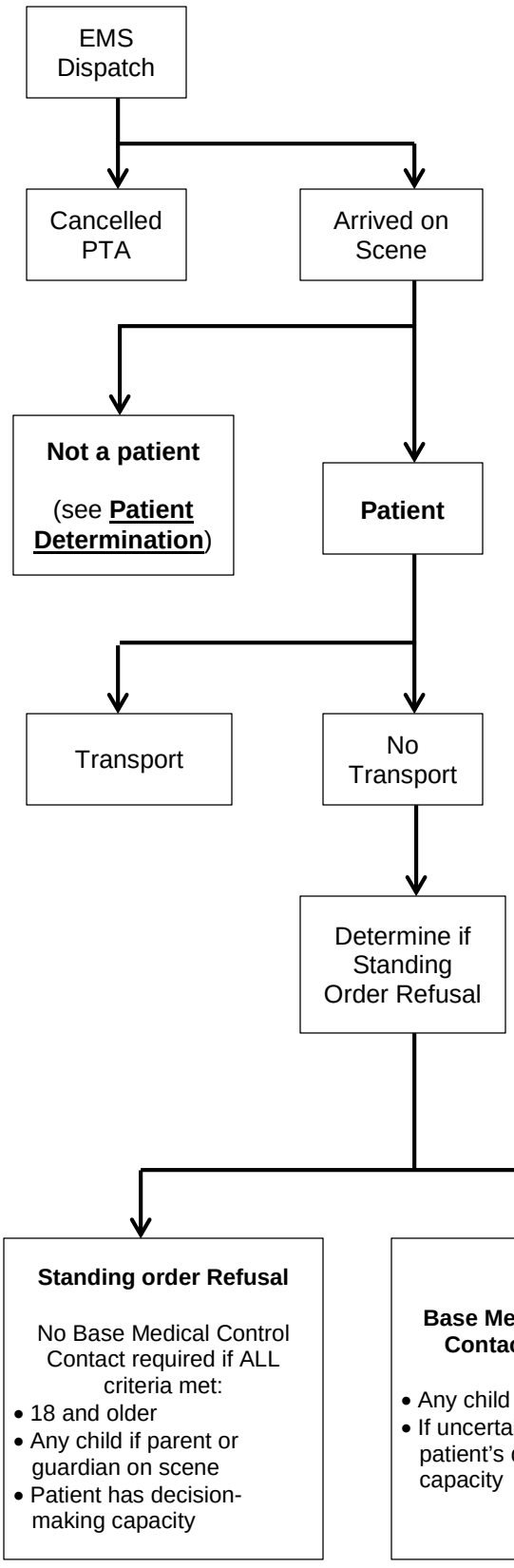
This protocol is intended to refer to individual patient contacts. In the event of a multiple party incident, such as a multi-vehicle collision, it is expected that a reasonable effort will be made to identify those parties with acute illness or injuries. Adult patients indicating that they do not wish assistance for themselves or dependent minors is such a multiple party incident do not necessarily require documentation as patients.

No protocol can anticipate every scenario and providers must use best judgement. When in doubt as to whether individual is a "patient", err on the side of caution and perform a full assessment and documentation.

Decision-Making Capacity
(Must meet all criteria)

- Understands nature of illness or injury
- Understands consequences of refusal of care
- Not intoxicated with drugs or alcohol
- No criteria for a Mental Health Hold:
  - Not homicidal or suicidal
  - Not gravely disabled or psychotic
  - Not a danger to self or others

GENERAL GUIDELINES:
PATIENT NON-TRANSPORT OR REFUSAL



A person who has decision-making capacity may refuse examination, treatment and transport

Refer to **003: General Guidelines: Consent** for complete decision-making capacity guidelines

A person is deemed to have decision-making capacity if he/she has the ability to provide consent, i.e., the patient:

- Understands nature of illness/injury or risk of illness/injury
- Understands the possible consequences of delaying treatment and/or refusing transport
- Given the risks and options, the patient voluntarily refuses or accepts treatment and/or transport

If in doubt about patient decision-making capacity, **CONTACT BASE MEDICAL CONTROL** for physician consult.

For potentially intoxicated patients, refer to **405 Alcohol Intoxication**

Documentation Requirements for Refusal

- Confirm decision-making capacity
- EMS assistance offered and declined
- Risks of refusal explained to patient
- Patient understands risk of refusal
- Name of Base Medical Control physician authorizing refusal of care unless standing order refusal
- Signed refusal of care against medical advice documentation, if possible
- Any minor with any complaint/injury is a patient and requires PCR

High Risk Patients

Base medical control contact is strongly recommended whenever, in the clinical judgement of the EMS provider, the patient is at high risk of deterioration without medical intervention.

GENERAL GUIDELINES: MANDATORY REPORTING OF ABUSED PATIENTS

Purpose

To provide guidelines for the reporting of suspected abuse patients.

General Principles

- Paramedics are required by law to report any suspected abuse or neglect or threatened abuse or neglect to a child seen in the course of their professional duties. Anyone who suspects a child is being maltreated may make such a referral. Persons making reports in good faith are immune from criminal or civil liability. Reports are made to the county in which the child or the child's family resides.
  - Dane County Department of Human Services
    Children, Youth & Families Services Intake
    2322 S Park Street Madison, WI 53713
    Office Hours: 608-261-KIDS (5437)
    After Hours: 608-255-6067
- If you suspect an elder adult or adult at risk has experienced, is currently experiencing, or is at risk of experiencing abuse, neglect, self-neglect, or financial exploitation, your first step should be to contact the appropriate agency.
  - Wisconsin Adults & Elders-at-Risk
    Dane County Department of Human Services
    Daytime Phone: 608-261-9933 (07:45-16:30)
    After Hours Phone: Request through the Dane County Communications Center

GENERAL GUIDELINES: TRANSPORT DESTINATION

Purpose

To provide guidelines for the transport of patients with Time Critical Diagnoses (TCDs) to the most appropriate facility that can provide definitive level care.

Recommendations

When feasible, patients[1] AND/OR their healthcare power of attorney should be permitted to make autonomous decisions regarding their destination hospital, and given the opportunity to choose. Occasionally, patients may need to be directed away from their preferred institution in favor of a specialty resource center, which can provide advanced levels of care not available at every hospital. In those instances, the EMS Provider's decision should be calmly and respectfully communicated to the patient and their family. By keeping a patient-centered focus and always working to do what is right for the patient, transport to the most appropriate level of care will hopefully be an obvious decision. At the time of publication, the following centers have achieved the appropriate level of credentialing for each of the Time Critical Diagnoses (TCDs) and Specialty Resource Center listed:

Primary Stroke Center: Meriter St Mary's- Madison UW Hospital- Main Campus VA Hospital	**Acute Stroke Ready:** (CT and TPA Only) St Mary's- Sun Prairie Columbus UW- American Center	**Burn Unit:** UW Hospital- Main Campus
Level I Trauma Center: (Adult and Pediatric Trauma) UW Hospital- Main Campus	**Level III Trauma Center:** Meriter Hospital St Mary's- Madison	**Level IV Trauma Center:** St Mary's- Sun Prairie Columbus
OB, L&D Receiving: Meriter Hospital St Mary's- Madison Columbus	**Pediatric Intensive Care:** UW Hospital- Main Campus	**Neonatal Intensive Care:** Meriter Hospital St Mary's- Madison UW Hospital- Main Campus
STEMI: (ST Segment Elevation MI) Meriter St Mary's- Madison UW Hospital- Main Campus VA Hospital		**Forensic Nurse:** (Sexual Assault Nurse Examiner) Meriter Hospital

[1] Wisconsin law gives the patient the right to make the ultimate decision on hospital destination as long as it is operationally available to the EMS service (a hospital the service would normally be allowed to transport to, that is not on diversion). If patient assessment dictates the patient should go to a different hospital than their original choice, but the patient is able to make decisions and wants to go another facility, attempt to quickly educate the patient regarding the reasons to go to the alternate facility. Transport per patient final request.

GENERAL PROTOCOL: TRAUMA GUIDELINES

Patients with major trauma (one or more of the following) should be transported to UW Hospital:

- Glasgow Coma Scale ≤13
- Systolic blood pressure (mmHg) <90 mmHG
- Respiratory rate <10 or >29 bpm OR need for ventilation support
- Penetrating Injury to head, neck, torso, extremities proximal to knee
- Chest wall instability or deformity
- ≥2 proximal long bone fractures
- Crushed, degloved, or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis
- Significant mechanism of injury in a pregnant patient

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization

Consider transport to UW ED for patients with the following mechanisms of injury and medical conditions:

- Ejection from an automobile during a motor vehicle crash
- Death of another patient in the same auto
- Extrication time of greater than 20 minutes
- Falls:
  - Children >10 feet (2-3x's patient height)
  - Adults >20 feet
- Victim of a high speed auto crash (impact speed of greater than 40 mph, major auto deformity, intrusion of auto damage into the passenger compartment)
- Auto-pedestrian or auto-bicycle injury with significant (>20mph) speed
- Pedestrian thrown or run over
- Motorcycle crash of greater than 20 mph, or separation of rider from bike
- Age of less than 5 or greater than 55 years old
- Patient with cardiac or respiratory disease
- Major trauma patient with immune system problems
- Major trauma patient with bleeding disorder, or currently taking an anticoagulant medication.

- For patients suffering a traumatic injury, a child is considered anyone 18 years old or younger.
- Patients with serious trauma require rapid assessment, treatment, and transportation to a designated trauma center for evaluation by a physician, critical interventions, and surgery. A shortened scene time results in rapid care at a hospital, which in turn is good for the patient because it can expedite how quickly a patient may receive critical care and necessary surgical interventions.

GENERAL GUIDELINES: BASE CONTACT FOR PHYSICIAN CONSULTATION

Purpose

To explain the SPEMS Medical Directors' expectations regarding base physician contact.

General Principles

A. Base contact for physician consultation is not the same as emergency department pre-notification of patient arrival and handoff.

B. Base contact is used in multiple care scenarios including but not limited to; forewarning of unstable or complicated patients, patient refusal and medical consultation and discussion.

C. Good communication is critical to a smooth transition of care between the prehospital setting and the emergency department.

D. The SPEMS protocols function as standing order treatment guidelines and algorithms designed to reflect WI DHS 110. Much of the scope of practice is also summarized in the **800 Quick Reference for Procedures and Medications Allowed.**

E. Throughout the protocol "**CONTACT BASE MEDICAL CONTROL**" is used to signify the need for call into the online medical control physician. These algorithm points are set and agreed upon by the SPEMSMD and reflect critical decision points in care where communication with physician support is expected.

F. As stated in the introduction the protocols are to be used as guidelines. Protocol cannot account for every patient scenario and deviation from protocol may at times be justified and in the patients' best interest. The SPEMSMD place great faith in the training and expertise of our prehospital colleagues and therefore wide latitude is granted throughout the protocol.

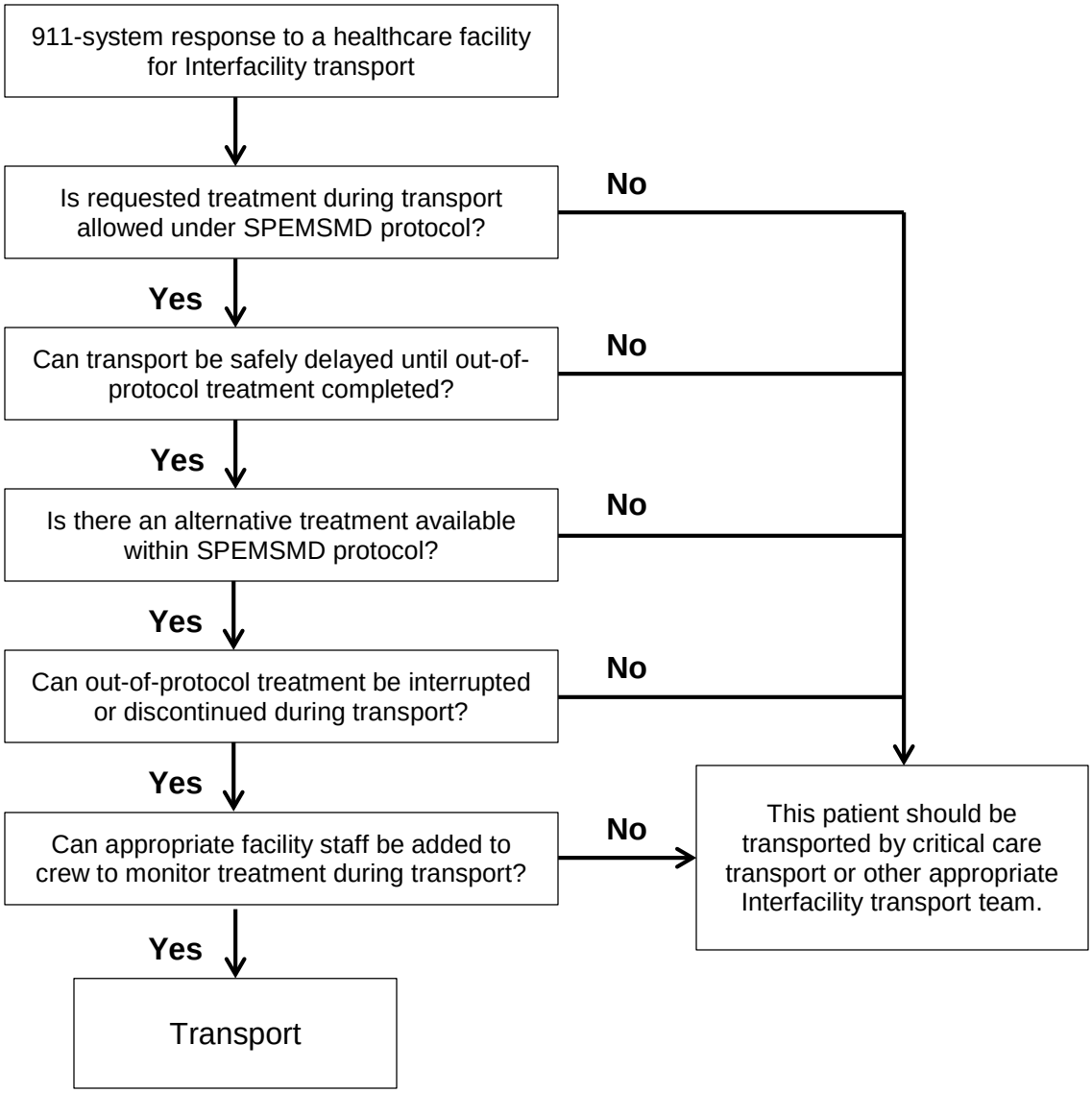
G. Calls to the base medical physician will always be made to (608)229-8564, which is the recorded telephone line at St Mary's Sun Prairie Emergency Center (SPEC).

Preferred Base Contact Recommendations

The SPEMSMD feels strongly that access to medical consultation should be readily available at all times and should be utilized in the following circumstances:

1. Any time "**CONTACT BASE MEDICAL CONTROL**" is required or recommended per protocol.
2. Unusual presentations or patient care situations not covered by set protocol and outside the scope of practice or comfort level of care by individual prehospital provider.
3. Necessary deviation from protocol deemed to be in the best interest of the patient.
4. For selected patient care refusals as indicated by **008 General Guidelines: Patient Non-Transport or Refusal.**
5. During the care of critically ill patient who is not responding to protocol/algorithmic treatment.

911 System Response to Request for Interfacility Transport



Guidelines:

- The purpose of this protocol is to address the scenario where a 911 response is requested for an interfacility transport and is not intended to supersede existing interfacility transport agency protocols for care.
- Follow existing SPEMSMD 911 protocols during transport.
- All reasonable efforts should be made to accommodate sending physician's destination choice, as specialized care may have already been arranged at the receiving facility, however, transports must be consistent with the **010 General Guidelines: Transport Destination** Protocol.

GENERAL GUIDELINES:
NON-PARAMEDIC TRANSPORT

Purpose

To provide guidelines for interactions of EMS Providers while on scene, and to help guide determination of the most appropriate level of service to transport patients to the Emergency Department.

General Principles

The provider with the highest level of Dane County EMS System credentialing on scene will conduct a detailed interview and physical assessment of the patient to determine the chief complaint and level of distress. If the provider determines that the patient is stable and ALL patient care needs can be managed by an EMS Provider at a lower level than Paramedic, then patient care may be transferred and transport initiated AND/OR completed by the lower level provider. All personnel are encouraged to participate in patient care while on-scene, regardless of who "attends" with the patient while en route to the hospital.

The determination of who attends should be based on the patient's immediate treatment needs and any reasonably anticipated treatment needs while en route to the hospital. The highest credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient's clinical conditions, current needs or anticipated needs based on the EMS Provider's evaluation and experience.

The highest credentialed EMS Provider who performs the assessment and determines the appropriate level of care for transport must document the findings of their assessment. Additional documentation shall be completed by the transporting provider. As with all documentation, both providers are responsible for the content of the report.

Patients who meet the criteria below shall be attended by Paramedics (per their operational plan) in the patient care compartment, unless mass casualty incident, natural disaster or previously approved by policy or the On-Line Medical Control.

The care of the following patients cannot be transferred to a lower level of credentialing:

- Any patient who requires or might reasonably require additional or ongoing medications, procedures AND/OR monitoring beyond the scope of practice of the lower credentialed provider. This includes any critically ill or unstable patient as advanced airway management may be required in any decompensating patient. EMT-Basic and EMT-Advanced providers may be credentialed to perform some but not all airway management, and medications associated with airway management are limited to the Paramedic scope of practice by the Wisconsin State Medical Board.
- Any patient for whom ALL EMS providers on scene do not agree can be safely transported without a Paramedic in attendance in the patient care compartment. As a general rule, if providers are questioning who should attend the patient, the highest credentialed level of care should attend.
- Any patient suffering from chest pain of suspected cardiac origin, cardiac dysrhythmia, moderate to severe respiratory distress, multiple trauma or imminent childbirth.
- Postictal patients with high probability of recurrent seizure.
- Patients who have been medicated on the scene cannot be transferred to a provider of a lower credentialing level UNLESS the provided medication is included in the receiving EMS Provider's scope.

If in doubt about which level of care should transport the patient **CONTACT BASE MEDICAL CONTROL** for guidance.

PROCEDURE PROTOCOL: OROTRACHEAL INTUBATION

Indications:
- Respiratory failure
- Absence of protective airway reflexes
- Present or impending complete airway obstruction
- Anticipated prolonged need for positive pressure ventilation

Contraindications:
- There are no absolute contraindications. However, in general the primary goals of airway management are adequate oxygenation and ventilation, and these should be achieved in the least invasive manner possible.
- Orotracheal intubation is associated with worse outcomes among pediatric patients and head injured patients when compared to BLS airway maneuvers. Therefore, it is relatively contraindicated in these populations.
- Intubation is associated with interruptions in chest compressions during CPR, which is associated with worse patient outcomes. Additionally, intubation itself has not been shown to improve outcomes in cardiac arrest.

Technique:
Initiate BLS airway sequence
1. Aggressively suction the airway and pre-oxygenate with BVM ventilations, if possible.
2. Check equipment and position patient:
   a. If trauma: have assistant hold in-line spinal immobilization in neutral position
   b. If no trauma, sniffing position or slight cervical hyperextension is preferred
4. Perform laryngoscopy (Video laryngoscopy primary, direct laryngoscopy back-up)
   a. Ensure that VividTrac is recording intubation procedure
   b. Bougie use is mandatory for video laryngoscopy
5. Place ETT. Confirm tracheal location, appropriate depth and secure tube
   a. Correct tube depth may be estimated as 3 times the internal diameter of tube at teeth or gums. (e.g.: 7.0 ETT is positioned at 21 cm at teeth)
6. Confirm and document tracheal location by:
   a. $ETCO_2$ is a mandatory component of confirmation
   b. Presence and symmetry of breath sounds
   c. Rising SpO_2
   d. Other means as needed
7. Ventilate with BVM. Assess adequacy of ventilations
8. During transport, continually reassess ventilation, oxygenation and tube position with continuous $ETCO_2$ and SpO_2.
9. Verify ET cuff pressure using manometer

Precautions:
- Ventilate at age-appropriate rates. Do not hyperventilate.
- If the intubated patient deteriorates, think “DOPE”
  - **D**islodgement
  - **O**bstruction
  - **P**neumothorax
  - **E**quipment failure (no oxygen)
- Reconfirm and document correct tube position after moving patient and before disconnecting from monitor in ED.
- Limit placement attempts to one for a trauma patient and two for a medical patient.
- Unsuccessful intubation does not equal failed airway management. Many patients cannot be intubated without paralytics. Use King airway or BVM ventilations if 2 attempts at intubation are unsuccessful.

PROCEDURE PROTOCOL: ENDOTRACHEAL TUBE INTRODUCER (BOUGIE)

Indications:
- Patient meets clinical indications for oral intubation.
- Bougie is required with placement of ETT using Video Laryngoscopy.
- Can be used to swap ET tubes when cuff failure is detected.

Considerations:
- 15fr bougie for use with Adult sized VividTrac, ETT size 6.0-8.0 mm ID
- 10fr bougie for use with Pediatric sized VividTrac, ETT size 4.0-6.0 mm ID

Technique:
Bougie Use with VividTrac Video Laryngoscope:
1. Prepare VividTrac as instructed by the manufacturer.
   a. Lube and load ET tube into VividTrac
   b. Lube and load Bougie into ET tube, straight end toward the patient.
2. Insert VividTrac into mouth and visualize airway structures as recommended by the manufacturer.
3. Advance bougie through the glottic opening.
4. Holding bougie in place, remove ETT from track and advance only ETT into the airway. Remove the bougie, take a picture of proper airway placement and remove VividTrac.
5. Verify ETT placement.
6. Secure ETT in place with tube holder.
7. Document procedure in the ePCR.

Bougie Use with Direct Laryngoscopy:
1. Select appropriate equipment for Orotracheal intubation procedure.
2. Lube and load Bougie into ET tube, with the coudé tip toward the patient.
3. Insert laryngoscope and visualize airway structures.
4. Insert the bougie through the glottic opening.
5. Hold the bougie in place and advance only the ETT into the airway.
6. While holding the ETT in place, the remove bougie.
7. Verify ETT placement.
8. Secure the ETT in place with tube holder.
9. Document procedure in the ePCR.

PROCEDURE PROTOCOL: KING AIRWAY

Indications:

- Rescue airway if unable to intubate a patient in need of airway protection
- Primary airway if intubation anticipated to be difficult and rapid airway control is necessary
- Primary airway in pulseless arrest, when attempts at intubation are likely to interrupt CPR

Contraindications:

- Intact gag reflex
- Caustic ingestion

Technique:

1. Initiate BLS airway sequence
2. Select proper size King airway based on patient size (wight or height):

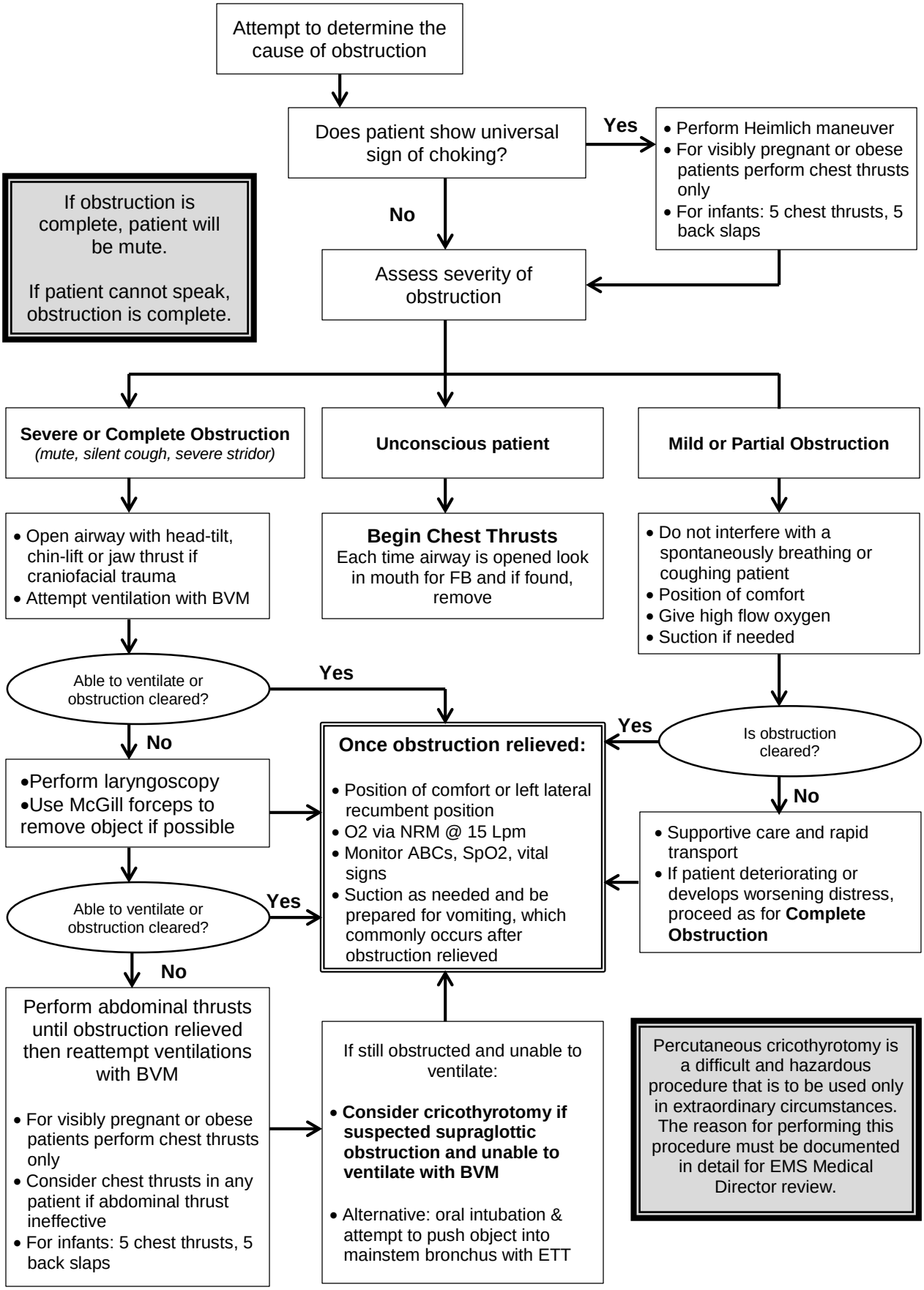
a.< 5kg	= #0
b.5-12kg	= #1
c.35” to 45” tall	= #2
d.41” to 51” tall	= #2.5
e.4’ to 5’ tall	= #3
f.5’-6’ tall	= #4
g.Greater than 6’ tall	= #5

3. Assemble equipment, note correct volume for inflation marked on tube itself, test balloon for leaks, lubricate posterior aspect distal tip with water-soluble lubricant (included)
4. Suction airway and pre-oxygenate with BVM ventilations, if possible
5. If trauma: have assistant hold in-line spinal immobilization in neutral position
6. If no trauma, sniffing position or slight cervical hyperextension is preferred
7. Hold King tube in dominant hand at the connector. With other hand, open mouth and lift chin
8. Rotate King tube so blue index line is facing corner of mouth
9. Introduce tip into mouth and advance airway behind tongue into the hypopharynx
10. As tube passes tongue, rotate King so that blue index line is again facing the chin
11. Without excessive force, advance King so that base is aligned with teeth or gums
12. Using supplied syringe, inflate cuff balloon with correct volume of air (marked on King tube):
    a. Size 0 = 10 mL
    b. Size 1 = 20 mL
    c. Size 2 = 30 mL
    d. Size 2.5 = 35 mL
    e. Size 3 = 50 mL
    f. Size 4 = 70 mL
    g. Size 5 = 80 mL
13. Attach bag to King and begin ventilating patient. While bagging, slowly and slightly withdraw King until ventilations are easy and chest rise is adequate
14. Confirm tube placement by auscultation, chest movement, and $ETCO_2$
15. Monitor patient for vomiting and aspiration
16. Continuously monitor $ETCO_2$, SpO_2, vital signs
17. Verify cuff pressure using manometer

Precautions:

- Use an appropriately sized pediatric King tube for each patient’s size.
- Use with caution in patients with broken teeth, which may lacerate balloon
- Use with caution in patients with known esophageal disease
- Do not remove a properly functioning King tube in order to attempt intubation
- Limit placement attempts to one for a trauma patient and two for a medical patient.

PROCEDURE PROTOCOL: OBSTRUCTED AIRWAY



PROCEDURE PROTOCOL: NEEDLE CRICOTHYROTOMY

Introduction:
Needle cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances for a pediatric patient under one year of age. The reason for performing this procedure must be documented in detail for EMS Medical Director review.

Indications:
- A life-threatening condition exists AND advanced airway management is indicated, ***AND*** adequate oxygenation and ventilation cannot be accomplished by other less invasive means.
- The patient is 12 months of age or less

If Possible **Contact Base Medical Control** ***Before Proceeding!***

Contraindications:
- Anterior neck hematoma is a relative contraindication
- Ability to ventilate the patient by less invasive means

Technique:

The following procedure will be completed using a prepared needle cricothyrotomy kit.

1. Identify cricothyroid membrane between the thyroid and cricoid cartilage.
2. Prepare the site with alcohol swab.
3. Attach a syringe to a 14-gauge intravenous catheter.
4. Puncture the skin in the midline directly over the cricothyroid membrane.
5. Direct the needle through the membrane at a 45-degree angle caudally (toward the feet). Aspirate while advancing the needle.
6. Aspiration of air and/or the sensation of a “pop” signifying entry into the trachea; advance the catheter over the needle.
7. Recheck the position of the catheter by aspirating with the syringe. Proceed with the ventilation using a BVM and high flow oxygen. The hub of the catheter may be attached to a 3.0 or 3.5 mm pediatric ET tube adapter.
8. Confirm and document placement using EtCO2, breath sounds, rising pulse oximetry and other means as needed.

Precautions:
- Success of procedure is dependent on correct identification of cricothyroid membrane
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage
- This technique is only a temporary airway and the patient should be transported emergently to the nearest appropriate facility.

PROCEDURE PROTOCOL: CAPNOGRAPHY

Indications:
- **MANDATORY**: to rule out esophageal intubation and confirm endotracheal tube position in all intubated patients.
- To identify late endotracheal tube dislodgement
- To monitor ventilation and perfusion in any ill or injured patient

Contraindications:
- None

Technique:
1. In a patient with ETT or advanced airway: place $ETCO_2$ detector in-line between airway adaptor and BVM after the airway is positioned and secured.
2. Patients without ETT or advanced airway in place: place $ETCO_2$ cannula on patient. May be placed under the CPAP, NRB facemask or Nebulizer mask.
3. Assess and document both capnography waveform and $ETCO_2$ value.

Precautions:
- To understand and interpret capnography, remember the 3 determinants of $ETCO_2$:
  - o Alveolar ventilation
  - o Pulmonary perfusion
  - o Metabolism
- Sudden loss of $ETCO_2$:
  - o Tube dislodged
  - o Circuit disconnected
  - o Cardiac arrest
- High $ETCO_2$ (> 45)
  - o Hypoventilation/CO_2 retention
- Low $ETCO_2$ (< 25)
  - o Hyperventilation
  - o Low perfusion: shock, PE, sepsis
  - o Cardiac Arrest:
    - In low-pulmonary blood flow states, such as cardiac arrest, the primary determinant of $ETCO_2$ is blood flow, so $ETCO_2$ is a good indicator of quality of CPR.
    - If $ETCO_2$ is dropping, change out the person doing chest compressions.
    - In cardiac arrest, if $ETCO_2$ is not > 10 mmHg after 20 minutes of good CPR, this likely reflects very low CO_2 production (dead body) and is a 100% predictor of mortality.
- Sustained and abrupt rise in ETCO2 during CPR, typically > 40 mmHg, may be indicative of ROSC.

- Change lead on the LP-15 to show capnography waveform.
- Print out a short strip to save capnography waveform on digital record of the event in the LifePak-15.

PROCEDURE PROTOCOL: CONTINUOUS POSITIVE AIRWAY PRESSURE

Indications:
Symptomatic patients with moderate-to-severe respiratory distress as evidenced by at least two (2) of the following:

- Rales (crackles) or bronchospasm
- Dyspnea with hypoxia (SpO_2 less than 93% despite O_2)
- Dyspnea with verbal impairment – i.e. cannot speak in full sentences
- Accessory muscle use
- Respiratory rate greater than 24/minute despite O_2
- Diminished tidal volume

Contraindications:

- Respiratory or cardiac arrest
- Systolic BP less than 90mmHg
- Lack of airway protective reflexes
- Significant altered level of consciousness and unable to follow verbal instructions or signal distress
- Vomiting or active upper GI bleed
- Suspected pneumothorax
- Trauma
- Patient size or anatomy prevents adequate mask seal

Technique:

1. Place the patient in a seated position and explain the procedure to him or her.
2. Assess vital signs (BP, HR, RR, SpO_2, and $ETCO_2$).
3. Plug CPAP device into oxygen port. (O2 RESQ device delivers a 50% FiO2)
4. Apply the CPAP mask and secure with provided straps, progressively tighten the mask as tolerated to minimize air leak.
5. Start with a PEEP setting of 5 cmH20 and titrate the PEEP setting to reach the desired effect.
6. Monitor patient continuously, record vital signs every 5 minutes.
7. Assess patient for improvement as evidenced by the following:
    a. Reduced dyspnea
    b. Reduced verbal impairment, respiratory rate and heart rate
    c. Increased SpO_2
    d. Stabilized blood pressure
    e. Appropriate $ETCO_2$ values and waveforms
    f. Increased tidal volume
8. Observe for signs of deterioration or failure of response to CPAP:
    a. Decrease in level of consciousness
    b. Sustained or increased heart rate, respiratory rate or decreased blood pressure
    c. Sustained low or decreasing SpO_2 readings
    d. Rising $ETCO_2$ levels or other $ETCO_2$ evidence of ventilatory failure
    e. Diminished or no improvement in tidal volume

Precautions:

- Should patient deteriorate on CPAP:
    - Troubleshoot equipment
    - Consider endotracheal intubation
    - Assess need for possible chest decompression due to pneumothorax
    - Assess for possibility of hypotension due to significantly reduced preload from positive pressure ventilation
- In-line nebulized medications (**Albuterol**/**Ipratropium**) may be given during CPAP as indicated.
- Consider adding supplemental oxygen to increase the percentage of oxygen delivered.

PROCEDURE PROTOCOL: PERCUTANEOUS CRICOTHYROTOMY

Introduction:
Percutaneous cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The reason for performing this procedure must be documented in detail for EMS Medical Director review.

Indications:
- A life-threatening condition exists AND advanced airway management is indicated, ***AND*** adequate oxygenation and ventilation cannot be accomplished by other less invasive means.
- Use a 2.0 mm QuickTrach for patients from 12 months to 8 years of age.

If Possible **Contact Base Medical Control** ***Before Proceeding!***

Contraindications:
- Anterior neck hematoma is a relative contraindication.
- Ability to ventilate the patient by less invasive means.

Technique:

1. Open the package, remove the device and familiarize yourself with its contents.
2. Place the patient in a supine position. Assure stable positioning of the neck region (place a pillow or towel under the patient's shoulders) and hyperextend the neck. Secure the larynx laterally between the thumb and forefinger. Find the cricothyroid ligament (in the midline between the thyroid cartilage and the cricoid cartilage). This is the puncture site. Cleanse this site with an alcohol swab.
3. Firmly hold the device and puncture the cricothyroid ligament at a 90-degree angle. (Note: Because of the sharp tip and conical shape of the needle, an incision of the skin with a scalpel is not necessary.) The opening of the trachea is achieved by dilating through the skin. This reduces the risk of bleeding as only the smallest necessary opening is made.
4. After puncturing the cricothyroid membrane, check the entry of the needle into the trachea by aspirating air through the syringe. If air is present, the needle is within the trachea. Should no aspiration of air be possible because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made. Now change the angle to 60 degrees and advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the rear wall of the trachea.
5. Remove the stopper. After the stopper is removed, be careful not to advance the device further with the needle still attached.
6. Hold the needle and the syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rest on the neck. Carefully remove the needle and syringe. Next, secure the cannula with the neck tape, apply the connecting tube to the 15 mm connection and connect the other end to the BVM.
7. Confirm and document placement using EtCO2, breath sounds, rising pulse oximetry and other means as needed.

Precautions:
- Success of procedure is dependent on correct identification of cricothyroid membrane.
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage.

PROCEDURE PROTOCOL: NEEDLE THORACOSTOMY

Indication:

All of the following clinical indicators must be present:

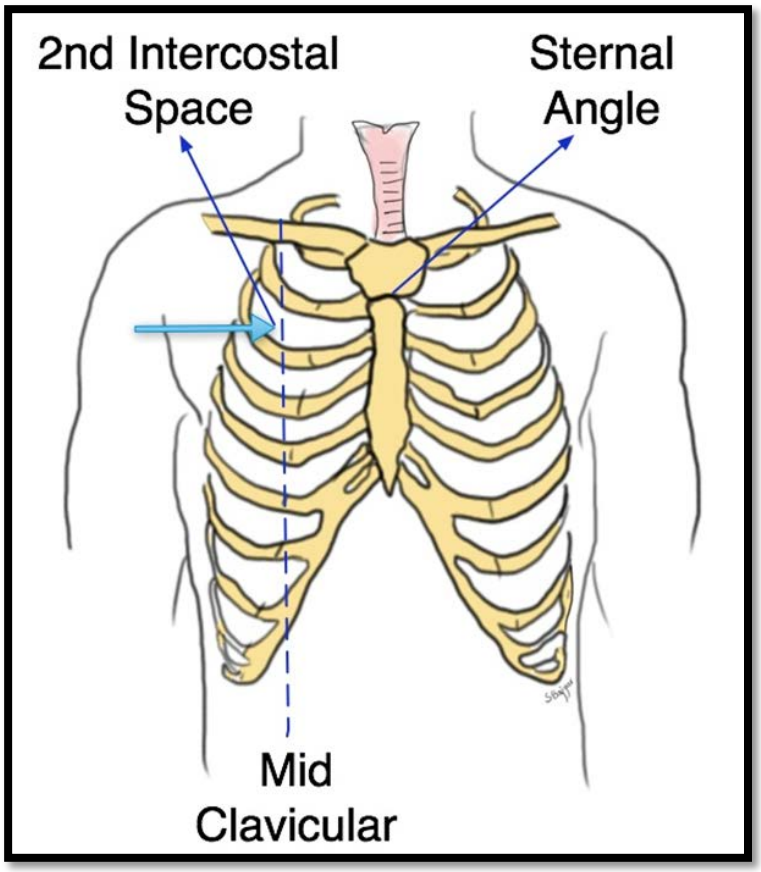
- Severe respiratory distress
- Unilateral absent or decreased breath sounds

Technique:

A. Expose entire chest.
B. Locate landmarks for needle thoracostomy- 2nd intercostal space at midclavicular line
C. Clean skin overlying site with available skin prep.
D. Insert 3.25", 14g angiocath immediately above superior edge of rib cage at selected site
   - Remember: the neurovascular bundle (nerve, artery and vein run under the inferior edge of the ribs)
E. Insert the needle perpendicular to the skin until there is a loss of resistance and a return of air.
F. Assess effectiveness of procedure- lung sounds, respiratory status, pulses, patient's clinical condition
G. Notify receiving hospital of needle decompression attempt.

Precautions:

A. Angiocath may become occluded with blood or by soft tissue.



PROCEDURE PROTOCOL:
SpCO MONITORING

Indications:

- Persons with suspected or known exposure to carbon monoxide.
- Signs and Symptoms - Altered mental status / dizziness, headache, nausea/vomiting, chest pain/respiratory distress, neurological impairments, vision problems/reddened eyes, tachycardia/tachypnea, arrhythmias, seizures, coma

Technique:

1. RAD-57c is available for use at the Sun Prairie Emergency Center. A unit (Fire or Law) must be sent to retrieve the device.
2. Apply probe to patient's middle finger or any other digit as recommended by the manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from lights if possible. Where the manufacturer provides a light shield it should be used.
3. Allow machine to register the percent of circulating carboxyhemoglobin values.
4. Verify pulse rate on machine with actual palpable pulse of the patient.
5. Record levels in patient care report or on the scene rehabilitation form.
   a. If CO <5%, assess for other possible illness or injury.
   b. If CO >5% to <15% and symptomatic from Carbon Monoxide – treat per **Carbon Monoxide Exposure Protocol.**
   c. If CO >15% = Treat per **Overdose and Poisoning: Carbon Monoxide Protocol** and Transport.
6. Monitor critical patients continuously with pulse ox and SpCO until arrival at the hospital.
7. Document percent of carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
8. Use the pulse oximetry feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
9. The pulse oximeter reading should never be used to withhold Oxygen from a patient in respiratory distress.
10. Factors which may reduce the reliability of the reading include:
    a. Poor peripheral circulation (blood volume, hypotension, hypothermia)
    b. Excessive external lighting, particularly strobe/flashing lights
    c. Excessive sensor motion
    d. Fingernail polish (may be removed with acetone pad)
    e. Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    f. Jaundice
    g. Placement of BP cuff on same extremity as pulse ox probe

PROCEDURE PROTOCOL: OROGASTRIC TUBE INSERTION

Indications:
- Gastric decompression in an intubated adult patient.
- After successful placement of an LTA

Contraindications:
- History of alkali ingestion, or esophageal disease (i.e. stricture or cancer).
- Comatose state with unprotected airway (as procedure will induce vomiting)
- Penetrating cervical injuries in the awake trauma patient.

Technique:
1. Measure the length of the tube from the umbilicus to ear lobe to corner of the mouth.
2. Lubricate the tube with a water based lubricant prior to insertion.
3. Insert lubricated tube through the gastric port of the LTA or lift tongue/jaw anteriorly while passing tip lateral to endotracheal tube.
4. Continue to advance the tube gently until the appropriate distance is reached.
5. Confirm placement by injecting 20cc of air and auscultate for the whoosh or bubbling of the air over the stomach. If any doubt about placement, remove and repeat the insertion.
6. Secure the tube.
7. Decompress the stomach of air and food by connecting the tube to low continuous suction (green).
8. Document the procedure, time, and result (success) on/with the PCR.

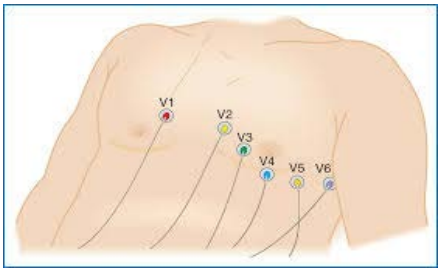
PROCEDURE PROTOCOL: CARDIAC MONITORING

Indications:

- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope
- CHF
- Abdominal pain above the umbilicus
- Undifferentiated respiratory complaint
- 4-Lead monitoring requires no specific condition to apply

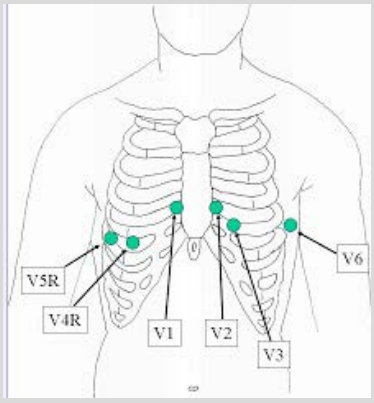
Technique:

1. Assess patient and monitor cardiac status. If possible, obtain 12-Lead EKG prior to initiating any treatments.
2. If patient is unstable, definitive treatment is the priority.
3. Prepare EKG monitor and connect patient cable to electrodes.
4. Expose chest and prep as necessary. Modesty of the patient should be respected.
5. Apply chest, extremity and precordial leads using the following landmarks:
    a. RA: Right arm or as directed by manufacturer
    b. LA: Left arm or as directed by manufacturer
    c. RL: Right leg
    d. LL: Left leg
    e. V1: 4th intercostal space at right sternal border
    f. V2: 4th intercostal space at left sternal border
    g. V3: Directly between V2 and V4
    h. V4: 5th intercostal space at mid-clavicular line
    i. V5: Level with V4 at left anterior axillary line
    j. V6: Level with V5 at left mid-axillary line
    k. Instruct patient to remain still

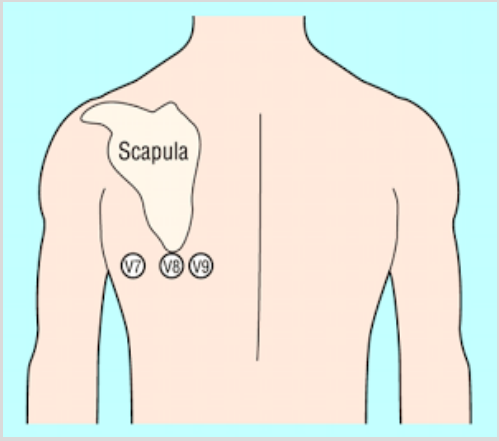


6. Press the 12-Lead EKG button to acquire EKG. (complete age and gender questions correctly)
7. If STEMI identified, notify STEMI Hospital immediately. Report STEMI Alert and a detailed report to follow. Transmit the EKG as soon as possible.
8. Transmission of LP-15 data to Field Bridge is required for all cardiac related patient contact and recommendations for all cardiac monitoring events.

•Consider the use of V4R for a suspected Right sided MI



•Consider the use of V7-V9 for a suspected posterior MI. V4=V7; V5=V8; V6=V9



PROCEDURE PROTOCOL: SYNCHRONIZED CARDIOVERSION

Unstable tachyarrhythmia with a pulse

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Check:
- O2 via NRB facemask
- Functioning IV line
- Suction
- Advanced airway equipment ready

↓

Sedate with **benzodiazepine** and **Pain Management** with **opioid** whenever possible

↓

Perform Synchronized Cardioversion
- Use 100 Joules biphasic in adults and 1-2 Joules/kg in children < 12 years old

↓

Repeat Synchronized Cardioversion
- Use double the dose of the first cardioversion

↓

Continue treatment according to **Tachyarrhythmia with a Pulse** protocol

This procedure protocol applies to conscious, alert patients with signs of poor perfusion due to tachyarrhythmia in whom synchronized cardioversion is indicated according to **Tachyarrhythmia with a Pulse** protocol

Precautions:
- If rhythm is AV nodal re-entrant tachycardia (AVNRT, historically referred to as "PSVT") it is preferred to attempt a trial of **Adenosine** prior to electrical cardioversion, even if signs of poor perfusion are present, due to rapid action of **Adenosine**
- If defibrillator does not discharge in 'Sync' mode, then deactivate 'Sync' mode and reattempt
- If sinus rhythm is achieved, however briefly, then dysrhythmia resumes immediately, repeated attempts at higher energies are unlikely to be helpful. First correct hypoxia, hypovolemia, etc. prior to further attempts at cardioversion
- If pulseless treat according to **Universal Pulseless Arrest Algorithm**
- Chronic atrial fibrillation is rarely a cause of hemodynamic instability, especially if the rate is < 150 bpm. First correct hypoxia, hypovolemia, etc., before considering cardioversion of chronic atrial fibrillation, which may be difficult or impossible and poses risk of stroke.
- Sinus tachycardia rarely exceeds 150 bpm in adults or 220 bpm in children < 8 years and does not require or respond to cardioversion. Treat underlying causes.
- Transient dysrhythmias or ectopy are common immediately following cardioversion and rarely require specific treatment other than supportive care

PROCEDURE PROTOCOL: TRANSCUTANEOUS CARDIAC PACING

Indications:
Symptomatic bradyarrhythmias (includes A-V block) not responsive to medical therapy

Precautions
- A conscious patient will experience discomfort; consider sedation with **benzodiazepine** if blood pressure allows.

Contraindications:
- Pacing is contraindicated in pulseless arrest.

Technique:
1. If not already placed, apply electrodes as per manufacturer specifications: (-) left anterior, (+) left posterior.
2. Turn pacer feature on.
3. Pacing rate is set at default to 70 beats per minute (BPM)
4. Increase current 10 mAmps until capture or 200 mAmps (usually captures around 100 mAmps).
5. Confirm that pacer senses intrinsic cardiac activity by adjusting ECG size.
6. If there is electrical capture, check for femoral pulse.
7. If no capture occurs with maximum output, discontinue pacing and resume ACLS.

Complications:
- Ventricular fibrillation and ventricular tachycardia are rare complications, but follow appropriate protocols if either occur.
- Pacing is rarely indicated in patients under the age of 12 years.
- Muscle tremors may complicate evaluation of pulses; femoral pulse may be more accurate.
- Pacing may cause diaphragmatic stimulation and apparent hiccups.

PROCEDURE PROTOCOL: PHYSICAL RESTRAINT

Indications:

A. Physical restraint of patients is permissible and encouraged if the patient poses a danger to him or herself or to others. Only reasonable force is allowable, i.e., the minimum amount of force necessary to control the patient and prevent harm to the patient or others. Try alternative methods first (e.g., verbal de-escalation should be used first if the situation allows).
B. Consider pharmacological treatment (sedation) of agitation in patients that require transport and are behaving in a manner that poses a threat to him or herself or others.
   - See **Agitated/Combative Patient Protocol**: (The term "chemical restraint" is no longer preferred)
C. Restraints may be indicated for patients who meet the following criteria:
   - A patient who is significantly impaired (e.g. intoxication, medical illness, injury, psychiatric condition, etc) and lacks decision-making capacity regarding his or her own care.
   - A patient who exhibits violent, combative or uncooperative behavior who does not respond to verbal de-escalation.
   - A patient who is suicidal and considered to be a risk for behavior dangerous to his or herself or to healthcare providers.

Precautions:

A. When appropriate, involve law enforcement
B. Restraints shall be used only when necessary to prevent a patient from seriously injuring him or herself or others (including the ambulance crew), and only if safe transportation and treatment of the patient cannot be accomplished without restraints. They may not be used as punishment, or for the convenience of the crew.
C. Any attempt to restrain a patient involves risk to the patient and the prehospital provider. Efforts to restrain a patient should only be done with adequate assistance present.
D. Be sure to evaluate the patient adequately to determine his or her medical condition, mental status and decision-making capacity.
E. Do not use hobble restraints and do not restrain the patient in the prone position or any position that is impairing the airway or breathing.
F. Search the patient for weapons.
G. Handcuffs are not appropriate medical restraints and should only be placed by law enforcement personnel. See **Handcuff Protocol**.

Technique:

A. Treat the patient with respect. Attempts to verbally reassure or calm the patient should be done prior to the use of restraints. To the extent possible, explain what is being done and why.
B. Have all equipment and personnel ready (restraints, suction, a means to promptly remove restraints).
C. Use assistance such that, if possible, 1 rescuer handles each limb and 1 manages the head or supervises the application of restraints.
D. Apply restraints to the extent necessary to allow treatment of, and prevent injury to, the patient. **Under-restraint may place patient and provider at greater risk**.
E. After application of restraints, check all limbs for circulation. During the time that a patient is in restraints, continuous attention to the patient's airway, circulation and vital signs in mandatory. A restrained patient may never be left unattended.

Documentation

Document the following in all cases of restraint:

A. Description of the facts justifying restraint
B. Efforts to de-escalate prior to restraint
C. Type of restraints used
D. Condition of the patient while restrained, including reevaluations during transport
E. Condition of the patient at the time of transfer of care to emergency department staff
F. Any injury to patient or to EMS personnel

Complications:

A. Aspiration: continually monitor patient's airway
B. Nerve injury: assess neurovascular status of patient's limbs during transport
C. Complications of medical conditions associated with need for restraint
   - Patients may have underlying trauma, hypoxia, hypoglycemia, hyperthermia, hypothermia, drug ingestion, intoxication or other medical conditions.
D. Excited Delirium Syndrome. This is a life-threatening medical emergency. These patients are truly out of control. They will have some or all of the following symptoms: paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, and hyperthermia

PROCEDURE PROTOCOL: TASER PROBE REMOVAL

Indications

- Patient with TASER probe(s) embedded in skin.

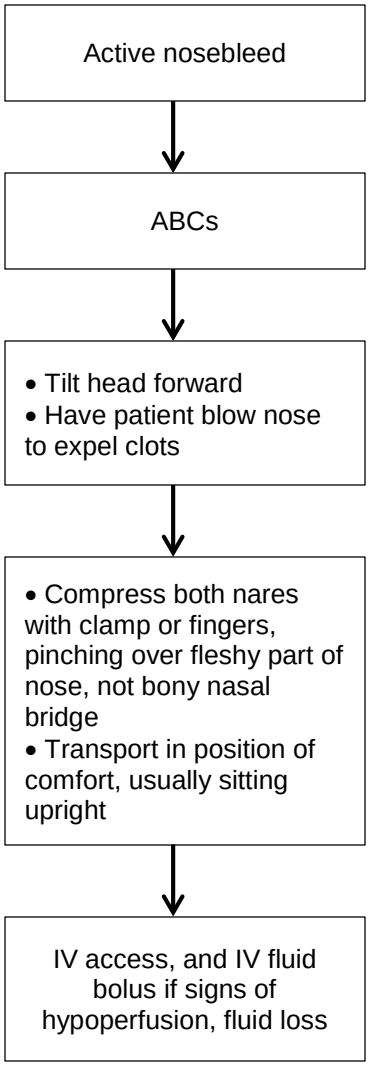
Contraindications

- TASER probe embedded in the eye or genitals. In such cases, transport patient to an emergency department for removal.

Technique

1. Confirm the TASER has been shut off and the barb cartridge has been disconnected.
2. Using a pair of shears cut the TASER wires at the base of the probe.
3. Place one hand on the patient in area where the probe is embedded and stabilize the skin surrounding the puncture site. Using the other hand (or use pliers) firmly grasp the probe.
4. In one uninterrupted motion, pull the probe out of the puncture site maintaining a 90° angle to the skin. Avoid twisting or bending the probe.
5. Repeat the process for any additional probes.
6. Once the probes are removed, inspect and assure they have been removed intact. In the event the probe is not removed intact or there is suspicion of a retained probe, the patient must be transported to the emergency department for evaluation.
7. Cleanse the probe site and surrounding skin with betadine and apply sterile dressing.
8. Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.

PROCEDURE PROTOCOL: EPISTAXIS MANAGEMENT



General Guidelines:

- Most nose bleeding is from an anterior source and may easily be controlled
- Anticoagulation with aspirin, clopidogrel (Plavix), warfarin (Coumadin) will make epistaxis much harder to control. Note if your patient is taking these or other anticoagulant medications
- Posterior epistaxis is a true emergency and may require advanced ED techniques such as balloon tamponade or international radiology. Do not delay transport. Be prepared for potential airway issues.
- Patients using nasal cannula oxygen may have cannula placed in mouth while nares are clamped or compressed for nosebleed

PROCEDURE PROTOCOL: TOURNIQUET PROTOCOL

Indications:

A tourniquet may be used to control potentially fatal hemorrhage only after other means of hemorrhage control have failed.

Precautions:

A. A tourniquet applied incorrectly can increase blood loss.
B. Applying a tourniquet can cause nerve and tissue damage whether applied correctly or not. Proper patient selection is of utmost importance.
C. Injury due to tourniquet placement is unlikely if the tourniquet is removed within 1 hour. In cases of life threatening bleeding, benefit outweighs theoretical risk.
D. A commercially made tourniquet is the preferred tourniquet. If a commercially manufactured tourniquet is not available, a blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. Other improvised tourniquets are not allowed.

Technique:

A. First attempt to control hemorrhage by using direct pressure over bleeding area.
B. If a discrete bleeding vessel can be identified, point pressure over bleeding vessel is more effective than a large bandage and diffuse pressure.
C. If unable to control hemorrhage using direct pressure, apply tourniquet according to manufacturer specifications and using the steps below:
    1. Cut away any clothing so that the tourniquet will be clearly visible. NEVER obscure a tourniquet with clothing or bandages.
    2. Apply tourniquet proximal to the wound and not across any joints.
    3. Tighten tourniquet until bleeding stops. Applying tourniquet too loosely will only increase blood loss by inhibiting venous return.
    4. Mark the time and date of application on the patient's skin next to the tourniquet.
    5. Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.

PROCEDURE PROTOCOL: MUCOSAL ATOMIZER (MAD)

Indications:
- Altered mental status, presumed or possible opiate overdose
- Seizures
- Pain management

Contraindications:
DO NOT USE on patient if:
- Severe nasal/facial trauma
- Active nasal bleeding or discharge

Technique:
1. Determine appropriate dose of medication per protocol
2. Draw medication into syringe and dispose of the sharps (add an additional 0.1 ml of medication due to dead space), do not administer more than 1 ml per nostril.
3. Attach Mucosal Atomizer Device (MAD) to syringe.
4. With one hand, control the patient's head.
5. Gently introduce MAD into nare, stop when resistance is met.
6. Aim slightly upwards and toward the ear on the same side.
7. Briskly compress the syringe to administer one-half of the medication, repeat the procedure with the remaining medication on the other nare.
8. Document the results in the PCR.

PROCEDURE PROTOCOL: SPINAL IMMOBILIZATION

Indications:
Need for spinal immobilization as determined by protocol

Technique:
1. Gather a backboard, straps, c-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient.
3. Apply an appropriately sized c-collar while maintaining in-line stabilization of the c-spine.
   - This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applies the collar.
   - This may be performed by any credentialed responder if indicated by protocol.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful, but will not do the job by itself).
5. If the patient is supine or prone, consider the log roll technique.
   - For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that maximizes maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars.
   - Never force a patient into a non-neutral position to immobilize them.
   - Such situation may require a second rescuer to maintain manual stabilization throughout the transport to the hospital.
8. Document the time of the procedure in the PCR.

PROCEDURE PROTOCOL: SPINAL IMMOBILIZATION (FOOTBALL PLAYERS)

Indications:
EMS providers must use extreme caution when evaluating and treating an injured football player, especially when the extent of the injury remains unknown. Suspect any unconscious football player to have an accompanying spinal injury until proven otherwise. If the football player isn't breathing or the possibility of respiratory arrest exists, its essential that certified athletic trainers and EMS providers work quickly and effectively to remove the face mask and administer care. In most situations, the helmet should not be removed in the field. Proper management of head and neck injuries includes leaving the helmet and shoulder pads in place whenever possible, removing only the face mask from the helmet and developing a plan to manage head-and-neck injured football players using well-trained sports medicine and EMS providers.

Technique:
The following guidelines and recommendations were developed by the Inter-Association Task Force for the Appropriate Care of the Spine-Injured Athlete:

General Guidelines for Care Prior to Arrival of EMS
- The Emergency Medical Services system should be activated.
- Any athlete suspected of having a spinal injury should not be moved and should be managed as though a spinal injury exists.
- The athlete's airway, breathing and circulation, neurological status and level of consciousness should be assessed.
- The athlete should NOT be moved unless absolutely essential to maintain airway, breathing and circulation
- If the athlete must be moved to maintain airway, breathing and circulation, the athlete should be placed in a supine position while maintaining spinal immobilization
- When moving a suspected spine injured athlete, the head and trunk should be moved as a unit. One accepted technique is to manually splint the head to the trunk.
- The face mask should be removed prior to transport, regardless of current respiratory status.

Indications for Football Helmet Removal:
The athletic helmet and chin straps should only be removed if:
- The helmet and chin strap do not hold the head securely, such that immobilization of the helmet does not also immobilize the head
- The design of the helmet and chin strap is such that even after removal of the face mask the airway cannot be controlled, or ventilation be provided.
- The face mask cannot be removed after a reasonable period of time
- The helmet prevents immobilization for transportation in an appropriate position.

Helmet Removal:
If it becomes absolutely necessary, spinal immobilization must be maintained while removing the helmet.
- Due to the varying types of helmets encountered, the helmet should be removed with close oversight by the team athletic trainers and/or sports medicine staff
- In most circumstances, it may be helpful to remove cheek padding and/or deflate air padding prior to helmet removal.

Spinal Alignment:
Appropriate spinal alignment must be maintained during care and transport using backboard, straps, tape, head blocks or other necessary equipment.
- Be aware that the helmet and shoulder pads elevate an athlete's trunk when in the supine position
- Should either be removed, or if only one is present, appropriate spinal alignment must be maintained.
- The front of the shoulder pads can be opened to allow access for CPR and defibrillation.

PROCEDURE PROTOCOL: VASCULAR ACCESS

Indications:
- Patients requiring IV medications or fluids
- Patients with any potential for deterioration (ie. seizures, altered mentation, trauma, chest pain, difficulty breathing)
- Access of an existing venous catheter for medication or fluid administration in a life threatening situation when no other access is available
- Central venous access in a patient in cardiac arrest

Contraindications:
Child with partial airway obstruction (ie. Suspected epiglotitis) – when agitation from performing procedure may worsen respiratory difficulty.

Technique:
Establishing a new external IV:
1. Saline locks may be used as an alternative to IV tubing and fluid at the discretion of the paramedic
2. Intraosseous access can be used where threat to life exists as provided for in the **PROCEDURE PROTOCOL INTRAOSSEOUS CATHETER INSERTION**.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins
4. Procedure for external jugular cannulation is similar, except there is no tourniquet used.
    - Contraindications to EJ placement: Anterior neck hematoma, anterior neck mass, medical appliance in place covering anterior neck, Previous Surgical Procedure of anterior neck
5. Assemble IV solution and tubing OR saline lock
6. Select appropriate site based on patient condition and insert selected IV catheter
7. Remove tourniquet and needle, placing sharps into appropriate container
8. Secure the IV catheter and tubing or saline lock
9. If using, set IV drip rate to make sure it is flowing at appropriate rate.
10. Document procedure in ePCR

Accessing Existing Catheters:
1. Clean the port of the catheter with alcohol wipe
2. Using sterile technique, withdraw 10cc of blood and place syringe in sharps box
3. Using 5cc normal saline, access the port with sterile technique and gently attempt to flush the saline
4. If there is no resistance, no evidence of infiltration (ie. no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 6.
5. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
6. Begin administration of medications or IV fluids slowly. Observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
7. Record procedure, any complications, and fluids/medications administered in the ePCR.

PROCEDURE PROTOCOL: INTRAOSSEUS CATHETER PLACEMENT

Indications (must meet all criteria):

A. Rescue or primary vascular access device when peripheral IV access not obtainable in a patient with critical illness defined as:
   - Cardiopulmonary arrest or impending arrest
   - Profound shock with severe hypotension and poor perfusion

B. IO placement may be considered prior to peripheral IV attempts in critical patients without identifiable peripheral veins

Technique:

A. Site of choice – tibial plateau: 2 fingerbreadths below the tibial tuberosity on the anteromedial surface of tibia.
B. Clean skin.
C. Place intraosseous needle perpendicular to the bone.
D. Entrance into the bone marrow is indicated by a sudden loss of resistance.
E. Flush line with 10 mL saline. If patient conscious, administer lidocaine for pain control before infusing any other fluids
F. Secure line
   - Even if properly placed, the needle will not be secure. The needle must be secured and the IV tubing taped. The IO needle should be stabilized at all times.
G. Observe for signs of limb swelling, decreased perfusion to distal extremity that would indicate a malpositioned IO catheter or other complication. If limb becomes tense or malperfused, disconnect IO tubing immediately and leave IO in place.
H. A person should be assigned to monitor the IO at the scene and en route to the hospital.
I. Do not make more than one IO placement attempt per bone.
J. Do not remove IO needles in the field.
K. Notify hospital staff of all insertion sites/attempts and apply patient wristband included with kit to identify IO patient.

Complications:

A. Fracture
B. Compartment syndrome
C. Infection

Contraindications:

A. Fracture of target bone
B. Cellulitis (skin infection overlying insertion site)
C. Osteogenesis imperfecta (rare condition predisposing to fractures with minimal trauma)
D. Total knee replacement (hardware will prevent placement)

Side Effects and Special Notes:

A. Some authorities recommend aspiration of marrow fluid or tissue to confirm needle location. This is not recommended for field procedures, as it increases the risk of plugging the needle.
B. Expect flow rates to be slower than peripheral IVs. Pressure bags may be needed. Any drug or IV fluid may be infused.
C. Some manufacturers recommend the use of lidocaine for the treatment of pain associated with fluid administration. Check with your manufacturer and Medical Director for further guidance.

PROCEDURE PROTOCOL: SURGICAL CRICOTHYROTOMY

Introduction:
Surgical cricothyrotomy is high risk / low utilization skill and can be a hazardous procedure. It is to be used only in extraordinary circumstances as defined below. You must document in detail the justification for its use to the EMS Medical Director for his review. Surgical cricothyrotomy is only to be performed by paramedics trained in this procedure. If the airway cannot be secured and the patient cannot be oxygenated move RAPIDLY to Surgical Cricothyrotomy.

Indications:
- A life-threatening condition exists AND advanced airway management is indicated, ***AND*** adequate oxygenation and ventilation cannot be accomplished by other less invasive means.

If Possible **Contact Base Medical Control** ***Before Proceeding!***

Contraindications:
- Anterior neck hematoma is a relative contraindication.
- Surgical cricothyrotomy is contraindicated in patients less than 12 years of age for anatomic reasons.
- Ability to ventilate the patient by less invasive means.

Technique:
1. If possible, position the patient supine with in-line spinal immobilization if indicated. If cervical spine injury is not suspected, neck extension will improve anatomic view.
2. Using aseptic technique (betadine/alcohol wipes), cleanse the area.
3. If right handed, position self on right side of patient, if left handed, position self on left side of patient. Stabilize the larynx with the thumb and middle finger of your non-dominant hand, and identify the cricothyroid membrane, typically 4 fingerbreadths below mandible and 3 fingerbreadths above the sternal notch.
4. Use the Cric-Knife to incise the skin. A vertical incision should be made initially to allow positive identification of cricothyroid membrane. Once cricothyroid membrane has been identified, rotate knife and make a single horizontal and perpendicular “plunge” cut through the cricothyroid membrane.
5. Once the horizontal incision through the cricothyroid membrane is performed, maintain downward pressure on knife. Do NOT remove knife from the tracheal opening. Slide the attached tracheal hook down until it “pops” though the cricothyroid membrane and stops against the posterior wall of the trachea. Hook is then lifted away from handle and traction applied with the non-dominant hand to maintain control of the cricothyroid membrane. Remove knife from patient.
6. While maintaining traction with trach hook, insert the Cric-Key through the incision. Confirmation of proper placement can be made by moving Cric-Key along anterior wall of the trachea palpating the tracheal rings with the device. Once correct placement is obtained, insert the Cric-Key tube down to level of flange. Flange should rest on patient’s anterior neck.
7. Rotate Cric-Key towards patients shoulder and retract to remove from airway.
8. Firmly stabilize the Cric-Key tube and remove the Cric-Key introducer with slow, steady pull. Inflate cuff until resistance is met.
9. Ventilate with BVM and 100% oxygen
10. Confirm and document tracheal tube placement as with all advanced airways: ETCO2 (preferably with waveform capnography) as well as clinical indicators e.g.: symmetry of breath sounds, rising pulse oximetry, etc.
11. Secure tube with supplied holder.
12. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position
13. Continually reassess ventilation, oxygenation and tube placement.

PROCEDURE PROTOCOL: SURGICAL CRICOTHYROTOMY

Precautions:

- Success of procedure is dependent on correct identification of cricothyroid membrane
- Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage from the carotid or jugular vessels, or their branches.
- Excessive force can cause injury to laryngeal cartilages.
- Scalpel and hook insertion through the cricothyroid membrane should be perpendicular to the larynx to avoid injuring the vocal cords.
- Improperly inflated cuff may result in aspiration. Verify the indwelling cuff pressure regularly.
- Removal of tracheal hook prior to full insertion of Cric-Key tube can result in damage to cuff.

Efficacy: **Mabry RI, Nicholas M, Shiner DC, et al. Ann Emerg Med. 2014;63:1-5. The Control Cric had a 100% success rate and only took 34 seconds for tube insertion.**

ADULT CARDIAC ARREST GENERAL PRINCIPLES

Specific Information Needed for Patient Care Report

- Onset (witnessed or unwitnessed), preceding symptoms, bystander CPR, downtime before CPR and duration of CPR
- Past History: medications, medical history, suspicion of ingestion, trauma, environmental factors (hypothermia, inhalation, asphyxiation)

Document Specific Objective Findings

- Unconscious, unresponsive
- Agonal, or absent respirations
- Absent pulses
- Any signs of trauma, blood loss
- Skin temperature

General Guidelines: Chest Compressions

- Push hard and push fast (at least 100/minute, but no more than 120/minute).
- Ensure full chest recoil; Rotate compressor every 2 minutes with rhythm checks.
- During CPR, any interruption in chest compressions deprives the heart and brain of necessary blood flow and lessens chance of successful defibrillation.
- Continue CPR while defibrillator is charging and resume CPR immediately after all shocks. Do not stop to check pulses except at end of CPR cycle and if rhythm is organized at rhythm check.
- Place the Lucas 2 Device as quickly as possible. Use the continuous compression setting.

General Guidelines: Defibrillation

- In unwitnessed cardiac arrest, give first 2 minutes of compressions without interruptions for ventilation. During this time period passive oxygenation is preferred with OPA and NRB facemask. If arrest is witnessed by EMS, immediate defibrillation is first priority.
- All shocks should be given as single maximum energy shocks (LifePak 15 = 360J)

General Guidelines: Ventilation during CPR

- If suspected cardiac etiology of arrest, during first approximately 6 minutes of VT/VF arrest, passive oxygenation with OPA and NRB facemask is preferred to positive pressure ventilation with BVM or advanced airway.
- EMS personnel must use good judgment in assessing likely cause of pulseless arrest. In patients suspected of having a primary respiratory cause of cardiopulmonary arrest, (e.g.: COPD or status asthmaticus), adequate ventilation and oxygenation are a priority.
- In general, patients with cardiac arrest initially have adequately oxygenated blood, but are in circulatory arrest. Therefore, chest compressions are initially more important than ventilation to provide perfusion to coronary arteries.
- Do not interrupt chest compressions and do not hyperventilate. Hyperventilation decreases effectiveness of CPR and worsens outcome.

General Guidelines: Vascular Access

- A peripheral intravenous line is the preferred route for vascular access
- Intraosseous route may be established if unable to gain IV access
- See **Procedure Protocol: Vascular Access**

General Guidelines: Timing of Placement of Advanced Airway

- Advanced airway (e.g. ETT, King) may be placed at any time after initial 2 rounds of chest compressions and rhythm analysis, provided placement does not interrupt chest compressions.
- Once an advanced airway is in place, compressions are given continuously and breaths given asynchronously at 8-10 per minute.
- Always confirm advanced airway placement with $ETCO_2$.
- Use continuous waveform capnography if available. In low flow states such as cardiac arrest, colorimetric CO_2 detector may be inaccurate and not sense very low CO_2 level.

CARDIAC ARREST GENERAL PRINCIPLES

General Guidelines: Pacing

- Pacing is not indicated for asystole and PEA. Instead start chest compressions according to **Universal Pulseless Arrest Algorithm**.
- Pacing should **not** be undertaken if it follows unsuccessful defibrillation of VT/VF as it will only interfere with CPR and is not effective.

General Guidelines: ICD/Pacemaker patients

- If the cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place combo pads at least 1 inch from device. Bi-axillary, anterior/posterior or apex/sternum pad placement may be used.

General Notes

- Manual CPR in a moving ambulance is ineffective, therefore ensure use of the Lucas 2 Device
- In general, work cardiac arrest on scene either to return of spontaneous circulation (ROSC) or to field pronouncement, unless the scene is unsafe or extenuating circumstances are identified.
- **CONTACT BASE MEDICAL CONTROL** for **termination of resuscitation.**

Special Notes:

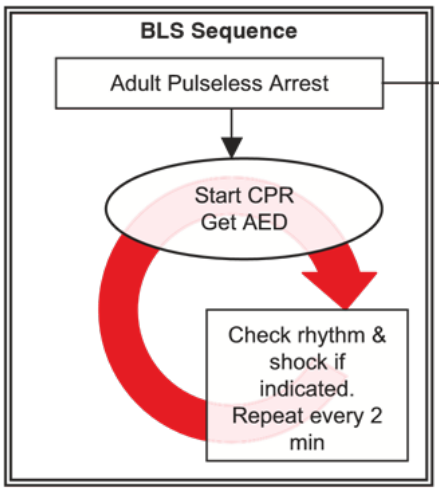
Consider reversible causes of cardiac arrest ("Hs and Ts"):

Hypovolemia	IV Fluid bolus
Hypoxia	Ventilation
Hydrogen Ion (acidosis)	Ventilation
Hyperkalemia	**Sodium bicarbonate, Calcium Chloride**
Hypothermia	See **hypothermia protocol**
Toxins: e.g.: opioid overdose	**Naloxone**
Tamponade (cardiac)	
Tension pneumothorax	**Needle thoracostomy**
Thrombosis (coronary, pulmonary)	

Cardiac Arrest Care Benchmarks:
(all time parameters begin with patient contact)

- 1 minute
  - Cardiac monitor and Lucas Device applied
  - Oral Airway and oxygen placed
- 90 Seconds
  - Vascular access established
- 2 minutes
  - First Epinephrine administered
- 3 minutes
  - Establish advanced airway for non-CCR candidates (cause of arrest = age < 18, respiratory, overdose, drowning, trauma, etc.)
  - Check BGL
- 6 minutes
  - Establish advanced airway for CCR candidates
- 20 minutes
  - **Contact Base Medical Control** to consult about transport if not already underway

ADULT UNIVERSAL PULSELESS ARREST ALGORITHM



- Start CPR
- Attach defibrillator
- Give oxygen

Shockable Rhythm?

YES

VT/VF

Shock + CPR 2 min

- Start IV/IO
- **Epinephrine**

Shockable Rhythm?

YES

A **Shock + CPR 2 min**

Epinephrine every 3-5 min

Shockable Rhythm?

YES

Shock + CPR 2 min

- **Epinephrine** every 3-5 minutes
- **Amiodarone**
- Treat reversible causes
- **Contact Base Medical Control** for additional antiarrhythmic

NO

Asystole/PEA **B**

CPR 2 min

- Start IV/IO
- **Epinephrine**

Shockable Rhythm?

NO

NO

- If asystole, go to box **B**
- If organized rhythm, check pulse. If no pulse, go to box **B**
- If ROSC, begin post-cardiac arrest care
- Treat reversible causes

YES

Go to Box **A**

Compressions

- 2 minutes uninterrupted compressions before rhythm analysis unless arrest witnessed by EMS.
- Minimize interruptions, resume compressions immediately after shocks, rhythm checks. Check pulses only if organized rhythm present.
- Push hard, push fast and allow complete chest recoil.
- Assess quality of CPR with continuous waveform capnography.
- If ETCO2 < 10mmHg improve quality of compressions.
- Apply Lucas 2 CPR device as soon as possible.

Ventilations

- If VF/VT passive oxygenation with NRB facemask preferred for first 6 minutes of CPR.
- If Asystole/PEA or hypoxic arrest suspected (e.g.: asphyxiation, overdose, status asthmaticus) begin ventilations immediately.
- Do not hyper-ventilate.
- If no advanced airway, ventilate at rate of 6-8 breath/min using BVM.
- If advanced airway in place, ventilate at rate of 6-8 breath/min.

Airway

An advanced airway (ETT, King) may be placed at any time after initial 6 minutes of passive oxygenation, if applicable, or as soon as possible if asphyxia arrest suspected, provided placement does not interrupt compressions.

Reversible Causes:

- Hypovolemia
- Hypoxia
- Hydrogen Ion (acidosis)
- Hypo/Hyper-kalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombus (pulmonary, coronary)

ROSC

- Pulse and blood pressure
- Sustained abrupt rise in ETCO2, typically > 40 mmHg
- Consider **Amiodarone** drip if VF/VT and not already given

ADULT POST-RESUSCITATION CARE WITH ROSC

Post-Cardiac Care

- Following ROSC, several simultaneous and stepwise interventions must be performed to optimize care and maximize patient outcome.
- Algorithm stresses high priority assessments and interventions, and will assist provider through complex management decisions.

Return of spontaneous circulation (ROSC) criteria:

- Pulse and measurable blood Pressure
- Increase in ETCO2 on capnography

Document:

- Time of arrest (or time last seen normal)
- Witnessed vs. unwitnessed arrest
- Initial rhythm shockable vs. non-shockable
- Bystander CPR given
- Time of ROSC
- GCS after ROSC
- Initial temperature of patient

ROSC after cardiac arrest

- Initiate Post-cardiac arrest care
- Perform 12-lead EKG

Is STEMI Present? — Yes → Initiate **STEMI Alert**

No

- Assess for shock and volume status
- Peripheral access: IV x2/IO
- Oxygenation/Ventilation
  - o Secure advanced airway if indicated
  - o Avoid hyperventilation
  - o Apply and monitor ETCO2
  - o Correct hypoxemia
- Elevate head of bed 30°

Is there hypotension for age and/or defined signs of shock? — Yes → **Medical Hypotension/Shock Protocol**

No

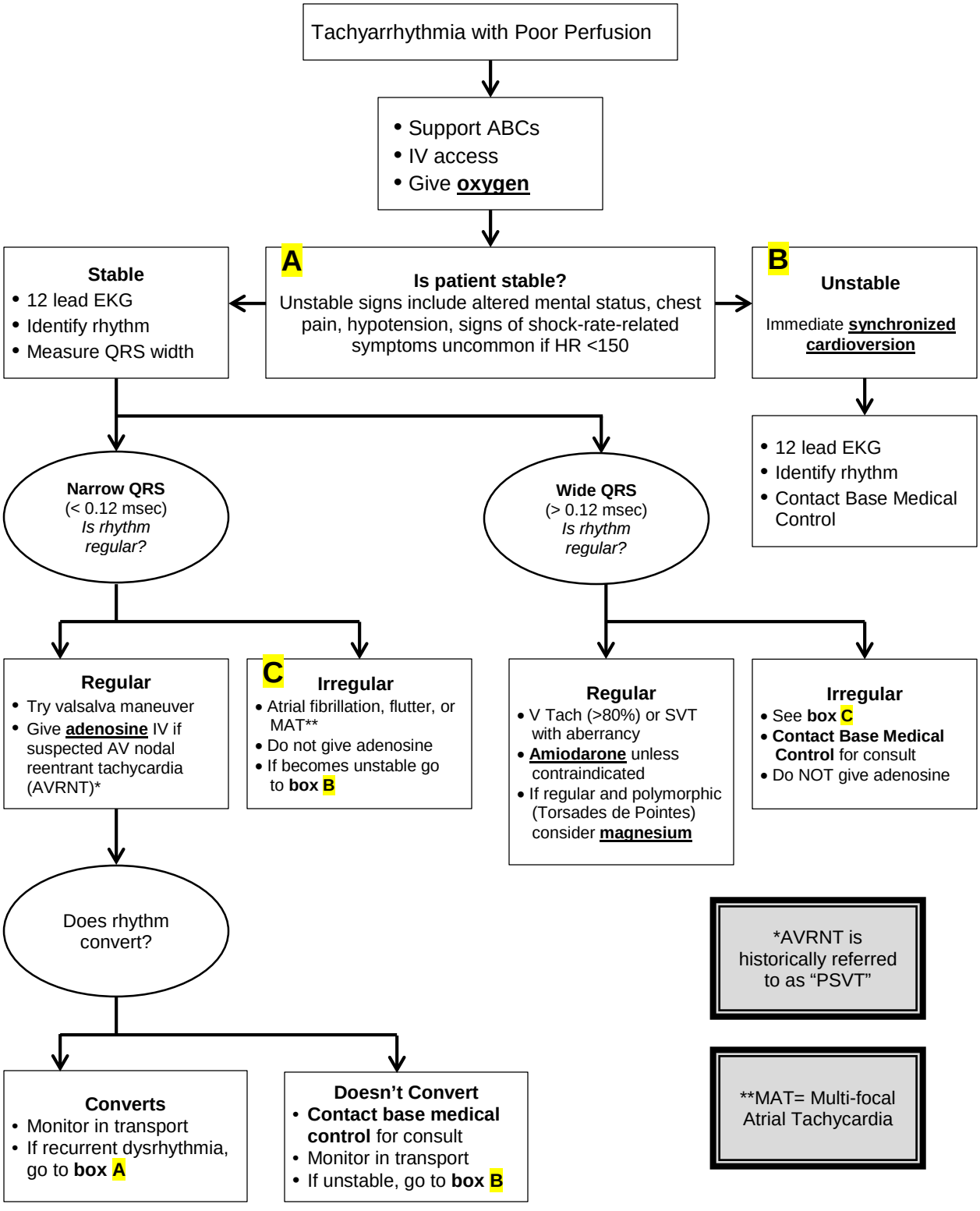
- Assess for dysrhythmia
- Continuous cardiac monitoring/pulse checks

Recurrent Dysrhythmia? — Yes → Treat recurrent dysrhythmia per specific protocol

No

- Focused neuro exam
- Targeted temperature management (TTM)
  - o Goal: 33-36°C (91.4-96.8°F)
  - o Check patient temperature, if possible
  - o Avoid fever and provide passive cooling
  - o Place ice packs to neck, axillae, groin if needed for fever
- Transfer to closest appropriate facility
- **Benzodiazepine** and **opioid** as necessary for sedation

ADULT TACHYARRHYTHMIA WITH POOR PERFUSION



ADULT BRADYARRHYTHMIA WITH POOR PERFUSION

Bradycardia with a Pulse
- Heart rate < 60 bpm
- Inadequate for clinical condition

- Support ABCs
- Give **Oxygen**
- Start IV
- Initiate transport

- Cardiac monitor
- Identify rhythm
- 12-lead ECG

Are there signs or symptoms of poor perfusion present?
(Altered mental status, chest pain, hypotension, signs of shock)

Adequate Perfusion

Monitor and Transport

Poor Perfusion

- Give **Atropine**
- Prepare for **transcutaneous pacing**

Consider **Norepinephrine infusion** early if pacing and poor perfusion or hypotension persists, either due to lack of capture or poor contractility despite capture

Monitor and Transport

Reminders:
- If pulseless arrest develops, go to **Pulseless arrest algorithm**
- Search for possible contributing factors:
  "5 H's and 5 T's."
- Symptomatic, severe bradycardia is usually related to one of the following:
  - Hypoxia
  - Ischemia (MI)
  - Drugs (beta blocker, Calcium channel blocker)
  - Electrolytes (hyperkalemia)

ADULT CHEST PAIN

Consider life threatening causes of chest pain in all patients

- While assessing ABCs, give supplemental **oxygen**, monitor vital signs, cardiac rhythm, start IV
- **Obtain 12 lead EKG**
- Administer **aspirin** if history suggests possible cardiac chest pain

STEMI?

No

Yes → Notify receiving facility immediately if STEMI Alert criteria met

Give SL **nitroglycerin** if suspected cardiac chest pain and no contraindication

For hypotension following nitroglycerin, give 250 mL NS bolus, reassess, and repeat bolus as needed. Do not give additional nitroglycerin.

Consider **opioid** for chest pain refractory to nitroglycerin, if no contraindication

- Consider repeat 12-lead if initial 12-lead non-diagnostic and/or patient's condition changes
- Consider additional 12-lead views
  - o R-sided leads for R ventricular infarct if inferior MI present
  - o Posterior leads

Life threatening causes of chest pain

- Acute coronary syndrome (ACS)
- Pulmonary embolism
- Thoracic aortic dissection
- Tension pneumothorax

Nitroglycerin Contraindications

- Suspected right ventricular ST-segment elevation MI (inferior STEMI pattern plus ST elevation in right-sided precordial leads e.g. V4R)
- Hypotension SBP < 100
- Lack of patent vascular access
- Recent use of erectile dysfunction (ED) medication (e.g. Viagra, Cialis)

STEMI ALERT

Goal:

To identify patients with ST-segment elevation myocardial infarction (STEMI) in the prehospital setting and provide advanced receiving hospital notification in order to minimize door-to-balloon times for percutaneous coronary intervention (PCI).

Inclusion Criteria:

- Symptoms compatible with ACS (chest pain, diaphoresis, dyspnea, etc)
- 12-lead ECG showing ST-segment elevation (STE) at least 1 mm in two or more anatomically contiguous leads (>2mm ST elevation in male patients for leads V2-3).

Exclusion Criteria:

- Wide complex QRS (paced rhythm, BBB, other)
- Symptoms NOT suggestive of ACS (e.g.: asymptomatic patient)
- If unsure if patient is appropriate for STEMI Alert, discuss with receiving hospital MD

Actions:

- Treat according to **chest pain protocol** en route (**cardiac monitor**, **oxygen**, **aspirin**, **nitroglycerine** and **opioid**)
- Notify receiving hospital ASAP with ETA and request STEMI ALERT. Do not delay hospital notification. If possible, notify ED before leaving scene
- Transmit 12-lead ECG to receiving facility as soon as possible
- Start 2 large bore peripheral IVs
- Rapid transport
- If patient does not meet inclusion criteria, or has exclusion criteria, yet clinical scenario and ECG suggests true STEMI, request medical consult with receiving hospital emergency physician

Additional Documentation Requirements:

- Time of first patient contact
- Time of first ECG

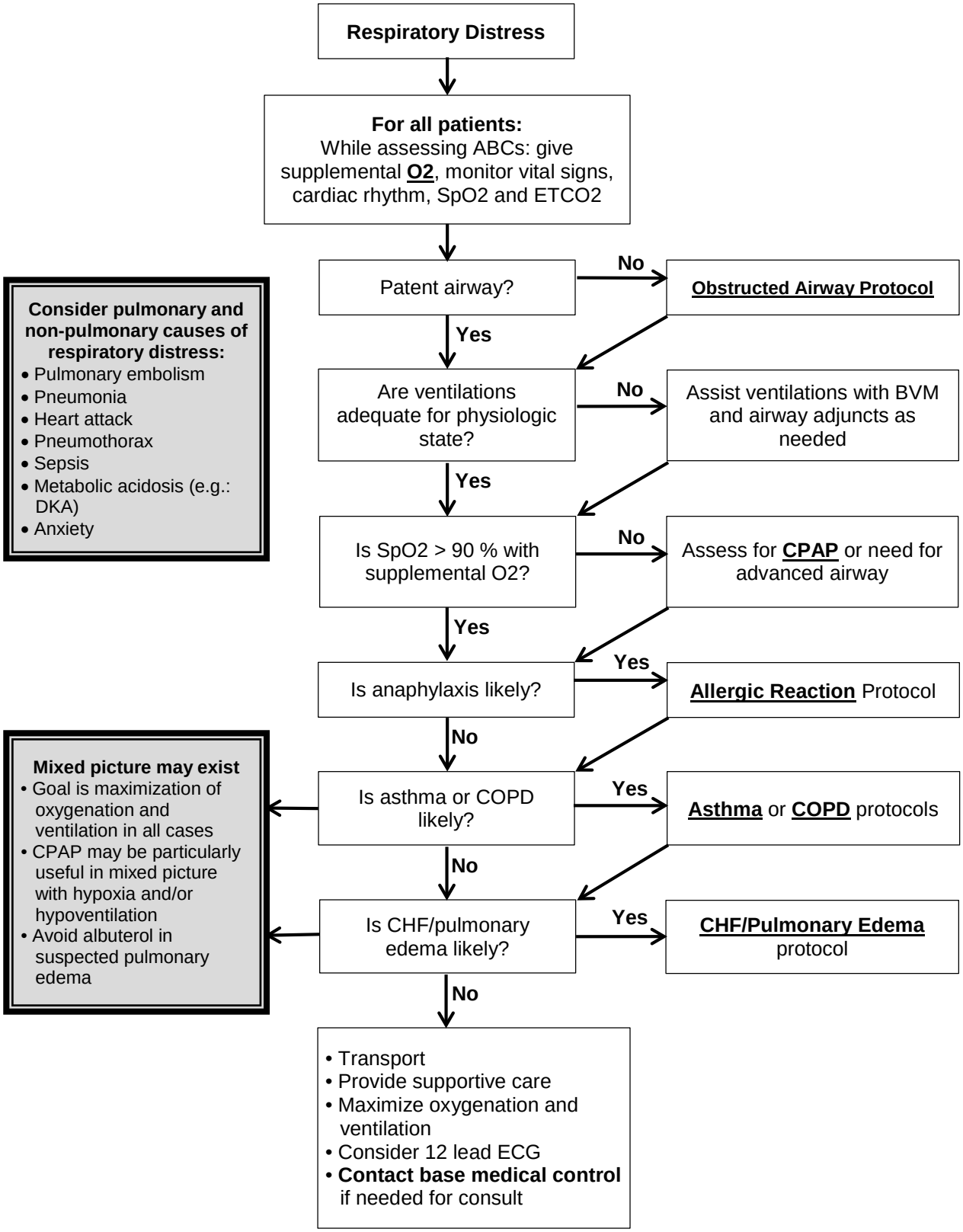
- Patient contact to transmission of 12-lead ECG < 10 minutes
- Non-ST-segment elevation myocardial infarction (N-STEMI) patients can be identified and Cath Lab activation requested through contact with receiving facility.

HYPERTENSION

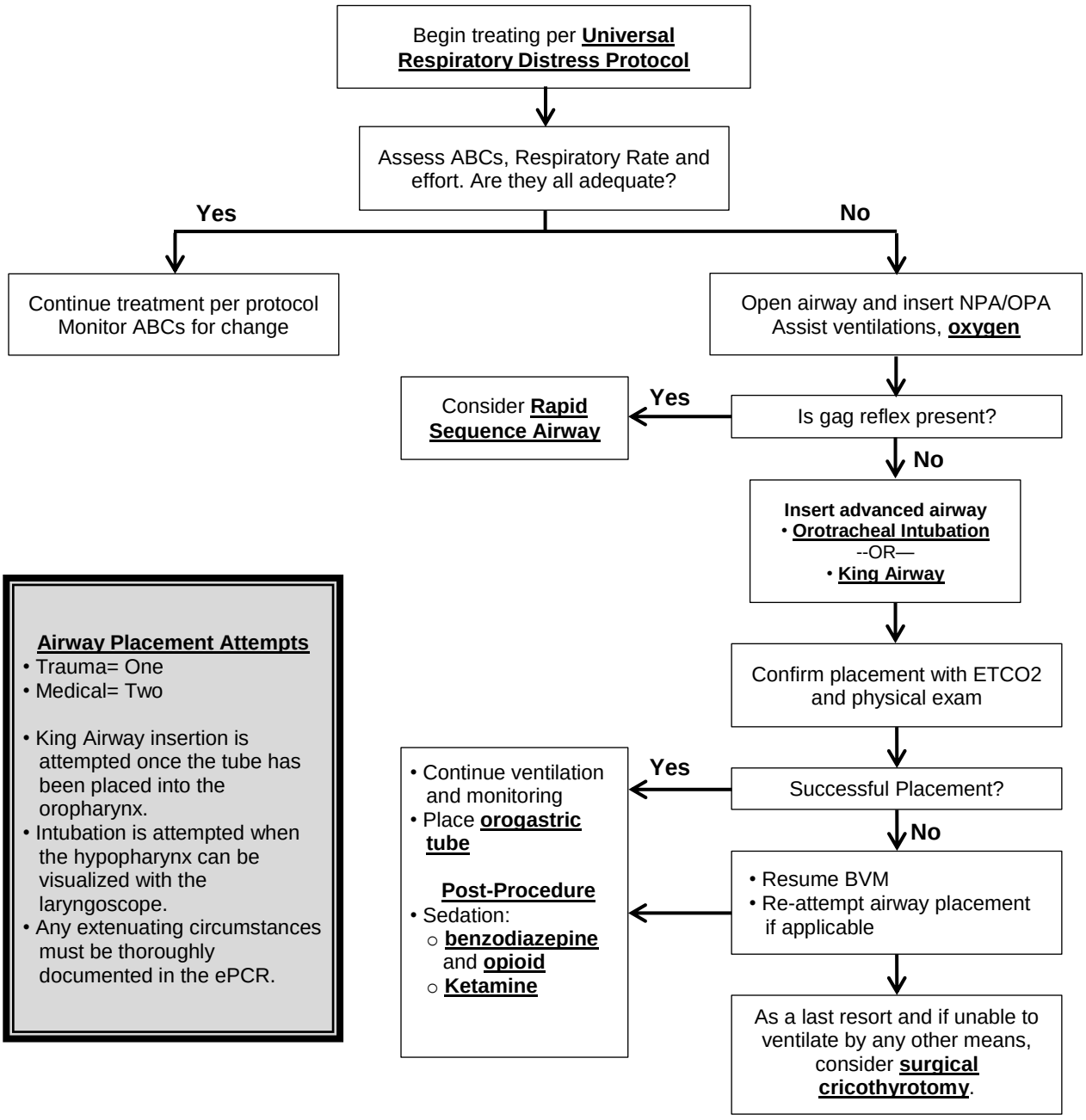
Intent:

A. Even with extremes of blood pressure, treat the medical emergency **associated** with hypertension ("treat the patient, not the number")
    1. Treat **chest pain, pulmonary edema**, or **stroke** according to standard protocols (pain control will usually improve BP significantly)
B. Do not use medication to treat asymptomatic hypertension
C. Do not treat hypertension in acute stroke

ADULT UNIVERSAL RESPIRATORY DISTRESS ALGORITHM



ADULT AIRWAY MANAGEMENT



- At any time, effective BVM ventilation is an acceptable level of airway management.
- Components of effective ventilation include oxygenation, chest rise and fall, adequate lung sounds and the presence of an alveolar waveform on capnography.
- Monitor ETCO2, oxygen saturation and assess for effective ventilation continuously.
- Attempt surgical cricothyrotomy only after all other ventilation methods have failed.
- If patient condition allows, another paramedic may attempt a King airway prior to performing a surgical airway.

ADULT RAPID SEQUENCE AIRWAY

*****2 PARAMEDICS ARE REQUIRED AT ALL TIMES*****

Patient requires advanced airway placement and has an intact gag reflex

Medical Director Authorized Paramedics only may perform this protocol

Pre-oxygenate with 100% **oxygen**. Patient can be ventilated with BVM?

No

Consider **cricothyrotomy** if unable to ventilate by other means

Yes

- Perform airway assessment (LEMON)
- Prepare equipment for **Orotracheal intubation**

Contraindications to RSA:

- Not approved for procedure by Medical Director
- Unable to provide BVM ventilations
- Inability to ventilate via BVM
- Suspected Hyperkalemia
- Myopathy or neuromuscular disease
- History of Malignant Hyperthermia
- Recent crush injury or major burn (>48 hours after injury)
- End Stage Renal Disease
- Recent Spinal Cord Injury (72 hours-6 months)

- Prepare primary equipment for intubation
- Prepare all necessary back-up equipment

Induction: **Etomidate** or **Ketamine,** only if Etomidate is not available

Paralysis: **Succinylcholine**

Insert advanced airway
- **Orotracheal Intubation** (preferred)

--OR—

- **King Airway** (back-up)

Confirm placement with ETCO2 and physical exam. Successful Placement?

Yes

- Continue ventilation and monitoring
- Place **orogastric tube**

Post-Procedure

- Sedation:
  - o **benzodiazepine** and **opioid**
  - o **Ketamine**
- Paralysis: **Rocuronium**

No

- Resume BVM
- Re-attempt primary airway placement or place back-up airway

- Rapid sequence airway placement is the highest risk procedure a paramedic can perform and under no circumstances should transport be delayed for RSA if the additional time to perform the procedure is greater than the transport time to the closest appropriate facility.
- Paralytic drugs take away the patient's ability to breathe, therefore if you are unable to provide assisted BVM ventilations, then the procedure cannot be initiated.

ADULT ASTHMA

Universal Respiratory Distress Protocol and prepare for immediate transport

Presentation suggests asthma: *wheezing, prolonged expiratory phase, decreased breath sounds, accessory muscle use, known hx of asthma*

Give **oxygen**, check SpO2, & consider IV for severe respiratory distress

Give nebulized **albuterol** and **ipratropium**

Is response to treatment adequate?

Yes

No

Severe exacerbation:
- IV methylprednisolone
- IM **epinephrine**. Indicated only if no response to neb and in severe distress
- IV **magnesium**

Is response to treatment adequate?

Yes

No

- Reassess for pneumothorax
- Consider **CPAP**
- If CPAP contraindicated, ventilate with BVM, and consider **advanced airway**
- IV **magnesium** (if not already given)
- Obtain ECG: rule out unstable rhythm, ACS

- Continue monitoring and assessment en route
- Be prepared to assist ventilations as needed
- Contact base for medical consult as needed

Therapeutic Goals:
- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia
- Obtain 12 lead EKG
- Identify complications, e.g. pneumothorax

IV **Methylprednisolone** will help resolve acute asthma exacerbation over hours, without immediate effect. In severe exacerbations, it may be given prehospital but should not be given for mild attacks responding well to bronchodilators

IM **epinephrine** is only indicated for most severe attacks deemed life threatening and not responding to inhaled bronchodilators. Use extreme caution when administering. Cardiopulmonary monitoring is mandatory.

IV **magnesium** may be beneficial in some patients with severe attacks. It should not be given routinely, rather should be reserved for life threatening attacks not responding to conventional therapy.

Consider pulmonary and non-pulmonary causes of respiratory distress:
Examples: pulmonary embolism, pneumonia, pulmonary edema, anaphylaxis, heart attack, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA), Anxiety

COPD

Universal Respiratory Distress Protocol and prepare for immediate transport

Presentation suggests COPD:
Hx of COPD w. *wheezing, prolonged expiratory phase, decreased breath sounds, accessory muscle use*

Therapeutic Goals:
- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia (Obtain 12 lead EKG)
- Identify complications, e.g. pneumothorax

Give **oxygen**, check SpO2, start IV and place on monitor

Give nebulized **albuterol** and **ipratropium**

Is response to treatment adequate?

Yes

No

- Reassess for pneumothorax
- Consider alternative diagnoses, including cardiac disease
- Consider **CPAP** if severe distress
- Assist ventilations with BVM as needed
- Consider **advanced airway** if CPAP contraindicated or not available
- Obtain ECG: rule out unstable rhythm, ACS

CPAP may be very helpful in severe COPD exacerbation, however these patients are at increased risk of complications of CPAP such as **hypotension** and **pneumothorax**. Cardiopulmonary monitoring is mandatory.

Is response to treatment adequate?

Yes

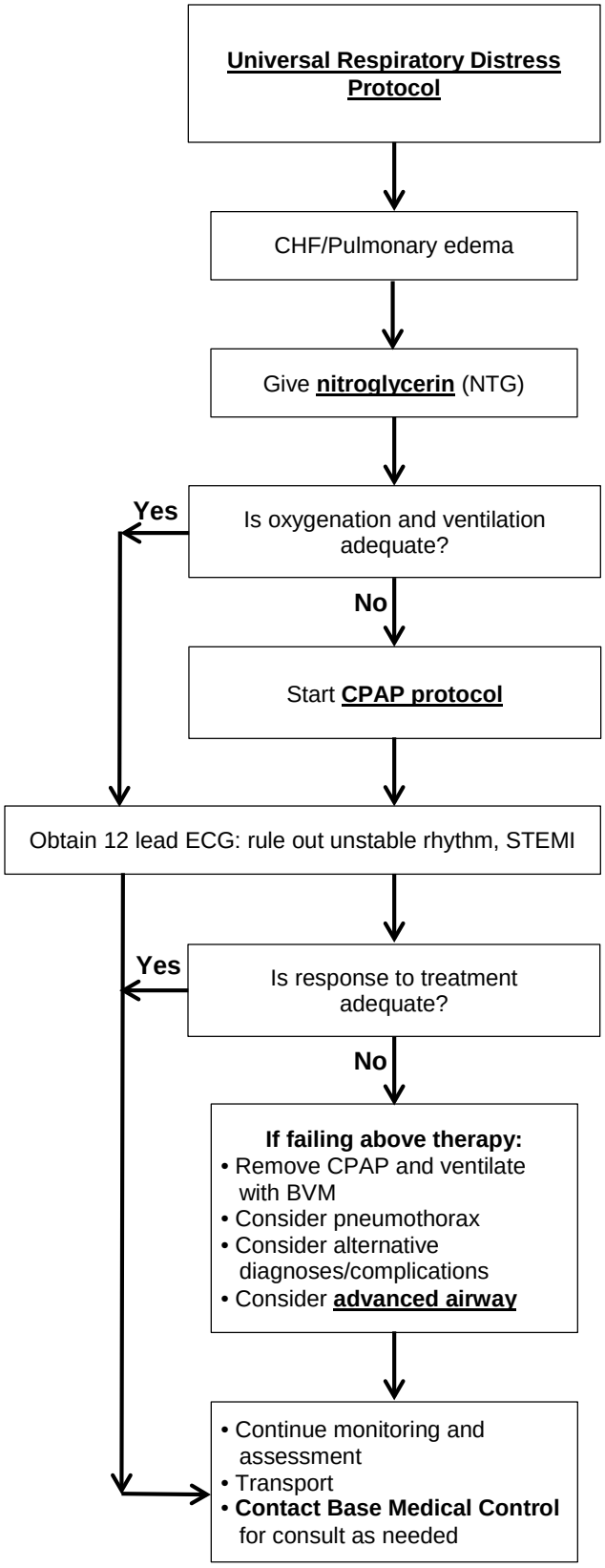
No

Severe exacerbation:
- IM **epinephrine**. Indicated only if no response to neb and in severe distress
- IV **magnesium**

- Continue monitoring and assessment en route
- Be prepared to assist ventilations as needed
- Contact base for medical consult as needed

Special Notes:
- **Correct hypoxia**: do not withhold maximum oxygen for fear of CO2 retention
- **Consider pulmonary and non-pulmonary causes of respiratory distress:** Examples: pulmonary embolism, pneumonia, pulmonary edema, anaphylaxis, heart attack, pneumothorax, sepsis, metabolic acidosis (e.g.: DKA), Anxiety
- Patients with COPD are older and have comorbidities, including heart disease.
- Wheezing may be a presentation of pulmonary edema or “cardiac asthma”.
- Common triggers for COPD exacerbations include: Infection, dysrhythmia (e.g.: atrial fibrillation), myocardial ischemia

CHF/PULMONARY EDEMA



Therapeutic Goals:
- Maximize oxygenation
- Decrease work of breathing
- Identify cardiac ischemia (Obtain 12 lead EKG)

Special Note:
- Morphine has been associated with worse outcomes in patients with CHF and is no longer preferred

STROKE/CVA

POSSIBLE STROKE
Any acute onset neurological deficit not likely due to trauma

↓

Assess and stabilize ABCs, give O2

↓

Assess Cincinnati Prehospital Stroke Score
(Presence of single sign sufficient)

→

Cincinnati Prehospital Stroke Score
Think "FAST" (face, arm, speech, time)

Assess Facial Droop
Say: "Smile for me", or "Show me your teeth"

Assess Arm Pronator Drift
Demonstrate, and say: "Put your arms up for me like this and hold them while I count to 10"

Assess Speech
Say: "Repeat after me: you can't teach an old dog new tricks", or "No ifs, ands, or buts"

CPSS does not identify all strokes.
See below

↓

Rule out or treat hypoglycemia

↓

- Determine when last KNOWN to be normal and document **specific** time
- "At 2:15 PM", **not** "1 hour ago"

↓

- Obtain medical history
- Document medications
- Identify family or friend who may assist with history and decision-making, get contact info and strongly encourage to come to ED as they may be needed for consent for treatments

↓

Consider common stroke mimics/syndromes

→

Stroke Mimics
- Hypoglycemia
- Post-ictal paralysis
- Complex migraine
- Overdose
- Trauma
- Bell's palsy

↓

- Start IV
- Document cardiac rhythm
- Ensure full monitoring in place: cardiac, SpO2

↓

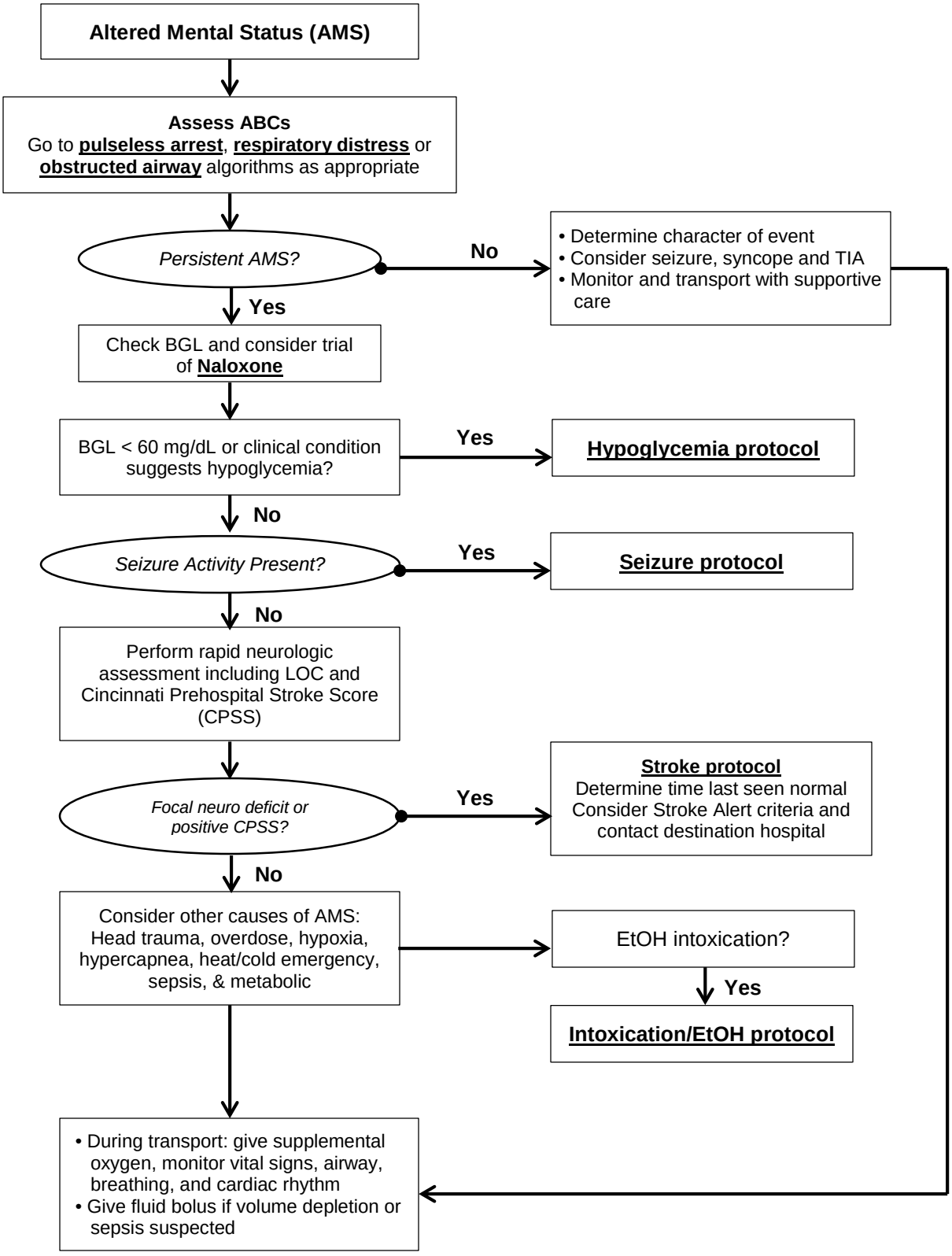
Fully monitor patient and continually reassess:
- Improvement or worsening of deficit
- Adequacy of ventilation and oxygenation
- Cardiovascular stability

↓

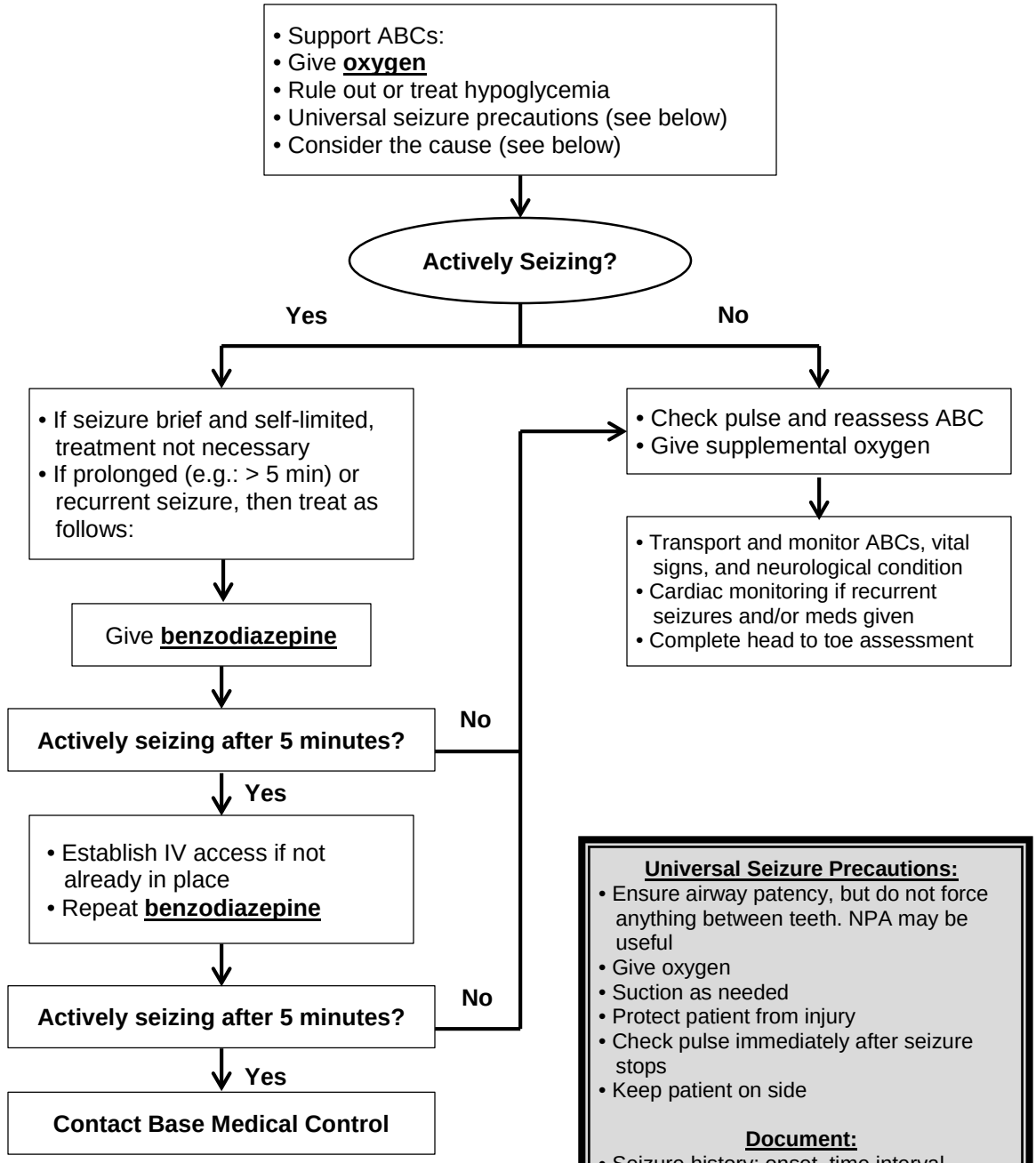
- Notify receiving hospital of suspected stroke and time of onset of symptoms in order to provide hospital the opportunity for Stroke Alert
- **It is more important that you know timeline of your patient's symptoms than an individual hospital's Stroke Alert criteria, which may vary**

- The Cincinnati Prehospital Stroke Score (CPSS) is designed to be very reproducible and identify those strokes most likely to benefit from reperfusion therapy, but does not identify all strokes.
- The CPSS is highly *specific* for stroke, but is not extremely *sensitive*, meaning if you have a positive CPSS, you are almost certainly having a stroke, but if you do not have a positive CPSS, you still may be having a stroke
- Stroke signs may be very subtle, therefore it is important to know other signs of stroke, which include:
  - o Impaired balance or coordination
  - o Vision loss
  - o Headache
  - o Confusion or altered mental status
  - o Seizure

UNIVERSAL ALTERED MENTAL STATUS



ADULT SEIZURE



Consider the Cause of Seizure

- Epilepsy
- EtOH withdrawal or intoxication
- Hypoglycemia
- Stimulant use
- Trauma
- Intracranial hemorrhage
- Overdose (TCA)
- Eclampsia
- Infection: Meningitis, sepsis

Universal Seizure Precautions:

- Ensure airway patency, but do not force anything between teeth. NPA may be useful
- Give oxygen
- Suction as needed
- Protect patient from injury
- Check pulse immediately after seizure stops
- Keep patient on side

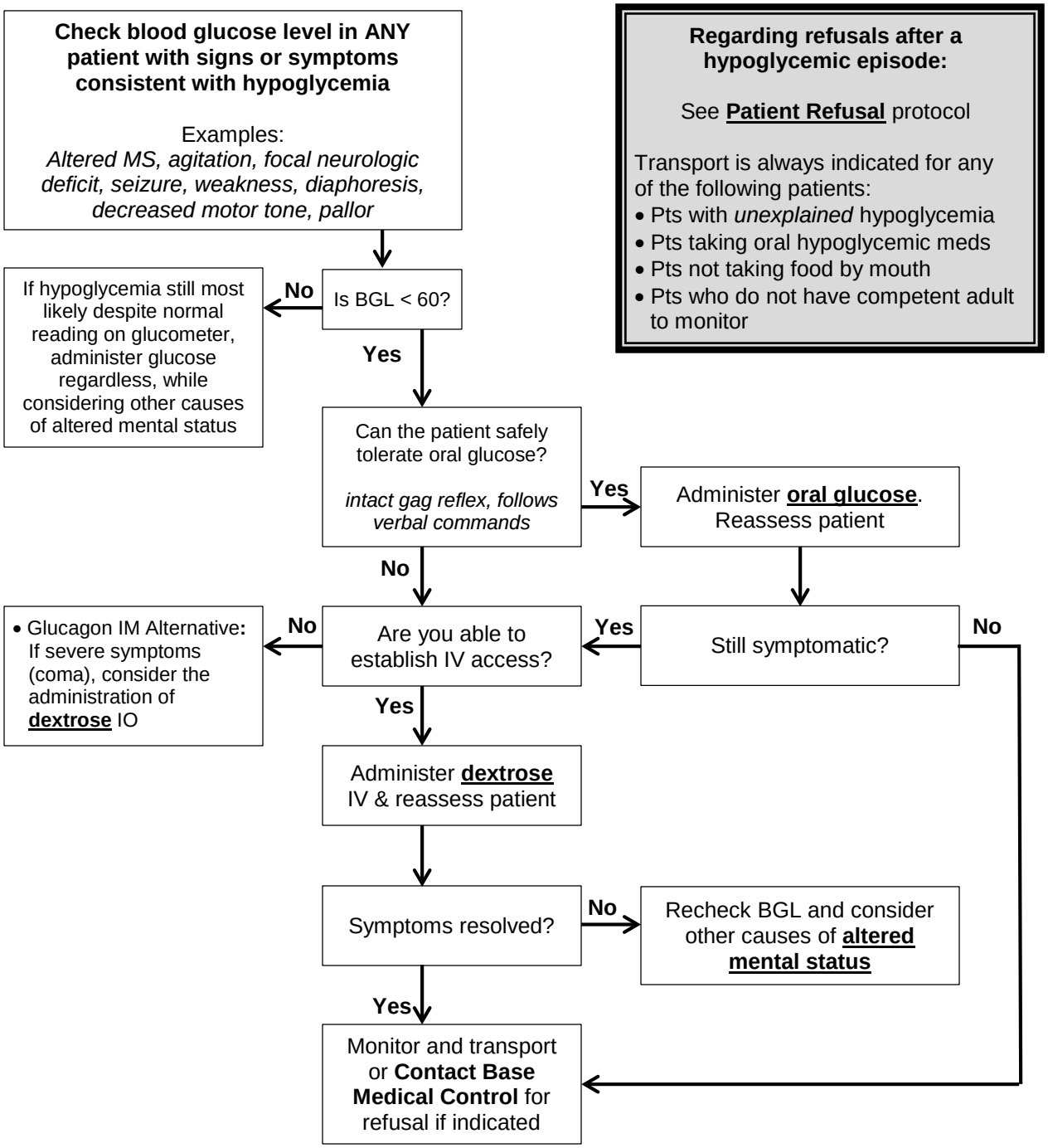
Document:

- Seizure history: onset, time interval, previous seizures, type of seizure
- Obtain medical history: head trauma, diabetes, substance abuse, medications, compliance with anticonvulsants, pregnancy

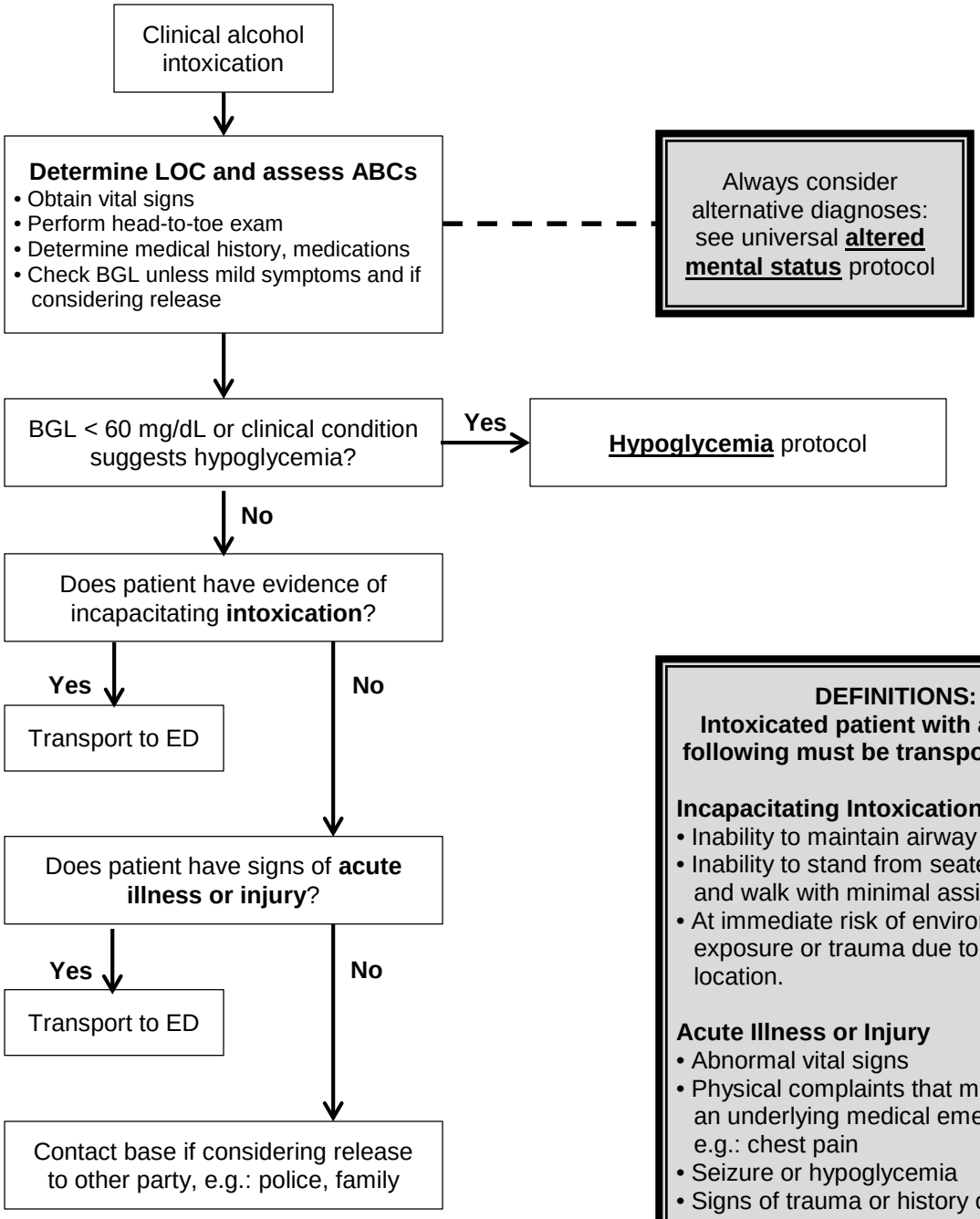
Pregnancy and Seizure:

- If 3rd trimester pregnancy or post-partum: administer **magnesium sulfate**

HYPOGLYCEMIA



ALCOHOL INTOXICATION

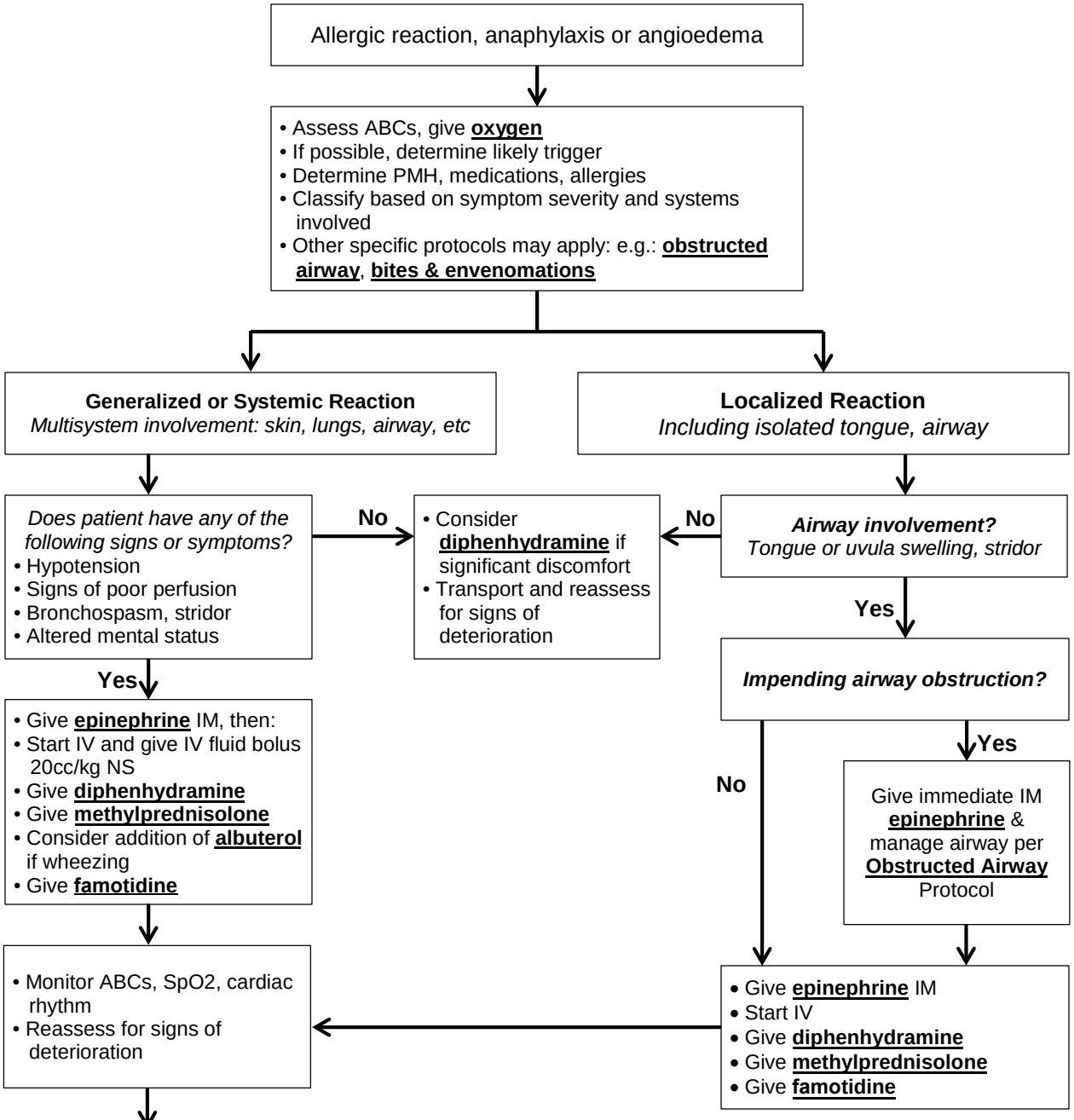


DEFINITIONS:
Intoxicated patient with any of the following must be transported to ED:

Incapacitating Intoxication
- Inability to maintain airway
- Inability to stand from seated position and walk with minimal assistance
- At immediate risk of environmental exposure or trauma due to unsafe location.

Acute Illness or Injury
- Abnormal vital signs
- Physical complaints that might indicate an underlying medical emergency, e.g.: chest pain
- Seizure or hypoglycemia
- Signs of trauma or history of acute trauma
- Signs of head injury, e.g.: bruising, lacerations, abrasions

ALLERGY AND ANAPHYLAXIS



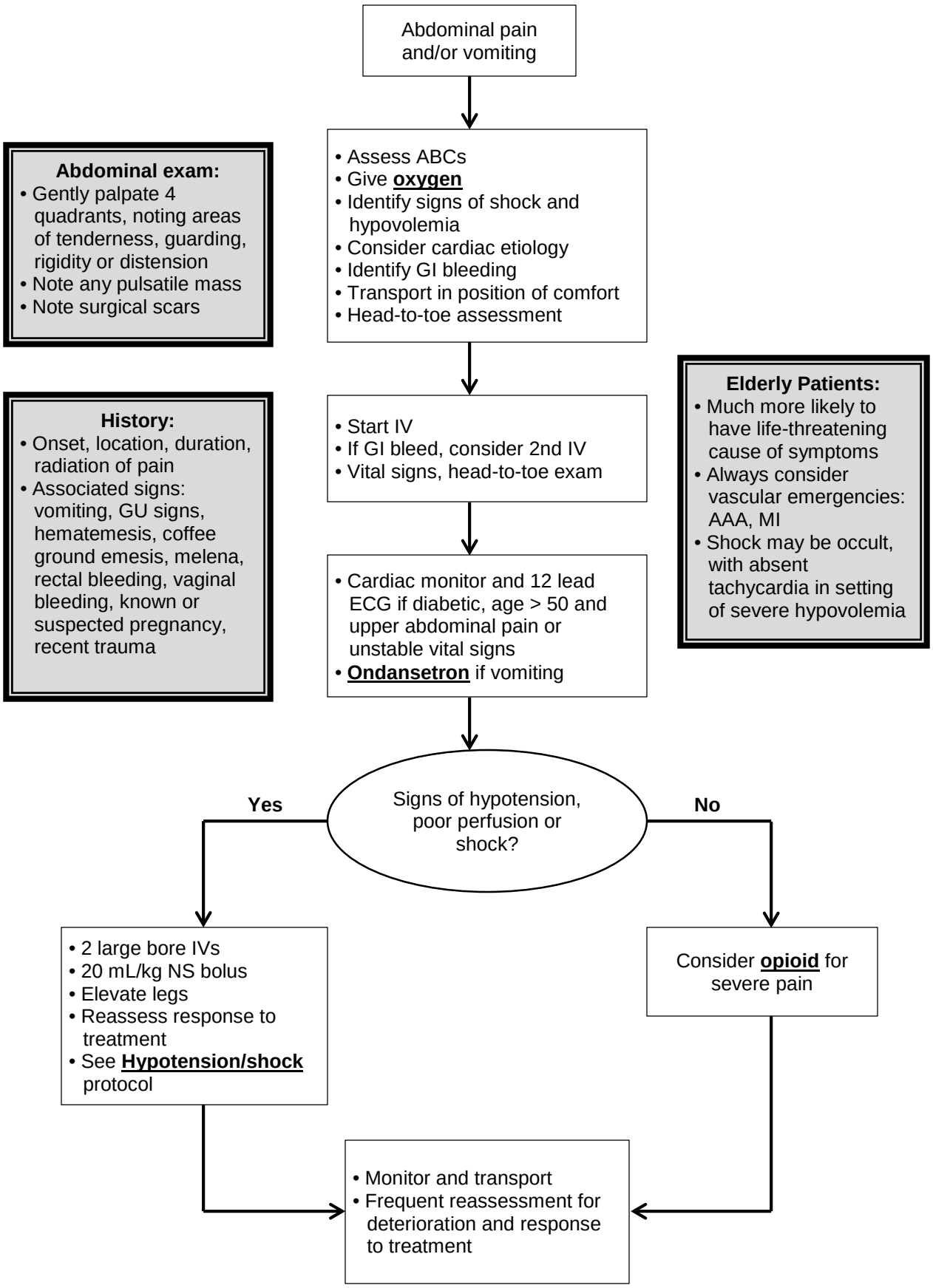
DEFINITIONS:

- **Anaphylaxis**: severe allergic reaction that is rapid in onset and potentially life-threatening. Multisystem signs and symptoms are present including skin and mucus membranes
  - o **Mainstay of treatment is epinephrine.**
- **Angioedema**: deep mucosal edema causing swelling of mucus membranes of upper airway. May accompany hives
  - o **Mainstay of treatment is methylprednisolone.**
- **Epinephrine is indicated for any impending airway obstruction.**

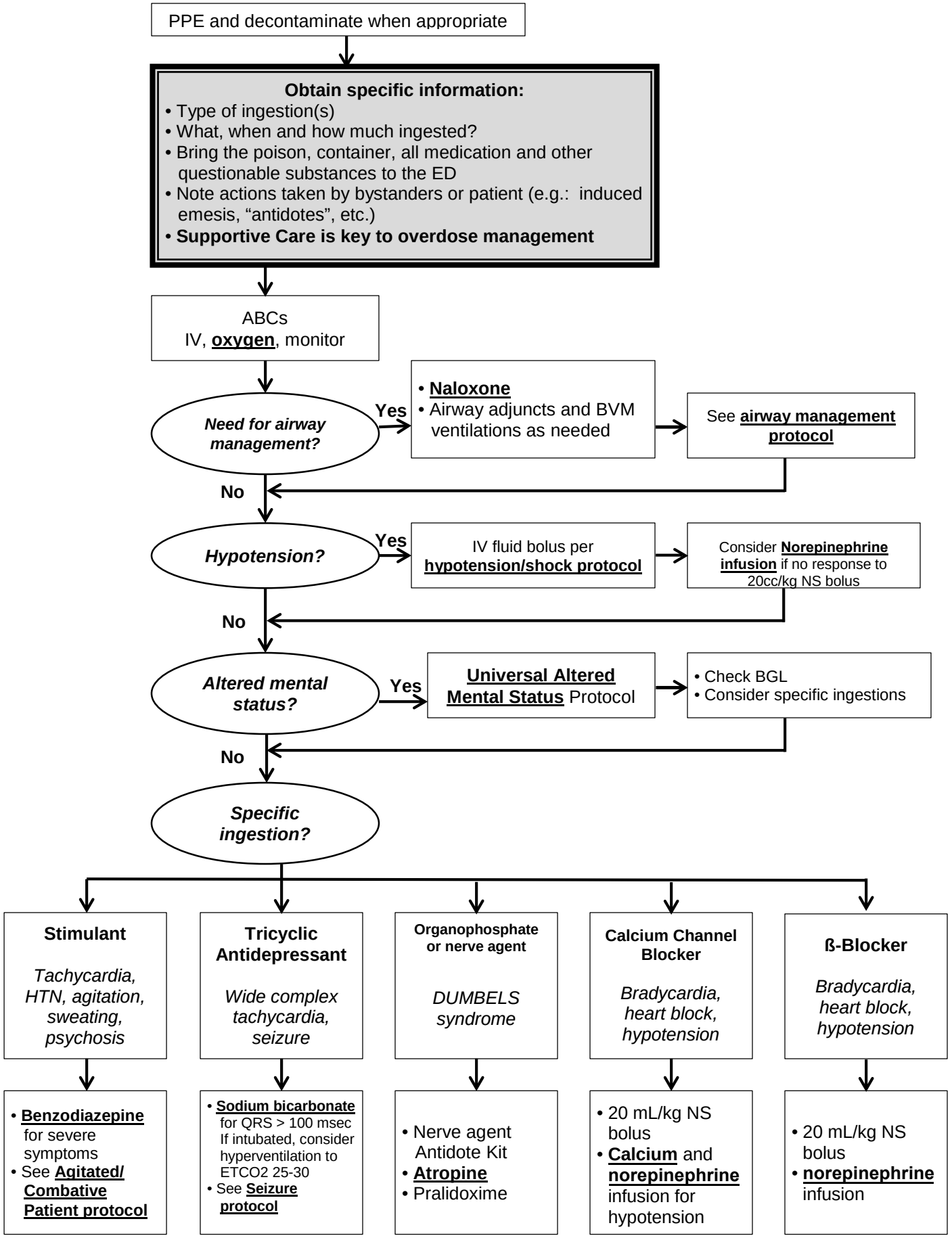
DOCUMENT:

- History of allergen exposure, prior allergic reaction and severity, medications or treatments administered prior to EMS assessment
- Specific symptoms and signs presented: itching, wheezing, respiratory distress, nausea, weakness, rash, anxiety, swelling of face, lips, tongue, throat, chest tightness, etc.

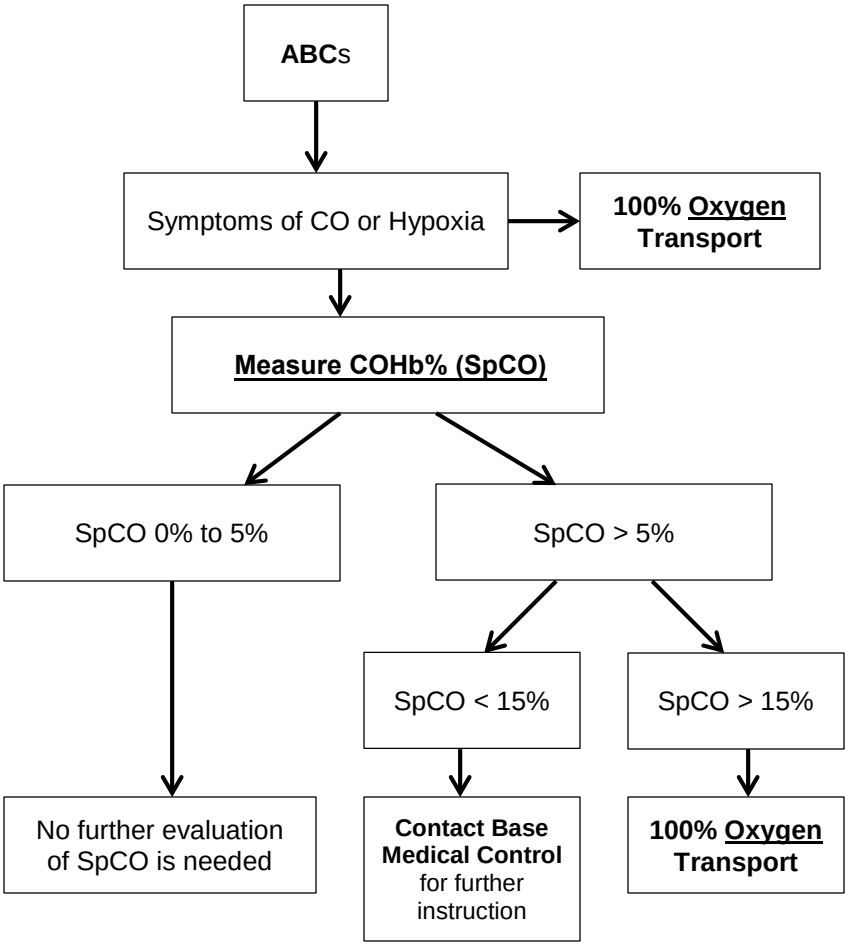
ABDOMINAL PAIN/VOMITING



OVERDOSE AND ACUTE POISONING



SUSPECTED CARBON MONOXIDE EXPOSURE

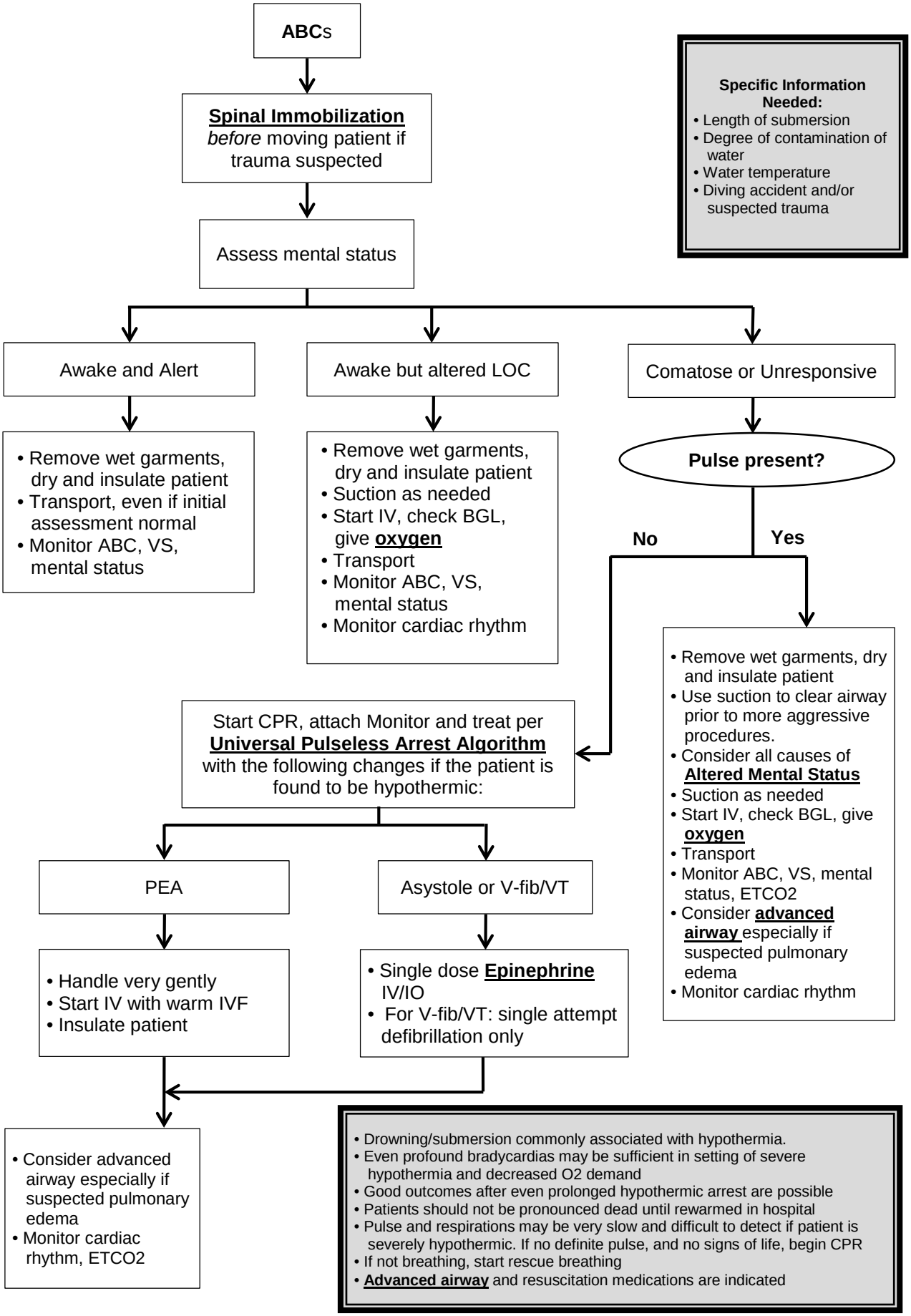


General Guidelines:

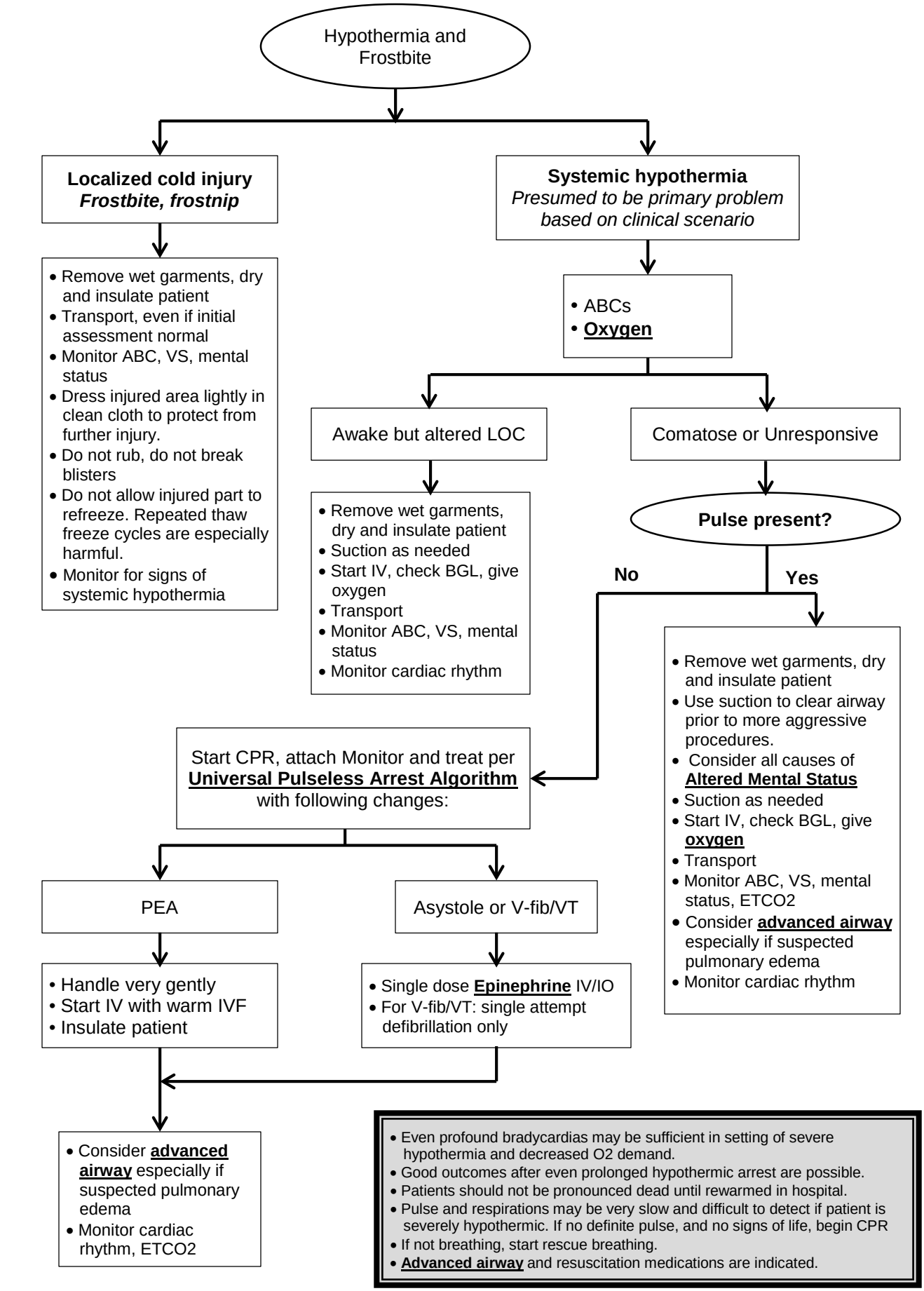
- *Signs and Symptoms of CO exposure include:*
  Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, nausea, vomiting, "flu-like illness"
- The absence or low readings of COHb is not a reliable predictor of toxicity or presence of other fire byproducts.
- The fetus of a pregnant woman is at a higher risk due to the greater affinity of fetal hemoglobin to CO. With CO exposure, the pregnant woman may be asymptomatic while the fetus may be in distress.

COHb	Severity	Signs and Symptoms
<15-20%	Mild	Headache, nausea, vomiting, dizziness, blurred vision
20-41%	Moderate	Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness
41-59%	Severe	Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest
> 60%	Fatal	Death

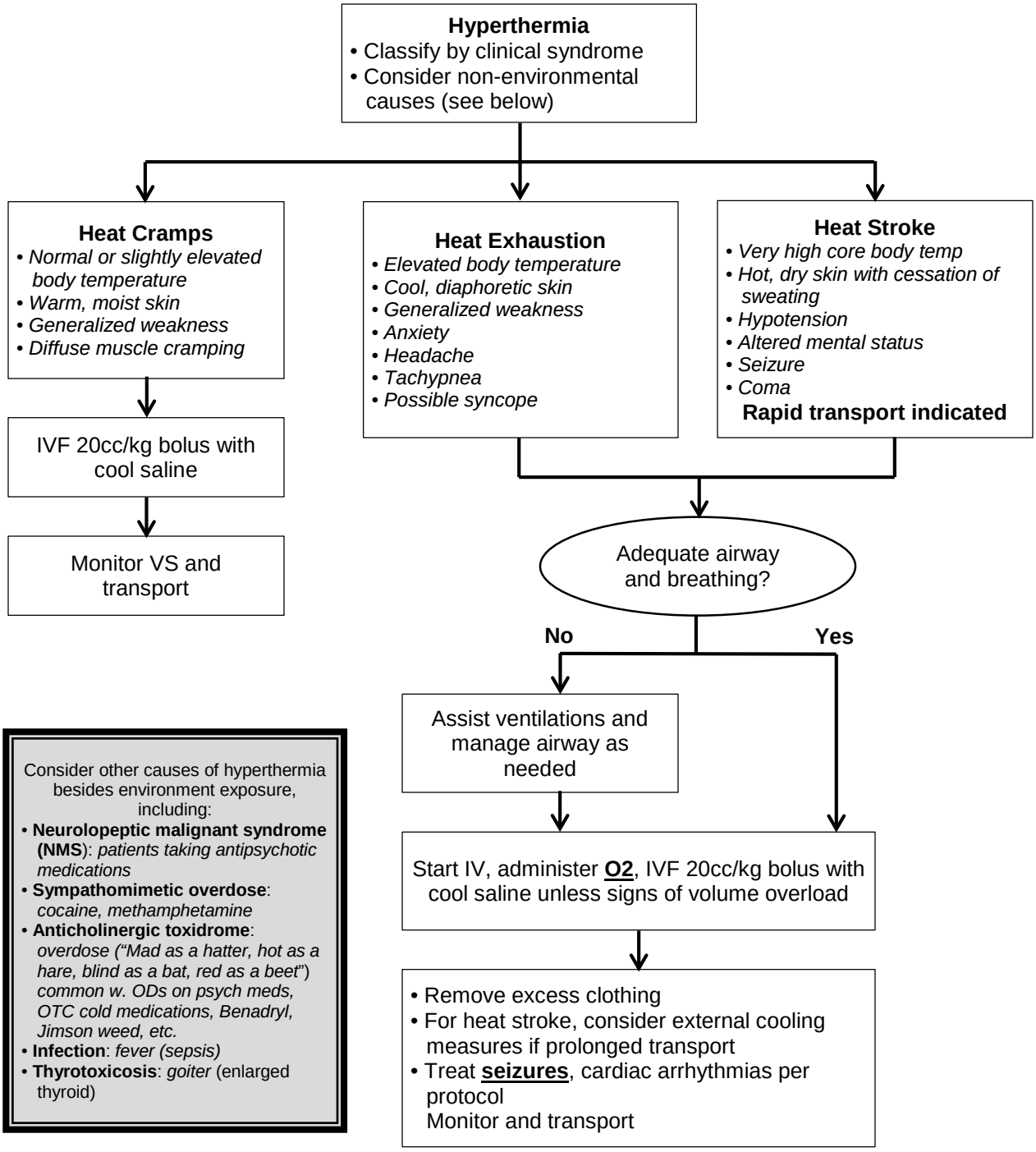
DROWNING


ABCs
Spinal Immobilization before moving patient if trauma suspected
Assess mental status
Specific Information Needed:
• Length of submersion
• Degree of contamination of water
• Water temperature
• Diving accident and/or suspected trauma
Awake and Alert
Awake but altered LOC
Comatose or Unresponsive
• Remove wet garments, dry and insulate patient
• Transport, even if initial assessment normal
• Monitor ABC, VS, mental status
• Remove wet garments, dry and insulate patient
• Suction as needed
• Start IV, check BGL, give oxygen
• Transport
• Monitor ABC, VS, mental status
• Monitor cardiac rhythm
Pulse present?
No
Yes
• Remove wet garments, dry and insulate patient
• Use suction to clear airway prior to more aggressive procedures.
• Consider all causes of Altered Mental Status
• Suction as needed
• Start IV, check BGL, give oxygen
• Transport
• Monitor ABC, VS, mental status, ETCO2
• Consider advanced airway especially if suspected pulmonary edema
• Monitor cardiac rhythm
Start CPR, attach Monitor and treat per Universal Pulseless Arrest Algorithm with the following changes if the patient is found to be hypothermic:
PEA
Asystole or V-fib/VT
• Handle very gently
• Start IV with warm IVF
• Insulate patient
• Single dose Epinephrine IV/IO
• For V-fib/VT: single attempt defibrillation only
• Consider advanced airway especially if suspected pulmonary edema
• Monitor cardiac rhythm, ETCO2
• Drowning/submersion commonly associated with hypothermia.
• Even profound bradycardias may be sufficient in setting of severe hypothermia and decreased O2 demand
• Good outcomes after even prolonged hypothermic arrest are possible
• Patients should not be pronounced dead until rewarmed in hospital
• Pulse and respirations may be very slow and difficult to detect if patient is severely hypothermic. If no definite pulse, and no signs of life, begin CPR
• If not breathing, start rescue breathing
• Advanced airway and resuscitation medications are indicated

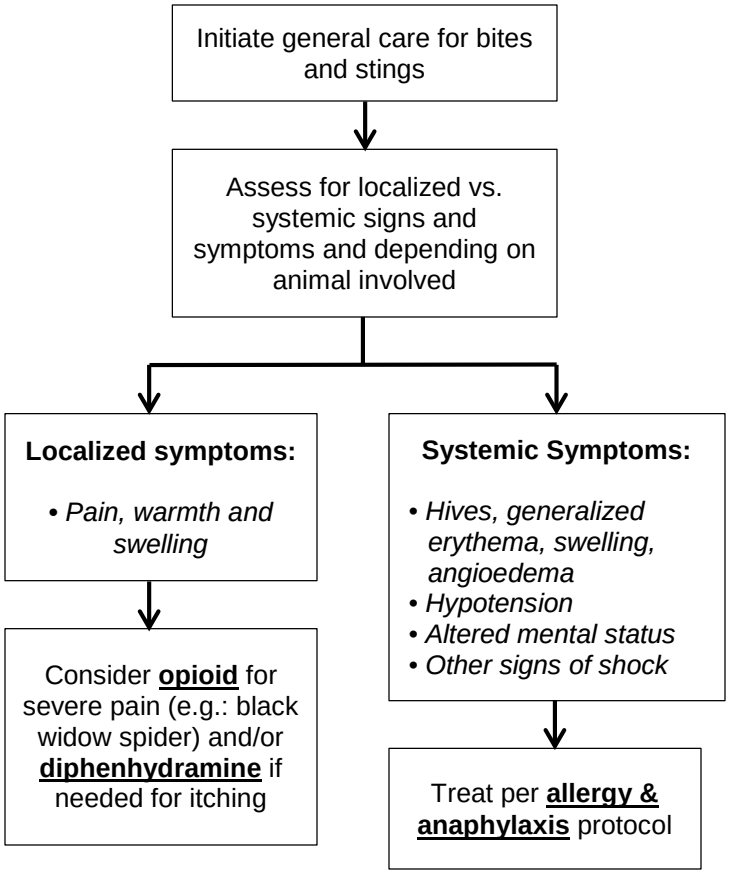
HYPOTHERMIA



ENVIRONMENTAL HYPERTHERMIA



INSECT/ARACHNID STINGS AND BITES PROTOCOL



General Care

- For bees/wasps:
  - Remove stinger mechanism by scraping with a straight edge
  - Do not squeeze venom sac
- For spiders:
  - Bring in spider if captured or dead for identification
- For any other insect needing removal:
  - **Contact Base Medical Control**, as each individual insect may need to be identified and follow-up care recommended.

Specific Information Needed:

- Timing of bite/sting
- Identification of spider, bee, wasp, other insect, if possible
- History of prior allergic reactions to similar exposures
- Treatment prior to EMS evaluation: e.g. EpiPen, diphenhydramine, etc

Specific Precautions:

- For all types of bites and stings, the goal of prehospital care is to prevent further envenomation and to treat allergic reactions
- Anaphylactoid reactions may occur upon first exposure to allergen, and do not require prior sensitization
- Anaphylactic reactions typically occur abruptly, and rarely > 60 minutes after exposure

SNAKE BITE PROTOCOL

- Assess ABCs, mental status
- Administer oxygen
- Start IV
- Monitor VS

↓

Initiate general care for snake bites

↓

Assess for localized vs. systemic signs and symptoms

↓

Localized Symptoms:

- *Pain and swelling*
- *Numbness, tingling to bitten body part*
- *Bruising/ecchymosis*

↓

<u>Opioid</u> for severe pain

↓

- Transport with bitten part immobilized
- Monitor ABCs and for development of systemic signs/sx
- Complete General Care en route

Systemic Symptoms:

- *Metallic or peculiar taste in mouth*
- *Hypotension*
- *Altered mental status*
- *Widespread bleeding*
- *Other signs of shock*

↓

Be prepared to manage airway if signs of airway obstruction develop

↓

<u>Opioid</u> for severe pain and if not contraindicated by hypotension

↓

Treat hypotension with 20cc/kg IV NS bolus See **<u>hypotension/ shock</u>** protocol

General Care:

- Remove patient from proximity to snake
- Remove all constricting items from bitten limb (e.g.: rings, jewelry, watch, etc.)
- Immobilize bitten part
- Initiate prompt transport
- Do NOT use ice, refrigerants, tourniquets, scalpels or suction devices
- Mark margins of erythema and/or edema with pen or marker and include time measured

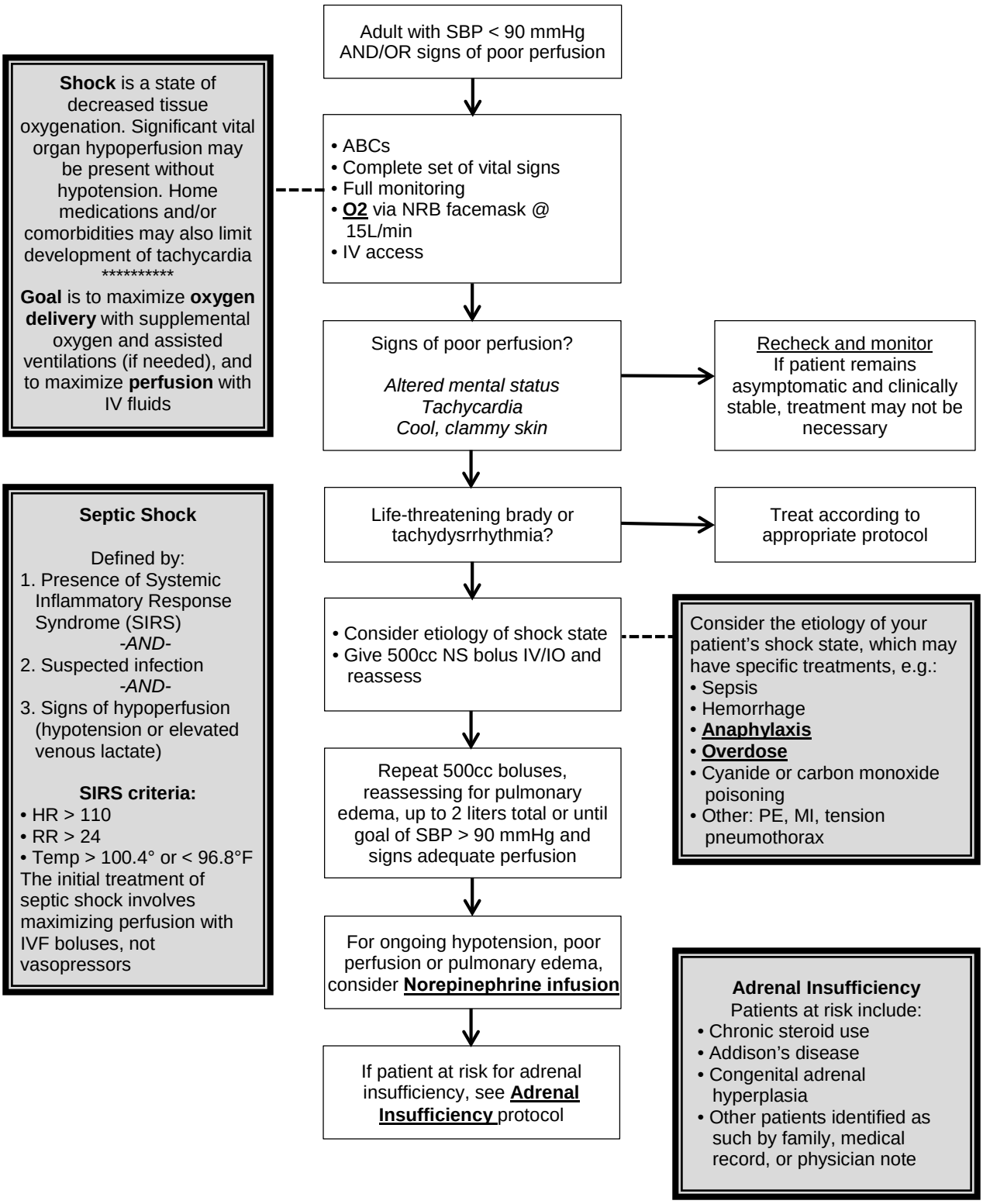
Obtain specific information:

- Appearance of snake (rattle, color, thermal pit, elliptical pupils)
- Appearance of wound: location, # of fangs vs. entire jaw imprint
- Timing of bite
- Prior 1st aid
- To help with identification of snake, photograph snake, if possible. Include image of head, tail, and any distinctive markings.
- Do not bring snake to ED

Specific Precautions:

- The timber rattlesnake is native to Dane County region and is most common venomous snake bite in region.
- Exotic venomous snakes, such as pets or zoo animals, may have different signs and symptoms than those of pit vipers. In case of exotic snake bite, contact base and consult zoo staff or poison center for direction.
- If adequate photo can be taken, it is not necessary to bring snake to ED.
- Never pick up a presumed-to-be-dead snake by hand. Rather, use a shovel or stick. A dead snake may reflexively bite and envenomate.
- > 25% of snake bites are “dry bites”, without envenomations.
- Conversely, initial appearance of bite may be deceiving as to severity of envenomation.
- Fang marks are characteristic of pit viper bites (e.g. rattlesnakes).
- Jaw prints, without fang marks, are more characteristic of non-venomous species.

MEDICAL HYPOTENSION/SHOCK PROTOCOL



ADRENAL INSUFFICIENCY PROTOCOL

Patient at risk for adrenal insufficiency (Addisonian crisis):

- Identified by family or medical alert bracelet
- Chronic steroid use
- Congenital Adrenal Hyperplasia
- Addison's disease

↓

Assess for signs of acute adrenal crisis:

- Pallor, weakness, lethargy
- Vomiting, abdominal pain
- Hypotension, shock
- Congestive heart failure

↓

All symptomatic patients:

- Check blood glucose and treat hypoglycemia, if present
- Start IV and give oxygen
- Give NS bolus IV 20 mL/kg up to 2 liters

↓

Does patient have hypotension and signs of poor perfusion?

- *Altered mental status*
- *Tachycardia*
- *Cool, clammy skin*

Yes ↓ Give **<u>methylprednisolone</u>** ↓

No ↓

- Repeat 20 mL/kg NS bolus, as needed
- Continue to monitor for development of hypoglycemia
- Monitor 12 lead ECG for signs of hyperkalemia
- If otherwise considering administration of corticosteroid **contact base medical control** for consult

- If the patient is confirmed to have a disease (such as congenital adrenal hyperplasia or chronic use of systemic steroids) that could lead to acute adrenal insufficiency or Addisonian crisis, then the administration of steroids may be life-saving and necessary for reversing shock or preventing cardiovascular collapse.
- Patients at risk for adrenal insufficiency may develop Addisonian crisis when under physiologic stress which would not lead to cardiovascular collapse in normal patients. Such triggers may include trauma, dehydration, infection, myocardial ischemia, etc.

PSYCHIATRIC/BEHAVIORAL PATIENT PROTOCOL

Scene Safety

A. Scene safety and provider safety are a priority. Consider police contact if scene safety is a concern.
B. Refer to **restraint protocol** as needed, especially as it relates to the safety of emergency responders.

Specific Information Needed

A. Obtain history of current event; inquire about recent crisis, toxic exposure, drugs, alcohol, emotional trauma, and suicidal or homicidal ideation.
B. Obtain past history; inquire about previous psychiatric and medical problems, medications.

Specific Objective Findings

A. Evaluate general appearance
   - E.g.: Well groomed, disheveled, debilitated, bizarrely dressed
B. Evaluate vital signs.
   - Is a particular toxidrome suggested, e.g.: sympathomimetic?
C. Note medic alert tags, breath odors suggesting intoxication.
D. Determine ability to relate to reality.
   - Does the patient know who they are, where the are, who you are and why you are there?
   - Does the patient appear to be hallucinating or responding to internal stimuli?
E. Note behavior. Consider known predictors of violence:
   - Is the patient male, intoxicated, paranoid or displaying aggressive or threatening behavior or language?

Treatment

A. If patient agitated or combative, see **Agitated/Combative Patient Protocol**
B. Attempt to establish rapport
C. Assess ABCs
D. Transport to closest Emergency Department
E. Be alert for possible elopement
F. Consider organic causes of abnormal behavior (trauma, overdose, intoxication, hypoglycemia)
G. If patient restraint considered necessary for patient or EMS safety, refer to **Restraint Protocol**.
H. Check blood sugar
I. If altered mental status or unstable vital signs:
   - Administer oxygen.
   - Establish venous access.
   - Refer to **Universal Altered Mental Status Protocol**.

Specific Precautions

A. Psychiatric patients often have an organic basis for mental disturbances. Be suspicious of hypoglycemia, hypoxia, head injury, intoxication, or toxic ingestion.
B. If emergency treatment is unnecessary, do as little as possible except to reassure while transporting. Try not to violate the patient's personal space.
C. If the situation appears threatening, consider a show of force involving police before attempting to restrain.
D. Beware of weapons. These patients can become very violent.

AGITATED/COMBATIVE PATIENT PROTOCOL

Patient is agitated and a danger to self or others

- Attempt to reasonably address patient concerns
- Assemble personnel

General Guideline:
Emphasis should be placed on scene safety, appropriate use of restraints and aggressive treatment of the patient's agitation.

Assume the patient has a medical cause of agitation and treat reversible causes

Does patient have signs of the Excited Delirium Syndrome?

Yes

Excited Delirium Syndrome

These patients are beyond any capability of rendering self-control or rationality and are exhibiting a life-threatening medical emergency. They will exhibit some or all of the following symptoms:

Paranoia, disorientation, hyperaggression, hallucination, tachycardia, increased strength, hyperthermia

No

Patient does not respond to verbal de-escalation techniques

Restraint Protocol
Obtain IV access as soon as may be safely accomplished

Restraints:
No transport in hobble or prone position. Do not inhibit patient breathing, ventilations

Sedate
- **Ketamine** IM
- **Midazolam** IM and/or **haloperidol** IM
- Consider **diphenhydramine** with haloperidol
- Goal is rapid tranquilization in order to minimize time struggling

Still significantly agitated?

Complete **Restraint Protocol**

Sedate
- Consider cause of Agitation
- **Benzodiazepine**

- Reassess ABCs post sedation
- High flow **O2**
- Start 2 large bore IVs as soon as may be safely accomplished
- Administer 2 liters NS bolus

Still significantly agitated?

Start external cooling measures

- Repeat sedation dose
- If still significantly agitated 5 minutes after 2nd dose sedative, **Contact Base Medical Control**

Full cardiac, SpO2, EtCO2 monitoring and rapid transport

Medication Dosing				
	Weight < 60 kg	Weight > 60 kg		Pediatric < 12 yo
Haloperidol	5 mg IM	5 mg IM		Use Midazolam
	Age > 65 y/o	Age < 65 y/o	Adult > 100kg	
Midazolam	2.5 mg IM/IN	5 mg IM/IN	10 mg IM/IN	0.1-0.2 mg/kg IM/IN
Lorazepam	2 mg IM, 1-2 mg IV	2 mg IM, 1-2 mg IV	2 mg IM, 1-2 mg IV	
Ketamine	4 mg/kg IM	4 mg/kg IM	4 mg/kg IM	
Diphenhydramine	25 mg IM/IV	25 mg IM/IV	25 mg IM/IV	25 mg IM/IV

DYSTONIC REACTION PROTOCOL

ABCs
• Determine cause of dystonia

↓

If airway compromised see **airway management protocol**

↓

Diphenhydramine

Common Causes of Dystonic Reactions:
Antipsychotics – i.e. Haldol, Prolixin, thorazine
Antiemetics – i.e. prochlorperazine, metoclopramide
Antidepressants – i.e. buspirone, sumitriptan
Antibiotics – i.e. erythromycin
Anticonvulsants – i.e. carbamazepine, vigabatrin
H2 receptor blockers – i.e. ranitidine, cimetidine
Recreational Drugs – i.e. cocaine

- Acute dystonic reactions are extrapyramidal side effects of antipsychotic and certain other medications. 90% occur within 5 days of starting a new medication.
- Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements or postures, and may affect any part of the body.
- Diphenhydramine is administered *with* butyrophenone class (haloperidol, Droperidol) medications to help prevent a dystonic reaction.

CHILDBIRTH PROTOCOL

Overview:
- EMS providers called to a possible prehospital childbirth should determine if there is enough time to transport expectant mother to hospital or if delivery is imminent.
- If imminent, **stay on scene** and immediately prepare to assist with the delivery.

ABCs
O2 15 liters via NRB
IV access

Obtain obstetrical history (see adjacent)

Specific Information Needed:
- Obstetrical history:
  - o Number of pregnancies (gravida)
  - o Live births (PARA)
  - o Expected delivery date
  - o Length of previous labors
  - o Narcotic use in past 4 hours

If suspected imminent childbirth:
- Allow patient to remain in position of comfort
- Visualize perineum
- Determine if there is time to transport

Imminent Delivery
Delivery is imminent if there is crowning or bulging of perineum

Delivery not imminent
- Transport in position of comfort, preferably on left side, to patient's requested hospital if time and conditions allow.
- Monitor for progression to imminent delivery.

Emergency Childbirth Procedure
- If there is a prolapsed umbilical cord or apparent breech presentation, go to **obstetrical complications** protocol and initiate immediate transport.

For otherwise uncomplicated delivery:
- Position mother supine on flat surface, if possible
- Do not attempt to impair or delay delivery
- Support and control delivery of head as it emerges
- Protect perineum with gentle hand pressure
- Check for cord around neck, gently remove from around neck, if present
- Suction mouth, then nose of infant as soon as head is delivered
- If delivery not progressing, baby is "stuck", see **obstetrical complications** protocol and begin immediate transport
- As shoulders emerge, gently guide head and neck downward to deliver anterior shoulder. Support and gently lift head and neck to deliver posterior shoulder
- Rest of infant should deliver with passive participation – get a firm hold on baby
- Keep newborn at level of mother's vagina until cord stops pulsating and is double clamped

Critical Thinking:
- Normal pregnancy is accompanied by higher heart rates and lower blood pressures.
- Shock will be manifested by signs of poor perfusion
- Labor can take 8-12 hours, but as little as 5 minutes if high PARA
- The higher the PARA, the shorter the labor is likely to be
- High risk factors include: no prenatal care, drug use, teenage pregnancy, DM, htn, cardiac disease, prior breech or C section, preeclampsia, twins
- Note color of amniotic fluid for meconium staining.

Postpartum Care Infant
- Suction mouth and nose only if signs of obstruction by secretions
- Respirations should begin within 15 seconds after stimulating reflexes. If not, begin artificial ventilations at 30-40 breaths/min
- If apneic, cyanotic or HR < 100, begin **neonatal resuscitation**
- Dry baby and wrap in warm blanket
- After umbilical cord stops pulsating, double clamp 6" from infant abdominal wall and cut between clamps with sterile scalpel or scissors. If no sterile cutting instrument available, lay infant on mother's abdomen and do not cut clamped cord
- Document 1 and 5 minute APGAR scores

Postpartum Care Mother
- Placenta should deliver in 20-30 minutes. If delivered, collect in plastic bag and bring to hospital. Do not pull cord to facilitate placenta delivery and do not delay transport awaiting placenta delivery
- If the perineum is torn and bleeding, apply direct pressure with sanitary pads
- Postpartum hemorrhage – see **obstetrical complications** protocol
- Initiate transport once delivery of child is complete and mother can tolerate movement

OBSTETRICAL COMPLICATIONS

For All Patients with obstetrical complications:
- Do not delay: immediate rapid transport
- Give high-flow **oxygen**
- Start IV en route if time and conditions allow. Treat signs of shock with IV fluid boluses per **Medical Hypotension/Shock Protocol.**

Possible actions for specific complications (below):
- The following actions may not be feasible in every case, nor may every obstetrical complication be anticipated or effectively managed in the field. These should be considered "best advice" for rare, difficult scenarios. In every case, initiate immediate transport to a definite care at hospital. (Meriter or St Mary's)

Prolapsed Umbilical Cord
- Discourage pushing by mother
- Position mother in Trendelenburg or supine with hips elevated
- Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician.
- Feel for cord pulsations.
- Keep exposed cord moist and warm.

Breech Delivery
- Never attempt to pull infant from vagina by legs
- IF legs are delivered gently elevate trunk and legs to aid delivery of head
- Head should deliver in 30 seconds. If not, reach 2 fingers into vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway.
- Apply gentle abdominal pressure to uterine fundus
- IF infant delivered see **childbirth protocol** – Postpartum care of infant and mother.

Postpartum Hemorrhage
- Massage abdomen (uterine fundus) until firm
- Initiate rapid transport
- Note type and amount of bleeding
- Treat signs of shock with IV fluid boluses

Complications of Late Pregnancy

3rd Trimester Bleeding (6-8 months)
- High flow **O2** via NRB, IV access
- Suspect placental abruption or placenta previa
- Initiate rapid transport
- Position patient on left side
- Note type and amount of bleeding
- IV NS bolus for significant bleeding or shock

Eclampsia/Toxemia
- High flow **O2** via NRB, IV access
- SBP > 140, DBP > 90, peripheral edema, headache, seizure
- Transport position of comfort
- Treat seizures with **Magnesium Sulfate**.
- See **seizure protocol**

Shoulder Dystocia
- Support baby's head
- Suction oral and nasal passages
- DO NOT pull on head
- May facilitate delivery by placing mother with buttocks just off the end of bed, flex her thighs upward and gentle open hand pressure above the pubic bone.
- IF infant delivered see **childbirth protocol** – Postpartum care of infant and mother.

TRANSPORT OF THE HANDCUFFED PATIENT

Purpose:

Guideline for transport of patients in handcuffs placed by law enforcement

Guideline:

1. Handcuffs are only to be placed by law enforcement. EMS personnel are not permitted to use handcuffs.
2. Request that law enforcement remain with the patient in the ambulance, if possible. If not possible, request that police ride behind ambulance so as to be readily available to remove handcuffs if needed in an emergency situation to facilitate medical care of the patient.
3. EMS personnel are not responsible for the law enforcement hold on these patients.
4. Handcuffed patients will not be placed in the prone position.
5. Handcuffs may be used with spinal immobilization.
6. Medical priorities should take priority in the positioning of the handcuffs.

GENERAL TRAUMA CARE

- BSI
- Scene safety
- Consider mechanism
- Consider need for additional resources

↓

- General impression
- ABCs and LOC
- Rapid Trauma Assessment
- Prepare for immediate transport
- SAMPLE history

↓

- Give high flow **oxygen**
- Assist ventilations and manage airway as indicated
- **Spinal immobilization** if indicated

↓

Control exsanguinating hemorrhage:
- Direct pressure
- Tourniquet protocol if indicated
- Pelvic stabilization if indicated

↓

Assess disability and limitation:
- Brief neuro assessment
- Extremity splinting if indicated

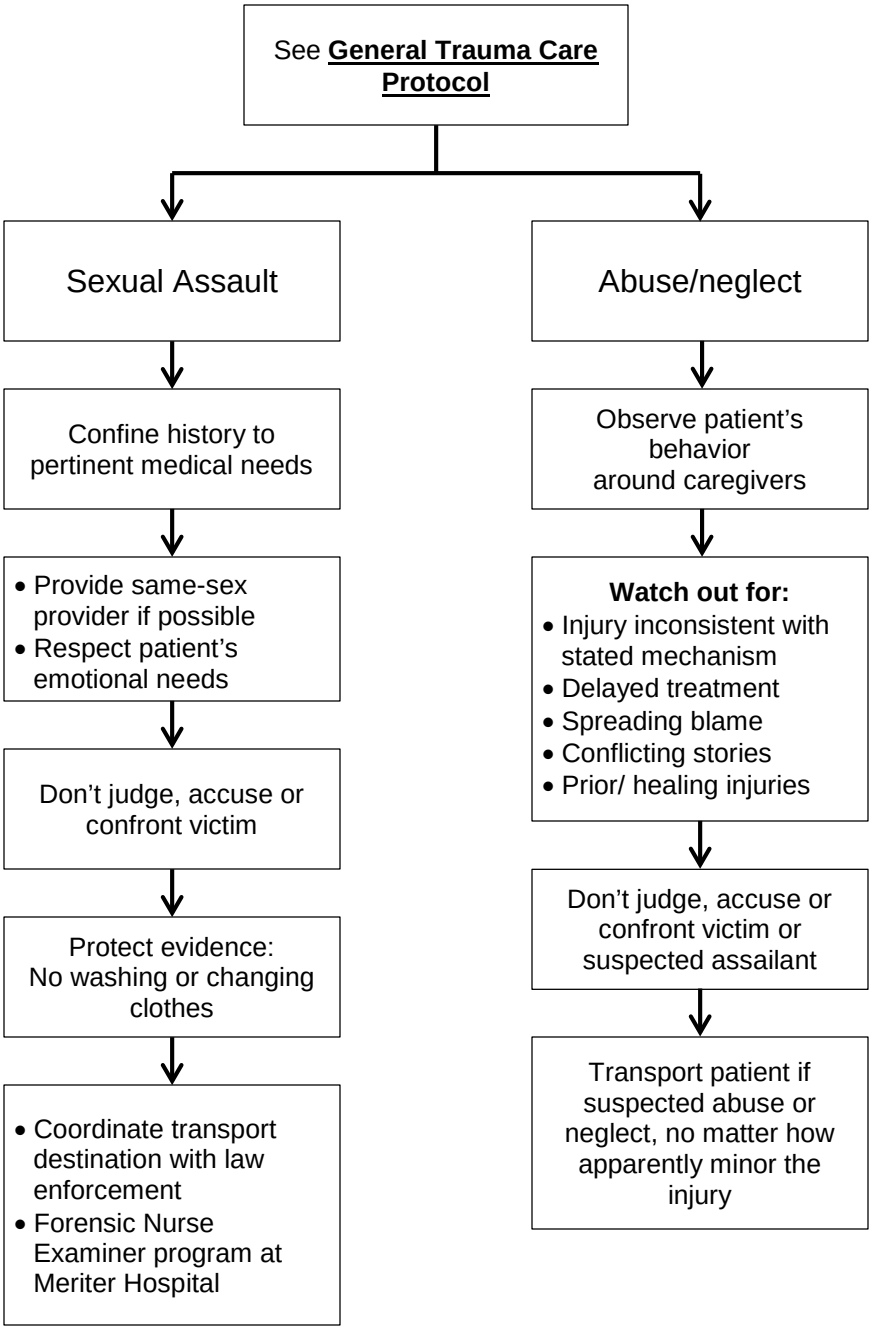
↓

- Rapid transport to appropriate Trauma Center
- Large bore IV, 2nd if unstable
- Consider IV fluid bolus 20mL/kg if unstable or suspected significant injuries. See **Traumatic Shock Protocol**
- Monitor vital signs, ABCs, neuro status, GCS
- Consider Helicopter EMS for lengthy extrication times or identified traffic delays

ON-SCENE TIME BENCHMARK:
- Trauma Patients = 15 min or fewer
- Variances from this should be documented in the ePCR
- Patients with serious trauma require rapid assessment, treatment, and transportation to a designated trauma center for evaluation by a physician, critical interventions, and surgery. A shortened scene time results in rapid care at a hospital, which in turn is good for the patient because it can expedite how quickly a patient may receive critical care and necessary surgical interventions.

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization

SPECIAL TRAUMA SCENARIOS PROTOCOL



TRAUMA IN PREGNANCY

See **General Trauma Care Protocol**

Pregnant Trauma (EGA < 20 weeks)

- Priority is mother.
- Transport all patients with any thoracic, abdominal, pelvic injury or complaint.

Pregnant Trauma (EGA ≥ 20 weeks)

- Priority is mother.
- Transport all patients.
- Assure hospital is aware of pregnancy and EGA

Patients with any thoracic, abdominal, or pelvic complaint or injury may require prolonged fetal monitoring in hospital, even if asymptomatic at time of evaluation, and even for seemingly minor mechanism

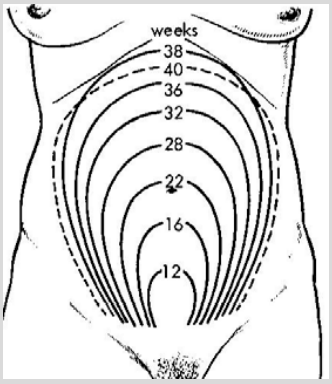
- Avoid supine position:
  - o Place in left lateral recumbent position if possible
  - o If immobilized tilt backboard 15 to 30 degrees to the left side

Interpret VS with caution.
Pregnant patient has:

- *Increased heart rate*
- *Decreased blood pressure*
- *Increased blood volume*

Estimated Gestational Age (EGA)

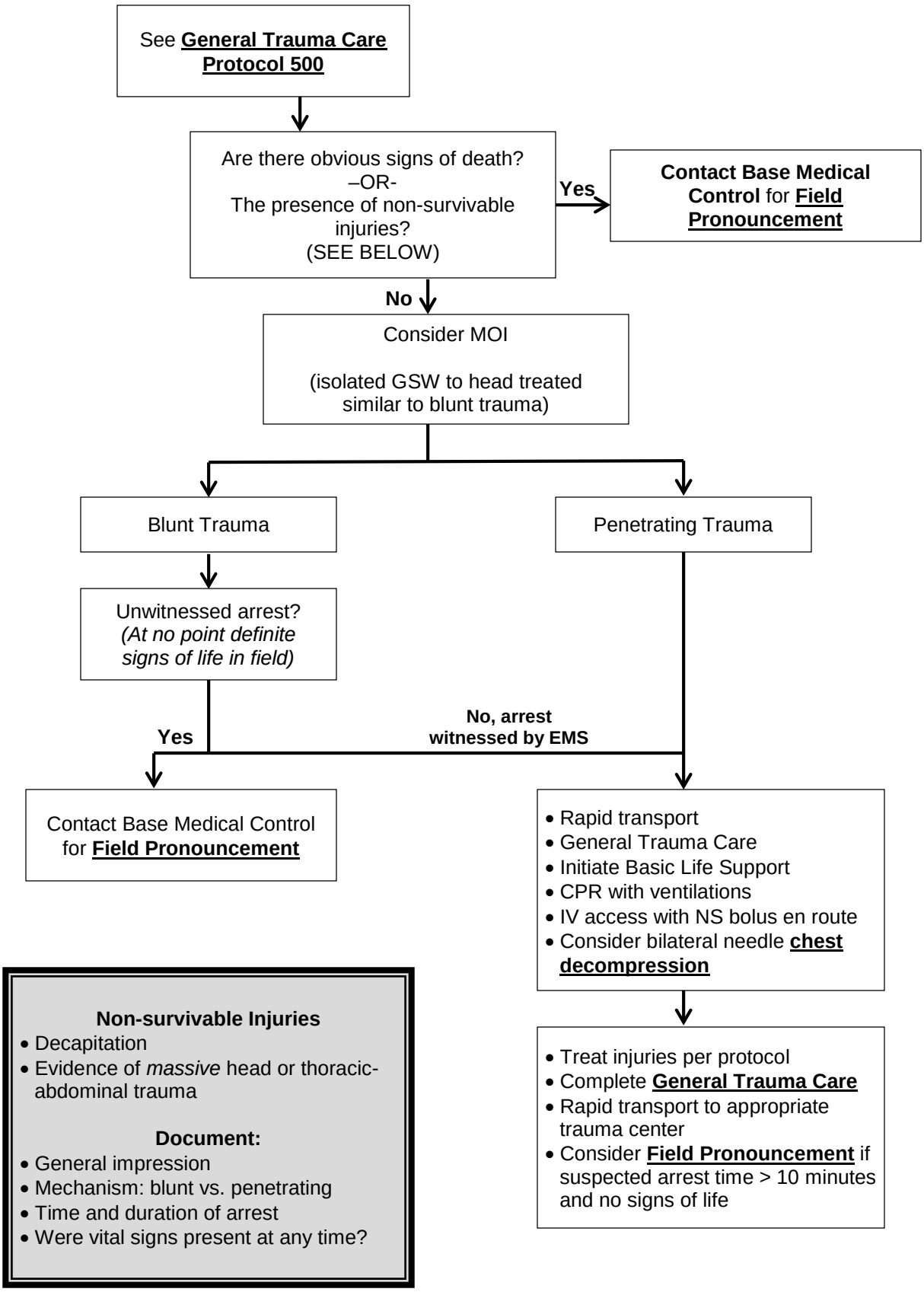
If EGA > 20 weeks, consider two patients: mother and fetus. Estimation of gestational age may be made based on fundal height by palpating for top of uterus:



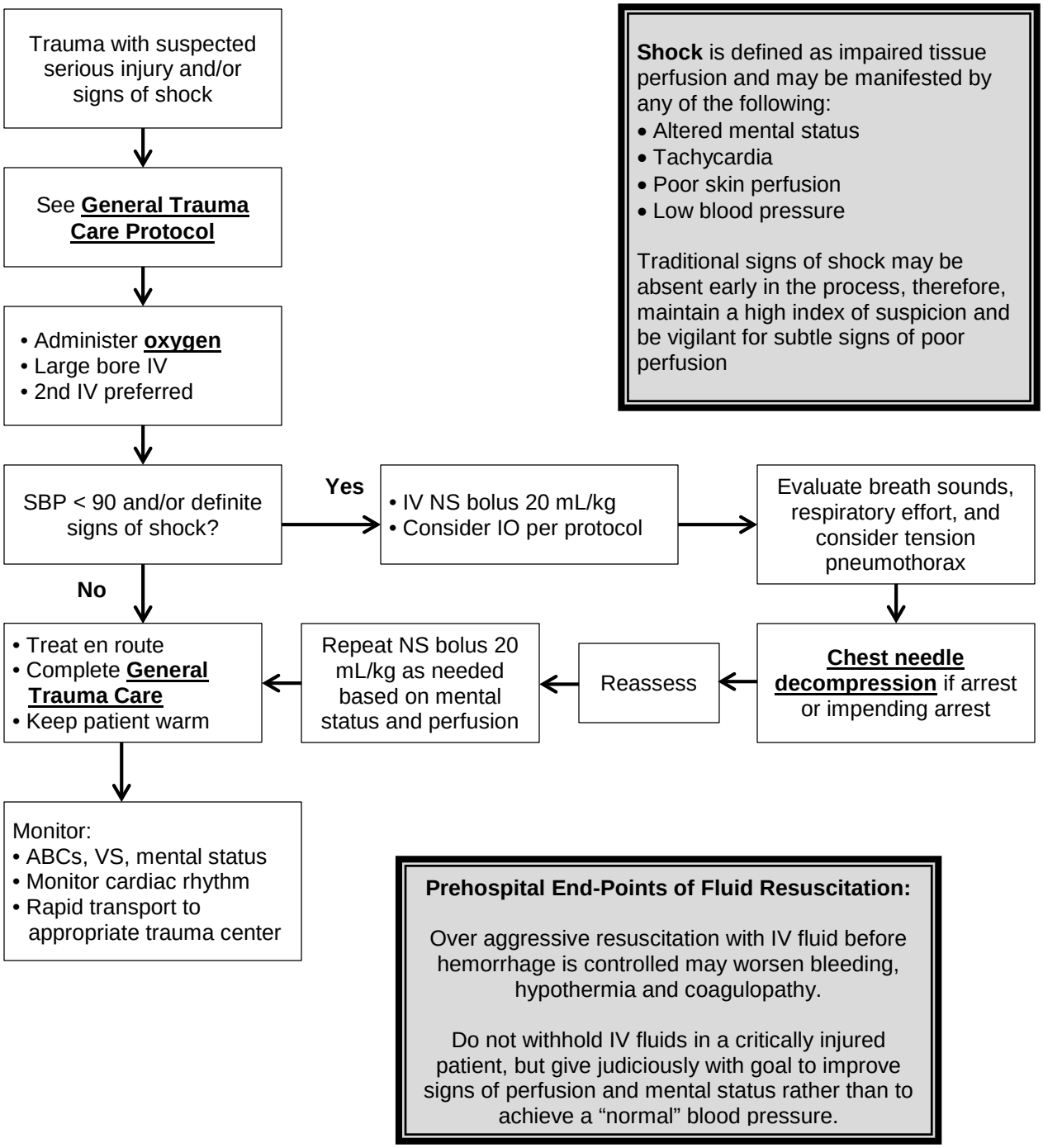
If uterus is at umbilicus, then EGA > 20 weeks

Estimation by Last Menstrual Period:
Due Date = LMP + 9 months + 7 days
EGA = due date – current date

ADULT TRAUMATIC PULSELESS ARREST



ADULT TRAUMATIC SHOCK PROTOCOL



Shock is defined as impaired tissue perfusion and may be manifested by any of the following:

- Altered mental status
- Tachycardia
- Poor skin perfusion
- Low blood pressure

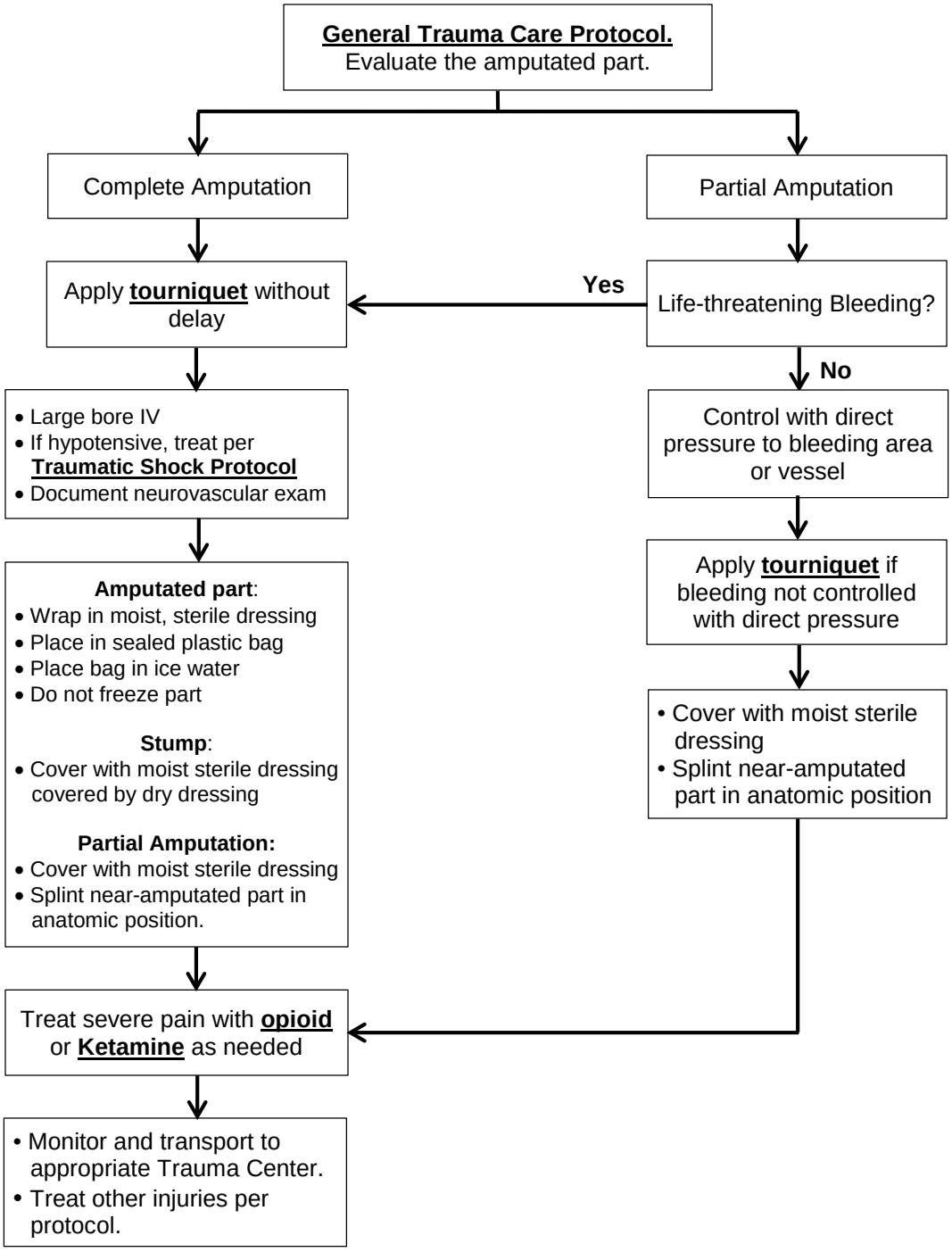
Traditional signs of shock may be absent early in the process, therefore, maintain a high index of suspicion and be vigilant for subtle signs of poor perfusion

Prehospital End-Points of Fluid Resuscitation:

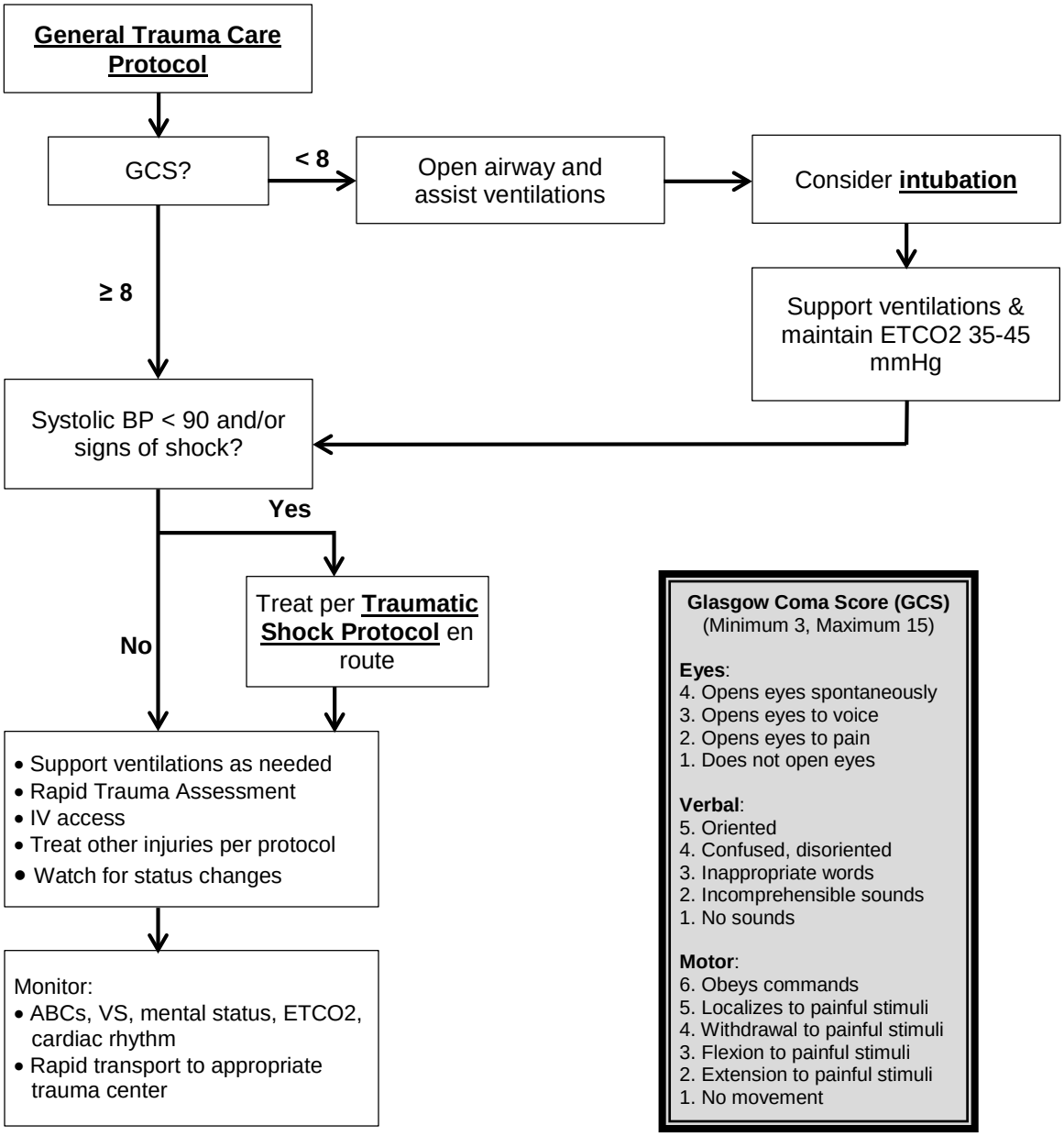
Over aggressive resuscitation with IV fluid before hemorrhage is controlled may worsen bleeding, hypothermia and coagulopathy.

Do not withhold IV fluids in a critically injured patient, but give judiciously with goal to improve signs of perfusion and mental status rather than to achieve a “normal” blood pressure.

AMPUTATIONS



HEAD TRAUMA PROTOCOL



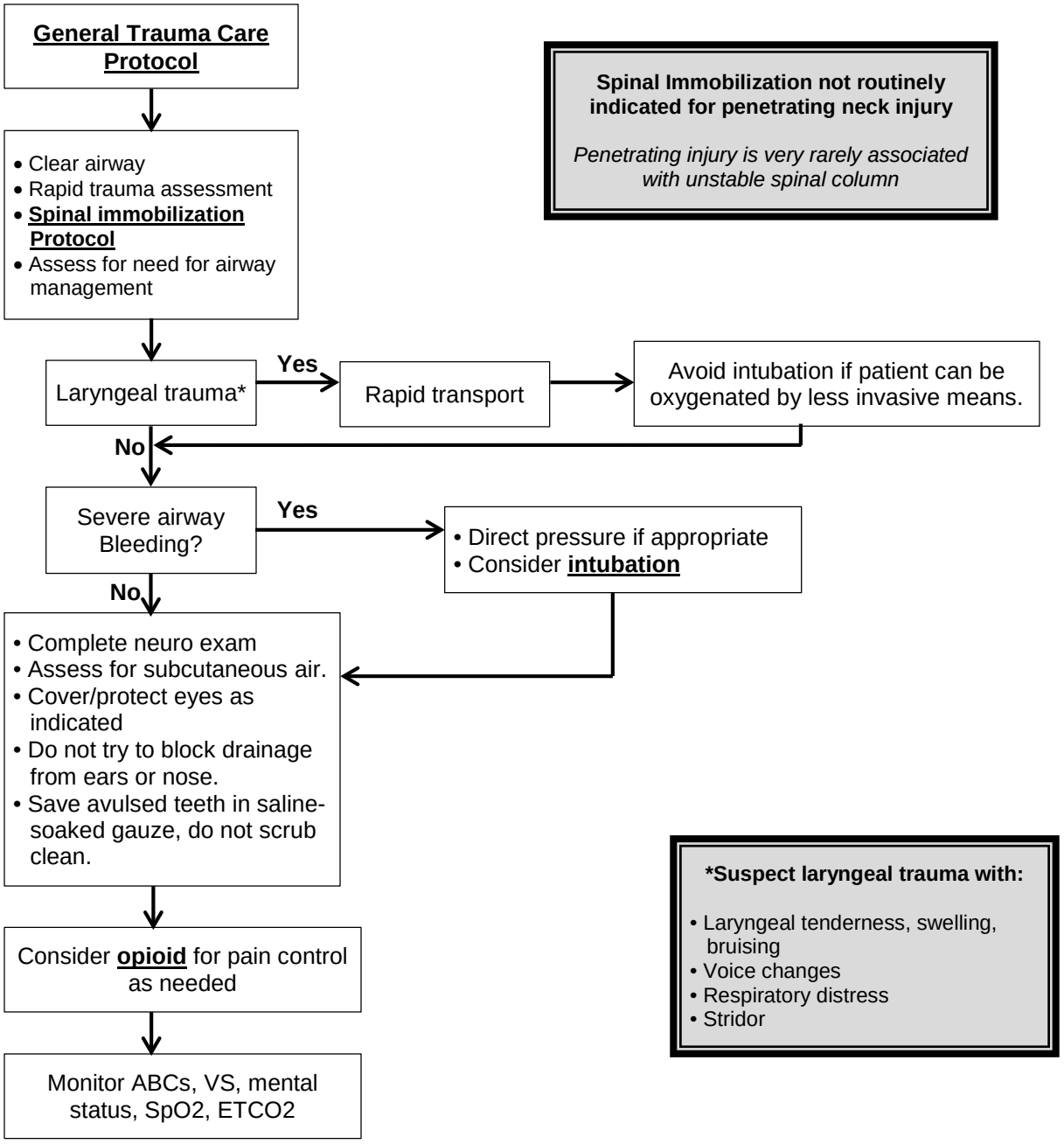
Glasgow Coma Score (GCS)
(Minimum 3, Maximum 15)

Eyes:
4. Opens eyes spontaneously
3. Opens eyes to voice
2. Opens eyes to pain
1. Does not open eyes

Verbal:
5. Oriented
4. Confused, disoriented
3. Inappropriate words
2. Incomprehensible sounds
1. No sounds

Motor:
6. Obeys commands
5. Localizes to painful stimuli
4. Withdrawal to painful stimuli
3. Flexion to painful stimuli
2. Extension to painful stimuli
1. No movement

FACE AND NECK TRAUMA



ADULT SPINAL TRAUMA

General Trauma Care Protocol

- Full spinal immobilization if suspected spine injury
- Document neuro assessments before and after immobilization

Rapid transport to appropriate **Trauma Center**

Large bore IV and consider 2nd line

If BP < 90 and/or signs of shock, resuscitate per **Traumatic Shock Protocol**

- Complete patient assessment
- Treat other injuries per protocol
- Monitor for status changes

Monitor ABCs, VS, mental status, SpO2, ETCO2

Consider **opioid** for pain control as needed

Signs of Spinal Cord Injury:
- Any neurological complaint
- Sensory loss, weakness and/or paralysis
- Numbness, tingling or painful burning in arms, legs

Spinal Immobilization not routinely indicated for penetrating neck injury

Penetrating injury is very rarely associated with unstable spinal column

ADULT SPINAL PRECAUTIONS PROTOCOL

Does patient have/complain of any of the following:

- Midline C/T/L spine tenderness on palpation
- Neurologic complaints or deficits
- Other injuries which are potentially distracting**
- Alteration in mentation or under influence of drugs or EtOH
- Barrier to evaluate for spinal injury (*e.g. language or developmental barrier*)
- Fall-related injuries with or without loss of consciousness

Yes → Place c-collar on patient and ask them to not move neck

No → If **NONE** of above criteria, no spinal precautions required

- Backboards have not been shown to be any benefit for spinal injuries, but may cause harm.
- Backboards/scoops are useful tools for carrying non-ambulatory patients to a gurney. Patients who do not need a backboard should be gently slid off of backboard/scoop onto gurney.
- Self-extrication from a vehicle with assistance is likely better than standard extrication procedures.
- If for any reason you are uncomfortable NOT immobilizing a patient, then place him or her on a backboard.
- **Use caution when assessing for spinal injury in elderly patients, who are at higher risk and may have minimal symptoms.**
- Consider improvised cervical spine immobilization such as towel rolls and tape to prevent airway compromise or worsening spinal injury or the rigid cervical collar cannot be correctly sized to the patient
- **Neurological exam documentation is MANDATORY in patients with potential spinal trauma, including serial exams.**

**A distracting injury is defined as a condition thought by the clinician to be producing pain sufficient to distract the patient from a second (neck) injury. This may include long bone fractures, visceral injuries, chest injuries, large lacerations, degloving injuries, crush injuries, large burns, and injuries producing acute functional impairment.

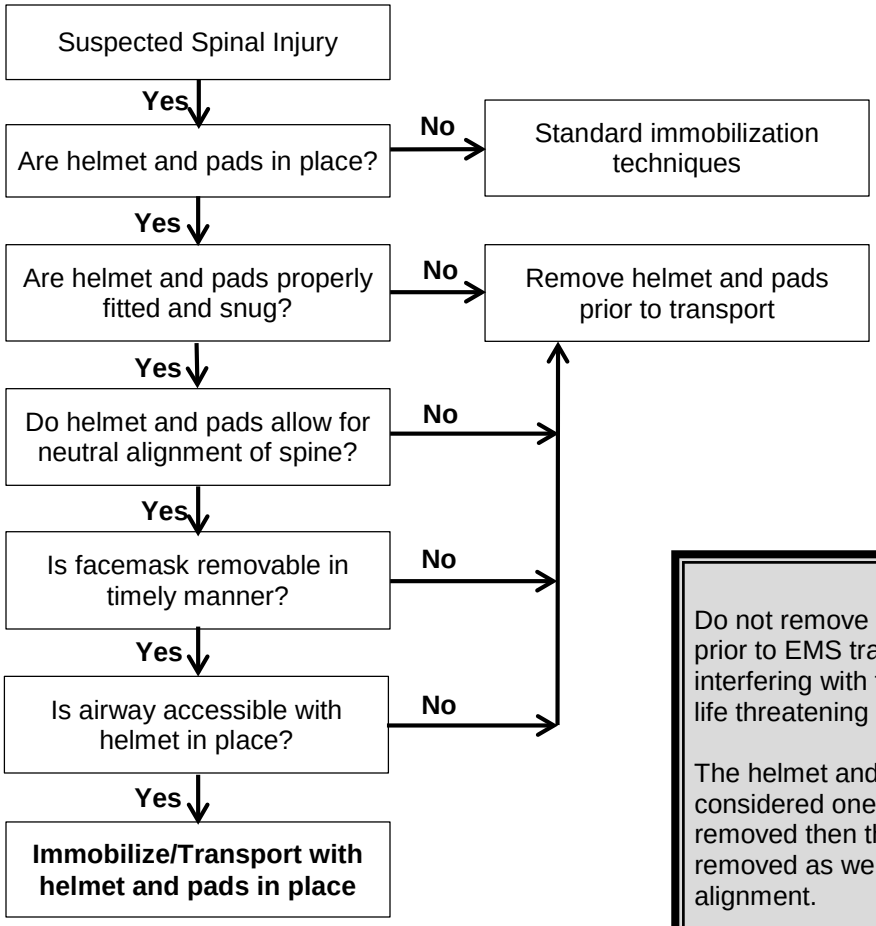
Is there an objective neurological deficit?

Yes → **Immobilize using backboard or scoop & cervical collar with standard technique**

No → Are there signs/symptoms of traumatic injury?

- **No** → Patient does **NOT** require a backboard. Have them lie still on the gurney, which will provide sufficient spinal precaution
- **Yes** → Did patient sustain **ONLY** penetrating trauma?
  - **Yes** → Patient does **NOT** require a backboard. Have them lie still on the gurney, which will provide sufficient spinal precaution
  - **No** → Is the patient ambulatory on scene at time of EMS arrival?
    - **Yes** → Patient does **NOT** require a backboard. Have them lie still on the gurney, which will provide sufficient spinal precaution
    - **No** → Is the patient able to comfortably lay still?
      - **Yes** → Patient does **NOT** require a backboard. Have them lie still on the gurney, which will provide sufficient spinal precaution
      - **No** → **Immobilize using backboard or scoop & cervical collar with standard technique**

SUSPECTED SPINAL INJURY WITH PROTECTIVE ATHLETIC EQUIPMENT IN PLACE



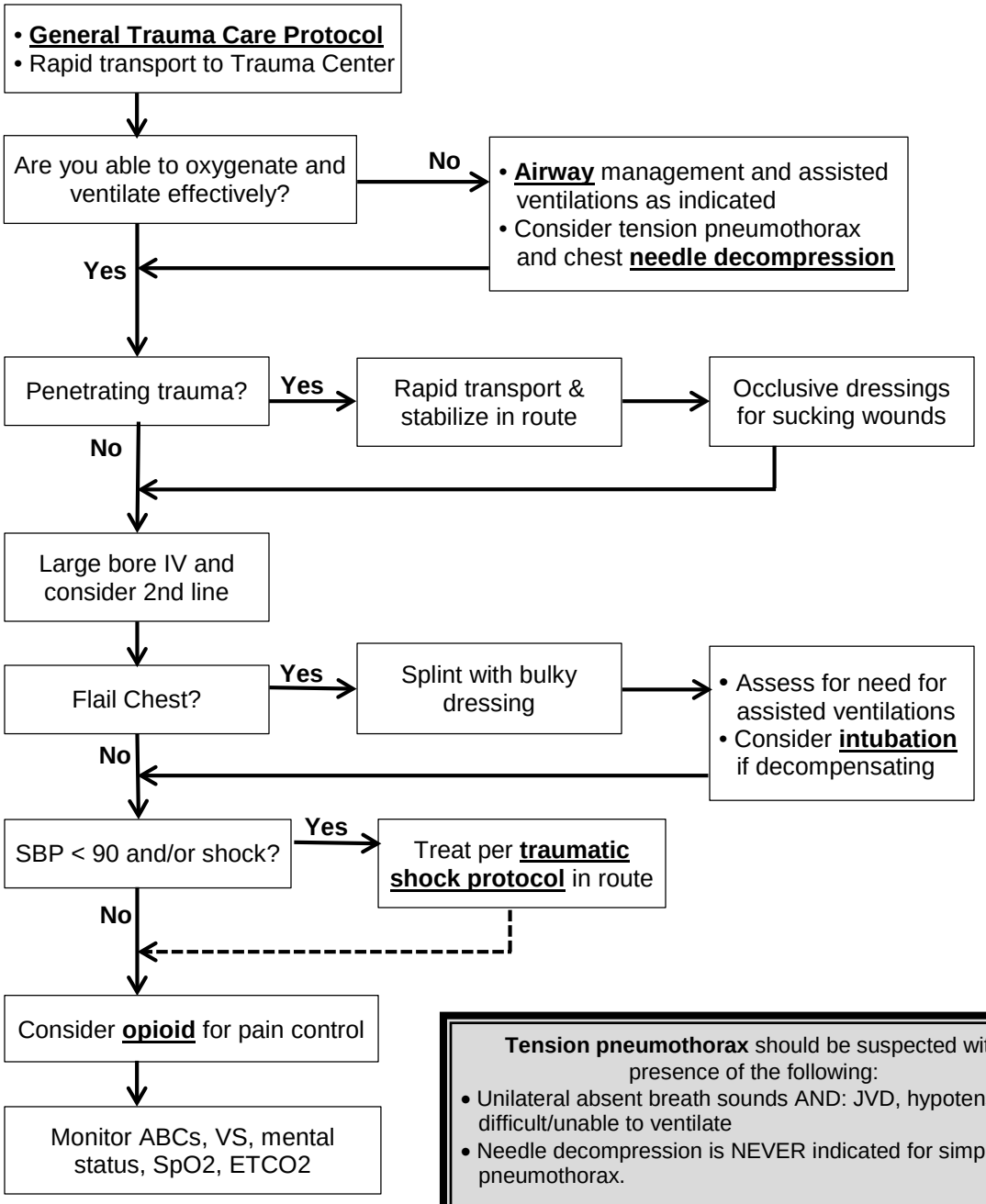
Overview

Do not remove helmet or shoulder pads prior to EMS transport unless they are interfering with the management of acute life threatening injuries.

The helmet and pads should be considered one unit therefore if one is removed then the other should be removed as well to assure neutral spine alignment.

All athletic equipment is not the same. Athletic Trainers on scene should be familiar with equipment in use and be able to remove facemask prior to, or immediately upon, EMS arrival.

CHEST TRAUMA

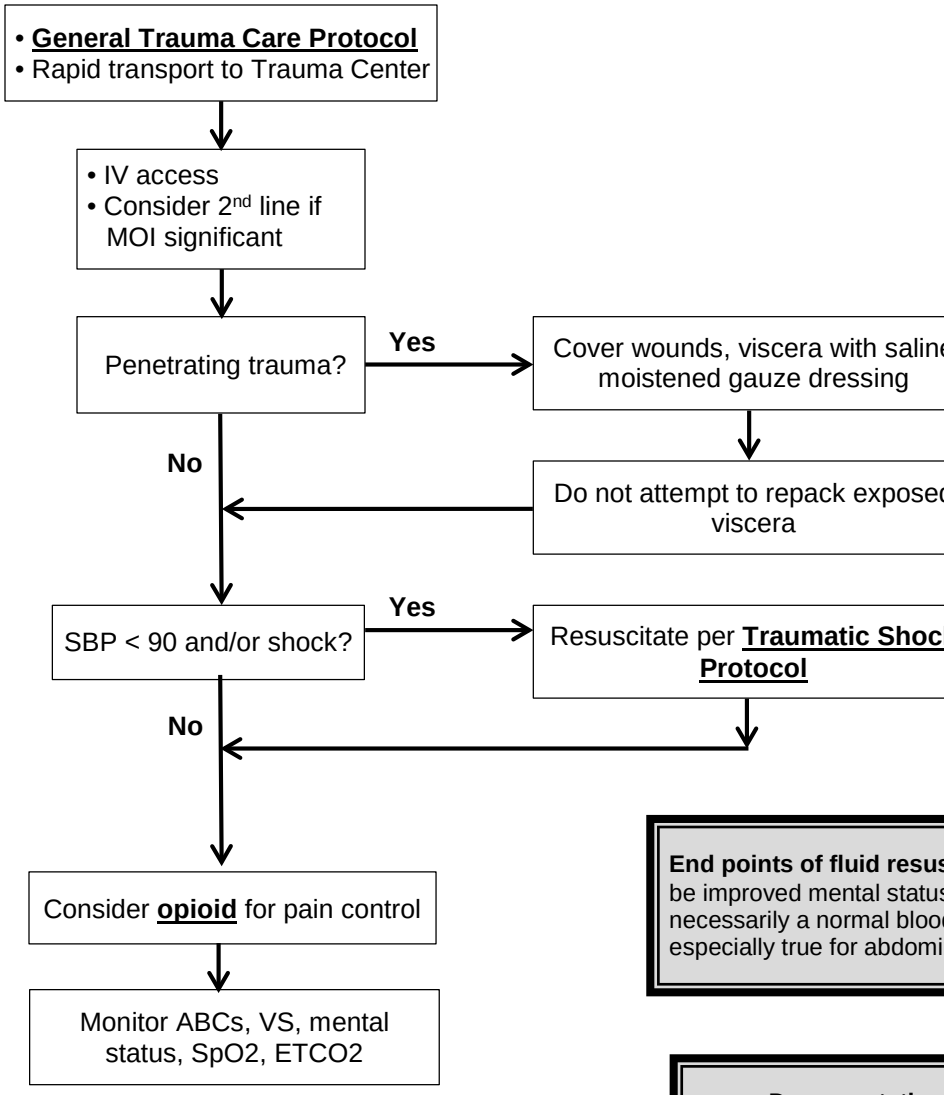


Tension pneumothorax should be suspected with presence of the following:

- Unilateral absent breath sounds AND: JVD, hypotension, difficult/unable to ventilate
- Needle decompression is NEVER indicated for simple pneumothorax.

End points of fluid resuscitation should be improved mental status and pulses, not necessarily a normal blood pressure. This is especially true for penetrating chest trauma.

ABDOMINAL TRAUMA



End points of fluid resuscitation should be improved mental status and pulses, not necessarily a normal blood pressure. This is especially true for abdominal trauma.

Documentation
- MOI
- Time of injury
- Initial GCS

Penetrating trauma
- Weapon/projectile/trajectory

Blunt vehicular trauma
- Condition of vehicle
- Speed
- Ejection
- Airbag deployment
- Restraints, helmets

BURNS

- **General Trauma Care Protocol**
- Rapid transport to Trauma Center

↓

Stop burning process:
- Remove clothes if not adhered to patient's skin
- Flood with water only if flames/smoldering present

↓

Respiratory Distress hoarseness or stridor? →
- **Oxygen** NRB 15 lpm
- Manage airway and assist ventilations as indicated
- Consider CO, CN

↓

Evaluate degree and body surface area involved

↓

Critical Burn*? →
- Start 2 large-bore IVs
- Fluids per ABA recommendations (chart below) **

↓

IV NS TKO

↓

- Remove rings, jewelry, constricting items
- Dress burns with dry sterile dressings
- Treat other injuries per protocol
- Cover patient to keep warm

↓

Consider **opioid** for pain control or **Ketamine** for severe pain

↓

Monitor ABCs, VS, mental status, SpO2, ETCO2

Regional Burn Center:
UW Hospitals and Clinics- Madison Campus

Documentation
- Type and degree of burn(s)
- % BSA
- Respiratory status including any voice changes or hoarseness.
- Singed nares, soot in mouth
- SpO2
- SpCO if available
- PMH
- Confined space (assume CO)

***Critical Burn:**
- 2º > 30% BSA
- 3º > 10% BSA
- Respiratory injury, facial burn
- Associated injuries, electrical or deep chemical burns, underlying PMH (cardiac, DM), age < 10 or > 50 yrs.

Types of Burns:
- Thermal: remove from environment, put out fire
- Chemical: brush off or dilute chemical. Consider HAZMAT
- Electrical: make sure victim is de-energized and suspect internal injuries
- Assume CO if enclosed space
- Consider cyanide poisoning (CN) if unconscious or pulseless arrest

**** ABA Recommended Prehospital Fluid Therapy**

14 and older	500 mL/hr NS or LR
5 - 13 years	250 mL/hr NS or LR
Younger than 5	125 mL/hr D5W, NS or LR

If no signs of clinical hypovolemia or shock, large volume of IV fluid is not needed. For typical 30-minute prehospital time, give 250cc bolus for patient age ≥ 14.

GENERAL GUIDELINES FOR PEDIATRIC PATIENTS

General Guideline:

Pediatric patients, defined as age < 12 years for the purpose of these protocols, have unique anatomy, physiology, and developmental needs that affect prehospital care. Because children make up a small percentage of total calls and few pediatric calls are critically ill or injured, it is important to stay attuned to these differences to provide good care. Therefore, **CONTACT BASE MEDICAL CONTROL** early for guidance when treating pediatric patients with significant complaints, including abnormalities of vital signs. Pediatric emergencies are usually not preceded by chronic disease. If recognition of compromise occurs early, and intervention is swift and effective, the child will often be restored to full health.

Specific Considerations:

The following should be kept in mind during the care of children in the prehospital setting:

1. Airways are smaller, softer, and easier to obstruct or collapse.
2. Respiratory reserves are small. A minor insult like improper position, vomiting, or airway narrowing can result in major deficits in ventilation and oxygenation.
3. Circulatory reserves are also small. The loss of as little as one unit of blood can produce severe shock in an infant. Conversely, it is difficult to fluid overload most children. You can be confident that a good hands-on circulation assessment will determine fluid needs accurately.
4. Assessment of the pediatric patient can be done using your knowledge of the anatomy and physiology specific to infants and children.
5. Listen to the parents' assessment of the patient's problem. They often can detect small changes in their child's condition. This is particularly true if the patient has chronic disease.
6. The proper equipment is very important when dealing with the pediatric patient.
7. When caring for pediatric patients, use the Broslow-Luten® weight/length based system to determine medication dosages and equipment sizes.

PEDIATRIC SEIZURE

- Support ABCs
- Give **oxygen**
- Rule out or treat **hypoglycemia**
- Universal seizure precautions (see below)
- Consider the cause (see below)

Actively Seizing?

Yes

Is seizure brief and self-limited?

Yes

- Check pulse and reassess ABCs

No

If seizure prolonged (e.g.: > 5 min) or recurrent, then treat as follows:

- Give **benzodiazepine**
- Establish IV, if not already in place

If the seizure continues, or recurs repeat **benzodiazepine.**

Contact Base Medical Control as necessary for seizure control.

No

- Transport and monitor ABCs, vital signs, and neurological condition
- Complete head to toe assessment

Common Causes of Seizures

- Epilepsy
- Febrile seizure
- Trauma/NAT
- Hypoglycemia
- Intracranial hemorrhage
- Overdose (TCA)
- Meningitis
- Stimulant use (cocaine, meth)

Universal Seizure Precautions

- Ensure airway patency, but do not force anything between teeth. NPA may be useful
- Give **oxygen**
- Suction as needed
- Protect patient from injury
- Check pulse immediately after seizure stops
- Keep patient on side

Document:

- Document: Seizure history: onset, time interval, previous seizures, type of seizure
- Obtain medical history: head trauma, diabetes, substance abuse, medications, compliance with anticonvulsants, pregnancy

PEDIATRIC CARDIAC ARREST-GENERAL PRINCIPLES

General Guideline:

Pediatric cardiac arrest more frequently represents progressive respiratory deterioration or shock rather than primary cardiac etiologies. Unrecognized deterioration may lead to bradycardia, agonal breathing, and ultimately asystole. The resulting hypoxic and ischemic insult to the brain and other vital organs make neurologic recovery extremely unlikely, even in the event that the child survives the arrest. Children who respond to rapid intervention with ventilation and oxygenation alone or to less than 5 minutes of advanced life support are much more likely to survive neurologically intact. Therefore, it is essential to recognize the child who is at risk for progressing to cardiopulmonary arrest and to provide aggressive intervention before asystole occurs.

Specific Information Needed for Patient Care Report:

A. Onset (witnessed or unwitnessed), preceding symptoms, bystander CPR, downtime before CPR and duration of CPR
B. Past History: medications, medical history, suspicion of ingestion, trauma, environmental factors (hypothermia, inhalation, asphyxiation)

Document Specific Objective Findings

A. Unconscious, unresponsive
B. Agonal, or absent respirations
C. Absent pulses
D. Any signs of trauma, blood loss
E. Skin temperature

General Treatment Guidelines

A. Treat according to **Pediatric Pulseless Arrest Algorithm.**
B. Primary cardiac arrest from ventricular arrhythmia, while less common than in adults, does occur in children. If history suggests primary cardiac event (e.g.: sudden collapse during exercise), then rapid defibrillation is most effective treatment
C. Most pediatric pulseless arrest is the result of primary asphyxial event, therefore initial sequence is chest compressions **with** ventilations, unlike adult pulseless arrest

General Guidelines: Chest Compressions for 2 Rescuers

- Once advanced airway in place, chest compressions should be given continually with ventilations at 8-10/minute

Neonate (≤ 1 month old)	**Infant and Child (1 month to 12 years old)**
– 1 cycle of CPR = 3:1 chest compressions: breaths	– 1 cycle of CPR = 15:2 chest compressions: breaths

- Push hard and fast at a compression rate of at least 100/minute, but no more than 120/minute.
- Use thumb encircling hand placement for infants.
- Minimize interruption to chest compressions
  a. Continue CPR while defibrillator is charging, and resume CPR immediately after all shocks. Do not check pulses except at end of CPR cycle and if rhythm is organized at rhythm check.
  b. Increase in compression interruption correlates with decrease in likelihood of successful defibrillation.
- Ensure full chest recoil
  a. Represents diastolic phase for cardiac filling due to negative intrathoracic pressure

- Avoid hyperventilation
  a. Associated with barotrauma and air trapping
  b. Makes CPR less effective by inhibiting cardiac output by increasing intrathoracic pressure and decreasing venous return to the heart
- Rotate compressors every 2 minutes during rhythm checks.

General Guidelines: Defibrillation

A. First shock delivered at 2 J/kg biphasic
B. All subsequent shocks delivered at 4 J/kg biphasic

General Guidelines: Ventilation during CPR

A. Do not interrupt chest compressions and do not hyperventilate.
B. Contrary to adult cardiac arrest, pediatric arrest is much more likely to be asphyxial and prolonged. During this period, blood continues to flow to the tissues causing oxygen saturation to decrease and carbon dioxide to increase. Pediatric patients need both prompt ventilation and chest compressions.
C. Hyperventilation decreases effectiveness of CPR and worsens outcome.

General Guidelines: Timing Of Placement Of Advanced Airway

A. ***BVM is preferred method of ventilation in all pediatric patients age < 8 years***
B. An **advanced airway** may be placed at any point in resuscitation in patients ≥ 8 years old and may be considered equivalent to, but not superior to BVM for ages 8-12
C. Do not hyperventilate.
D. Always confirm advanced airway placement by objective criteria: $ETCO_2$
   - Continuous waveform capnography is mandatory for confirmation of advanced airway placement.

General Guidelines: Pacing

- Effectiveness of transcutaneous pediatric pacing has not been established and is not recommended.

General Guidelines: ICD/Pacemaker patients

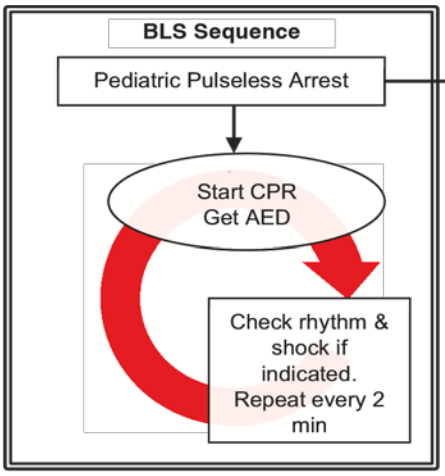
- If cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place pacer/defib pads at least 1 inch from device. Biaxillary, anterior/posterior or apex/sternum pad placement may be used.

Special Notes:

Consider reversible causes of cardiac arrest ("Hs and Ts"):

Hypovolemia	IV Fluid bolus
Hypoxia	Ventilation
Hydrogen Ion (acidosis)	Ventilation
Hyperkalemia	**Sodium bicarbonate, Calcium Chloride**
Hypothermia	See **hypothermia protocol**
Toxins: e.g.: opioid overdose	**Naloxone**
Tamponade (cardiac)	
Tension pneumothorax	**Needle thoracostomy**
Thrombosis (coronary, pulmonary)	

PEDIATRIC (AGE < 12 YEARS) UNIVERSAL PULSELESS ARREST ALGORITHM



- Start CPR
- Attach defibrillator
- Give **oxygen**

Shockable Rhythm?

YES → VT/VF → **Shock + CPR 2 min** → Start IV/IO; **Epinephrine** → Shockable Rhythm?

NO → Asystole/PEA **B** → CPR 2 min → Start IV/IO; **Epinephrine** → Shockable Rhythm?

Shockable Rhythm? YES → **A** **Shock + CPR 2 min** → **Epinephrine** every 3-5 min → Shockable Rhythm?

Shockable Rhythm? NO → **Shock + CPR 2 min** → **Epinephrine** every 3-5 minutes; **Amiodarone**; Treat reversible causes; **Contact Base Medical Control** for additional antiarrhythmic → Shockable Rhythm?

Shockable Rhythm? NO → If asystole, go to box **B**; If organized rhythm, check pulse. If no pulse, go to box **B**; If ROSC, begin **post-cardiac arrest care**; Treat reversible causes

Shockable Rhythm? YES → Go to Box **A**

CPR, Ventilation and Advanced Airway:

- BVM is an appropriate primary means of ventilation in all pediatric patients.
- An **advanced airway** can be placed as soon as feasible to assist in ventilation and oxygenation.
- If no advanced airway in place, alternate ventilations and compressions in 15:2 ratio
- If advanced airway in place, ventilate continuously at a rate of 8-10 breath/min.
- Avoid excessive ventilation.

Defibrillation:

- 1st shock @ 2 J/kg, subsequent shocks @ 4 J/kg

ROSC

- Pulse and blood pressure
- Sustained abrupt rise in ETCO2, typically > 40 mmHg
- Consider **Amiodarone** drip if VF/VT and not already given

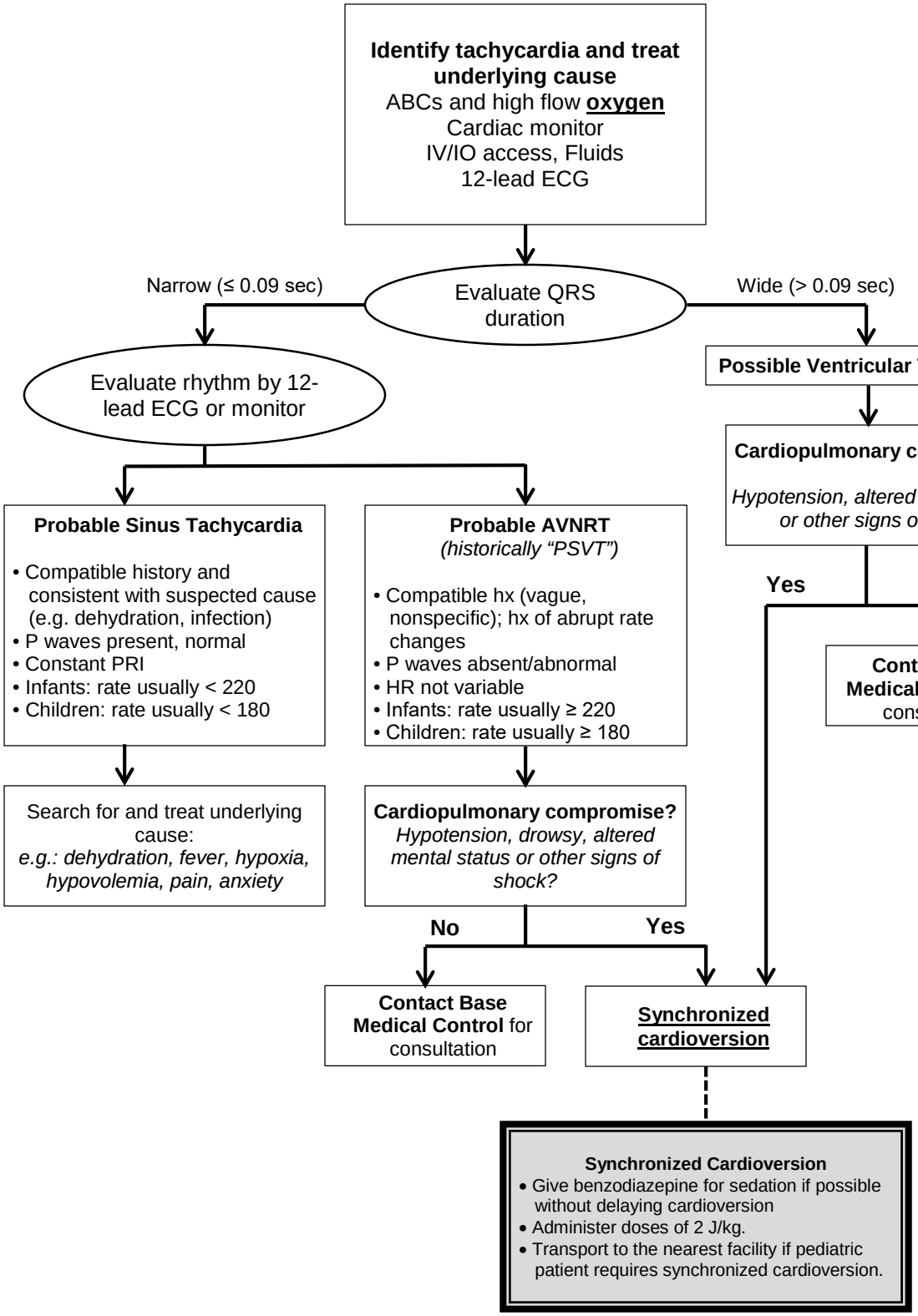
Reversible Causes:

- Hypovolemia
- Hypoxia
- Hydrogen Ion (acidosis)
- Hypo/Hyper-kalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombus (pulmonary, coronary)

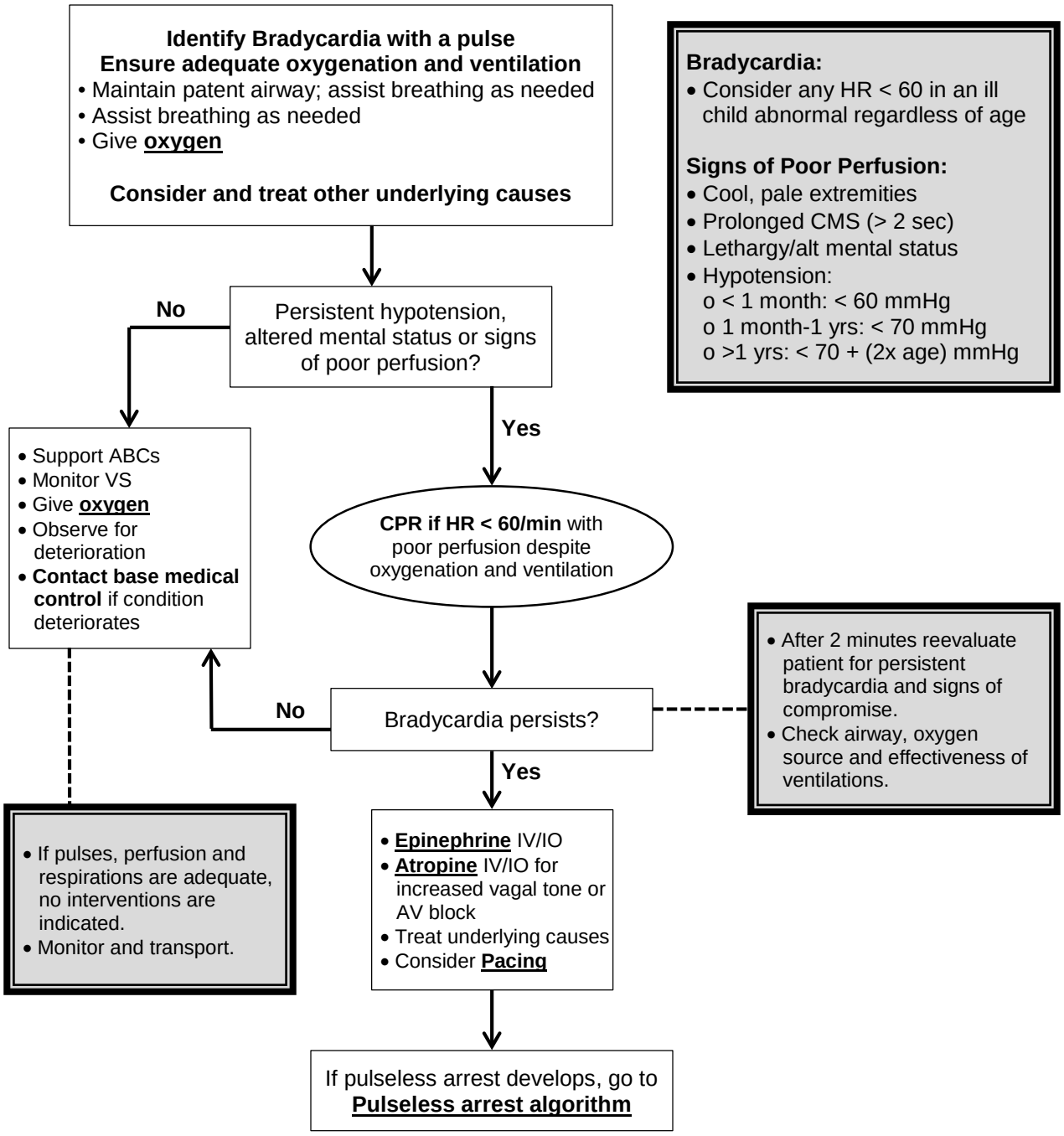
Transport and Family:

- Limited scene time and prompt transport to the ED, even without ROSC, is recommended for pediatric cardiac arrest cases.
- Family presence is recommended and preferred by most families. It is rarely disruptive and may help with the grieving process for family members.
- **Contact Base Medical Control** for termination of resuscitation.

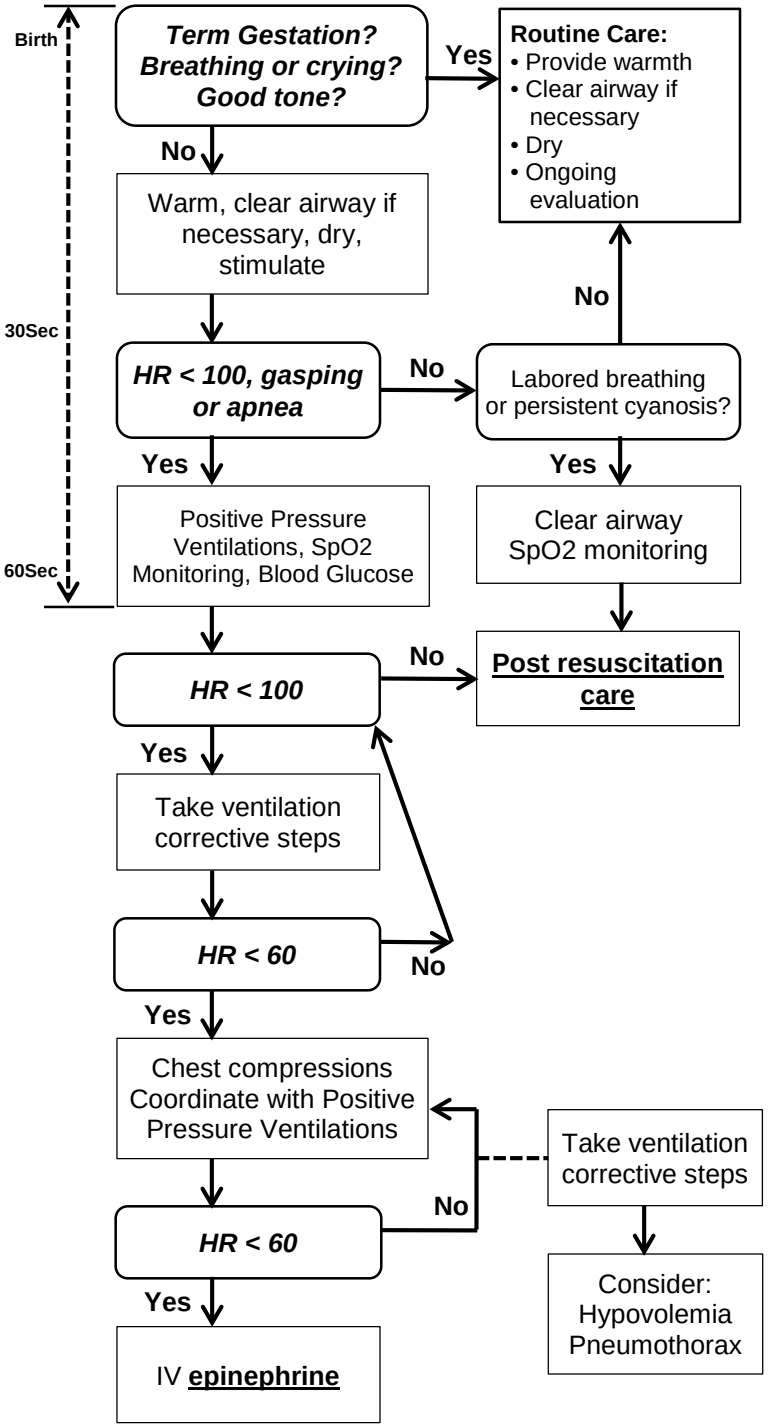
PEDIATRIC (AGE < 12 YEARS) TACHYCARDIA



PEDIATRIC (AGE < 12 YEARS) BRADYCARDIA



NEONATAL RESUSCITATION



General Considerations:

- Newborn infants who do not require resuscitation can be identified generally based on 3 questions:
  - o Term gestation?
  - o Crying or breathing?
  - o Good muscle tone?
- If answer to all 3 questions is "yes" then baby does not require resuscitation and should be dried, placed skin-to-skin on mother and covered to keep warm.
- If answer to any of 3 questions is "no" then infant should receive 1 or more of following 4 categories of intervention in sequence:
  - o Initial steps in stabilization (warm, clear airway, dry, stimulate)
  - o Ventilation
  - o Chest compression
  - o Administration of epinephrine and/or volume expansion
- It should take approx. 60 seconds to complete initial steps.
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored or unlabored breathing) and heart rate (>/< 100 bpm).
- Check blood glucose level and treat accordingly with **dextrose**.

Assisting Ventilations:

- Assist ventilations at rate of 40-60 breaths per minute to maintain HR > 100.

Chest compressions:

- Indicated for HR < 60 despite adequate ventilation with supplemental O2 for 30 seconds.
- 2 thumb – encircling hands technique preferred.
- Allow complete chest recoil.
- Coordinate with ventilations so not delivered simultaneously.
- 3:1 ratio of compressions to ventilations with exhalation occurring during 1st compression after each ventilation.

NEONATAL CONSIDERATIONS

General Considerations:

A. A neonate refers to a newly born child under the age of 30 days. While most neonates transition to post-natal life without difficulty, 10% will require medical assistance. Respiratory insufficiency is the most common complication observed in the newly born.

B. Neonates born precipitously may exhibit signs of stress such as apnea, grunting respirations, lethargy or poor tone.

1. Provide warmth, bulb suction mouth and then nose, and dry the infant.
2. If breathing spontaneously, HR >100 and infant is vigorous, continue to monitor.
3. If apneic, cyanotic, lethargic, or HR <100, provide 100% oxygen via BVM ventilations at a rate of 40-60 bpm.
4. If HR < 60, begin CPR at 3:1 compression to ventilation ratio.

C. For neonates who do not respond to initial interventions as above:

1. Obtain blood glucose level and if < 60, administer dextrose IV/IO.
2. Administer **epinephrine** IV for persistent HR < 60.
3. Consider hypovolemia and administer 10-20ml/kg NS over 5-10 minutes.

D. Neonates with congenital heart disease may not be detected prior to hospital discharge after delivery. Consider a cardiac cause of shock in the neonate who remains hypoxic or has persistent cyanosis despite 100% oxygen. These neonates may decompensate precipitously and fluid administration should be used judiciously (10ml/kg NS).

E. Newborns are at high risk for hypothermia. Provide early warming measures, keep covered as much as possible (especially the head) and increase the temperature in the ambulance.

F. Acrocyanosis (cyanosis of only the hands and feet) is normal in newborns and does not require intervention.

G. Prolonged apnea without bradycardia or cyanosis may indicate respiratory depression caused by narcotics. However, naloxone should be avoided in infants of a known or suspected narcotic addicted mother as this may induce a withdrawal reaction. Respiratory support alone is recommended.

H. Obtain pregnancy history, gestational age of the neonate, pregnancy complications, and any illicit drug use during pregnancy.

I. Check blood glucose level and treat accordingly with **dextrose.**

CARE OF THE CHILD WITH SPECIAL NEEDS

General Guideline:

Children with special health care needs include those with chronic physical, developmental, behavioral or emotional health issues. These children often have complex medical needs and may be technology-dependent. Parents or caregivers for such children can be a wealth of knowledge about their child's care and may carry a reference care sheet. **CONTACT BASE MEDICAL CONTROL** for any concerns or to request orders for treatments that the patient's primary physician has requested.

Feeding Tubes:

A. Feedings tubes are used for administration of medications and to provide feeds to children with an impaired ability to take oral feeds. Always ask caretaker the type of feeding tube (does the tube end in the stomach or jejunum?) and when it was placed.
B. Tubes may be placed through the nose, mouth or abdomen and end in the stomach or jejunum (upper intestine).
C. Consider venting and/or gently aspirating the feeding tube in a child with respiratory or abdominal distress to allow removal of gastric contents and decompression.
D. Feeding tubes that have been placed less than 6 weeks ago are not well established and may close within 1 hour of tube removal. If transport time is prolonged, place an 8 Fr suction catheter tube 2 inches into the stoma to maintain patency. Do NOT use the feeding tube.

Tracheostomy:

A. A tracheostomy is a surgical opening between the trachea and the anterior surface of the neck. Its purpose is to bypass the upper airway for chronically ventilated patients, upper airway obstructions, or to facilitate secretion removal in those with ineffective gag or swallow reflexes.
B. Use bag-valve attached to the tracheostomy to assist ventilations if needed. May also attempt BVM with gloved finger over the tracheostomy.
C. Inability to ventilate and/or signs of respiratory distress (nasal flaring, retractions, hypoxia, etc) may indicate tracheostomy obstruction. Suction tracheostomy, passing the suction catheter no further than 6 cm into the trachea. Limit suctioning time to minimum amount of time necessary to accomplish effective suctioning. Oxygenate between passes with the suction catheter.
D. 0.5ml of saline may be instilled into the tracheostomy to assist suctioning of thick secretions.
E. If unable to ventilate through the tracheostomy tube and patient is apneic, bradycardic, or in pulseless arrest, remove tracheostomy tube and pass an appropriately sized endotracheal tube through the stoma approximately 1-2 inches, secure and ventilate. Appropriate depth must be based upon breath sounds, as right mainstem intubation is likely.
F. Remember that caregivers are often the best people to change and suction a tracheostomy tube. Use them as your resource when possible.

Central Venous Catheters (CVCs):

A. Because of their size and location, a much greater risk of serious bacterial infections exists with CVCs compared to peripheral intravenous lines. Special care must be used when accessing such lines.
B. Prior to accessing a CVC, hands should be washed and gloves worn. Vigorously scrub the CVC hub with an alcohol swab. While alcohol possesses some antimicrobial properties, the friction produced by scrubbing is the most effective.
C. A port is an implanted venous central venous catheter (below the surface of the skin). These devices require a non-coring (e.g. Huber) needle for accessing and should not be accessed in the field.

PEDIATRIC (AGE < 12 YEARS) UNIVERSAL RESPIRATORY DISTRESS ALGORITHM

All patients:
- Give **oxygen** to all patients with respiratory distress via least distressing means, either blow-by or NRB facemask
- Minimize patient discomfort and avoid agitation.
- Transport in position of comfort

Inadequate ventilations?
- Place in neutral position with towel roll beneath shoulders if age <8 years
- Place oral airway if unconscious.
- Assist ventilations with BVM.

Inadequate ventilations and unable to ventilate with BVM?
- **Consider ETI in a child ONLY if unable to adequately ventilate with BVM and oral airway**
- Reposition airway, check technique and equipment. If still unable to adequately oxygenate and ventilate, proceed with **Orotracheal Intubation Protocol.**

General Assessment:
- Attempt to determine the cause of respiratory distress based on clinical scenario, age, past history and exam.
- Assess Airway, Breathing, perfusion and mental status in all patients.

Airway Assessment
- If obstructed, see **Obstructed Airway Protocol**
- Observe for stridor, hoarseness, and drooling.
- Consider foreign body if there is a sudden onset of stridor in a young child.
- Early suctioning of secretions (mouth and nose) may dramatically improve respiratory distress in bronchiolitis.

Breathing Assessment
- Note rate and effort ("work of breathing").
- Normal RR neonate >40, infants >20, child >12bpm
- Listen for upper airway abnormal sounds which may mimic wheezing: stridor, hoarseness, barky cough (suggests croup).
- Note grunting, nasal flaring, head bobbing, chest wall movement, retractions, accessory muscle use.
- Auscultate breath sounds for wheezing, crackles, decreased air movement (suggests bronchospasm).

Treat specific conditions

Croup
Stridor, barky cough, URI symptoms. Symptoms often rapid and have nocturnal onset.
- Transport in position of comfort
- Blow-by **O2**
- Nebulized **racemic epinephrine**

For severe symptoms:
Stridor at rest, severe retractions, cyanosis, altered LOC
- Repeat nebulized **racemic epinephrine**

Bronchiolitis
Cough, fever, resp. distress, +/- wheezing
- Transport in position of comfort with parent
- Blow-by **O2**

For severe symptoms:
Hypoxia despite O2, severe retractions, cyanosis, altered LOC
- Nasal suctioning
- Give nebulized **racemic epinephrine**

Asthma
- Give **albuterol** by nebulizer.
- If age > 2 yrs, add **ipratropium**
- Repeat albuterol as needed.

For severe symptoms and inadequate response to all above treatment:
Hypoxia despite O2, severe retractions, cyanosis, altered LOC
- Give **epinephrine** IM
- Give **methylprednisolone** IV
- Give **magnesium sulfate** IV

Inadequate response to treatment?
- Initiate prompt transport to nearest facility

***Contact base medical control** for consult*

Consider pulmonary and non-pulmonary causes of respiratory distress in all cases:
- **Common**: croup, bronchiolitis, asthma**.**
- **Less common**: foreign body aspiration, allergic reaction, pneumonia.
- **Rare**: epiglottitis,bacterial tracheitis.
- **Also**: Congenital heart disease (CHF), sepsis, other metabolic acidosis (e.g.: DKA, inborn error of metabolism)

PEDIATRIC APPARENT LIFE- THREATENING EVENT (ALTE)

DEFINITION:
An infant < 1 year of age with an episode frightening to the observer characterized by apnea, choking/gagging, color change or change in muscle tone.

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Support ABCs as necessary

↓

Obtain detailed history of event and medical history

↓

Complete head-to-toe assessment

↓

- Any child with an ALTE should be transported to ED for evaluation.
- Monitor vital signs en route.

Clinical history to obtain from observer of event:

- Document **observer's** impression of the infant's color, respirations and muscle tone.
- For example, was the child apneic, or cyanotic or limp during event?
- Was there seizure-like activity noted?
- Was any resuscitation attempted or required, or did event resolve spontaneously?
- How long did the event last?

Past Medical History:

- Recent trauma, infection (e.g. fever, cough)
- History of GERD
- History of Congenital Heart Disease
- History of Seizures
- Medication history

Examination/Assessment

- Head to toe exam for trauma, bruising, or skin lesions
- Check anterior fontanelle: is it bulging, flat or sunken?
- Pupillary exam
- Respiratory exam for rate, pattern, work of breathing and lung sounds.
- Cardiovascular exam for murmurs and symmetry of brachial and femoral pulses.
- Neuro exam for level of consciousness, responsiveness and any focal weakness.

PEDIATRIC TRAUMA CONSIDERATIONS (AGE < 12 YEARS)

Spinal Immobilization

Context/Special Considerations:

A. 60-80% of spine injuries in children occur at the cervical level.
B. Children < 8 age year are more likely to sustain high C1-C3 injuries.
C. Less force is required to injure the cervical spine in children than adults.
D. Children with Down Syndrome are at risk for cervical spine injury.
E. Avoid strapping of the abdomen, as children are abdominal breathers.
F. Use age and size appropriate immobilization devices.
G. Proper immobilization of pediatric patients should **prevent**:
    1. Flexion/extension, rotation, lateral bending or axial loading of the neck (car seats do not prevent axial loading and are not considered proper immobilization technique).
    2. Non-neutral alignment or alteration in normal curves of the spine for age (consider the large occiput).
    3. Twisting, sliding or bending of the body during transport or care.

Spinal Immobilization criteria:

A. Be conservative. Children are difficult to assess and “clinical clearance” criteria are not well established, as in adults.
B. Immobilize the following child you suspect clinically may have a spine injury:
    1. Altered Mental Status (GCS < 15, AVPU < A, or intoxication)
    2. Focal neurologic findings (paresthesias, loss of sensation, weakness)
    3. Non-ambulatory patient
    4. Any complaint of neck pain
    5. Torticollis (limited range of motion, difficulty moving neck in history or physical)
    6. Substantial torso Injury (thorax, abdomen, pelvis)
    7. High Risk MVC (head on collision, rollover, ejected from the vehicle, death in the same crash, or speed > 55 mph)
    8. Diving accident

ADENOSINE (ADENOCARD)

Description

Adenosine transiently blocks conduction through the AV node thereby terminating re-entrant tachycardias involving the AV node. It is the drug of choice for AV nodal re-entrant tachycardia (AVNRT, often referred to as “PSVT”). It will not terminate dysrhythmias that do not involve the AV node as a reentrant limb (e.g. atrial fibrillation).

Onset & Duration

- Onset: almost immediate
- Duration: 10 sec

Indications

- Narrow-complex supraventricular tachyarrhythmia
- Pediatric administration requires call in for direct verbal order

Contraindications

- Any irregular tachycardia. Specifically, never administer to an irregular wide-complex tachycardia, which may be lethal
- Heart transplant

Adverse Reactions

- Chest pain
- Shortness of breath
- Diaphoresis
- Palpitations
- Lightheadedness

Drug Interactions

- Methylxanthines (e.g. caffeine) antagonize adenosine, a higher dose may be required
- Dipyridamole (persantine) potentiates the effect of adenosine; reduction of adenosine dose may be required
- Carbamazepine may potentiate the AV-nodal blocking effect of adenosine

Dosage and Administration

ADULT:

- 12 mg IV bolus, rapidly, followed by a normal saline flush.
- Additional dose of 12 mg IV bolus, rapidly, followed by a normal saline flush
- **CONTACT BASE MEDICAL CONTROL** for further considerations

PEDIATRIC:

- **CONTACT BASE MEDICAL CONTROL**

ADENOSINE (ADENOCARD)

Protocol

- **Adult Tachyarrhythmia with Poor Perfusion**

Special Considerations

- Reliably causes short lived but very unpleasant chest discomfort. Always warn your patient of this before giving medication and explain that it will be a very brief sensation
- May produce bronchospasm in patients with asthma
- Transient asystole and AV blocks are common at the time of cardioversion
- Adenosine is not effective in atrial flutter or fibrillation
- Adenosine is safe in patients with a history of Wolff-Parkinson-White syndrome if the rhythm is regular and QRS complex is narrow
- A 12-lead EKG should be performed and documented, when available
- Adenosine requires continuous EKG monitoring throughout administration

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

Description

- Albuterol is a selective ß-2 adrenergic receptor agonist. It is a bronchodilator and positive chronotrope.
- Because of its ß agonist properties, it causes potassium to move across cell membranes inside cells. This lowers serum potassium concentration and makes albuterol an effective temporizing treatment for unstable patients with hyperkalemia.

Onset & Duration

- Onset: 5-15 minute after inhalation
- Duration: 3-4 hours after inhalation

Indications

- Bronchospasm
- Known or suspected hyperkalemia with ECG changes (i.e.: peaked T waves, QRS widening)

Contraindications

- Severe tachycardia is a relative contraindication.

Adverse Reactions

- Tachycardia
- Palpitations
- Dysrhythmias

Drug Interactions

- Sympathomimetics may exacerbate adverse cardiovascular effects.
- ß-blockers may antagonize albuterol.

How Supplied

- **Pre-diluted nebulized solution:** 2.5 mg in 3 mL NS (0.083%)

Dosage and Administration

ADULT:

- **Single Neb dose-** Albuterol sulfate solution 0.083% (one-unit dose bottle of 3.0 mL), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice (total of 3 doses).

PEDIATRIC:

- **Single Neb dose-** Albuterol sulfate solution 0.083% (one-unit dose bottle of 3.0 mL), by nebulizer, at a flow rate (6-8 lpm) that will deliver the solution over 5 to 15 minutes. May be repeated twice (total of 3 doses).

ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

Protocol

- **Adult Asthma**
- **COPD**
- **Pediatric Respiratory Distress**
- **Allergy and Anaphylaxis**

Special Considerations

- Consider inline nebulizers for patients requiring endotracheal intubation or CPAP.
- May precipitate angina pectoris and dysrhythmias.
- Should be used with caution in patients with suspected or known coronary disease, diabetes mellitus, hyperthyroidism, prostatic hypertrophy, or seizure disorder.
- Wheezing associated with anaphylaxis should first be treated with **epinephrine** IM.

AMIODARONE (CORDARONE)

Description

Amiodarone has multiple effects showing Class I, II, III and IV actions with a quick onset. The dominant effect is prolongation of the action potential duration and the refractory period.

Indications

- Pulseless arrest in patients with shock refractory or recurrent VF/VT
- Wide complex tachycardia not requiring immediate cardioversion due to hemodynamic instability

Precautions

- Wide complex irregular tachycardia
- Sympathomimetic toxidromes, i.e. cocaine or amphetamine overdose
- NOT to be used to treat ventricular escape beats or accelerated idioventricular rhythms

Contraindications

- 2nd or 3rd degree AV block
- Cardiogenic shock

Adverse Reactions

- Severe hypotension
- Bradycardia

Dosage and Administration

ADULT:

Pulseless Arrest (Refractory VT/VF)

- 300 mg IV bolus.
- Administer additional 150 mg IV bolus in 5 minutes if shock refractory or recurrent VF/VT.

Symptomatic wide complex tachycardia with a pulse

- 150 mg IV infusion over 10 minutes.

PEDIATRIC:

Pulseless Arrest (Refractory VT/VF)

- 5mg/kg IV bolus. (**MAX** dose 300 mg)

Symptomatic wide complex tachycardia with a pulse

- 5 mg/kg mg IV infusion over 10 minutes (**MAX** individual dose 150 mg)

Protocol

- **Adult Universal Pulseless Arrest Algorithm**
- **Pediatric Universal Pulseless Arrest Algorithm**
- **Adult Tachycardia with Poor Perfusion**

Special Considerations

- A 12-lead EKG should be performed and documented, when available.

ASPIRIN (ASA)

Description

Aspirin inhibits platelet aggregation and blood clotting and is indicated for treatment of acute coronary syndrome in which platelet aggregation is a major component of the pathophysiology. It is also an analgesic and antipyretic

Indications

- Suspected acute coronary syndrome

Contraindications

- Acute gastrointestinal bleeding
- Aspirin allergy

How supplied

325 mg Aspirin-To-Go aspirin powder

Dosage and Administration

- 325 mg PO (one packet)

Special Consideration

- Patients with suspected acute coronary syndrome taking warfarin (Coumadin) or clopidogrel (Plavix) may still be given aspirin.

ATROPINE SULFATE

Description

Atropine is an endogenous antimuscarinic, anticholinergic substance. It is the prototypical anticholinergic medication with the following effects:

- Increased heart rate and AV node conduction
- Decreased GI motility
- Urinary retention
- Pupillary dilation (mydriasis)
- Decreased sweat, tear and saliva production (dry skin, dry eyes, dry mouth)

Indications

- Symptomatic bradycardia
- 2nd and 3rd degree heart block
- Organophosphate poisoning

Precautions

- Should not be used without **medical control direction** for stable bradycardias.
- Closed angle glaucoma

Adverse Reactions

- Anticholinergic toxidrome in overdose, think “blind as a bat, mad as a hatter, dry as a bone, red as a beet”

Dosage and Administration

Hemodynamically Unstable Bradycardia

ADULT:

- 0.5 mg IV/IO bolus.
- Repeat if needed at 3-5 minute intervals to a maximum dose of 3 mg. (Stop at a ventricular rate that provides adequate mentation and blood pressure)

PEDIATRIC:

- 0.02 mg/kg IV/IO bolus. Minimum dose is 0.1 mg; maximum single dose is 0.5 mg; may repeat once.

Antidote for poisonings/overdoes

ADULT:

- 2 mg IV/IO bolus; May repeat every 5 minutes; titrate until respiratory secretions/distress begin to decrease.

PEDIATRIC:

- 0.02 mg/kg IV/IO bolus; May repeat every 5 minutes; titrate until respiratory secretions/distress begin to decrease.

Protocol

- **Adult Bradycardia with Poor Perfusion**
- **Neonatal Resuscitation**
- **Overdose and Acute Poisoning**

Special Considerations

- Atropine causes pupil dilation, even in cardiac arrest settings.

BENZODIAZEPINES (DIAZEPAM, LORAZEPAM, MIDAZOLAM)

Description
Benzodiazepines or sedative-hypnotics that act by increasing GABA activity in the brain. GABA is the major inhibitory neurotransmitter, so increased GABA activity *inhibits* cellular excitation. Benzodiazepine effects include anticonvulsant, anxiolytic, amnestic and muscle relaxant properties. Each individual benzodiazepine has unique pharmacokinetics related lipid or water solubility.

Onset & Duration
- Any agent given IV will have the fastest onset of action, typical time of onset 2-3 minutes.
- Intranasal administration has slower onset and is less predictable compared to IV administration, however it may still be preferred if an IV cannot be safely or rapidly obtained. Intranasal route has faster onset compared to intramuscular route.
- IM administration has the slowest time of onset.

Indications
- Status epilepticus
- Sedation of the severely agitated/combative patient
- Sedation for cardioversion or transcutaneous pacing (TCP)
- Sedation for agitated/combative and excited delirium

Contraindications
- Hypotension
- Respiratory depression

Adverse Reactions
- Respiratory depression, including apnea
- Hypotension
- Consider ½ dosing in the elderly for all benzodiazepines

Dosage and Administration
Midazolam

- **Seizure:**
  ADULT:
  - < 65 y/o 5 mg IV/IO/IM/IN
  - >65 y/o 2.5 mg IV/IO/IM/IN
  - May repeat once to a maximum dose of 10 mg

  PEDIATRIC:
  - 0.1-0.2 mg/kg IV/IO/IM/IN (maximum individual dose = 5 mg)
  - May repeat once

- **Sedation for cardioversion or transcutaneous pacing:**
  ADULT:
  - 1-2 mg IV/IO, titrate to maximum dose of 4 mg

  PEDIATRIC:
  - 0.1 mg/kg IV/IO (max dose 2 mg)

- **Sedation after placement of an advanced airway:**
  ADULT:
  - 5-10mg IV/IO every 2 minutes, titrate to effect. Do not exceed 3 doses without **Base Medical Control Contact.**

- **Sedation for Agitiated/Combative** and **Excited Delerium:**
  ADULT:
  - > 65 y/o 2.5 mg IM/IN
  - < 65 y/o 5 mg IM/IN
  - < 65 y/o and > 100kg 10 mg IM/IN
  - May repeat once

  PEDIATRIC:
  - 0.1-0.2 mg/kg IM/IN (maximum individual dose = 5 mg)

Diazepam

- **Seizure in the presence of poisoning**
  - 10 mg IM auto injector

Lorazepam

- **Seizure:**
  ADULT:
  - 1-2 mg, IV/IO. IV route should be administered slowly – rate not to exceed 1 mg/min
  - May repeat to a maximum dose of 4 mg

  PEDIATRIC:
  - 0.05 mg/kg, IV/IO (maximum single dose 2mg) IV route should be administered slowly – rate not to exceed 0.5 mg/min; may repeat once.

- **Sedation of severely anxious, agitated or combative patient**
  ADULT:
  - IM route: 2 mg
  - IV route: 1-2 mg

Protocol

- **Synchronized Cardioversion**
- **Transcutaneous Pacing**
- **Adult Seizure**
- **Pediatric Seizure**
- **Pediatric tachycardia**
- **Agitated/Combative Patient**
- **Poisoning/Overdose**
- **Adult Airway Management**
- **Adult Rapid Sequence Airway**

Special Considerations

- All patients receiving benzodiazepines must have cardiac and pulse oximetry monitoring during transport. Continuous waveform capnography recommended.
- Sedative effects of benzodiazepines are increased in combination with opioids, alcohol or other CNS depressants.
- Co-administration of opioids and benzodiazepines is discouraged and may only be done with direct physician verbal order.
- In elderly patients > 65 years old or small adults < 50 kg, lower doses may be sufficient and effective. Consider ½ dosing in these patients.

CALCIUM CHLORIDE

Description

Calcium chloride can help to protect the myocardium from dangerously high levels of serum potassium in hyperkalemia. Calcium chloride can be used to quickly treat calcium channel blocker toxicity, from the side effects of drugs such as diltiazem (Cardizem) — helping avoid potential heart attacks.

Indications

- Adult pulseless arrest associated with any of the following clinical conditions:
  - Known hyperkalemia
  - Renal failure with or without hemodialysis history
  - Calcium channel blocker overdose
- **Not indicated for routine treatment of pulseless arrest.**
- Calcium channel blocker overdose with hypotension and bradycardia

Contraindications

- Known hypercalcemia
- Suspected digoxin toxicity (i.e. digoxin overdose)

Side Effects/Notes

- Extravasation of calcium chloride solution may cause tissue necrosis.
- Because of the risk of medication error, if calcium chloride is stocked, consider limiting to 1 amp per medication kit to avoid accidental overdose.
- Must give in separate line from IV sodium bicarb to prevent precipitation/formation of calcium carbonate.
- In setting of digoxin toxicity, may worsen cardiovascular function.

Dosage and Administration

ADULT:

- **Pulseless arrest assumed due to hyperkalemia:**
  - 1 gm (10 mL) slow IV push
- **Calcium channel blocker overdose with hypotension and bradycardia:**
  - 1 gm (10 mL) slow IV/IO push. Dose may be repeated every 10 minutes for total of 3 doses.

PEDIATRIC:

- **Calcium channel blocker overdose with hypotension for age and bradycardia:**
  - 20 mg/kg (0.2 mL/kg), **not to exceed 1 g** slow IV/IO push not to exceed 1 mL/min, may repeat once after 10 minutes.
- **Pulseless arrest assumed due to hyperkalemia:**
  - 1 gm (10 mL) slow IV push

Protocol

- **Adult Universal Pulseless Arrest ALS Algorithm**
- **Pediatric Universal Pulseless Arrest ALS Algorithm**
- **Overdose and Acute Poisoning**

DEXTROSE

Description

Glucose is the body's basic fuel and is required for cellular metabolism. A sudden drop in blood sugar level will result in disturbances of normal metabolism, manifested clinically as a decrease in mental status, sweating and tachycardia. Further decreases in blood sugar may result in coma, seizures and cardiac arrhythmias. Serum glucose is regulated by insulin, which stimulates storage of excess glucose from the blood stream, and glucagon, which mobilizes stored glucose in the blood stream.

Indications

- Hypoglycemia
- The unconscious or altered mental status patient with unknown etiology.

Precautions

- None

Dosage and Administration

ADULT: (choose one)

- 12.5-25 gm (125-250 mL of a 10% solution) IV/IO bolus, may repeat once in 10 minutes
- 12.5-25 gm (25-50 mL of a 50% solution) IV/IO bolus

PEDIATRIC:

Neonates (≤ 30 days old) BGL < 40 mg/dL

- Dextrose 10% at 4 ml/kg

Child (30 days old -12 years old) BGL <70 mg/dL

- Dextrose 10% at 4 ml/kg, maximum of 250 mL

Protocol

- **Universal Altered Mental Status**
- **Seizures**
- **Overdose and Acute Poisoning**
- **Psych/Behavioral**
- **Neonatal Resuscitation**

Special Considerations

- The risk to the patient with ongoing hypoglycemia is enormous. With profound hypoglycemia and no IV access, consider IO insertion.
- Draw blood sugar sample before administration if possible.
- Use glucometer before administration if possible.
- Extravasation may cause tissue necrosis; use a large vein and aspirate occasionally to ensure route patency.
- Dextrose can be irritable to the vein and the vein should be flushed after administration.

DIPHENHYDRAMINE (BENADRYL)

Description

Antihistamine for treating histamine-related symptoms of allergic reaction. Also Anticholinergic and antiparkinsonian effects used for treating dystonic reactions caused by antipsychotic and antiemetic medications (e.g.: haloperidol, Droperidol, Compazine, etc.).

Indications

- Allergic reaction
- Dystonic medication reactions or akathisia.

Precautions

- Asthma or COPD, thickens bronchial secretions
- Narrow-angle glaucoma

Side Effects

- Drowsiness
- Dilated pupils
- Dry mouth and throat
- Flushing

Drug interactions

- CNS depressants and alcohol may have additive effects.
- MAO inhibitors may prolong and intensify anticholinergic effects of antihistamine.

Dosage and Administration

Adult:

- 50 mg IV/IO/IM
- 25 mg IV bolus for acute dystonic reaction, may repeat in 10 minutes if no response
- 25 mg IV/IM along with butyrophenones for agitated/combative patients

Pediatric:

- 1 mg/kg IV or IM. Single maximum dose is 50 mg.
- Single dose of 25 mg in acute dystonic reaction.

Protocol

- **Allergy/Anaphylaxis**
- **Agitated/Combative Patient**
- **Dystonic reaction**

NOREPINEPHRINE (LEVOPHED)

Description

Norepinephrine is a vasopressor, which acts predominantly on Alpha-adrenergic (α) and to a lesser effect Beta-adrenergic (β) agonist, used to increase peripheral resistance, blood pressure, and to a lesser effect heart rate.

Indications

- Hypotension with malperfusion refractory to adequate fluid resuscitation (30 mL/kg or 2 Liters of a crystalloid).

Contraindications

Extravasation, hypertension, hypersensitivity to sympathomimetics or sulfites

Adverse Reactions

- Reflex bradycardia
- Hypertension
- Extravasation necrosis

Drug Interactions

Concurrent use with the following may increase blood pressure further: linezolid, dihydroergotamine, TCAs

Dosage and Administration:

Adult IV/IO:

- Must be diluted; a usual concentration is 4mg in 250mL of D5W or NS (16mcg/mL)
- 8-16 mcg/min, titrate IV drip to maintain MAP> 65 mmHg or SBP >100 mmHg

Protocol

- **Adult Post-Resuscitation with ROSC**
- **Allergy and Anaphylaxis Protocol**
- **Bradycardia with Poor Perfusion**
- **Medical Hypotension/Shock**
- **Overdose and Acute Poisoning**

Special Considerations

Norepinephrine should be given into a large, patent vein.
Avoid Hypertension.

DROPERIDOL (INAPSINE)

Description

Droperidol is a butyrophenone derivative closely related to haloperidol. Droperidol produces a dopaminergic blockage, a mild alpha-adrenergic blockage and causes peripheral vasodilation. Its major actions are sedation, tranquilization and potent anti-emetic effect.

Onset & Duration

- Onset: 3-10 minutes after IM administration
- Duration: 2-3 hours

Indications

- Primary use for management of agitated/combative patients.
- Combative head injury patients.

Contraindications

Any patient with:

- Suspected acute myocardial infarction/ACS
- Systolic blood pressure under 100 mm/Hg or the absence of a palpable radial pulse
- Signs of respiratory depression

Side Effects

- Due to the vasodilation effect, Droperidol can cause a transient hypotension that is usually self-limiting and can be treated effectively with leg elevation and IV fluids. Droperidol may cause tachycardia which usually does not require pharmacological intervention.
- Extra-pyramidal reactions have been noted hours to days after treatment.
- Rare instances of neuroleptic malignant syndrome have been known to occur following treatment using Droperidol.

Dosage and Administration

ADULT:

- IV/IM route: 5.0 mg slow IV/IM administration, after 10 minutes if desired effect is not achieved **CONTACT BASE MEDICAL CONTROL** prior to second dose.

PEDIATRIC:

- Under the age of 12 **CONTACT BASE MEDICAL CONTROL**

Special Considerations

- Due to Droperidol's potential effect on QT interval prolongation, all patients receiving Droperidol **MUST** be placed on the cardiac monitor. Though it is understood that obtaining an EKG on the combative or agitated patient may be difficult, every effort should be made to do so.
- Avoid Droperidol in frail or elderly patients due to increases risk of prolonged and over-sedation as well as increased risk of hypotension and prolonged QT. If it must be given, administer ½ typical dose.
- Extra-pyramidal reactions (dystonic) have been noted to occur hours to days after treatment, usually presenting as spasm of the muscles of the tongue, face, neck and back. To avoid this administer **diphenhydramine**.

Protocol

- **Agitated/Combative Patient Protocol**

EPINEPHRINE (ADRENALIN)

Description
Endogenous catecholamine alpha, beta-1, and beta-2 adrenergic receptor agonist. Causes dose related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation.

Indications
- Pulseless Arrest
- Anaphylaxis
- Asthma
- Bradycardia with poor perfusion

Adverse Reactions
- Tachycardia and tachydysrhythmia
- Hypertension
- Anxiety
- May precipitate angina pectoris

Drug Interactions
Should not be added to sodium bicarbonate or other alkaloids as epinephrine will be inactivated at higher pH.

Dosage and Administration

ADULT:

Pulseless Arrest:
- 1 mg (10 mL of a 1:10,000 solution), IV/IO bolus. Repeat every 3-5 minutes.

Asthma:
- 0.3 mg (0.3 mL of a 1: 1,000 solution) IM. May repeat dose x 1.

Systemic allergic reaction:
- 0.3 mg (0.3 mL of a 1: 1,000 solution) IM. May repeat dose x 1.

Imminent Cardiac Arrest due to anaphylaxis:
- 0.5 mg IV/IO (0.5 mL of a 1: 10,000 solution)

For Severe Systemic Anaphylactic Reaction: (SBP <90mmHg, stridor, severe respiratory distress)
- **Contact Base Medical Control**
- Continuous IV/IO infusion: mix 1.0mg (1: 1,000) in 250 cc D5W or NS (4mcg/mL)
- Run at 2-10 mcg/min; every 15 gtts/min = 1.0mcg/min

PEDIATRIC:

Cardiac arrest:
- 0.01 mg/kg IV/IO (0.1 mL/kg of 1: 10,000 solution). Repeat every 3-5min.

Bradycardia:
- 0.01 mg/kg (0.1 mL/kg of 1: 10,000 solution) IV/IO

Asthma:
- 0.01mg/kg (0.01 mL/kg of 1: 1,000 solution) IM. (max individual dose 0.3 mg)

Moderate to Severe Allergic Reactions:
- 0.01 mg/kg (0.01 mL/kg of 1: 1,000 solution) IM

Imminent Cardiac Arrest due to anaphylaxis:
- 0.005 mg/kg IV/IO (max individual dose 0.1 mg, 1: 10,000 solution)

EPINEPHRINE (ADRENALIN)

Protocol

- **Adult Universal Pulseless Arrest Algorithm**
- **Pediatric Pulseless Arrest ALS Algorithm**
- **Neonatal Resuscitation**
- **Allergy and Anaphylaxis Protocol**
- **Bradycardia with Poor Perfusion**
- **Pediatric Respiratory Distress**
- **Pediatric Bradycardia**

Special Considerations

- May increase myocardial oxygen demand and angina pectoris. Use with caution in patients with known or suspected CAD.

ETOMIDATE (AMIDATE)

Description

Ultrashort-acting non-barbiturate hypnotic used for rapid induction of anesthesia with minimal cardiovascular effects. It modulates GABA A receptors to induce general anesthesia. Etomidate does NOT have any analgesic properties. Etomidate has a protein binding rate 76%; it is metabolized by hepatic and plasma esterase and is excreted by kidneys. The drug has a half-life of 1.25 hours.

Onset & Duration

- Onset: 30-60 seconds, with peak effect within 1 min
- Duration: 3-5 min

Indications

- Induction agent for rapid-sequence airway

Contraindications

- Hypersensitivity
- Possibly sepsis/septic shock

Precautions/Side Effects

- Depresses the respiratory drive producing apnea, requiring ventilation
- Hypotension
- Adrenal Suppression
- Myoclonic jerks (mimics seizures)
- Pain at injection site

Dosage and Administration

Adult:

- 0.3 mg/kg IV/IO (max individual dose of 20 mg)

Protocol

- **Adult Rapid Sequence Airway**

GLUCAGON

Description
Increases blood sugar concentration by converting liver glycogen to glucose. Glucagon also causes relaxation of smooth muscle of the stomach, duodenum, small bowel and colon.

Onset & Duration
- Onset: variable

Indications
- Altered level of consciousness where hypoglycemia is suspected and IV access is unavailable.

Side Effects
- Tachycardia
- Headache
- Nausea and vomiting

Dosage and Administration
ADULT
- Hypoglycemia: 1.0 mg IM

PEDIATRIC
- Hypoglycemia:
  - <25 kg = 0.5mg
  - ≥25 kg = 1.0mg

Protocol
- **Hypoglycemia**

HALOPERIDOL (HALDOL)

Description

Haloperidol is a dopamine antagonist antipsychotic medication. Haloperidol produces a dopaminergic blockade, a mild alpha-adrenergic blockade and causes peripheral vasodilation. Its major actions are sedation and tranquilization.

Onset & Duration

- Onset: Within 10 minutes after IM administration. Peak effect seen within 30 minutes
- Duration: 2-4 hours (may be longer in some individuals)

Indications

- Sedation of severely agitated/combative patient

Contraindications

- Suspected myocardial infarction
- Hypotension
- Respiratory or CNS depression
- Pregnancy
- Children < 8 years old **(Contact Base Medical Control)**

Precautions

- Haldol may cause hypotension, tachycardia and prolongation of the QT interval. Use with caution in severe cardiovascular disease.
- Cardiac monitor and establish IV as soon as possible with all administrations.
- Some patients may experience unpleasant sensations manifested as restlessness, hyperactivity or anxiety following haloperidol administration.
- Rare instances of neuroleptic malignant syndrome (very high fever, muscular rigidity) have been known to occur after the use of haloperidol.
- Avoid Haloperidol in patients with known history of MAOI Antidepressant use (Phenelzine, Tranylcypromine) OR history of Parkinson's Disease.

Dosage and Administration

ADULT:

- 5 mg IM if < 60 kg
- 10 mg IM if > 60 kg
- **CONTACT BASE MEDICAL CONTROL** for additional doses (consider if no effects within 20 min) or potential uses in pediatric patients

Special Considerations

- Extra-pyramidal reactions (dystonic) have been noted to occur hours to days after treatment, usually presenting as spasm of the muscles of the tongue, face, neck and back. To avoid this administer **diphenhydramine**.
- Hypotension and tachycardia secondary to haloperidol are usually self-limiting and should be treated with IV fluid boluses.
- Use reduced dose in patient age ≥ 65

Protocol

- **Agitated/Combative Patient**

IPRATROPIUM BROMIDE (ATROVENT)

Description
Ipratropium is an anticholinergic antimuscarinic bronchodilator chemically related to atropine.

Onset & Duration
- Onset: 5-15 min. after inhalation
- Duration: 6-8 hours after inhalation

Indications
- Bronchospasm

Contraindications
- Do not administer to children < 2 years
- Soy or peanut allergy is a contraindication to use of Atrovent metered dose inhaler, not the nebulized solution, which does not have the allergen contained in the propellant.

Adverse Reactions
- Palpations
- Tremors
- Dry mouth

How Supplied
- Premixed Container: 0.5 mg in 2.5 ml NS

Dosage and Administration
ADULT:
Bronchospasm
- Ipratropium (0.5 mg/2.5 mL) along with initial Albuterol in a nebulizer
- **Not indicated for repetitive dose or continuous neb use**

PEDIATRIC:
Bronchospasm
- Ipratropium (0.5 mg/2.5 mL) along with initial Albuterol in a nebulizer
- **Not indicated for repetitive dose or continuous neb use**

Protocol
- **Adult Asthma**
- **COPD**
- **Allergy/Anaphylaxis**
- **Pediatric Universal Respiratory Distress**

KETAMINE (KETALAR)

Description

Produces a cataleptic-like state in which the patient is dissociated from the surrounding environment by direct action on the cortex and limbic system. Noncompetitive NMDA receptor antagonist that blocks glutamate in the brain. Low doses produce analgesia and modulate central sensitization, hyperalgesia and opioid tolerance. Reduces polysynaptic spinal reflexes.

Onset & Duration

- Onset: IV = 30 sec; IM = 3-4 min
- Peak Effect: IV = 5-10 min; IM = 12-25 min

Indications

- Excited Delirium
- Secondary induction/sedation agent when Etomidate or Midazolam are not available.
- Patient experiencing severe pain due to substantial burns or long bone injury, but is not indicated for routine pain management.

Contraindications

- Uncontrolled hypertension
- Known hypersensitivity
- Known or suspected schizophrenia (even if currently stable or controlled with medications)
- Do not administer if Haloperidol has already been given

Adverse Reactions

- Increased intracranial pressure, increased ocular pressure, thyroid disorders, cardiovascular disease, respiratory depression airway complications, CNS depression, emergence reaction
- Ketamine crosses the placenta and can be detected in fetal tissue.

Drug Interactions

- Ketamine may have an increased CNS depressant effect on medications already in the patient's system, therefore EtCO2, SPO2 and cardiac monitoring are necessary when administering.
- Ketamine may increase the toxic effects of the following: memantine, mifepristone, thiopental, and SSRI antidepressants.

Dosage and Administration (Adults Only)

Excited Delirium-

- 4 mg/Kg IM

RSA/Induction Agent (only if Etomidate is not available)

- 2 mg/Kg IV/IO

Post Intubation/RSA Sedation (only for patients without a cardiac etiology–ROSC, STEMI, CHF, SCA—for post-intubation)

- 2 mg/Kg IV/IO, may repeat every 5-10 min as needed. Do not exceed 3 doses without **Base Medical Control Contact**

Analgesia with a patient suffering severe pain and after an **opioid** has been administered

- 0.5 mg/Kg IV/IO

Protocol

- **Adult Advanced Airway**
- **Agitated/Combative Patient**
- **Adult Rapid Sequence Airway**
- **Burns**
- **Amputations**

LIDOCAINE 2% SOLUTION

Description

Local anesthetic for relief of pain during intraosseous fluid administration.

Indications

- Analgesic for intraosseous infusion

Side Effects

- Seizure
- Drowsiness
- Tachycardia
- Bradycardia
- Confusion
- Hypotension

Precautions

- Lidocaine is metabolized in the liver and therefore, elderly patients and those with liver disease or poor liver perfusion secondary to shock or congestive heart failure are more likely to experience side effects.

Dosage and Administration

- 0.5 mg/kg IO bolus, maximum dose is 50 mg

Protocol

- **Intraosseous Administration**

Special Notes

- Seizure from lidocaine toxicity likely to be brief and self-limited. If prolonged, or status epilepticus, treat per seizure protocol.
- Treat dysrhythmias according to specific protocol.

MAGNESIUM SULFATE

Description

Magnesium sulfate reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction. In cardiac patients, it stabilizes the potassium pump, correcting repolarization. It also shortens the QT interval in the presence of ventricular arrhythmias due to drug toxicity or electrolyte imbalance. In respiratory patients, it may act as a bronchodilator in acute bronchospasm due to asthma or other bronchspastic diseases. In patient suffering from eclampsia, it controls seizures by blocking neuromuscular transmission and lowers blood pressure as well as decreases cerebral vasospasm.

Indications

Antiarrhythmic

- Torsades de pointes associated with prolong QT interval

Respiratory

- Severe bronchospasm unresponsive to continuous albuterol, ipratropium and IM epinephrine.

Obstetrics

- Eclampsia: Pregnancy > 20 weeks gestation age or post-partum seizures.

Precautions

- Bradycardia
- Hypotension
- Respiratory Depression

Adverse Reactions

- Bradycardia
- Hypotension
- Respiratory Depression

Dosage and Administration

ADULT

- Torsade de pointes suspected caused by prolonged QT interval
  - 2 gm IV bolus over 1-2 minutes
- Refractory Severe Bronchospasm
  - 2 gm IV infusion
  - Mix 2 gm diluted in 100 mL of D5W or NS. IV drip over 10 minutes.
- Eclampsia
  - 4 gm IV infusion
  - Mix 4 gm diluted in 100 mL of D5W or NS. IV drip over 10 minutes.

PEDIATRIC

- 50 mg/kg in 100 ml D5W IV over 10 minutes, max 2gm

Protocol

- **Adult Universal Pulseless Arrest Algorithm**
- **Pediatric Universal Respiratory Distress Algorithm**
- **COPD**
- **Asthma**
- **Obstetric Complications**

METHYLPREDNISOLONE (SOLU-MEDROL)

Description

Methylprednisolone is a synthetic steroid that suppresses acute and chronic inflammation and may alter the immune response. In addition, it potentiates vascular smooth muscle relaxation by beta-adrenergic agonists and may alter airway hyperactivity.

Indications

- Anaphylaxis
- Severe asthma
- Suspected Addisonian Crisis (cardiovascular collapse in patient at risk for adrenal insufficiency)

Contraindications

- Evidence of active GI bleed
- Not to be used in a patient with COPD

Adverse Reactions

Most adverse reactions are a result of long-term therapy and include:

- Gastrointestinal bleeding
- Hypertension
- Hyperglycemia

Dosage and Administration

ADULT (Age 12 years or older):

- 125 mg, IV/IO bolus, slowly over 2 minutes

PEDIATRIC (age < 12 years):

- 2 mg/kg, IV/IO bolus, slowly over 2 minutes to a max dose of 125 mg

Protocol

- **Asthma**
- **Allergy and Anaphylaxis**
- **Adrenal insufficiency**
- **Pediatric Universal Respiratory Distress Algorithm**

Special Considerations

- Must be reconstituted and used immediately.
- The effect of methylprednisolone is generally delayed for several hours.
- Methylprednisolone is not considered a first line drug. Be sure to attend to the patient's primary treatment priorities (i.e. airway, ventilation, beta-agonist nebulization) first. If primary treatment priorities have been completed and there is time while en route to the hospital, then methylprednisolone can be administered. Do not delay transport to administer this drug.

NALOXONE (NARCAN)

Description

Naloxone is competitive opioid receptor antagonist.

Onset & Duration

- Onset: Within 5 minutes
- Duration: 1-4 hours

Indications

- For reversal of suspected opioid-induced CNS and respiratory depression.
- Coma of unknown origin with impaired airway reflexes or respiratory depression.

Adverse Reactions

- Tachycardia
- Nausea and vomiting
- Pulmonary Edema

Dosage and Administration

ADULT

- 0.5 mg IV/IO/IM/IN and titrate to the desired effect, up to 2 mg total per individual dose. May repeat once.
- In cases of severe respiratory compromise or arrest, 2 mg bolus IV/IM/IO/IN is appropriate, otherwise the drug should be titrated to the patient's respiratory rate.

PEDIATRIC

- 0.1 mg/kg IV/IO/IM/IN and titrate to the desired effect, up to 2 mg total.

Protocol

- **Universal Altered Mental Status**
- **Poisoning/Overdose**

Special Considerations

- Not intended for use unless respiratory depression or impaired airway reflexes are present. Reversal of suspected mild-moderate opioid toxicity is not indicated in the field as it may greatly complicate treatment and transport as narcotic-dependent patients may experience violent withdrawal symptoms.
- Patients receiving naloxone **must** be transported to the hospital.

NITROGLYCERINE (NITROSTAT, NITROQUICK)

Description

Short-acting peripheral venodilator decreasing preload and afterload.

Onset & Duration

- Onset: 1-3 minutes
- Duration: 20-30 minutes

Indications

- Pain or discomfort due to suspected Coronary Artery Syndrome.
- Pulmonary Edema due to congestive heart failure.

Contraindications

- Suspected right ventricular ST-segment elevation MI (Inferior STEMI pattern plus ST elevation in right-sided precordial leads)
- Hypotension: SBP < 100
- Recent use of erectile dysfunction (ED) medication (e.g. Viagra, Cialis, Levitra)

Adverse Reactions

- Hypotension
- Headache
- Syncope

Dosage and Administration

ADULT

- 0.4 mg (1/150 gr) sublingually, every 3-5 minutes as needed for chest pain, CHF and pulmonary edema, if no contraindication develops

Protocol

- **Adult Chest Pain**
- **CHF/Pulmonary Edema**

ONDANSETRON (ZOFRAN)

Description
Ondansetron is a selective serotonin 5-HT3 receptor antagonist antiemetic.

Indications
- Nausea and vomiting

Contraindications
- Ondansetron: No absolute contraindication.

Adverse Effects:
- Ondansetron: very low rate of adverse effects, very well tolerated.

CAUTION: Ondansetron should be avoided in patients with a prolonged QT-Interval

Dosage and Administration

ADULT:
- 4 mg IV/IM/PO May repeat x 1 dose as needed.

PEDIATRIC < 4 years old:
- 2 mg IV/IO/IM/PO

PEDIATRIC ≥ 4 years old:
- 4 mg IV/IO/IM/PO

Protocol
- **Abdominal Pain/Vomiting**

OPIOIDS (FENTANYL, MORPHINE)

Description

These are opioid analgesics with the desired effects of analgesia, euphoria and sedation as well as undesired effects of respiratory depression and hypotension. A synthetic opioid, fentanyl is 100 times more potent than morphine, and is less likely to cause histamine release.

Indications

- Treatment of hemodynamically stable patients with moderate to severe pain due to traumatic or medical conditions, including cardiac conditions, abdominal pain, back pain, etc.
- Treatment of shivering with Targeted Temperature Management (TTM).
- Maintenance of sedation for the patient with an advanced airway placed.

Contraindications

- Hypotension, hemodynamic instability or shock
- Respiratory depression

Caution/Comments

- Opioids should only be given to hemodynamically stable patients and titrated slowly to effect.
- The objective of pain management is not the removal of all pain, but rather, to make the patient's pain tolerable enough to allow for adequate assessment, treatment and transport
- Respiratory depression, including apnea, may occur suddenly and without warning, and is more common in children and the elderly. **Start with ½ traditional dose in the elderly.**
- Co-administration of opioids and benzodiazepines is discouraged and may only be done with direct physician verbal order.
- Chest wall rigidity has been reported with rapid administration of fentanyl.

Dosage and Administration

FENTANYL:

- Adult doses may be rounded to nearest 25 mcg increment
- Initial dose in adults may typically be 100 mcg
- Strongly consider ½ typical dosing in elderly or frail patient

ADULT:

Pain Management IV/IO/IM/IN route: 1 mcg/kg (max individual dose of 100 mcg).

- Dose may be repeated after 5 minutes and titrated to clinical effect to a maximum cumulative dose of 200 mcg
- Additional dosing **CONTACT BASE MEDICAL CONTROL**

Sedation following advanced airway placement

- 50-100mcg IV/IO every 2 minutes, titrate to effect. Do not exceed 3 doses without **Base Medical Control Contact.**

PEDIATRIC:

IV/IO route: 1 mcg/kg (max individual dose of 75mcg).

- Dose may be repeated once after 5 minutes.
- Additional dosing **CONTACT BASE MEDICAL CONTROL**

IN route: 1.5 mcg/kg.

- Administer a **maximum of 1 mL of fluid** per nostril
- Dose may be repeated after 5 minutes after initial IN dose to a maximum cumulative dose of 3 mcg/kg. IV route is preferred for repeat dosing.

MORPHINE:

ADULT:

IV/IO/IM routes: 0.1 mg/kg (max individual dose of 5 mg).

- Dose may be repeated after 10 minutes and titrated to clinical effect to a maximum cumulative dose of 15 mg.
- Additional dosing **CONTACT BASE MEDICAL CONTROL**
- **Morphine may not be given IN as it is poorly absorbed**

PEDIATRIC:

CONTACT BASE MEDICAL CONTROL

IV/IO routes: 0.1 mg/kg. Maximum single dose is 4 mg

- **Morphine may not be given IN as it is poorly absorbed**

NOTE: IV route is preferred for all opioid administration because of more accurate titration and maximal clinical effect. IO/IN/IM are acceptable alternatives when IV access is not readily available. Repeat doses of IN Fentanyl can be given if IV access cannot be established. However greater volumes and repeat IN administration are associated with greater drug run off and may therefore be less effective. Continuous pulse oximetry monitoring is mandatory. Frequent evaluation of the patient's vital signs is also indicated. Emergency resuscitation equipment and naloxone must be immediately available.

Protocol

Adult Chest Pain
Abdominal Pain and vomiting
Amputations
Burns
Adult Airway Management
Adult Rapid Sequence Airway
Bites/Stings
Snake Bites
Face and Neck Trauma
Chest Trauma
Abdominal Trauma
Spinal Trauma

ORAL GLUCOSE (GLUTOSE, INSTA-GLUCOSE)

Description

Glucose is the body's basic fuel and is required for cellular metabolism.

Indications

- Known or suspected hypoglycemia and able to take by mouth.

Contraindications

- Inability to swallow or protect airway.
- Unable to take oral medications for another reason.

Dosage and Administration

- One full tube 15 gm orally.

Protocol

- **Hypoglycemia**

OXYGEN

Description

Oxygen added to the inspired air increases the amount of oxygen in the blood, and thereby increases the amount delivered to the tissue. Tissue hypoxia causes cell damage and brain death. Breathing, in most people, is regulated by small changes in the acid-base balance and CO2 levels. It takes relatively large decreases in oxygen concentration to stimulate respiration.

Indications

- Suspected hypoxemia or respiratory distress from any cause
- Acute chest or abdominal pain
- Hypotension/shock states from any cause
- Trauma
- Suspected carbon monoxide poisoning
- Obstetrical complications, childbirth

Precautions

- If the patient is not breathing adequately, the treatment of choice is assisted ventilation, not just oxygen.
- When pulse oximetry is available, titrate SpO2 to ≥ 93%. This may take some time.
- Do not withhold oxygen from a COPD patient out of the concerns for loss of hypoxic drive. This is rarely a concern in the prehospital setting with a short transport time.

Dosage and Administration

- Oxygen may be administered at the paramedic's discretion for the above indications and to maintain an SpO2 ≥ 93%.

Flow	LPM Dosage	Indications
Low Flow	1-4 LPM	Minor medical/trauma
Moderate Flow	3-6 LPM	Moderate medical/trauma
High Flow	10-15 LPM	Severe medical/trauma

Special Notes

- Adequate oxygenation is assessed clinically and with the SpO2, while adequate ventilation is assessed clinically and with EtCO2.

OXYGEN FLOW RATES

METHOD	FLOW RATE	OXYGEN INSPIRED
Room Air		21%
Nasal Cannula	1 LPM 2 LPM 6 LPM	24% 28% 44%
Simple Face Mask	8 - 10 LPM	40-60%
Non-rebreather Mask	10 LPM	90%
Mouth to Mask	10 LPM 15 LPM	80% 50%
Bag/Valve/Mask (BVM)	Room Air 12 LPM	21% 40%
Bag/Valve/Mask with Reservoir	10-15 LPM	90-100%

RACEMIC EPINEPHRINE

Description

Racemic epinephrine 2.25% is an aqueous solution that delivers 11.25 mg of racemic epinephrine per 0.5 mL for us by oral inhalation only. Inhalation causes local effects of the upper airway as well as systemic effects from absorption. Vasoconstriction may reduce swelling in the upper airway and β effects on bronchial smooth muscle may relieve bronchospasm.

Onset & Duration

- Onset: 1-5 minutes
- Duration: 1-3 hours

Indications

- Bronchospasm in bronchiolitis
- Stridor at rest in croup
- Suspected epiglottitis in children

Side Effects

- Tachycardia
- Palpitations
- Muscle tremors

Dosage and Administration

- 0.5 mL racemic epinephrine (acceptable dose for all ages) mixed in 2 mL saline, via nebulizer at 6-8 LPM to create a fine mist and administer over 15 minutes

Protocol

- **Pediatric Univeral Respiratory Distress Algorithm**

Special Considerations

- Racemic epi is heat and photo-sensitive.
- Once removed from the refrigerator, the unopened package is stable at room temperature until the expiration date stated on the package.
- Do not confuse the side effects with respiratory failure or imminent respiratory arrest.

FAMOTIDINE (PEPCID)

Description

Famotidine competitively inhibits the action of histamine at the histamine H2-receptors. This antihistamine property functions to inhibit gastric acid secretion and to inhibit the action of histamine from contributing to anaphylactoid reactions and/or anaphylaxis.

Onset & Duration

- Onset: almost immediate
- Peak: 30-60 minutes
- Duration: 8-15 hours

Indications Onset & Duration

- Allergic/ Anaphylactic Reactions in adult and pediatric patients
- Famotidine is indicated even in the presence of hypotension.

Contraindications

- Known hypersensitivity

Adverse Reactions

- Rare instances of arrhythmias and hypotension have been reported following rapid IV bolus.

Dosage and Administration

ADULT

- 20 mg in 100 ml D5W or NS Intravenous Piggyback (IVPB) over 15 min

PEDIATRIC

- 0.5 mg/kg in 100 ml D5W or NS Intravenous Piggyback (IVPB) over 15 min

Protocol

- **Allergy/Anaphylaxis**

ROCURONIUM (ZEMURON)

Description

Rocuronium is an intermediate acting non-depolarizing neuromuscular blocker. It binds cholinergic receptors at the post synaptic motor end plate preventing acetylcholine mediated neurotransmission and inhibits transmission of nerve impulses by binding with cholinergic receptor sites, antagonizing action of acetylcholine.

Onset & Duration

- Onset: 60-70 sec
- Duration: 30-50 minutes

Indications

- Longer-acting paralysis post intubation and RSA.

Contraindications

- Unable to effectively ventilate with a bag-valve-mask
- Hypersensitivity

Precautions/side effects

- Only to be used in the setting where a trained and medical director approved provider that is capable of endotracheal intubation and advanced airway placement is caring for the patient.
- Causes apnea, oxygen and resuscitation medication and equipment must be readily available.

Dosage and Administration

Adult:

- 1 mg/kg IV/IO

Protocol

- **Adult Rapid Sequence Airway**

SODIUM BICARBONATE

Description

Sodium bicarbonate is an alkalotic solution, which neutralizes acids found in the body. Acids are increased when body tissues become hypoxic due to cardiac or respiratory arrest.

Indications

- Tricyclic overdose with arrhythmias, widened QRS complex, hypotension, seizures
- Suspected hyperkalemic pulseless arrest: consider in patients with renal failure.

Contraindications

- Metabolic and respiratory alkalosis
- Hypocalcemia
- Hypokalemia

Adverse Reactions

- Metabolic alkalosis
- Hyperosmolarity may occur, causing cerebral edema

Drug Interactions

- May precipitate in calcium solutions
- Alkalization of urine may increase half-life of some drugs
- Vasopressors may be deactivated

Dosage and Administration

ADULT 8.4%

- Tricyclic OD with hypotension or prolonged QRS > 0.10 sec or suspected hyperkalemia-related pulseless arrest:
    - 1 mEq/kg slow IV push, repeat if needed in 10 minutes

PEDIATRIC 8.4%

- Tricyclic OD with hypotension or prolonged QRS > 0.10 sec or suspected hyperkalemia-related pulseless arrest:
    - 1 mEq/kg slow IV push, repeat if needed in 10 minutes

Protocol

- **Adult Cardica Arrest, General Principals**
- **Pediatric Cardiac Arrest General Principles**
- **Poisoning/Overdose**

Special Considerations

- Sodium bicarbonate administration increases CO2, which rapidly enters cells, causing a paradoxical intracellular acidosis.
- Sodium bicarbonate is no longer recommended for the use in prolonged cardiac arrest. Its use in pulseless arrest should be limited to known or suspected hyperkalemia (e.g. dialysis patient).

SUCCINYLCHOLINE (ANECTINE)

Description

Succinylcholine is a short acting depolarizing neuromuscular blocker. It acts similar to acetylcholine, producing depolarization of the motor endplate at the myoneural junction which causes sustained flaccid skeletal muscle paralysis. It binds the cholinergic receptors at the motor end plate causing depolarization and thereby inhibiting further neurotransmission.

Onset & Duration

- Onset: 60-90 sec
- Duration: 5-6 min

Indications

- Facilitation of endotracheal intubation

Contraindications

- Hypersensitivity
- Hyperkalemia
- Myopathy or neuromuscular disease
- History of Malignant Hyperthermia
- Recent history of major burn or crush injury (> 48 hours after the injury)
- End Stage Renal Disease
- History of Plasma Cholinesterase deficiency
- Unable to effectively ventilate with a bag-valve-mask
- Open globe eye injuries
- Glaucoma
- Increased intracranial pressure

Precautions/Side Effects

- Only to be used in the setting where a trained and medical director approved provider that is capable of endotracheal intubation and advanced airway placement is caring for the patient.
- Causes apnea, oxygen and resuscitation medication and equipment must be readily available
- Apnea, wheezing, fasciculation, increased ocular and intracranial pressure, bradycardia, hypotension

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Dosage and Administration

ADULT:

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

Protocol

- **Rapid Sequence Airway**

PROCEDURE AND MEDICATION QUICK REFERENCE

The following is a quick reference of procedures and medications approved for use by the SPEMSMD for use by SPEMS Paramedics. For complete details, see each individual protocol.

Abbreviations (A)	S = Standing Order	**B** = Base Medical Control

Airway Procedures	A	
Capnography	S	
King airway	S	
Continuous positive airway pressure (CPAP)	S	
Orotracheal intubation (Video, Direct)	S	
Percutaneous cricothyrotomy (Quick Trach)	S	
Needle cricothyrotomy	S	
Surgical cricothyrotomy (Control Cric)	S	
Needle thoracostomy for tension pneumothorax decompression	S	

Cardiovascular Procedures	A	Recommended Dosage
Tourniquet	S	
ECG - Acquire & Interpretation (including 12-lead)	S	
Blood glucose monitoring	S	
IV – Peripheral	S	
IV – External jugular	S	
IO -- Intraosseous	S	
Use of established central line (including PICC) for fluid and medication administration (excluding subcutaneous ports)	S	
Manual Defibrillation – Adult	S	360J
Manual Defibrillation – Pediatric	S	2J/kg, 4J/kg
Valsalva maneuver	S	
Synchronized cardioversion – Adult	S	100J, 200J, 300J, 360J
Synchronized cardioversion – Pediatric	S	1-2J/kg, 2-4J/kg
Transcutaneous cardiac pacing	S	

Medications	A	Recommended Dosage
Specialized prescription medications to address an acute crisis given the route of administration is within the scope of the provider	**B**	
Adenosine (Adenocard) – Adult	S	12mg, 12mg
Adenosine (Adenocard) – Pediatric	**B**	
Albuterol sulfate	S	2.5mg nebulized
Amiodarone, Pulseless arrest – Adult	S	300mg, 150mg (bolus)
Amiodarone, Pulseless arrest – Pediatric	S	5mg/kg (bolus)
Amiodarone, Tachyarrhythmia with poor perfusion – Adult	S	150mg (drip)
Amiodarone, Tachyarrhythmia with poor perfusion – Pediatric	S	5mg/kg (drip)
Aspirin	S	324mg
Atropine sulfate, Hemodynamically unstable bradycardia – Adult	S	0.5mg, repeat to 3mg
Atropine sulfate, Hemodynamically unstable bradycardia – Pediatric	S	0.02 mg/kg, min 0.1mg
Atropine sulfate, Organophosphate poisoning – Adult	S	2mg
Atropine sulfate, Organophosphate poisoning – Pediatric	S	0.02 mg/kg, min 0.1mg
Calcium, Pulseless arrest assumed due to hyperkalemia – Adult	S	1gm, slow IVP
Calcium, Pulseless arrest assumed due to hyperkalemia – Pediatric	S	1gm, slow IVP
Calcium, Calcium channel blocker overdose – Adult	S	1gm, may be repeated
Calcium, Calcium channel blocker overdose – Pediatric	S	20mg/kg, slow IVP
Dextrose – Adult D10	S	12.5-25gm
Dextrose – Pediatric D10	S	4 mL/kg (see BGL)
Diazepam, Seizure in presence of poisoning	S	10mg auto-injector
Diphenhydramine (Benadryl), Allergy/Anaphylaxis – Adult	S	50mg
Diphenhydramine (Benadryl), Allergy/Anaphylaxis – Pediatric	S	1mg/kg
Diphenhydramine (Benadryl), Dystonic/Butyrophenones	S	25mg
Epinephrine, Pulseless arrest – Adult	S	1mg every 3-5 min
Epinephrine, Pulseless arrest – Pediatric	S	0.01mg/kg every 3-5 min

Medications	A	Recommended Dosage
Epinephrine, Asthma, Systemic allergic reaction – Adult	S	0.3mg IM (1:1000)
Epinephrine, Asthma, Systemic allergic reaction – Pediatric	S	0.01 mg/kg IM (1:1000)
Epinephrine, Imminent arrest due to anaphylaxis – Adult	S	0.5mg IM (1:10,000) IV
Epinephrine, Imminent arrest due to anaphylaxis – Pediatric	S	0.005 mg/kg(1:10,000) IV
Epinephrine, Hypotension due to anaphylaxis – Adult	**B**	2-10mcg/kg/min
Etomidate (Amidate), RSA-- Adult	S	0.3mg/kg
Famotidine (Pepcid) - Adult	S	20mg, IV drip
Famotidine (Pepcid) - Pediatric	S	0.5mg/kg, IV drip
Fentanyl (Sublimaze), Analgesia – Adult	S	1mcg/kg
Fentanyl (Sublimaze), Analgesia – Pediatric	S	1mcg/kg IV/IO
Fentanyl (Sublimaze), Analgesia – Pediatric	S	1.5mcg/kg IN
Fentanyl (Sublimaze), Sedation after airway procedure – Adult	S	50-100mcg, repeat
Glucagon – Adult	S	1mg IM
Glucagon – Pediatric, <25 kg	S	0.5mg IM
Glucagon – Pediatric, ≥25 kg	S	1mg IM
Haloperidol (Haldol) – Adult < 60 kg	S	5mg
Haloperidol (Haldol) – Adult > 60 kg	S	10mg
Haloperidol (Haldol) – Pediatric under 12yo	**B**	
Ipratropium Bromide (Atrovent)	S	0.5mg nebulized
Ketamine (Ketalar), Excited Delirium – Adult	S	4mg/kg IM
Ketamine (Ketalar), RSA/Induction – Adult	S	2mg/kg IV
Ketamine (Ketalar), Post Intubation Sedation – Adult	S	2mg/kg IV
Ketamine (Ketalar), Analgesia – Adult	S	0.5mg/kg IV
Lidocaine 2% Solution – Anesthetic for IO needle insertion	S	0.5mg/kg, max 50mg
Lorazepam (Ativan), Seizure – Adult	S	1-2mg IV/IO, may repeat
Lorazepam (Ativan), Seizure – Pediatric	S	0.05mg/kg IV/IO, repeat
Lorazepam (Ativan), Anxious, agitated or combative patient– Adult	S	2mg IM; 1-2mg IV
Magnesium sulfate, Torsades de pointes – Adult	S	2gm IV bolus
Magnesium sulfate, Torsades de pointes – Pediatric	S	50mg/kg IV drip
Magnesium sulfate, Refractory severe bronchospasm – Adult	S	2gm IV drip
Magnesium sulfate, Refractory severe bronchospasm – Pediatric	S	50mg/kg IV drip
Magnesium sulfate, Eclampsia – Adult	S	4gm IV drip
Methylprednisolone (Solu-Medrol) – Adult	S	125mg IV/IO
Methylprednisolone (Solu-Medrol) – Pediatric	S	2mg/kg IV/Io, max 125mg
Midazolam (Versed), Seizure – Adult > 65 y/o	S	2.5mg IV/IO/IM/IN, repeat
Midazolam (Versed), Seizure – Adult < 65 y/o	S	5mg IV/IO/IM/IN, repeat
Midazolam (Versed), Seizure – Pediatric	S	0.2mg/kg IV/IO/IN, max 3mg
Midazolam (Versed), Sedation for cardioversion or TCP – Adult	S	1-2mg IV/IO
Midazolam (Versed), Sedation for cardioversion or TCP – Pediatric	S	0.1 mg/kg IV/IO
Midazolam (Versed), Sedation after advanced airway – Adult	S	5mg IV/IO, repeat
Midazolam (Versed), Agitated/Combative, Excited Delerium – Adult > 65 y/o	S	2.5 mg IM/IN
Midazolam (Versed), Agitated/Combative, Excited Delerium – Adult < 65 y/o	S	5 mg IM/IN
Midazolam (Versed), Excited Delerium – Adult < 65 y/o & > 100kg	S	10 mg IM/IN
Midazolam (Versed), Agitated/Combative, Excited Delerium – Pediatric	S	0.1-0.2 mg/kg IM/IN
Morphine sulfate, Analgesia – Adult	S	0.1mg/kg
Morphine sulfate, Analgesia – Pediatric	**B**	
Naloxone (Narcan) – Adult	S	0.5mg IN/IV/IM/IO titrate
Naloxone (Narcan) – Pediatric	S	0.1mg IN/IV/IM/IO titrate
Nitroglycerin (Nitrostat, Nitroquick) – Adult	S	0.4mg ever 3-5min
Norepinephrine (Levophed) – Adult	S	8-16mcg/min, titrate to BP
Ondansetron (Zofran) – Adult	S	4mg IV/IM
Ondansetron (Zofran) – Pediatric < 4 years old	S	2mg IV/IM
Ondansetron (Zofran) – Pediatric ≥ 4 years old	S	4mg IV/IM
Oral glucose (Glutose, Insta-glucose)	S	15gm
Racemic epinephrine (Vaponepherine) – Pediatric	S	0.5mL drug mixed in 2mL
Rocuronium (Zemuron) – Adult	S	1mg/kg
Sodium bicarbonate, Pulseless arrest suspected hyperkalemia – Adult/Ped	S	1mg/kg, repeat
Sodium bicarbonate, Tricyclic antidepressant overdose – Adult/Ped	S	1mg/kg, repeat
Succinylcholine (Anectine) – Adult	S	2 mg/kg, max 200