Pennsylvania Statewide

Advanced Life Support Protocols

Pennsylvania Department of Health
Bureau of Emergency Medical Services

Effective July 1, 2011

(717) 787-8740

March 1, 2011

Dear EMS Provider:

The Bureau of EMS, Department of Health, is pleased to provide this updated version of the Statewide ALS Protocols. The original version of the Statewide ALS Protocols was introduced July 1, 2007 and was then updated in November 2008. New sections of the protocols that correspond to these 2011 updates are identified with yellow highlighting and deleted sections are identified by a line striking through the deleted text. These will assist EMS providers in locating changes. These protocols were developed with input from many of Pennsylvania's EMS stakeholders, and they were unanimously approved at a meeting of the Commonwealth's Regional EMS Medical Directors.

There are many benefits to using Statewide Protocols:

- **Uniformity** – Since many ALS providers provide EMS for multiple agencies in more than one region, statewide protocols provide a uniform expectation for EMS care. A recent report of the Institute of Medicine (IOM) has called for the development of evidence-based model pre-hospital care protocols for the treatment, triage, and transport of patients. The IOM report states that "These protocols will facilitate much more uniform treatment of injuries and illnesses across the country so that all patients will receive the current standard of care at the most appropriate location."
- **Evidence-based** – These protocols were written to be as evidence-based as is possible. The basic pathophysiology of human illness is the same in all areas of Pennsylvania, and we would expect all patients to receive the best quality EMS care. Statewide protocols bring the results of the best research in EMS to our patients.
- **Up-to-Date** – Regular updates to the statewide protocols continuously provide up-to-date protocols to all regions. This update has incorporated information from the 2010 American Heart Assocation guidelines into care provided by all of Pennsylvania's EMS providers within months of the release of the guidelines.
- **Standardization** – Standardized protocols permit better integration with the scope of practice, ALS drug list, ambulance equipment list, training curricula, and complaint investigation.
- **Disaster Preparedness** – Disaster preparedness planning often crosses the boundaries of EMS regions, and the PA EMS Strike Teams have responded within and outside of the Commonwealth. The uniformity of statewide protocols are useful when geographically diverse EMS groups must work together to provide emergency medical care and when setting standards for disaster-related care for medical conditions that are not frequently encountered during day-to-day EMS operations.

In addition to the Statewide BLS Protocols and these Statewide ALS Protocols, regions may use additional current Department-approved regional protocols for conditions that are not covered by the Statewide BLS/ALS Protocols.

This version of the Statewide EMS Protocols may be used by ALS providers as soon as the protocols are adopted by the EMS region, but all providers must be using these protocols by the effective date of July 1, 2011. Several resources will be available to assist ALS providers in becoming familiar with the protocol updates. These include an in-service presentation that will be available to regions and agencies and educational information on the Learning Management System (LMS).

The Department of Health's Bureau of EMS website will always contain the most current version of the EMS protocols, the scope of practice for each level of provider, important EMS Information Bulletins, and many other helpful resources. This information can be accessed online at www.health.state.pa.us . The Statewide ALS Protocols may be directly printed or downloaded into a PDA for easy reference.

The Department is committed to providing Pennsylvania's EMS providers with the most up-to-date protocols, and to do this requires periodic updates. The protocols will be reviewed annually, and EMS providers are encouraged to provide recommendations for improvement at any time. Comments should be directed to the Commonwealth EMS Medical Director, Pennsylvania Dept of Health, Bureau of EMS, Room 606, 625 Forster Street, Harrisburg, PA 17120.

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GENERAL PROTOCOL PRINCIPLES
STATEWIDE ALS PROTOCOL

Criteria:

A. These general principles apply to the use of all protocols used by ALS providers

Purpose:

A. The Statewide Protocols are written with the goal of providing the highest quality of EMS patient care to patients treated by EMS providers in the Commonwealth.

B. The Statewide Protocols provide a statewide uniformity and consistency to expected EMS care provided by EMS providers.

C. The Statewide Protocols are written based upon the most current and best scientific evidence related to prehospital/ out-of-hospital EMS care, when this evidence is available.

D. The Statewide Protocols are written to provide a balance between expected patient care and some educational information related to possible variations, newer information, and important warnings/ contraindications.

Policy:

A. Scope of Practice

1. An ALS provider who is appropriately credentialed by the EMS agency and EMS agency medical director may perform EMS which may be performed by an EMT and ALS skills as defined by the EMS provider's scope of practice as published in the PA Bulletin and listed on the EMS Bureau website when following the order of a medical command physician or when using Department approved transfer and medical treatment protocols as authorized by the EMS agency medical director.
2. The Statewide BLS Protocols apply to patient care provided by ALS providers unless a statewide ALS protocol or Department-approved regional protocol supersedes the statewide BLS protocol.
3. The Statewide BLS Protocols and Statewide ALS Protocols apply to patient care provided by air ambulances unless superseded by a Department-approved air ambulance protocol.
4. Regions may establish Department-approved regional protocols, and all ALS providers are expected to follow applicable Department-approved regional protocols from the region in which their ALS service is based.

B. Deviation from Protocols:

1. When providing patient care under the EMS Act, EMS providers must follow the orders of a medical command physician or, in the absence of such orders, the applicable protocols. In addition to the Statewide ALS Protocols, ALS providers must follow applicable Statewide BLS Protocols and Department-approved Regional Medical Treatment Protocols. Since written protocols cannot feasibly address all patient care situations that may develop, the Department expects EMS providers to use their training and judgment regarding any protocol-driven care that in their judgment would be harmful to a patient under the circumstances. When the provider believes that following a protocol is <u>not</u> in the best interest of the patient, the EMS provider must contact a medical command physician if possible. Cases where deviation from a protocol is justified are rare. The reason for any deviation should be documented. All deviations are subject to investigation to determine whether or not they were appropriate. In all cases, EMS providers are expected to deliver care within the scope of practice for their level of certification.
2. Medical command physicians are permitted to provide orders for patient care that are not consistent with the protocols when, under the circumstances, the procedures identified in a

protocol are not the most appropriate care in the judgment of the physician or when there is not a specific protocol that is appropriate to the patient's condition. Some protocols have a section of "Possible Medical Command Orders". These are provided as a possible resource for the medical command physician and as an educational resource for the EMS providers. These "Possible Medical Command Orders" do not substitute for the judgment of the medical command physician, and the medical command physician is under no obligation to follow the treatment options listed in this section.

3. In cases where a specific step, treatment, or medication dose within a protocol is contraindicated, EMS providers are expected to use their judgment and training to identify these contraindications, and in these situations, the provider is not expected to provide that specific treatment. Failure to provide a treatment that is contraindicated is not considered a deviation from protocol, but the EMS provider should document the contraindication. Medical command must be contacted if the patient's condition requires alternative treatments that are not listed within the protocol.

4. Under no circumstance may an EMS agency medical director institute a protocol that is separate from Department-approved Statewide or Regional protocols. Under no circumstance may an EMS agency medical director institute a policy that contradicts or is not consistent with the Statewide Protocols or the Department-approved Regional Treatment Protocols.

C. Guidelines and Protocol Options:

1. Some documents are labeled as guidelines rather than protocols. Guidelines serve as "best practice" suggestions, and these may be used by agencies and regions. The suggested guidelines are not considered expected care, although a region may choose to request Department approval to use a guideline as a regional protocol.

2. Some protocols or treatments within a protocol may be listed as "optional" or "if available". Regions or agencies may choose to use an optional protocol or treatment/medication. Regions may set requirements for options, treatments, or medications that apply to all agencies within the region. EMS agency medical directors may set requirements for options, treatments, or medications that apply to all ALS providers within the agency. **When statewide protocols permit options, regional requirements will supersede agency level requirements regarding the options that are permitted.**

3. When protocols provide for options, regions may standardize the use of these options across the region, and services may choose options only If the choice does not conflict with regional policies.

D. Format and Use of Protocols

1. Criteria/Exclusion Criteria - these sections list the patient conditions that are applicable to the specific protocol and list exclusion criteria that are examples of patient conditions that are not applicable to the specific protocol.

2. System Requirements - this section defines specific service or provider requirements that must be met in addition to the usual expectations of every EMS agency or provider when providing treatments within the specific protocol. Most ALS protocols are applicable to all ALS providers, and therefore specific "system requirements" are rare.

3. Possible Medical Command Orders - this section is added for educational purposes. It provides EMS providers with an understanding of options that may be available through medical command order, and it may be useful to medical command physicians when providing medical command orders.

4. Using the algorithm flow charts:

   a. Although algorithms follow a step-wise approach to patient care, there are frequently several treatments that should vary in order or may be done simultaneously. Treatments

that are listed within solid boxes may be done in any order, based upon the patient presentation, or may be done simultaneously when additional EMS providers are present.

b. When several medication/treatment options are available, the algorithm step may refer the EMS provider to a "box" (outlined with a broken line) that is outside of the algorithm flow. The provider should refer to the box to choose the appropriate treatment and then return to the algorithm step and continue to follow the algorithm flow sheet. Regions or EMS agency medical directors may define specific expectations for expected treatment options to be chosen from these boxes.

c. In general, the algorithms and protocols do not specify when to initiate packaging or transportation of most patients. Patient condition and paramedic judgment of the utility of on-scene treatment should determine where packaging and initiation of transport are done. If transport issues are not directly identified in the protocols, quality improvement benchmarks set by regions or agency medical oversight should guide transport expectations.

d. EMS providers are not required to follow every step within a protocol if a step is deemed to be inappropriate for a particular patient. For example, if a patient's condition has improved and the treatment would be unnecessary or if a medication is contraindicated.

e. In most cases, the algorithm does not specify when or how to reassess patients. It is expected that patients are reassessed frequently, particularly after each medical intervention or medication administration. Vital signs or other appropriate reassessments should be done and documented after administering any medication that could change hemodynamic parameters, level of consciousness, etc.

f. Most protocols list a "Contact Medical Command" point. Although medical command should be contacted earlier if the EMS provider believes that consultation with a medical command physician would be helpful in treating the patient, ALS providers must use the Medical Command Contact Protocol (# 9001), which defines actions that must be taken, when the "Contact Medical Command" point is reached.

5. Notes - these footnotes refer to the identified step of the algorithm. The notes provide additional information regarding the general step. Notes are generally used to draw attention to rarer circumstances or to provide additional educational information. Providers are expected to follow information within the notes as if they were a step in the algorithm flow chart.

6. Performance Parameters - this section provides suggested benchmarks for quality improvement reviews that may occur at the service, regional or statewide level. In some instances, following quality improvement review using, at a minimum, the listed performance parameters is required.

E. Use of medical command

1. Medical command may be contacted at any step in patient care, and EMS providers should contact medical command if a patient's condition is unusual and is not covered by a specific protocol, if a patient's presentation is atypical and the protocol treatment may not be the best treatment for the patient, or in any situation where the EMS provider is not sure about the best treatment for the patient.

2. Agency medical directors may place limitations on an EMS provider that require contact with medical command earlier than defined by the Statewide Protocols. These limitations may be placed upon an individual ALS provider when there is reason to restrict the skills that the provider is credentialed to perform, or the limitations may apply to all agency ALS providers for uncommon skills/procedures that may require online direction.

3. The "Medical Command Contact" Protocol # 9001 defines when medical command must be contacted and when it is appropriate to proceed beyond the "Contact Medical Command" step if communication with a medical command facility cannot be established.

F. Regional and Statewide Drug Lists

1. Paramedics may only use medications that are listed on the Statewide ALS Drug List as published in the Pennsylvania Bulletin and posted on the Bureau of EMS website.

2. Every region must publish a Department-approved regional drug list, which may not exceed the Statewide ALS Drug List. This regional list will set the standard for the minimum medications that must be carried on every ALS vehicle based within the region, but ALS services may carry additional medications listed on the Statewide ALS Drug List. At a minimum, the ALS agency must carry each medication that is required to provide the care that is listed in the Statewide and applicable regional protocols. This list will be used by regional council staff when conducting licensure inspections.

G. Medications/Procedural Skills

1. The protocols list many medications and treatments that are optional and are not required of every ALS service or of every EMS provider. EMS regions may choose to require the use of some of these options if there is a regional reason for standardization (for example a specific medication may be required because of a regional drug box exchange program). Medications or treatments that are not required by the region may be standardized by the EMS agency medical director using agency level policy.

2. General medication issues

   a. When possible, dosing for various medications has been standardized across all protocols. EMS providers must use their training and knowledge to assure that doses given are appropriate for the patient's age and weight. Although doses may not exceed those listed in the protocol, it may be appropriate to decrease the doses of some medications based upon patient condition, patient vital signs or patient age.

   b. All references to medications, abbreviations, and doses have been standardized with attention to pharmacologic principles of medication error reduction.

   c. Agencies should assure that medications are stored in a manner that provides for maximal shelf life and appropriate security. Some medications, for example lorazepam, may have limitations to the listed expiration date if the medication is not refrigerated. EMS agencies should follow Department guidance and good medication storage practices to assure that medications have not lost their potency.

   d. EMS providers are expected to know the contraindications for each medication and are expected to assess patients for allergies, when possible, to any medication that is given. EMS providers should not administer medications to a patient when that medication is contraindicated in that situation.

3. Infusion mixtures - EMS regions or agencies may set standards for the mixture of medications that are to be given by infusion. When such standard concentrations are established, it is recommended that the region or agency also provide ALS providers with a table to assist in administering the correct infusion dosage.

4. Drawing blood samples - Drawing blood in the prehospital setting may assist receiving facilities in providing better diagnoses or more rapid treatment of patients, but in some areas the receiving facilities will not accept blood drawn by prehospital providers. Although it would be appropriate for an EMS agency to require blood draw in most situations where IV access is listed, EMS regions or agencies may determine whether drawing blood on prehospital patients is appropriate based upon the practices of local receiving hospitals.

5. Vascular Access - Many protocols list "Initiate IV/IO NSS". The most appropriate means of establishing this peripheral vascular or intraosseous access should be determined by agency policy or by the ALS provider's judgment based upon the condition of the patient.

   a. Peripheral venous access may be established with a saline lock or a NSS intravenous infusion. The rate of the infusion may be KVO or should be determined by specific IV fluid volumes as stated in the appropriate protocol.

   b. Intraosseous access - When IV access is indicated but not obtainable in a timely manner, intraosseous access is an acceptable alternative. An IO access may be initiated on any critically ill patient, requiring IV fluids or medications.

      1) IO access may be obtained in the following extremity sites:

         a) Proximal tibia

         b) Distal femur

         c) Proximal humerus

      2) Any acceptable method or device that obtains IO access in an extremity site listed above is appropriate. Regional or agency policy may indicate which technique or extremity sites listed above are acceptable for IO access.

      3) ALS services must have the capability of providing pediatric IO access, but adult IO access is considered optional unless required by the region.

      4) In conscious patients, lidocaine (2%, adults= 20-40 mg, peds = 0.5 mg/kg) should be administered prior to infusing medications or fluids through an IO to reduce the pain of infusions.

   c. Narcotic Use - when a medical command physician orders an ALS provider to administer a controlled substance, the medical command physician is responsible for providing a prescription in the patient's name for the order. A medical command physician may also provide a prescription for controlled substances that were given on protocol prior to contact with the medical command physician, but if the medical command physician is not comfortable writing this prescription for a medication that he/she did not order, then it is the EMS agency medical director's responsibility to arrange for a prescription in the patient's name to account for the controlled substance that was administered.

   d. Acetaminophen – acetaminophen (if available) at 15 – 20 mg/kg (not to exceed 1000 mg) may be administered to any patient with a fever if ALL of the following apply:

      1) Patient is at least 3 months old.

      2) Temperature > 38° C or 100.4° F (ambulances are required to have a non-tympanic, digital thermometer).

      3) Patient has not had a dose of acetaminophen within the last 4 hours.

H. Pediatric issues

1. Unless otherwise stated, pediatric protocols will apply to patients ≤ 14 years of age. If the patient's age is not known, then pediatric protocols will apply until there are physical signs that the patient has reached puberty/adolescence as indicated by armpit hair in boys and breast development in girls.

2. All ALS services must carry a commercial length-based device to estimate patient weight and appropriate drug dosages. When possible, these devices should be used as the primary method for determining the weight/appropriate drug doses for children. Additionally, the following formula or table may be used:

   a. Formula: (Age in years x 3) + 7 = estimated weight in kgs.

b. Table

1) 1 y/o =10 kg

2) 3 y/o =15 kg

3) 5 y/o =20 kg

4) 7 y/o =25 kg

5) 9 y/o =30 kg

I. Equipment Issues

1. All medical devices must be used, maintained, and calibrated in accordance with the recommendations from the manufacturer.

2. Electronic glucose testing meters must be carried by all ALS services, and these services must have either a CLIA license or certificate of waiver. An ALS service performing glucose testing with a meter cleared for home use by the FDA must hold a CLIA certificate of waiver. A CLIA certificate of waiver (CoW) is good for two years. Each agency is responsible for determining whether a CLIA license or waiver is required.

ALS RELEASE TO BLS
STATEWIDE BLS PROTOCOL

Criteria:

A. Patient assessed by ALS provider who determines that ALS treatment is not needed or anticipated to be needed.

Exclusion Criteria:

A. Any patient who refuses ALS care (e.g. patient refuses IV) should be transported by the ALS unit, unless patient refuses transport by the ALS unit then contact medical command

Procedure:

A. If a BLS crew arrives on-scene prior to the ALS provider arrival:

1. If multiple patients, perform triage.
2. BLS provider performs assessment of the patient in accordance with Statewide BLS Protocols and prepares for transport.

B. When ALS and BLS services have arrived at a patient incident:

1. If BLS provider did initial patient assessment, BLS provider will give a verbal patient report to the ALS provider.
2. ALS provider will assess the patient and determine if ALS care is needed or may be anticipated to be needed[1] The ALS provider will complete a PCR documenting his/her assessment for every patient assessed except when triaging patients in a multi-casualty incident
3. ALS provider may hand off patient to BLS provider if patient does not require ALS care.
4. If ALS provider performs any ALS procedure (including ECG, but not general ALS patient assessment or glucose check) he/she must contact Medical Command prior to hand off to BLS:

C. When the ALS and BLS providers are on the crew of an ALS ambulance together:

1. The ALS provider must perform the initial assessment. After determining that ALS care is not needed or anticipated to be needed, the ALS provider may hand off care to the BLS provider on the crew, but the ALS provider must review and is also responsible for the PCR completed by his/her BLS partner

Performance Parameters:

A. Review cases of ALS release to BLS for appropriateness of ALS assessment and for outcomes like need for ALS recall or need for ALS care on arrival to receiving facility.

Notes:

1 When the number of patients exceeds the number of ALS providers, the ALS provider(s) must triage the patients that require ALS care, and may not have the resources to evaluate all patients directly.

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CONFIRMATION OF AIRWAY PLACEMENT
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient who has ET tube or alternative airway device inserted by EMS provider.

Exclusion Criteria:

A. None

System Requirements:

A. Every ALS service must carry and use an electronic wave-form $ETCO_2$ detector device[1] for confirmation and continuous monitoring of endotracheal tube/ alternative airway device placement.

Procedure:

A. Insert ETT [2] or Alternative Airway Device

B. Attach electronic $ETCO_2$ monitor to BVM.

C. Ventilate [3] while simultaneously:

1. Assuring "positive" CO_2 wave with each ventilation.
2. Verifying absence of gastric sounds.

D. Verify presence of bilateral breath sounds.

E. Secure tube.

F. Continuously monitor waveform $ETCO_2$. [4]

G. Reassess bilateral breath sounds and absence of gastric sounds after each move or transfer of the patient.

H. Document all of the above.

Notes:

1. Colorimetric $ETCO_2$ detectors may give false negative results when the patient has had prolonged time in cardiac arrest. EDD aspiration devices may give false negative results in patients with lung disease (e.g. COPD or status asthmaticus), morbid obesity, late stages of pregnancy, or cardiac arrest. ALS services may consider carrying colorimetric $ETCO_2$ detectors or EDD aspiration devices as back-ups in case of electronic device failure, but must primarily use the wave-form $ETCO_2$ detector as described in this procedure.
2. If ETT is not visualized to pass through a good view of glottic opening, then the chance of misplaced esophageal intubation is increased and transmitted sounds during auscultation alone may lead to misdiagnosed tube position.
3. Immediately remove ETT or Alternative Airway Device if any step reveals evidence of lack of lung ventilation. If there is any doubt about adequate ventilation with an ETT or Alternative Airway Device, remove the device and ventilate with BVM.
4. Quantitative $ETCO_2$ readings may be beneficial in assessing the quality of CPR or as an indicator of the prognosis for successful resuscitation.

Performance Parameters:

A. Review all ETI and Alternative Airway Device insertions for documentation of absence of gastric sound, presence of bilateral breath sounds, and appropriate use of a confirmation device.

B. If systems have the capability of recording a capnograph tracing, review records of all intubated patients to assure that capnograph was recorded.

C. Document $ETCO_2$ reading immediately after intubation, after each movement or transfer of patient and final transfer to ED stretcher.

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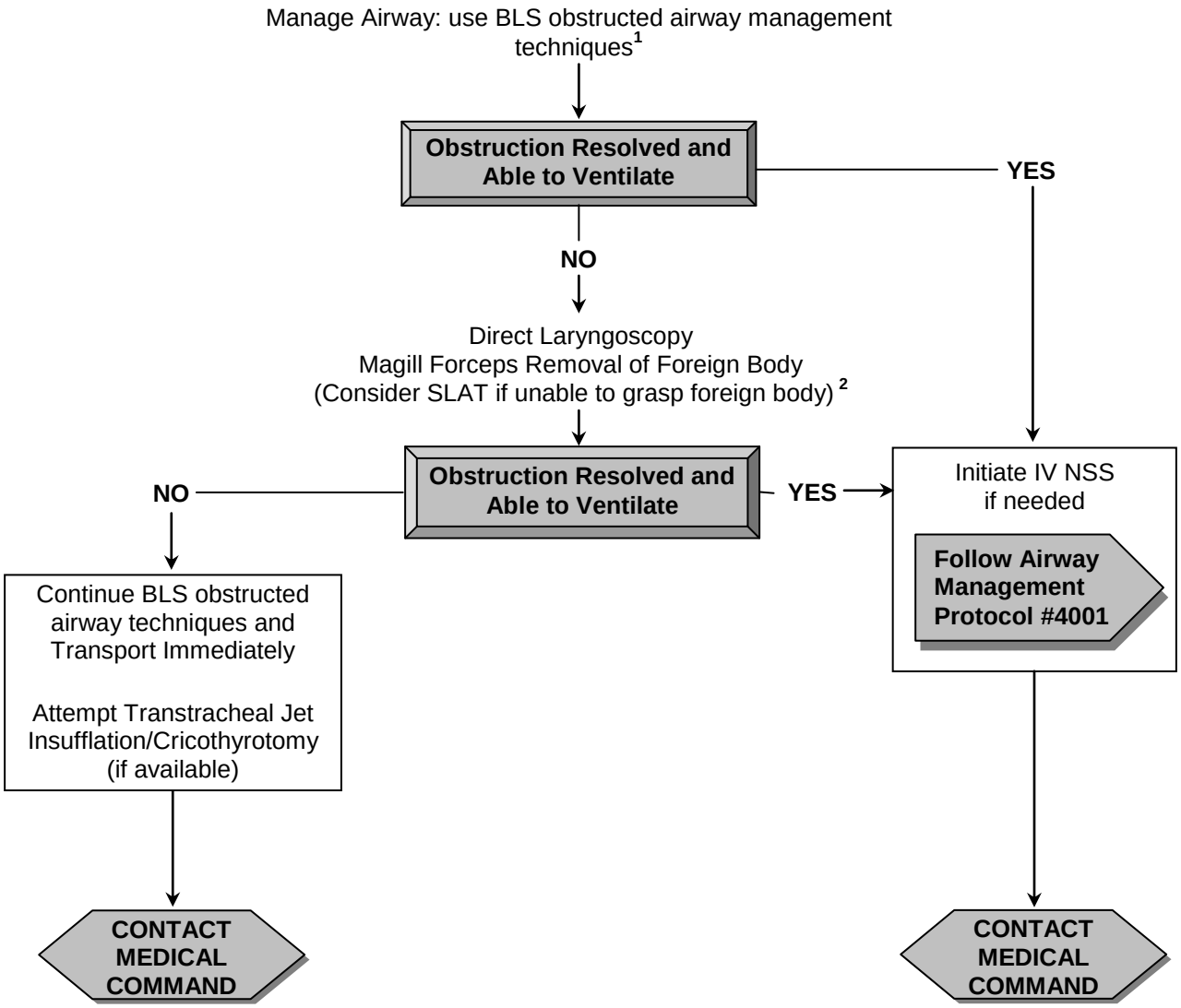
AIRWAY OBSTRUCTION
STATEWIDE ALS PROTOCOL



AIRWAY OBSTRUCTION
STATEWIDE ALS PROTOCOL

Criteria:

A. Obstructed airway from suspected foreign body.

Exclusion Criteria:

A. Acute obstruction of the airway is due to systemic allergic reactions - Follow Allergic Reaction Protocol # 4011.

Possible MC Orders:

A. Cricothyrotomy, if available.

Notes:

1. For children < 1 year of age, put head down and use black blows/chest thrusts. For adults and children > 1 year of age, use abdominal thrusts. For pregnant patients or patients who are too obese for abdominal thrusts, use chest thrusts.
2. **SLAT** = **S**imultaneous **L**aryngoscopy and **A**bdominal **T**hrusts. When the foreign body can be visualized within the trachea but cannot be grasped by Magill forceps, there have been case reports of success when one rescuer visualizes the airway with a laryngoscope and another rescuer applies abdominal thrusts to temporarily dislodge the foreign body so that it can be grasped by the first rescuer with the Magill forceps

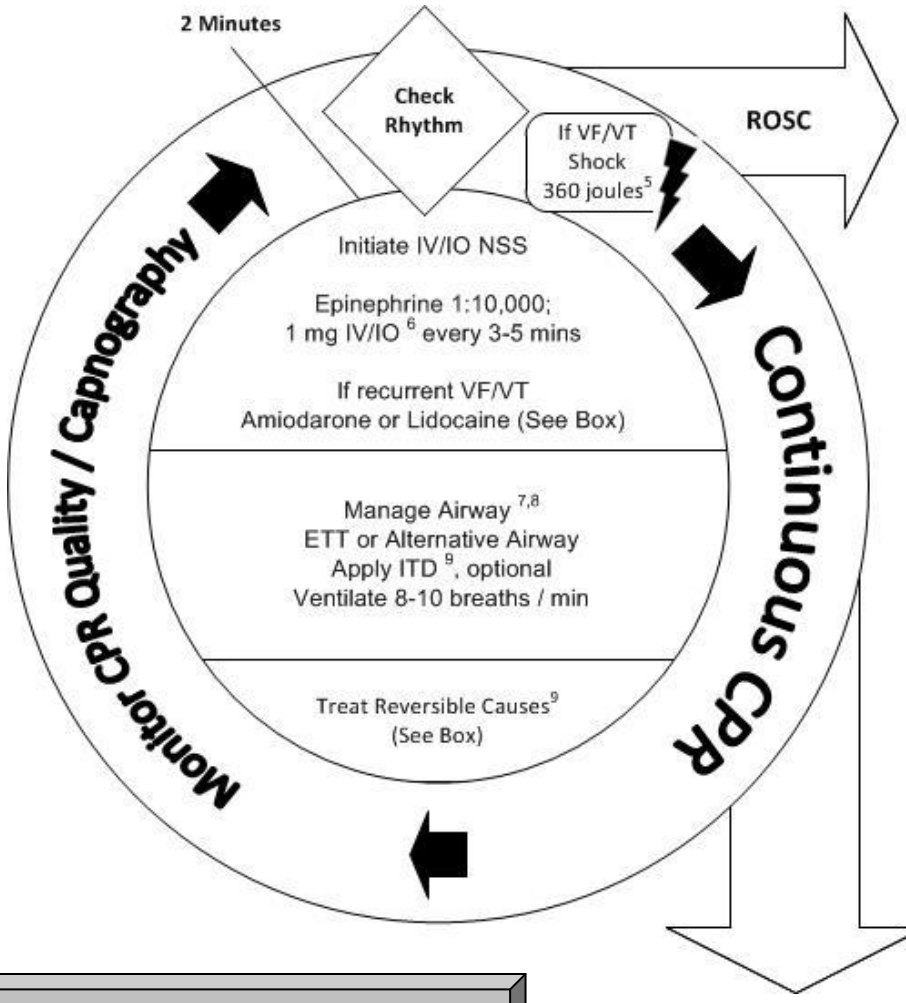
GENERAL CARDIAC ARREST – ADULT STATEWIDE ALS PROTOCOL

Initial Patient Contact - See Protocol # 201
Assess for pulse and monitor ECG[1]

Cardiac arrest witnessed by ALS personnel
OR
Quality CPR in progress on ALS arrival

NO [2,3] → Perform CPR[1] (30:2) for 2 minutes or until defibrillator charged

YES [2,4]



Proceed to Post-Resuscitation Protocol #3080

OTHER MEDICATIONS/ TREATMENTS

For recurrent VF/VT:

Amiodorone 300 mg IV/IO [11] (if available) **OR** **Lidocaine** 1.5 mg/kg IV/ IO [6,10]

If torsades de pointes:
Administer **Magnesium sulfate** 2 g IV/IO (if available)

Sodium bicarbonate not indicated unless hyperkalemia or tricyclic antidepressant overdose

If hyperkalemia suspected in dialysis patient administer:
Calcium Cl (10%)10 mL IV/IO (if available)
Sodium bicarbonate 1 mEq/kg IV/IO

If hypovolemia suspected:
Give NSS 2 liters wide open.

Naloxone and Glucose are not indicated in cardiac arrest

If intubated, assess for tension pneumothorax or misplaced ETT:
If tension pneumothorax suspected, perform needle decompression

Contact Medical Command[12]

CONSIDER FIELD TERMINATION OF RESUSCITATION [13]
OR
CONTINUE RESUSCITATION AND BEGIN TRANSPORT

GENERAL CARDIAC ARREST – ADULT
STATEWIDE ALS PROTOCOL

Criteria:

A. Adult patient with cardiac arrest (may have gasping or agonal breathing).

Exclusion Criteria:

A. Cardiac arrest due to acute traumatic injury - Follow Cardiac Arrest - Traumatic Protocol #3032.

B. Cardiac arrest due to severe hypothermia - Follow Hypothermia Protocol #3035

C. Patient displaying an Out-of-Hospital Do Not Resuscitate (OOH-DNR) original order, bracelet, or necklace - see OOH-DNR Protocol #324.

Possible MC Orders:

~~**A.**~~ Additional antidysrhythmic therapy ~~during cardiac arrest (magnesium sulfate 2 gm IV/ IO, procainamide 20 mg/min IV/IO if available)~~

B. If tricyclic antidepressant overdose is suspected, sodium bicarbonate 1 mEq/kg IV/IO.

C. Field termination of resuscitation.

Notes:

1. Excellent CPR is a priority:
   a. 30 compressions: 2 ventilations in groups of 5 cycles over 2 minutes.
   b. Push hard and fast (≥100/min) and allow full recoil of chest during compressions by releasing hand pressure completely after each compression.
   c. Change rescuer doing compressions every 2 minutes to avoid fatigue
   d. After advanced airway, ventilation rate should be 8-10 / minute without pausing compressions to deliver ventilation. Timer on impedance threshold device (if available) or respiratory rate on $ETCO_2$ monitor may help to avoid harmful hyperventilation.
   e. Restart CPR immediately after any defibrillation attempts.
   f. Keep pauses in CPR to a minimum by charging defibrillator during CPR, restarting compressions immediately after defibrillation without checking pulse or rhythm, and avoiding pauses in CPR during airway management.
   g. Monitor CPR Quality with waveform capnography – in cardiac arrest level of $ETCO_2$ correlates with perfusion/cardiac output from CPR. A SUDDEN increase in $ETCO_2$ by >10 mmHg may indicate return of spontaneous circulation (ROSC).
2. Implantable Cardiac Defibrillator (ICD) may be present. Rescuer may receive slight shock, which is not dangerous.
3. If AED has been applied by BLS provider, skip to appropriate place in protocol that incorporates previous care. ALS providers should switch to manual defibrillator after initial AED shock.
4. Precordial thump may be used when ALS providers witness VF arrest in a monitored patient.
5. Shock at maximum output of defibrillator, up to maximum of 360 joules, for initial and subsequent defibrillation attempts.
6. Endotracheal medications are not very effective, but if IV/IO is unsuccessful, epinephrine~~,~~ ~~atropine,~~ and lidocaine may be administered via endotracheal tube at twice the IV dose.
7. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds ***AND*** continuous waveform $ETCO_2$ detector. Follow Confirmation of Airway Placement Protocol #2032 May insert gastric tube, if available, to decompress stomach.
8. If unable to intubate in up to 3 attempts, consider an alternative/ rescue airway device.
9. If available, an inspiratory impedance threshold device (ITD) may be placed on the end of an advanced airway or two-person BVM during CPR.
10. Repeat lidocaine, 0.75 mg/kg IV/IO, every 5 -10 minutes to a total dose of 3 mg/kg.
11. May repeat one additional dose of amiodarone, 150 mg IV/IO, after 10 minutes.
12. If possible, contact medical command prior to moving or transporting patient. CPR is much less effective during patient transportation, and any possible interventions by medical command will be less effective without optimal CPR.
13. Field termination of resuscitation must be ordered by Medical Command Physician, otherwise continue resuscitation attempts and initiate transport.

Performance Parameters:

A. Documentation of code summary from monitor /ECG rhythm strips.

B. Documentation of confirmation of advanced airway placement including documentation of gastric sounds, breath sounds and use of confirmatory device (include print out of $ETCO_2$ monitor if possible

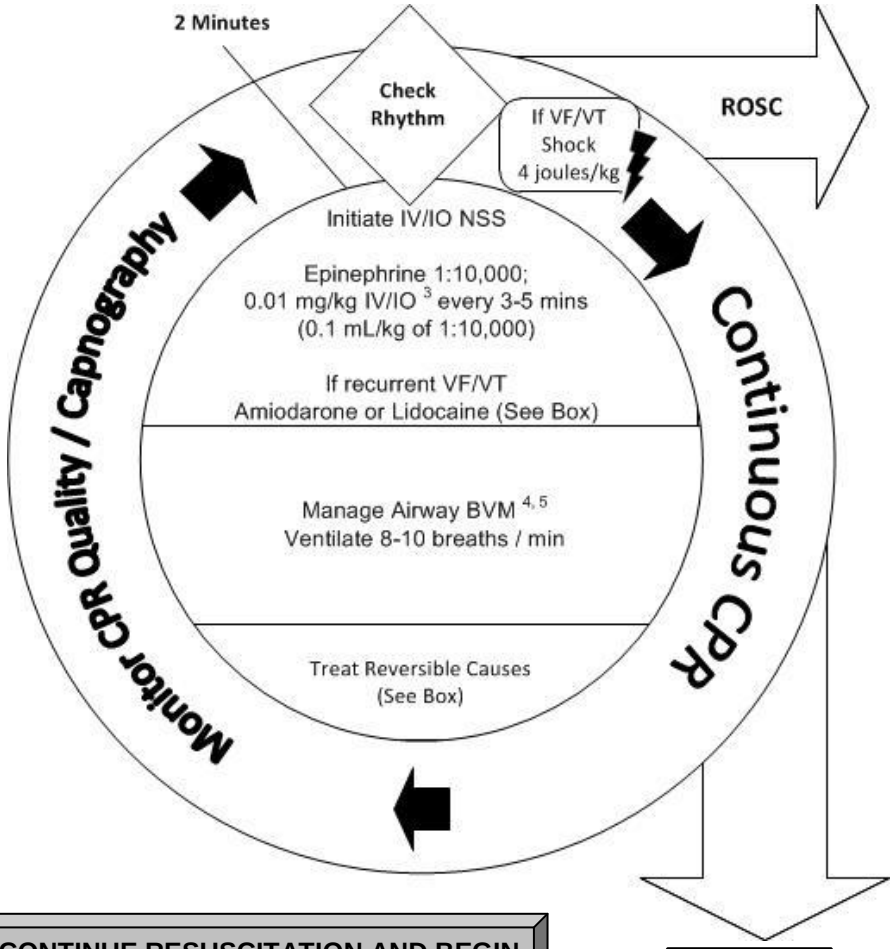
GENERAL CARDIAC ARREST – PEDIATRIC
STATEWIDE ALS PROTOCOL

Initial Patient Contact - See Protocol # 201
Assess for pulse and monitor ECG[1]

Cardiac arrest witnessed by ALS personnel
OR
Quality CPR in progress on ALS arrival

NO [2,3] → Perform CPR[1] (15:2) for 2 minutes or until defibrillator charged

YES [2,4]



Proceed to Post-Resuscitation Protocol #3080

Contact Medical Command [7]

CONTINUE RESUSCITATION AND BEGIN TRANSPORT
OR
CONSIDER FIELD TERMINATION OF RESUSCITATION [8]

OTHER MEDICATIONS/ TREATMENTS

For recurrent VF/VT:

Amiodrone 5 mg/kg IV/IO 300 mg max (If available) ***OR*** Lidocaine 1mg/kg IV/IO

If torsade de pointes:
Administer **Magnesium sulfate** 25-50 mg/kg Max 2 g IV/IO (if available)

If intubated, assess for tension pneumothorax or misplaced ETT:
If tension pneumothorax suspected, perform needle decompression

Sodium bicarbonate not indicated unless hyperkalemia or tricyclic antidepressant overdose

If hyperkalemia suspected, administer:
Calcium Cl (10%)0.2 mL/kg IV/IO (if available)
Sodium bicarbonate 1 mEq/kg IV/IO

If hypovolemia suspected:
Give NSS 20 mL/kg wide open.

Naloxone not indicated in cardiac arrest

~~**If glucose <60:**~~
~~Administer 50% **Dextrose**, 50 mL IV/ IO~~

GENERAL CARDIAC ARREST – PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Pediatric patient (preadolescent ≤ 14 y/o) with cardiac arrest (may have gasping or agonal breathing).

Exclusion Criteria:

A. Cardiac Arrest in newborns - Follow Neonatal Resuscitation Protocol #3033.

B. Cardiac arrest due to acute traumatic injury - Follow Cardiac Arrest - Traumatic Protocol #3032.

C. Cardiac arrest due to severe hypothermia - Follow Cardiac Arrest - Hypothermia Protocol #3035.

D. Patient displaying an Out-of-Hospital Do Not Resuscitate (OOH-DNR) original order, bracelet, or necklace - see OOH-DNR Protocol #324.

Possible MC Orders:

~~**A.**~~ Defibrillation attempts at doses up to 10 joules/kg.

~~**B.**~~ Additional antidysrhythmic therapy ~~during cardiac arrest (magnesium sulfate 25-50 mg/kg (max 2 gm) IV/IO, procainamide 15 mg/kg over 15-30 min IV/IO if available)~~

C. If tricyclic antidepressant overdose is suspected, administer sodium bicarbonate 1-2 mEq/kg IV/IO.

D. Field termination of resuscitation.

Notes:

1. Excellent CPR is a priority:
   a. 15 compressions: 2 ventilations in groups of 10 cycles over 2 minutes (30:2 if only one rescuer).
   b. Push hard and fast (≥100/min) and allow full recoil of chest during compressions.
   c. Change rescuer doing compressions every 2 minutes to avoid fatigue.
   d. After advanced airway, ventilation rate should be 8-10 / minute without pausing compressions to deliver ventilation. Respiratory rate on $ETCO_2$ monitor may help to avoid harmful hyperventilation.
   e. Restart CPR immediately after any defibrillation attempts.
   f. Keep pauses in CPR to a minimum by charging defibrillator during CPR, restarting compressions immediately after defibrillation without checking pulse or rhythm, and avoiding pauses in CPR during airway management.
   g. Monitor CPR quality with waveform capnography – in cardiac arrest, level of ETCO2 correlates with perfusion/ cardiac output from CPR. A SUDDEN increase in $ETCO_2$ by >10 mmHg may indicate return of spontaneous circulation (ROSC).
2. If AED has been applied by BLS provider, skip to appropriate place in protocol that incorporates previous care. ALS providers should switch to manual defibrillator after initial AED shock.
3. Endotracheal medications are not very effective, but if IV/IO is unsuccessful, epinephrine, ~~atropine,~~ and lidocaine may be administered via endotracheal tube. Epinephrine 0.1 mg/kg (0.1 mL/kg of 1:1,000).
4. Ventilation with BVM may be as effective as endotracheal intubation in children when transport times are short. Attempt ETT intubation or alternative airway if unable to ventilate adequately with BVM.
5. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds ***AND*** continuous waveform $ETCO_2$ detector. Follow Confirmation of Airway Placement Protocol #2032. May insert gastric tube, if available, to decompress stomach.
6. Repeat lidocaine, 1 mg/kg IV, in 15 minutes (maximum total dose of 3 mg/kg).
7. If possible, contact medical command prior to moving or transporting patient. CPR is much less effective during patient transportation, and any possible interventions by medical command will be less effective without optimal CPR.
8. Field termination of resuscitation must be ordered by Medical Command Physician, otherwise continue resuscitation attempts and initiate transport.

Performance Parameters:

A. Documentation of code summary from monitor /ECG rhythm strips.

B. Documentation of confirmation of advanced airway placement including documentation of gastric sounds, breath sounds and use of confirmatory device (include print out of $ETCO_2$ monitor if possible)

CARDIAC ARREST – TRAUMATIC
STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol # 201
Cervical spine stabilization, when indicated
Rapid extrication

Assess for evidence of DOA and apparent cause of cardiac arrest? [1]

Traumatic cause [2,3]

DOA OR Medical / Non-traumatic cause → **Proceed to appropriate cardiac arrest protocol *OR* DOA Protocol #322**

- Effective CPR[4] is important
- Manage Airway [5,6,7]
  - ETT or Alternative Airway, appropriate for initial airway
  - Ventilate 8-10 breaths/min, after advanced airway
- Assess for tension pneumothorax:
  - Perform Chest Needle Decompression, if indicated
- Control severe external bleeding
- **Rapid Transport is a priority** [8,9]
  - Spinal immobilization as indicated [10]
- **Consider Other Medications/Treatments** (See Box at Right)

OTHER MEDICATIONS/ TREATMENTS
Consider these treatments enroute if patient can arrive at a Trauma Center in < 15 minutes

Initiate IV/IO NSS
Adults: administer NSS wide open up to 2000 mL
Peds: administer NSS wide open up to 60 mL/kg

Monitor ECG / Pulse oximetry

If VF or pulseless VT, attempt defibrillation every 2 minutes (follow doses listed in VF protocols)

Epinephrine 1:10,000;
Adults: 1 mg IV/IO [11] every 3-5 mins.
Peds: 0.01 mg/kg IV/IO every 3-5 mins

~~**If asystole or slow PEA, administer Atropine**~~
~~**Adults:** 1 mg IV/IO [10] every 3-5 mins~~
~~**Peds:** 0.02 mg/kg IV/IO every 3-5 mins~~
~~maximum 3 mg or 0.04 mg/kg total~~

Monitor $ETCO_2$

Consider other etiologies of cardiac arrest and follow appropriate protocol

Return of spontaneous circulation (ROSC)?

YES → **Follow Major Multisystem Trauma Protocol #6002**

NO → **CONSIDER FIELD TERMINATION OF RESUSCITATION** [12]
OR
CONTINUE RESUSCITATION AND BEGIN TRANSPORT

→ **Contact Medical Command**

→ Repeat NSS bolus
Adult: up to 2000 mL wide open
Peds: up to 60 mL/kg wide open

CARDIAC ARREST - TRAUMATIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient in cardiac arrest from suspected traumatic cause.

Exclusion Criteria:

A. Patient that meets DOA criteria (including unwitnessed cardiac arrest of traumatic cause, decapitation, rigor mortis, etc…) – See DOA Protocol #322.

B. Patient in cardiac arrest due to medical or non-traumatic causes [1]

Possible MC Orders:

A. Terminate resuscitation in the field

Notes:

1. If the trauma appears to be minor and a medical condition appears to be the cause of the cardiac arrest, follow the appropriate cardiac arrest protocol.
2. If cardiac arrest is witnessed by EMS provider, or there is evidence that the patient had any signs of life within a few minutes before the arrival of EMS personnel, proceed with this protocol. Otherwise, follow DOA Protocol # 322.
3. Unless there is an immediately correctable cause victims of traumatic cardiac arrest must arrive at a hospital within a few minutes to have any chance of survival. Placement of an advanced airway (ETT or Alternative Airway Device) or decompression of a tension pneumothorax may increase this very short time window for survival.
4. Excellent CPR is a priority:
   a. 30 compressions: 2 ventilations (15:2 for children and infants) in groups of 5 cycles over 2 minutes.
   b. Push hard and fast (≥100/min) and allow full recoil of chest during compressions.
   c. Change rescuer doing compressions every 2 minutes to avoid fatigue.
   d. After advanced airway, ventilation rate should be 8-10/minute without pausing compressions to deliver ventilation.
   e. Keep pauses in CPR to a minimum by checking rhythm when rotating rescuer doing compressions and by avoiding pauses in CPR during airway management and other interventions.
   f. Monitor CPR Quality with waveform capnography – in cardiac arrest level of $ETCO_2$ correlates with perfusion/cardiac output from CPR. A SUDDEN increase in $ETCO_2$ by >10 mmHg may indicate return of spontaneous circulation (ROSC).
5. Ventilate with BVM may be as effective as endotracheal intubation in children when transport times are short. Attempt ETT intubation or alternative airway if unable to ventilate adequately with BVM.
6. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds *AND* confirmatory device (like wave-form $ETCO_2$ detector). Follow Confirmation of Airway Placement Protocol #2032. May place orogastric tube, if available, to decompress stomach.
7. If unable to intubate on up to 3 attempts, consider alternative/ rescue airway device.
8. Transport immediately if patient can arrive at a trauma center (preferred destination) or the closest hospital in ≤ 15 minutes.
   a. If the patient can arrive at the closest trauma center within 15 minutes, the patient should be taken to the trauma center even if another hospital is closer.
   b. Notify the receiving facility ASAP to allow maximum time for preparation to receive the patient.
   c. Air medical transport of patients in traumatic cardiac arrest is generally not indicated.
9. Contact medical command for possible field termination of resuscitation if the patient remains in cardiac arrest after initial resuscitation attempt and cannot arrive at the closest receiving facility within 15 minutes.
10. See Cervical Spine Immobilization Protocol # 261
11. Endotracheal medications are not very effective, but if IV/IO is unsuccessful, epinephrine, atropine, and lidocaine may be administered via endotracheal tube at twice the IV dose.
12. Field termination of resuscitation must be ordered by Medical Command Physician, otherwise continue resuscitation attempts and initiate transport.

Performance Parameters:

A. Review all care given on scene for benefit of intervention versus potential delay to transport time. Especially procedures other than airway management and chest needle decompression in non-entrapped victims with short transport times.

B. Review for transport to appropriate destination based upon protocol.

C. Consider possible benchmark of on-scene time < 10 minutes for non-entrapped patients, although agencies may want to set goal of even less time on-scene

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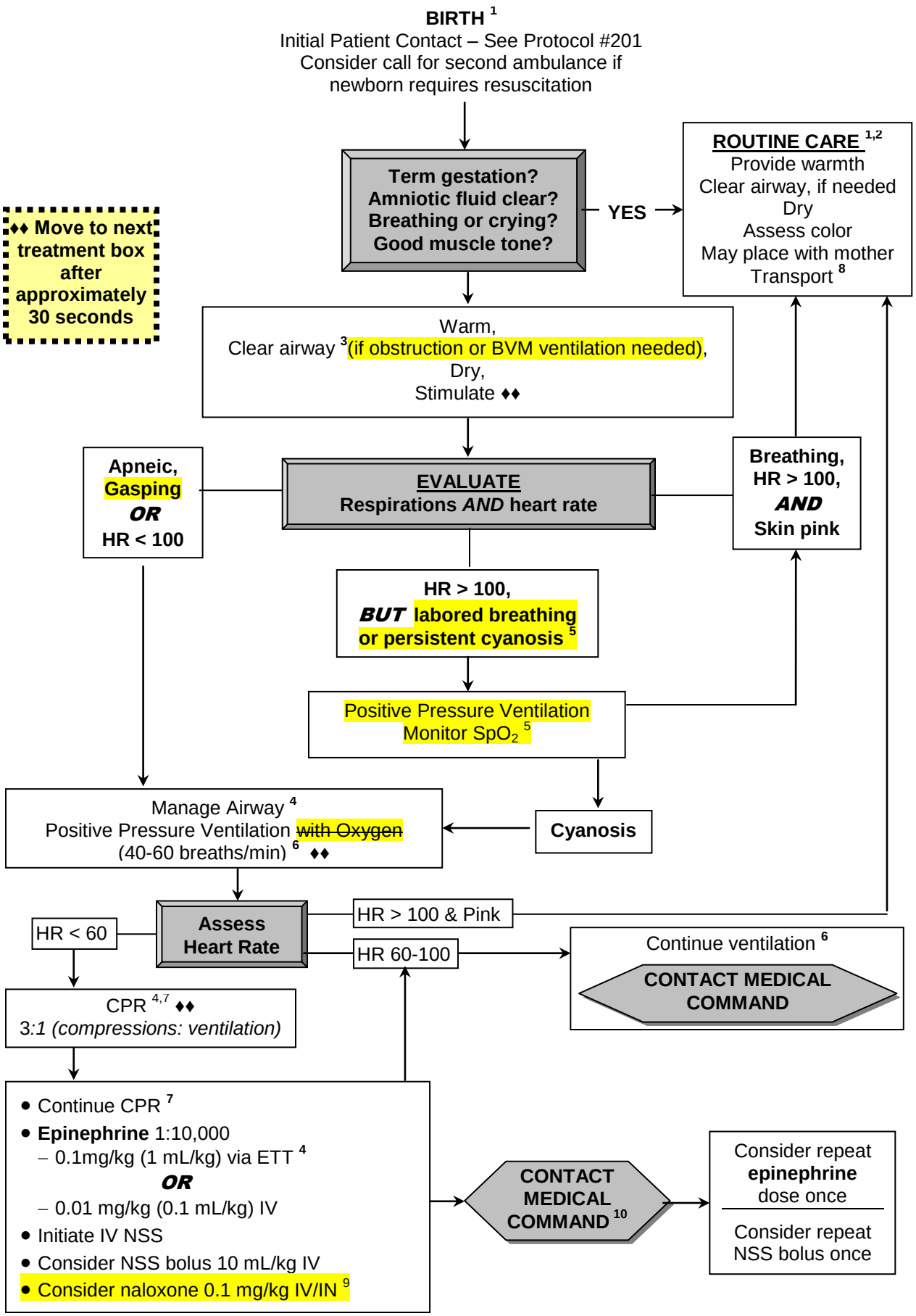
NEWBORN / NEONATAL RESUSCITATION STATEWIDE ALS PROTOCOL



NEWBORN / NEONATAL RESUSCITATION
STATEWIDE ALS PROTOCOL

Criteria:

A. Newborn infant

Exclusion Criteria:

A. Resuscitation may not be appropriate in rare cases where gestational age (confirmed gestational age <20 weeks) or fatal birth defects (for example anencephaly or absence of skull bones and brain hemispheres) are consistently associated with certain early death.

Note:

1. The newborn should be evaluated immediately after birth and reevaluated for respiratory effort, heart rate, and color every 30 seconds during the initial care until it is clear that the newborn is stable.
2. Transport the stable infant in a warm environment and within an infant car seat (if available) that has been firmly secured within the ambulance.
3. If there is evidence of meconium staining and the infant is not vigorous, use of endotracheal intubation to suction meconium from the trachea should be considered.
4. Endotracheal intubation may be appropriate at various points, although intubation is not mandatory if ventilations are positive pressure ventilations are effective. Consider ETI in the following situations:
   a. When tracheal suctioning for meconium is required
   b. If BVM ventilation is ineffective or prolonged
   c. When chest compressions are performed
   d. When endotracheal administration of medications is desired
5. Examine for central cyanosis at the face, trunk and mucous membranes. Acrocyanosis of hands and feet only is usually a normal finding if the infant is vigorous, breathing, and heart rate >100. Monitor SpO2 and apply oxygen only if SpO2 below targets of: 1 min (60-65%); 3 min (70-75%); 5 min (80-85%); and 10 min 85-95%.
6. Positive pressure ventilation should use the minimum volume and pressure to achieve chest rise and /or achieve or maintain HR>100. Consider placing a gastric tube, if available, to decompress the stomach when positive pressure ventilation is required.
7. Two thumb-encircling chest technique is preferred. Compressions and ventilations should occur in a 3:1 ratio and should be done quickly enough to provide approximately 90 compressions and 30 ventilations per minute.
8. Newborns who required resuscitation are at risk for deterioration, reassess frequently.
9. Consider naloxone if mother has history of narcotic abuse or received narcotics near delivery..
10. After10 minutes of continuous and adequate resuscitation efforts, discontinuation of resuscitation may be justified if there are no signs of life.

APGAR SCORING CHART			
Clinical Signs	**Zero**	**One**	**Two**
A = Appearance (Color)	Blue, pale	Body pink, Extremities blue	All pink
P = Pulse (Heart Rate)	Absent	< 100	> 100
G = Grimace (Reflex Response) i, ii	No response	Grimace	Cough, sneeze
A = Activity (Muscle Tone)	Limp	Some flexion of arms and/or legs	Well flexed
R = Respiratory effort	Absent	Weak cry Hypoventilation	Strong cry

[i] Tangential foot slap [ii] Response to catheter in nostril (tested after pharynx is cleared)

CARDIAC ARREST – HYPOTHERMIA
STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol #201
- **Lengthen time for breathing and pulse checks to 45 seconds each**
- **Begin CPR if pulseless**
- **Monitor ECG**
- **Assess body temperature, if obtainable**

→ **If ANY breathing or pulse, Follow Hypothermia Protocol #6081**

↓

Follow appropriate Cardiac Arrest protocols EXCEPT:

- Limit defibrillation to a single attempt
- **Either:**
  - Do not administer any medications except oxygen, if temperature < 30°C (< 86°F),

    OR
  - Give a single dose of any medications, if temperature unknown or 30°C to 34°C (86°F to 93.2°F)
- Transport (by ground or air) ASAP to closest center capable of providing bypass rewarming [1]
- Notify receiving center ASAP [2]
- Protect against heat loss [3]
- Administer warmed IV/IO NSS and warmed humidified oxygen if possible

These patients may have excellent outcomes after prolonged CPR and bypass rewarming [4]

↓

TRANSPORT ASAP to Facility capable of bypass rewarming (if possible)

Contact Medical Command

↓

If temperature > 30°C (86°F),
consider additional doses of medications
per VF or PEA/Asystole protocol,
but double the time interval between doses

CARDIAC ARREST – HYPOTHERMIA
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient in cardiac arrest from a suspected hypothermic cause (Generalized cooling that reduces the body temperature). Hypothermia may be:

1. Acute/Immersion (e.g. sudden immersion in cold water)
2. Subacute/Exertion (e.g. individual wandering in the woods)
3. Chronic/ "urban" (e.g. elderly individual with no heat in home)

Exclusion Criteria:

A. Patients in cardiac arrest that meet criteria for DOA – Follow BLS DOA Protocol #322.

1. Hypothermic patient in cardiac arrest after submersion for more than 1 hour.
2. Body tissue/chest wall frozen solid.
3. Hypothermia patients whose body temperature has reached the temperature of the surrounding environment with other signs of death (decomposition, lividity, etc.).

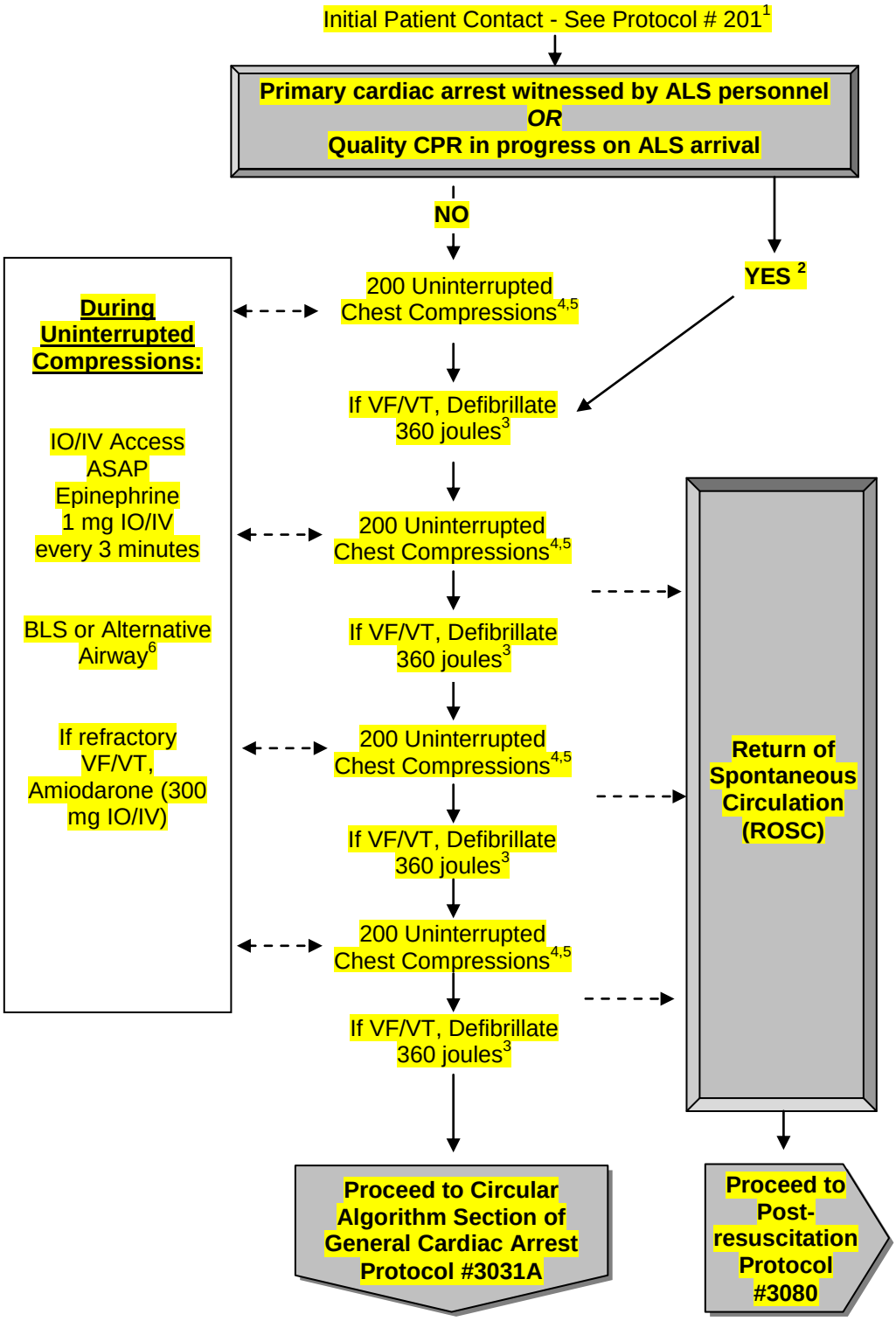
B. Patients in cardiac arrest but without suspected hypothermia (temperature >34 C° or > 92.3 F°) or who have been rewarmed to a temperature > 34 C°, follow appropriate Cardiac Arrest protocol.

C. Patients with hypothermia (temperature < 34 C°) that are not in cardiac arrest. Follow Hypothermia Protocol #6081.

Notes:

1. Initiate transport to center capable of cardiac bypass rewarming (Level I trauma centers or other facilities known to have capability of emergency bypass rewarming) as soon as possible. Medical Command can be contacted for assistance in identifying appropriate facility and mode of transport. Consider air transport if ground transport time is > 30 minutes or if it will decrease transport time. Generally air ambulances are not indicated for patients in cardiac arrest, but hypothermia is the exception to this.
2. Notify the receiving facility as soon as possible. Bypass rewarming requires the mobilization of specialized personnel and equipment.
3. Prevent heat loss by all means available:
   a. Move to warm environment (like inside ambulance with heaters on maximum)
   b. Remove wet clothing
   c. Wrap patient in warm dry blankets
   d. Apply heat packs to axilla, groin, and neck
4. In severe hypothermia, EMS providers should attempt to prevent additional heat loss, but transport should not be delayed by attempts to provide rewarming in the field.

PRIMARY CARDIAC ARREST – ADULT
STATEWIDE ALS PROTOCOL [OPTIONAL]



PRIMARY SUDDEN CARDIAC ARREST
STATEWIDE ALS PROTOCOL [OPTIONAL]

Criteria:

A. Adult patient with primary sudden cardiac arrest associated with all of the following:

1. Sudden collapse from normal state of health
2. May or may not be preceded by symptoms of acute coronary syndrome (ACS)
3. Collapse witnessed by bystander (seen or heard) without delay to activating EMS

Exclusion Criteria:

A. Secondary cardiac arrest due to hypoxia, drowning, sepsis, overdose or other suspected cause:

1. Cardiac arrest without primary witnessed sudden cardiac arrest – Follow General Cardiac Arrest Protocol #3031A
2. Pediatric cardiac arrest – Follow General Cardiac Arrest – Pediatric Protocol #3031P
3. Cardiac arrest due to acute traumatic injury - Follow Cardiac Arrest - Traumatic Protocol #3032.
4. Cardiac arrest due to severe hypothermia - Follow Hypothermia Protocol #3035
5. Patient displaying an Out-of-Hospital Do Not Resuscitate (OOH-DNR) original order, bracelet, or necklace - see OOH-DNR Protocol #324.

System Requirements:

A. This protocol may **ONLY** be followed by EMS personnel in pre-approved high-functioning EMS agencies capable of complying with all of the following rigorous agency requirements:

1. EMS agency medical director must approve of agency participation and oversee education and quality improvement of primary cardiac arrest care.
2. Agency personnel must have initial and regular continuing education. Training should include teamwork simulations integrating QRS, BLS, and ALS crew members who regularly work together.
3. The EMS agency, overseen by the agency medical director, must perform a QI review of care and outcome for every patient that receives CPR. This includes whether the initial dispatch categorized each case as a possible cardiac arrest and whether bystander CPR was done prior to EMS arrival.
   d. The QI must be coordinated with local receiving hospitals to include hospital admission, discharge, and condition information.
   e. The QI must be coordinated with local PSAP/dispatch centers to review opportunities to assure optimal recognition of possible cardiac arrest cases and provision of dispatch-assisted CPR (including hands-only CPR when appropriate).
4. Primary Cardiac Arrest programs must be approved by the agency's local EMS regional council, and each agency must participate in the regional QI committee including submission of quarterly cardiac arrest QI summaries with the information required by the Bureau of EMS. Some of the agency QI requirement can be met by participation in the Cardiac Arrest Registry for Enhanced Survival (CARES) program.

Notes:

1. If AED has been applied by BLS provider, skip to appropriate place in protocol that incorporates previous care. ALS providers should switch to manual defibrillator as soon as possible.

2. Precordial thump may be used when ALS providers witness VF arrest in a monitored patient. Begin chest compressions if any delay to defibrillation.

3. Shock at maximum output of defibrillator, up to maximum of 360 joules, for initial and subsequent defibrillation attempts.

4. Excellent CPR is a priority:

   h. Push hard and fast (≥100/min) and allow full recoil of chest during compressions.

   i. Change rescuer doing compressions every 2 minutes to avoid fatigue

   j. Restart CPR immediately after any defibrillation attempts.

   k. Keep pauses in CPR to a minimum by charging defibrillator during CPR, restarting compressions immediately after defibrillation without checking pulse or rhythm, and avoiding pauses in CPR during airway management.

5. Do not move or package patient for transport at this time. Chest compressions are much less effective during patient transportation/movement, and any possible interventions by medical command will be less effective without optimal CPR.

6. The optimal airway management during compression-only CPR has not been established. Agency medical directors can set agency policy using the following approaches:

   a. Open airway with manual technique or naso/oropharyngeal airway or King LT/Combitube – with or without passive oxygenation with NRB mask

   b. Provide either no active ventilation or bag ventilate (e.g. at one ventilation every 10 compressions) – without interrupting compressions

---

Performance Parameters:

A. High-performance systems should practice teamwork using simulations with predefined roles and crew resource management principles. For example:

1. Rescuer 1 initiates chest compressions or relieves bystander/QRS compressor
2. Rescuer 2 applies monitor and operates defibrillator
3. Rescuer 3 obtains IO (or IV) access and gives epinephrine
4. Rescuer 4 inserts BLS or alternative airway
5. Any rescuer relieves compressor who has completed 200 consecutive compressions

B. Documentation of code summary from monitor /ECG rhythm strips.

C. EMS agency must document patient outcome and QI indicators required by BEMS for cardiac arrest, including ROSC during EMS care, ROSC on arrival to ED, admitted to hospital, discharged from hospital alive, and neurologic function on discharge

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POST-RESUSCITATION CARE
STATEWIDE ALS PROTOCOL

ROSC after cardiac arrest

↓

Manage Airway/ Ventilate [1,2,3], if needed
- Monitor continuous waveform $ETCO_2$ if intubated.
- **Avoid hyperventilation (10-12 breaths/min, $ETCO_2$ 35-40)**
- Consider sedation, initial dose, (see box) if agitated [1]

Administer oxygen (titrate to **minimum** O_2 needed to achieve SpO_2 > 94%)
Assure/initiate IV/IO NSS
Monitor ECG/pulse oximetry
Consider/ treat associated factors (see box)

↓

Reassess Patient and Check Vital Signs
(Follow multiple treatment paths, if applicable)

↓

Hypotension?
SBP < 100 mmHg
[Peds: SBP < 70 + (age x 2)]

↓

Treat/titrate to target perfusion pressure of SBP > 110 mmHg [4]
[Peds: 70 + (age x 2)]

If no signs of CHF, Administer 20 mL/kg NSS wide open (up to 2000 mL total)

Epinephrine[5], Dopamine, *OR* Dobutamine (if available) infusion [6]

↓

Altered Level of Consciousness?
GCS Motor < 6

↓

If patient does not follow commands, avoid warming:
- Remove excess clothing
- Cover only with light sheet
- Avoid heat packs or warm IV fluids

Check blood glucose. If ≤60, **Dextrose** 25 g IV/ IO (10-50% concentration)
[Peds: **Dextrose** 25% 2 mL/kg IV/ IO]

↓

Dysrhythmia? [7]
Bradycardia or Tachycardia (not-sinus)

↓

Follow appropriate dysrhythmia protocol (Bradycardia, Wide-complex tachycardia, Narrow-complex tachycardia)[8]

↓

Contact Medical Command

↓

If unstable from recurrent VF/VT, consider antidysrhythmic infusion:
Lidocaine 2-4 mg/min IV/IO
OR
Amiodarone 1 mg/min IV/IO

Additional dose(s) of sedation if patient is agitated

Consider transport to a center that consistently provides a comprehensive, structured, multidisciplinary system of care for post-cardiac arrest patients, including PPCI and hypothermia.

POST-RESUSCITATION CARE
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient that has return of spontaneous circulation (ROSC) after cardiopulmonary arrest.

1. This includes resuscitation after CPR by EMS providers and after CPR by first responders/ laypersons with or without AED use.
2. The post-resuscitation goals are to:
   a. Optimize brain perfusion by optimizing cardiopulmonary function and systemic perfusion
   b. Identify the cause/associated factors of the cardiac arrest
   c. Prevent recurrence of cardiac arrest

Exclusion Criteria:

A. Patient in cardiac arrest who does not sustain a pulse (ROSC) after resuscitation. Continue to follow appropriate cardiac arrest protocol (VF/VT, PEA/Asystole, Cardiac Arrest- Hypothermia protocols.

B. Patients with ROSC after cardiac arrest from trauma. Continue to follow appropriate trauma protocol(s).

C. Patient whose cardiac arrest was due to hypothermia. Follow Hypothermia protocol #6081

Possible Medical Command Orders:

A. Cold (4º C) NSS bolus of 20-30 mL/kg, if available, may be ordered if patient not following commands after ROSC from nontraumatic cardiac arrest.

Notes:

1. If previously intubated and not tolerating endotracheal tube, administer initial dose of sedation medication. Consider extubation only if wide awake, following commands, and unable to tolerate endotracheal tube. If possible, sedation is preferred over extubation.
2. Do not permit patient to struggle against an alternative/ rescue airway. These devices should generally be removed if the patient awakens.
3. Before removing an endotracheal tube or alternative/ rescue airway device, turn patient on side and have suction running, if possible,
4. Hemodynamic instability is common after cardiac arrest, and ALS providers should aggressively treat hypotension to improve perfusion, especially to the brain.
5. Epinephrine infusion, 0.1-0.5 mcg/kg/min (7-35 mcg/min) titrated until SBP > 100 mmHg, may be used for hypotension following ROSC. Consider mixing epinephrine effusion using 1 mg (1:1,000) in 250 mL NSS, and consider administration with electronic pump.
6. Dobutamine drip, in addition to dopamine, may be preferable if mild hypotension (SBP 70-100) is present, while dopamine is preferred if significant hypotension or bradycardia are present. Mix dobutamine or dopamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP >100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**
7. Premature ventricular contractions and non-sustained VT are best treated in post-resuscitation patients with oxygenation and waiting for catecholamine levels to return to normal.
8. Narrow-complex tachydysrhythmias should generally not be treated in post cardiac arrest settings unless associated with hypotension or symptoms of poor perfusion.

POSSIBLE ASSOCIATED FACTORS:

Hypovolemia
Follow Shock protocol

Hypoxia
Reassess oxygen delivery

Hydrogen Ion (Acidosis)
Treat by optimizing blood pressure

Hyperkalemia
Consider in dialysis patient

Toxins
Follow appropriate Poisoning /Toxin protocol

Tamponade (cardiac)
Follow Shock protocol

Tension pneumothorax
Perform chest needle decompression, if indicated

Thrombosis (acute MI)
Obtain 12-lead ECG, if available

Trauma
Follow Multisystem Trauma protocol

Sedation Options:
(Choose one)
(Titrate to minimum amount necessary)

Midazolam 1-5 mg IV/ IO (0.05 mg/kg)
titrated slowly
may repeat every 5 minutes
until maximum of 0.1 mg/kg

OR

Diazepam 5-10 mg IV/ IO (0.1 mg/kg)
titrated slowly
may repeat every 5 minutes
until maximum 0.3 mg/kg

OR

Lorazepam 1-2 mg IV/ IO (0.1 mg/kg, max 2 mg/dose)
titrated
may repeat every 5 minutes
until maximum of 4 mg

Performance Parameters:

A. Review record for frequent documentation of vital signs (at least every 5 minutes for 15 minutes after cardiac arrest or for the entire time on vaspressor infusions).

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TERMINATION OF RESUSCITATION
STATEWIDE ALS GUIDELINE

Purpose:

A. When there is no response to prehospital cardiac arrest treatment, it is acceptable and often preferable to cease futile resuscitation efforts in the field.

1. In patients with cardiac arrest, prehospital resuscitation is initiated with the goal of returning spontaneous circulation before permanent neurologic damage occurs. Unfortunately, most patients do not respond to an aggressive resuscitation attempt. In most situations ALS providers are capable of performing an initial resuscitation that is equivalent to an in-hospital resuscitation attempt, and there is usually no additional benefit to emergency department resuscitation in most cases.
2. CPR that is performed during patient packaging and transport is much less effective than CPR done at the scene. Additionally, EMS providers risk physical injury while attempting to perform CPR in a moving ambulance while unrestrained. In addition, continuing resuscitation in futile cases increases the time that EMS crews are not available for another call, impedes emergency department care of other patients, and incurs unnecessary hospital charges.
3. When cardiac arrest resuscitation becomes futile, the patient's family should become the focus of the EMS providers. Families need to be informed of what is being done, and transporting all cardiac arrest patients to the hospital is an inconvenience and inconveniences the grieving family by requiring a trip to the hospital where they must begin grieving in an unfamiliar setting. Most families understand the futility of the situation and are accepting of ceasing resuscitation efforts in the field.

Criteria:

A. Any cardiac arrest patient that has received resuscitation in the field but has not responded to treatment, ***AND*** a medical command physician has ordered termination of resuscitation efforts.

1. Consider field termination of resuscitation in the following situations:
   a. There is no response to approximately 20 minutes of ALS care including ventilation with advanced airway and several "rounds" of resuscitation drugs.
   b. During resuscitation, new information related to DNR or terminal medical condition is obtained. If patient has OOH-DNR order, must follow OOH-DNR Protocol #324 before this protocol.
   c. BLS care when AED has advised "no shock" on 3 sequential analyses, and the patient cannot arrive at a hospital or ALS cannot arrive at the patient within 15 minutes.

Exclusion Criteria:

A. <u>Consider</u> continuing resuscitation and transporting patients with the following conditions (although under certain circumstances, a medical command physician may order termination of resuscitation in these conditions also):

1. Cardiac arrest associated with medical conditions that may have a better outcome despite prolonged resuscitation, including:
   a. Hypothermia
   b. Near-drowning
   c. Lightning strike
   d. Electrocution
   e. Drug overdose
2. Cardiac arrest in infants and children
3. Cardiac arrest in a public place
4. Cardiac arrest in an environment where the bystanders do not accept the idea of ceasing efforts in the field. While most families understand the futility of the situation and are very accepting of field termination, some family members or bystanders can become hostile.

System Requirements:

A. Ideally, the EMS agency medical director should be involved in the decision to begin a program of terminating resuscitation in the field. Each agency should develop policies (e.g. related to transportation of bodies) and should make proactive contacts with key individuals (e.g. the coroner/ medical examiner, local nursing homes). Every ALS provider that participates in this process should have training related to "breaking bad news", dealing with grieving individuals, and interpersonal skills.

Procedure:

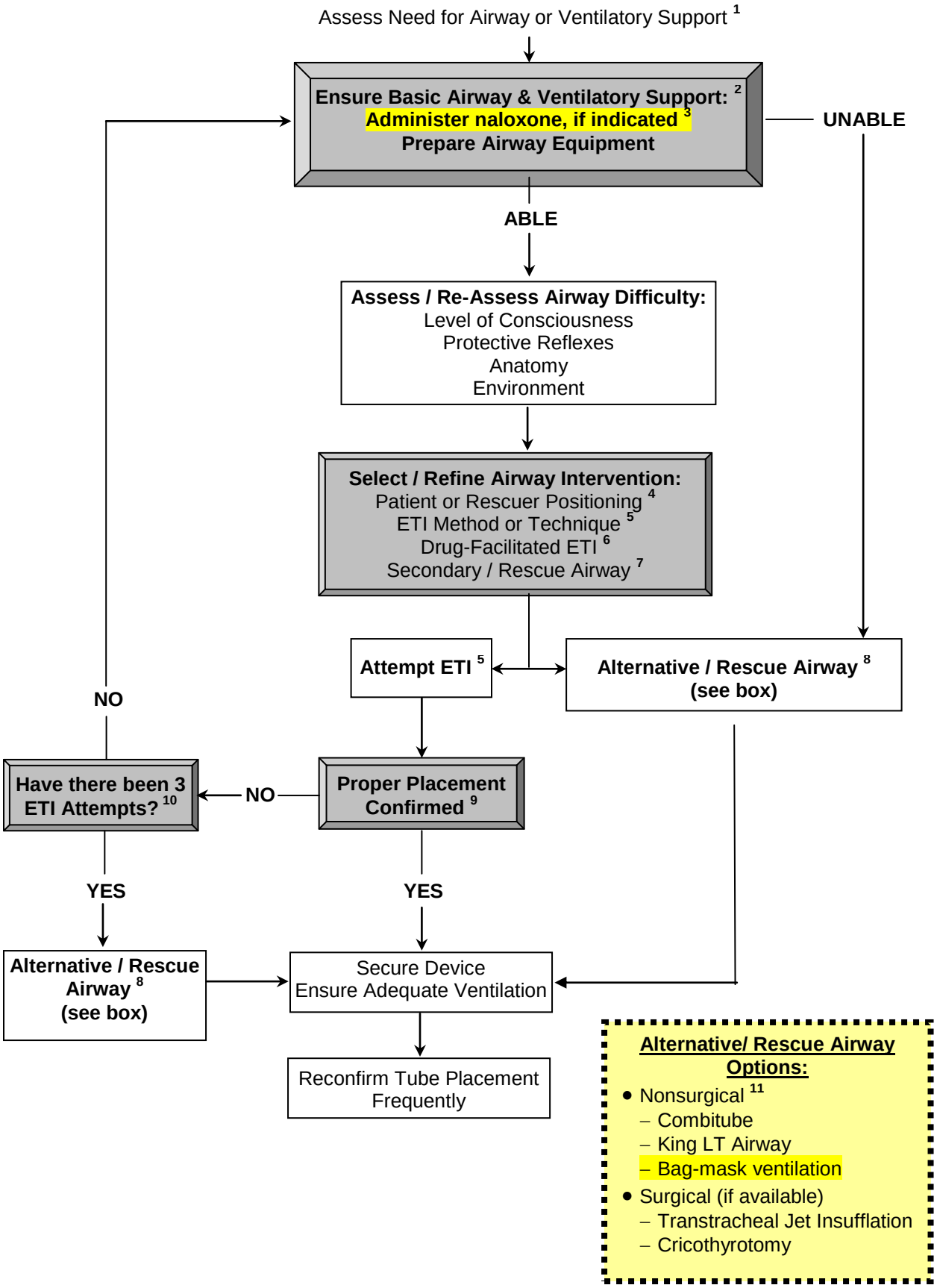
A. All Patients:

1. Follow appropriate resuscitation protocol to the point of "Contact Medical Command" to consider termination of resuscitation. Verify appropriate patient:
   a. No femoral pulse
   b. No respiratory efforts
   c. Asystole or wide complex PEA at < 60 BPM
2. Contact medical command. **EMS providers may terminate resuscitation only after order from a medical command physician.** [1]
3. Terminate resuscitation efforts and document time of death.
4. Consider the possibility of a crime scene. If suspected, restrict access (if possible) and notify law enforcement immediately. See Crime Scene Preservation Guideline #919.
5. Inform any family at the scene of the patient's death and facilitate early grieving.
6. Contact the coroner or medical examiner
   a. Do not move the body or remove any resuscitation adjuncts (e.g. endotracheal tube or IV lines) until given permission by the coroner or medical examiner.
7. Provide for dignity. If the coroner has given permission:
   a. Remove airway devices and IV catheters
   b. Place the patient in a position that appears comfortable
   c. Clean up debris from the resuscitation
8. Assist the family.
   a. Offer to call a friend, pastor, or funeral director.
   b. Consider notifying the patient's primary care physician.
   c. Do not leave the scene until the family has adequate support.
9. Consider calling the local organ donation program [800-DONORS1 (Eastern PA) or 800-DONORS7 (Western PA)] for the family. Many individuals can donate corneas, skin grafts or bone grafts.
10. It is not generally the role of EMS to transport bodies, and this is usually handled by funeral directors or medical examiner offices. In some situations, EMS agencies may have a policy that permits transport of deceased patients to a local morgue for the coroner or to a local funeral director. These arrangements should not take EMS vehicles out of service for an extended time to perform these services.

Notes:

1. In remote or wilderness situations, EMS providers **must** make every effort to contact medical command, but resuscitation may be terminated in the field without medical command when the following have occurred:
   a. There has been no return of pulse despite >30 minutes of CPR (This does not apply in the case of hypothermia)
   b. Transport to an emergency department will take > 30 minutes (This does not apply in the case of hypothermia)
   c. The EMS providers are exhausted and it is physically impossible to continue the resuscitation

AIRWAY MANAGEMENT
STATEWIDE ALS PROTOCOL



AIRWAY MANAGEMENT
STATEWIDE ALS PROTOCOL

Criteria:

A. Any patient that requires airway management to assure adequate ventilation or a patent airway

Exclusion Criteria:

A. Patient with obstructed airway- See Airway Obstruction Protocol #3001

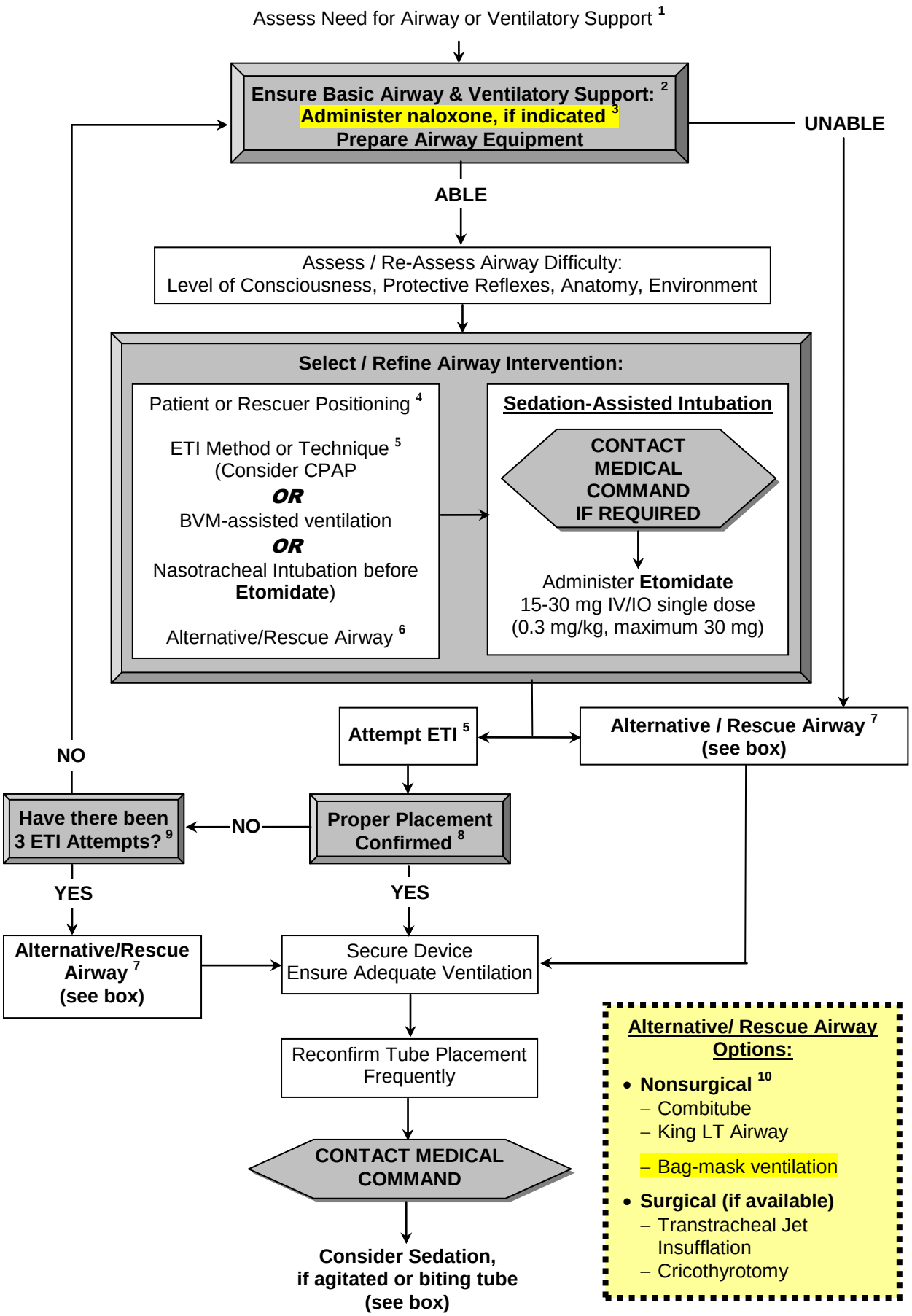
Notes:

1. The need for airway management is based upon the provider's judgment after a rapid global assessment of the patient. Indications for airway management include:
   a. Apnea or agonal respirations
   b. Airway reflexes compromised
   c. Ventilatory effort compromised
   d. Injury or medical condition compromising airway patency
   e. Potential for future rapid compromise of airway (for example airway burns or expanding neck hematoma).
2. If patient ventilation is initially adequate, but airway management is anticipated, high-flow oxygen should be administered. If ventilation is inadequate, provide positive pressure ventilation with high-flow oxygen (ideally, BVM ventilation should be done with two-person technique, cricoid pressure, and an oropharyngeal/ nasopharyngeal airway if possible).
3. If narcotic overdose is suspected, administer naloxone per Altered Mental Status Protocol #7002A or 7002P while ventilating with BVM if needed.
4. Techniques that may improve position for laryngoscopy are "sniffing position", head elevation, elevation of head of backboard if patient immobilized to backboard, or raising stretcher height.
5. **Consider using external laryngeal manipulation to improve laryngoscopy view**. Consider nasotracheal intubation in patient's that are awake or have clenching of teeth. May use directional -tipped ETT or BAAM whistle to assist with nasotracheal intubation. May use bougie, lighted stylet, or fiberoptic stylet as adjuncts to endotracheal intubation (ETI).
6. Topical atomized or nebulized lidocaine or tetracaine may be used. ALS providers who are qualified to perform drug-facilitated may follow the Sedation-Assisted Intubation Protocol when appropriate- See Protocol #4002. Some PHRNs may perform rapid sequence intubation when following approved air ambulance service protocols.
7. Secondary/ rescue airway options may be used as the primary airway/ ventilation technique in certain situations (for example: cardiac arrest to reduce interruption in compressions, narcotic overdose until naloxone is administered, or confined/ entrapped patient in position that precludes laryngoscopy, or air medical patient inside a helicopter). Ventilation with BVM may be as effective as ETI in children when transport times are short.
8. There should be a low threshold for using a secondary/ rescue device when basic techniques do not provide adequate ventilation, when ETI may be futile or when there have been multiple attempts at ETI.
9. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds *AND* continuous waveform $ETCO_2$ monitor. Follow Confirmation of Airway Placement Protocol #2032
10. Placing the laryngoscope blade into the patient's mouth is considered an intubation attempt. A maximum of 3 attempts (total for all providers) is suggested, because the success rate dramatically decreases after 3 attempts. In some cases, it may be appropriate to proceed to a rescue airway before 3 ETI attempts have been made. Regions or agency medical directors may determine the number of intubation attempts that are appropriate.
11. ALS services must carry one type of nonsurgical Alternative/ Rescue airway device in various sizes.

Performance Parameters:

A. Review PCRs for documentation of the following:
   1. In perfusing patients, document pulse oximetry, heart rate, and wave-form $ETCO_2$ during intubation attempts. In perfusing patients, ideally a continuous recording strip is documented.
   2. Document number of attempts at ETI and/or alternative/ rescue airway placement.
   3. Document confirmation of tube placement consistent with protocol #2032

SEDATION-ASSISTED INTUBATION STATEWIDE ALS PROTOCOL [OPTIONAL]



SEDATION-ASSISTED INTUBATION
STATEWIDE ALS PROTOCOL [OPTIONAL]

Sedation Options:
(Choose one)

(Titrate to minimum amount necessary)
Midazolam 1-5 mg IV/IO (0.05 mg/kg) titrated slowly
may repeat every 5 minutes
until maximum of 0.1 mg/kg

OR

Diazepam 5-10 mg IV/IO (0.1 mg/kg) titrated slowly
may repeat every 5 minutes
until maximum 0.3 mg/kg

OR

Lorazepam 1-2 mg IV/IO (0.1 mg/kg, max 2 mg/dose) titrated
may repeat every 5 minutes
until maximum of 4 mg

SEDATION-ASSISTED INTUBATION
STATEWIDE ALS PROTOCOL [OPTIONAL]

Criteria:

A. Sedation-assisted intubation may be appropriate for patients with compromised respiratory effort and partially intact protective airway reflexes. Examples of appropriate criteria for sedation-assisted intubation include:

1. Hypoxia (pulse oximetry < 90%) despite high flow oxygen by NRB mask or by CPAP.
2. Inability to protect airway.
3. Traumatic injury with GCS < 8 at the time of decision to intubate.

Exclusion Criteria:

A. **CAUTION:** Sedation-assisted intubation may not be appropriate for patients with fully-intact protective airway reflexes. The advantages of an airway secured by an endotracheal tube must be weighed against the potential risk of worsened hypoxia, hypotension, bradycardia, or elevated intracranial pressure that may be side effects of the sedative or complications of the intubation attempt. There is also risk of worsening a patient's outcome or misplaced esophageal intubation with this procedure. ALS provider judgment is critical, and providers must be aware of the potential adverse effects of this procedure. Other options may be preferred in some situations:

1. CPAP and medications may be preferred if patient has acute pulmonary edema/ CHF.
2. Nasotracheal intubation may be preferred in breathing patients.
3. Assisting ventilation with BVM and high-flow oxygen may be preferred if ETA to receiving facility is short, if airway reflexes are fully-intact, or until naloxone can be administered in narcotic overdose.

B. This protocol may only be used by ALS providers who have been approved for this skill by their agency medical director and are functioning with an ALS service that meets all of the system requirements for sedation-assisted intubation. The Pennsylvania Department of Health does not condone sedation-assisted intubation by ALS providers or EMS agencies that do not meet all of the system requirements of this protocol, and does not condone the use of benzodiazepine and/or narcotic medications for the purpose of intubation when given outside of a Department approved protocol. <u>Medical command physicians should not order such medications in an attempt to facilitate intubation.</u>

System Requirements:

A. EMS region must approve the use of sedation-assisted intubation within the region, and the region must perform a QI audit of **<u>every</u>** case of sedation-assisted intubation for compliance with this protocol. All results must be forwarded to the Bureau of EMS for statewide QI.

B. Agency medical director must approve of sedation-assisted intubation by the EMS service, and must perform a QI audit of **<u>every</u>** case of sedation-assisted intubation for compliance with this protocol.

C. Agency medical director must personally assure training and continuing education in patient selection, endotracheal intubation, use of alternative/ rescue airway device, use of wave-form $ETCO_2$ monitoring, and use of this protocol.

D. Agency medical director must assure initial and ongoing competence (including supervised sedation-assisted intubation) for each individual EMS provider who will use sedation-assisted intubation. Only individuals credentialed for this procedure will perform the procedure. Medical directors should strongly consider requirements for regular supervised operating room intubations (if it is possible to arrange for such experience) and should consider the use of high-fidelity simulation as a component of assuring competence.

E. **<u>Two</u>** ALS providers must be treating the patient before sedation-assisted intubation may be used.

F. Service must carry an alternative/ rescue airway device in various sizes.

G. Service must have the capability of monitoring and recording the following parameters continuously before, during and after all intubation attempts. Recordings of these parameters must be documented for every patient treated with this protocol:

1. Wave-form $ETCO_2$ (documented to confirm intubation, and monitored continuously thereafter)
2. Heart rate by continuous ECG monitoring (documented by recording strip demonstrating trending of heart rate before, during, and after each intubation attempt).
3. Oxygen saturation by continuous pulse oximetry (documented by recording strip demonstrating trending of pulse oximetry before, during, and after each intubation attempt).
4. Blood pressure (documented before and immediately after intubation or intubation attempts).

H. Etomidate may only be carried by ALS services that follow all aspects of this protocol, and will be removed from the service's ambulances if either the agency or regional QI determines that there are significant variances from this protocol.

I. Regions or agency medical directors may add more stringent criteria for use within the agency. For example, regions or agencies may require that medical command be contacted before sedation-assisted intubation.

Notes:

1. The need for airway management is based upon the provider's judgment after a rapid global assessment of the patient. Indications for airway management include:
   a. Apnea or agonal respirations
   b. Airway reflexes compromised
   c. Ventilatory effort compromised
   d. Injury or medical condition compromising airway patency
   e. Potential for future rapid compromise of airway (for example airway burns or expanding neck hematoma).
2. If patient ventilation is initially adequate, but airway management is anticipated, high-flow oxygen should be administered. If ventilation is inadequate, provide positive pressure ventilation with high-flow oxygen (ideally, BVM ventilation should be done with two-person technique, cricoid pressure, and an oropharyngeal/ nasopharyngeal airway if possible).
3. If narcotic overdose is suspected, administer naloxone per Altered Mental Status Protocol #7002A or 7002P while ventilating with BVM if needed.
4. Techniques that may improve position for laryngoscopy are "sniffing position", head elevation, elevation of head of backboard if patient immobilized to backboard, or raising stretcher height.
5. **Consider using external laryngeal manipulation to improve laryngoscopy view**. Consider nasotracheal intubation in patient's that are awake or have clenching of teeth. May use directional -tipped ETT or BAAM whistle to assist with nasotracheal intubation. May use bougie, lighted stylet, or fiberoptic stylet as adjuncts to endotracheal intubation (ETI).
6. Secondary/ rescue airway options may be used as the primary airway/ ventilation technique in certain situations (for example: cardiac arrest to reduce interruption in compressions, narcotic overdose until naloxone is administered, or confined/ entrapped patient in position that precludes laryngoscopy, or air medical patient inside a helicopter). Ventilation with BVM may be as effective as ETI in children when transport times are short.
7. There should be a low threshold for using a secondary/ rescue device when basic techniques do not provide adequate ventilation, when ETI may be futile or when there have been multiple attempts at ETI.
8. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds *AND* continuous waveform $ETCO_2$ monitor. Follow Confirmation of Airway Placement Protocol #2032
9. Placing the laryngoscope blade into the patient's mouth is considered an intubation attempt. A maximum of 3 attempts (total for all providers) is suggested, because the success rate dramatically decreases after 3 attempts. In some cases, it may be appropriate to proceed to a rescue airway before 3 ETI attempts have been made. Regions or agency medical directors may determine the number of intubation attempts that are appropriate.
10. ALS agencies must carry one type of nonsurgical Alternative/ Rescue airway available in various sizes.

Performance Parameters:

A. Review PCRs for documentation of the following:
   1. Review for documentation of reason for intubation.
   2. Review for complications related to intubation attempts including hypoxia, bradycardia, hypotension, and esophageal intubation(s).
   3. Review for overall successful placement of an ETT and number of attempts at ETI and alternative/ rescue airway placement.
   4. Include recording strip of continuous trend of heart rate and pulse oximetry before, during, and after each intubation attempt.
   5. Document pulse oximetry, blood pressure, and heart rate readings before and after intubation attempts. Document wave-form $ETCO_2$ readings after intubation attempts.
   6. Document number of attempts at ETI and/or alternative/ rescue airway placement.
   7. Document confirmation of tube placement by both auscultation and continuous wave-form $ETCO_2$ consistent with protocol #2032

ALLERGIC REACTION
STATEWIDE ALS PROTOCOL

Initial Patient Contact - see Protocol #201
Look for Medic Alert bracelet/necklace

↓

Manage Airway/ Ventilate, if needed
Apply Oxygen if needed

↓

Monitor ECG (unless mild reaction) and Pulse Oximetry, remove stinger if visible[1], keep part dependent if possible, apply cold pack as available

↓

Severe Respiratory Distress/ Wheezing or Hypotension (BP < 90 systolic) [2]

NO

↓

Initiate IV NSS for moderate reactions [3]

↓

Patient

Adult

↓

Diphenhydramine 50 mg IV/IM/PO [3,4]

↓

Contact Medical Command

Patient

Pediatric

↓

Diphenhydramine 1 mg/kg IV/IM/PO [3] (max. dose 50 mg) [4]

↓

Contact Medical Command

YES

↓

Patient

Adult

↓

Epinephrine 1:1000; 0.3 mg IM

↓

Initiate IV/IO NSS
If Hypotension is present, 1000 mL wide open

↓

Diphenhydramine 50 mg IV/IO [4,5]

↓

If wheezing, Nebulized Bronchodilator (see box)
May repeat continuously, if needed

↓

Contact Medical Command

↓

Repeat **Epinephrine** IM [6]

Repeat IV/IO NSS bolus (up to 2000 mL total)

Methylprednisolone 125 mg IV/IO (if available)

Pediatric

↓

Epinephrine 1:1000; 0.01 mg/kg IM (max dose 0.3 mg)

↓

Initiate IV/IO NSS [6]
If Hypotension is present, 20 mL /kg wide open

↓

Diphenhydramine 1 mg/kg IV/IO [4,5] (max. dose 50 mg)

↓

If wheezing, Nebulized Bronchodilator (see box)
May repeat continuously, if needed

↓

Contact Medical Command

↓

Repeat **Epinephrine** IM [6]

Repeat IV/IO NSS bolus (up to 60 mL/kg total)

Methylprednisolone 2mg/kg IV/IO (if available)

BRONCHODILATOR OPTIONS

- **Albuterol** (approx. 2.5 mg) nebulized

OR

- **Albuterol** (approx 3 mg)/ **ipratropium** (500 mcg) combination nebulized. [Half dose if ≤ 14 y/o]

OR

- ~~**Alupent** (0.2-03 mL of 0.5% diluted with NSS) nebulized~~

ALLERGIC REACTION
STATEWIDE ALS PROTOCOL

Criteria:

A. Severe Allergic Reaction/Anaphylaxis: A patient with any of the following symptoms of severe allergic reaction after suspected exposure to an allergen (e.g. bee/wasp stings, medications/antibiotics, nuts, seafood):

1. Difficulty breathing and wheezing
2. Difficulty breathing from swollen tongue/lips
3. Hypotension

B. Moderate Allergic Reaction: A patient with less severe reaction may have:

1. Mild shortness of breath with wheezing
2. Extensive hives and itching
3. Mild tongue/lip swelling without difficulty swallowing or shortness of breath

C. Mild Allergic Reaction: A patient with a mild reaction may have:

1. Local swelling or itching isolated to extremity or area around bite site.

Possible MC Orders:

A. If unconscious or life threatening condition, consider additional doses of Epinephrine.

1. Additional dose of 1:1000 epinephrine 0.3 mg IM
2. Epinephrine infusion (1 mg/250 mL NSS) IV/IO infused until hypotension resolves.
3. 1:10,000 Epinephrine 0.1 mg (1mL) IV/IO very slow bolus over 5 minutes.

B. Glucagon, if available, (1-2 mg IV repeated every 5 minutes to 10 mg total) may be ordered if patient is taking ß-blocker and hypotension does not resolve with NSS bolus and epinephrine.

C. Consider nebulized epinephrine if severe airway swelling.

D. Dexamethsone or hydrocortisone, if available.

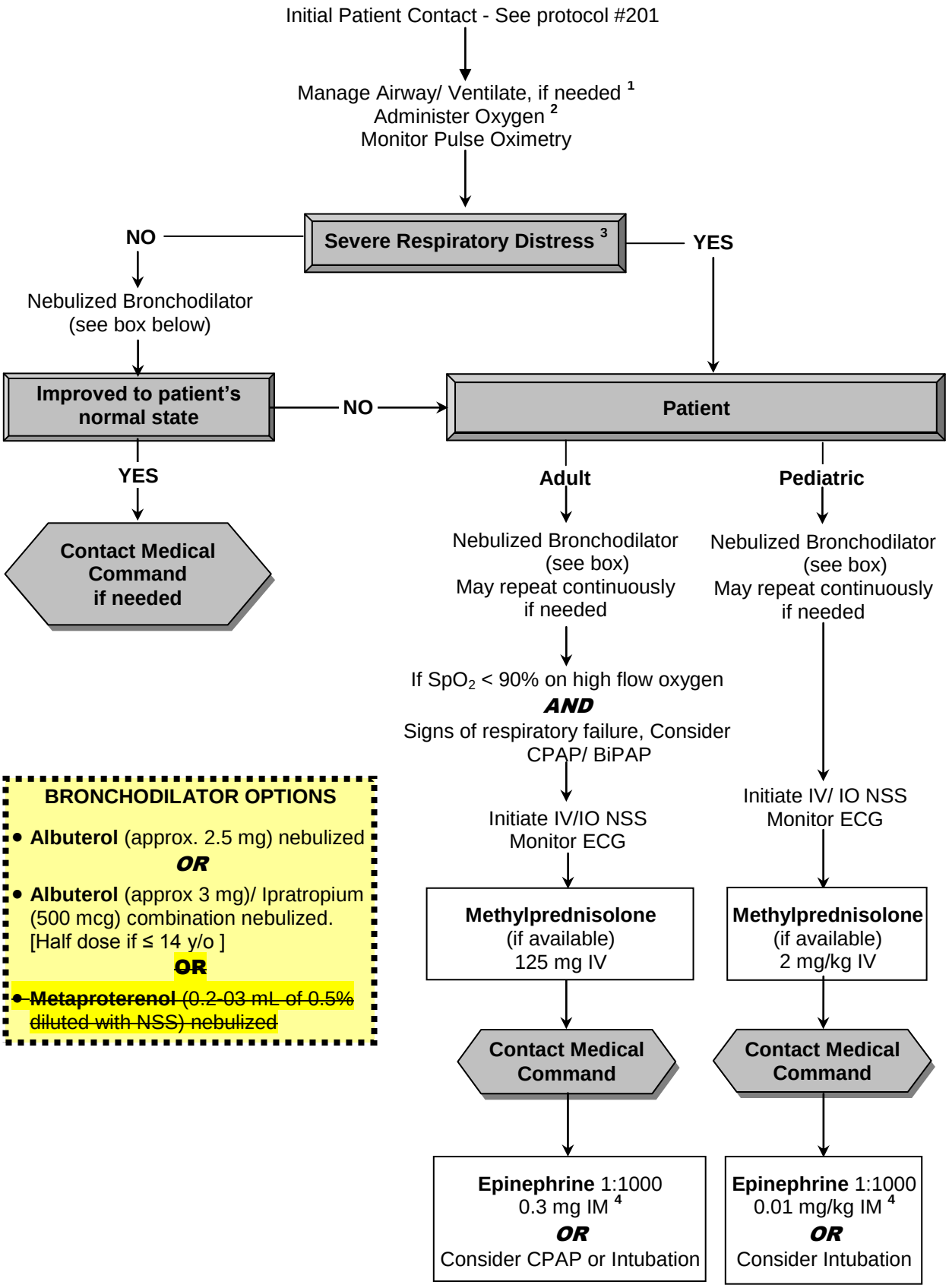
Notes:

1. Remove stinger(s) by gently scraping stinger free with a blade or credit card, without squeezing or using forceps. In severe reaction, do not delay treatment while attempting to remove stingers.
2. In pediatrics, hypotension is SBP < [70 + (age x 2)]
3. For mild reactions, IV access is not necessary. May provide diphenhydramine, 1 mg/kg to maximum of 50 mg orally (if tablets/capsules/elixir available). May use local benzocaine applicator at bite/sting site.
4. May repeat diphenhydramine dose up to 50 mg total.
5. IV route is preferred. Diphenhydramine (Benadryl) may be given IM if IV/IO is not available.
6. Epinephrine dose may be repeated if hypotension and severe symptoms persist. Use caution when giving IV epinephrine to any patient with perfusing vital signs, especially those over 50 years old. Doses should be controlled, given slowly, and titrated only to adequate blood pressure. Higher doses may be needed in patients that are taking ß-blocker medications. Dosing options include:
   a. Repeat the original IM dose.
   b. Administer dilute epinephrine infusion with frequent vital sign checks. Stop infusion when hypotension resolves:
      i. Adults – 1 mg in 250 or 500 mL of NSS IV/IO infusion.
      ii. Pediatrics – 0.1 mg/kg in 20 mL /kg of NSS IV/IO infusion
   c. Administer epinephrine bolus 0.01 mg/kg (0.1 mL /kg) 1:10,000 very slowly over 10 minutes:

Performance Parameters:

A. Review for documentation of level of consciousness, airway patency, and pulse oximetry reading.

ASTHMA / COPD / BRONCHOSPASM STATEWIDE ALS PROTOCOL



ASTHMA / COPD / BRONCHOSPASM
STATEWIDE ALS PROTOCOL

Criteria:

A. A patient with signs and symptoms of acute respiratory distress from bronchospasm or restrictive airway disease:

1. Symptoms/signs may include:
   a. Wheezing - will have expiratory wheezing unless they are unable to move adequate air to generate wheezes
   b. May have signs of respiratory infection (e.g. fever, nasal congestion, cough, sore throat)
   c. May have acute onset after inhaling irritant
2. This includes:
   a. Asthma exacerbation
   b. COPD exacerbation
   c. Wheezing from suspected pulmonary infection (e.g. pneumonia, acute bronchitis)

Exclusion Criteria:

A. Respiratory distress secondary to trauma – Follow appropriate trauma protocol.

B. Respiratory distress secondary to congestive heart failure - Follow CHF Protocol #5002.

C. Allergic reactions – Follow Allergic Reaction Protocol #4011.

D. Suspected Croup – Follow Croup Protocol #4023

Possible MC Orders:

A. Additional nebulized bronchodilators

B. Intravenous volume, NSS bolus or 20 mL/kg if fever, infection, or signs of dehydration.

C. Additional doses of Epinephrine (IM or IV/IO)

D. CPAP/BiPAP, if available and not already being used.

E. Endotracheal Intubation, if not already done

F. Magnesium sulfate 2 gm slow IV or infusion.

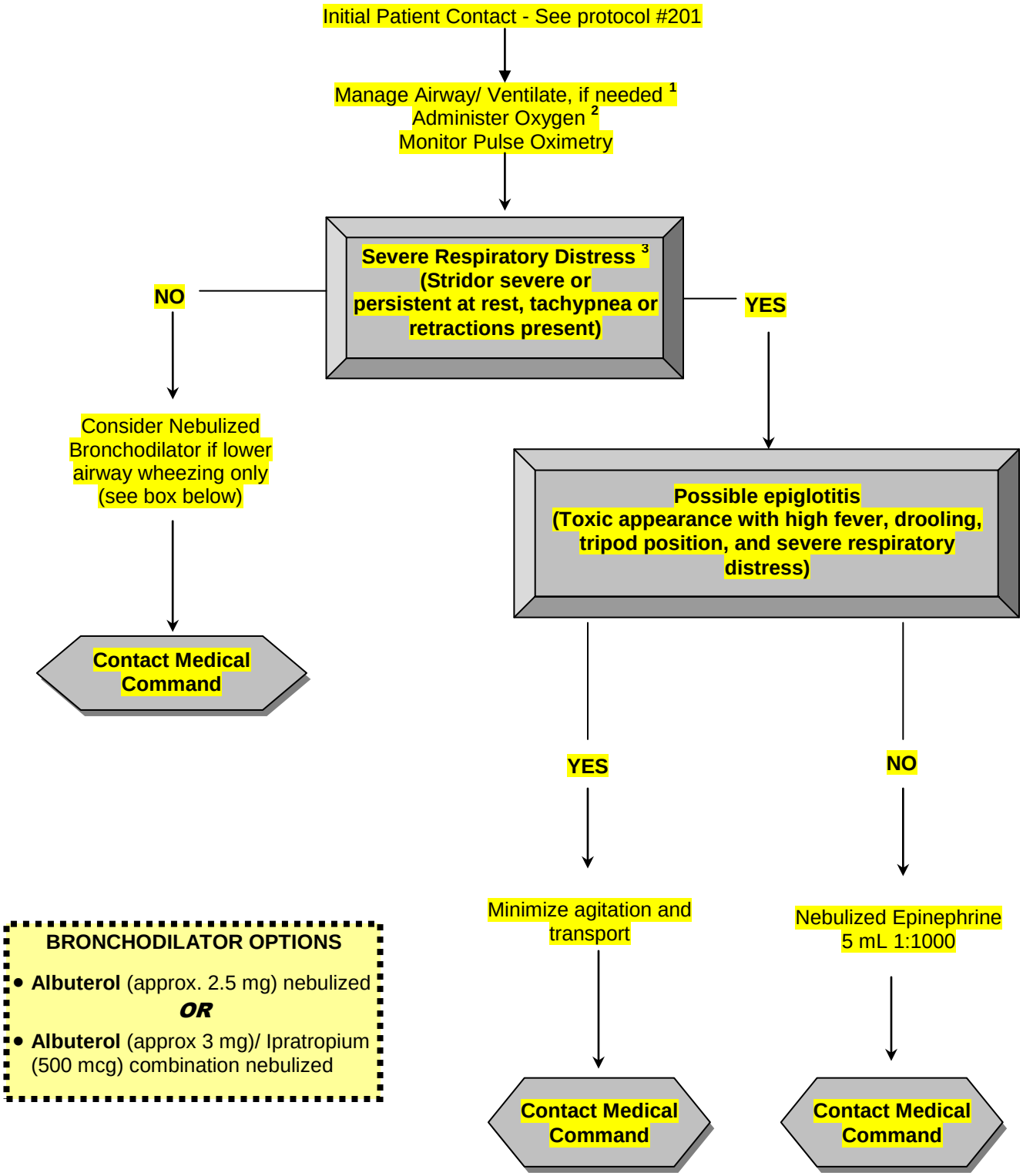
Notes:

1. **WARNING:** Although sometimes needed, intubation further narrows the airway restriction in a severe asthma exacerbation, and this may worsen some cases. Aggressive use of bronchodilators is generally the most important therapy for severe asthma exacerbation.
2. Administer oxygen at high-flow rate to all patients in severe respiratory distress. COPD patients **NOT** in respiratory distress should be given oxygen to maintain adequate O_2 saturation (e.g. > 90%).
3. Indications of severe respiratory distress include:
   a. apprehension, anxiety, combativeness
   b. hypoxia, $SpO_2 < 90\%$
   c. intercostals/subcostal retractions
   d. nasal flaring
   e. cyanosis
   f. use of accessory muscles
4. Epinephrine administration may be ordered by Medical Command Physician regardless of patient's age or past medical history. Epinephrine is relatively contraindicated during pregnancy; report pregnancy to physician. Epinephrine may be repeated only with order from Medical Command Physician.

Performance Parameters:

A. Review for documentation of lung sounds, pulse oximetry, repeat assessments/ pulse oximetry readings, and response to treatment.

CROUP/ STRIDOR/ UPPER AIRWAY DISEASE – PEDIATRIC STATEWIDE ALS PROTOCOL



CROUP/ STRIDOR/ UPPER AIRWAY DISEASE – PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. A pediatric patient with signs and symptoms of stridor and cough from upper respiratory disease:

1. Symptoms/signs may include:
   a. Stridor
   b. Barking cough
   c. May have signs of respiratory infection (e.g. fever, nasal congestion, cough, sore throat)

Exclusion Criteria:

A. Foreign body airway obstruction – Follow Airway Obstruction Protocol #3001

B. Resipiratory distress secondary to lower airway bronchoconstriction – Follow Asthma/ COPD/Bronchospasm Protocol #4022

C. Respiratory distress secondary to trauma – Follow appropriate trauma protocol.

D. Allergic reactions – Follow Allergic Reaction Protocol #4011.

Possible MC Orders:

A. Nebulized bronchodilator if suspected lower airway bronchospasm.

B. Intravenous volume, NSS bolus or 20 mL/kg if fever, infection, or signs of dehydration.

Notes:

1. **WARNING:** Avoid intubation attempts if epiglottitis is suspected – most patients can be adequately ventilated with BVM. If epiglottitis is possible, manipulating the airway with intubation attempts can be fatal.
2. Administer oxygen at high-flow rate to all patients in severe respiratory distress.
3. Indications of severe respiratory distress include:
   a. apprehension, anxiety, combativeness
   b. hypoxia, $SpO_2 < 90\%$
   c. intercostals/subcostal retractions
   d. nasal flaring
   e. cyanosis
   f. use of accessory muscles

Performance Parameters:

A. Review for documentation of lung sounds, pulse oximetry, repeat assessments/ pulse oximetry readings, and response to treatment.

B. Review cases of nebulized epinephrine use for appropriate differentiation between croup and lower respiratory bronchospasm.

SUSPECTED ACUTE CORONARY SYNDROME
STATEWIDE ALS PROTOCOL

Initial Patient Contact – see Protocol #201
Consider non-cardiac causes [1,2]
Administer Oxygen titrated to $SpO_2 \geq 94$ [3]
Monitor Pulse Oximetry
Monitor ECG

↓

Unstable tachycardia/ bradycardia present

→ **YES** → **Proceed to Appropriate Dysrhythmia Protocol**

↓ **NO**

Administer Aspirin 324 mg PO chewed [4]

↓

Systolic pressure >100

YES →

Initiate IV NSS

Obtain 12-Lead ECG (if available) [5,6,7]
if STEMI suspected, notify receiving facility ASAP

If not using **Viagra-type** drugs [8], **Nitroglycerin** 0.4 mg SL (Repeat as needed [7,9])

↓

If pain continues after 3 doses of NTG and systolic pressure > 100, Administer First Dose of Narcotic Analgesic (See box at right)

↓

Contact Medical Command [7]

↓

Administer Repeat Dose(s) of Narcotic Analgesic (See box at right)

NO →

Initiate IV NSS

Obtain 12-Lead ECG (if available) [5,6,7]

↓

Proceed to Shock Protocol # 7005 [7,10]

NARCOTIC ANALGESIC OPTIONS
(Choose one)

Fentanyl 50-100 mcg IV/IO (1 mcg/kg)
may repeat ½ dose every 5 minutes
until maximum of 3 mcg/kg

OR

Morphine sulfate 2-5 mg IV (0.05 mg/kg)
may repeat dose every 5 minutes
until maximum of 0.2 mg/kg

SUSPECTED ACUTE CORONARY SYNDROME
STATEWIDE ALS PROTOCOL

Criteria:

A. Adult patients with symptoms of possible cardiac ischemia. Diabetics, women, and elderly patients may have atypical symptoms without retrosternal chest pain. May include:
1. Retrosternal chest heaviness/pressure/pain
2. Radiation of pain to arm(s), neck, or jaw
3. Associated SOB, nausea/vomiting, or sweating
4. Possibly worsened by exertion
5. Patient with history of recent cocaine/amphetamine use

Exclusion Criteria:

A. Chest pain/symptoms, probably not cardiac origin:
1. May include:
   a. Pleuritic chest pain - worsens with deep breath or bending/turning
   b. Patient less than 30 y/o

Possible MC Orders:

A. Diversion to receiving facility capable of emergent primary percutaneous coronary intervention (PPCI).

Notes:

1. Some potentially lethal mimics of Acute Coronary Syndrome (ACS) that must be considered as the patient is assessed and treated include:
   a. Aortic dissection
   b. Acute pericarditis
   c. Acute myocarditis
   d. Spontaneous pneumothorax
   e. Pulmonary embolism
   f. Pneumonia/Lung infection
2. If patient has an implanted defibrillator and is receiving shocks when not in VF/VT, may place a magnet (if available) over the AICD to deactivate it.
3. Administer oxygen by appropriate method and monitor Pulse Oximetry. Place patient in position of comfort. Nasal cannula may be utilized if patient is unable to tolerate a facemask.
4. Preferred method is to chew 4 baby ASA (81 mg each). Do not give aspirin if the patient has had his/her daily dose of 324 mg or has an aspirin allergy.
5. **If a 12-lead ECG is obtained, ideally it should be transmitted to receiving/ command facility ASAP. Otherwise, give copy of all 12-lead ECGs to ED physician ASAP on arrival to facility.**
6. If 12-lead ECG is consistent with ST-elevation MI (STEMI), either:
   a. Follow regional destination protocol for STEMI, or
   b. Contact medical command ASAP since some patients may benefit from transport to a receiving facility capable of emergent primary percutaneous coronary intervention (PPCI).
7. Early contact with Medical Command is encouraged for patients with chest pain who have continued pain despite 3 doses of NTG, shock, or evidence of STEMI on prehospital 12-lead ECG, since these patients may benefit by direct transport to a receiving facility capable of PPCI.
8. **WARNING:** Nitroglycerin may lead to fatal hypotension if given to patients using drugs for erectile dysfunction.
   a. **DO NOT** administer nitroglycerin (NTG) to a patient has taken sildenafil (Viagra/Revatio) or vardenafil (Levitra) within 24 hours.
   b. **DO NOT** administer NTG to a patient who has taken tadalafil (Cialis) within the last 48 hours.
   c. These medications may be used for conditions other than erectile dysfunction (e.g. Revation is used for pulmonary hypertension).
9. Use caution in giving NTG to patients with inferior or suspected right ventricular STEMI. If chest pain continues and SBP > 100, may repeat NTG approximately every 3-5 minutes as needed.
10. If initial fluid bolus in shock protocol leads to SBP > 100, may return to this protocol and continue with NTG/analgesic medication.

Performance Parameters:

A. All patients should either receive aspirin or the PCR should include documentation of why aspirin was contraindicated.

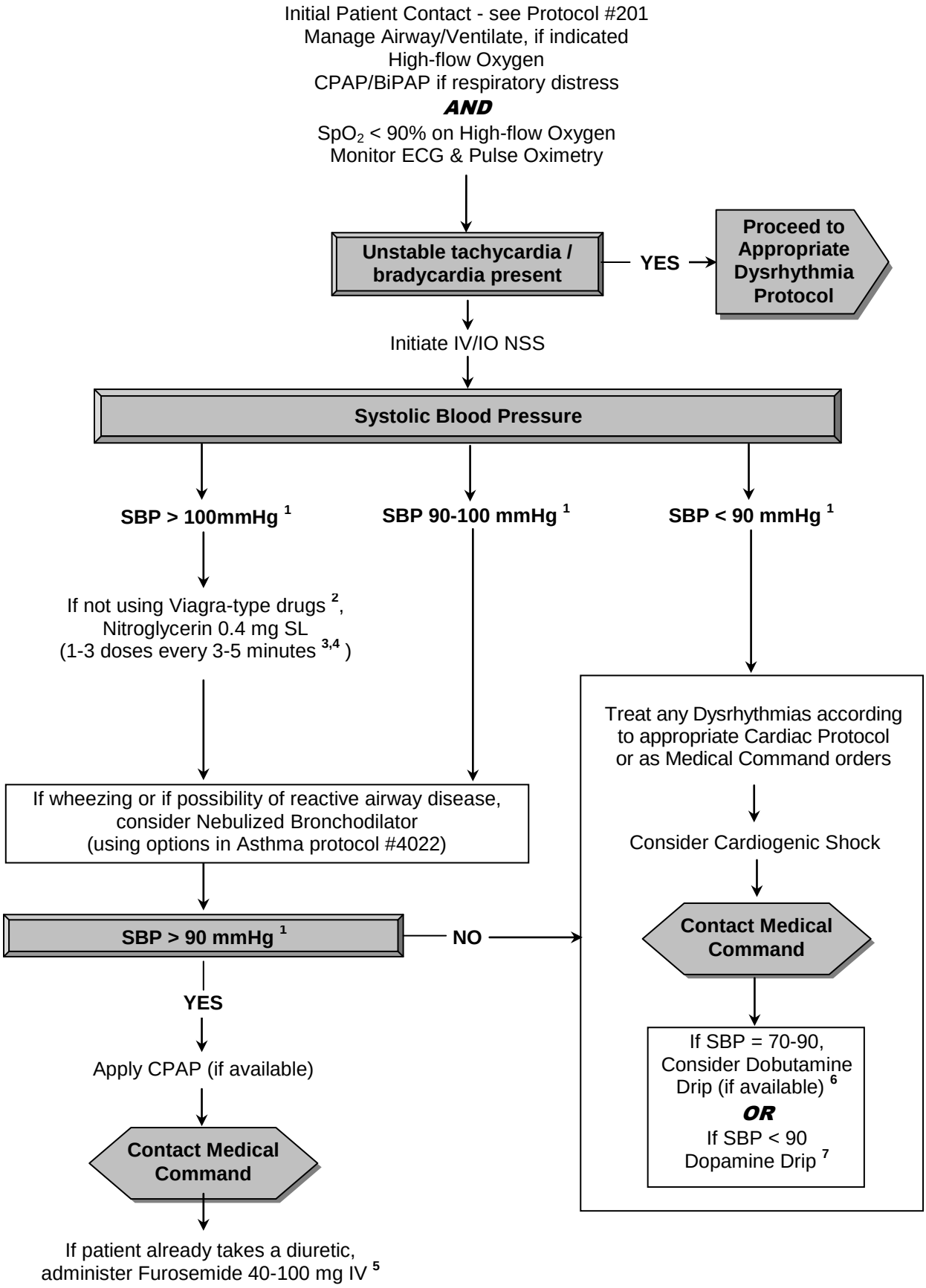
B. Review for appropriate transmission of 12-lead ECG when possible. Review for appropriate diversion to facility capable of PCI and/or for appropriate notification of receiving facility when STEMI is identified.

C. Cardiac rhythm monitored and 12-lead ECGs done (when available) and rhythm strips/12-lead ECGs documented with graphs included in PCR.

D. Possible benchmark for on scene time of ≤ 20 minutes.

E. Vital signs documented after each use of vasoactive medication (e.g. nitroglycerin or narcotic analgesics).

CONGESTIVE HEART FAILURE
STATEWIDE ALS PROTOCOL



CONGESTIVE HEART FAILURE (CHF)
STATEWIDE ALS PROTOCOL

Criteria:

A. Patients presenting with shortness of breath from pulmonary edema/CHF, as indicted by:
1. Severe dyspnea, tachypnea, bilateral rales, tachycardia, cough with frothy sputum, or orthopnea.
2. No fever
3. May be associated with restlessness, agitation, pedal edema, diaphoresis, or pallor.
4. Patient may have history of diuretic or digitalis use.

Exclusion Criteria:

A. Patients presenting with shortness of breath from non-CHF etiologies:
1. Pneumonia: **WARNING** - Patients with SOB from pneumonia may have symptoms similar to those of CHF, but these patients may be harmed by diuretics. Fever may be present in these patients.
2. COPD exacerbation: These patients may take bronchodilators without a history of diuretic use.
3. Pneumothorax: CPAP is contraindicated in these patients.

Possible MC Orders:

A. Additional Nitroglycerin
B. Dopamine or dobutamine (if available) infusion
C. Captopril (if available) 25 mg sublingual or enalapril (if available) 0.625 – 1.25 mg IV
D. Endotracheal Intubation
E. Morphine sulfate

Notes:

1. Relative hypotension in pulmonary edema may indicate poor cardiac function. Aggressive use of diuretics and nitroglycerin may result in extreme hypotension and further reduction of cardiac output. Contact Medical Command to discuss individualizing treatment options in these patients.
2. **WARNING:** Nitroglycerin may lead to fatal hypotension if given to patients using drugs for erectile dysfunction.
   a. **DO NOT** give nitroglycerin (NTG) to a patient who has taken suldenafil (Viagra/Revation) or vardenafil (Levitra) within 24 hours.
   b. **DO NOT** give NTG to a patient who has taken tadalafil (Cialis) within the last 48 hours.
   c. These medications may be used for conditions other than erectile dysfunction (e.g. Revation is used for pulmonary hypertension).
3. After initial single tablet/spray of NTG, give nitroglycerin dose based upon blood pressure:
   a. 3 SL tablets or sprays – for SBP > 180
   b. 2 SL tablets or sprays – for SBP 140-180
   c. 1 SL tablet or spray – for SBP 100-140
   d. For patients on CPAP who do not tolerate SL NTG, may use 1 – 2 inches of topical nitroglycerin paste, if available.
   e. When available, may substitute nitroglycerin IV infusion 5 – 200 mcg / min titrated to SBP>100.
4. NTG may be repeated every 3-5 minutes but avoid decreasing SBP below 100 or by more than 25% of initial SBP. [**Note:** One NTG repeated every 5 minutes is equivalent to a NTG infusion of 80 mcg/min]
5. If patient is taking prescription furosemide, administer IV dose equal to the patient's daily dose.
6. Some recommendations suggest using dobutamine for mild cardiogenic shock (SBP 70-90) and dopamine for severe shock (SBP< 70). Mix dobutamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP > 100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**
7. Mix dopamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP > 100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**

Performance Parameters:

A. Outcomes follow-up to determine percentage of patients treated with this protocol that ultimately had hospital diagnoses of non-CHF conditions (e.g. pneumonia).
B. Blood pressure documented after each dose of vasoactive medication (e.g. nitroglycerine)

BRADYCARDIA – ADULT
STATEWIDE ALS PROTOCOL

Initial Patient Contact - see Protocol # 201

↓

If patient has severe hypotension or impending cardiac arrest, begin Pacing IMMEDIATELY.[1,2,3]

↓

Maintain Airway/Ventilate, if needed.
Administer Oxygen
Monitor ECG & Pulse Oximetry
Initiate IV/IO NSS
Consider 12-Lead ECG, if available

↓

Signs or symptoms of poor perfusion? (e.g. acute altered mental status, ongoing chest pain, hypotension, or signs of shock) [4]

NO →

Second-degree AV block (Type II)
OR
Third-degree AV block

NO → Observe/Monitor

YES → Consider applying Pacer pads [5] → Observe/Monitor

Observe/Monitor → **CONTACT MEDICAL COMMAND**

YES [5] →

Atropine 0.5 mg IV/IO [6,7] while preparing Pacer (May repeat if needed to maximum of 3 mg)

OR

Begin Pacing [3,6,8]
Sedation [3]
Initial dose, if needed (see box below)

↓

Pacing effective AND SBP > 100 mm/Hg

YES → **CONTACT MEDICAL COMMAND** → Repeat additional sedation (see box below)

NO → **CONTACT MEDICAL COMMAND** → Consider **Dopamine** Drip IV [9]
OR
Consider **Epinephrine** Drip [10]
Repeat additional sedation (see box below)

Sedation Options [3]:
(Choose one)
(Titrate to minimum amount necessary)
Midazolam 1-5 mg IV/ IO (0.05 mg/kg) titrated slowly
may repeat every 5 minutes
until maximum of 0.1 mg/kg
OR
Diazepam 5-10 mg IV/ IO (0.1 mg/kg) titrated slowly
may repeat every 5 minutes
until maximum 0.3 mg/kg
OR
Lorazepam 1-2 mg IV/ IO (0.1 mg/kg, max 2 mg/dose) titrated
may repeat every 5 minutes
until maximum of 4 mg

BRADYCARDIA - ADULT
STATEWIDE ALS PROTOCOL

Criteria:

A. Adult patient with heart rate less than 60 bpm with associated symptoms.

Exclusion Criteria:

A. Patient without pulse - Follow appropriate cardiac arrest protocol.

B. History or evidence of trauma - Follow appropriate trauma protocol

Possible MC Orders:

A. Additional doses of sedation or analgesia.

B. Dopamine infusion.

C. Glucagon 3-5 mg IV (0.05mg/kg) (if available) if beta-blocker or calcium channel blocker overdose is suspected. May be repeated in 10-15 minutes.

D. Calcium Cl 10 mL of 10% solution IV (if available) if calcium channel-blocker overdose or hyperkalemia is suspected.

Notes:

1. When applying transcutaneous pacer for serious bradycardia or impending cardiac arrest, begin rapidly increasing the energy to obtain electrical capture.
2. Application and initiation of transcutaneous pacer should not be delayed while awaiting IV access if patient has severe symptoms.
3. Some patients may not tolerate the pacing stimulus to the skin and chest wall that occurs with transcutaneous pacing. In these cases, consider sedation if SBP > 100. (See box)
4. Consider possible etiologies:
   a. Hyper/hypokalemia, other metabolic disorders
   b. Hypothermia
   c. Hypovolemia (including vomiting/diarrhea)
   d. Hypoxia
   e. Toxins/ overdose (e.g. beta-blocker or calcium channel-blocker)
   f. Tamponade
   g. Tension pneumothorax
5. Transcutaneous pacemaker electrode pads may be applied to these patients without initiating pacing so that the pacemaker is ready if patient condition deteriorates.
6. For symptomatic high-degree (second-degree or third-degree) AV block, begin pacing without delay.
7. Atropine should be administered by rapid IV push and may be repeated every 3-5 minutes, to a maximum dose of 3 mg. Atropine is ineffective and should be avoided in heart transplant patients.
8. Start pacing at heart rate of 80 and 80 mAmps. When initiating trancutaneous pacing on a patient that is conscious with a perfusing rhythm, the pacing energy level should be increased gradually to a level slightly above the minimum energy required to obtain electrical capture.
9. Mix dopamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP >100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**
10. Epinephrine infusion, 0.1-0.5 mcg/kg/min (7-35 mcg/min) titrated until SBP >90 mmHg.Mix epinephrine infusion using regional or agency prescribed concentration, and administer 2-10 mcg/min. **DO NOT exceed 10 mcg/min unless ordered by medical command physician.**

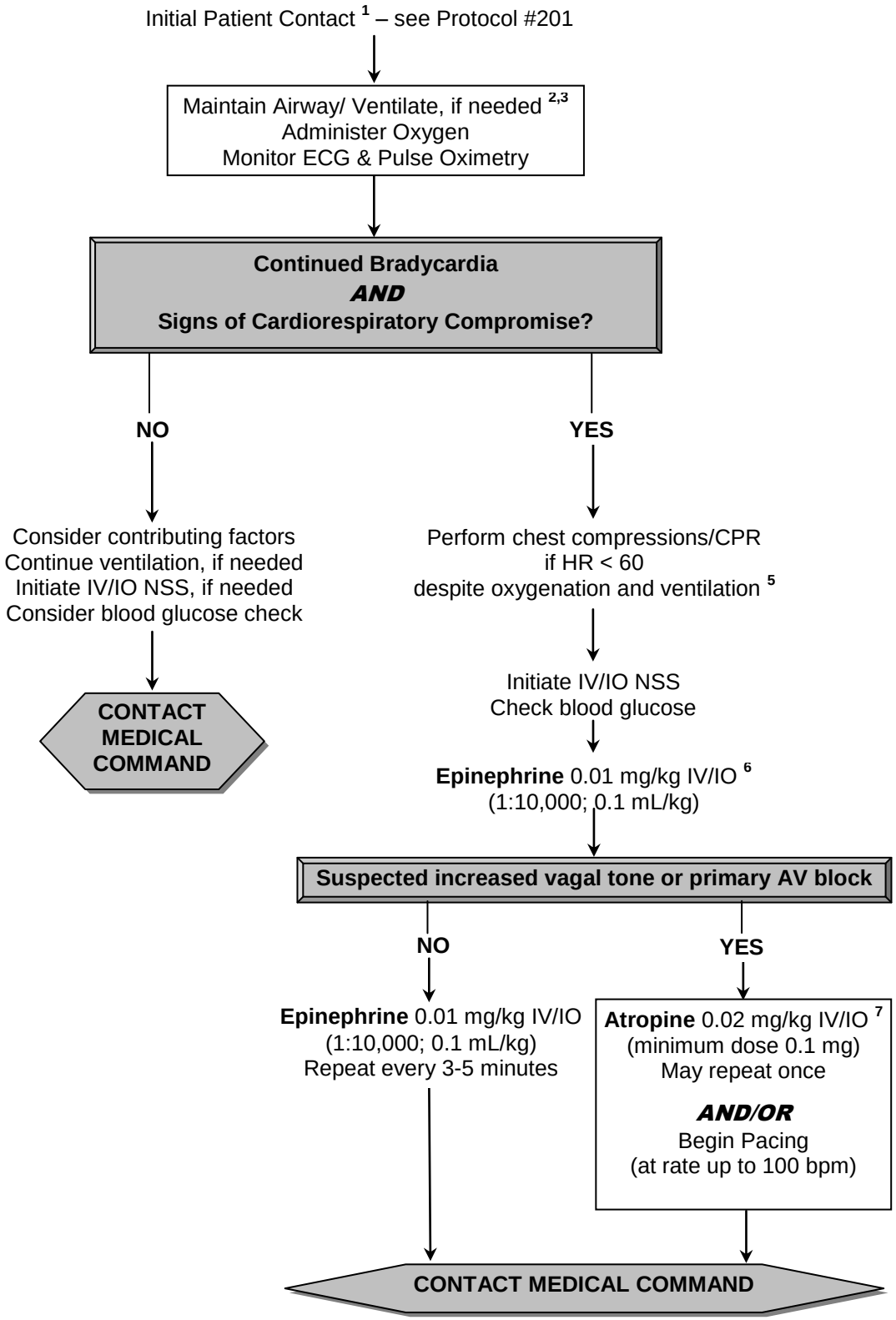
Performance Parameters:

A. Document presence or absence of signs of poor perfusion/ shock before and after interventions.

B. Review for appropriate use of immediate pacing before IV or atropine for patients with serious hypoperfusion or impending cardiac arrest.

C. Documentation of correct ECG rhythm interpretation and inclusion of rhythm strips and ECGs on PCR.

BRADYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL



BRADYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Pediatric patient with heart rate < 60. Bradycardia in children is usually caused by hypoxia and often responds to oxygen and ventilatory support.

Exclusion Criteria:

A. Patient without pulse - Follow appropriate cardiac arrest protocol.

B. Newborn patient – Follow Neonatal Resuscitation Protocol #7090.

C. History or evidence of trauma - Follow appropriate trauma protocol.

D. Severe hypothermia – Follow Hypothermia Protocol #6081.

Possible MC Orders:

A. Dopamine or epinephrine infusion.

B. Glucagon 0.05mg/kg IV/IO (if available) if beta-blocker or calcium channel blocker overdose is suspected. May be repeated in 10-15 minutes.

C. Calcium Cl 0.2 mL/kg of 10% solution IV/IO (if available) if calcium channel-blocker overdose or hyperkalemia is suspected.

Notes:

1. Consider possible etiologies:
   a. Hypovolemia (including vomiting/diarrhea)
   b. Hypoxia
   c. Hypothermia
   d. Hyper/hypokalemia, other metabolic disorders
   e. Hypoglycemia
   f. Toxins/overdose (e.g. beta-blocker or calcium channel-blocker)
   g. Trauma/Tension Pneumothorax - follow appropriate trauma protocol.
2. Ventilation with BVM may be as effective as endotracheal intubation in children when transport times are short. If unable to intubate on up to 3 attempts, ventilate with BVM.
3. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds *AND* confirmatory device (like wave-form $ETCO_2$ detector). Follow Confirmation of Airway Placement Protocol #2032
4. Serious signs or symptoms include:
   a. Poor perfusion - indicated by absent or weak peripheral pulses, increased capillary refill time, skin cool/mottled.
   b. Hypotension is SBP < 70 + (age x 2).
   c. Respiratory difficulty (respiratory rate >60/minute) indicated by increased work of breathing (retractions, nasal flaring, grunting), cyanosis, altered level of consciousness (unusual irritability, lethargy, failure to respond to parents), stridor, wheezing.
5. When CPR is required, a precise diagnosis of the specific bradyarrhythmia is not important. Perform chest compressions if, despite oxygenation and ventilation, the heart rate is < 60/minute and associated with poor systemic perfusion in infant or child. If severe hypothermia, do not perform chest compressions and follow Hypothermia Protocol #6081.
6. When given IV/IO, Epinephrine may be repeated every 3-5 minutes. Epinephrine 0.1 mg/kg (1:1,000, 0.1 mL /kg) flushed with 5 mL NSS may be administered via endotracheal tube, but IV/IO route is preferred.
7. Atropine administration may be repeated once in five minutes. Maximum dose is 1 mg per dose. Atropine 0.03 mg/kg flushed with 5 mL NSS may be administered via endotracheal tube, but IV/IO route is preferred.

NARROW COMPLEX TACHYCARDIA – ADULT
STATEWIDE ALS PROTOCOL

Initial Patient Contact – see protocol #201

↓

Manage Airway/Ventilate, if needed
Apply Oxygen
Monitor ECG & Pulse Oximetry

↓

Unstable with serious signs or symptoms [1]
Related symptoms uncommon if HR <150

STABLE →

IV/IO Access
12-Lead ECG, if available

↓

Regular Narrow QRS Rhythm?

REGULAR [2] →

Consider Valsalva Maneuver [3]

Adenosine 6 mg IV/IO [4] (if available) May repeat 12 mg IV

OR

Diltiazem 15-20 mg (0.25 mg/kg) IV/IO slowly [5,6] (if available) (After 15 min., may repeat 20-25 mg (0.35 mg/kg) IV/IO)

↓

Contact Medical Command

↓

Adenosine 12 mg IV [4] (if available)

IRREGULAR [7] →

Contact Medical Command

↓

If symptomatic from atrial fibrillation/flutter with tachycardia,
Diltiazem 15-20 mg (0.25 mg/kg) IV/IO slowly [5] (if available) (After 15 min., may repeat 20-25 mg (0.35 mg/kg) IV/IO)

OR

Verapamil 5 mg IV/IO [5,6]

UNSTABLE →

IV/IO Access

Sedation if conscious
(see box below)

DO NOT delay cardioversion

Synchronized Cardioversion
50 - 100 joules [8,9,10]
If no conversion, repeat at 100, 200, 300, 360 joules [9] until conversion

↓

Contact Medical Command

↓

Consider treatments (**adenosine** or **calcium channel blocker** under stable regular QRS pathway

<u>Sedation Options:</u>
(Choose one)
(Titrate to minimum amount necessary)
Midazolam 1-5 mg IV/IO
(0.05 mg/kg) titrated
OR
Diazepam 5-10 mg IV/IO
(0.1 mg/kg) titrated to effect
OR
Lorazepam 1-2 mg IV/IO
0.1 mg/kg, max 2 mg/dose) titrated

NARROW COMPLEX TACHYCARDIA – ADULT
STATEWIDE ALS PROTOCOL

Criteria:

A. Symptomatic adult patients with heart rates >100 bpm and narrow QRS complex (< 0.12 sec). It is uncommon for serious symptoms to be related to tachycardia if heart rate is <150 bpm.

Exclusion Criteria:

A. Sinus tachycardia - treat underlying cause rather than rhythm. Causes may include:

1. Trauma - Follow appropriate trauma protocol
2. Fever
3. Hypovolemia/ Shock

B. Wide-complex tachycardias should not be treated with this protocol (SVT with wide QRS complex may be due to Wolf-Parkinson-White, and the use of calcium channel-blockers in these patients can lead to cardiac arrest.)

Possible MC Orders:

A. Synchronized cardioversion

B. Amiodarone (if available) for narrow complex irregular rhythm or for unstable patient.

Notes:

1. Many patients who present with SVT have evidence of cardiovascular dysfunction (low blood pressure, chest pain, congestive heart failure, altered level of consciousness). Some of these patients are unstable (such as shock, pulmonary edema, decreased level of consciousness) and require immediate synchronized cardioversion. The rest who have mild hypotension, mild shortness of breath/scattered rales, chest discomfort and a GCS **>** 13 may be treated with medications. If the patient develops signs/ symptoms of unstable SVT at any time during treatment, proceed immediately to the cardioversion column. The following chart illustrates the continuum from borderline to critically unstable.

Borderline	**Unstable**
Low BP	Shock
SOB, Scattered Rales	Pulmonary Edema
Mild chest discomfort	Severe chest discomfort
Alert & oriented	Decreased level of consciousness
GCS 14-15	GCS $\leq$ 13

2. Regular narrow complex supraventricular tachycardias (SVTs) include reentry AV nodal tachycardia and atrial tachycardia. Atrial flutter with 2:1 conduction may be difficult to distinguish from other forms of SVT. Adenosine is not indicated if the ECG is determined to be atrial flutter or fibrillation. If atrial flutter is identified, proceed to treatment of irregular narrow complex tachycardia. If sinus tachycardia is noted, treat the underlying cause with other appropriate protocol. Fast irregular rhythms can appear regular- measure R-R intervals to be sure.
3. Avoid carotid massage if patient is older than 50 y/o or has history of hypertension.
4. Adenosine must be given by rapid IV/IO push (over 1-3 seconds) by immediate bolus of 20 ml NSS. Adenosine success may be enhanced by administration through an antecubital IV with the arm elevated above the level of the heart during injection.
5. **Do NOT give diltiazem or verapamil if wide complex QRS or if SBP < 100**. Calcium channel blocker medications may not be the best treatment for patients with impaired ventricular function and medical command should assist with this decision.
6. May substitute verapamil 5 mg IV/IO slowly over 3-5 minutes. May repeat once at 5-10 mg dose after 15 minutes.
7. Irregular narrow complex tachycardias include atrial fibrillation, atrial flutter, or multifocal atrial tachycardia (MAT). **DO NOT** treat MAT with medications.
8. Begin with 100 joules if using a monophasic defibrillator or if ECG rhythm is atrial fibrillation.
9. If using a biphasic defibrillator, initial and subsequent countershock energy doses should be determined by agency medical director.
10. Unstable patients with known chronic atrial fibrillation may be refractory to cardioversion. Consider early Medical Command contact and rapid transport.

Performance parameters

A. Review for correct documentation of rhythm and for inclusion of rhythm strip in PCR

B. Review for documentation of vital signs and rhythm after each medication or cardioversion.

NARROW COMPLEX TACHYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL

Initial Patient Contact – see protocol #201

↓

Manage Airway/ Ventilate, if needed
Apply Oxygen
Monitor ECG & Pulse Oximetry
Consider 12-Lead ECG, if available and patient stable

↓

Probable SVT
- History of abrupt rate changes
- P waves absent/abnormal
- HR not variable
- Infants: rate usually ≥ 220 bpm
- Children: rate usually ≥ 180 bpm

OR

Probable Sinus Tachycardia
- Known cause [5]
- P waves present/normal
- Constant P-R; variable R-R
- Infants: rate usually < 220 bpm
- Children: rate usually < 180 bpm

↓

Probable SVT
Unstable with signs of Poor Perfusion [1]

↓

STABLE

↓

Consider vagal maneuvers [2]

Initiate IV/IO NSS

↓

Adenosine 0.1 mg/kg IV/IO [3]
Maximum 6 mg
(if available)
May repeat with 0.2 mg/kg IV/IO [3]
Maximum 12 mg

↓

UNSTABLE [1]

↓

Initiate IV/IO NSS

Sedation before cardioversion
if conscious (see box at right)

DO NOT delay cardioversion [4]

If IV/IO readily available [4],
Adenosine 0.1 mg/kg IV/IO [3]
Maximum 6 mg
(if available)
May repeat with 0.2 mg/kg IV/IO [3]
Maximum 12 mg

If HR >180, consider
Synchronized Cardioversion
0.5 - 1 joules/kg
If no conversion, repeat
at 2 joules/kg,
~~then at 4 joules/kg~~

↓

Contact Medical Command

Probable Sinus Tachycardia

↓

Assess for cause of sinus tachycardia [5]

↓

Follow other appropriate protocol

Sedation Options:
(Choose one)
(Titrate to minimum amount necessary)
Midazolam 0.05 mg/kg IV/IO titrated
OR
Diazepam 0.1 mg/kg IV/IO titrated
OR
Lorazepam 0.1 mg/kg IV/IO (max 2 mg/dose) titrated

NARROW COMPLEX TACHYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Pediatric (preadolescent ≤ 14 years of age) patient presenting with narrow QRS complex (≤ 0.08 sec) and symptomatic heart rates greater than normal for age.

Exclusion Criteria:

A. Tachycardia in trauma patients (see appropriate trauma protocol)

B. Tachycardia due to shock – Follow Shock Protocol #7005.

Possible MC Orders:

A. Amiodarone (if available) 5 mg/kg IV/IO infused over 20-60 minutes.

B. Procainamide (if available) 15 mg/kg IV/IO infused over 30-60 minutes. Avoid administering both amiodarone and procainamide.

C. Additional synchronized cardioversions.

Notes:

1. Poor perfusion is suggested by central cyanosis, tachypnea, altered level of consciousness, weak or absent peripheral pulses, or hypotension for age [SBP < 70 + (2 x age)].
2. Appropriate vagal maneuvers include:
   a. Infants and young children: Cover entire face with large bag of ice without occluding the airway.
   b. Older children: Valsalva (blow through obstructed straw) and/or carotid sinus massage.
3. Adenosine must be given by rapid IV/IO push (over 1-3 seconds) by immediate bolus of 5 -10 mL NSS. Adenosine success may be enhanced by administration through an antecubital IV with the arm elevated above the level of the heart during injection.
4. In unstable patients, do not delay cardioversion for administration of sedation or trial of adenosine. In borderline unstable patients, adenosine may be tried and conscious patients should be sedated before cardioversion.
5. Possible causes of sinus tachycardia include:
   a. Fever
   b. Shock
   c. Hypovolemia (e.g. vomiting/ diarrhea, blood loss)
   d. Hypoxia
   e. Abnormal electolyes
   f. Drug ingestions
   g. Pneumothorax
   h. Cardiac tamponade

Performance Parameters:

A. Review for documentation of vital signs and rhythm after each medication or cardioversion.

B. Review for correct documentation of rhythm and for inclusion of rhythm strip in PCR

WIDE COMPLEX TACHYCARDIA – ADULT
STATEWIDE ALS PROTOCOL

Initial Patient Contact – see protocol #201

Manage Airway/ Ventilate, if needed
Apply Oxygen
Monitor ECG & Pulse Oximetry

Unstable with serious signs or symptoms [1]
Related symptoms uncommon if HR <150

STABLE

IV/IO Access
12-Lead ECG, if available

Regular Wide QRS Rhythm?

REGULAR [2]

First consider , **Adenosine** 6 mg IV/IO [3,4] (if available)
May repeat 12 mg IV

OR

Lidocaine
1.5 mg/kg IV/ IO

OR

Amiodarone
150 mg IV/IO infused over 10 minutes
(if available)

Contact Medical Command

Consider repeat
Lidocaine 0.75 mg/kg IV/IO or
Lidocaine infusion at 2-4 mg/min
OR
Consider repeat
Amiodarone dose or
Amiodarone infusion (1 mg/min)
(if available)

IRREGULAR [5]

Contact Medical Command

Amiodarone
150 mg IV/IO infused over 10 minutes
(if available)

OR

If torsades,
Magnesium
2 g IV/ IO

If unstable, repeat synchronized cardioversion after antidysrhythmic

UNSTABLE

IV/IO Access

Consider Sedation, if conscious
(see box below)

DO NOT delay cardioversion

Synchronized Cardioversion
100 joules [6,7,8]
If no conversion, repeat at 200, 300, 360 joules [7] until conversion

Sedation Options:
(Choose one)
(Titrate to minimum amount necessary)

Midazolam 1-5 mg IV/IO (0.05 mg/kg) titrated;
OR
Diazepam 5-10 mg IV/IO (0.1 mg/kg) titrated;
OR
Lorazepam 1-2 mg IV/IO (0.1 mg/kg, max 2 mg/dose) titrated

WIDE COMPLEX TACHYCARDIA – ADULT
STATEWIDE ALS PROTOCOL

Criteria:

A. Symptomatic adult patients with heart rates >100 bpm and wide QRS complex (≥ 0.12 sec). It is uncommon for serious symptoms to be related to tachycardia if heart rate is <150 bpm.

Exclusion Criteria:

A. Sinus tachycardia with aberrancy - treat underlying cause rather than rhythm. Causes may include:

1. Trauma- Follow appropriate trauma protocol
2. Fever
3. Hypovolemia/ Shock – Follow Shock Protocol #7005.

B. PEA – Follow PEA Protocol #3041A.

Possible MC Orders:

A. Synchronized cardioversion

B. Amiodarone (if available) 150 mg IV/IO infused over 10 minutes. May be repeated as needed up to 2.2 gm in 24 hours.

C. Consider sodium bicarbonate if suspected hyperkalemia or overdose.

D. Consider calcium chloride, 10 ml of 10% solution IV (if available) if suspected renal failure/ dialysis patient or overdose of calcium channel blocker.

E. Consider glucagon, 3-10 mg (0.05mg/kg) IV (if available) if suspected calcium channel blocker overdose that is unresponsive to calcium chloride.

Notes:

1. Many patients who present with wide complex tachycardia have evidence of cardiovascular dysfunction (low blood pressure, chest pain, congestive heart failure, altered level of consciousness). Some of these patients are unstable (such as shock, pulmonary edema, decreased level of consciousness) and require immediate synchronized cardioversion. The rest who have mild hypotension, mild shortness of breath/scattered rales, chest discomfort and a GCS **>**13 may be treated with medications. If the patient develops unstable signs/symptoms at any time during treatment, proceed immediately to the cardioversion column. The following chart illustrates the continuum from borderline to critically unstable.

Borderline	**Unstable**
Low BP	Shock
SOB, Scattered Rales	Pulmonary Edema
Mild chest discomfort	Severe chest discomfort
Alert & oriented	Decreased level of consciousness
GCS 14-15	GCS ≤ 13

2. Regular wide complex tachycardias include ventricular tachycardia and SVT with aberrancy. If the patient has a previous history of coronary artery disease, then VT is most likely. If SVT with aberrancy is suspected, adenosine (if available) may be tried. If sinus tachycardia is noted, treat the underlying cause with other appropriate protocol.
3. Vagal maneuvers may be considered. Avoid carotid massage if patient is older than 50 y/o or has history of hypertension.
4. Adenosine must be given by rapid IV push (over 1-3 seconds) by immediate bolus of 20 mL NSS. Adenosine success may be enhanced by administration through an antecubital IV with the arm elevated above the level of the heart during injection.
5. Irregular wide complex tachycardias include atrial fibrillation, pre-excitation atrial fibrillation, polymorphic VT and torsades de pointes.
6. Begin with 100 joules if using a monophasic defibrillator or if ECG rhythm is atrial fibrillation.
7. If using a biphasic defibrillator, initial and subsequent countershock energy doses should be determined by agency medical director.
8. Unstable patients with known chronic atrial fibrillation may be refractory to cardioversion. Consider early Medical Command contact and rapid transport.

Performance Parameters:

A. Review for correct documentation of rhythm and for inclusion of rhythm strip in PCR.

B. Review for documentation of vital signs and rhythm after each medication or cardioversion.

WIDE COMPLEX TACHYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL

Initial Patient Contact – see protocol #201

Manage Airway/ Ventilate, if needed
Apply Oxygen
Monitor ECG & Pulse Oximetry
Consider 12-Lead ECG, if available and patient stable

Probable VT/ SVT
- **History of abrupt rate changes**
- **P waves absent/abnormal**
- **HR not variable**

OR

Probable Sinus Tachycardia
- **Known cause [6]**
- **P waves present/normal**
- **Constant P-R; variable R-R**
- **Infants: rate usa. < 220 bpm**
- **Children: rate usa. < 180 bpm**

Probable VT/ SVT
Unstable with signs of Poor Perfusion [1]

STABLE

Consider vagal maneuvers [2]

Initiate IV/IO NSS

Adenosine 0.1 mg/kg IV/IO [3]
Maximum 6 mg (if available)
May repeat with 0.2 mg/kg IV/IO [3]
Maximum 12 mg

Contact Medical Command

Lidocaine 1 mg/kg IV/IO

OR

Amiodarone 5 mg/kg IV/IO infused over 20-60 minutes [5] (if available)

UNSTABLE [1]

Contact Medical Command

Initiate IV/IO NSS

DO NOT delay cardioversion [4]

If IV/ IO readily available [4], Adenosine 0.1 mg/kg IV/IO [3]
Maximum 6 mg (if available)
May repeat with 0.2 mg/kg IV/IO [3]
Maximum 12 mg

Sedation before cardioversion
if conscious (see box at right)

Synchronized Cardioversion
0.5 - 1 joules/kg
If no conversion, repeat at 2 joules/kg,
~~then at 4 joules/kg~~

Probable Sinus Tachycardia

Assess for cause of sinus tachycardia [6]

Follow other appropriate protocol

Sedation Options:
(Choose one)
(Titrate to minimum amount necessary)

Midazolam 0.05 mg/kg IV/IO titrated
OR
Diazepam 0.1 mg/kg IV/IO titrated
OR
Lorazepam 0.1 mg/kg IV/IO (max 2 mg/dose) titrated

WIDE COMPLEX TACHYCARDIA – PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Pediatric (preadolescent ≤ 14 years of age) patient presenting with narrow QRS complex (> 0.08 sec) and symptomatic heart rates greater than normal for age

Exclusion Criteria:

A. Tachycardia in trauma patients (see appropriate trauma protocol)

B. Tachycardia due to shock – Follow Shock Protocol #7005.

C. PEA - Follow PEA Protocol # 3041P.

Treatment:

A. See accompanying flowchart.

Possible MC Orders:

A. Amiodarone (if available) 5 mg/kg IV/IO infused over 20-60 minutes.

B. Lidocaine 1 mg/kg IV/IO

C. Procainamide (if available) 15 mg/kg IV/IO infused over 30-60 minutes. Avoid administering both amiodarone and procainamide.

D. Additional synchronized cardioversions.

E. Consider sodium bicarbonate, 1-2 mEq/kg IV/IO, if suspected hyperkalemia or overdose on tricyclic antidepressant or cocaine.

F. Consider calcium chloride, 0.2 mL/kg of 10% solution IV (if available) and glucagon, 0.1 mg/kg IV/IO (if available) if suspected overdose of calcium channel blocker.

G. **WARNING:** Calcium channel blocker medications should not be given for wide QRS rhythms.

Notes:

1. Poor perfusion is suggested by central cyanosis, tachypnea, altered level of consciousness, weak or absent peripheral pulses, or hypotension for age [SBP < 70 + (2 x age)].
2. Appropriate vagal maneuvers include:
   a. Infants and young children: Cover entire face with large bag of ice without occluding the airway.
   b. Older children: Valsalva (blow through obstructed straw) and/or carotid sinus massage.
3. Adenosine must be given by rapid IV push (over 1-3 seconds) by immediate bolus of 5 -10 mL NSS. Adenosine success may be enhanced by administration through an antecubital IV with the arm elevated above the level of the heart during injection.
4. In unstable patients, do not delay cardioversion for administration of sedation or trial of adenosine. In borderline unstable patients, adenosine may be tried and conscious patients should be sedated before cardioversion.
5. May substitute lidocaine, 1 mg/kg IV/IO, repeated every 5 minutes to total of 3 mg/kg.
6. Possible causes of sinus tachycardia include:
   a. Fever
   b. Shock
   c. Hypovolemia (e.g. vomiting/ diarrhea, blood loss)
   d. Hypoxia
   e. Abnormal electolyes
   f. Drug ingestions
   g. Pneumothorax
   h. Cardiac tamponade

Performance Parameters:

A. Review for documentation of vital signs and rhythm after each medication or cardioversion.

B. Review for correct documentation of rhythm and for inclusion of rhythm strip in PCR.

MULTISYSTEM TRAUMA OR TRAUMATIC SHOCK
STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol #201
Stabilize C-spine during assessment
Open airway using modified jaw thrust, if indicated.
Consider Air Ambulance – per Trauma Triage Protocol #180
Consider Rapid Extrication [1]

↓

Manage Airway/Administer Oxygen/Ventilate, if needed [2,3,4,5,6]
If tension pneumothorax suspected, Needle Decompression [7]
Control External Bleeding
Complete Spinal Immobilization, if indicated [8]

↓

The Following Treatments Should Not Delay Transport:

- Initiate IV/IO NSS
  - Initiate 2 large-bore IVs or single IO, if possible
  - If hypotensive, titrate NSS bolus as described [9]
- Monitor ECG/Pulse Oximetry
- Notify Trauma Center/receiving facility of ETA/category ASAP

→

Injury Specific Treatments:

- Follow other appropriate protocols [10]
- Immobilize Suspected Fractures
  - Traction splint preferred for isolated femur fracture
  - Consider pelvic binder (if available) for suspected pelvis fracture with hypotension [11]
- Occlude sucking chest wounds [12]
- Cover eviscerations [13]

↓

BEGIN TRANSPORT TO TRAUMA CENTER ASAP, if possible
(See Trauma Destination Protocol #180)

↓

CONTACT MEDICAL COMMAND

↓

If hypotension persists
AND
due to hypovolemic shock:
Repeat IV/IO NSS fluid bolus [9]

OR

If hypotension persists
AND
due to spinal cord injury:
Dopamine Drip [14]

MULTISYSTEM TRAUMA OR TRAUMATIC SHOCK
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient that meets Category 1 or Category 2 trauma triage criteria related to traumatic injury.

B. Patients with symptoms of spinal cord injury including extremity weakness, numbness or sensory loss.

Exclusion Criteria:

A. Cardiac Arrest related to trauma – Follow BLS Cardiac Arrest – Traumatic Protocol #332.

B. Hypotension not related to trauma – See appropriate Shock or Cardiac protocol.

C. Patient that meets Category 3 trauma triage criteria – See appropriate injury-specific protocol.

Possible Medical Command Orders:

A. Additional NSS for hypotension.

B. Dopamine or epinephrine infusion for neurogenic shock

C. Assistance with destination decisions (Trauma Center v. non-Trauma Center, Pediatric Trauma Center v. Adult Trauma Center, etc.)

Notes:

1. Rapid extrication may be appropriate in any unsafe environment: danger of explosion (including potential secondary explosion at a terrorism incident); rapidly rising water; danger of structural collapse; hostile environments (e.g. riots); patient position prevents access to another patient that meets criteria for rapid extrication; shock; inability to establish an airway, adequately ventilate a patient, or control bleeding in entrapped position; or cardiac arrest.
2. Indications for ventilatory support include GCS < 8, inadequate respiratory effort, and airway not patent.
3. When possible, the patient should be intubated by orotracheal route using manual inline stabilization of the cervical spine. When patient's reflexes and muscle tone do not permit orotracheal intubation, consider BVM ventilation if adequate or nasotracheal intubation. Ventilation with BVM may be as effective as endotracheal intubation in children when transport times are short.
4. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds *AND* confirmatory device (like wave-form $ETCO_2$ detector). Follow Confirmation of Airway Placement Protocol #2032.
5. If unable to intubate patient on up to 3 attempts, consider the use alternative/ rescue airway device.
6. If intubation/ventilation is needed, **AVOID OVERZEALOUS HYPERVENTILATION**.
   a. For patients with these signs of severe head injury (GCS motor score of 1-2 or unequal/unreactive pupils), hyperventilate at:
      1) 20 bpm for adults
      2) 30 bpm for children >1 and ≤14 y/o
      3) 35 bpm for infant < 1 y/o
   b. For all other trauma patients requiring ventilation, ventilate at:
      1) 10 bpm for adults
      2) 20 bpm for children > 1 and ≤ 14 y/o

3) 25 bpm for infant < 1 y/o

7. Perform needle chest decompression if indicated by hypotension *AND* diminished breath sounds.
8. Follow BLS Spinal Immobilization Protocol #261.
9. IV/IO NSS fluid resuscitation should be guided by the following:
   a. Adults: Administer NSS at wide open rate only until desired blood pressure is attained:
      1) When bleeding has not been controlled, titrate NSS to permit moderate hypotension (SBP between 70-90) unless severe head injury also present.
      2) When bleeding has been controlled or if severe head injury, titrate NSS to achieve SBP >90.
      3) Maximum NSS dose is 2000 mL before contacting Medical Command.
   b. Pediatrics (preadolescent or age ≤ 14 y/o:
      1) When bleeding has not been controlled, titrate NSS to permit moderate hypotension (SBP between [50 + 2(age)] – [70 + 2(age)]), unless severe head injury also present.
      2) When bleeding has been controlled or if severe head injury, titrate NSS to achieve SBP > 70 + 2(age).
      3) Maximum NSS dose is 40 mL/kg before contacting Medical Command.
10. Other injury-specific appropriate protocols may include amputation, extremity trauma, burn, impaled object, or head injury.
11. Pelvic binder splinting devices (circumferential commercial devices that compress the pelvis) are appropriate splinting devices. ~~MAST, if available, may also be used for suspected pelvis fracture with hypotension or for suspected pelvis fracture when associated with other femur, tibia, or fibula fractures. See MAST Suit Use Protocol #263.~~
12. If sucking chest wound, cover wound with occlusive dressing sealed on 3 sides. Release dressing if worsened shortness of breath or signs of tension pneumothorax.
13. If intestinal evisceration, cover intestines with a sterile dressing moistened with sterile saline or water; cover the area with an occlusive material (aluminum foil or plastic wrap). Cover the area with a towel or blanket to keep it warm. Transport with knees slightly flexed if possible.
    a. **DO NOT PUSH VISCERA BACK INTO ABDOMEN**, unless prolonged extrication. In wilderness/delayed transport situations with prolonged evacuation time (at least several hours), examine the bowel for visible perforation or fecal odor. If no perforation is suspected, irrigate the eviscerated intestine with saline and gently try to replace in abdomen.
14. Mix dopamine infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP > 100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**

Performance Parameters:

A. Documentation of reason for any on scene time interval over 10 minutes.

B. Percentage of calls, without entrapment, with on scene time interval ≤ 10 minutes. Consider benchmark for on scene time for non-entrapped patients ≤ 10 minutes and ≤ 20 minutes for entrapped trauma patients and Category 2 trauma patients.

C. Documentation of applicable trauma triage criteria.

D. Appropriate destination per Trauma Patient Destination Protocol #180.

E. Appropriate utilization of air medical transport per Trauma Patient Destination Protocol #180.

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MUSCULOSKELETAL ~~EXTREMITY~~ TRAUMA

STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol #201

Assess pain on 1-10 scale
Assess Neurovascular Status distal to injury

Splint suspected fractures as appropriate:

- Traction splinting is preferred ~~over MAST~~ for isolated femur fractures [1]
- Straighten severely angulated fractures if distal extremity has signs of decreased perfusion.

If Analgesia indicated: [2]

- Monitor Pulse Oximetry
- Administer oxygen, if indicated
- Initiate IV/IO NSS [3]
- Administer Analgesic Medication [4,5] (see box below)

CONTACT MEDICAL COMMAND

ANALGESIC MEDICATION OPTIONS
(Choose one)

Fentanyl 50-100 mcg IV/IO/IN [6,7] (1 mcg/kg)
may repeat ½ dose every 5 minutes until maximum of 3 mcg/kg

OR

Morphine sulfate 2-5 mg IV [6,7]
(0.05 mg/kg)
may repeat dose every 5 minutes
until maximum of 0.2 mg/kg

OR

Nitrous Oxide (50:50) by inhalation [8]

MUSCULOSKELETAL TRAUMA
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with isolated suspected extremity fractures.

B. Patient with acute extremity pain after trauma

C. Patient with acute back pain, excluding chronic back pain

D. Patient with acute thoracic/ rib pain after trauma

Exclusion Criteria:

A. Multisystem trauma or traumatic/hypovolemic shock (Follow Multisystem Trauma or Traumatic Shock protocol #6002)

Possible Medical Command Orders:

A. Additional fentanyl or morphine or acetaminophen

B. Intramuscular fentanyl or morphine

Notes:

1. Traction splinting should not be used for hip (proximal femoral neck) fractures.
2. Narcotic pain medication should not be given if:
   a. Oxygen saturation $\leq$ 95%
   b. SBP < 100 for adults
   c. SBP < 70 + 2(age in years) for children < 14 y/o
   d. Patient has altered level of consciousness
3. IV/IO access is not required for administration of nitrous oxide.
4. Narcotic pain medication may not be administered for other medical/trauma conditions (e.g. abdominal pain or multiple rib fractures) before attempted contact with Medical Command.
5. Reassess and document 1-10 pain score after each dose of analgesia.
6. Reduce dose for patients over 65 y/o.
7. If respiratory depression or hypoxia occur after narcotic:
   a. Administer oxygen and ventilate if necessary
   b. If significant respiratory depression, administer naloxone 0.4 mg IV, titrate additional doses until adequate ventilation or total of 2 mg.
8. Nitrous oxide should be self-administered. Patient should be coached to hold mask on his/her face, and the patient will drop mask if he/she becomes sedated. Oversedation may occur if EMS provider holds mask to patient's face. Nitrous oxide may be administered without IV access.

Performance Parameters:

A. Pain medication given or documentation of pain medication being offered for suspected isolated extremity fractures.

B. Traction splinting used for isolated femur fractures without hypotension in all cases.

C. Vital signs and oxygen saturation documented before and after any administration of narcotic.

D. Severity of pain documented for all painful conditions, and documented before and after analgesic medications/ interventions.

CRUSH SYNDROME
STATEWIDE ALS PROTOCOL

Initial Patient Contact- See Protocol #201
Follow all other appropriate Trauma Protocols also
Administer Oxygen
In collapsed building, place surgical mask/ filter mask on patient, if possible [1]
Monitor ECG and pulse oximetry

↓

Initiate IV/ IO NSS
Administer NSS bolus of 20 mL /kg (warm if possible) [2,3]

↓

Patient Entrapped?

NO → **See Multisystem Trauma Protocol #6002, Extremity Injury Protocol #6003, or other appropriate protocol(s)**

YES ↓

Before Extrication:
Coordinate extrication time with Rescue
Monitor ECG continuously if possible [4]
Assess extremity neurovascular status
Initiate second IV/IO if possible
Administer analgesia per protocol #6003 [5]
If hypotension or entrapped > 1 hour, administer additional NSS bolus of 20 mL /kg/hr
(or administer fluids to maintain urine output of 300 mL/hr [Peds: 2 mL/kg/hr])
Examine urine/ measure output if prolonged entrapment

Contact Medical Command if communications possible

Immediately prior to extrication:
Sodium Bicarbonate, 1 mEq/kg IV/IO
If hyperkalemia, Calcium chloride (if available), 10 mL 10% solution IV/IO
[Peds: 0.2 mL/kg IV/IO]
Caution: bicarbonate and **calcium** will precipitate if given together in same IV site
Anticipate possible cardiac arrest on extrication

After extrication:
IV NSS wide open to maintain SBP > 100 [Pediatrics SBP > 70 + 2 (age)]
If QRS widens repeat **sodium bicarbonate** and **calcium chloride** (if available) doses above.

Contact Medical Command

CRUSH SYNDROME
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient entrapped and crushed under heavy load (e.g. extremities and/or body crushed in building collapse, trench collapse, industrial accident, or pinned under/by heavy vehicle/ farm equipment for more than 30 minutes and with suspected crush syndrome:

Exclusion Criteria:

A. Patient trapped for less than 30 minutes

B. Patient entrapped but without significant tissue crushing.

C. Altered mental status – See Altered Level of Consciousness Protocol #7002A or #7002P.

Possible Medical Command Orders:

A. Additional narcotic analgesic

B. Alteration in intravenous fluid volume

C. Benzodiazepine for anxiety

D. Additional sodium bicarbonate

Notes:

1. In addition to a dust mask, victims may need eye, head and hearing protection if rescue crews are working nearby. Surgical mask should not be applied if patient requires oxygen by mask.
2. Avoid using Ringer's lactate as an IV fluid due to its potassium content.
3. Victims of structural collapse may become hypothermic in prolonged incidents, even in warm weather.
4. Pain control is important; crush injury is painful, often increasing upon release.
5. EKG signs of severe and life threatening hyperkalemia should be treated with calcium chloride and sodium bicarbonate using dose in protocol.
   a. Signs of hyperkalemia:
      1) Mild – peaked T waves
      2) Moderate – prolonged PR interval, decreased P wave amplitude, ST segment depression
      3) Severe – QRS widening, flat P waves, second degree Mobitz I, PVCs
      4) Life Threatening – absent P waves, V-tach, AV block, extremely widened QRS

Performance Parameters:

A. Review every case where crush syndrome protocol used.

BLAST/ EXPLOSIVE INJURY
STATEWIDE ALS PROTOCOL

Criteria:

A. Injuries sustained in a blast or explosion, including:
1. Industrial explosions
2. Terrorist bombings
3. Any other type of explosion

Exclusion Criteria:

A. None

System Requirements:

A. If elevated threat of terrorist bombing, agencies should consider carrying several commercial tourniquets.

B. If elevated threat of terrorist bombing, fire/rescue/EMS agencies should consider availability of a Geiger counter with initial responding units.

C. Personal Protective Equipment:
1. If toxic materials are suspected, only appropriately trained and equipped personnel should enter the immediate area.
2. Without suspected toxic hazards, appropriate PPE for explosion scenes include outerwear (like coveralls and heavy "turn out" coat), heavy gloves, steel-toed shoes, hardhat, eye protection, dust particle mask.

Treatment:

A. All Patients:
1. Scene Safety – see Protocol # 102
   a. Consider risks of secondary explosions at scene, triage area, staging area, or receiving facilities
      1) Be observant for victims, vehicles, packages or containers that seem out of place.
   b. Consider risks of radiation contaminated victims of terrorist explosions.
      1) Screen scene with Geiger counter, if radiation is suspected and device is available
   c. Consider risks of unstable buildings and infrastructure.
2. Initial Patient Contact – see Protocol #201
   a. Initiate regional MCI plan if needed
      1) Triage patients using regional MCI plan [1,2,3]
         a) During triage, apply tourniquets to severely bleeding extremities.
      2) Explosion scenes should be presumed to be crime scenes until cleared by authorities – see Protocol # 919
   b. Explosions/ blasts may cause bilateral ruptured tympanic membranes – consider that communications with patients may be impaired.
   c. If thrown by explosion, immobilize spine if indicated – see Protocol # 261
3. If severe bleeding, see Protocol #501
   a. Use tourniquets early if severe extremity bleeding.
4. Consider blast-related injuries:
   a. Primary blast injuries (from blast pressure wave) [4]
      1) If Blast Lung suspected due to: SOB, rapid respirations, hypoxia[5] (pulse oximetry <95% when available), wheezing, cough, or coughing blood. Bradycardia may occur with blast lung.
         a) Administer high-flow oxygen
         b) Monitor pulse oximetry [Optional], if available [5]
         c) Initiate IV/IO NSS at KVO
            (1) Fluids may accumulate in lungs as edema

(2) If hypotension, hypovolemia, crush injury, or burns, infusion rates should be guided by appropriate related protocol(s), but Medical Command should be contacted, if possible, before exceeding 250 mL (Peds: 20 mL/kg) if concern for associated Blast Lung.

d) Observe stable patients for signs of blast lung

b. Secondary blast injuries (from projectiles) [6]

1) If impaled objects, follow Protocol #632

c. Tertiary blast injuries (from patient falling or being thrown by blast or pinned by debris) [7]

1) Immobilize spine, if required – see Protocol # 261
2) If multisystem trauma – see Protocol # 6002
3) If crush syndrome suspected – see Protocol # 6004

d. Quaternary blast injuries (all other injuries/conditions) [8]

1) If burns – see Protocol # 6071

5. Transport

a. Transport to trauma center if Category I or II trauma patient – see Protocol # 180

b. Closest ED may not be most appropriate receiving facility [9]

6. Contact Medical Command, if needed

Notes:

1. Severe internal injuries caused by blast wave may not be apparent initially. Eardrum (tympanic membrane – TM) rupture is the most common type of blast pressure injury and may be associated with other more serious blast injuries. When TM rupture is not present, other blast pressure injuries are less likely.
2. Projectile injuries (e.g. from nails or other sharp objects) may be overlooked at initial triage.
3. In MCIs with explosions, most patients have minor injuries. Overtriage may delay treatment of the smaller number of patients with salvageable life-threatening injuries.
4. Primary blast injuries are caused by the pressure wave of the blast. These include eardrum (tympanic membrane – TM) rupture, eye globe rupture, blast lung, intestinal rupture, and intraabdominal bleeding.
5. Hypoxia may precede other signs of blast lung injury like tachypnea or shortness of breath. Hypoxia despite high-flow oxygen is an indication for early endotracheal intubation, and highest priority triage and priority transport are indicated.
6. Secondary blast injuries are caused by projectiles. These may include debris from structures like glass or wood or may include debris from improvised explosive devices (IEDs) like nails in a pipe bomb. Serious injuries from penetrating objects may be overlooked during triage.
7. Tertiary blast injuries are caused by falling, being thrown or being pinned or entrapped. These include fractures and other injuries seen in blunt trauma. They also may include crush syndrome and compartment syndrome in entrapped patients.
8. Quaternary blast injuries are caused by other trauma/ environment related to explosions or by preexisting conditions of patient. Examples include burns and respiratory distress due to post-explosion dust.
9. Historically, in explosions with a large number of patients, the closest ED becomes overwhelmed with ambulatory patients before any EMS patients arrive. These overwhelmed facilities may not be able to appropriately treat more serious patients arriving by EMS. Transport officer should take this into consideration when dispersing patients to receiving facilities.

Performance Parameters:

A. Transport Category I and II trauma patients within 10 minutes of EMS patient contact unless delayed because patients exceed medical resources available

Additional Resources:

www.emergency.cdc.gov/BlastInjuries Centers for Disease Control

BURNS
STATEWIDE ALS PROTOCOL

Initial Patient Contact - Protocol #201
Use PPE/Remove from source of burn [1]
Follow BLS Burn Protocol # 671

History/Evidence of Category 1 or 2 Trauma

YES → **Proceed to Multisystem Trauma Protocol #6001**

NO

Manage Airway/Ventilate, if needed [2,3,4]
Administer Oxygen, if indicated [2]
Immobilize Spine, as indicated by BLS Protocol #261

Mechanism of burn injury

Chemical	**Thermal**	**Electrical / Lightning**
Brush off dry, then flush with water [5]	Dry, sterile sheet Cool, unless large BSA involved	Monitor ECG Dry, sterile dressing to entrance and exit wounds

Monitor Pulse Oximetry and/or ECG, if indicated [2,6]
Determine Burn Extent & Severity [7] (rule of nines)
Initiate IV/IO NSS, if indicated

Administer 20 mL /kg NSS wide open for hypotension or severe burn, [8]

Administer Analgesic Medication (see box below), if indicated [9]

TRANSPORT TO CLOSEST APPROPRIATE FACILITY/ TRAUMA CENTER [13]

Contact Medical Command [14]

If hypotension persists or if extensive BSA burn, repeat 20 mL /kg NSS fluid bolus [8]

If pain continues, Administer Repeat dose(s) of Analgesic Medication (see box below)

ANALGESIC MEDICATION OPTIONS
(Choose one)

Fentanyl 50-100 mcg IV/IO/IN [10,11] (1 mcg/kg)
may repeat ½ dose every 5 minutes until maximum of 3 mcg/kg

OR

Morphine sulfate 2-5 mg IV [10,11] (0.05 mg/kg)
may repeat dose every 5 minutes until maximum of 0.2 mg/kg

OR

Nitrous Oxide (50:50) by inhalation [12]

BURNS
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with burns from:

1. Thermal injury
2. Chemical dermal injury.

B. Patient with lightning or electrical injury.

Possible MC Orders:

A. Additional morphine or fentanyl

B. Transport to a burn center or trauma center

C. CPAP/BiPAP for respiratory difficulty

Notes:

1. Consider scene safety. Be aware of possible chemical contamination and/or electrical sources. Stop the burning process. Remove clothing and constricting jewelry.
2. Determine presence of respiratory burns as indicated by carbonaceous sputum, cough, hoarseness, or stridor (late). All patients with exposure to smoke or fire in a confined space should receive high-flow oxygen and Pulse Oximetry monitoring.
3. Consider early intubation in patients with respiratory distress, hoarseness, carbonaceous sputum or stridor. If unsure, contact medical command early for assistance with this decision.
4. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds **AND** confirmatory device (like wave-form $ETCO_2$ detector). Follow Confirmation of Airway Placement Protocol #2032.
5. For chemical burn exposure, begin flushing immediately with water or appropriate agent for chemical. **Exceptions:** for phosphorous and sodium, **DO NOT** flush with water, cover with cooking oil if available; for Phenol remove with alcohol and follow with large volume of water. If eye is burned, flush with large volume of NSS for 15-20 minutes. May administer tetracaine eye drops before flushing. Continue eye flushing during transport.
6. Monitor ECG for all patients with:
   a. Electrical/Lightning injury
   b. Respiratory symptoms
   c. Multisystem trauma
   d. Hypovolemic/Traumatic Shock
7. Indicators of severe burn injury include:
   a. Respiratory tract injury, inhalation injury.
   b. 2nd and 3rd degree burns that involve face, hands, feet, genitalia or perineal area or those that involve skin overlying major joints.
   c. 3rd degree burns of greater than 5% BSA.
   d. 2nd degree burns of greater than 15% BSA.
   e. Significant electrical burns, including lightning injury.
   f. Significant chemical burns.

g. Burn injury in patients with pre-existing illnesses that could complicate management, prolong recovery, or affect mortality.

Medical Command physician may direct transport to Burn Center in these cases.

8. **DO NOT** provide fluid bolus if respiratory symptoms are present.
9. Narcotic pain medication should not be given if:
   a. Oxygen saturation ≤ 95%
   b. SBP < 100 for adults
   c. SBP < 70 + 2(age in years) for children < 14 y/o
   d. Patient has altered level of consciousness
10. Reduce dose for patients over 65 y/o.
11. If respiratory depression or hypoxia occur after narcotic:
    a. Administer oxygen and ventilate if necessary
    b. If significant respiratory depression, administer naloxone 0.4 mg IV, titrate additional doses until adequate ventilation or total of 2 mg.
12. Nitrous oxide should be self-administered. Patient should be coached to hold mask on his/her face, and the patient will drop mask if he/she becomes sedated. Oversedation may occur if EMS provider holds mask to patient's face.
13. Transport to the closest appropriate medical facility, using the following order of preference:
    a. If unable to maintain airway or unable to ventilate or patient has symptoms of shortness of breath/cough or inhalation injury is suspected, transport to closest hospital.
    b. Transport to Trauma Center, if patient has associated trauma. Follow Trauma Destination Protocol #180.
    c. Transport to a burn center if:
       1) The patient has burns to more than 15% BSA or burns to face or hands, and
       2) The patient does not meet trauma triage criteria, and
       3) The difference between estimated transport time to the closest receiving facility and the burn center is 20 minutes or less.
    d. If none of the above apply, transport to the closest hospital.
14. Medical Command Physician may direct transport to Burn Center.

Performance Parameters:

A. Review all burn calls for compliance with Trauma Destinations Protocol # 180

B. Review all burn calls for frequency of administration of or documentation of offering pain medication.

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HYPOTHERMIA / COLD INJURY / FROSTBITE
STATEWIDE ALS PROTOCOL

Initial Patient Contact – Follow Protocol #201
Assess respirations and pulse for 45 seconds each [1]

- Manage Airway/ Ventilate, as indicated
  - Intubate gently if indicated
- Apply Oxygen [2]
- Monitor ECG / Pulse Oximetry
- Environment
  - Move patient to warm dry place
  - Remove wet clothing
  - Wrap in warm blankets

Patient temperature > 30° C (86° F)?
Patient is shivering and conscious?

NO

- **TRANSPORT IMMEDIATELY** [3,4]
  - **Transport to center capable of bypass rewarming, if possible**
  - Consider air ambulance if transport time > 30 minutes
- Obtain IV/ IO NSS
  - administer NSS 20 mL/kg up to 2000 mL total
  - use warmed NSS if possible
- Check blood glucose
  - if < 60 mg/dL, administer **Dextrose** [5]

If cardiac arrest develops, follow Cardiac Arrest-Hypothermia protocol #3035

Contact Medical Command

Repeat warmed NSS bolus to total of 60 mL/kg (max.3000 mL)

YES

- Active external rewarming:
  - apply heat packs to groin, axillae, and neck, if possible. [6]
- Consider IV NSS
- Check blood glucose
  - if < 60 mg/dL, administer **Dextrose**
- If the patient is alert, administer warm non-caffeinated beverages (if available) by mouth slowly.[7]

Contact Medical Command

HYPOTHERMIA / COLD INJURY / FROSTBITE
STATEWIDE ALS PROTOCOL

Criteria:

A. Generalized cooling that significantly reduces the body temperature.

B. Body temperature < 35° C (95° F).

1. Hypothermia is severe if core body temperature is < 30° C (86° F).

C. Frostbite generally affects feet, hands, ears, and/or face. Skin initially appears reddened, then mottled, bluish, white and/or gray. This is painful initially then becomes numb.

Exclusion Criteria:

A. Cardiac Arrest from hypothermia – Follow protocol # 3035.

B. DOA, including the following - see DOA protocol # 322.

1. Submersion for >1 hour.
2. Body tissue/chest wall frozen solid.
3. Body temperature same as surrounding temperature and other signs of death (lividity/ rigor)

C. Frostbite or cold injury isolated to soft tissues – Follow BLS Hypothermia Protocol # 681

Notes:

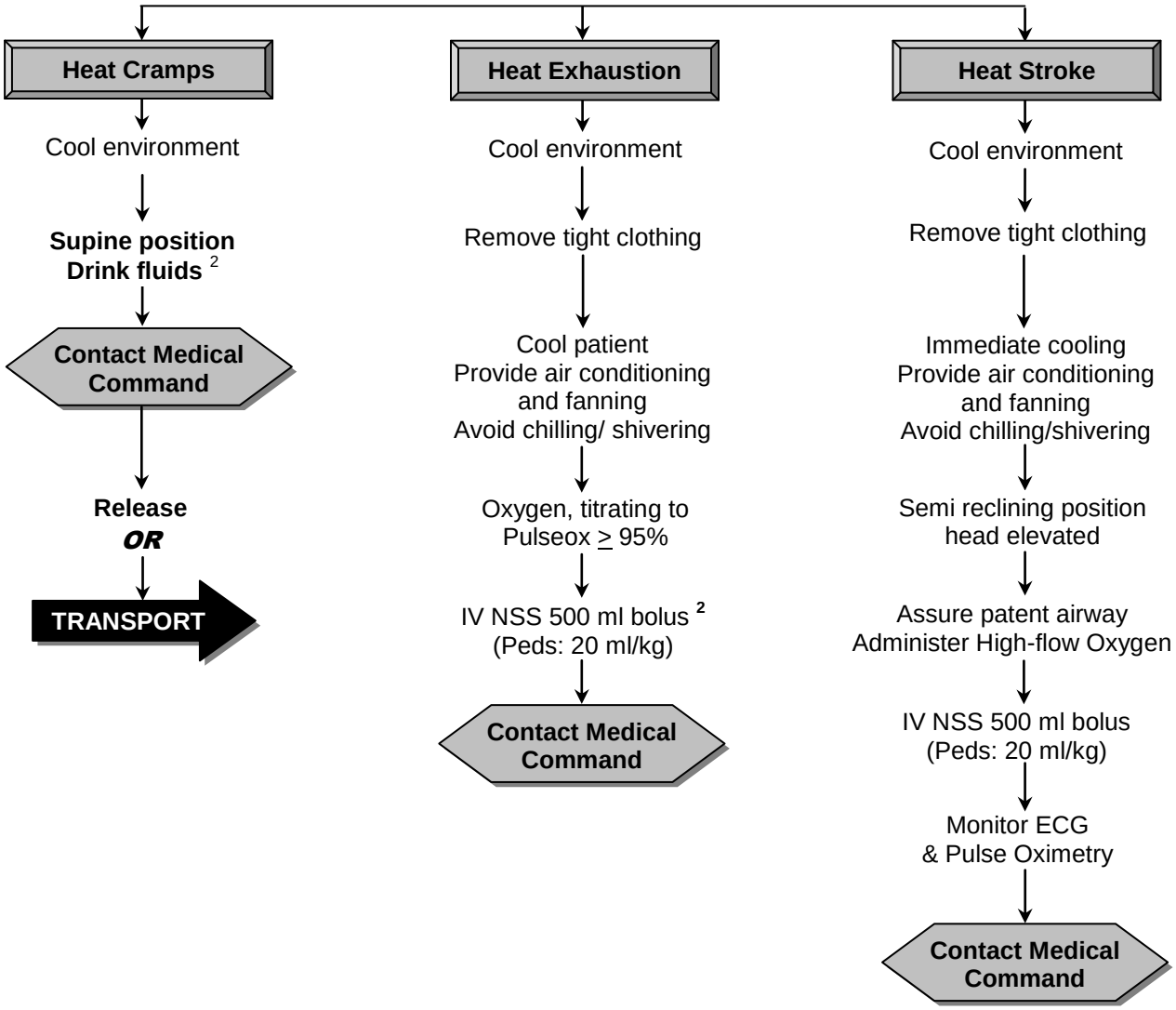
1. **Vital signs should be taken for a longer time than usual, so that a very slow pulse or respiratory rate is not missed. Assess pulse for 45 seconds. If a pulse or respirations are detected, *do not perform CPR.***
2. Use warmed humidified oxygen if available.
3. If unresponsive to verbal stimuli or temperature <30° C (86° F), transport to center capable of extracorporeal rewarming (cardiac bypass) if possible. If unsure whether center is capable of 24-hour/7-day emergent bypass rewarming, contact medical command to confirm availability *OR* transport to the closest Level II or III Trauma Center, following Trauma Triage Protocol # 180. Contact medical command at destination facility as soon as possible to provide maximum time for staff to prepare to receive the patient.
4. If the patient has severe hypothermia and vertical evacuation is required, transport the patient in a level position when possible. Transporting vertically with the head up has been associated with seizures and death.
5. Dextrose dosing:
   a. Adults- 25 gms IV/ IO, 10-50% dextrose concentration
   b. Pediatrics- 2 mL/kg IV/ IO of 25% dextrose (or 5 mL/kg of 10% concentration)
6. Do not place heat packs directly against skin- wrap in towel.
7. **DO NOT** permit fluids by mouth if patient also has severe traumatic injuries or abdominal pain.

Performance Parameters:

A. Review for transport to center capable of bypass rewarming when appropriate

HEAT EMERGENCIES
STATEWIDE ALS PROTOCOL

History/evidence of HEAT exposure
Initial Patient Contact – see Protocol # 201
Check blood glucose and treat hypoglycemia per protocol #7002
Follow Heat Emergency Protocol – see Protocol #686



HEAT EMERGENCY
STATEWIDE ALS PROTOCOL

Criteria:

A. Heat Cramps - Painful muscle spasms of the skeletal muscles that occur following heavy work or strenuous exercise in hot environments. Thought to be caused by rapid changes in extracellular fluid osmolarity resulting from fluid and sodium loss. Signs and symptoms include

1. Alert
2. Muscle cramps (normally in muscles most recently heavily exercised)
3. Hot, diaphoretic skin
4. Tachycardia
5. Normotensive

B. Heat exhaustion - Patient presents with dizziness, nausea, headache, tachycardia, and possibly syncope. Usually from exposure to high ambient temperatures accompanied by dehydration due to poor fluid intake. Temperature is less than 103° F. Rapid recovery generally follows saline administration.

C. Heat Stroke [1] - Patient should be treated as heat stroke if he/she has ALL of the following

1. Exposure to hot environment, and
2. Hot skin, and
3. Altered mental status

Exclusion Criteria:

A. None

Possible MC Orders:

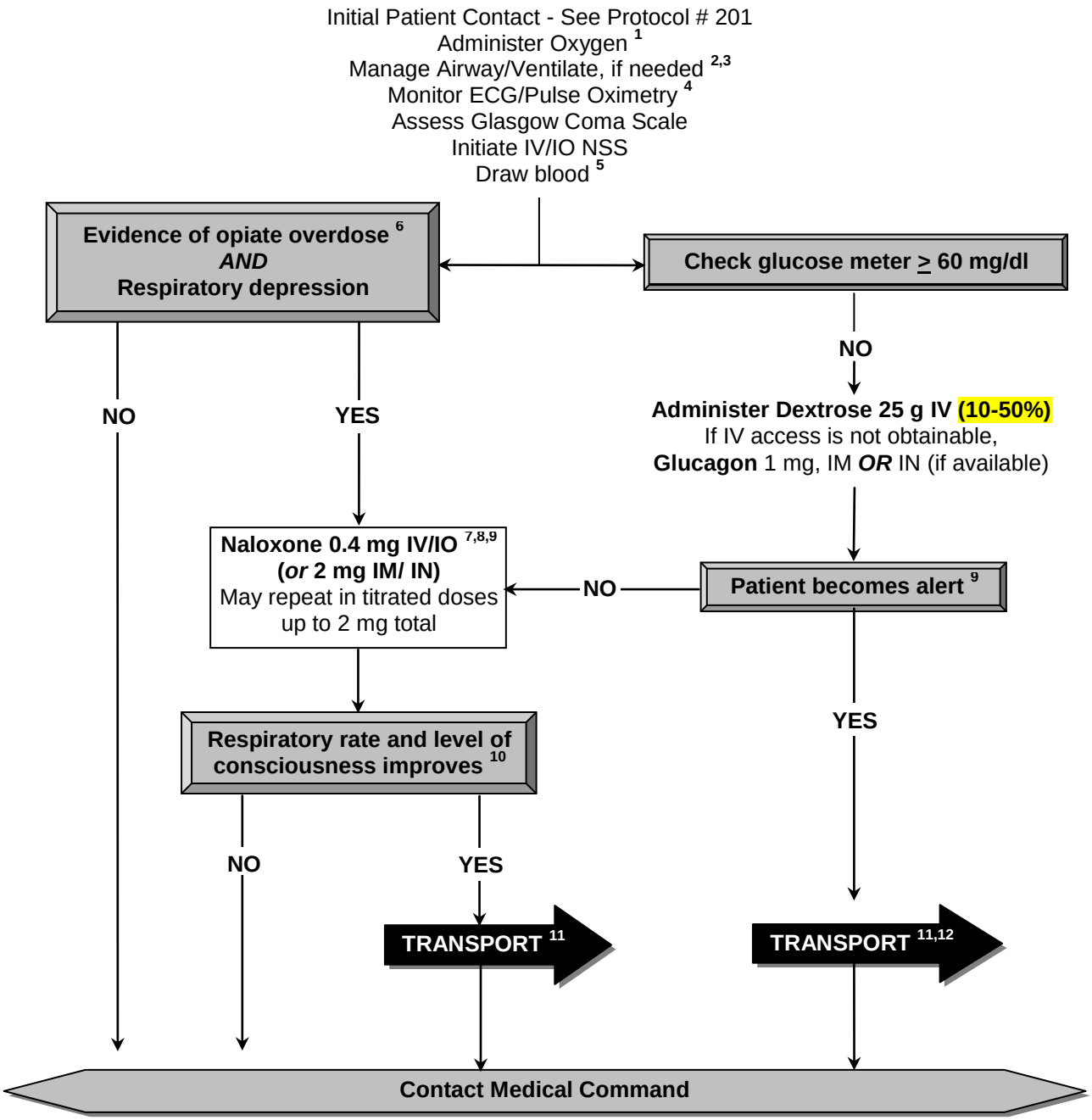
A. Medical command physician may order release of care for mild heat cramps or mild heat exhaustion.

B. May order additional fluid boluses

Notes:

1. Patient's thermoregulatory mechanisms break down completely. Body temperature is elevated to extreme levels, which results in multi-system tissue damage including altered mental status. Heat stroke often affects elderly patients with underlying medical disorders. Patients usually have dry skin; however, up to 50% of patients with exertional heat stroke may exhibit persistent sweating. Therefore, patients with heat stroke may be sweating.
2. Patient may take oral fluid replacement rather than IV if no nausea. Allow oral intake of cool fluids or water (may use commercial sport/rehydration drinks like Gatorade or Powerade) if patient is alert. Do not permit the patient to drink if altered mental status, abdominal pain or nausea. Avoid carbonated sodas, alcoholic beverages, and caffeinated beverages.

ALTERED LEVEL OF CONSCIOUSNESS
STATEWIDE ALS PROTOCOL



ALTERED LEVEL OF CONSCIOUSNESS - ADULT
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with altered level of consciousness due to:

1. Unclear etiology after assessing patient
2. History consistent with hypoglycemia
3. Suspected drug ingestion /overdose

Exclusion Criteria:

A. Altered level of consciousness due to:

1. Trauma - Follow appropriate trauma protocol (e.g. head injury or multi-system trauma protocol)
2. Shock - Follow Shock protocol # 7005
3. Dysrhythmias - Follow appropriate dysrhythmia protocol.
4. Toxicologic
   a. Carbon monoxide - Follow Poisoning/Toxic Exposure Protocol #8031.
   b. Cyanide - Follow Cyanide Exposure Protocol #8081.
   c. Nerve agent exposure - Follow Nerve Agent Exposure Protocol #8083.
5. Seizure - Follow Seizure Protocol #7007.
6. Stroke - Follow Stroke Protocol #7006.
7. Other medical problems specifically suspected due to history or exam, e.g. choking, hypoxia due to respiratory failure, etc…- Follow applicable specific protocol.

Possible MC Orders:

A. Additional doses of naloxone

B. Additional doses of dextrose or glucagon (if available)

Notes:

1. Administer oxygen by appropriate method.
2. Confirm and document tube placement with auscultation and $ETCO_2$ detector/secondary device - Follow Confirmation of Airway Placement Protocol #2032
3. If unable to intubate on up to 3 attempts, consider Alternative/ Rescue airway.
4. See Pulse Oximetry Protocol #226. Pulse Oximetry must not delay the application of oxygen. Record SpO_2 after administration of oxygen or intubation.
5. If receiving facility will accept blood samples, blood should be drawn in red top tube for analysis at the hospital unless the patient is a known diabetic who takes insulin or oral diabetic medications (e.g. micronase, glyburide, glucophage, etc…)
6. Indications of possible opiate overdose include decreased respirations, pinpoint pupils, skin “track marks”, *AND/OR* the presence of drug paraphernalia.
7. Naloxone should not be given to patients that have been intubated.
8. Naloxone can be administered IM, IO, or intranasally if IV cannot be established. Ideally, IN administration should be done via an atomizing device. If IM route is required, use 2 mg.

9. Dose should be titrated to improved respirations. Larger individual doses of naloxone can precipitate opiate withdrawal with the potential for a violent or combative patient that is difficult to manage at the scene and once the patient is admitted to the hospital. If no response to dose of naloxone, dose may be repeated in 0.4 mg increments to a total of 2 mg. Some opiods, like propoxyphene and dextromethorphan, require higher doses of naloxone.
10. Indicators of improved mental status include:
    a. Orientation to person, place and time
    b. Increased alertness
    c. Increased responsiveness to questions
11. For patients refusing transport, adhere to Refusal of Treatment /Transport Protocol #111.
12. Patient may be released without Medical Command if all of the following are met in addition to criteria in protocol #111:
    a. Repeat glucose meter is > 80 mg/dl
    b. Patient is an insulin-dependent diabetic (not on oral antihyperglycemics)
    c. Patient returns to normal mental status, with no focal neurologic signs/symptoms after receiving glucose
    d. Patient can promptly obtain and will eat a carbohydrate meal.
    e. Patient refuses transport, or patient and paramedics agree transport not needed
    f. Another competent adult will be staying with patient
    g. No major co-morbid conditions exist, such as chest pain, arrhythmias, dyspnea, seizures, intoxication
    h. Patient should not be released without medical command contact if given glucagon instead of dextrose or if he/she received naloxone.
    i. If all of the above conditions are not met and the patient or legal guardian refuses transport, contact medical command. If the patient or legal guardian requests transport, honor the request.

Performance Parameters:

A. Review for proper use of naloxone and glucose and documentation of neurologic assessment/ response to treatment.

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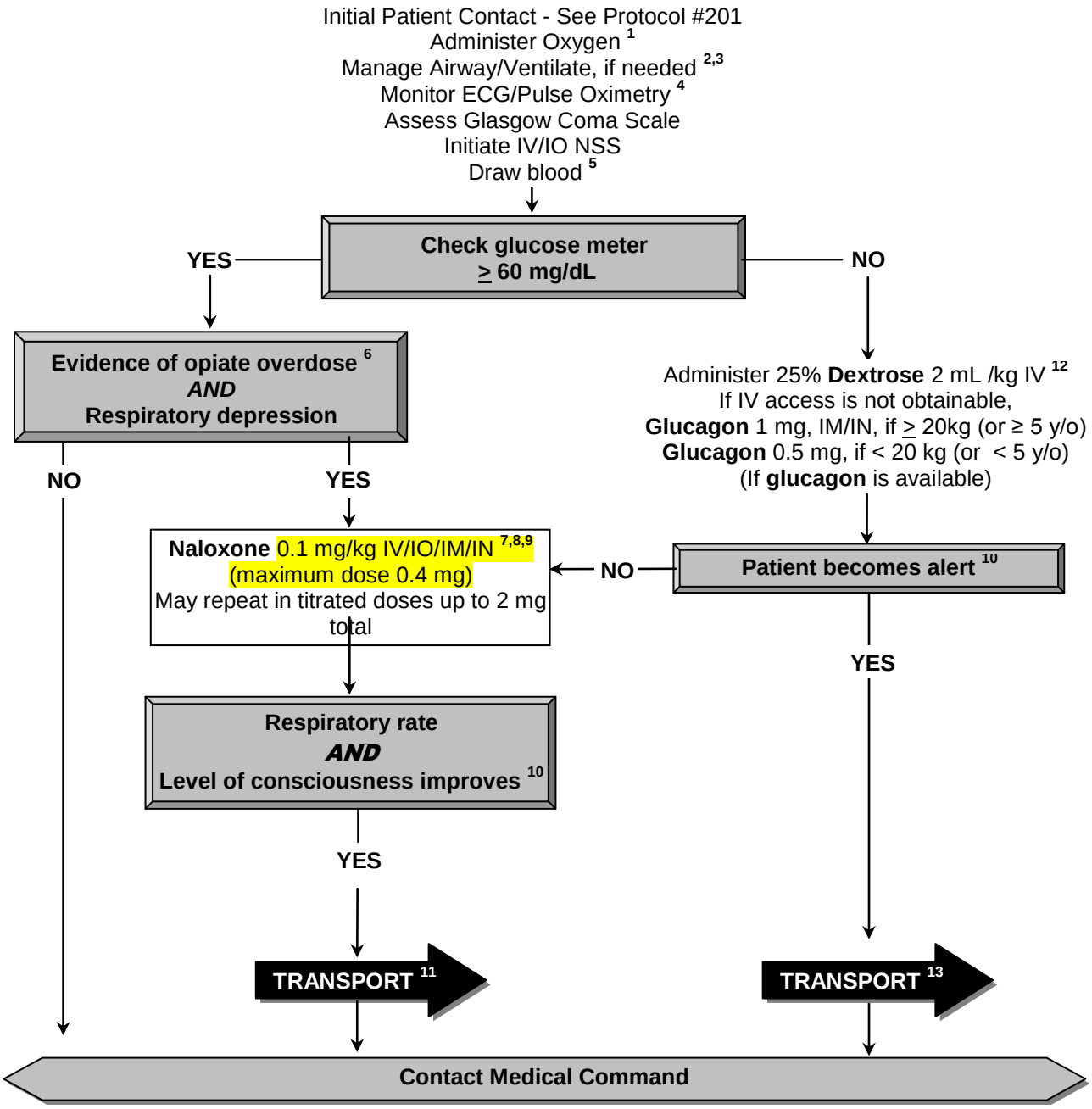
ALTERED LEVEL OF CONSCIOUSNESS - PEDIATRIC
STATEWIDE ALS PROTOCOL



ALTERED LEVEL OF CONSCIOUSNESS - PEDIATRIC
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with altered level of consciousness due to:

1. Unclear etiology after assessing patient
2. History consistent with hypoglycemia (in infants and children, hypoglycemia frequently accompanies overdose, alcohol ingestion, poisoning, or metabolic/medical diseases)
3. Suspected drug ingestion /overdose

Exclusion Criteria:

A. Altered level of consciousness due to:

1. Trauma - Follow appropriate trauma protocol (e.g. head injury or multi-system trauma protocol)
2. Shock - Follow Shock Protocol #7005
3. Dysrhythmias - Follow appropriate dysrhythmia protocol.
4. Toxicologic
   a. Carbon monoxide - Follow Poisoning / Toxic Exposure Protocol #8031.
   b. Cyanide - Follow Cyanide Exposure Protocol #8081.
   c. Nerve agent exposure - Follow Nerve Agent Exposure Protocol #8083.
5. Seizure - Follow Seizure Protocol #7007.
6. Stroke - Follow Stroke Protocol #7006.
7. Other medical problems specifically suspected due to history or exam, e.g. choking, hypoxia due to respiratory failure, etc…- Follow applicable specific protocol.

Possible MC Orders:

A. Additional doses of naloxone

B. Additional doses of dextrose or glucagon (if available)

Notes:

1. Administer oxygen by appropriate method.
2. In children, ventilation by bag-valve-mask is the preferred method of airway maintenance and ventilation if transport time is short. However, if patient cannot be adequately oxygenated or ventilated by bag-valve-mask or if transport time is long, intubation is indicated. Use a length-based device to assist with selection of appropriate sized airway equipment.
3. Confirm and document tube placement with auscultation and $ETCO_2$ detector/secondary device - Follow Confirmation of Airway Placement Protocol #2032
4. See Pulse Oximetry Protocol #226. Pulse Oximetry must not delay the application of oxygen. Record SpO_2 after administration of oxygen or intubation.
5. Blood should be drawn in red top tube for analysis at the hospital unless the patient is a known diabetic who takes insulin or oral diabetic medications (e.g. micronase, glyburide, glucophage, etc…)
6. Indications of possible opiate overdose include decreased respirations, pinpoint pupils, skin “track marks”, *AND/OR* the presence of drug paraphernalia.

7. Naloxone should not be given to patients that have been intubated.
8. Naloxone can be administered IM, IO, or intranasally if IV cannot be established. Ideally, IN administration should be done via an atomizing device.
9. Dose should be titrated to improved respirations. Larger individual doses of naloxone can precipitate opiate withdrawal with the potential for a violent or combative patient that is difficult to manage at the scene and once the patient is admitted to the hospital. If history of chronic narcotic use, naloxone dose should be decreased to 0.01 mg/kg. If no response to dose of naloxone, dose may be repeated in 0.4 mg increments to a total of 2 mg. Some opiods, like propoxyphene and dexamethorphan, require higher doses of naloxone.
10. Indicators of improved mental status include:
    a. Orientation to person, place and time
    b. Increased alertness
    c. Increased
    d. If no response to dose responsiveness to questions
11. For patients refusing transport, adhere to Refusal of Treatment/Transport Protocol #111.
12. For neonates, 25% dextrose dose should be diluted with equal amounts of NSS for 12.5% dextrose at 4 mL/kg (or administer 5 mL/kg of 10% dextrose for any age).
13. Patient may be released without Medical Command if all of the following are met in addition to criteria in protocol #111:
    a. Repeat glucose meter is > 60 mg/dl
    b. Patient is an insulin-dependent diabetic (not on oral antihyperglycemics)
    c. Patient returns to normal mental status, with no focal neurologic signs/symptoms after receiving glucose.
    d. Patient can obtain and will promptly eat a carbohydrate meal.
    e. Legal guardian refuses transport, or patient, legal guardian and paramedics agree transport not needed
    f. Legal guardian or another competent adult will be staying with patient
    g. No major co-morbid conditions exist, such as chest pain, arrhythmias, dyspnea, seizures, intoxication
    h. Patient should not be released without medical command contact if given glucagon instead of dextrose or if he/she received naloxone.
    i. If all of the above conditions are not met and the patient or legal guardian refuses transport, contact medical command. If the patient or legal guardian requests transport, honor the request.

Performance Parameters:

A. Review for proper use of naloxone and glucose and documentation of neurologic assessment/ response to treatment.

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SHOCK / SYSTEMIC INFLAMMATORY RESPONSE SYNDROME (SIRS)
STATEWIDE ALS PROTOCOL

Initial Patient Contact - Follow protocol #201[1]
Manage Airway/Ventilate, if needed [2,3]
High-flow oxygen
Keep patient warm
Monitor ECG/Pulse Oximetry [4]

Serious Dysrhythmia — **YES** → **Proceed to appropriate protocol**

Adult or Pediatric Patient

Adult

Initiate IV/ IO NSS
Infuse fluid challenge of
500 mL as rapidly as possible [5,6]

Reassess BP after each fluid challenge

Contact Medical Command

If no CHF, repeat
fluid challenge of NSS
500 mL IV/IO [5,6]
Up to total of 2000 mL IV/IO [5]
OR
to SBP > 100

If SBP = 70-90 and cardiogenic shock,
Consider **Dobutamine** Drip (if available) [7]
OR
If SBP <90
Consider **Dopamine** Drip [7]

Pediatric
(≤ 14 years old)

Initiate IV/ IO NSS [8]
Infuse fluid challenge of
20 mL /kg as rapidly as possible [5,9]

Reassess BP after each fluid challenge

Contact Medical Command

Repeat fluid challenge of NSS [9]
20 mL /kg IV/IO
Up to total of 60 mL/kg IV/IO
OR
to SBP > 70 + (2 x age in years)

If history of Congenital Adrenal Hyperplasia (CAH) or daily steroid use, check glucose and give Hydrocortisone (if available or if carried by patient)
0 – 3 y/o = 25 mg IV/IO
3 – 12 y/o = 50 mg IV/IO
≥ 12 y/o = 100 mg IV/IO
Or patient's prescribed dose, if known

If hypotensive
Consider **Dopamine** Drip [7]

SHOCK / SYSTEMIC INFLAMMATORY RESPONSE SYNDROME (SIRS)
STATEWIDE ALS PROTOCOL

Criteria:

A. Hypoperfusion of body organs is characterized by alterations in mental status, pallor, diaphoresis, tachypnea, tachycardia, poor capillary refill, and hypotension.

1. Septic Shock - signs or symptoms of hypoperfusion from a suspected infectious source (e.g. urosepsis, pneumonia, bacteremia / septicemia). These patients may present with a fever or preceding infectious illness.
2. SIRS is a systemic inflammatory response that may be a precursor to septic shock in a patient that is not yet hypotensive. Consider SIRS in patient with generalized weakness, hypoxia, or suspected infection like pneumonia. SIRS can be recognized in adults when there is a possible infection with at least two of the following:
   a. Temperature > 38° C (100.4° F) or < 36° C (96.8° F) (ambulances are required to have a non-tympanic, digital thermometer).
   b. Heart rate > 90 bpm
   c. Tachypnea > 20 bpm
3. Hypovolemic Shock from gastrointestinal bleeding or from repetitive vomiting/diarrhea in infants/children.
4. Hypoperfusion of unknown etiology.

Exclusion Criteria:

A. Cardiogenic Shock- hypotension with suspected pulmonary edema - See CHF Protocol #5002.

B. Hypovolemic/Traumatic Shock of traumatic etiology - See Multisystem Trauma or Traumatic Shock Protocol #6002.

C. Neurogenic Shock due to spinal cord injury – See Multisystem Trauma or Traumatic Shock Protocol #6002.

Possible MC Orders:

A. Additional NSS fluid boluses

B. Earlier intervention with vasopressor infusions (dopamine, dobutamine, epinephrine).

Notes:

1. Confirm and document tube placement with auscultation and $ETCO_2$ detector/secondary device - Follow Confirmation of Airway Placement Protocol #2032.
2. If unable to intubate on up to 3 attempts, consider alternative/ rescue airway device.
3. In children, ventilation by bag-valve-mask is the preferred method of airway maintenance and ventilation if transport time is short. However, if patient cannot be adequately oxygenated or ventilated by bag-valve-mask or if transport time is long, intubation is indicated. Use a length-based device to assist with selection of appropriate sized airway equipment.
4. See Pulse Oximetry Protocol #226. Pulse Oximetry must not delay the application of oxygen. Record SpO_2 after administration of oxygen or intubation.
5. Bolus IV fluid should be given as quickly as possible, ideally in less than ten minutes.
6. Do not give IV fluid bolus prior to medical command if the patient has signs of CHF (for example, rales or significant pitting edema).
7. Some recommendations suggest using dobutamine for mild cardiogenic shock (SBP 70-90) and dopamine for severe shock (SBP< 70). Mix infusion using regional or agency prescribed concentration, and administer 5-20 mcg/kg/min. Generally start at 5 mcg/kg/min, and increase every 10 minutes by an additional 5 mcg/kg/min until SBP >100 mmHg. **DO NOT exceed 20 mcg/kg/min unless ordered by medical command physician.**
8. If unable to obtain peripheral IV access, place an intraosseous (IO) line, if available.
9. In infants, it is difficult to distinguish between hypoperfusion from hypovolemia and that due to cardiogenic shock. Hypovolemia frequently follows a history of repetitive vomiting/diarrhea. If cardiogenic shock is suspected, fluid boluses should be limited to the initial 20 mL/kg.

STROKE
STATEWIDE ALS PROTOCOL

Initial Patient Contact - See Protocol #201
Administer Oxygen titrated to SpO2≥94%[1]
Manage Airway/Ventilate, if needed [2,3]
Monitor ECG/Pulse Oximetry [4]

Altered Mental Status — **YES** → **Also, proceed with Altered LOC Protocol #7002A**

NO

Current Seizure Activity — **YES** → **Also proceed with Seizure Protocol #7007**

NO

Is acute stroke suspected by Cincinnati Prehospital Stroke Scale [5,6] (CPSS)?

Face - facial droop present,

OR

Arm - upper extremity arm drift present (arms extended/ palms up),

OR

Speech - inability to say, "The sky is blue in Pennsylvania" normally,

AND

Time - time of symptom onset definitely < 3 hours [7]

Exclude patient if another history of a stroke within last 3 months,

OR

Major surgery within last 14 days.

YES

Package Patient ASAP
Transport in supine position [8,9,10]

Transport to certified primary Stroke Center, if possible

Notify Receiving Facility ASAP
Initiate IV NSS 250 mL bolus [8,12]
Consider Drawing Bloods [13]
Check Glucometer [14]

Contact Medical Command[11]

NO

Initiate IV NSS
Consider Drawing Blood[13]
Check Glucometer [14]

Contact Medical Command[11]

STROKE
STATEWIDE ALS PROTOCOL

Criteria:

A. Patients may have the following clinical symptom(s):

1. Impaired expression or understanding of speech
2. Unilateral weakness/hemiparesis
3. Facial asymmetry/droop
4. Headache
5. Poor coordination or balance
6. Partial loss of peripheral vision
7. Vertigo

B. **CAUTION:** Respiratory and cardiovascular abnormalities may reflect increased intracranial pressure. Lowering of the blood pressure may be dangerous.

Exclusion Criteria:

A. Consider hypoglycemia, trauma, and other etiologies that can cause focal neurological symptoms that mimic stroke, and follow applicable protocol if appropriate.

Possible MC Orders:

A. Transport to a receiving facility that is a certified primary stroke center.

Notes:

1. Administer oxygen by appropriate method and monitor Pulse Oximetry, if available.
2. Confirm and document tube placement with auscultation and $ETCO_2$ detector/secondary device - Follow Confirmation of Airway Placement Protocol #2032
3. If unable to intubate on up to 3 attempts, consider alternative/ rescue airway device.
4. See Pulse Oximetry Protocol #226. Pulse Oximetry must not delay the application of oxygen. Record SpO_2 after administration of oxygen or intubation.
5. Neurological examination includes level of consciousness, Glasgow Coma Scale, pupils, individual limb movements, and Cincinnati Prehospital Stroke Scale (CPSS).
6. **Cincinnati Prehospital Stroke Scale**. If any of the following is **abnormal** and **new** for the patient, he/she may have an acute stroke:
   a. Facial Droop (patient smiles or shows teeth) - abnormal if one side of the face does not move as well as the other.
   b. Arm Drift (patient holds arms straight out in front of him/her and closes eyes) – abnormal if one arm drifts down compared with the other.
   c. Speech (patient attempts to say “The sky is blue in Pennsylvania”) – abnormal if patient slurs words, uses inappropriate words, or can’t speak.
7. Attempt to identify the precise time of the onset of the patient’s first symptoms. The time of onset is extremely important information, and patient care may be different if patient can be delivered to a certified primary stroke center within 3 hours from onset of symptoms. Time is based upon the last time that the patient was witnessed to be at his/her neurologic baseline.

8. Transport and Medical Command contact should not be delayed by attempts to initiate IV or draw blood in patients who are awake. In these patients, the IV should be done enroute after notifying receiving facility or medical command.

9. If patient can be delivered by air (but not by ground) to receiving facility within 3 hours of symptom onset, consider contact with medical command for assistance in deciding upon the utility of air medical transport. See Protocol #181.

10. If patient can't tolerate supine position, transport with head elevated < 30 degrees.

11. Contact Medical Command for all patients with acute CPSS symptoms that have onset within 3 hours of estimated arrival at the receiving facility, so the receiving hospital can prepare for the patient's arrival. Describe to the Medical Command Physician your findings, including CPSS results. Medical command may order transport to a certified primary stroke center. If the medical command physician is not at the receiving facility, the medical command physician should relay pertinent information to the receiving facility.

12. If patient will arrive for ED treatment within 3 hours of symptoms, initiate a second IV access with saline lock enroute to hospital. Ideally 18-20 gauge IV access.

13. Before administering glucose, blood should be drawn in red top tube for analysis at the hospital unless the patient is a known diabetic who takes insulin or oral diabetic medications (e.g. micronase, glyburide, glucophage, etc…).

14. If Glucometer < 60 mg/dL, give dextrose 25 g. IV (10-50% concentration).

Performance Parameters:

A. Review on scene time for all cases of suspected stroke with time of symptom onset less than 3 hours from time of EMS arrival. Consider benchmark of on scene time ≤10 minutes.

B. Review documentation for CPSS criteria, time of symptom onset, glucose determination, and appropriate communication with medical command and receiving facility to maximize prearrival warning to receiving facility and most appropriate receiving facility.

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SEIZURE
STATEWIDE ALS PROTOCOL

Initial Patient Contact - See Protocol #201 [1]
If history/evidence of trauma, maintain c-spine stabilization
(Follow C-Spine Immobilization Protocol if indicated)
Administer Oxygen [2]
Manage Airway/Ventilate, if needed [3,4]
Monitor ECG/Pulse Oximetry, if seizure permits [5]
Initiate IV/IO NSS, if possible

Ongoing seizure activity [7]

- **NO** → **Proceed to appropriate protocol *OR* Contact Medical Command**
- **YES** → **Prior history of seizure disorder**

Prior history of seizure disorder

- **YES** → **Seizure Continues**
- **NO** → **Check Glucose Meter**

Check Glucose Meter
If glucose < 60 mg/dL, Administer Dextrose

Adult Patient
Dextrose 25 gm IV (10-50%)
***OR* Glucagon** 1mg IM, if available

Pediatric Patient ≤ 14 y/o
25% **Dextrose** 2 mL /kg IV
(OR 10 % **Dextrose** 5 mL/kg)
(If no IV access, give **Glucagon** IM [8,9])

Seizure Continues

- **NO** → **Contact Medical Command**
- **YES** → **Administer Anticonvulsant**

Administer Anticonvulsant

Pregnant Patient (Eclampsia)[10]

Magnesium SO_4,
if available
1 g/min IV until seizure stops [11]
(maximum 4 g)

Adult Patient Options:
(Choose one)
TITRATE UNTIL SEIZURE STOPS

Lorazepam 1-2 mg IV/IO/IN
(0.1 mg/kg, max 2 mg/dose);
may repeat every 5 minutes
until maximum of 4 mg

Diazepam 5-10 mg IV/IO
(0.1 mg/kg);
may repeat every 5 minutes
until maximum 0.3 mg/kg

Midazolam 1-5 mg IV/IO/IN
(0.05 mg/kg);
may repeat every 5 minutes
until maximum of 0.1 mg/kg

Pediatric Patient Options:
(Choose one)
TITRATE UNTIL SEIZURE STOPS

Lorazepam 0.1 mg/kg IV/IO/IN
(maximum 2 mg/dose)
may repeat every 5 minutes
until maximum of 4 mg

Diazepam 0.3 mg/kg IV/IO
(0.5 mg/kg PR[12])
may repeat every 5 minutes
until maximum of 0.6 mg/kg

Midazolam 0.1 mg/ kg IV/IO/IN
(0.15 mg/kg IM[12])
may repeat every 5 minutes
until maximum of 0.2 mg/kg IV

Assess for Fever[13]

Contact Medical Command

SEIZURE
STATEWIDE ALS PROTOCOL

Criteria:

A. Patients who are actively seizing with generalized clonic-tonic seizure. Indicators of seizures requiring treatment include:

1. two or more consecutive seizures without return of consciousness between episodes.
2. ongoing seizure for more than 5 minutes.
3. seizures associated with hypoxia.

B. Patients who have had tonic-clonic seizure activity prior to EMS arrival.

Exclusion Criteria:

A. Patients who are postictal following a single seizure and have history or evidence of trauma - Follow Multi-system Trauma or Traumatic Shock Protocol #6002 or Head Injury Protocol #611, as indicated.

Possible MC Orders:

A. May order additional doses of benzodiazepine.

B. May order lidocaine.

Notes:

1. Determine (if possible):
   a. Type of seizure: generalized or focal.
   b. Stage of seizure: active or post-ictal.
   c. Cause of seizure:
      - Infections
      - Drug overdose
      - Metabolic
      - Hypoxia
      - Toxins
      - Stroke
      - Traumatic
      - Vascular
      - Alcohol withdrawal
      - Non-compliance with medications
2. Administer oxygen by appropriate method and monitor Pulse Oximetry, if available. Patients with prolonged ongoing seizure activity should receive high-flow oxygen.
3. Confirm and document tube placement with auscultation and $ETCO_2$ detector/secondary device - Follow Confirmation of Airway Placement Protocol #2032
4. If unable to intubate on up to 3 attempts, consider alternative/ rescue airway.
5. See Pulse Oximetry protocol #226. Pulse Oximetry must not delay the application of oxygen. Record SpO_2 after administration of oxygen or intubation.
6. Blood should be drawn in red top tube for analysis at the hospital unless the patient is a known diabetic who takes insulin or oral diabetic medications (e.g. micronase, glyburide, glucophage, etc…), has a known history of seizure disorder, or has ongoing seizure activity that prohibits blood draw.
7. Prevent patient from sustaining physical injury.
8. 50% Dextrose may be diluted 1:1 with NSS to administer 25% Dextrose
9. Glucagon dosage (if available):
   a. 1 mg IM if patient is $\geq$ 20 kg or 5 y/o
   b. 0.5 mg IM if patient is < 20 kg or 5 y/o
10. Seizures related to eclampsia can occur in the third trimester or can even occur days or weeks after delivery. Eclampsia should be considered in pregnant or post-partum women who have a new onset seizure without prior history of seizure disorder or who have a history of preeclampsia or hypertension associated with the pregnancy.
11. If eclampsia seizure does not stop after magnesium, then administer benzodiazepine as listed.
12. If IV/ IO is not obtainable, may administer rectal or IM medications. May repeat these doses once.
13. If fever > 38° C or 100.4° F, administer acetaminophen (if available),15 mg/kg. If patient is still seizing or not awake enough to swallow, suppository form should be inserted rectally.

Performance Parameters:

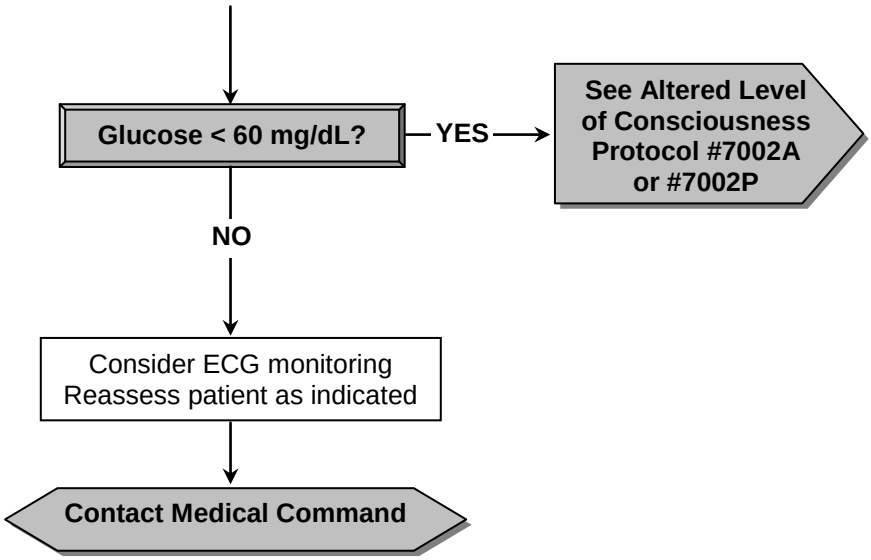
A. Review for documentation of blood glucose if patient does not have a history of seizure disorder.

B. Review for documentation of vital signs and Pulse Oximetry after administration of benzodiazepine.

C. Review for documentation of description of any witnessed seizure activity.

SERIOUSLY ILL APPEARING PATIENT
STATEWIDE ALS PROTOCOL

Initial Patient Contact- See Protocol #201
Initiate IV NSS
If signs of hypoglycemia, check blood glucose
Consider obtaining blood samples



SERIOUSLY ILL APPEARING PATIENT
STATEWIDE ALS PROTOCOL

Criteria:

A. Any situation not covered under another existing protocol, in which the provider determines that the patient is potentially seriously ill with a condition that may suddenly deteriorate with the possibility of requiring the administration of medications or fluids.

Exclusion Criteria:

A. Patient is stable and no ALS intervention is anticipated.

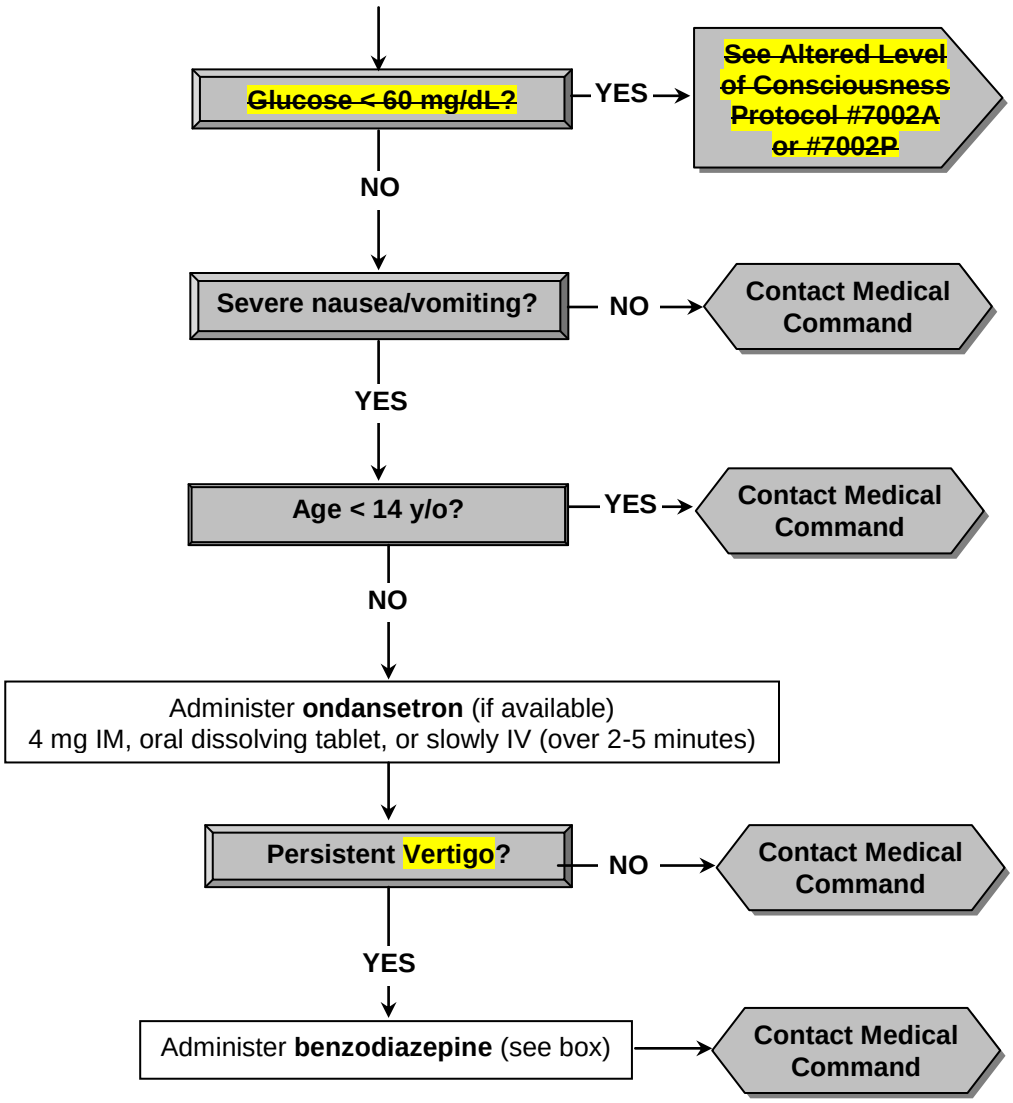
Performance Parameters:

A. Review for stable patients with no indication for necessity of initiating IV access.

B. Review for specific documentation of need for IV.

NAUSEA / VOMITING
STATEWIDE ALS PROTOCOL

Initial Patient Contact- See Protocol #201
Initiate IV NSS
Administer NSS bolus of 20 mL /kg (2000 mL max) if signs of tachycardia or hypotension
(unless contraindicated by h/o CHF, renal failure, etc)
Check blood glucose
Consider drawing blood samples



Benzodiazepine Options:
(ADULTS ONLY, choose one)
Midazolam 1 mg IV/ IO slowly
OR
Diazepam 5 mg IV/ IO slowly
OR
Lorazepam 1mg IV/ IO slowly

NAUSEA / VOMITING
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with persistent nausea or vomiting.

Exclusion Criteria:

A. Patient is stable and no ALS intervention is anticipated.

B. Hypotension- See Shock Protocol # 7005.

C. Altered mental status – See Altered Level of Consciousness Protocol #7002A or #7002P.

Possible Medical Command Orders:

A. For children between 6 m/o –14 y/o, may order ondansetron (if available) 0.1 mg/kg IM/IV (maximum dose of 4 mg).

Performance Parameters:

A. Review for contact with Medical Command before giving ondansetron to patients who are < 14 y/o.

POST-PARTUM HEMORRHAGE
STATEWIDE ALS PROTOCOL

See Emergency Childbirth Protocol # 781
Assure all fetuses have been delivered

↓

Administer Oxygen
Firmly massage the uterus

↓

Initiate IV/IO NSS, 500 mL bolus
(If hypotension, administer up to 2000 mL NSS at wide-open rate)
Monitor ECG/Pulse Oximetry

↓

Contact Medical Command

↓

Oxytocin IV infusion (if available)
10-20 units/1000mL NSS at wide open rate

↓

If hypotension
Follow Shock Protocol #7005

POST-PARTUM HEMORRHAGE
STATEWIDE ALS PROTOCOL

Criteria:

A. Excessive uterine bleeding after delivery of neonate (continued steady flow of bright red blood)

B. Uterine bleeding and signs of hypoperfusion after delivery of neonate

Exclusion Criteria:

A. Patient known to be pregnant with multiple fetuses (more than delivered)

B. Patient who has not had a prenatal ultrasound to confirm the number of fetuses.

Possible MC Orders:

A. Oxytocin IV infusion (if available), 10-20 units / 1000 ml NSS at wide-open rate.

AGITATED BEHAVIOR / PSYCHIATRIC DISORDERS
STATEWIDE ALS PROTOCOL

Follow BLS Agitated Behavior/Psychiatric Disorders Protocol #801
The safety of EMS personnel is top priority
Wait for law enforcement if scene is unsafe
Request Law Enforcement as needed

↓

Physical Restraint of Patient Indicated

NO → (skip to Follow appropriate protocol)

YES →

Follow Patient Restraint Procedure (see next page)

↓

MUST Contact Medical Command, if possible, after restraining any patient against his/her will

↓

Follow appropriate protocol for suspected underlying medical conditions
(such as hypoglycemia, drug overdose, trauma, hypoxia, or postictal from seizure)

Monitor continuous ECG and pulse oximetry, if possible

↓

Contact Medical Command, if possible

↓

If continued struggling, [2] Administer Sedation
(See box below)

↓

Monitor continuous ECG and Pulse Oximetry, when feasible

<u>Sedation Options:</u>
(Choose one)

Lorazepam 1-2 mg IM/IV/IO/IN [3] (0.1 mg/kg, max 2 mg/dose)
may repeat every 5 minutes until maximum of 4 mg

OR

Diazepam 5-10 mg IM/IV/IO [3] (0.1 mg/kg)
may repeat every 5 minutes until maximum 0.3 mg/kg

OR

Midazolam 1-5 mg IM/IV/IO/IN [3,4] (0.05 mg/kg)
may repeat every 5 minutes until maximum of 0.1 mg/kg

AGITATED BEHAVIOR / PSYCHIATRIC DISORDERS
STATEWIDE ALS PROTOCOL

CRITERIA:

A. Patient with a psychiatric or behavioral disorder who is at imminent risk of self-injury or is a threat to others.

OR

B. Patient with a medical condition causing agitation and possibly violent behavior. Examples of these conditions are:

1. Alcohol or drug (e.g. PCP, methamphetamine, cocaine) intoxications
2. Hypoglycemia
3. Stroke
4. Drug overdose
5. Post-ictal after seizure
6. Head trauma

Procedure for patients that require physical restraint:

A. All Patients:

1. Use the minimum amount of restraint necessary to safely accomplish patient care and transportation with regard to the patient's dignity.
2. Assure that adequate personnel are present and that police assistance has arrived, if available, before attempts to restrain patient.
3. Restrain all 4 extremities with patient supine on stretcher.[5,6,7,8]
4. Use soft restraints to prevent the patient from injuring him or herself or others.[9]
   a. If the handcuffs or law enforcement devices are used to restrain the patient, a law enforcement officer should accompany the patient in the ambulance
   b. It is preferable that a law enforcement officer follows the ambulance in a patrol car to the receiving facility if physical restraint is necessary.
5. Do not place restraints in a manner that may interfere with evaluation and treatment of the patient or in any way that may compromise patient's respiratory effort.[10]
6. If the patient is spitting, may cover his/her face with a surgical mask or with a NRB mask with high flow oxygen.[11]
7. Evaluate circulation to the extremities frequently.
8. Thoroughly document reasons for restraining the patient, the restraint method used, and results of frequent reassessment.

Possible Medical Command Orders:

A. Additional benzodiazepine

Notes:

1. Verbal techniques include:
   a. Direct empathetic and calm voice.
   b. Present clear limits and options.
   c. Respect personal space.

d. Avoid direct eye contact.

e. Non-confrontational posture.

2. Do not permit patient to continue to struggle against restraints. This can lead to death due to severe rhabdomyolysis, acidosis, dysrhythmia, or respiratory failure. Medical command should be contacted for possible chemical restraint with sedative medication.

3. If age > 65, reduce doses of sedative benzodiazepines in half.

4. Regional or agency policy may permit intranasal midazolam, but this may not be as effective as parenteral medications.

5. Initial "take down" may be done in a prone position to decrease the patient's visual field and ability to bite, punch, and kick. After the individual is controlled, he/she should be restrained to the stretcher or other transport device in the supine position.

6. **DO NOT restrain patient in a hog-tied or prone position.**

7. **DO NOT** sandwich patient between devices, such as long boards or Reeve's stretchers, for transport. Avoid restraint to unpadded devices like backboards.

8. A stretcher strap that fits snuggly just above the knees is effective in decreasing the patient's ability to kick.

9. Padded or leather wrist or ankle straps are appropriate. Handcuffs and plastic ties are not considered soft restraints.

10. Never apply restraints near the patient's neck or apply restraints or pressure in a fashion that restricts the patient's respiratory effort.

11. Never cover a patient's mouth or nose except with a surgical mask or a NRB mask with high flow oxygen. A NRB mask with high flow oxygen may be used to prevent spitting in a patient that also may have hypoxia or another medical condition causing his/her agitation, but a NRB mask should never be used to prevent spitting without also administering high flow oxygen through the mask.

Performance Parameters:

A. Review every case of the use of physical or chemical restraint for documentation of physical restraint procedure, monitoring of respiratory effort, assessment of extremity neurovascular status every 15 minutes, and medical command physician orders for use of physical or chemical restraint.

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POISONING/TOXIN EXPOSURE
STATEWIDE ALS PROTOCOL

INITIAL PATIENT CONTACT- SEE PROTOCOL #201

- ***WARNING:*** EMS personnel must not enter confined spaces with potential toxic gases
  - (e.g. manure pits, silos, spaces with carbon monoxide, spaces with industrial gases) unless personnel have proper training and PPE
- ***NOTE:*** In situations where the patient has not been fully decontaminated, EMS personnel must be in appropriate PPE before treatment/transport.
  - Notify the receiving ED ASAP to allow them time to prepare for any additional decontamination needed on arrival
- If toxic exposure/overdose is the result of intentional behavior – See also Agitated Behavior/ Psychiatric Disorders Protocol #8001 [1]
- Consider contact with Poison Control Center (800-222-1222) enroute or on scene after substance is identified.

↓

Manage airway
Administer oxygen by appropriate method
(High-flow oxygen if suspected carbon monoxide poisoning, respiratory distress, or cough)
Monitor Pulse Oximetry, if available [2]

↓

Determine
What: Identify specific toxin and amount, if possible
(If possible, safely transport source of toxin (e.g. prescription pill bottles) w/patient to ED)
When: Identify time of exposure, if possible
Why: Identify reason for exposure, if possible
Where: Identify environmental site issues (e.g. exposure in a confined space or CO present)

↓

Treat specific toxins based upon the appropriate category

↓

- **Ingested Toxins** **Go to Page 8031-2**
- **Inhaled Toxins** **Go to Page 8031-2**
- **Absorbed Toxins** **Go to Page 8031-3**
- **Injected Toxins/ Snakebite** **Go to Page 8031-3**

POISONING/TOXIN EXPOSURE
STATEWIDE ALS PROTOCOL

INGESTED TOXINS

↓

NOT INDUCE VOMITING

↓

For asymptomatic ingestions that may not require transport
Consider contacting Poison Control Center [3,4]

↓

Initiate IV/IO NSS KVO
if patient has symptoms
(if hypotensive, follow Shock
Protocol #7005)

↓

If mental status changes,
check blood glucose and treat hypoglycemia
per Altered Level of Consciousness Protocol #7002A or #7002P

↓

Contact Medical Command

INHALED TOXINS

↓

REMOVE PATIENT FROM ENVIRONMENT

↓

Administer High-flow oxygen and ventilate with BVM, if needed

Intubate, if indicated

Initiate IV/IO NSS KVO
(if hypotensive, follow Shock Protocol #7005)

↓

Monitor ECG and
Pulse Oximetry, if available

WARNING:

Pulse Oximetry monitors give false readings in patients that have been exposed to carbon monoxide, cyanide, or drugs/ chemicals that may cause methemaglobinemia.
Use 100% oxygen in these patients regardless of Pulse Oximetry reading.

↓

Contact Medical Command

↓

Consider transport to facility with hyperbaric oxygen,
if patient has suspected carbon monoxide exposure and has altered mental status or is pregnant.
May be appropriate if time to hyperbaric facility is within 30 minutes of time to closest facility and patient is deemed stable for the longer transport.

POISONING/TOXIN EXPOSURE
STATEWIDE ALS PROTOCOL

ABSORBED TOXINS

↓

Remove contaminated clothing

↓

Flush affected area:

- **Liquid substance:**
  - Irrigate with copious amounts of room temperature water
  - Do Not contaminate uninjured areas while flushing
- **Dry substances:**
  - With gloves and appropriate PPE, brush remaining powder from skin and clothing, then irrigate with copious amounts of water. [6]
- **Eyes:**
  - Instill 1-2 drops of **ophthalmic tetracaine** (if available)
    If there is a penetrating injury to eye, **DO NOT** instill tetracaine.
  - Flush affected eyes continuously with water or saline if eye exposure.

↓

Contact Medical Command

INJECTED TOXINS / SNAKEBITE

↓

Identify snake or animal, if safe & possible.
If identify of snake if unknown, treat as if snake is poisonous.

↓

Calm Patient
Administer High-flow oxygen if respiratory symptoms present

↓

Remove jewelry any tight clothing

↓

Consider immobilizing the involved body part. If extremity involved, keep the extremity below the level of the patient's heart.
Keep the patient as still as possible to reduce the circulation of the venom.
Carry patient for transport, if possible.

↓

Apply constricting band proximal to bite if patient is hypotensive.
DO NOT APPLY TOURNIQUET
DO NOT APPLY ICE

↓

Initiate IV/IO NSS KVO and draw blood
(include tubes for type and cross match, if available)

↓

Contact Medical Command

POISONING/TOXIN EXPOSURE
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient who has accidentally or purposefully been exposed to toxic substances. Including:

1. **Ingested toxins**
   a. For example pills, capsules, medications, recreational drugs, poisonous plants, strong acids or alkali household or industrial compounds.
2. **Inhaled toxins**
   a. For example carbon monoxide and other toxic gases.
3. **Absorbed toxins**
   a. For example substances on skin or splashed into eyes.
4. **Injected toxins**
   a. For example snake bites or substances injected through the skin.

Exclusion Criteria:

A. Patient with altered level of consciousness (unless suspected carbon monoxide poisoning) - follow Altered Level of Consciousness Protocol #7002A or #7002P.

B. Patient with exposure to organophosphate pesticide or nerve agent – follow Nerve Agent Exposure Protocol #8083.

C. Patient with exposure to cyanide – follow Cyanide Exposure Protocol #8081.

D. Patient with suspected allergic reaction/anaphylaxis – follow Allergic Reaction Protocol #4011.

Treatment:

A. All patients:

1. Initial Patient Contact – see Protocol #201.
   a. **WARNING: EMS providers must not enter confined spaces with potential toxic gases (e.g. manure pits, silos, spaces with carbon monoxide, spaces with industrial gases) unless providers have proper training and PPE.**
   b. **Decontamination- Ideally, patients will be fully decontaminated before treatment and transport. In situations where the patient has not been fully decontaminated, EMS providers must be in appropriate PPE before treatment/ transport. The receiving ED should be notified ASAP so that they can prepare for any additional decontamination that is needed on arrival.**
   c. If toxic exposure/overdose is the result of intentional behavior - also see Agitated Behavior/Psychiatric Disorders protocol # 8001. [1]
2. Maintain adequate airway.
3. Administer oxygen by appropriate method and monitor Pulse Oximetry [2], if available.
   a. (High-flow oxygen if suspected carbon monoxide poisoning, respiratory distress, or cough).
4. Determine:
   a. **What** – identify specific toxin and amount, if possible.
      1) If possible, safely transport source of toxin (e.g. prescription pill bottles) with patient to receiving facility.
      2) EMS vehicles should not transport dangerous items (e.g. toxic chemicals that are not sealed in their original containers, live snakes, etc…)
   b. **When** – identify time of exposure, if possible.
   c. **Why** – identify reason for exposure, if possible.
   d. **Where** – identify environmental site issues (e.g. exposure in a confined space or carbon monoxide present).
5. Treat specific toxins based upon the appropriate category:

a. **Ingested Toxins.** Treat all exposures as follows:

1) **DO NOT INDUCE VOMITING.**

2) For asymptomatic ingestions that may not require transport, consider contacting Poison Control Center. [3,4]

3) Initiate IV/IO NSS KVO if patient has symptoms.

a) If hypotensive, follow Shock Protocol #7005.

4) If mental status changes, then check blood glucose and treat hypoglycemia per Altered Level of Consciousness Protocol #7002A or #7002P.

5) Monitor ECG

6) Contact Medical Command for possible order for activated charcoal.[3,4,5]

b. **Inhaled Toxins.** Treat all symptomatic (e.g. SOB, cough, headache, decreased LOC) patients as follows:

1) Only providers with proper training and wearing proper PPE should enter environments that may have toxic gases.

2) Remove patient from environment.

3) Administer 100% oxygen.

4) Ventilate with BVM, if needed.

5) Intubate if indicated.

6) Initiate IV/IO NSS KVO

a) If hypotensive, follow Shock Protocol # 7005

7) Monitor ECG and Pulse Oximetry

a) **WARNING: Pulse Oximetry monitors give false readings in patients that have been exposed to carbon monoxide or cyanide, and normal readings should not diminish the use of 100% oxygen in these patients**.

8) Consider transport to a facility with hyperbaric oxygen if patient has suspected carbon monoxide exposure and has altered mental status or is pregnant. This may be appropriate if time to transport to a facility with hyperbaric oxygen capability is within 30 minutes of the time to transport to the closest facility and the patient is deemed to be stable for the longer transport.

9) Contact Medical Command

c. **For Absorbed Toxins:**

1) Remove contaminated clothing.

2) Flush affected area copiously:

a) Liquid substance - Irrigate with copious amounts of room temperature water. Do not contaminate uninjured areas while flushing.

b) Dry substances - With gloves and appropriate PPE, brush remaining powder from skin and clothing, then irrigate with copious amounts of water.[6]

c) **Eyes** - Flush affected eyes continuously with water or saline if eye exposure. Prior to flushing eyes, may instill 1-2 drops of ophthalmic tetracaine (if available) and may repeat every 15 minutes as needed for comfort. Do not instill tetracaine or irrigate eyes if there has been blunt trauma/ possible penetrating injury to the eye.

d. **For Injected Poisons/Snakebite:**

1) Identify type of snake or animal (e.g. scorpion), if safe and possible. If identity of a snake is not known, all victims of snakebite should be treated as if the snake is poisonous. Do not delay transport or endanger individuals by attempting to capture or kill a snake.

2) Calm patient.

3) Administer high-flow oxygen, if respiratory symptoms are present.

4) Remove jewelry and tight clothing.

5) Consider immobilizing the involved body part. For snakebite, apply a pressure immobilization bandage using an elastic (ACE-type) bandage wrapped around the entire length of the bitten extremity – comfortably tight and snug but allowing for a finger to be slipped under it.If extremity involved, keep the extremity below the level of the patient's heart.
6) Keep the patient as still as possible to reduce the circulation of the venom. Carry patient for transport, if possible.
7) Apply constricting band proximal to bite if patient is hypotensive. **DO NOT APPLY TOURNIQUET.**
8) **DO NOT APPLY ICE.**
9) Initiate IV/IO NSS KVO and draw blood (including tubes for type and cross, if available)
   a) If hypotensive, follow Shock Protocol - #7005
10) Contact Medical Command.

Possible Medical Command Orders:

A. Administration of activated charcoal, if available, may be ordered [4,5]:
1. **Adults:** 25 - 50 gm orally of pre-mixed activated charcoal.
2. **Children:** 1 gm/kg orally or approximately 12.5 - 25 gm orally of pre-mixed activated charcoal.

B. If tricyclic antidepressant overdose and patient hypotensive, may order sodium bicarbonate, 1 mEq/kg IV/IO.

C. If calcium channel blocker or beta-blocker overdose and hypotensive, may order calcium chloride, 10% 0.2 mg/kg IV/IO over 5-10 minutes (if available) or glucagon, 3-10 mg IV/IO over 3-5 minutes (if available).

D. If dystonic reaction, may order diphenhydramine.

E. If smoke inhalation (cyanide risk) or suspected asphyxiation from hydrogen sulfide (e.g. in manure pit), may order sodium thiosulfate (if available).

F. If suspected carbon monoxide toxicity and altered level of consciousness or pregnant, may order transport to center capable of hyperbaric oxygen therapy.

Notes:

1. Patients who have ingested a toxic substance with suicidal intent may not refuse transport. See Refusal of Treatment/Transport Protocol #111.
2. See Pulse Oximetry Protocol #226. Pulse Oximetry is not accurate in patients with suspected exposure to carbon monoxide or cyanide and shall not be used in these situations.
3. **National Poison Control Center telephone number is 800-222-1222**. EMS providers must follow instructions from Poison Control Center unless the orders are superceded by orders from a medical command physician. These instructions must be documented on the PaPCR. Poison Control Center should only be contacted for stable patients with minor ingestions. Medical Command should be contacted for patients who are likely to require transportation to a hospital.
4. Activated charcoal may only be given by order of medical command or poison control.
5. Contraindications to charcoal:
   a. Patient unable to swallow/protect airway.
   b. Seizures.
   c. Hydrocarbons ingestion (e.g. turpentine)
   d. Caustic substance ingestion (e.g. liquid drain cleaner or milk pipe cleaner)
6. **Note** - some substances, like dry lime will cause a heat-producing reaction when mixed with water. Copious water should be available before beginning to irrigate.

Performance Parameters:

A. Review for documentation of orders received from Poison Control Centers or Medical Command.

CYANIDE COMPOUND EXPOSURE
STATEWIDE ALS PROTOCOL

Decontaminate patient
If possible, treat patients with severe exposure during decontamination
CAUTION: **Only personnel wearing Level B PPE (with appropriate training) should treat patient before decontamination**

↓

Initial Patient Contact - See protocol #201
Manage Airway/Ventilate, if needed [1]
Administer High-flow Oxygen [1]

NOTE: Pulse Oximetry may be inaccurate and should be avoided

↓

Patient with decreased LOC, seizures, or apnea

Adult

↓

Initiate IV NSS, macro drip, KVO [1]
Administer **Sodium Thiosulfate** (if available):
(12.5 grams [50 mL] IV over 1-2 minutes [2])
Monitor ECG, if available

↓

Pediatric

↓

Initiate IV NSS, macro drip, KVO [1]
Administer **Sodium Thiosulfate** (if available):
(1.6 mL/kg, Maximum dose 12.5 grams [2])
Monitor ECG, if available

↓

Contact Medical Command

CYANIDE COMPOUND EXPOSURE
STATEWIDE ALS PROTOCOL

Criteria:

A. Patients experiencing symptoms after suspected exposure to cyanide or cyanogen chloride:

1. Serious exposure: symptoms include unconsciousness, seizures, and apnea. The skin may be bright red.
2. Moderate exposure: symptoms may include dizziness, nausea, weakness, eye/throat irritation, and giddiness.

B. Fire victims may be exposed to cyanide when entrapped in an enclosed structure fire. Fire victims with altered mental status, seizures, and apnea may be treated with this protocol in addition to the Poisoning protocol #8031.

C. Patients exposed hydrogen sulfide in an enclosed space (for example a manure pit) that have altered mental status, seizures, or apnea may be treated with sodium thiosulfate, but a medical command physician or poison control center should be contacted before using this protocol in this situation.

Exclusion Criteria:

A. Patients with suspected exposure, but without symptoms, should be evaluated for decontamination but do not require further medical treatment.

B. If patients are seizing and have pinpoint pupils, excessive nasal/oral secretions, or muscle fasciculation (rippling tremors under skin), EMS providers should consider exposure to nerve agents (See Nerve Agent Protocol).

System Requirements:

A. Sodium thiosulfate may be carried by ALS services if the medication is permitted by the regional treatment protocols. The agency must report the amount carried to the regional EMS council, and the regional EMS council should coordinate the stocks of antidote with the regional counterterrorism task forces.

B. Until the patient has been properly decontaminated, all EMS providers who treat patients of suspected exposure to cyanide compounds should use Level B PPE. Level B PPE should only be used by providers with appropriate training.

Possible Medical Command Orders:

A. Additional sodium thiosulfate

B. Sodium bicarbonate for acidosis

NOTES:

1. In mass casualty incidents, oxygen and intravenous access should be prioritized to patients with symptoms of serious exposure if resources are limited.
2. May repeat sodium thiosulfate with half of initial dose once if symptoms persist after 5-10 minutes.

Performance Parameters:

A. Every case of suspected cyanide compound exposure with any symptoms should receive QI review for appropriate use of oxygen and sodium thiosulfate.

NERVE AGENT/PESTICIDE EXPOSURE
STATEWIDE ALS PROTOCOL

Decontaminate patients – Contact Medical Command to order release of CHEMPACK if indicated [1]
CAUTION: **Personnel must be in appropriate PPE before treating patients who have not been decontaminated.** If possible, treat patients with severe exposure during decontamination.

Initial Patient Contact - See protocol #201
Manage Airway/ Ventilate, if needed [2]
Administer Oxygen, if needed [3]

Patient

ADULT

Symptom Severity

MILD SYMPTOMS

Complete Decontamination, as indicated
↓
Reassess for signs of worsening symptoms

MODERATE SYMPTOMS

Administer 1 NAAA(s) [4,5,6,7]
Repeat every 5 minutes if no improvement in SOB/wheezing
↓
Monitor ECG and Pulse Oximetry [3]
↓
Initiate IV NSS KVO [3]

SEVERE SYMPTOMS

Administer 3 NAAA(s) [4,5,6,7]
↓
Initiate IV/ IO NSS KVO [3]
↓
Monitor ECG and Pulse Oximetry [3]
↓
Administer Anticonvulsant
(IM if not seizing, IV/IO if seizing)
- 1 **CANA** auto-injector IM
  OR
- Adult Anticonvulsant
  (see box next page)

PEDIATRIC

Symptom Severity

MILD SYMPTOMS

Complete Decontamination, as indicated
↓
Reassess for signs of worsening symptoms

MODERATE SYMPTOMS

Complete Decontamination, as indicated
↓
Monitor ECG and Pulse Oximetry [3]
↓
Initiate IV/IO NSS KVO [3]
↓
Reassess for signs of worsening symptoms

SEVERE SYMPTOMS

Administer NAAA(s) [4,5,6,7]
or Atropens
(see Nerve Agent Antidote Table)
↓
Initiate IV/IO NSS KVO [3]
↓
Monitor ECG and Pulse Oximetry [3]
↓
Administer Anticonvulsant
(IM if not seizing, IV/IO if seizing)
Pediatric Anticonvulsant
(see box next page)
OR
1 **CANA** auto-injector IM if 10-14 y/o

Contact Medical Command

Nerve Agent Antidote Table

	Adult & Older Children > 90 lbs (>41 kg) ≥ 10 y/o	**Pediatric 40-90 lbs (18-41 kg) 4-10 y/o**	**Pediatric 15-40 lbs (7-18 kg) 6 m/o-4 y/o**	**Pediatric** (Infant) **< 15 lbs (< 7kg) < 6 m/o**
Moderate symptoms include: • Blurred vision • Excessive tearing or runny nose • Drooling • Mild shortness of breath/ wheezing • Vomiting • Diarrhea, Stomach Cramps • Muscle twitching or sweating at site of exposure	1 **NAAA** IM [**atropine** 2mg + **pralidoxime** 600 mg IM]	1 **Atropen** (Red) [**atropine** 1 mg IM]	1 **Atropen** (Blue) [**atropine** 0.5 mg IM]	1 **Atropen** (Yellow) [**atropine** 0.25 mg IM]
Severe symptoms include: • Altered Mental Status • Severe shortness of breath/ wheezing • General Weakness/ Severe muscle twitching • Incontinence (urine or feces) • Seizures • Unconsciousness	3 **NAAA(s)** IM [**atropine** 6 mg + **pralidoxime** 1800 mg IM] ***AND*** Anticonvulsant 1CANA autoinjector [**diazepam** 10 mg IM] ***OR*** (see box below)	2 **NAAA(s)** IM ***OR*** 3 **Atropen** (Red) [**atropine** 3 mg IM] ***AND*** Anticonvulsant (see box below)	1 **NAAA(s)** IM (if > 2 y/o) ***OR*** 3 **Atropen** (Blue) [**atropine** 1.5 mg IM] ***AND*** Anticonvulsant (see box below)	3 **Atropen** (Yellow) [**atropine** 0.75 mg IM] ***AND*** Anticonvulsant (see box below)

Adult Anticonvulsant Options:
(Choose one)
Titrate until seizure stops

Lorazepam 1-2 mg IV/IO mg/kg, max 2 mg/dose); may repeat every 5 minutes until maximum of 4 mg

OR

Diazepam 5-10 mg IV/IO(0.01 mg/kg); may repeat every 5 minutes until maximum 0.3 mg/kg

OR

Midazolam 1-5 mg IV/IO (0.05 mg/kg); may repeat every 5 minutes until maximum of 0.1 mg/kg

Pediatric Anticonvulsant Options:
(Choose one)
Titrate until seizure stops

Lorazepam 0.1 mg/kg IV/IO/ IM (max 2 mg/dose) may repeat every 5 minutes until maximum of 4 mg

OR

Diazepam 0.3 mg/kg IV/IO/ IM Max 10 mg/dose IV/IO (0.5 mg/kg PR[12]) may repeat every 5 minutes until maximum of 0.6 mg/kg

OR

Midazolam 0.1 mg/ kg IV/IO Max 5 mg/dose IV/IO (0.15 mg/kg IM[12]) may repeat every 5 minutes until maximum of 0.2 mg/kg IV

NERVE AGENT/PESTICIDE EXPOSURE
STATEWIDE ALS PROTOCOL

CRITERIA:

A. Patients experiencing symptoms after suspected exposure to:

Nerve Agents (Tabun, Sarin, Soman, VX)

OR

Organophosphate (Malathion, Parathion) / carbamate (Sevin) pesticides.

1. **<u>Mild symptoms</u> include:**
   a. Pinpoint pupils
   b. Runny nose
   c. Suspected exposure to nerve agent, but no symptoms
2. **<u>Moderate symptoms</u> include:**
   a. Blurred vision
   b. Excessive tearing or runny nose
   c. Drooling
   d. Mild shortness of breath/ wheezing
   e. Vomiting
   f. Diarrhea, Stomach Cramps
   g. Muscle twitching or sweating at site of exposure
3. **<u>Severe symptoms</u> include**:
   a. Altered Mental Status
   b. Severe shortness of breath/ wheezing
   c. General Weakness/ Severe muscle twitching
   d. Incontinence (urine or feces)
   e. Seizures
   f. Unconsciousness

EXCLUSION CRITERIA:

A. Patients with suspected exposure, but without symptoms, should be decontaminated as appropriate, but do not require further medical treatment.

B. If patients are seizing and **do not** have pinpoint pupils, excessive nasal/oral secretions, or muscle fasciculation (rippling tremors under skin), EMS providers should consider exposure to cyanide (See Cyanide Protocol).

SYSTEM REQUIREMENTS:

A. Nerve agent antidote auto-injectors (NAAAs) and pralidoxime chloride (2-PAMCl) may be carried by ALS services if the medication is permitted by the regional drug list. The agency must report the amount carried to the regional EMS council, and the regional EMS council should coordinate the stocks of antidote with the regional counterterrorism task forces.

B. Until the patient has been properly decontaminated, all EMS providers who treat patients of suspected exposure to nerve agents should use Level B PPE. Level B PPE should only be used by providers with appropriate training.

C. EMTs, who have completed Department approved BLS NAAA training, may administer NAAAs under the supervision of an on-scene paramedic after the paramedic has assessed the patient and determined the number of NAAAs to be administered.

D. BLS ambulance services may carry NAAAs for personal protection of EMS providers. In this situation, these medications must be prescribed by the agency medical director who is

responsible for assuring appropriate instruction on when and how to use the medication. These NAAAs are not for patient use unless supervised by appropriate ALS providers.

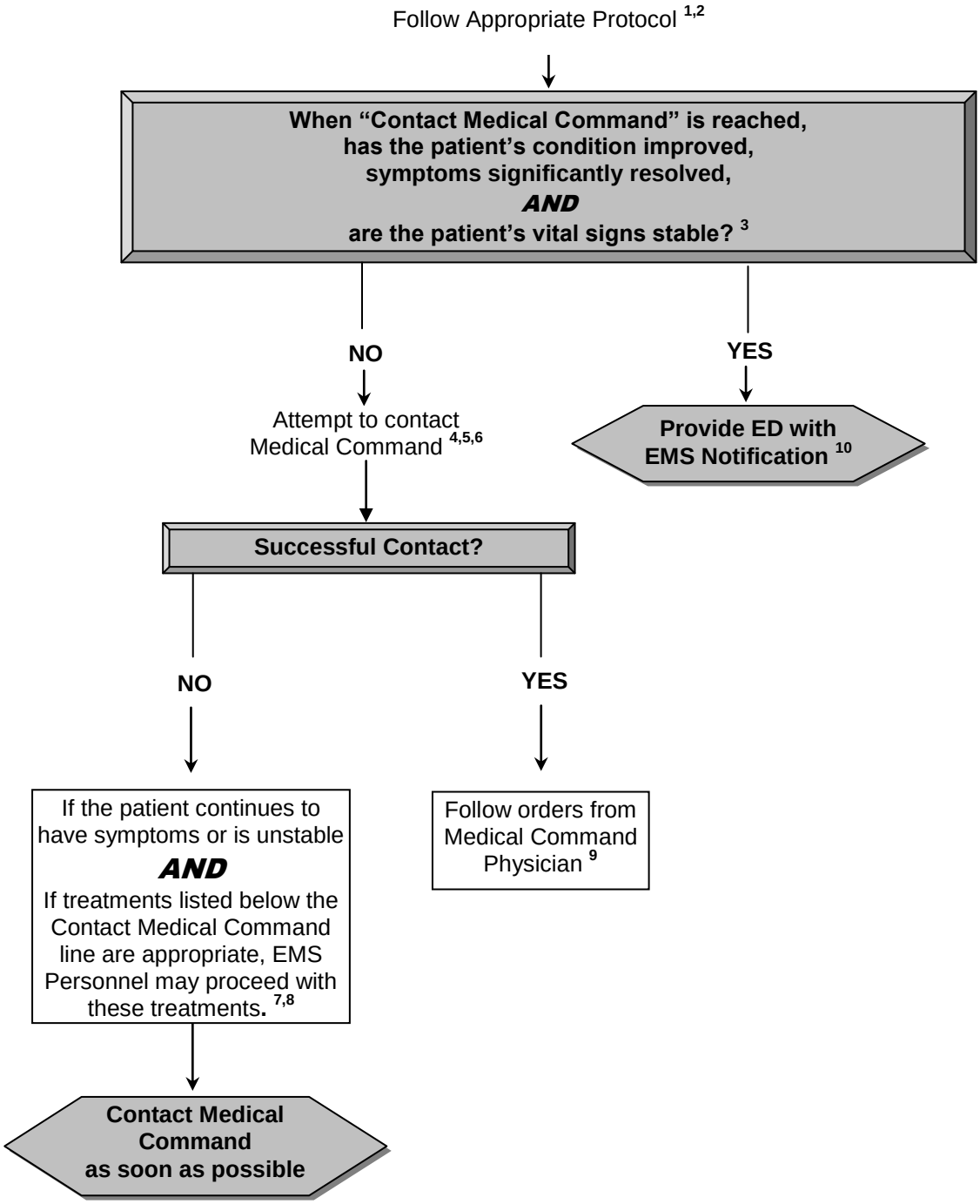
NOTES:

1. The Strategic National Stockpile CHEMPACKs are located at predetermined locations throughout the Commonwealth. The CHEMPACKs include autoinjectors and antidotes for nerve agent exposure. In the event of a mass casualty incident involving a suspected nerve agent, CHEMPACK(s) shall be released to an incident scene when a medical command physician orders the release of these antidotes through a county Emergency Management Agency
2. Due to severe bronchoconstriction and secretions, ventilation may be difficult, therefore atropine should be administered before attempts to intubate patient.
3. In mass casualty incidents, oxygen, intravenous access, pulsoximetry monitoring, and ECG monitoring should be prioritized to patients with severe symptoms if resources are limited.
4. NAAA (Nerve Agent Antidote Autoinjectors) are available in several brands. MARK 1 kits include 2 mg atropine and 600 mg pralidoxime in separate autoinjectors in a single kit. DuoDote autoinjectors contain 2.1 mg atropine and 600 mg pralidoxime in a single autoinjector. Atropens contain atropine in various doses depending upon the color-coded autoinjector.
5. Do not administer pralidoxime (2-PAMCl) to patients with exposure to carbamate pesticide (Sevin).
6. If NAAAs are not available, alternatively administer:
   a. Atropine IM or IV/ IO and pralidoxime IM only, if available. Always administer atropine dose before pralidoxime dose. See Nerve Agent Antidote Table for doses.
   b. **Mark I kits and DuoDotes are not recommended for children under 2 years old**, but appropriate Atropen or atropine doses may be given (see Nerve Agent Antidote Table).
7. **Use of the NAAAs:**
   a. The **NAAA** contains either a single autoinjector or a kit with two auto injectors. These are administered IM by pressing the end of the device onto the thigh or buttocks.
      1) Remove the NAAA from its storage location.
      2) With your non-dominate hand, hold the auto injectors by the plastic clip so that the larger auto injector is on top and both are positioned in front of you at eye level.
      3) With the other hand check the injection site (lateral thigh muscle) for buttons or objects in the pockets which may interfere with the injections.
      4) Grasp the auto injector with the thumb and first two fingers. **Do not place your thumb/finger/palm over the end of the autoinjector. Atropine doses should all be administered prior to the administration of 2-PAM if using MARK 1 kits.**
      5) Pull the injector out of the clip with a smooth motion.
      6) Hold the auto injector like a pen or pencil, between the thumb and first two fingers.
      7) Position the green tip of the auto injector against the injection site.
      8) Apply firm, even pressure (not a jabbing motion) to the injector until it pushes the needle into the lateral thigh muscle.
      9) Hold the injector firmly in place for at least 10 seconds.
      10) Carefully remove the auto injector.
      11) Place the used auto injector into a sharps container.
      12) Administer additional autoinjectors using the procedures outlined in steps 4 through 11.
      13) Annotate the number of auto injectors administered on your patient care report or (in a mass casualty incident) on the triage tag.

Performance Parameters:

A. Every case of suspected nerve agent or pesticide exposure with any symptoms should receive QI review for appropriate use of antidotes.

MEDICAL COMMAND CONTACT
STATEWIDE ALS PROTOCOL



MEDICAL COMMAND CONTACT
STATEWIDE ALS PROTOCOL

Purpose of Medical Command contact:

A. By the Pennsylvania EMS Act and its regulations, EMS personnel will provide care within their scope of practice and will follow Department of Health-approved protocols or Medical Command orders when delivering EMS care.

B. Medical Command must order any ALS treatment (medication or procedure) that an EMS provider administers when that treatment is not included in or is a deviation from the Department-approved protocols. This applies to all ALS care, including interfacility transport.

C. In certain circumstances, as defined by the Statewide BLS Protocols, medical command must be contacted by EMS (BLS or ALS) providers.

D. Protocols cannot adequately address every possible patient scenario. The Pennsylvania EMS System provides a structured Medical Command system so that EMS providers can contact a Medical Command Physician when the providers are confronted with a situation that is not addressed by the protocols or when the EMS providers have any doubt about the appropriate care for a patient.

E. In some situations and geographic locations, it is not possible for an EMS provider to contact a medical command physician. In some protocols, there are accommodations for additional care when a medical command facility cannot be contacted.

F. The protocol section entitled "Possible Medical Command Orders" are intended to educate EMS providers to the possible orders that they may receive, and as a resource to medical command physicians. Medical command physicians are not obligated to provide orders consistent with these "possible orders". **Interventions listed under "Possible Medical Command Orders" may ONLY be done when they are ordered by a medical command physician. These possible treatments should not be done in situations where medical command cannot be contacted.**

G. Contact with medical command may be particularly helpful in the following situations:

1. Patients who are refusing treatment
2. Patients with time-dependent illnesses or injuries who may benefit from transport to a specific facility with special capabilities (e.g. acute stroke, acute ST-elevation MI)
3. Patients with conditions that have not responded to the usual protocol treatments.
4. Patients with unusual presentations that are not addressed in protocols.
5. Patients with rare illnesses or injuries that are not frequently encountered by EMS providers.
6. Patients who may benefit from uncommon treatments (e.g. unusual overdoses with specific antidotes).

H. EMS agency medical directors may require more frequent contact with medical command than required by protocol for ALS personnel who have restrictions to the skills that they are credentialed to perform. EMS agency medical directors that want medical command to be contacted on every call must do this in conjunction with local medical command facilities or within a regional plan.

Purpose of facility "EMS Notification":

A. If a patient's condition has improved and the patient is stable, interventions from a medical command physician are rarely needed, and contact with the medical command physician is disruptive to the physician's care of other patients.

B. When medical command is not required or necessary, regional policy may require that the receiving facility should still be notified if the patient is being transported to the Emergency

Department. This "EMS notification" should be provided to the facility by phone or radio, and may be delivered to any appropriate individual at the facility.

C. An "EMS Notification" should be a short message that includes the ambulance identifier or designation, the patient age/gender, the chief complaint or patient problem, and whether the patient is stable or unstable.

D. "EMS Notification" is not necessary when a patient is not being transported to the receiving facilities Emergency Department (e.g. Inter-facility transfer to an acute care facility when the patient is a direct admission to an inpatient floor).

E. Providing "EMS Notification" to the ED may allow a facility to be better prepared for a patient arriving by ambulance and may decrease the amount of time needed to assign an ED bed to an arriving patient.

Notes:

1. You may contact medical command regardless of your position in the protocol if you need advice or direction in caring for the patient. Medical command should be contacted for orders if a patient requiring interfacility transport needs a medication/ treatment that is not included above the contact medical command line in any Department-approved protocol.
2. When in doubt, contact medical command.
3. For example, a patient with chest pain may have almost complete resolution of pain after oxygen, aspirin, and several nitroglycerins AND may have normal vital signs.
4. Regional policy may determine the preferred method of medical command contact/ EMS notification.
5. Cellular technology may be utilized but all EMS services must maintain the ability to contact medical command by radio also.
6. **If the receiving facility is also a medical command facility, the initial medical command contact should be made to the receiving facility.** If the receiving facility cannot be contacted, an alternate facility may be contacted. The medical command physician at the alternate facility is responsible for relaying the information to the receiving facility.
7. Procedures or treatments listed after the medical command box may be considered and performed at the discretion of the ALS provider if unable to contact medical command if the ALS provider believes that these treatments are appropriate and necessary.
8. Attempts to contact medical command must be documented on the PCR, and the provider should document the reasons for continuing with care below the medical command box. Only mark the Medical Command section of the PA PCR if you sought Medical Command.
9. Every time medical command was contacted, the EMS provider must document the medical command facility, the medical command physician, and the orders received.
10. If patient condition worsens after EMS notification, contact medical command.

Performance Parameters:

A. 100% audit of cases where treatments beyond the "contact medical command" box were performed after unsuccessful contact with medical command.

B. Documentation of medical command facility contacted, medical command physician contacted, and orders received in every case where medical command is contacted.

C. Review of cases for appropriate contact with medical command when required by certain protocols (e.g. acute stroke symptoms, refusal of treatment, etc…), when patient's condition does not improve with protocol treatment, and when patients are unstable.

D. Review of cases for appropriate use of EMS notification, and inappropriate use of medical command contact for stable patients whose symptoms were alleviated by protocol treatments.

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Airway Management ..... 4001-1 thru 4001-2
Airway Obstruction ..... 3001-1 thru 3001-2
Allergic Reaction ..... 4011-1 thru 4011-2
ALS Release to BLS ..... 1101-1 thru 1101-X
Altered Level of Consciousness-Pediatric ..... 7002P-1 thru 7002P-3
Altered Level of Consciousness-Adult ..... 7002A-1 thru 7002A-4
Asthma/COPD/Bronchospasm ..... 4022-1 thru 4022-2
~~Asystole/Pulseless Electrical Activity (PEA) – Adult~~ ..... REMOVED SEE 3031A
~~Asystole/Pulseless Electrical Activity (PEA) – Pediatric~~ ..... REMOVED SEE 3031P

Blast / Explosive Injury ..... 6005-1 thru 6005-2
Bradycardia - Adult ..... 5021A-1 thru 5021A-2
Bradycardia - Pediatric ..... 5021P-1 thru 5021P-2
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Cardiac Arrest - Traumatic 3032-1thru 3032-2
Cardiac Arrest - Hypothermia ..... 3035-1 thru 3035-2
Cardiac Arrest – Adult, Primary ..... 3050A-1 thru 3050A-3
Confirmation of Airway Placement ..... 2032-1 thru 2032-2
Congestive Heart Failure ..... 5002-1 thru 5002-2
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Crush Syndrome ..... 6004-1 thru 6004-2
Cyanide Compound Exposure ..... 8081-1 thru 8081-2

General Cardiac Arrest – Adult ..... 3031A-1 thru 3031A-2
General Cardiac Arrest – Pediatric ..... 3031P-1 thru 3031P-3
General Protocol Principles ..... 1000-1 thru 1000-6

Heat Emergencies ..... 6086-1 thru 6086-2
Hypothermia / Cold Injury / Frostbite ..... 6081-1 thru 6081-2

Medical Command Contact ..... 9001-1 thru 9001-3
Multisystem Trauma or Traumatic Shock ..... 6002-1 thru 6002-3
Musculoskeletal Trauma ..... 6003-1 thru 6003-2

Narrow Complex Tachycardia – Adult ..... 5022A-1 thru 5022A-2
Narrow Complex Tachycardia – Pediatric ..... 5022P-1 thru 5022P-2
Nausea/Vomiting ..... 7010-1 thru 7010-2
Nerve Agent/Pesticide Exposure 8083-1-thru 8083-4
Newborn/Neonatal Resuscitation ..... 3033-1 thru 3033-2

Poisoning / Toxin Exposure (Ingestion / Inhalation / Absorption / Injection) ..... 8031-1 thru 8031-6
Post-Partum Hemorrhage ..... 7087-1 thru 7087-2
Post-Resuscitation Care ..... 3080-1 thru 3080-3

Sedation-Assisted Intubation ..... 4002-1 thru 4002-4
Seizure ..... 7007-1 thru 7007-2
Seriously Ill Appearing Patient ..... 7009-1 thru 7009-2
Shock / Systemic Inflammatory Response Syndrome ..... 7005-1 thru 7005-2
Stroke ..... 7006-1 thru 7006-3
Suspected Acute Coronary Syndrome ..... 5001-1 thru 5001-2

Termination of Resuscitation ..... 3091-1 thru 3091-2

~~Ventricular Fibrillation/Pulseless VT – Adult~~ ..... REMOVED SEE 3031A
~~Ventricular Fibrillation/Pulseless VT – Pediatric~~ ..... REMOVED SEE 3031P

Wide Complex Tachycardia – Adult ..... 5023A-1 thru 5023A-2
Wide Complex Tachycardia – Pediatric ..... 5023P-1 thru 5023P-2