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TO: All Ambulance Services and MA EMTs

FR: Jon Burstein, MD State Medical Director-OEMS

DT: **November 19, 2007**

RE: Statewide Treatment Protocols Version 7.02 (**effective 2/1/2008**)

Attached are the revised current Statewide Treatment Protocols (STP) as developed by the EMCAB Medical Services Committee, version 7.02, with an effective date of **February 1, 2008.**

In addition, version 7.02 of the Appendix has been updated and are to be used in conjunction with version 7.02 of the STP, with an effective date of **February 1, 2008.**

Finally, this version includes the 2006 ECC guidelines from the American Heart Association, which must be **phased in no later than January 1, 2009.**

A summary of the edits are listed in the October 12, 2007, Edits Summary document.

Any questions please email Tom Quail, RN at [tom.quail@state.ma.us](mailto:tom.quail@state.ma.us)

Thank you.

# EMERGENCY MEDICAL SERVICES PRE-HOSPITAL TREATMENT PROTOCOLS

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COMPLETE TEXT

**Seventh Edition**  
**Official Version # 7.02**  
**Effective 2/1/2008**



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## ACKNOWLEDGMENTS

The Massachusetts Department of Public Health, Office of Emergency Medical Services gratefully acknowledges the efforts of many individuals and organizations in the development of this text. The most prominent contributions of time and effort have come from the five Regional Councils in the Commonwealth and their respective Medical Directors and Executive Directors. Many thanks to all of you and to those EMS physicians, Basic EMTs, Intermediate EMTs, and Paramedics around the Commonwealth who have greatly influenced the development process and the resultant Protocols Text.

Abdullah Rehayem  
Director

Jonathan L. Burstein, M.D.  
State Medical Director

# INTRODUCTION

## INTRODUCTION TO STATEWIDE TREATMENT PROTOCOLS

The goal of any Emergency Medical Services System is to provide the finest out of hospital medical care to all the citizens and visitors of its jurisdiction in a timely and efficient manner. The treatment protocols found in this text are designed to immediately and definitively manage emergent patient illnesses and injuries such that rapid intervention by all levels of EMT personnel will alleviate patient suffering and ultimately allow the patient to be delivered to a receiving hospital in an already improved clinical state whenever possible.

The intent of the Statewide Treatment Protocols is to establish an acceptable standard for managing patient injury and illness by EMTs working for ambulance services and/or first responder agencies (whether paid or volunteer). In this regard, a great deal of attention has been paid to the format of the protocols and the clinical correctness of the protocols. The narrative format allows the protocols to serve as a reference text when needed, while the algorithmic treatment sections provide guidance in the acute situation.

## STRUCTURE OF INDIVIDUAL PROTOCOL

Each protocol begins with a brief explanatory preamble that delineates the clinically important parameters for that particular injury or illness being managed in the out of hospital arena. The next section of the protocol emphasizes the assessment and treatment priorities for each illness or injury being addressed. This section states the most important treatment measures relevant to a particular illness or injury and is considered to be part of the treatment protocols themselves.

The treatment section of each protocol is divided into three levels: BASIC PROCEDURES, INTERMEDIATE (ALS) PROCEDURES and PARAMEDIC (ALS-P) PROCEDURES. As with any sequentially designed treatment protocol, the higher-level EMT is expected to have carried out the relevant parts of each lower level of clinical management. Note that “standing orders” are intended to represent available options for the provider prior to contacting medical control, rather than mandatory interventions; they should of course be performed when clinically appropriate.

## ROLES / RESPONSIBILITIES OF EMS PROVIDERS

### Personnel and Training

Emergency Medical Technicians are trained to provide out of hospital care at several levels of training. The untrained bystander is often the first to come to the aid of a stricken patient and may be the first to activate the EMS System. Police officers and firefighters, given their greater availability in most communities, usually arrive before an ambulance, and can often provide help at the First Responder or EMT level. In Massachusetts, EMTs may be trained to the Basic, Intermediate, or Paramedic levels.

The capabilities of each EMT level are defined elsewhere, but are clearly included in these protocols for each level.

## Responsibilities of EMS Providers

EMTs, working for ambulance services or first responder agencies (whether paid or volunteer), providing prehospital patient care in Massachusetts, have an obligation to understand the Statewide EMS System. Proper use of adequate communications equipment is essential to an effective system operation; early, accurate, brief and well-organized radio communication and notification with the Receiving Facility should be required in each EMS system. A properly completed Trip Record for each patient management situation is mandatory. A minimum Pre-Hospital Data set for each transport should be entered on the trip record such that systems-wide improvement can be undertaken by identifying issues important to the out of hospital management of patients. EMTs at all levels, BASIC to PARAMEDIC, may request Physician Medical Direction on ANY call in order to facilitate patient care. Early and concise reporting to the Receiving Facility is strongly recommended in all EMS systems. Physician Medical Direction must be obtained for all procedures outside the established Standing Orders, unless communications failures intervene (in which case Regional Communications failure protocols should be followed). An Estimated Time of Arrival should be communicated on all calls to the Receiving Facility.

## CATEGORIZATION OF PROTOCOLS

The treatment protocols have been divided into groups for ease of utilization. As new treatment modalities are developed for all levels of EMT (including entirely new curricula for EMT-Basic to Paramedic), additions and deletions will be made and communicated.

The treatment categories are the following:

- Cardiac Emergencies
- Environmental Emergencies
- Medical Emergencies
- Traumatic Emergencies
- Pediatric Emergencies

The development of separate Pediatric Emergencies protocols was deemed necessary by the Medical Services Committee due to the unique nature of management of certain pediatric clinical disorders.



**TREATMENT FACILITY/POINT OF ENTRY (POE)**

The Point-of-Entry designation for each Region is based on the Department's EMS System Regulations (105 CMR 170.000) and the Department approved POE plans. The EMT must be familiar with the regulations and the Department approved POE plans when providing patient care services in any particular Region of the Commonwealth.

The necessity to deviate from the Department approved POE plans may occur, from time to time, due to mitigating circumstances (such as a particular institution needing to go on Bypass/Diversion).

Ambulance services must also be familiar with the process of activating air ambulance resources in their particular region.

**GENERAL POLICIES**

1. In all circumstances, EMS providers should maintain personal safety. Assure scene safety in all patient encounters. Maintain appropriate body substance isolation precautions. Federal and State laws require the proper management of patients such that the provider and the patient are protected from undue exposure to communicable diseases. A reporting mechanism has been established under the Ryan White Law and must be adhered to by EMS providers and provider services.
2. Each protocol emphasizes the importance of rapid transport to the nearest appropriate treatment facility as defined in EMS regulations. In rare circumstances, delayed transport may occur when treatment cannot be performed during transport.
3. Each protocol emphasizes the importance of Advanced Life Support backup notification and utilization whenever indicated. Each ambulance service should strive to improve the quality of its service to its cities and towns. Each community should strive to improve the availability of ALS services to its cities and towns wherever feasible.
4. Communications, QA/QI, and system familiarity are key to a good EMS system:
  - Personnel communicating with EMS field providers must have a working knowledge of the Statewide EMS system and be fully aware of the skills and capabilities of the EMS providers with whom they are communicating.
  - Hospital personnel providing Medical Direction must be familiar with the communication system and its usage and, therefore, must also know the treatment guidelines established in this document for each level of EMT.
  - Hospital personnel and EMS providers must respect patient confidentiality.
  - Medical Directors for provider services must take an active role in reviewing EMT performance in the delivery of patient care. Medical Directors must establish an ongoing Quality Assurance program, whereby proper Morbidity and Mortality review takes place, and ensure that the system performs in an overall improved fashion whenever the need is identified.
5. In developing the protocols, a number of issues regarding statewide EMS service provider variations have been discussed. Many of these issues and topics have been addressed and incorporated directly into the protocols. However, several require special mention to clarify present situations and patient management issues:
  - A number of ALS ambulance services allow for blood drawing in certain patients with particular diagnostic conditions. For example, a blood sample on a patient with chest pain may be indicated in those areas where the receiving facility might feel the blood sample would contribute to the ultimate diagnosis

and aid in patient management. A number of institutions would welcome this opportunity; however, other receiving facilities might not see the need and would not test the sample taken. The EMT should be aware of local policy and procedures for their service in this regard.

- From time to time, there may exist certain diagnostic and treatment modalities and capabilities that will be available to the EMT in certain EMS provider systems, which will be utilized under standard procedure protocols or under approved pilot projects / demonstration projects. For example: transmitting 12-lead EKGs; paralytic agents to aid in the management of the difficult airway patient; thrombolytic eligibility survey of the patient; the use of cetacaine spray, phenylephrine spray and 2% lidocaine jelly to assist with nasotracheal intubation; the use of the Diver Alert Network in certain regions, and so on. The EMT must be aware of these diagnostic and treatment modalities and capabilities in the EMS system in which he/she is working. The Medical Director of these EMS systems must be aware and responsible for the activities of his/her EMTs in such circumstances.
  - The Comfort Care / DNR (CC/DNR) Order Verification Protocol was promulgated and implemented in 1997. This verification protocol has been added to the educational curricula for all levels of EMTs. The CC/DNR verification protocol is a program that will aid the EMT in recognizing the patient who is not to receive resuscitation measures as defined in the protocols, but will clearly allow for palliative care to all those patients deemed appropriate. A separate protocol on cessation of resuscitation in the field has become part of this text.
  - Use of the IV saline lock: Many protocols call for the considered initiation of an IV/ KVO. An acceptable alternative in many situations is the initiation of an IV saline lock when the need for IV medication may arise.
  - The Appendix Medication Reference List is extensive and includes those medications that are utilized in both the Statewide Treatment Protocols and the Statewide Interfacility Transfer Guidelines. ***This list is intended as a reference document, and may contain information about a given medication that may not be included in a treatment protocol. Inclusion of such information does not imply approval for any use of that medication other than that specifically described in the treatment protocol.***
  - In various protocols the basic or intermediate level EMT will be directed to “treat for shock” when the systolic blood pressure is less than 100 mmHg. The paramedic level EMT may be directed to initiate certain procedures to counteract shock when the systolic pressure is less than 90 mmHg. The EMT should be aware that certain basic measures to prevent / treat for shock should be initiated at a higher blood pressure to attempt to forestall hypoperfusion.
6. Each protocol assumes that the EMT will treat all life threatening conditions, as they become identified. While initial treatment is characterized as “standing

orders”, these are not intended to be mandatory but are options available to the crew to be used in the best treatment of the patient.

7. ETT confirmation: All Intermediate and Paramedic Protocols require that the EMT “Provide advanced airway management (endotracheal intubation) if indicated.” The standard of care in endotracheal intubation requires that EMS providers receive training in the use of specific methods for the verification of ETT placement, in conjunction with advanced airway training. EMS services performing ETT intubation should be issued equipment for confirming proper tube placement. Tube placement verification should be performed by the EMT, based upon accepted standards of practice, while taking into account whether the patient has a perfusing rhythm. ETT Verification methods should include a combination of clinical signs and the use of adjunctive devices such as the presence of exhaled carbon dioxide and esophageal detection devices. Once placement of the ETT has been confirmed, the ETT should be secured. Ongoing patient assessment is a dynamic process and reconfirmation of tube position must be performed utilizing clinical assessment and adjunctive devices any time the patient is moved, or if ETT dislodgment is suspected.
8. Beginning November 1, 2002, the use of NGT / OGT for those unconscious post-intubation patients who need gastric decompression has become a required skill for Intermediates and Paramedics.
9. Use of electronic glucose measuring devices by EMT Basic and Intermediate personnel is considered to be an Optional Skill when the EMT B or I is working under the supervision of a Paramedic in the P-B or P-I staffing configuration. The EMT-B or I is required to complete a standardized, Paramedic Assistant training program approved by the Department, which incorporates Education and Training in the safe and appropriate use of such devices. EMT Basic personnel may also be trained in the use of a glucometer at the solo Basic level as a service option.
10. The AHA, in its ACLS Guidelines 2000, strongly recommended the implementation of 12-lead ECG programs for all ALS services. This is a recommendation that MDPH/OEMS also supports. Any service which will be considering upgrade and/or purchase of new cardiac monitoring equipment must maintain or add 12-lead ECG capability either as part of the new equipment or as an ancillary device.
11. AEDs utilizing biphasic technology are acceptable for prehospital usage, as well as those utilizing pre-existing monophasic technology. There is no current consensus regarding the risks/benefits associated with energy levels (fixed or escalating) utilized in biphasic technology, or the risks/benefits of rectilinear versus truncated exponential biphasic technology. The specific device will vary from service to service; the use of any individual device must be based upon FDA approval and the recommendations of the manufacturer’s guidelines. Energy levels for device use are given in this text as “standard” monophasic values. Biphasic technology should be used at manufacturer-specified equivalent levels.

12. In addition to these Protocols, the Department from time to time issues Advisories and Administrative Requirements relating to EMTs' practice and ambulance services' responsibilities with regard to EMT practice. EMTs and ambulance services are bound to adhere to those Advisories and Administrative Requirements as they do to the Protocols.

### 13. General Principle of the Protocols

The Statewide Treatment Protocols represent the best efforts of the EMS physicians and pre-hospital providers of the Commonwealth to reflect the current state of out-of-hospital *emergency medical care*, and as such should serve as the basis for such treatment.

We recognize, though, that on occasion good medical practice and the needs of patient care may require deviations from these protocols, as no protocol can anticipate every clinical situation. In those circumstances, EMS personnel deviating from the protocols should only take such actions as allowed by their training **and** only in conjunction with their on-line medical control physician.

Any such deviations must be reviewed by the appropriate local medical director, but for regulatory purposes are considered to be appropriate actions, and therefore within the scope of the protocols, unless determined otherwise on OEMS review by the State OEMS Medical Director.

### 14. IO Access:

For IO access in **adults** who may be able to perceive pain, after the IO device's position is confirmed and it is secured, as a standing option, assuming the patient's clinical condition permits:

EMT-P's may give 20 (twenty) milligrams of lidocaine IO as a bolus, wait 30 seconds, flush with at least 10 cc. of NS, then use the IO access for medications.

For IO access in **pediatric** patients who may be able to perceive pain, after the IO device's position is confirmed and it is secured, as a standing option, assuming the patient's clinical condition permits, **CONTRAINDICATED** for pediatric patients with acute seizure or a history of non-febrile seizure:

EMT-P's may give 1 mg./kg. to a maximum of 20 (twenty) milligrams of lidocaine IO as a bolus, wait 30 seconds, flush with at least 10 cc. of NS, then use the IO access for medications.

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**For APPENDIX go to:**

[www.ma.gov/dph/oems](http://www.ma.gov/dph/oems)

## **PROTOCOL CHANGES TO REFLECT THE 1994 REVISED DOT EMT-BASIC CURRICULA**

As of September 1, 1998, all initial, basic EMT level training programs were required to utilize the 1994 Revised DOT EMT-B curriculum. Furthermore, as of January 1, 1999, all EMT-B refresher-training programs were required to use the DOT Revised Refresher curriculum. These curricula stress an assessment based approach to patient care and expand the scope of practice of the EMT-B to include administration of certain prescribed medications to patients experiencing chest pain, anaphylaxis or respiratory distress / bronchospasm.

The DOT EMT-B Curriculum lists the following initial steps to be taken at the scene of every patient encounter:

- a) Body substance isolation.
- b) Scene Safety of rescuers, bystanders and patient(s).
- c) Determine mechanism of injury/nature of illness.
- d) Determine total number of patients.
- e) Evaluate need for additional resources (ground versus air ambulances, fire rescue/suppression units, law enforcement, ALS, HAZMAT team, other specialized search and/or rescue units.

The initial and refresher curricula stress obtaining an appropriate assessment and history for each patient, and uses cues such as **(D-C-A-P-B-T-L-S)**, **(O-P-Q-R-S-T)**, and **(S-A-M-P-L-E)** to remind the EMT of the information needed to perform a thorough examination. The text of these protocols will also refer to an “appropriate **(D-C-A-P-B-T-L-S)** and/or **(O-P-Q-R-S-T)** assessment” and an “appropriate **(S-A-M-P-L-E)** history”, with the intention of reminding the EMT to elicit the following information:

### **Assessment (Medical or Trauma)**

- **Onset:** when did the symptoms begin and what was the patient doing at the time?;
- **Provocation:** activities that change the pain / complaint;
- **Quality:** sharp, dull, throbbing, crushing, constant vs. intermittent;
- **Radiation:** yes/no and to where?;
- **Severity:** rate on a scale of 1 to 10;
- **Time:** how long has pain / complaint lasted?

### **Detailed Trauma Assessment: Check for presence of:**

- **Deformities**
- **Contusions**
- **Abrasions**
- **Punctures / penetrations**
- **Burns**
- **Tenderness**
- **Lacerations**
- **Swelling**

## History

- **S**igns and symptoms: of present illness/injury
- **A**llergies: medications and environmental
- **M**edications: prescribed, over the counter, and illicit
- **P**ast Medical History:
- **L**ast Oral Intake:
- **E**vents Leading to the current illness / injury:

In an effort to remain consistent with the standards in the Revised DOT EMT-B curricula, the protocols include the administration of a patient's prescribed Nitroglycerin, Epinephrine Auto-injector and/or inhalers (bronchodilator). When administering these medications the EMT-B must keep in mind several important factors. These are:

1. The medication must be specifically that of the patient ("the right medication for the right patient");
2. The medication has not expired;
3. The patient has not already administered his/her maximum dosage ("the right dose").

In order to accomplish this, EMT-B's must make every effort to verify items 1 and 2 above by inspecting the prescription label on the box or container in which the medication was dispensed. If unable to verify that the medication was prescribed to the patient, or if unable to specifically identify the drug itself, the EMT-B should not administer the medication.

It is important to note that an EMT-B **MAY NOT** administer or assist with the administration of any patient's prescribed medication unless he/she has been trained under the 1994 Revised DOT EMT-B Curriculum, AND he/she works for an ambulance / first responder service that maintains a current memorandum of agreement with a hospital that addresses, at a minimum, training, medical control, documentation and quality assurance.

Only EMT's who have completed a state approved course for the administration of an ambulance services epinephrine auto-injector (Epi-pen ®), AND who work for an ambulance / first responder service that maintains a current memorandum of agreement with a hospital that addresses, at a minimum, training, medical control, documentation and quality assurance, may use the service's epinephrine auto-injectors.

EMT's are reminded not to allow patients with medical or trauma conditions found in these protocols, to walk, or otherwise exert themselves. All patients, especially children, shall be properly secured to the ambulance cot, using all of the required straps, or in an approved infant/child carrier or seat, or harness\*, or in an appropriate immobilization device, in a position of comfort, or in a position appropriate to the chief complaint, and/or the nature of the illness or injury.

The federal GSA specifications for ambulance equipment (KKK 1822) require that the patient be secured to the cot to prevent **horizontal, latitudinal and rotational** movement. A court ruling under the federal "common carrier" statute



stated that an ambulance service, "...must therefore equip its vehicles with the equipment which would provide the greatest degree of protection..."\*\*

The state ambulance equipment list requires all stretchers to be equipped with an over the shoulder harness, hip and leg restraining straps. Proper securing of a patient means the use of all required straps, at all times. If patient care requires that a strap be removed, the strap must be re-secured as soon as practical.

Jonathan L. Burstein, M.D.FACEP  
Medical Director, MDPH/OEMS

\* See M.G.L. c.90, § 7AA

\*\* U.S. District Court of Rhode Island, C.A. #92-0705 P

# CARDIAC EMERGENCIES

## 1.1. ASYSTOLE (Cardiac Arrest)

Asystole is defined as the complete absence of electrical activity in the myocardium. Usually this represents extensive myocardial ischemia or infarct, with a very grim prognosis. Most often, asystole represents a confirmation of death as opposed to a dysrhythmia requiring treatment. However, once asystole has been recognized, unless appendix C applies, the team leader must consider the differential diagnosis while beginning and maintaining CPR and ALS interventions. Do not defibrillate asystole, as the increased vagal tone may prevent resuscitation. Rescuers should confirm asystole when faced with a “flat line” on the monitor. One should always consider these possible causes of asystole and manage accordingly: drug overdose, hypokalemia, hypoxemia, hypothermia, and pre-existing acidosis.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Maintain an open airway with appropriate device(s), remove secretions, vomitus, initiate CPR (“push hard, push fast”, limit interruptions), and deliver supplemental oxygen, using appropriate oxygen delivery device, as clinically indicated.
4. Continually assess level of consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers and / or digoxin preparations.
6. Every effort should be made to determine the possible causes of asystole in the patient.
7. Initiate transport as soon as possible, with or without ALS.

### TREATMENT BASIC PROCEDURES

**NOTE:** Inasmuch as Basic-EMTs are unable to confirm the presence of Asystole, check patient for pulselessness and manage according to the following protocol:

1. **Early defibrillation**
  - a. Perform CPR until AED device is attached and operable.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories
  - c. Resume CPR when appropriate.
2. Activate ALS intercept, if available.
3. Initiate transport as soon as possible, with or without ALS.
4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as Intermediate-EMTs are unable to confirm the presence of Asystole, check patient for pulselessness and manage according to the following protocol:

8. **ALS STANDING ORDERS:**
  - a. Provide advanced airway management.
  - b. Initiate IV **Normal Saline** KVO. Administer 250 cc/ bolus IV NS if clinically appropriate.
9. Notify receiving hospital.

## PARAMEDIC PROCEDURES

- 1 **ALS-P STANDING ORDERS:**
  - a. Provide advanced airway management.
  - b. Administer a 250 cc bolus of IV Normal Saline if warranted
  - d. **Epinephrine (1:10,000) 1 mg IV/IO push** every 3-5 minutes. If IV/IO not yet established, as a less-preferred option can give **2-2.5 mg of Epinephrine** by ETT, every 3-5 minutes)
  - e. **Atropine 1 mg IV push** or IO every 3-5 minutes to a total of 3 mg. Atropine may also be given via Endotracheal Tube if IV/IO not yet established (**2.0 mg of Atropine via ETT**; maximum dose 6 mg.).
2. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Normal Saline fluid bolus(es).
  - b. Special Considerations:
    - Hypothermia management per protocol.
    - Drug overdose management per protocol.
    - **Sodium Bicarbonate** 1 mEq/kg IV Push especially if known pre-existing hyperkalemia or known pre-existing bicarbonate-responsive acidosis or if overdose with tricyclic antidepressants.
    - Cessation of Resuscitation per protocol.

## 1.2. ATRIAL FIBRILLATION

Atrial fibrillation is chaotic activity of the atrial muscle fibers manifested by an irregularly irregular heart rate. In addition, since the atria are fibrillating, there is incomplete (or non-existent) emptying of these chambers and a loss of as much as 20% of the cardiac output. The loss of the "atrial kick" may, in and of itself, result in hypotension or other signs of cardiovascular compromise. In this regard, one may differentiate the stable albeit symptomatic patient with a heart rate greater than 150 (palpitations, anxiety, perhaps mild chest discomfort) from the unstable patient with a blood pressure less than 100. In addition to being a primary rhythm abnormality, atrial fibrillation may occur due to acute myocardial infarction, hypoxia, pulmonary embolus, electrolyte abnormalities, toxic effects due to medication (particularly digoxin or quinidine), and thyrotoxicosis.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine patient's hemodynamic stability and symptoms. Assess Level of Consciousness, ABCs, and Vital Signs.
3. Maintain open airway and assist ventilations as needed.
4. Administer **oxygen** using appropriate oxygen delivery device, as clinically indicated.
5. Obtain appropriate assessment, (O-P-Q-R-S-T), related to event.
6. Obtain appropriate, (S-A-M-P-L-E) history, related to event.
7. Monitor and record vital signs and ECG.
8. Most patients tolerate Atrial Fibrillation well; however, some patients may require emergent treatment. Emergent treatment should be administered when the Atrial Fibrillation results in an unstable condition. Signs and symptoms may include: chest pain, shortness of breath, decreased level of consciousness, systolic BLOOD PRESSURE less than 100 m Hg, pulmonary congestion, congestive heart failure and acute myocardial infarction.
9. Initiate transport as soon as possible, with or without Paramedics. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**NOTE:** Inasmuch as Basic-EMTs are unable to confirm the presence of Atrial Fibrillation, check patient for a rapid and /or irregular pulse and possible complaint of palpitations. If present, treat according to the following protocol.

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible, with or without ALS.
3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as EMT-Intermediates are unable to confirm the presence of Atrial Fibrillation: check patient for a rapid and/or irregular pulse and possible complaint of palpitations. If present, treat according to the following protocol.

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated (patient's condition deteriorates).
- b. Initiate IV **Normal Saline** (KVO).
- c. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock. Administer a **250 ml** bolus of IV **Normal Saline**, or titrate IV to patient's hemodynamic status.

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a) Provide advanced airway management if indicated (patient's condition deteriorates).
- b) Initiate IV **Normal Saline** (KVO).
- c) **Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**
- d) If the rhythm appears to be amenable, e.g. "regular narrow SVT", may attempt vagal maneuvers: "Valsalva" and/or cough.
- e) If the patient's systolic blood pressure is **unstable** (less than **100 mm Hg, with signs of hypoperfusion**): **Synchronized cardioversion** at **50 J, 100 J, 200 J, 300J, and 360 J** or the equivalent biphasic values as per manufacturer). Check rhythm and pulse between each attempted cardioversion.
- f) If Cardioversion is warranted, consider administration of any of the following for sedation:
  - **Diazepam**: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or
  - **Midazolam** 0.5 mg-2.5 mg SLOW IV Push or,
  - **Morphine Sulfate** 2.0 mg – 10 .0 mg SLOW IV Push or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.
  - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**
- g) Administration of **Diltiazem HCL**  
Heart rate greater than 150 and patient stable but symptomatic:  
Initial bolus : **0.25 mg/kg slow IV push over two (2) minutes.**  
If inadequate response after 15 minutes, re-bolus **0.35 mg/kg SLOW IV PUSH over two (2) minutes.**  
IV Infusion **10.0-15.0 mg/hr.**

**NOTE:** **5.0 mg/hr** may be an appropriate starting infusion for some patients.  
**CONTRAINDICATIONS:** Wolff-Parkinson-White Syndrome, second or third degree heart block and sick sinus syndrome (except in the presence of a ventricular pace maker), severe hypotension or cardiogenic shock.

- **Heart rate less than 150 and patient stable but symptomatic: Contact Medical Control.**

2. Contact **MEDICAL CONTROL**. The following may be ordered.

a. Administration of **Diltiazem**:-

- Initial bolus: **0.25 mg/kg SLOW IV PUSH over two (2) minutes.**
- **If inadequate response after 15 minutes, re-bolus 0.35 mg/kg SLOW IV PUSH over two (2) minutes.**
- **IV Infusion 10.0-15.0 mg/hr.**

**NOTE: 5.0 mg/hr may be appropriate starting infusion for some patients.**  
**CONTRAINDICATIONS: Wolff-Parkinson-White Syndrome, second or third degree heart block and sick sinus syndrome (except in the presence of a ventricular pace maker), severe hypotension or cardiogenic shock.**

**OR**

**Amiodarone 150.0 mg Slow IV push over 10 minutes.**

**Administration of Metoprolol:**

**Bolus: 2.5 mg to 5 mg SLOW IV PUSH over 2 minutes.**

**Repeat dosing in 5 minute intervals for a maximum of 15 mg.**

**NOTE: For rate control in adult patients currently prescribed a beta- blocker.**

**CAUTION: DO NOT USE IV METOPROLOL WITH IV Ca BLOCKERS**

- c. **If Systolic BLOOD PRESSURE is unstable (e.g. less than 100): Synchronized cardioversion at 50 J, 100 J, 200 J, 300J, and 360 J or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.**
- d. If Cardioversion is warranted, consider administration of any of the following for sedation:
  - **Diazepam if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
  - **Midazolam 0.5 mg-2.5 mg SLOW IV Push or**
  - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push or**
  - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**

## 1.3. ATRIAL FLUTTER

Atrial Flutter is an "unstable" rhythm, which will usually quickly deteriorate into Atrial Fibrillation, or return to sinus rhythm, or another form of supraventricular tachycardia. Atrial Flutter may produce a very rapid ventricular response. The ventricular rate can be variable and may result in hypotension or other signs of cardiovascular compromise. In this regard, one may differentiate the stable but symptomatic patient with a heart rate greater than 150 (palpitations, anxiety, chest discomfort) from the unstable patient with a blood pressure less than. Atrial Flutter is often the result of: AMI, hypoxia, pulmonary embolus, electrolyte abnormalities, toxic effects due to medication (particularly digoxin or quinidine), and thyrotoxicosis.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine patient's hemodynamic stability and symptoms. Assess Level of Consciousness, ABCs, and Vital Signs.
3. Maintain open airway and assist ventilations as needed.
4. Administer **oxygen** using appropriate oxygen delivery device, as clinically indicated.
5. Obtain appropriate assessment, (O-P-Q-R-S-T), related to event.
6. Obtain appropriate S-A-M-P-L-E history related to event.
7. Monitor and record vital signs and ECG.
8. Most patients tolerate Atrial Flutter well; however, some patients may require emergent treatment. Emergent treatment should be administered when the Atrial Flutter results in an unstable condition. Signs and symptoms may include: chest pain, shortness of breath, decreased level of consciousness, systolic BLOOD PRESSURE less than 100 mm Hg, shock, pulmonary congestion, congestive heart failure and acute myocardial infarction.
9. Initiate transport as soon as possible, with or without Paramedics. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**NOTE:** Inasmuch as Basic-EMTs are unable to confirm the presence of Atrial Flutter: check patient for a rapid and /or irregular pulse and possible complaint of palpitations. If present, treat according to the following protocol.

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as EMT-Intermediates are unable to confirm the presence of Atrial Flutter: check patient for a rapid and/or irregular pulse and possible complaint of palpitations. If present treat according to the following protocol.

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated (patient's condition deteriorates).
- b. Initiate IV **Normal Saline (KVO)**.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management if indicated (patient's condition deteriorates).
- b. Initiate IV **Normal Saline (KVO)**.
- c. If patient's BLOOD PRESSURE drops below 100 systolic. Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
- d. Vagal Maneuvers: Valsalva and/or cough.
- e. **If the patient's Systolic BLOOD PRESSURE is unstable (e.g. less than 100):**

**Synchronized cardioversion at 50 J, 100 J, 200 J, 300J, and 360 J** or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.

- f. If Cardioversion is warranted, consider administration of any of the following for sedation:
  - **Diazepam**: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or
  - **Midazolam** 0.5 mg - 2.5 mg SLOW IV Push or
  - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push** or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.
  - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**

### g. Administration of **Diltazem HCL**

Heart rate greater than 150 and patient stable but symptomatic:

Initial bolus : **0.25 mg/kg slow IV push over two (2) minutes.**

If inadequate response after 15 minutes, re-bolus **0.35 mg/kg SLOW IV PUSH over two (2) minutes.**

IV Infusion 10-15 mg/hr.

**NOTE:** **5.0** mg/hr may be appropriate starting infusion for some patients.

**CONTRAINDICATIONS:** Wolff-Parkinson-White Syndrome, second or third degree heart block and sick sinus syndrome (except in the presence of a ventricular pace maker), severe hypotension or cardiogenic shock.



## 1.3. ATRIAL FLUTTER

### PARAMEDIC PROCEDURES (continued)

2. Contact **MEDICAL CONTROL**. The following may be ordered.
  - a. Administration of **Diltiazem HCL** :
    - Initial bolus: 0.25 mg/kg **SLOW IV PUSH** over two (2) minutes.
    - **If inadequate response after 15 minutes, re-bolus 0.35 mg/kg SLOW IV PUSH over two (2) minutes. IV Infusion 10.0 -15.0 mg/hr.**

**NOTE: 5.0 mg/hr may be appropriate starting infusion for some patients.**

**CONTRAINDICATIONS: Wolff-Parkinson-White Syndrome, second or third degree heart block and sick sinus syndrome (except in the presence of a ventricular pace maker), severe hypotension or cardiogenic shock.**

OR

Based on **Service** Options: **Amiodarone 150 .0 mg IV slowly over 10 minutes.**

#### **Administration of Metoprolol:**

**Bolus: 2.5 mg to 5 mg SLOW IV PUSH over 2 minutes.**

**Repeat dosing in 5 minute intervals for a maximum of 15 mg.**

**NOTE: For rate control in adult patients currently prescribed a beta- blocker.**

#### **CAUTION: DO NOT USE IV LOPRESSOR WITH IV Ca BLOCKERS**

- c. **If Systolic BLOOD PRESSURE is unstable (less than 100): Synchronized cardioversion at 50 J, 100 J, 200 J, 300J, and 360 J or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.**
- d. If Cardioversion is warranted, consider administration of any of the following for sedation:
  - **Diazepam: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
  - **Midazolam 0.5 mg-2.5 mg SLOW IV Push or**
  - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push, or or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.**
  - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**

## 1.4. BRADYDYSRHYTHMIAS

Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia, toxic ingestion or exposure, damage to the cardiac conduction system (e.g. infarct), and late shock. Bradycardia may be a late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, or CNS tumor. Out of hospital treatment is directed to the symptomatic patient only. In treating bradycardia, as in treating tachycardia the admonition **"treat the patient, not the monitor"** should be emphasized. REMINDER: EMS providers must be aware of the concept of "relative" bradycardia, i.e., the patient's pulse rate in relation to the patient's BLOOD PRESSURE and clinical condition.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway with appropriate device(s), and Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
3. Remove secretions, vomitus, etc., be prepared to initiate CPR and assist ventilations as needed.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers, and digoxin preparations.
6. Monitor and record vital signs and ECG.
7. Symptomatic patients will have abnormally slow heart rates accompanied by decreased level of consciousness, weak and thready pulses or hypotension (systolic BLOOD PRESSURE less than 100).
8. Initiate transport as soon as possible, with or without Paramedics. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**NOTE:** Inasmuch as Basic-EMTs are unable to confirm the presence of Bradydysrhythmias, check patient for a slow and /or irregular pulse. If present, treat according to the following protocol.

1. If pulse <60 and patient is symptomatic, and/or blood pressure falls below 100 systolic, place the patient supine, treat for shock.
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as EMT-Intermediates are unable to confirm the presence of Bradycardias, check patient for a slow and/or an irregular pulse. If present, treat according to the following protocol.

### 1. ALS STANDING ORDERS

Advanced Airway Management if indicated.

Initiate IV Normal Saline (KVO).

If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

Advanced Airway Management if indicated.

Initiate IV Normal Saline (KVO).

Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

If patient is symptomatic as defined in Assessment Priorities:

- **Transcutaneous Pacing (TCP).**
- **While waiting for pacer set-up, consider atropine sulfate 0.5 mg IV/IO push every three (3) to five (5) minutes up to total dose 3 mg. If administered via ET, each dose is 2.0 mg, to max. 6 mg.**

**NOTE:** If Transcutaneous Pacing (TCP) is warranted, consider administration of **midazolam 0.5 mg to 2.5 mg IV push.**

### 2. Contact **MEDICAL CONTROL.** The following may be ordered:

a. Additional Fluid Boluses of Normal Saline as indicated.

b. **Dopamine  $2 \mu\text{g}/\text{kg}$  to  $20 \mu\text{g}/\text{kg}$  per minute. (Rate determined by physician)**

c. **Epinephrine Infusion (mix 1 mg in 250 ml Normal Saline). Administer  $2 \mu\text{g}$  to  $10 \mu\text{g}$  per minute**

d. **Glucagon 1.0 to 5.0 mg IM, SC or IV for suspected beta-blocker toxicity.**

**Calcium Chloride 10% 2 - 4 mg/kg maximum of 1 gram IV slowly over five (5) minutes for suspected calcium channel blocker toxicity.**

Sedation for transcutaneous pacing: administer **midazolam 0.5 mg to 2.5 mg IV push**

## 1.5. ACUTE CORONARY SYNDROME

Acute coronary syndrome (ACS) represents a spectrum of disease. There are at least three conditions identified within the spectrum of ACS: Unstable Angina; Non-Q wave MI; and Q wave MI. Patients experiencing a myocardial infarction or ischemic event of unknown etiology may present with any of the following symptoms:

- Chest pain (squeezing; dull pressure or discomfort)
- Pain radiating down the arms or jaw
- Sudden onset of sweating [in itself a significant finding]
- Difficulty breathing, anxiety or restlessness
- Impending feeling of doom
- Abnormal and/or irregular pulse rate
- Abnormal blood pressure
- Epigastric pain
- Nausea/vomiting, etc.

All ACS patients must be carefully monitored until a definitive diagnosis can be made at the hospital. All patients with ACS-like symptoms of a non-traumatic etiology should be considered to be of cardiac origin until proven otherwise.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed.
3. Administer **oxygen**, using appropriate oxygen delivery device, as clinically indicated.
4. Obtain appropriate assessment, (O-P-Q-R-S-T), related to event.
5. Obtain appropriate (S-A-M-P-L-E) history, related to event.
6. Monitor and record ECG and vital signs.
7. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Activate ALS, if available and deemed necessary.
2. Initiate transport as soon as possible, with or without ALS.
3. **BLS STANDING ORDERS**
  - a. Determine patient's history of allergies, and administer **aspirin** (Dose= 162-325 mg., chewable preferred) if not contraindicated and if not already administered.
  - b. **If patient complains of chest pain, chest pressure or chest discomfort administer patient's nitroglycerin (NTG), 1 tablet or spray sublingual, If BLOOD PRESSURE is greater than 100 systolic. May repeat dosage in 5 minute intervals times two (x2), if BLOOD PRESSURE remains greater than 100 systolic, to a maximum of three doses, including any doses the patient may have self administered prior to EMS arrival.**
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.

**Note: For patients, both male and female, who have, within the last 48 hours, taken any medications classified in the phosphodiesterase-type-5 inhibitor category (e.g. sildenafil, vardenafil, tadalafil), nitrates should not be administered unless medical control has been contacted and has provided the Emergency Medical Technician (EMT-B; EMT-I; EMT-P) with a medical control order to administer nitrates.**

4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated (i.e., patient's condition deteriorates).
- b. Initiate IV **Normal Saline** (KVO).
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV **Normal Saline**, or titrate IV to patient's hemodynamic status
- d. Determine patient eligibility for fibrinolytic therapy. (See appendix)

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS:

Provide advanced airway management if indicated (patient's condition deteriorates).  
Initiate IV **Normal Saline** (KVO).

If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV **Normal Saline**, or titrate IV to patient's hemodynamic status.

**NOTE:** A second IV line may be indicated for high-risk patient.

- d. If a dysrhythmia is identified, treat per protocol.
- e. **Determine patient's history of allergies, and administer aspirin (Dose= 162-325 mg) if not contraindicated and if not already administered.**
- f. **If the patient is at high risk for Acute Coronary Syndrome, based upon clinical presentation and/or diagnostic 12-lead EKG changes administer Nitroglycerin 0.4 mg (1/150) SL tablet or spray if BLOOD PRESSURE is greater than 100 systolic; may repeat in 5 minute intervals x two (2) if BLOOD PRESSURE remains greater than 100 systolic (total of 3 doses), including any doses the patient may have self administered prior to EMS arrival.**

**Note: For patients, both male and female, who have, within the last 48 hours, taken any medications classified in the phosphodiesterase-type-5 inhibitor category (e.g. sildenafil, vardenafil, tadalafil), nitrates should not be administered unless medical control has been contacted and has provided the Emergency Medical Technician (EMT-B; EMT-I; EMT-P) with a medical control order to administer nitrates.**

- g. If patient has taken his/her **nitroglycerin** prior to your arrival, and you have determined that the pharmacologic potency of that nitroglycerin was normal (based upon standard side effects of the med, e.g., headache/tingling sensation) without pain relief, contact **Medical Control** for other treatment options.

- 
- h. Administer Morphine Sulfate 2.0 mg- 4.0 mg Slow IV PUSH** or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.
2. Contact **MEDICAL CONTROL**. The following may be ordered:
- a. **Nitroglycerin 0.3 mg - 0.4 mg SL tablet or spray.**
  - b. **More morphine or fentanyl IV. If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**
  - c. If patient's BLOOD PRESSURE remains below 100 systolic in response to Nitroglycerin or Morphine Sulfate, may order further IV Normal Saline.
  - d. **If the patient is at high risk for Acute Myocardial Infarction, based upon clinical presentation and diagnostic 12-lead EKG changes, then Metoprolol 5.0 mg IV may be ordered. May be repeated in 5-10 minutes.**
  - e. Determine patient eligibility for fibrinolytic therapy if possible. (See appendix). **If the patient's ECG is consistent with STEMI, and the patient is hypotensive, in congestive heart failure, has contraindications to thrombolytics, or the nearest PCI-capable hospital *as established in a Department approved STEMI POE plan* is within 30 minutes further transport, medical control may order transport direct to the PCI facility.**

## 1.6. POST-RESUSCITATION CARE

The immediate goals of post resuscitation care are to (1) provide cardiorespiratory support to optimize tissue perfusion, especially to the brain; (2) transport the patient to an appropriate hospital emergency department and then to an appropriately equipped critical care unit; (3) attempt to identify the precipitating causes of the arrest; and (4) institute measures such as anti-arrhythmic therapy to prevent recurrence.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine patient's hemodynamic stability and symptoms. Assess Level of Consciousness, ABCs and Vital Signs.
3. Maintain an open airway with appropriate device(s). This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated. Assist ventilations as needed.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Monitor and record vital signs and ECG.
7. Identification of complications, such as rib fractures, hemothorax or pneumothorax, pericardial tamponade, intra-abdominal trauma and/or improperly placed endotracheal tube.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible, with or without ALS.
3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

Provide advanced airway management if indicated.

##### Initiate IV Normal Saline (KVO).

If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.

#### PARAMEDIC PROCEDURES

##### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management if indicated.
- b. Initiate/maintain IV Normal Saline (KVO).
- c.. Manage dysrhythmias according to specific protocols.

- d. If the cardiac arrest was the result of Ventricular Fibrillation or Ventricular Tachycardia and no anti-arrhythmic treatment was given, administer a Lidocaine bolus of 1.0 -1.5 mg/kg followed by maintenance infusion of 2.0 mg – 4.0 mg/minute unless contraindicated.  
**CONTRAINDICATION:** patients with perfusion due to a ventricular escape rhythm.
  - e. Consider induced hypothermia, such as by application of ice packs to axilla, groin, neck, and head, and/or use of 250-cc. boluses of chilled saline IV titrated to hemodynamic status.
  - f. **Dopamine 10.0 mcg/kg per minute if BP is < 80 systolic after a fluid bolus**
2. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. **Dopamine** 2.0 mcg/kg to 20.0 mcg/kg per minute. All other medical control treatment modalities as indicated.
    - b. **Amiodarone** 1 mg./min. IV drip.

**REMEMBER:** This is an extremely unstable period. The patient should be monitored closely and frequently. Recurrent dysrhythmias, hypotension and re-arrest are not uncommon occurrences.

**Avoid hyperthermia and hyperventilation.**



## 1.7. PREMATURE VENTRICULAR COMPLEXES (PVCs)

Premature ventricular contractions (PVC's) are depolarizations that arise in either ventricle prior to the next expected sinus beat. The subsequent rhythm is irregular with a shorter than normal R-R interval separating the PVC from the preceding normal beat. P waves are absent before the PVC, and the QRS complex is distorted, wide and often bizarre in appearance. PVC's can lead to ventricular tachycardia and ventricular fibrillation. They are of particular concern in patients with chest pain of cardiac etiology.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Obtain appropriate S-A-M-P-L-E history related to event.
5. Monitor and record vital signs and ECG.
6. Prevent / treat for shock.
7. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**NOTE: Inasmuch as Basic-EMTs are unable to confirm the presence of PVCs: check patient for an irregular pulse and possible complaint of palpitations. If present, treat according to the following protocol.**

1. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
2. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

**NOTE: Inasmuch as EMT-Intermediates are unable to confirm the presence of PVCs: check patient for an irregular pulse and possible complaint of palpitations. If present treat according to the following protocol.**

1. **ALS STANDING ORDERS**  
Provide advanced airway management if indicated (patient's condition deteriorates).  
**Initiate IV Normal Saline (KVO).**  
**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

### PARAMEDIC PROCEDURES

1. Cardiac monitor and 12 lead ECG (avoiding transport delay).
2. Determine if PVCs are present and if patient is severely symptomatic, or if:
  - a. related to an ongoing cardiac ischemic event (i.e., chest pain, syncope, coronary artery disease)

- b. frequent (> 6/min.)
- c. multifocal
- d. exhibiting the R on T phenomenon
- e. occurring in patterns ( e.g., bigeminy, trigeminy, etc.).

3. **ALS-P STANDING ORDERS**

Provide advanced airway management if indicated (patient's condition deteriorates)  
Initiate IV Normal Saline (KVO).

If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.

If the heart rate is **less than 50/min. not counting PVCs**, and accompanied by a **systolic BLOOD PRESSURE less than 90** and/or other associated signs of shock or ischemia are present, administer **Atropine 0.5 mg IV** push and refer to Bradycardias Protocol.

If patient is symptomatic and is not bradycardic, the administration of Lidocaine may be considered. **Lidocaine 0.5 mg/kg-1.0 mg/kg** IV push; may repeat to a total dose of 3 mg/kg.

**Lidocaine Maintenance Infusion 2 mg/min.- 4 mg/min.**

As an alternative to lidocaine, consider **amiodarone, 150 mg. over 10 minutes IV**, which may be repeated to **total dose of 300 mg.**

8. Contact **MEDICAL CONTROL**, who may order:  
**Lidocaine 0.5 mg/kg-1.0 mg/kg** IV push; may repeat to a total dose of 3 mg/kg. (if not performed on standing orders).  
**Lidocaine Infusion 2 mg/min.- 4 mg/min.** (if not performed on standing orders).  
**Atropine 0.5 mg** IV push, repeat to **maximum dose of 0.04 mg/kg.**  
**Amiodarone** if not given under standing orders.

## 1.8. PULSELESS ELECTRICAL ACTIVITY (Cardiac Arrest)

The absence of a detectable pulse and the presence of some type of electrical activity other than ventricular tachycardia or ventricular fibrillation define this group of dysrhythmias. These rhythms can represent the last electrical activity of a dying myocardium, or they may indicate specific disturbances. Wide-complex PEA can appear as a result of severe hypovolemia, hypoxia, acidosis, hyper/hypokalemia, hypothermia, or toxic overdose (tricyclic antidepressants, beta-blockers, calcium channel blockers, digitalis). Treatment of PEA may include suspecting and treating other specific possible causes, such as cardiac tamponade, tension pneumothorax, coronary thrombosis (ACS), and pulmonary embolism.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Maintain an open airway with appropriate device(s), remove secretions and vomitus, initiate CPR ("push hard, push fast", limit interruptions), and administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers and/or digoxin preparations.
6. Initiate transport as soon as possible, with or without ALS.

### TREATMENT

#### BASIC PROCEDURES

1. **EARLY DEFIBRILLATION.**
  - a. Perform CPR until AED device is attached and operable.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories.
  - c. Resume CPR when appropriate.
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS
4. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

1. Activate Paramedic intercept, if deemed necessary and if available.

2. **ALS STANDING ORDERS**

Provide advanced airway management.

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

Consider underlying causes for PEA

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

Provide advanced airway management

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

Consider and treat underlying causes for PEA:

- hypothermia: **initiate 2 large bore IVs (warm) normal saline**
- drug overdose: **see specific toxicology protocol**
- pneumothorax: **perform needle chest decompression**

e. If cause is unknown and PEA persists:

- **Epinephrine 1:10,000 1 mg IV/IO Push** every 3-5 minutes. Epinephrine may be given via Endotracheal Tube **if IV/IO is not established. (2 - 2.5 mg of Epinephrine 1:1,000 is preferred (ET) every 3-5 minutes).**
- If electrical bradycardia (less than 60 Beats per minute) exists, administer **Atropine 1 mg IV/IO Push** every 3-5 minutes to a total of 3 mg. Atropine may be given via Endotracheal Tube if IV is not established. **(Atropine 2.0 mg via ET tube to maximum 6.0 mg)**

2. Contact **MEDICAL CONTROL**. The following may be ordered:

- a. Additional Normal Saline Fluid bolus(es) as indicated.
- b. **Sodium Bicarbonate 1 mEq/kg IV push**

## 1.9. SUPRAVENTRICULAR TACHYCARDIA

Supraventricular Tachycardia (SVT) includes all tachydysrhythmias in which the pacemaker impulse is originating above the ventricles. Examples of these are Paroxysmal Supraventricular Tachycardia (PSVT), Atrial Fibrillation, Atrial Flutter, and Junctional Tachycardia with a rapid ventricular response. Generally these groups of tachycardias are narrow complex rhythms and should not be confused with sinus tachycardia, which is treated quite differently. Narrow complex SVT with heart rates greater than 150/min. often requires rapid intervention.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed.
3. Determine patient's hemodynamic stability and symptoms. Assess level of consciousness, ABCs, and vital signs.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
6. Obtain appropriate S-A-M-P-L-E history related to event.
7. Monitor and record vital signs and ECG.
8. Most patients tolerate SVT well, however, some patients may require emergent treatment. Emergent treatment should be administered when the SVT results in an unstable condition. Signs and symptoms may include: chest pain, palpitations, shortness of breath, decreased level of consciousness, systolic BLOOD PRESSURE less than **100** shock, pulmonary congestion, congestive heart failure and/or acute myocardial infarction.

### TREATMENT

#### BASIC PROCEDURES

**NOTE:** Inasmuch as EMT-Basics are unable to confirm the presence of SVT: check patient for a rapid and /or irregular pulse and possible complaint of palpitations. If present treat according to the following protocol.

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as EMT-Intermediates are unable to confirm the presence of SVT: check patient for a rapid and /or irregular pulse and possible complaint of palpitations. If present treat according to the following protocol.

#### 1. ALS STANDING ORDERS

Provide advanced airway management if indicated (patient's condition deteriorates).

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

**PARAMEDIC PROCEDURES**

**1. ALS STANDING ORDERS**

Provide advanced airway management if indicated (patient's condition deteriorates).

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

Vagal Maneuvers: **Valsalva's and/or cough.**

If Systolic BLOOD PRESSURE is unstable (less than 100): **Synchronized cardioversion at 50 J, 100 J, 200 J, 300 J and 360 J** or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.

If cardioversion is warranted, consider administration of any of the following for sedation:

- **Diazepam**: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or
- **Midazolam** 0.5 mg - 2.5 mg SLOW IV push or
- **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV push or or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.**
- **If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ**

Administer **Adenosine 6.0 mg rapid IV push over 1-3 seconds**. If previous 6.0 mg dose failed to resolve rhythm disturbance: Administer **Adenosine 12.0 mg rapid IV push over 1-3 seconds**. Repeat **Adenosine 12.0 mg rapid IV push over 1-3 seconds** if previous doses failed to resolve rhythm disturbance.

**Note:** Follow all Adenosine with a **20 ml normal saline bolus** and elevate extremity.

**2. Contact MEDICAL CONTROL.** The following may be ordered.

**Administration of diltiazem HCL:**

**Initial bolus:** 0.25 mg/kg SLOW IV PUSH over two (2) minutes.

If inadequate response after 15 minutes, **re-bolus** 0.35 mg/kg SLOW IV PUSH over two (2) minutes.

IV Infusion 10.0-15.0 mg/hr

**NOTE:** 5.0 mg/hr may be appropriate starting infusion for some patients. **CONTRAINDICATIONS:** Wolff-Parkinson-White Syndrome, second or third degree heart block and sick sinus syndrome (except in the presence of a ventricular pace maker), severe hypotension or cardiogenic shock.

**OR**

**Amiodarone 150.0 mg IV slowly over 10 minutes.**

- b. **If Systolic BLOOD PRESSURE is unstable (such as less than 100 mm Hg): Synchronized cardioversion at 50 J, 100 J, 200 J, 300 J, and 360 J** or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.

- 
- c. If Cardioversion is warranted, Medical Control may order any of the following for sedation:
- **Diazepam**: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or,
  - **Midazolam** 0.5 mg-2.5 mg SLOW IV Push or,
  - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push or or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.**
  - **If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ**
- d. Administer IV Normal Saline 250 ml bolus(es) or titrate IV to patient's hemodynamic status.

## 1.10. VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA (Cardiac Arrest)

The need for early defibrillation is clear and should have the highest priority. Since these patients will all be in cardiopulmonary arrest, use of adjunctive equipment should not divert attention or effort from Basic Cardiac Life Support (BCLS) resuscitative measures, early defibrillation and Advanced Cardiac Life Support (ACLS). Remember: rapid defibrillation and early ACLS is the major determinant of survival.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Consider all potential non-cardiac causes (i.e. electric shock and remove from danger).
4. Maintain an open airway with appropriate device(s), remove secretions and vomitus, initiate CPR ("push hard, push fast", limit interruptions), and administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Continually assess Level of Consciousness, ABCs and Vital Signs.
6. Obtain appropriate S-A-M-P-L-E history related to event.
7. Begin CPR and assist ventilations while awaiting defibrillator.
8. Basic and/or Intermediate providers should activate a paramedic intercept system (ACLS) as soon as possible, if available.

### TREATMENT BASIC PROCEDURES

1. a. Perform CPR until defibrillator is attached and operable.  
b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories  
c. Resume CPR when appropriate.
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

#### 1. ALS STANDING ORDERS

Provide advanced airway management.

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**



**PARAMEDIC PROCEDURES****1. ALS STANDING ORDERS**

- a. **Defibrillate** once at 360 J monophasic equivalent energy, or 120-200 J biphasic.

Resume CPR.

Repeat one shock at same energy.

Provide advanced airway management.

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

- b. Administer **Epinephrine (1:10,000) 1 mg** IV/IO push; repeat every 3 - 5 minutes. Epinephrine may be given via Endotracheal Tube if IV is not yet established. (**2 - 2.5 mg of Epinephrine 1:1,000 if by ET every 3-5 minutes**).
- c. Continue CPR and defibrillate (each shock at 360J monophasic equivalent) per AHA recommendations if VENTRICULAR FIBRILLATION/ VENTRICULAR TACHYCARDIA is persistent.

- d. **Administer either:**

**AMIODARONE** 300 mg slow IV/IO push.

**OR**

**Lidocaine** 1.5 mg/kg IV/IO; subsequent dosage: 0.5 to 0.75 mg/kg IV/IO every 3 - 5 minutes to a total dose of 3 mg/kg IV/IO or Lidocaine ET 2 - 2.5 times the IV dose; subsequent dosage: ET 2 - 2.5 times the IV dose every 3 - 5 minutes to a total dose of 6 mg/kg ET.

If dysrhythmia is successfully converted, consider IV infusion of lidocaine 2-4 mg/min. or amiodarone 1 mg./min. (use the drug resulting in conversion if possible) and follow Post-Resuscitation Care protocol.

2. Contact **MEDICAL CONTROL**, who may order:

- a. **Sodium Bicarbonate 1 mEq/kg**, IV/IO push.
- b. **Magnesium Sulfate 1 - 2 grams** IV/IO in torsades de pointes or suspected hypomagnesemic state or refractory VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA.
- c. **Amiodarone 150 mg. slow IV/IO push if one dose already given, or 300 mg slow IV/IO push** if not already given.

## 1.11. VENTRICULAR TACHYCARDIA WITH PULSES

Ventricular tachycardia represents a grave, life-threatening situation in which the patient requires immediate treatment. The diagnosis is suggested any time three or more premature ventricular beats occur in succession. With ventricular tachycardia, cardiac output may drop dramatically or be absent altogether and progress into ventricular fibrillation. In VENTRICULAR TACHYCARDIA, the patient is considered to be either:

**PULSELESS**: in essence in Cardiopulmonary Arrest. See the **Ventricular Fibrillation Protocol**.

**STABLE**: presents with pulses, conscious, without chest pain, systolic BLOOD PRESSURE greater than **100 mm Hg**.

**UNSTABLE**: presents with pulses, but is severely symptomatic: chest pain, palpitations, shortness of breath (SOB), signs and symptoms of congestive heart failure (CHF), hypotension (systolic BLOOD PRESSURE less than **100 mm Hg**), decreasing level of consciousness (LOC) or unresponsive.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine patient's hemodynamic stability and symptoms. Assess LOC, ABCs and Vital Signs.
3. Maintain an open airway with appropriate device(s), remove secretions, vomitus, initiate CPR.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Monitor and record vital signs and ECG.
7. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**Note:** Inasmuch as Basic EMTs are unable to confirm the presence of V-Tach, treat patient according to the following protocol:

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. If patient's BLOOD PRESSURE drops below 100 mm Hg systolic: treat for shock.
4. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

Note: Inasmuch as Intermediate EMTs are unable to confirm the presence of V-Tach, treat patient according to the following protocol:

**1. ALS STANDING ORDERS**

Provide advanced airway management if indicated.

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

Provide advanced airway management if indicated.

**Initiate IV Normal Saline (KVO).**

**Consider a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

If Systolic BLOOD PRESSURE is unstable (less than **100**): **synchronized cardioversion at 100 J, 200 J, 300 J and 360 J** or the equivalent biphasic values as per manufacturer. Check rhythm and pulse between each attempted cardioversion.

If cardioversion is warranted, consider administration of any of the following for sedation:

- **Diazepam**: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or,
- **Midazolam** 0.5 mg - 2.5 mg SLOW IV push or,
- **Morphine Sulfate** 2.0 mg - 10 mg IV or **Fentanyl** 1 mcg/kg. to max. 150 mcg. slow IV push.
- If no IV access, **Morphine Sulfate** 2.0 mg – 10.0mg IM/SQ

If systolic BLOOD PRESSURE is stable (greater than or equal to 100 mm Hg) administer **Amiodarone** 150.0 mg in 10 cc Normal Saline, slow IV/IO push over 8-10 minutes.

**OR**

**Lidocaine** 1.0 - 1.5 mg/kg IV/IO; subsequent dosage: 0.5 - 0.75mg/kg IV/IO every 3 - 5 minutes to a total dose of 3 mg/kg

If dysrhythmia is successfully converted after administration of **Lidocaine** bolus, consider IV infusion of **Lidocaine** 2.0-4.0 mg/min.

**6. Contact MEDICAL CONTROL, who may order:**

- a. **Magnesium Sulfate 10%** (for Torsades de Pointes for suspected hypomagnesemic state or severe refractory VENTRICULAR TACHYCARDIA) **1.0-2.0 grams IV/IO Push over 1-2 minutes.**  
**CONTRAINDICATIONS:** Heart Block, renal disease.
- b. Further attempts at cardioversion as indicated.
- c. **Amiodarone 150.0 - 300.0 mg** in 10 ml Normal Saline, slow IV/IO push over 8-10 minutes.
- d. **Amiodarone 1 mg./min. IV drip.**

## ENVIRONMENTAL EMERGENCIES

### 2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

Drowning begins with accidental or intentional submersion in any liquid. Fresh-water drowning/near-drowning and salt-water drowning/near-drowning have different physiologic mechanisms leading to asphyxia. However, out of hospital management of these patients is the same: treatment must be directed toward correcting severe hypoxia.

Factors affecting survival include the patient's age, length of time of submersion, general health of the victim, type and cleanliness of liquid medium and water temperature that may contribute to the effectiveness of the **mammalian diving reflex** (decreased respirations, decreased heart rate, and vasoconstriction, with maintenance of blood flow to the brain, heart and kidneys).

#### SPECIAL CONSIDERATIONS:

- a. The **cold-water** drowning/near-drowning victim should be not considered dead until he/she is warm and dead, unless the patient has been submerged for a prolonged period (typically greater than one (1) hour). Near-drowning victims may exhibit delayed pulmonary complications up to 24-36 hours after the submersion incident. This is especially true concerning salt-water exposure. Patients who have had a true near-drowning exposure should seek/receive medical attention and be informed as to the potential delayed complications.
- b. All drowning/near-drowning victims with suspected barotrauma/ decompression sickness should be transported in the left lateral Trendelenburg position to prevent any emboli in the ventricles from migrating to the arterial system. These patients also should be considered candidates for hyperbaric chamber therapy.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene and rescuer safety. Call appropriate public safety agencies: fire, rescue, or police teams, including scuba teams to properly stabilize the scene and safely rescue the victim(s) from the source of submersion. Consider need for additional EMS unit(s) for rescuer rehabilitation and/or treatment.
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway immediately upon obtaining access to patient. Ensure spinal stabilization and immobilization if indicated (i.e., unwitnessed event, unconscious patient, or mechanism of injury). Assist ventilations as needed.
4. Once the patient is rescued and is placed in a safe environment, rescuers may administer specific emergency care such as: suctioning the airway and use of airway adjuncts and assisted ventilations, and the administration of oxygen.

5. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified. Initiate CPR when appropriate.
6. Obtain appropriate S-A-M-P-L-E history related to event. (length of exposure, temperature of liquid medium, potential for injury).
7. Monitor and record vital signs and ECG.
8. If suspected hypothermia: see **Hypothermia / Cold Emergencies** protocol.
9. If near drowning incident involves a scuba diver, suggesting barotrauma, consider utilization of **hyperbaric treatment facility** and follow **Department approved** point-of-entry protocol.
10. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. See **Air Ambulance** protocol, in Appendix
11. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## TREATMENT

### BASIC PROCEDURES

1. Relieve gastric distension **ONLY** if it interferes with artificial ventilations.
2. Activate ALS intercept, if deemed necessary and if available.
3. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

#### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated.
- b. Initiate IV Normal Saline (KVO) **enroute to the hospital** in non-traumatic drowning/near drowning.
- c. **If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**

### PARAMEDIC PROCEDURES

#### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. Initiate IV Normal Saline (KVO) **enroute to the hospital** in non-traumatic drowning/near drowning.
  - c. **If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**
  - d. Cardiac monitor, and if feasible 12 lead ECG - dysrhythmia recognition: **manage per protocols.**
2. Contact **MEDICAL CONTROL**. Medical Control may order:
    - a. Additional 250 ml - 500 ml fluid bolus(es), wide open or titrate to patient's hemodynamic status.

## **2.2. ELECTROCUTION / LIGHTNING INJURIES**

The manifestations and severity of electrical trauma encompass a wide spectrum, ranging from a transient unpleasant sensation due to brief contact with low-intensity household current to instantaneous death and massive injury from high-voltage electrocution/lightning injury. Unlike thermal burns, electrical injuries commonly involve multiple body systems with the potential to pose difficult challenges regarding accurate assessment and proper management. Injury due to electricity may include burns to the skin and deeper tissues, cardiac rhythm disturbances and associated injuries from falls and other trauma. The amperage, voltage, type of current (AC vs. DC) duration of contact, tissue resistance and current pathway through the body will determine the type and extent of injury. Higher voltage, greater current, longer contact and flow through the heart are associated with worse injury and worse outcome.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety, i.e. by ascertaining that the source of electricity is removed from the patient and the rescue area. Call appropriate public safety agencies for assistance if needed.
2. Maintain appropriate body substance isolation precautions.
3. Maintain open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. Maintain an open airway with appropriate device(s), remove secretions, vomitus, initiate CPR.
5. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
6. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
7. Obtain appropriate S-A-M-P-L-E history related to event, (voltage source, time of contact, path of flow through body and unresponsiveness or seizures). Assess patient for entry and exit wounds, particularly under rings or other metal objects.
8. Monitor and record vital signs and ECG.
9. Prevent / treat for shock.
10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**2.2. ELECTROCUTION / LIGHTNING INJURIES****TREATMENT  
BASIC PROCEDURES**

1. If patient is in cardiopulmonary arrest:
  - a. Initiate CPR with supplemental oxygen.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS
4. Manage burn injuries and/or entrance and exit wounds as indicated. (See **Burn Protocol**.)
5. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
6. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate large bore IV Normal Saline.
  - c. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA

For transport times LESS THAN 1 HOUR use the following pre-hospital rates:

- Over 15 yrs. of age – 500ml/hour
- 5 –15 yrs. of age – 250ml/hour
- 2 – 5 yrs. of age – 125ml/hour
- Under 2 yrs. of age – 100ml/hour

For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:

- \*Adults: 2-4 ml x kg x % burn [Adult = over 15 yrs. of age]
- \*Pediatric: 3-4 ml x kg x % burn

\*Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn

**If suspected hypovolemia (consider other injuries), administer 250ml - 500ml fluid bolus and titrate to patient's hemodynamic status.**

- d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management, if indicated.
- b. Cardiac Monitor: **12 lead ECG; Manage dysrhythmia(s) per protocol.**
- c. Initiate large bore IV Normal Saline. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA

For transport times LESS THAN 1 HOUR use the following pre-hospital rates:

- Over 15 yrs. of age – 500ml/hour
- 5 –15 yrs. of age – 250ml/hour
- 2 – 5 yrs. of age – 125ml/hour
- Under 2 yrs. of age – 100ml/hour

For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:

- \*Adults: 2-4 ml x kg x % burn [Adult = over 15 yrs. of age]
- \*Pediatric: 3-4 ml x kg x % burn

\*Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn

**If suspected hypovolemia (consider other injuries), administer 250ml - 500ml fluid bolus and titrate to patient's hemodynamic status.**



## 2.3. HYPERTHERMIA / HEAT EMERGENCIES

Heat emergencies result from one of two primary causes: environmental (exogenous heat load when the temperature exceeds 32° C or 90° F) or excessive exercise in moderate to extreme environmental conditions (endogenous heat load). Regardless of the cause, hyperthermic conditions can lead to the following conditions: Heat Cramps, Heat Exhaustion, or Heat Stroke.

**Heat Cramps** most commonly occur in the patient who exercises and sweats profusely and subsequently consumes water without adequate salt. Heat cramps most commonly involve the most heavily exercised muscles. These patients may present with normal temperature but hot sweaty skin with mild tachycardia and normal blood pressure.

**Heat Exhaustion** presents with minor mental status changes, dizziness, nausea, headache, tachycardia and mild hypotension. Temperature is less than 103° F. Rapid recovery generally follows cooling and saline administration.

**Heat Stroke** occurs when the patient's thermoregulatory mechanisms break down completely. Body temperature is elevated to extreme levels resulting in multi-system tissue damage, including altered mental status and physiological collapse. Heat stroke usually affects the elderly patient with underlying medical disorders. Patients with heat stroke usually have dry skin; however, up to 50% of patient's with **exertional heat stroke** may exhibit persistent sweating. Therefore, the presence of sweating **does not** preclude the diagnosis

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Monitor and record vital signs and ECG.
7. In general, rapid recognition of heat illness is required and rapid cooling of the patient is the priority.
8. Loosen or remove all nonessential clothing. Move patient to a cool environment.
9. For Heat Cramps and Heat exhaustion, administer water or oral re-hydration-electrolyte solution if patient is alert and swallows easily.
10. If evidence of Heat Stroke, see protocol below.
11. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

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**2.3. HYPERTHERMIA / HEAT EMERGENCIES****TREATMENT****BASIC PROCEDURES**

1. Provide rapid cooling as soon as possible.

**CAUTION: Do not over-chill patient, observe for shivering. If shivering occurs, discontinue active cooling procedures.**

- a. Remove patient to cool area and place patient in a supine position.
  - b. Loosen or remove all unnecessary clothing, while protecting privacy.
  - c. Apply cool packs to armpits, neck and groin.
  - d. Use evaporation techniques if possible (fans, open windows).
  - e. Keep skin wet by applying water with wet towels or sponges.
2. For Heat Cramps and/or Heat Exhaustion: administer water or oral re-hydration-electrolyte solution if patient is alert and has a normal gag reflex and can swallow easily. Elevate legs of supine patient with heat exhaustion.
  3. Activate ALS intercept, if deemed necessary and if available.
  4. Initiate transport as soon as possible with or without ALS.
  5. Notify receiving hospital.

**INTERMEDIATE PROCEDURES****1. ALS STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - Additional IV Normal Saline 250 ml- 500 ml bolus (es), wide open or titrated to patient's hemodynamic status.

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
  - b. Cardiac monitor and (if feasible) 12 lead ECG; manage dysrhythmia(s) per protocol
  - c. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - Additional IV Normal Saline 250 ml - 500 ml bolus(es), wide open or titrated to patient's hemodynamic status.

## 2.4. HYPOTHERMIA / COLD EMERGENCIES

Cold Emergencies include conditions from mild frostbite to severe accidental hypothermia. Frostbite is defined as a localized injury resulting from freezing of body tissues and can be categorized from mild (frostnip) to severe (deep frostbite). Hypothermia is the result of a decrease in heat production (often seen in patient's with metabolic, neurologic and infectious illnesses), increased heat loss (traumatic, environmental and toxic), or a combination of the two factors. Hypothermia is defined as a core temperature below 95°F (35°C). Mild hypothermia often presents as altered mental status. Shivering may or may not be present. Moderate to severe hypothermia will not only have altered mental status, but may show decreased pulse, respiratory rate and blood pressure. Failure to recognize and properly treat hypothermia can lead to significant morbidity and mortality. **REMEMBER:** A patient in cardiopulmonary arrest with suspected severe hypothermia is not considered dead until all attempts at active rewarming have been completed in a hospital setting and resuscitation efforts remain unsuccessful.

### ASSESSMENT / TREATMENT PRIORITIES

**NOTE: Hypothermic patients must be handled gently as jarring movements may cause cardiac arrest.**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Monitor and record vital signs and ECG.
7. Remove wet clothing (by cutting clothing to limit patient movement).
8. Prevent heat loss with use of blankets. If available, place heat sources at patient's neck, armpits, flanks and groin.
9. Handle patient gently. Do not allow patients to walk or exert themselves.
10. Do **not** allow patient to eat or drink stimulants.
11. Do **not** massage extremities.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

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**2.4. HYPOTHERMIA / COLD EMERGENCIES****TREATMENT  
BASIC PROCEDURES**

1. Determine patient's hemodynamic status: Assess pulse and respiratory rates for a period of 60 seconds to determine pulselessness or profound bradycardia, for which CPR would be required.
2. If patient is in cardiopulmonary arrest:
  - a. Initiate CPR and administer oxygen using appropriate oxygen delivery device, as clinically indicated.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories
3. Whenever possible, use warmed, humidified oxygen (104°F - 107°F, 40°C - 42°C) by **non-rebreather mask**, during resuscitation procedures for hypothermic patients.
4. Contact **MEDICAL CONTROL**: Medical Control may order:
  - a. Further defibrillations with AED as patient rewarms.
  - b. If patient is known diabetic who is conscious and can speak and swallow: oral glucose or other sugar source as tolerated.

**CAUTION: Do NOT administer anything orally if patient does not have a reasonable level of consciousness and normal gag reflex.**

5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated. Administer oxygen, using warmed humidified oxygen whenever possible, (104°F - 107°F, 40°C - 42°C) by non-rebreather mask, or an appropriate oxygen delivery device, as clinically indicated, during resuscitation procedures for hypothermic patients.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
2. Contact **MEDICAL CONTROL**: Medical Control may order:
  - a. Further defibrillations with AED as patient rewarms.
  - b. Administer warmed Normal Saline IV Solution (104°F - 107°F, 40°C - 42°C) whenever possible.
  - c. If patient is known diabetic who is conscious and can speak and swallow: oral glucose or other sugar source as tolerated.

**CAUTION: Do NOT administer anything orally if patient does not have a reasonable level of consciousness and normal gag reflex.**

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## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management, if indicated. Apply Oxygen, using warmed humidified oxygen whenever possible, (104°F - 107°F, 40°C - 42°C) by non-rebreather mask, or an appropriate oxygen delivery device, as clinically indicated, during resuscitation procedures for hypothermic patients.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
  - d. Apply Cardiac monitor: 12 lead ECG, Manage dysrhythmia(s) per protocol.
  - e. Determine Blood Glucose level:
    - If glucose is less than **70mg/dL**, administer 12.5 to 25 gm of 50% Dextrose solution IV push.
  - g. Administer naloxone 0.4 - 2.0 mg IV Push, IM or Nasal via atomizer if obvious narcotic overdose.
2. Contact **MEDICAL CONTROL**: Medical Control may order:
- a. Warmed Normal Saline IV Solution (104°F - 107°F, 40°C - 42°C) whenever possible.
  - b. Thiamine 100 mg IV Push or IM

### COLD EMERGENCY / FROSTBITE

1. Follow Hypothermia protocol as indicated above.
2. Avoid trauma to injured areas (do not rub; do not break blisters)
3. Apply dry sterile dressings as padding over injured areas and splint as needed; avoid pressure or constriction. Do not allow victim to use injured part(s).
4. Do not attempt rapid rewarming of the frozen part in out of hospital setting. Keep frozen part(s) from direct heat while warming the patient.

## 2.5. RADIATION INJURIES

Exposure to radiation can occur through two mechanisms: the first mechanism is from a strong radioactive source such as uranium; the second mechanism is contamination by dust, debris and fluid that contain radioactive material. Factors that determine severity of exposure include: duration of time exposure, distance from radioactive source, and shielding from radioactive exposure. The three types of radiation exposure include alpha, beta and gamma. The most severe exposure is gamma (x-ray radiation).

In general, radiation exposure does not present with any immediate side effects unless exposure is severe. Most commonly, serious medical problems occur years after the exposure. Acute symptoms include nausea, vomiting and malaise. Severe exposure may present with burns, severe illness and death (beta or gamma).

**Scene safety is of utmost importance for the patient(s), bystander(s) and rescuers.**

**NOTE: In the event of a radiation emergency contact the Nuclear Incident Advisory Team (NIAT) at either:**

**(617) 727-9710 (business hours - Monday-Friday) - Mass. Dept. of Public Health  
(617) 566-4500 x237 (Other hours) - Massachusetts State Police**

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety, i.e. by ascertaining that the source of radiation is removed from the patient and the rescue area. Call appropriate public safety agencies in order to properly stabilize the scene and rescue any victims that may be in the "hot zone". The patient will need to be removed from scene and properly decontaminated (radioactive liquid and/or dust). Note that immediately life-threatening injuries (e.g. airway, exsanguination) may require stabilization by appropriately trained personnel prior to decontamination, while minimizing rescuer exposure to the lowest achievable level. Rescuers will then need to place the patient in a safe environment for further care.
2. Maintain appropriate body substance isolation precautions.
3. Maintain open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
6. Obtain appropriate S-A-M-P-L-E history related to event including information such as: (alpha, beta and gamma exposure, duration of time exposed, distance from radioactive source, and shielding from radioactive exposure).
7. Monitor and record vital signs and ECG.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

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**2.5. RADIATION INJURIES****TREATMENT  
BASIC PROCEDURES**

1. Activate ALS intercept if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital. If severe radiation burns are noted, consider appropriate Point-of-Entry as defined by the **Department approved POE and facility** capabilities, i.e., Burn Center.

**INTERMEDIATE PROCEDURES**

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**PARAMEDIC PROCEDURES**

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

## 2.6 NERVE AGENT EXPOSURE PROTOCOL

An intentional release of chemical weapons may result in a large number of ill and contaminated patients presenting to EMS services in a very short period of time. If the event is a mass casualty incident (MCI), it will require the use of the Incident Command System to properly coordinate all responding agencies.

Critical to safe and effective operation will be the strict observance of scene safety. It is expected that your agency will implement its hazardous materials response policy.

Any person involved in patient care should, in addition, take precautions to prevent contamination by residual agent that may be present on casualties, even after they have been decontaminated.

EMS providers must wear PPE appropriate for the zone in which they are operating (hot, warm or cold), and should use PPE that they have been trained to use safely.

EMS providers with prior training in the proper use of personal protective equipment (PPE) may be able to provide medical care, including the administering of the antidotes, in the warm zone or in the decontamination line.

Nerve agents will present with Cholinergic Syndrome symptoms. **The syndrome of Cholinergic Symptoms can be remembered by the mnemonic SLUDGE (Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal cramping and Emesis) or DUMBBELS (Diarrhea, Urination, Miosis (Constricted Pupils), Bronchorrhea, Bradycardia, Emesis, Lacrimation and Salivation).**

The effects produced by nerve agent inhalation exposure (Vapor) begin in seconds to minutes after the onset of exposure, depending on the concentration of vapor. Dermal exposure (Liquid) effects may manifest many hours between exposure and the appearance of signs and symptoms of up to 18 hours. The treatment of nerve agent exposure is based on the degree of the presenting symptoms.

- **NOTE 1. Ambulance services opting to carry and use autoinjectors must do so in compliance with the regulations of the Division of Food and Drug Control.**
- **NOTE 2. EMT-Basic can now carry and use Mark 1 or similar kits as long as they are issued by the hospital where the ambulance service has a current drug replacement agreement and or affiliation agreement.**
- **NOTE 3. To administer the Mark 1™ or similar auto-injector to patients, the ambulance service's EMTs certified at each level, must complete a State approved autoinjector course and work for a Massachusetts licensed ambulance service that maintains a valid Medical Control Agreement with an affiliate hospital medical director, or be operating at an MCI/disaster scene.**



**ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions for toxic chemicals and blood and body fluids EMS providers must wear PPE appropriate for the zone in which they are operating (hot, warm or cold)"
2. Observe strict adherence to hot, warm and cold zone areas. Activate HAZMAT Response if necessary.
3. Attempt identification of offending agent, if possible.
4. Activate ALS intercept if necessary and available.
5. Initiate mass casualty/ disaster plan if necessary.
6. Administer Mark-1 or similar kit to adult patient if evidence of nerve agent exposure and if kit is available.
  - a. Administer 1 to 3 Mark-1 or similar kits based on the degree of symptoms.

➤ **NOTE: Do not administer adult kit to a child less than 15 years of age or less than 50 kg, use pediatric autoinjector kit. (See Appendix)**

➤ **NOTE: If no pediatric autoinjector kit or pralidoxime/atropine vials are available, see Appendix for pediatric dosing with adult kit**

**TREATMENT (FIRST RESPONDERS)****PROCEDURES FOR SELF-CARE AND CARE OF AUTHORIZED PUBLIC EMPLOYEES<sup>1</sup>**

Remove self **or fellow authorized public employee** from area if possible.

1. Assess degree of symptoms: Mild, Moderate or Severe (see Appendix)
2. Administer 1 to 3 Mark-1 or similar Kits 1M (each kit with Atropine 2 mg IM and Pralidoxime 600 mg IM) as guided by degree of symptoms.
3. Seek additional medical support for further monitoring and transport of anyone receiving therapy.
4. Disrobing will significantly enhance the decontamination process. Perform decontamination, and seek assistance in further decontamination measures.

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<sup>1</sup> Under 105 CMR 700.003 of the Department of Public Health's Drug Control Program regulations, an authorized public employee in this context is "a public employee or volunteer to a municipality, agency, department or authority of the Commonwealth ("agency") whose function includes emergency preparedness and response and is designated by a municipality's or agency's medical director" to administer nerve agents.

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## **2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)**

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### **TREATMENT**

#### **EMT BASIC PROCEDURES**

1. If approved and trained to do so, administer Mark-1 or similar kit to adult patient if evidence of nerve agent exposure and if kit is available.
  - a. Administer 1 to 3 Mark-1 or similar kits based on the degree of symptoms.
2. Notify receiving hospital, unless disaster plan otherwise instructs.

#### **INTERMEDIATE PROCEDURES**

1. Administer Mark-1 or similar kit to adult patient if evidence of nerve agent exposure and if kit is available.
  - a. Administer 1 to 3 Mark-1 or similar kits based on the degree of symptoms.
2. Activate Paramedic intercept if necessary and available.

#### **ALS STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Obtain IV access if situation permits.

#### **PARAMEDIC PROCEDURES**

##### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Obtain IV access if situation permits (low priority in disaster situation).
- c. Treat for shock as needed (blood pressure below 100 systolic).
- d. Initiate cardiac monitoring if situation permits (low priority in disaster situation).
- e. Treatment using Mark-1 or similar kits: Administer kit to adult patient if evidence of nerve agent exposure and if kit is available. (If not previously administered)
  - i. Administer 1 to 3 kits based on degree of symptoms,

**OR**

  - ii. For multi-dose vial (See appendix )

##### **2. Contact MEDICAL CONTROL. Medical Control may order:**

- a. Additional Pralidoxime Chloride 1 gm by IV infusion.
- b. Midazolam 2.5-5.0 mg IV for seizure or cardiac arrest.
- c. Albuterol 0.5% via nebulizer (for bronchospasm management)

## **2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)**

### **MILD SYMPTOMS:**

#### **BLS/ ALS STANDING ORDERS :**

- i. Administer One kit IM **OR**

#### **ALS STANDING ORDERS**

- ii. 2 mg atropine IM only **& either:**
- iii. 600 mg IM pralidoxime **OR**  
1 gm IV pralidoxime

### **MODERATE SYMPTOMS:**

#### **BLS/ALS STANDING ORDERS**

- i. Administer Two kits IM **OR**

#### **ALS STANDING ORDERS**

- ii. 4 mg atropine IM only **& either:**
- iii. 600-1200 mg IM pralidoxime **OR**  
1 gm IV pralidoxime Medical Control may order an additional  
1 gram IV **OR** 600 mg IM.

### **SEVERE SYMPTOMS:**

#### **BLS/ALS STANDING ORDERS**

- i. Administer **Three** kits IM **OR,**

#### **ALS STANDING ORDERS**

- ii. 6 mg atropine IM only **& either:**
- iii. 1200-1800 mg IM pralidoxime **OR,**  
1gm IV pralidoxime Medical Control may order an additional  
1 gram IV **OR** 600 mg IM.

**&**

**one of the following:**

- iv.
  - a.) Diazepam 10 mg IM Autoinjector (CANA kit) **OR,**
  - b.) Diazepam 10 mg IM/IV **OR,**
  - c.) Lorazepam 2-4 mg IM/IV **OR,**
  - d.) Midazolam 2.5-5.0 MG IM/IV **Contact Medical Control for**  
additional 2.5-5.0 mg if required.

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## 3. MEDICAL EMERGENCIES

### 3.1. ABDOMINAL PAIN (non-traumatic)

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. This may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated. Assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
5. Obtain appropriate assessment, (O-P-Q-R-S-T), related to event.
6. Obtain appropriate S-A-M-P-L-E history related to event, including: surgery, LMP, prior episodes.
7. Allow the patient to assume a comfortable position, unless contraindicated. Flexion of the knees and hips may help reduce pain.
8. Monitor and record vital signs and ECG.
9. Prevent / treat for shock.
10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

#### TREATMENT

##### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

##### INTERMEDIATE PROCEDURES

###### 1. ALS STANDING ORDERS

- b. Provide advanced airway management (if indicated).
  - c. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. **Medical Control** may order:
    - a. administration of additional fluid

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**3.1. ABDOMINAL PAIN (non-traumatic)****PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Cardiac monitor, and, if feasible, **12 lead ECG** - dysrhythmia recognition.  
Treat dysrhythmias per protocol.
- e. Initiate 1-2 IVs Normal Saline, enroute to the hospital.
- f. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**8. Contact MEDICAL CONTROL. Medical Control may order:**

- a. administration of additional IV Saline 250 ml -500 ml or wide open titrated to patient's condition.
  
- b. If patient in severe pain and is stable with a BP > 110 systolic consider usage of Adult pain management protocol.

## 3.2. ALLERGIC REACTION / ANAPHYLAXIS

Anaphylaxis is an acute, generalized, and violent antigen-antibody reaction that can be rapidly fatal. An Anaphylactic Reaction may present as a mild to severe response; and management is based upon severity. There are multiple causes of anaphylaxis: most commonly these causes are injected substances or drugs such as: penicillin, cephalosporins, sulfonamides, iron, and thiamine. Other causes include food sensitivities, vaccines, contrast dyes, insect sting(s) and other environmental allergens. Most reactions occur within thirty minutes following allergen exposure, although the onset of symptoms can vary from several seconds to hours.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Determine if patient is in mild or severe distress:
  - a. **Mild Distress:** itching, isolated urticaria, nausea, no respiratory distress.
  - b. **Severe Distress:** stridor, bronchospasm, severe abdominal pain, respiratory distress, tachycardia, shock (systolic BLOOD PRESSURE <90), observe for edema of lips, tongue or face and generalized urticaria.
7. Monitor and record ECG and vital signs.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Activate ALS intercept if deemed necessary and available.
2. **BLS STANDING ORDERS**
  - a. If patient presents in Severe Distress, as defined in Assessment Priorities, and if patient age is between 5 and 65 years: administer epinephrine by auto-injection.
  - b. A second injection may be administered, if available, in 5 minutes if necessary.

**NOTE: Adult EPI-PENS® should be used on patients greater than 30 kg (66 lbs). Pediatric EPI-PENS® (EPI-PEN JR. ®) should be used on patients less than 30 kg (66 lbs).**

**NOTE: EMTs must contact Medical Control prior to administration of epinephrine by auto-injector when patient is under age 5 or over age 65.**

3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital.

**INTERMEDIATE PROCEDURES****1. INTERMEDIATE STANDING ORDERS**

- a. If patient presents in Severe Distress, as defined in Assessment Priorities, and if patient age is between 5 and 65 years: administer epinephrine by auto-injection.
  - b. A second injection may be administered, if available, in 5 minutes if necessary.
2. Provide advanced airway management, if indicated.
  3. Initiate IV Normal Saline (KVO) enroute to the hospital.  
If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated)
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
  - d. Mild Distress:
    - monitor for signs of severe distress.
    - Diphenhydramine 25 mg- 50 mg IV push or deep IM.
  - e. Severe Distress:
    - Epinephrine (1:1,000) 0.3 mg - 0.5 mg SC; a second dose may be required.
    - Large Bore IV normal saline, titrate to BLOOD PRESSURE >90.
    - Diphenhydramine 25 mg- 50 mg IV push or deep IM.
    - Albuterol 0.5% (~~0.5~~) **2.5 mg** mixed with 3 ml of Normal Saline) via nebulizer.
6. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. Epinephrine (1:1,000) 0.3 mg - 0.5 mg SC.
    - b. Epinephrine (1:10,000) 0.1 mg - 0.5 mg IV Push.
    - c. Epinephrine Infusion 1-10 µg/minute. Mix Epinephrine (1:1000) 1 mg in 250 ml Normal Saline. (30 microdrops/minute = 2 µg / min.)
    - d. Albuterol 0.5% (~~0.5~~) **2.5 mg** mixed with 3 ml of Normal Saline) via nebulizer.
    - e. Diphenhydramine 25 mg- 50 mg IV Push or deep IM.
    - f. Dopamine infusion 2 - 20 µg/Kg minute (Rate determined by physician)

### 3.3. ALTERED MENTAL/NEUROLOGICAL STATUS

An alteration in mental/**neurological** status is the hallmark of central nervous system (CNS) injury or illness. Any alteration in mental/**neurological** status is abnormal and warrants further examination. Altered mental/**neurological** status may be due to many factors. A common grouping of causes for altered mental/**neurological** status is the following: **A E I O U – T I P S**; **A**lcoholism, **E**pilepsy, **I**nsulin, **O**verdose, **U**nderdose, **T**rauma, **I**nfection, **P**sychiatric and **S**troke.

Altered mental/**neurological** status may present as mild confusion or complete unconsciousness (coma). Altered mental status may be a result of a medical condition, traumatic event, or both. EMS agencies should use the Glasgow Coma Scale (GCS) or AVPU for their ongoing neurological assessment, as appropriate for the possible causes of the patient's condition. Note that GCS has been validated as a predictor of outcome specifically for trauma.

**NOTE:** See also Protocols for DIABETIC; Toxicology/ Poisoning; Seizures; Shock; Syncope; and/or Head Trauma/Injury.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Monitor and record vital signs and ECG.
7. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.



## 3.2 ALTERED MENTAL/NEUROLOGICAL STATUS

### TREATMENT

#### BASIC PROCEDURES

##### 1. BLS STANDING ORDERS

- a. If authorized and trained to do so perform Glucometry reading.
- b. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose may be necessary. (**SEE Diabetic Protocol**)

**CAUTION: Do NOT administer anything orally if the patient does not have a reasonable level of Consciousness and normal gag reflex.**

**CAUTION: If cerebrovascular accident is suspected, contact Medical Control**

2. If patient is unconscious or seizing, transport on left side (coma position).
3. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
4. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 5. ALS STANDING ORDERS

- a. **If authorized and trained to do so perform obtain Glucometry reading**
- b. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose (tube) may be necessary. (**SEE Diabetic Protocol**)
- c. Provide advanced airway management (if indicated).
- d. Initiate IV Normal Saline (KVO) enroute to the hospital.

#### PARAMEDIC PROCEDURES

##### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
- d. Apply Cardiac Monitor: If clinically appropriate, also obtain 12 lead ECG - Manage dysrhythmias per protocol.
- e. If obvious narcotic overdose:
  - Naloxone 0.4-2.0 mg IV Push or IM, SC, ET or Nasal via atomizer. Additional naloxone (0.4-2.0 mg) may be administered as necessary.
- f. Thiamine 100 mg IV or IM
- g. Determine Blood Glucose level:
  - If glucose is less than 70 mg/dL, administer Dextrose 50%, 12.5 to 25 grams IV Push. Additional Dextrose 50% may be administered as necessary.

- **CAUTION:** If cerebrovascular accident is suspected, contact Medical Control prior to administration.
  - h. If no IV access, administer Glucagon 1-2 mg IM for suspected hypoglycemia.
2. Contact **MEDICAL CONTROL** who may order:
- a. Dextrose 50%, 12.5 to 25 gm IV Push
  - b. Naloxone 0.4-2.0 mg IV Push, IM or Nasal via atomizer
  - c. Further Normal Saline bolus.
  - d. Dependent upon conditions for suspected substance abuse, overdose, or toxic exposure: refer to specific protocols.

### 3.4. BRONCHOSPASM / RESPIRATORY DISTRESS

**Bronchospasm** is defined as spasmodic narrowing (contraction) of the lumen (bronchial muscle) of a bronchus for whatever reason resulting in restricted airflow. This results in hypoventilation of the alveoli leading to hypoxemia. The causes of acute bronchospasm may not always be easily discernible. Asthma is the most common disorder to present with bronchospasm. However, there are many other conditions that may present with bronchospasm. Other causes include: allergic reaction, respiratory infection, changes in environmental conditions (humidity or temperature), inhalation of caustic gases (smoke, chlorine gas etc.), emotional stress, exercise, and medications (aspirin or similar non-steroidal anti-inflammatory agents). Patients may present with mild to severe distress and management is based upon severity.

**Respiratory Distress** is defined as inadequate breathing in terms of any of\_: rate, rhythm, quality, and/or depth of breathing. Persons who are breathing too fast or slow may not be receiving enough oxygen to support bodily functions and may suffer an increase in blood carbon dioxide to dangerous levels. Irregular breathing (e.g. Cheyne-Stokes respiration) can be a sign of a serious medical problem and needs to be evaluated by a physician. Quality of breathing in terms of either unequal breath sounds, “noisy” breathing (rales, rhonchi, wheezes, snoring, stridor), use of accessory muscles, and/or nasal flaring (especially in children) can also be valuable signs. Cyanosis is usually a late sign and requires immediate treatment.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilation as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and vital signs.
5. Obtain appropriate (O-P-Q-R-S-T) assessment, related to event
6. Obtain appropriate (S-A-M-P-L-E) history related to event, including prior asthma, anaphylaxis, allergies. **NOTE:** exposures to foreign body, foods, medicines, chemicals or envenomation should be ascertained.
7. Determine if patient is in mild or severe distress:
  - a. **Mild Distress:** Slight wheezing and/or mild cough. Able to move air without difficulty.
  - b. **Severe Distress:** Evidenced by poor air movement, speech dyspnea, use of accessory muscles, tachypnea and/or tachycardia.**NOTE: Severe bronchospasm may present without wheezes, indicating minimal air movement.**
8. Monitor and record vital signs and ECG.
9. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**3.4. BRONCHOSPASM / RESPIRATORY DISTRESS****TREATMENT  
BASIC PROCEDURES**

1. Activate ALS intercept, if available.
2. Initiate transport as soon as possible with or without ALS.

**3. BLS STANDING ORDERS****MILD DISTRESS**

- a. The following may be considered if the patient has not taken the prescribed maximum dose of their own **inhaler** prior to the arrival of EMS: **and the inhaler is present:**
  - i) Encourage and/or assist patient to self-administer their own prescribed **inhaler** medication if indicated or if not already done.
  - ii) If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed **inhaler**.
  - iv) Reassess vital signs.
  - v) **Contact MEDICAL CONTROL. The following may be ordered**
    - a. Repeat a second dose if required, and if prescribed maximum dose has not been administered,

**NOTE: EMT-B administration of an inhaler is CONTRAINDICATED, if:**

- I the maximum dose has been administered prior to the arrival of the EMT.
- II the patient cannot physically use the device properly. (Patient cannot receive inhalation properly.)
- III the device has not specifically been prescribed for the patient.

**\*\*If properly trained and authorized, use the EMS Assisted Albuterol Program Protocol to treat the patient.**

**NOTE: YOUR MEDICAL DIRECTOR MUST HAVE AUTHORIZED YOU AS AN EMT TO UTILIZE THIS PORTION OF THE PROTOCOL.**

**3.4. BRONCHOSPASM / RESPIRATORY DISTRESS (con't)****INTERMEDIATE PROCEDURES****1. INTERMEDIATE STANDING ORDERS****MILD DISTRESS**

a. The following may be considered if the patient has not taken the prescribed maximum dose of their own inhaler prior to the arrival of EMS: **and the inhaler is present:**

- i) Encourage and/or assist patient to self-administer their own prescribed inhaler medication if indicated or if not already done.
- ii) If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
- iii) Reassess vital signs.
- iv) **Contact MEDICAL CONTROL. The following may be ordered**
  - a. Repeat a second dose if required, and if prescribed maximum dose has not been administered.

**NOTE:** EMT-I (with EMT-B training) administration of an inhaler is CONTRAINDICATED, if:

- a. the maximum dose has been administered prior to the arrival of the EMT.
- b. the patient cannot physically use the device properly. (Patient cannot receive inhalation properly.)
- c. the device has not specifically been prescribed for the patient.

**\*\*If properly trained and authorized, use the EMS Assisted 45 Program Protocol to treat the patient.**

**NOTE: YOUR MEDICAL DIRECTOR MUST HAVE AUTHORIZED YOU AS AN EMT TO UTILIZE THIS PORTION OF THE PROTOCOL.**

**3.4 BRONCHOSPASM / RESPIRATORY DISTRESS (cont)**

4. Provide advanced airway management if indicated.
5. Initiate IV Normal Saline (KVO) enroute to the hospital.
6. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS****a. MILD DISTRESS:**

- Administer Albuterol 0.5% solution, (~~0.5~~) **2.5 mg** mixed with 3 ml of Normal Saline via nebulizer. Additional Albuterol treatments may be administered as necessary.

- b. **SEVERE DISTRESS:**
- Advanced Airway management if indicated.
  - Administer Albuterol 0.5% solution (~~0.5~~ **2.5 mg** ml mixed with 3 ml of Normal Saline via nebulizer. **Ipratropium Bromide, 0.02%, 2.5 ml** treatment may be combined with the **Albuterol** treatment. Additional Albuterol treatments may be administered as necessary with or without **Atrovent**. Consider **magnesium sulfate 2-4 gm. IV** over 5 minutes.
7. Initiate IV Normal Saline (KVO) enroute to the hospital.
8. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
9. Contact **MEDICAL CONTROL**. The following may be ordered:
- a. Repeat **Albuterol Sulfate 0.5%** nebulizer treatment.
  - b. **Ipratropium Inhalation Aerosol** (2 puffs) via metered dose inhaler with or without spacer device (e.g. - aerochamber).
  - c. **Ipratropium 0.02%** nebulizer treatment (may be combined with **Albuterol 0.5% solution** treatment)
  - d. **Epinephrine 1:1,000 0.3 mg-0.5 mg subcutaneously\*** (may be repeated q 15 min.)
  - e. **Epinephrine 1:10,000, 0.1 mg- 0.5 mg IV very slow push\***
  - f. For patients with known cardiac disease: **Terbutaline Sulfate 0.25 mg** subcutaneous (SC). A second dose may be required.
  - g. Magnesium sulfate 2-4 gm. IV over 5 minutes.

**\*CAUTION: The use of Epinephrine in patients over the age of 40 or with known cardiac disease and patients who have already taken high dosage of inhalant bronchodilator medications may result in cardiac complications.**

### 3.5. CONGESTIVE HEART FAILURE / PULMONARY EDEMA

Severe congestive heart failure (CHF) and/or acute pulmonary edema are caused by acute left ventricular failure, resulting in pulmonary congestion. Most commonly these conditions are the result of myocardial infarction, diffuse infection, opiate poisoning, inhalation of toxic gases, and severe over-hydration. Pulmonary edema is typically characterized by shortness of breath, cough, anxiety, cyanosis, diaphoresis, rales and/or wheezing.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions
2. Maintain open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Place patient in full sitting position as tolerated.
5. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
6. Obtain appropriate S-A-M-P-L-E history related to event, including any Trauma (recent head injury/fracture.
7. Monitor and record vital signs and ECG.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

#### TREATMENT

##### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

##### INTERMEDIATE PROCEDURES

###### 1. ALS STANDING ORDERS

- a. Provide advanced airway management (endotracheal intubation), if indicated.
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

##### PARAMEDIC PROCEDURES

###### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management (endotracheal intubation), if indicated.
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
- d. Administer **Nitroglycerin (NTG) SL tablet; 0.4 mg (1/150 gr.) or NTG spray** if systolic BLOOD PRESSURE is greater than 100. **Nitroglycerin** may be repeated in five (5) minute intervals times two (2) as dictated by patient's Blood Pressure.

**Note: For patients, both male and female, who have, within the last 48 hours, taken any medications classified in the phosphodiesterase-type-5 inhibitor category (e.g. sildenafil, vardenafil, tadalafil), nitrates should not be administered unless medical control has been contacted and has provided the Emergency Medical Technician (EMT-B; EMT-I; EMT-P) with a medical control order to administer nitrates.**

e. Furosemide: 20.0- 40.0 mg IV PUSH, or 40-80 mg. IV PUSH if patient is already on diuretics.

f. Contact **Medical Control** if systolic blood pressure is less than 100 mmHg.

7. Contact **MEDICAL CONTROL**.

- In patients who require emergent intubation
- Cannot be intubated by conventional means
- The treating paramedic has been duly authorized by the Service's Medical Director in use of an alternative airway (LMA or Combitube)
- To facilitate intubation: **Medical Control** may order:

- a. **Midazolam 2.5 mg SLOW IV PUSH**. Repeat if necessary to a total dose of **5.0** mg.
- b. Repeat doses of **Nitroglycerin SL or spray**.
- c. **1" Nitropaste** to anterior chest wall
- d. Repeat doses of **Furosemide**.
- e. Morphine Sulfate: 2.0 mg to 10.0 mg SLOW IV PUSH, or
- f. If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ
- g. Dopamine infusion **2.0 – 20.0** µg/kg/minute.



## 3.6. EYE EMERGENCIES

Eye emergencies can be either medical or traumatic. In general they are not life threatening. However, they present serious potential difficulties for the patient. The primary medical emergency involving the eye are glaucoma, or sudden painless loss of vision secondary to arterial embolus. Eye injuries can be caused by chemical or thermal burns, penetrating or blunt trauma, which can result in permanent disfigurement and/or blindness. In addition small foreign particles landing on the surface of the eye can also result in ocular emergencies. Established **Department approved POE plans** may determine transport to an appropriate facility.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning, or use of airway adjuncts as indicated.
3. If eye injury is the result of blunt and/or penetrating trauma, assume spinal injury and manage appropriately.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Obtain appropriate S-A-M-P-L-E history related to incident, including any trauma (i.e. recent head trauma).
6. Depending upon mechanism of injury, the following procedures should be followed:
  - a. **Chemical irritants:** Eye(s) should be flushed as soon as possible using copious amounts of water for a period of fifteen (15) minutes with a controlled stream of Sterile Normal Saline, Sterile water or tap water.
  - b. **Blunt Trauma:** Both eyes should be patched and protected.
  - c. **Penetrating Trauma:** Puncture wound with no impaled object: Both eyes should be patched and protected.  
**NOTE: \*If object is impaled in the eye, the object must be immobilized and both eyes should be patched and protected. (Objects penetrating the eye globe should only be removed in-hospital.)**
  - d. **Thermal Burns:** Both eyes should be patched and protected.
7. If patient is unable to close eyelids, moisten eyes with sterile Normal Saline (exception: chemical irritants which need continuous irrigation) to maintain eye integrity. The eye(s) may then be irrigated and covered with moistened gauze pads.
8. Obtain visual history, including use of contact lenses, corrective lenses (glass/plastic), safety goggles.  
**NOTE: As a general rule, EMTs should not attempt to remove contact lenses of patients with eye injuries. However, in certain chemical burn cases, MEDICAL CONTROL may instruct removal of the lenses, if patient is unable to do so.\*\***
9. Monitor and record vital signs and ECG.

### 3.6. EYE EMERGENCIES

#### ASSESSMENT / TREATMENT PRIORITIES (continued)

10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

#### TREATMENT

##### BASIC AND INTERMEDIATE PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

##### PARAMEDIC PROCEDURES

1. Contact **MEDICAL CONTROL**. **Medical Control may order:**
  - a. Topical anesthetic: **tetracaine** 1-2 eye drops as needed.
  - b. Use of Morgan lens for eye irrigation.
  - e. **Special consideration: Sudden painless loss of vision: If suspect central retinal artery occlusion in patient with acute non-traumatic, painless loss of vision in one eye (most common in elderly patient): apply vigorous pressure using heel of hand (massage) to affected eye for three(3) to five(5) seconds, then release. The patient may perform this procedure. Repeat as necessary. NOTE: Cardiac (EKG) monitor (12 lead ECG ) is required for this procedure (i.e., vagal stimulus: bradycardia). CAUTION: If tetracaine has been administered, do not apply pressure to eye.**

#### \*GUIDELINES FOR SECURING IMPALED OBJECT IN AN EYE

1. Place a roll of gauze bandage or folded gauze pads on either side of the impaled object, along the vertical axis of the head. These rolls or pads should be placed so they stabilize the object.
2. Fit a paper or styrofoam cup or other protective cup/cone etc. over the impaled object. The protective cup should not touch the impaled object and it must rest upon the rolls of gauze or gauze pads.
3. Secure the dressings and cup in place with self adherent roller bandage or wrapping of gauze. **DO NOT** secure bandage over the top of the cup.
4. Patch and bandage the uninjured eye to reduce eye movements.

**\*\* GUIDELINES FOR REMOVAL OF CONTACT LENSES****CATEGORY A:** Removal of soft contact lenses.

1. Pull down the lower eyelid.
2. Gently slide the lens down onto the conjunctiva.
3. Compress the lens between the thumb and index finger using a pinching motion.
4. Remove the lens.
5. Store lens in a container with water or normal saline and label appropriately (i.e., left/right eye and patient's name).

**CATEGORY B:** Removal of rigid and hard gas permeable lenses.

1. Separate the eyelids such that the lid margins are beyond the top and bottom edges of the lens.
2. Gently press the eyelids down and forward to the edges of the lens.
3. Move the eyelids toward each other, thereby forcing the lens to slide out between them.
4. Store lens in a container with water or normal saline and label appropriately (i.e., left/right eye and patient's name).
5. If lens removal proves difficult: gently move the lens downward from the cornea to the conjunctiva overlying the sclera until arrival in the ED.

## **3.7. HYPERTENSIVE EMERGENCIES**

A hypertensive emergency is characterized by a rapid and severe elevation of a patient's diastolic BLOOD PRESSURE (greater than 115 mm Hg-130 mm Hg), which will lead to significant, irreversible end-organ damage within hours if not treated. The brain, heart and kidneys are at risk. The patient may also present with restlessness, confusion, blurred vision, nausea and/or vomiting.

Hypertensive encephalopathy is a true emergency and is the direct result of untreated hypertension. It is characterized by severe headache, vomiting, visual disturbances (including transient blindness), paralysis, seizures, stupor, and coma. This condition may lead to pulmonary edema, left ventricular failure or cardiovascular accident (CVA).

The goal of therapy for hypertensive emergencies is to reduce the BLOOD PRESSURE, on average, approximately 10% - 20% or until patient's clinical presentation is improved. Caution should be taken to reduce the BLOOD PRESSURE in a controlled fashion as opposed to rapid reduction.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Place patient in position of comfort.
5. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
6. Obtain appropriate S-A-M-P-L-E history related to event, including any Trauma (recent head injury).
7. Monitor and record vital signs and ECG.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### **TREATMENT BASIC PROCEDURES**

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management (endotracheal intubation), if indicated.
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management (endotracheal intubation), if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
  - d. Cardiac monitor and, as clinically appropriate, 12 lead ECG - Manage dysrhythmias per protocol
7. Contact **MEDICAL CONTROL**. The following may be ordered:

- a. Administer **Nitroglycerin (NTG) 0.4 mg (1/150 gr.)** tablet or spray SL if **diastolic BLOOD PRESSURE** is **greater** than 115 mmHg to 130 mmHg. **Nitroglycerin** may be repeated in five (5) minute intervals x two (2) as dictated by patient's BLOOD PRESSURE. May also administer Nitropaste, 1" to anterior chest wall.

**Note: For patients, both male and female, who have, within the last 48 hours, taken any medications classified in the phosphodiesterase-type-5 inhibitor category (e.g. sildenafil, vardenafil, tadalafil), nitrates should not be administered unless medical control has been contacted and has provided the Emergency Medical Technician (EMT-B; EMT-I; EMT-P) with a medical control order to administer nitrates.**

- b. Morphine Sulfate 2.0 mg to 10.0 mg IV push or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push, or if no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ
- c. **Furosemide 0.5 mg/kg - 1.0 mg/kg** IV push (SLOWLY) for patients presenting with congestive heart failure (CHF) or pulmonary edema.
- d. Other vasoactive medications in the STP, eg. Metoprolol or calcium channel blockers.

### 3.8. OBSTETRICAL EMERGENCIES

These emergencies include, but are not limited to the following: **abortion**, (spontaneous, threatened, inevitable, incomplete), **trauma**, **ectopic pregnancy**, **pre-eclampsia**, **eclampsia**, **abnormal deliveries** (breech, prolapsed cord, limb presentation, and multiple births), **bleeding during any trimester**, **complications of labor and delivery** (antepartum hemorrhage, abruptio placenta, placenta previa, uterine rupture, uterine inversion, toxemia of pregnancy, pulmonary embolism and post-partum hemorrhage).

Pre-existing medical conditions can lead to obstetrical complications. The primary concerns are diabetes, hypertension, heart disease and substance abuse. All of these conditions may adversely affect the developing fetus and therefore, may complicate the delivery of the fetus and compromise the health of the mother and child.

All obstetrical emergencies should be managed as though the patient is at risk for hypovolemic shock and should be considered an acute emergency requiring efficient management and transport per the **Shock Protocol**. The Obstetrical Emergencies protocol relates to complications of birth and their out of hospital management.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
5. Obtain appropriate S-A-M-P-L-E history related to event, (gravidity, parity, length of gestation, estimated date of delivery, prior C-sections, prior obstetrical or gynecological complications, bleeding, pain, vaginal discharge, LMP).
6. Management of unscheduled field delivery with or without obstetrical complications as they are identified: (see appropriate procedures in this protocol)
  - **Vaginal Bleeding**
  - **Supine-Hypotensive Syndrome**
  - **Abruptio Placenta**
  - **Pre-eclampsia and Eclampsia**
  - **Placenta Previa**
  - **Uterine Inversion**
  - **Postpartum Hemorrhage**
7. Obstetrical emergencies that result in shock should be managed according to the Shock Protocol.

**3.8. OBSTETRICAL EMERGENCIES****ASSESSMENT / TREATMENT PRIORITIES (continued)**

8. Obstetrical emergencies due to trauma should be managed according to the Abdominal Trauma Protocol: Special Considerations.
9. Monitor and record vital signs and ECG.
10. Transport patient(s) to the nearest appropriate facility as defined by the **Department approved POE plans.**
11. Record exact time and location (especially if in transit) of birth.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**NOTE:** EMTs should be prepared to handle a minimum of two patients (mother and infant), with a possibility of additional patients (twins, triplets, etc.).

**TREATMENT  
BASIC PROCEDURES**

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. **Medical Control** may order:
  - a. administration of additional IV Normal Saline

**PARAMEDIC PROCEDURES**

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
  - d. Cardiac monitor, and if clinically appropriate 12 lead ECG - Manage dysrhythmias per protocol
  - e. Eclamptic Seizures

- a. Lorazepam 2mg-4mg slow IV push or Intramuscularly (IM) or Diazepam 5-10 mg slow IV push or Intramuscularly (IM)
2. Contact **MEDICAL CONTROL**. **Medical Control** may order:
- a. Administration of additional IV Normal Saline.
  - b. Magnesium Sulfate 10% 1- 4 gm IV over three (3) minutes (i.e., for eclampsia).
    - **Calcium Chloride 10% 2 mg-4 mg/kg slow IV push over 5 minutes.**  
(Antidote for Magnesium Sulfate).
  - c. Further anticonvulsant therapy.

## SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

### VAGINAL BLEEDING:

Vaginal bleeding at any given time during pregnancy is not normal and is always of concern. Though the exact etiology of the bleeding cannot be determined in the out of hospital setting, the onset of bleeding may provide clues to indicate the etiology. For example, bleeding early in the pregnancy may suggest an ectopic pregnancy or spontaneous abortion. Third-trimester bleeding is often the result of abruptio placentae or placenta previa but it also may be the result of trauma. Due to the variable mechanisms for bleeding, the amount of blood loss will vary anywhere from spotting to extensive hemorrhage that will require aggressive resuscitation measures.

**NOTE:** The amount of visualized vaginal blood loss is NOT a reliable indicator as to the actual amount of blood loss occurring. Visualized blood loss will most likely be out of proportion to the degree of shock, inasmuch as several of the bleeding etiologies may conceal the actual blood loss.

### ABRUPTIO PLACENTA:

This presentation is usually during the third trimester or after twenty (20) weeks of gestation and is a partial or complete separation of the placenta from the wall of the uterus. This condition may present with blood loss ranging from none at all to severe. The patient will most likely complain of severe pain characterized as a severe "**tearing**" sensation. The more extensive the abruption (tear), the more likely there will be a greater severity of pain and blood loss.

- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.



**PLACENTA PREVIA:**

Condition when the placenta attaches to the lower portion of the uterus such that it partially or completely covers the cervical opening. The implantation of the placenta occurs early in the pregnancy. However, it is usually not discovered or manifest complications until the third trimester. Common signs and symptoms include: "**painless**" bright red vaginal bleeding. As a general rule, all incidents of painless vaginal bleeding during pregnancy are considered to be placenta previa until proven otherwise. Another complication of a placenta previa is that the placenta may be the presenting part during delivery, thus will require an emergency cesarean delivery in hospital.

**NOTE: Vaginal examinations should never be performed since it may cause a rupture in the placenta resulting in severe life threatening hemorrhage and may precipitate labor.**

**SUPINE-HYPOTENSION SYNDROME:**

This condition usually occurs during the third trimester of pregnancy and while the pregnant patient is in a supine position. The increased mass and weight of the fetus and the uterus compress the inferior vena cava resulting in a marked decrease in blood return to the heart reducing cardiac output which results in a drop in BLOOD PRESSURE: hypotension. Precipitating factors to this syndrome may be the result of dehydration or a reduced circulating blood volume. Therefore, an attempt should be made to determine whether or not there is any evidence of dehydration and/or blood loss.

**HYPERTENSIVE DISORDERS OF PREGNANCY:****PRE-ECLAMPSIA and ECLAMPSIA**

These disorders occur in approximately 3%-5% of pregnancies. Formerly known as "toxemia of pregnancy," these disorders are characterized by hypertension, weight gain, edema, protein in urine, and in late stages, seizures. **Pre-eclampsia**, in addition to the signs and symptoms just noted, is characterized by headaches and visual disturbances. **Eclampsia** is further complicated by seizure disorders with resultant high morbidity/mortality for both mother and child.

**NORMAL DELIVERY / COMPLICATIONS OF LABOR:**

**Labor** is divided into three (3) stages: The **first stage** begins with the onset of uterine contractions and ends with complete dilation of the cervix. The **second stage** begins with the complete dilation of the cervix and ends with delivery of the fetus. The **third stage** begins with the delivery of the fetus and ends with delivery of the placenta.

In general, the most important decision to be made with a patient in labor is whether to attempt delivery of the infant at the scene or transport the patient to the hospital. Factors that effect this decision include: frequency of contractions, prior vaginal deliveries, maternal urge to push, and the presence of crowning. The maternal urge to push and/or the presence of crowning indicate that delivery is imminent. In such cases, the infant should be delivered at the scene or in the ambulance.

Those conditions that prompt immediate transport, despite the threat of delivery, include: prolonged membrane rupture, breech presentation, cord presentation, extremity presentation, evidence of meconium staining, and nuchal cord (cord around infant's neck).

### UNSCHEDULED NORMAL FIELD DELIVERY

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Follow general treatment guidelines as indicated in Obstetrical Emergencies protocol.
3. Document pertinent gestational/labor history:
  - history of hypertension, diabetes, edema or other pertinent medical/surgical history
  - history of previous obstetrical complications.
  - history of previous pregnancies/deliveries.
  - identify expected date of delivery.
  - identify possibility of multiple births.
  - identify length of time between contractions.
  - identify presence/absence of membrane rupture.
  - identify presence/absence of vaginal bleeding.
4. Determine need for imminent delivery or need for immediate transport.
5. Position mother for delivery. Have mother lie back, if tolerated, with knees drawn up and spread apart. Elevate buttocks with pillow or blankets.
6. Whenever possible, use sterile or aseptic technique.
7. Coach mother to breathe deeply between contractions and to **push with** contractions.
8. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
9. As the head crowns control with gentle pressure and support the head during delivery and examine neck for the presence of a looped (nuchal) umbilical cord. **If cord is looped around neck, gently slip it over the infant's head (If unable to do**
10. Suction mouth, then nose of the infant as soon as possible.
11. Support the infant's head as it rotates for shoulder presentation.
12. With gentle pressure, guide the infant's head downward to deliver the anterior shoulder and then upward to release the posterior shoulder. Complete the delivery of the infant.
13. Hold infant firmly with head dependent to facilitate drainage of secretions. Clear infant's airway of any secretions with sterile gauze and repeat suction of infant's mouth, then nose using bulb syringe.
14. Apply two clamps to umbilical cord (if not already done due to Nuchal cord): the first one is placed approximately ten (10) inches from the infant and the second is placed 2"-3" proximal to the first clamp (7"-8" from infant's abdomen). Cut cord between clamps and check for umbilical cord bleeding. If umbilical cord bleeding is evident apply additional clamp(s) as needed.
15. Dry infant and wrap in warm towels/blanket (cover infant's head).
16. Place infant on mother's abdomen for mother to hold and support.
17. Note and record infant's gender, time and geographical location (especially if in transit) of birth.

18. If infant resuscitation **is not** necessary, record **APGAR** score at 1 minute and 5 minutes post-delivery.
19. If infant resuscitation is necessary, **follow neonatal resuscitation protocol.**
20. Delivery of the Placenta: (do not delay transport)
  - As the placenta delivers, the mother should be encouraged to push with contractions.
  - Hold placenta with both hands, place in plastic bag or other container and transport with mother to receiving hospital. NEVER "pull on" umbilical cord to assist placenta delivery.
  - Evaluate perineum for tears. If present, apply sanitary napkins to the area while maintaining direct pressure.
21. Initiate transport as soon as possible.
22. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
23. Notify receiving hospital.

### **COMPLICATIONS OF LABOR**

#### **BREECH PRESENTATION**

In general, breech presentations include buttocks presentation and/or extremity presentation. An infant in a breech presentation is best delivered in the hospital setting since an emergency cesarean section is often necessary. However, if it is necessary to perform a breech delivery in an out of hospital setting, the following procedures should be performed:

1. Allow the fetus to deliver spontaneously up to the level of the umbilicus. If the fetus is in a front presentation, gently, extract the legs downward after the buttocks are delivered.
2. After the infant's legs are clear, support the baby's body with the palm of the hand and the volar surface of the arm.
3. After the umbilicus is visualized, gently extract a 4"-6" loop of umbilical cord to allow for delivery without excessive traction on the cord. Gently rotate the fetus to align the shoulder in an anterior-posterior position. Continue with gentle traction until the axilla is visible.
4. Gently guide the infant upward to allow delivery of the posterior shoulder.
5. Gently guide the infant downward to deliver the anterior shoulder.
6. During a breech delivery, avoid having the fetal face or abdomen toward the maternal symphysis.
  7. The head is often delivered without difficulty. However, be careful to avoid excessive head and spine manipulation or traction.
8. If the head does not deliver immediately, action must be taken to prevent suffocation of the infant.
  - a. Place a gloved hand in the vagina with the palm toward the babies face.
  - b. With the index and middle fingers, form a "V" on either side of the infant's nose.
  - c. Gently push the vaginal wall away from the infant's face until the head is delivered.
  - d. If unable to deliver infant's head within three (3) minutes, maintain the infant's airway with the "V" formation and rapidly transport to the hospital.

## SHOULDER DYSTOCIA

This occurs when the fetal shoulders impact against the maternal symphysis, blocking shoulder delivery. Delivery entails dislodging one shoulder and rotating the fetal shoulder girdle into the wider oblique pelvic diameter. The anterior shoulder should be delivered immediately after the head:

1. Attempt to guide the infant's head downward to allow the anterior shoulder to slip under the symphysis pubis.
2. Gently rotate the fetal shoulder girdle into the wider oblique pelvic diameter. The posterior shoulder usually delivers without resistance.

## PROLAPSED UMBILICAL CORD

This occurs when the cord slips down into the vagina or presents externally after the amniotic membranes have ruptured. Fetal asphyxia may rapidly ensue if circulation through the cord is not re-established and maintained until delivery. If umbilical cord is seen in the vagina, insert two fingers of a gloved hand to raise the presenting part of the fetus off of the cord.

1. Position the mother in Trendelenburg or knee-chest-position to relieve pressure on the cord.
2. Instruct the mother to "pant" with each contraction to prevent her from bearing down.
3. Insert two gloved fingers into the vagina and gently elevate the presenting part to relieve pressure on the cord and restore umbilical pulse. DO NOT attempt to reposition or push the cord back into the uterus.
4. If assistance is available, apply moist sterile dressings to the exposed cord.
5. Maintain hand position during rapid transport to the receiving hospital. The definitive treatment is an emergency cesarean section.

## UTERINE INVERSION

This is a turning "**inside out**" of the uterus. Signs and symptoms include postpartum hemorrhage with sudden and severe abdominal pain. Hypovolemic shock may develop rapidly.

1. Follow standard hemorrhagic shock protocol.
2. Do not attempt to detach the placenta or pull on the cord.
3. Make one (1) attempt to reposition the uterus:
  - Apply pressure with the fingertips and palm of a gloved hand and push the uterine fundus upward and through the vaginal canal.
  - If procedure is ineffective, cover all protruding tissues with moist sterile dressings and rapidly transport to hospital.

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**POSTPARTUM HEMORRHAGE**

This is defined as the loss of 500 ml or more of blood in the first twenty-four (24) hours following delivery. The most common cause is the lack of uterine muscle tone and is most frequently seen in the multigravida and/or multiple birth mother. However, any other obstetrical malady may cause hemorrhage.

Follow general treatment guidelines as indicated in protocols. Treat for shock; administer oxygen using appropriate oxygen delivery device, as clinically indicated. Advanced procedures should include **1-2 IVs of Normal Saline** (recommended during transport) followed by a **250 ml - 500 ml** fluid bolus of **Normal Saline**. Titrate IV flow rate to patient's hemodynamic status.

## 3.9 SEIZURES

A seizure is a temporary alteration in behavior due to large-scale electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized absence or tonic/clonic seizure, partial/ simple, or partial/complex. The single most common cause of seizure disorder is idiopathic epilepsy. However, there are multiple other causes: alcohol abuse, hypoglycemia, head trauma, vascular disorders, cerebrovascular accidents, overdose, infection, psychiatric, electrolyte abnormalities, eclampsia, hypoxemia, toxic exposure, drug withdrawal and structural brain disorders such as tumors. The seizure may be followed by a post-ictal state or complete coma depending upon cause.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Consider nasopharyngeal airway. Protect patient from injury and secure airway as opportunity arises.
3. Administer oxygen, using appropriate oxygen delivery device, as clinically indicated. Be certain that the oropharynx is clear of secretions and/or vomitus.
4. Obtain appropriate (S-A-M-P-L-E) history related to event. Question witnesses or bystanders as to actual event if possible.
5. The majority of seizures are self-limiting, followed by a gradual awakening. However, prolonged or recurrent seizures may indicate status epilepticus. (see below)
6. Monitor and record vital signs and ECG.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**NOTE: Status epilepticus is considered to be occurring when it has been reported, or is known that, a patient has been seizing for 10 minutes or greater.**

### TREATMENT

#### BASIC PROCEDURES

1. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose may be necessary.

**CAUTION: Do NOT administer anything orally if the patient does not have a reasonable Level of Consciousness and normal gag reflex.**

2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

**INTERMEDIATE PROCEDURES****1. ALS STANDING ORDERS:**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO).
- c. Cardiac Monitor and if feasible 12 lead ECG - Manage dysrhythmias per protocol
- d. If obvious narcotic overdose:
  - Naloxone 0.4-2.0 mg IV Push, IM, SC, ET or Nasal via atomizer
- e. Thiamine 100 mg IV or IM (in patient with obvious alcohol abuse, malnourished state).
- f. Determine Blood Glucose level:
  - If glucose is less than **70mg/dL**, **Administer Dextrose 50%,12.5 to 25 grams IV Push.**

**CAUTION: If cerebrovascular accident is suspected, contact Medical Control prior to administration.**

- g. If patient is in **Status Epilepticus**, administer one of the following:

- **Diazepam 5 mg - 10 mg slow IV push.**
- **Lorazepam 2 mg - 4 mg slow IV push or IM.**

**CAUTION: Benzodiazepines may be contraindicated in head injury or hypotension; discuss with medical control.**

- h. If no IV access, administer **Glucagon 1-2 mg IM** for suspected/known hypoglycemia.
2. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. Additional Dextrose 50% IV push.
    - b. Naloxone 0.4 - 2.0 mg IV push, IM, ET, or Nasal via atomizer
    - c. Magnesium Sulfate 1-4 grams IV over three (3) minutes if suspect eclampsia of pregnancy.
    - d. Further doses of anticonvulsants

## 3.10 SHOCK (HYPOPERFUSION) OF UNKNOWN ETIOLOGY

Shock is defined as inadequate tissue perfusion and oxygenation resulting in abnormal tissue metabolism at the cellular level. Multiple causes of shock exist and include: **hypovolemia** (hemorrhage, burns, dehydration, anaphylaxis); **cardiogenic** (myocardial infarction, congestive heart failure, dysrhythmias); **obstructive** (pericardial tamponade, pulmonary embolism, aortic dissection); **distributive** (infection, sepsis, poisonings, spinal cord injuries).

The patient with severe decompensated shock will typically present with hypotension and changes in mental/neurological status (agitation, restlessness) eventually leading to confusion and coma.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
2. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
3. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
4. Obtain appropriate (S-A-M-P-L-E) history related to event.
5. Monitor and record vital signs and ECG.
6. Treat for shock (maintain body temperature).
7. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Control/stop hemorrhage (direct pressure, pressure points, etc.).
2. Place patient in supine position with legs elevated, unless suspected respiratory compromise.
3. Activate ALS intercept, if deemed necessary and if available.
4. Initiate transport as soon as possible with or without ALS.
5. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status



2. Contact **MEDICAL CONTROL** who may order:
  - a. administration of additional fluid

## **PARAMEDIC PROCEDURES**

### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
  - d. Cardiac Monitor and if feasible 12 lead ECG - Manage dysrhythmias per protocol Initiate transport as soon as possible.
- 
9. Contact **MEDICAL CONTROL**, who may order:
    - :
    - a. Repeat fluid bolus(es).
    - b. Dopamine infusion 2-20  $\mu\text{g}/\text{kg}/\text{minute}$

### 3.11 ACUTE STROKE

The American Heart Association notes that stroke is the third leading cause of death in the United States and the leading cause of brain injury in adults. With the advent of organized systems for stroke management and many new urgent care options, it is imperative that pre-hospital care providers recognize, treat and appropriately transport stroke victims.

The American Heart Association further recommends the use of the Cincinnati Stroke Scale by pre-hospital care providers to easily identify, properly treat and ensure transport to an appropriate facility of suspected acute stroke patients. A modification of this scale, the **Massachusetts Stroke Scale (MASS; see appendix Q)** should be used. The scale evaluates three major physical findings; facial droop, arm weakness and speech difficulties.

Once the diagnosis of acute stroke is suspected, pre-hospital care providers should make every effort to determine the time of onset of symptoms and to minimize time in the field. The suspicion of acute stroke mandates rapid transport because there is a small window of opportunity to institute therapies that can only be provided within the hospital.

#### ASSESSMENT/TREATMENT PRIORITIES

1. Maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and vital signs.
5. Obtain S-A-M-P-L-E history related to event. If possible, establish the time of onset of stroke signs and symptoms.
6. Monitor and record vital signs and ECG.
7. Initiate transport ASAP, with or without ALS. Do not allow the patient to exert themselves.
8. Properly secure patient to cot in position of comfort or appropriate to treatment(s) required.

#### TREATMENT

##### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and available.
2. Determine blood glucose level if trained and allowed.
3. If patient is known diabetic who is conscious and can speak and swallow, do not administer oral glucose without contacting medical control.
4. If patient is unconscious or seizing, transport on left side (coma position)
5. If patient blood pressure drops below 100 systolic, treat for shock.
6. Initiate transport as soon as possible, with or without ALS, to nearest appropriate facility.

7. If patient is possible ischemic stroke victim and time permits, use appropriate **Thrombolytic Checklist** to determine if patient is candidate for ischemic stroke reperfusion.
8. Notify receiving facility.

## **INTERMEDIATE PROCEDURES**

### **1. ALS STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV **Normal Saline** (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.

## **PARAMEDIC PROCEDURES**

### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
- d. Determine Blood Glucose level:
  - If glucose is less than **70**mg/dl, contact Medical control prior to administration of D50%.

## 3.12 SYNCOPE OF UNKNOWN ETIOLOGY

Syncope is a brief loss of consciousness caused by inadequate perfusion of the brain. If the patient remains unconscious, they should be treated according to the "Altered Mental/Neurological Status" protocol. Syncope may be caused by any mechanism that results in decreased blood flow to the brain, such as: **vasovagal hypovolemia** (orthostatic), **cerebrovascular disease** (TIA/CVA), **cardiac dysrhythmia, pulmonary embolism, carotid sinus sensitivity, metabolic causes** (intoxication, COPD, suffocation, hypoglycemia), **neuropsychologic** (seizure, hyperventilation), and **medications** (e.g. nitroglycerin, thorazine, quinidine, isosorbide dinitrate, captopril).

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer **oxygen** using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate (S-A-M-P-L-E) history related to event. Question witnesses or bystanders as to the actual event.
6. Monitor and record ECG and vital signs.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### **BASIC PROCEDURES**

1. If suspected hypovolemia etiology (i.e. GI bleed, ectopic pregnancy) place patient supine, cover to prevent heat loss and elevate legs.
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

#### **INTERMEDIATE PROCEDURES**

##### **7. ALS STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
9. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. Fluid bolus of Normal Saline.

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management, if indicated.
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
- d. Cardiac monitoring and if feasible 12 lead ECG - manage dysrhythmias per protocol
- e. Determine Blood Glucose level.
  - If glucose is less than 70mg/dL: administer Thiamine 100 mg IV Push or IM, followed by 50% Dextrose (12.5 to 25 gm)\* IV Push. A second dose of 50% Dextrose may be necessary.

\* NOTE: If cerebrovascular accident is suspected, contact Medical Control prior to administration.

NOTE: If no IV access, administer Glucagon 1 mg-2 mg IM for suspected/known hypoglycemia.

- f. If suspected/known narcotic overdose: Naloxone **0.4-2.0 mg** IV Push, IM, or Nasal via atomizer. May repeat as necessary.

**8. Contact MEDICAL CONTROL.** The following may be ordered.

- a. additional **50% Dextrose** IV Push.
- b. Naloxone **0.4-2.0 mg** IV Push, IM or Nasal via atomizer
- c. Further Normal Saline bolus.
- d. **Calcium Chloride 10% 2-4 mg/Kg** IV **slowly** over 5 minutes for suspected calcium channel blocker toxicity.
- e. **Sodium Bicarbonate 0.5 - 1.0 mEq/Kg** IV Push.
- f. **Atropine 0.5 - 1.0 mg** IV Push for bradycardia to **total dose of 0.0 4 mg/kg**.
- g. **Glucagon 1.0 to 5.0 mg IM, SC, or IV** for suspected beta-blocker toxicity.

### **3.13. TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE**

Poisoning may be the result of exposure to toxic substances from **ingestion, inhalation, injection or skin absorption**. The most common poisoning emergencies include, but are not limited to: corrosive agents (acids/alkalis), hydrocarbons (gasoline, oil, pesticides, paints, turpentine, kerosene, lighter fluids, benzene, and pine-oil products), methanol (wood alcohol), ethylene glycol (anti-freeze), isopropyl alcohol, cyanide, food poisonings (bacterial, viral, and non-infectious) and plant poisonings. Envenomations are also managed as clinical poisonings. The primary goal of physical assessment of the poisoned patient is to identify effects on the three vital organ systems most likely to produce immediate morbidity and/or mortality: respiratory system, cardiovascular system, and central nervous system. An **"overdose"** is the result of an individual's intentional/accidental exposure to a pharmacological substance(s). The most common drugs of abuse resulting in overdose are: narcotics, central nervous system depressants, central nervous system stimulants and hallucinogens.

General management principles should be directed towards patient's clinical status and suspected cause for their clinical condition. ALS personnel must constantly be aware of immediate need for potential antidote (e.g., Naloxone for narcotic overdose). Due to the complex nature of poisonings and substance abuse emergencies, it is strongly recommended that Medical Control be utilized in the initial management of these patients.

**The Regional Poison Control may be reached at: 1- 800- 682- 9211 MA/RI or 1- 617- 232- 2120 MA/RI or 1- 800- 222- 1222 MA/RI & Nationwide**

#### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation, i.e. by ascertaining the source and type of poisoning. This is especially important when responding to industrial and/or farm accidents. Call appropriate public safety agencies: fire, rescue, or HAZMAT teams to properly stabilize the scene and rescue the victim(s) from the source of contamination. The patient will need to be removed from point of exposure and must be properly decontaminated. Rescuers will need to place patient in a safe environment such that the EMTs and/or Paramedics may administer emergency care.
2. Maintain open airway and assist ventilations as needed. Ensure spinal stabilization/immobilization if indicated. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate (S-A-M-P-L-E) history related to event.
6. General management principles should be directed towards patient's clinical status and suspected cause for their clinical condition.
7. Envenomations: immobilize the extremity in a dependent position. May utilize cold packs and/or constricting bands, as indicated.
8. Monitor and record ECG and vital signs.
9. Prevent / treat for shock.

10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## TREATMENT

### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Contact **MEDICAL CONTROL**. Medical Control may order:
  - a. Administration of **activated charcoal** 1 gram per kg by mouth mixed with water or sorbitol **ONLY** if the patient is fully conscious and has **NOT** ingested hydrocarbon, petroleum distillate, corrosive substances or heavy metals. (i.e. Iron, Lithium, Lead, Mercury, Cadmium)
4. Notify receiving hospital..

### INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical Control may order:
  - a. Administration of **activated charcoal** 1 gram per kg by mouth mixed with water or sorbitol **ONLY** if the patient is fully conscious and has **NOT** ingested hydrocarbon, petroleum distillate, corrosive substances or heavy metals. (i.e. Iron, Lithium, Lead, Mercury, Cadmium)

### PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
  - d. Apply cardiac monitor and if clinically feasible, obtain 12 lead ECG - Manage dysrhythmias per protocol.
  - f. Administer Naloxone 0.4-2.0 mg IV Push or IM, SC, ET or Nasal via atomizer. May be repeated as indicated.
  - g. Administer **Thiamine 100 mg** IV or IM if appropriate.
  - h. Determine **Blood Glucose** level:
    - If glucose is **less** than **70mg/dL**, administer **Dextrose 50%,12.5 to 25 grams** IV Push. May be repeated as indicated.

**CAUTION:** If cerebrovascular accident is suspected, contact Medical Control prior to administration.

- i. If no IV access, administer **Glucagon 1-2 mg** IM for suspected/known hypoglycemia.
7. Contact **MEDICAL CONTROL**. Medical Control may order:

- a. Administration of **activated charcoal** 1 gram per kg by mouth mixed with water or sorbitol **ONLY** if the patient is fully conscious and has **NOT** ingested hydrocarbon, petroleum distillate, corrosive substances or heavy metals. (i.e. Iron, Lithium, Lead, Mercury, Cadmium)
- b. **Dextrose 50%, 25 gm** IV Push.
- c. **Naloxone 0.4-2.0 mg** IV Push, IM, or Nasal via atomizer
- d. Further Normal Saline bolus.
- e. **Calcium Chloride 10%, 2-4 mg/kg** IV Push **SLOWLY OVER FIVE (5) MINUTES** (i.e., for calcium blocker toxicity).
- f. **Sodium Bicarbonate 0.5 - 1.0 mEq/Kg** IV Push.
- g. **Atropine 2.0- 5.0 mg** I V Push.(i.e., organophosphate poisoning management).
- h. **Albuterol 0.5%** (i.e., bronchospasm management).
- i. **Furosemide 40 mg** IV bolus (i.e., pulmonary edema management).
- j. Diazepam **5 mg-10 mg** slow IV push or **Lorazepam 2mg-4mg** slow IV push.
- k. If Atropine is ineffective in patient(s) with known organophosphate poisoning and if available: **Pralidoxime Chloride (2-PAM Chloride): Adult: 1 gram IV over 15-30 minutes; Pedi: 20-50 mg/kg IV over 15-30 minutes.**
- l. **Amyl nitrite**: administer vapors of a crushed inhalant or pearl under the patients nose for 15 out of every 30 thirty seconds with intermittent 100% oxygen administration.
- m. **CYANIDE ANTIDOTE KIT if available by EMS service and/or industrial site:**
  - Two (2) **Amyl Nitrite** inhalants.
  - **3% Sodium Nitrite** (stop Amyl nitrite):
    - ADULT: 10 ml slow IV administration over 2-4 minutes.
    - PEDI: 0.2 ml/kg (up to 10 ml) slow IV administration over 5 minutes.
  - **Sodium Thiosulfate 25%:**
    - ADULT: 50 ml IV bolus.
    - PEDI: 5 ml Sodium Thiosulfate per 1 ml Sodium Nitrate given. **NOTE:** If hypotension develops, STOP all nitrites, treat for shock, and consider administration of Dopamine.
- n. **HYDROXOCOBALAMIN** 5 gm. IV for cyanide toxicity.
- o. **Glucagon** 1.0 - 5.0 mg IM, SC, IV for beta-blocker overdose



## 3.14 ADULT PAIN AND NAUSEA MANAGEMENT

Pain management with analgesics should be considered utilizing the following protocol\*\*. The purpose of this protocol is to:

- Attempt to decrease and/or alleviate pain and minimize patient anxiety
- Facilitate positioning and splinting techniques

**\*\* NOTE: This protocol excludes patients with Head Injury, Altered Mental Status, Respiratory Distress, Cardiac Emergencies, Abdominal Pain and Unstable patients. However, upon contacting Medical Control, the physician may order pain medication for these patients. Some of the protocols for these entities may also include use of pain medications.**

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions
2. Maintain an open airway and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event, including any Trauma (recent head injury/fracture.)
6. Monitor and record vital signs and ECG.
7. Treat all life threatening conditions as they become identified.
8. Prevent / treat for shock.
9. Multiple patients need to be appropriately triaged.
10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
11. Transport to the nearest appropriate facility .

### TREATMENT BASIC PROCEDURES

### INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**: Medical Control may order:
  - a. Fluid bolus of Normal Saline (expected fluid bolus of 20 ml/kg). This order may be repeated at the discretion of Medical Control.

## **PARAMEDIC PROCEDURES**

### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management, if indicated.
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
- d. Administer Morphine 0.1mg/kg to a maximum of 10mg IV or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.

### **8. Contact MEDICAL CONTROL: Medical Control may order:**

- a. Fluid bolus of Normal Saline.
- b. Naloxone HCL 0.4 – 2 mg IV/IM.
- c. **Morphine** 0.1mg/kg to a maximum of 10mg IV/IM/SC or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.
- d. **Ondansetron** 4 mg. IV.

## **3.15 ADULT UPPER AIRWAY OBSTRUCTION**

Causes of airway obstruction include prolapse of tongue in the unconscious patient; foreign bodies in the oropharynx, trachea, or esophagus (commonly chunks of meat or food); allergic swelling of upper airway structures ("angioedema"); chemical burns; inhalation injuries; altered mental/Neurological status and congenital abnormalities (patients with small jaws or large tongues). Infectious causes are pertussis, epiglottitis, and retropharyngeal or peritonsillar abscess. Trauma resulting in upper tracheal or laryngeal injury may also result in airway obstruction.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine presence of upper airway obstruction (stridor):
  - a. If the obstruction due to a foreign body is complete or is partial with inadequate air exchange: follow the American Heart Association (AHA) BCLS age appropriate guidelines for foreign body obstruction. Maintain an open airway, remove secretions, vomitus and assist ventilations as needed.
  - b. If partial obstruction due to a foreign body is suspected and the patient has adequate air exchange: transport to appropriate medical facility. Do not attempt to remove foreign body in the field.
  - c. If suspected epiglottitis (stridor, drooling), maintain an open airway and place patient in position of comfort. Avoid upper airway stimulation.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event, including recent infectious history (fever, cough, etc.) or exposure to allergens.
6. Monitor and record vital signs and ECG.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, immobilization device, in position of comfort, or appropriate to treatment(s) required.

### **TREATMENT BASIC PROCEDURES**

1. If tracheostomy tube exists and there is evidence of obstruction resulting in inadequate air exchange;

**CONTACT Medical Control** for further instructions. Medical control may provide instructions for emergent removal of the tracheostomy tube to establish an airway.\*

2. Activate ALS intercept, if deemed necessary and if available.

3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

**\* See Tracheostomy Tube Obstruction Management in this Protocol.**

## **INTERMEDIATE PROCEDURES**

### **1. ALS STANDING ORDERS**

- a. Provide advanced airway management if indicated for **mechanical obstruction**: Perform direct laryngoscopy if foreign body suspected. If foreign body is visible and readily accessible, attempt removal with Magill forceps.
- b. Provide positive pressure ventilations if needed.

## **PARAMEDIC PROCEDURES**

### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management if indicated for **mechanical obstruction**: Perform direct laryngoscopy if foreign body suspected. If foreign body is visible and readily accessible, attempt removal with Magill forceps. If unable to remove obstructing foreign body, continue BLS airway management by providing positive pressure ventilations.
- b. If foreign body is removed proceed with endotracheal intubation if necessary.
- c. If unable to clear airway obstruction, unable to intubate as needed or unable to perform positive pressure ventilations, perform a **needle cricothyroidotomy**.
- d. Contact **MEDICAL CONTROL** for further orders.
- e. IV Normal Saline titrated to appropriate BLOOD PRESSURE en route.

### **\* Tracheostomy tube obstruction management:**

In the patient with an obstructed tracheostomy tube, in whom no effective ventilation/oxygenation is possible, the following are to be considered **Standing Orders**:

- wipe neck opening with gauze
- attempt to suction tracheostomy tube
- remove tracheostomy tube if necessary
- once airway is open, begin ventilations as necessary/possible
- Intermediates and Paramedics may attempt intubation of the patient if no other means of ventilating/oxygenating the patient are possible

**Medical Control** may order:

- in patients in whom the removed tracheostomy tube is noted to be plugged, on-line medical control may order clearing of the tube and re-insertion.

In patients who are being oxygenated or ventilated by the above criteria, Medical Control may order:

- wipe neck opening with gauze

- attempt to suction tracheostomy tube
- remove tracheostomy tube as necessary
- once airway is open, begin ventilations as possible/necessary
- Attempt to intubate the patient

Signs of inadequate oxygenation/ventilation are:

- falling pulse oximetry
- patient's color
- patient's vital signs

inability to deliver oxygenation by all other means

## **3.16 DIABETIC EMERGENCIES**

The patient presenting with a potential diabetic emergency in the prehospital environment may be difficult to assess without the capability of measuring a blood sugar. An alteration in mental/neurological status may be related or unrelated to their diabetes mellitus. Other potential reasons for altered mental/neurological status include ethanol, epilepsy, overdose, trauma, infection, stroke, and psychiatric causes. See these protocols if hypo or hyperglycemia is not the reason for their presentation.

**Altered Mental/Neurological Status; Shock Toxicology/ Poisoning; Seizures; Syncope; and/or Head Trauma/Injury.**

**Hypoglycemia:** Hypoglycemia (**low blood sugar**) is the most common type of diabetic emergency and may be life threatening. The diabetic may have taken too much insulin or oral diabetic medication, reduced their food intake, or increased their level of physical activity acutely. Typically, the **hypoglycemia** patient may present with a change in mental status, an appearance of intoxication, unsteady gait, slurred speech, unconscious, elevated heart rate, cold clammy skin, seizures, or combativeness.

**Hyperglycemia:** Hyperglycemia (**overly high blood sugar**) although not as common as an emergency presentation, may still be life threatening to the patient. Typically, though, it is the underlying cause that is the issue (e.g. sepsis, injury, myocardial infarction). Hyperglycemia occurs because the diabetic does not produce enough natural insulin to move sugar from the blood into cells. The diabetic may not have taken enough or skipped an insulin dose. The diabetic may have overeaten or has an infection altering his blood sugar. In physical stress situations, endogenous catecholamines and cortisol will raise blood glucose; severe dehydration may do so as well. Typically, the **hyperglycemic** patient may present with confusion, weakness, tachycardia, and hypotension.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer **oxygen** using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Obtain appropriate S-A-M-P-L-E history related to event.
6. Obtain blood glucose level.
7. Treat hypoglycemia or hyperglycemia per protocol.
8. Monitor and record vital signs and ECG.
9. Initiate transport as soon as possible, with or without ALS.
10. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## 3.16 DIABETIC EMERGENCIES

### TREATMENT

#### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.

#### 3. BLS STANDING ORDERS

- a. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose may be necessary.
- b. If authorized and trained to do so, and prior to administering oral glucose, obtain a blood sugar reading.
- c. If glucose is **less than 70** mg/dl and the patient is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated.

**CAUTION:** Do NOT administer anything orally if the patient does not have a reasonable level of Consciousness and normal gag reflex.

**NOTE:** One dose equals one tube.

- d. If after 10 minutes the patient continues to be symptomatic, re-determine Blood Glucose level and administer a second dose of oral glucose if glucose is still below **70** mg/dl.

**CAUTION:** If cerebrovascular accident is suspected, follow stroke protocols and notify Medical Control

8. If patient is unconscious or seizing, transport on left side (coma position).
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management (if indicated)
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient is a known diabetic who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose may be necessary.
- d. If authorized and trained to do so, and prior to administering oral glucose, obtain a blood sugar reading.

- i. If blood sugar is **less than 70** mg/dl and the patient is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated.

**CAUTION:** Do NOT administer anything orally if the patient does not have a reasonable level of Consciousness and normal gag reflex.

**NOTE:** One dose equals one tube.

- e. If after 10 minutes and the patient continues to be symptomatic re-determine Blood Glucose level and administer a second dose of glucose if glucose is still below 70 mg/dl.

**CAUTION:** If cerebrovascular accident is suspected, follow stroke protocols and notify Medical Control

4. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.

## **PARAMEDIC PROCEDURES**

### **1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
  - d. Apply cardiac monitor and if feasible 12 lead ECG - Manage dysrhythmias per protocol.
  - e. If obvious narcotic overdose:
    - Naloxone 0.4-2.0 mg IV Push or IM, SC, ET or Nasal via atomizer. Additional naloxone (0.4-2.0 mg) may be administered as necessary.
  - f. Thiamine 100 mg IV or IM
  - g. Determine Blood Glucose level:
    - If glucose is less than 70 mg/dL, administer Dextrose 50%, 12.5-25 grams IV Push. Additional Dextrose 50% may be administered as necessary.
  - h. If no IV access, administer **Glucagon 1-2 mg** IM for suspected hypoglycemia.
6. Contact **MEDICAL CONTROL** who may order:
    - a. Dextrose 50%, 25 gm IV Push
    - b. Naloxone 0.4-2.0 mg IV Push, IM or Nasal via atomizer
    - c. Further Normal Saline bolus.
    - d. Dependent upon conditions for suspected substance abuse, overdose, or toxic exposure: refer to specific protocols.



## 4. TRAUMA EMERGENCIES

### 4.1 ABDOMINAL/PELVIC TRAUMA

Abdominal injuries can result from blunt or penetrating trauma, and most commonly result from motor vehicle crashes, blast injuries, falls from heights, blows to the abdomen, abdominal compression, gunshot and stab wounds. Injuries include skeletal, renal, splenic, hepatic, bladder, gastrointestinal, vascular, pancreatic and diaphragmatic.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Treat all life threatening conditions as they become identified.
6. When multiple patients are involved, they need to be appropriately triaged.
7. Obtain appropriate S-A-M-P-L-E history related to event.
8. Prevent / treat for shock.
9. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
10. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. See **Air Ambulance** protocol.
11. Monitor and record vital signs and ECG.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

#### TREATMENT BASIC PROCEDURES

1. Cover eviscerations with sterile non-adherent material (saline or sterile water moistened).
2. If applicable, stabilize any impaled object(s).
3. Activate ALS intercept, if deemed necessary and if available.
4. Initiate transport as soon as possible with or without ALS.
5. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
6. Notify receiving hospital.

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**INTERMEDIATE PROCEDURES****1. ALS STANDING ORDERS**

- a. Provide advanced airway management if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Additional IV Normal Saline bolus(es) 250 ml - 500 ml bolus or wide open titrated to patient's condition.

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Additional IV Normal Saline bolus(es) 250 ml- 500 ml bolus or wide open titrated to patient's condition.

**NOTE: SPECIAL CONSIDERATION: THE PREGNANT PATIENT**

Pregnant victims involved in major trauma to the abdomen are more susceptible to life-threatening injuries. In general, the fluid-filled gravid uterus protects the fetus from blunt trauma. However, direct trauma may result in premature separation of the placenta from the uterine wall, premature labor, uterine rupture, abortion and fetal death. Therefore, immediate transport to the appropriate emergency facility is of highest priority.

**Abdominal trauma during pregnancy:**

- Follow all procedures identified above.
- Place patient in left lateral recumbent position (non-spinal injured patient).
- If suspected spinal injury: completely immobilize the patient on a long board and place the patient on her left side (while immobilized).
- Notify appropriate facility immediately.

## 4.2 BURNS / INHALATION INJURIES

A burn injury is caused by an interaction between energy (thermal, chemical, electrical,\* or radiation\*) and biological matter. Thermal burns (flames, scolds, contact with hot substances or objects, including steam) account for the majority of burns. Chemical burns are caused by acids, alkalis and organic compounds (phenols, creosote, and petroleum products) commonly found in industrial and household environments.

\* **NOTE: see specific protocols.**

Burn severity should be assessed and classified by degree. The **first-degree** burn involves only the upper layers of the epidermis and dermis. The **second-degree** burn penetrates slightly deeper and produces blistering of the skin. First- and second-degree burns are considered **partial thickness** burns. **Third-degree** or **full thickness** burns penetrate the entire dermis. These burns may involve injury to blood vessels, nerves, muscle tissue, bone, or internal organs. Burn surface area should be assessed by the rule of nines.

**Inhalation injury** and **fire toxicology** (Carbon Monoxide, Hydrogen Chloride, Phosgene, Nitrogen Dioxide, Ammonia, Cyanide, Sulfur Dioxide, Methane, and/or Argon) frequently accompany burn injuries. This is especially true if injury occurred in a closed space and/or patient presents with facial burns, singed nasal hairs, beard or mustache, sooty or bloody sputum, difficulty breathing, or brassy cough. The signs and symptoms of inhalation injuries may not be noted until several hours after inhalation.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety, including safety for the patient(s) and rescuer(s). Call appropriate public safety agencies for assistance if needed. Take appropriate personal protective measures against airborne dust or toxic fumes and any other potential chemical agents.
2. Maintain appropriate body substance isolation precautions.
3. Maintain open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Early endotracheal intubation must be considered for all patients with suspected inhalation injuries and/or who present in respiratory distress.
6. Determine patient's hemodynamic stability and symptoms. Continually assess, level of consciousness, ABCs and Vital Signs.
7. Treat all life threatening conditions as they become identified.
8. Obtain appropriate S-A-M-P-L-E history related to event (determine mechanism and time of exposure, assess patient for evidence of inhalation injury including potential for toxic inhalation exposure).
9. If suspected severe Carbon Monoxide Poisoning, consider **Department approved** Point-of-Entry plans, i.e., Burn Center and/or Hyperbaric chamber availability.
10. Monitor and record vital signs and ECG.
11. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**TREATMENT****BASIC PROCEDURES**

1. Appropriately manage Thermal vs./Chemical burns.
  - a. **THERMAL**
    - Stop burning process with water or saline for up to 10 minutes.
    - Remove smoldering, non-adherent clothing and jewelry. **DO NOT** pull off skin or tissue.
    - Cover burns with a **CLEAN, DRY DRESSING**
  - b. **CHEMICAL**
    - Determine offending agent(s) if possible. Consider HAZMAT intervention if indicated.
    - Wash with copious amounts of clean water and/or sterile normal saline for 10-15 minutes, unless contraindicated by chemical agent (i.e., Sodium, Potassium and/or Lithium metals). **CAUTION:** Dry Lime/Lye and/or Phenol exposure: water irrigation is not recommended as primary treatment since water exposure may produce further chemical reactions. Dry powders should be brushed off prior to flushing with large amounts of water. It is advised to contact **MEDICAL CONTROL** for further advice.
2. Activate ALS intercept if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.\*\*

\*\* See Burn Center Guidelines in this protocol.

**INTERMEDIATE PROCEDURES**

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate large bore IV Normal Saline.. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA

For transport times LESS THAN 1 HOUR use the following pre-hospital rates:

Over 15 yrs. of age – 500ml/hour

5 –15 yrs. of age – 250ml/hour

2 – 5 yrs. of age – 125ml/hour

Under 2 yrs. of age – 100ml/hour

For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:

\*Adults: 2-4 ml x kg x % burn [Adult = over 15 yrs. of age]

\*Pediatric: 3-4 ml x kg x % burn

\*Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn

If suspected hypovolemia (consider other injuries), administer 250ml - 500ml fluid bolus and titrate to patient's hemodynamic status.

2. Contact **MEDICAL CONTROL**. Medical Control may order:
  - Additional IV NS 250 ml - 500 ml bolus(es), wide open or titrated to patient's hemodynamic status
3. Notify receiving hospital.\*\*

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management, if indicated.
- b. Cardiac monitor, and if feasible, 12 lead ECG - Manage dysrhythmias per protocol.
- c. Initiate large bore IV Normal Saline. Begin fluid resuscitation for treatment of the BURN INJURY if greater than 20% BSA

For transport times LESS THAN 1 HOUR use the following pre-hospital rates:

- Over 15 yrs. of age – 500ml/hour
- 5 –15 yrs. of age – 250ml/hour
- 2 – 5 yrs. of age – 125ml/hour
- Under 2 yrs. of age – 100ml/hour

For transport times GREATER THAN 1 HOUR consult medical control regarding the following fluid rates:

- \*Adults: 2-4 ml x kg x % burn [Adult = over 15 yrs. of age]
- \*Pediatric: 3-4 ml x kg x % burn

\*Infusion rate regulated so one-half of estimated volume is given in the first 8 hours post burn

If suspected hypovolemia (consider other injuries), administer 250ml - 500ml fluid bolus and titrate to patient's hemodynamic status.

d. After a complete patient assessment consider using the pain management protocol.

2. Contact **MEDICAL CONTROL**. Medical Control may order:
  - Additional Normal Saline 250 ml – 500 ml bolus(es), wide open or titrated to patient's hemodynamic status
  - Morphine Sulfate 2.0- 10.0 mg SLOW IV PUSH or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push or,
  - If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ

**Burn Center Guidelines**

The committee on Trauma of the American College of Surgeons (ACS) and the American Burn Association (ABA) have identified certain injuries as those which generally require referral to a burn center.

The following injuries generally require referral to a burn unit:

1. Partial thickness burns greater than 10% total body surface area (TBSA)
2. Burns that involve the face, hands, feet, genitalia, perineum, or major joints
3. Third-degree burns in any age group
4. Electrical burns, including lightning injury
5. Chemical burns
6. Inhalation injury
7. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality Burns in any patients with concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses a greater immediate risk than the burns, it may be necessary to stabilize the patient in a trauma center before being transferred to a burn unit. Physician judgment is necessary in such situations and should be in concert with **established** triage protocols.
8. Burns in children being cared for in hospitals without qualified personnel or equipment for the care of children
9. Burn injury in patients who will require special social, emotional, or long-term rehabilitative intervention.

**AMERICAN BURN ASSOCIATION CATEGORIZATION OF BURNS  
(SEE BURN CHARTS IN APPENDIX )****MAJOR BURN**

- 25% of BSA or greater
- Functionally significant involvement of hands, face, feet, or perineum
- Electrical or Inhalation Injury
- Concomitant Injury or severe pre-existing medical problems

**MODERATE BURN**

- 15-25% BSA
- No complications or involvement of hands, face, feet, or perineum
- No electrical injury, inhalation injury, concomitant injury
- No severe pre-existing medical problem

**MINOR BURN**

- 5% or less BSA
- No involvement of hands, face, feet, or perineum.
- No electrical burns, inhalation injury, severe pre-existing medical problems, or complications

## 4.3 HEAD TRAUMA / INJURIES

Head trauma can be categorized into the following elements: Superficial injury involving scalp, fascia, and skull, internal injury involving brain and spinal cord, and sensory organ injury involving the eye and the ear. Neck injury involves skeletal and soft tissue structures. All these conditions must be considered when managing patients with head injury. Therefore, cervical spine injury may accompany head injury; intubation may be required to secure the airway as protective gag reflexes may be lost; sudden death may result from brain herniation; severe bleeding from scalp wounds may occur; severe facial trauma may make airway management difficult, etc. Hyperventilation **may** help brain injury by reducing intracranial pressure. Hyperventilate the patient in suspected cases of herniation syndrome (e.g. - decorticate posturing; decerebrate posturing; fixed, dilated pupils, etc.).

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway with appropriate device(s) and assist ventilations as needed. Administer oxygen, using appropriate oxygen delivery device, as clinically indicated. Ensure cervical spine stabilization and immobilization
3. Consider hyperventilation if clinically appropriate with a significant closed head injury and signs of herniation syndrome.
4. Determine patient's hemodynamic stability and symptoms. Continually assess, level of consciousness (Glasgow Coma Scale), ABCs, disability and Vital Signs. Examine head for presence of lacerations, depressions, swelling, Battle Sign, Cerebrospinal Fluid (CSF) from ears/nose, and foreign (impaled) objects.
5. Treat all life threatening conditions as they become identified.
6. When multiple patients are involved, they need to be appropriately triaged.
7. Obtain appropriate S-A-M-P-L-E history related to event, and mechanism of injury.  
**NOTE: Family and friends may be useful during the assessment to determine normal or abnormal mental status.**
8. Patient care activities must not unnecessarily delay transport to an appropriate facility.
9. Prevent / treat for shock.
10. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. (See **Air Ambulance** protocol.)
11. Monitor and record vital signs and ECG.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

**TREATMENT****BASIC PROCEDURES**

1. Ensure cervical spine stabilization and immobilization
2. Consider hyperventilation if clinically appropriate.
3. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
7. Notify receiving hospital.

**INTERMEDIATE PROCEDURES****1. ALS STANDING ORDERS**

- a. Provide advanced airway management if indicated.
- b. Ventilate with 100% oxygen.
- c. Initiate IV Normal Saline (KVO) enroute to the hospital.
- d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management if indicated.
- b. Ventilation with 100% oxygen.
- c. Initiate IV Normal Saline (KVO) enroute to the hospital.
- d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
- e. Consider 75-100 mg Lidocaine IV push prior to intubation, if intubation is indicated.

**2. Contact MEDICAL CONTROL**

- In patients who require emergent intubation, and cannot be intubated by conventional means, and the treating paramedic has been duly authorized by the Service's Medical Director in use of an alternative airway (LMA or Combitube)

Medical Control may order:

- a. Use of 2.5-5.0 mg IV of Midazolam to facilitate intubation



## 4.4 MUSCULOSKELETAL INJURIES

Musculoskeletal injuries can occur from both blunt and penetrating trauma. Injuries may include contusions, cramps, dislocations, fractures, spasm, sprains, strains and/or subluxations. Early proper treatment of these injuries may prevent long term morbidity and disability. Major injuries to the musculoskeletal system (e.g., pelvic fractures and hip dislocations) may cause shock due to hemorrhage, injury to adjacent nerves and blood vessels and infection due to the presence of an open fracture. Fractures of the humerus, pelvis or femur take priority over other musculoskeletal injuries, as do fractures or dislocations involving circulatory or neurologic deficits.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. If indicated, continually assess level of consciousness, ABCs and Vital Signs.
5. Assess the neurovascular status (motor, sensory and circulation) distal to the injury before and after proper immobilization.
6. If no palpable, distal pulse is present, apply gentle traction along the axis of the extremity distal to the injury until the distal pulse is palpable and immobilize in place.  
**Note: This does not apply to dislocations.**
7. Immobilize all painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains and/or dislocations) involving joints, in the position found.
8. All jewelry should be removed from an injured extremity.
9. Obtain appropriate S-A-M-P-L-E history related to event. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate
10. Prevent / treat for shock.
11. Monitor and record vital signs.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## 4.4 MUSCULOSKELETAL INJURIES

### TREATMENT

#### BASIC PROCEDURES

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.
3. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical Control may order:
- a. Administer additional IV Normal Saline 250 ml bolus(es) wide open or titrated to patient's hemodynamic status.

#### PARAMEDIC PROCEDURES

##### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management (if indicated).
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
  - d. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate. (See Appendix) After thorough patient assessment consider using the pain management protocol (which includes standing-order pain medications) if clinically appropriate.
12. **MEDICAL CONTROL** may order:
- a. Administer additional IV Normal Saline 250 ml bolus(es) wide open or titrated to patient's hemodynamic status.
  - b. Pain medications, as per pain management protocol.

## 4.5 MULTI-SYSTEM TRAUMA

Multi-system trauma is a leading cause of death and disability. Trauma victims require definitive surgical intervention to repair and/or stabilize their injuries in order to enhance survival and reduce complications. Successful management of trauma victims will require rapid assessment, stabilization and transportation to an appropriate trauma center as defined by the Department approval POE plans. Activate air transport services as appropriate.

Multiple trauma victims are identified by the history of the incident in which serious injury can occur as well as the physiologic alterations that an individual suffers. Many injuries are occult and one must be careful not to be fooled by obvious external injuries, which ultimately prove to be less serious than hidden internal disorders. Physiologic alterations may not occur immediately post-injury. However, once they develop, they may lead to shock and death within a few minutes. About one liter of further blood loss converts a stage II hemorrhage with minimal abnormalities of vital signs to a stage IV hemorrhage with refractory shock and inevitable death. Proper, timely interventions may well prevent this occurrence.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Ensure cervical spine stabilization and immobilization, when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions as they become identified.
5. When multiple patients are involved, they need to be appropriately triaged.
6. Obtain appropriate S-A-M-P-L-E history related to event.
7. Prevent / treat for shock.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
9. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. See **Air Ambulance** protocol.
10. Monitor and record vital signs and ECG.
11. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## 4.5 MULTI-SYSTEM TRAUMA

### TREATMENT

#### BASIC PROCEDURES

1. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
5. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
2. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. IV Normal Saline 250 ml -500 ml- bolus or wide open titrated to patient's condition.

#### PARAMEDIC PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Additional IV Normal Saline 250 ml - 500 ml bolus or wide open titrated to patient's condition.
    - b. In patients who require emergent intubation who cannot be intubated by conventional means and the treating paramedic has been duly authorized by the Service's Medical Director in use of an alternative airway (e.g. LMA or Combitube) -- Use of 2.5-5.0 mg IV of Midazolam to facilitate intubation.

## 4.6 SOFT TISSUE / CRUSH INJURIES

Trauma to the skin may include abrasions, lacerations, hematomas, punctures, avulsions, contusions, incisions, amputations, crush injuries and compartment syndromes. In general, such injuries rarely threaten life. However, soft tissue injuries may damage blood vessels, nerves, connective tissue and other internal structures. Crush and compartment syndromes can be devastating to the patient. Early recognition and prompt therapy are essential to achieve a favorable outcome. Delay in diagnosis and treatment can result in permanent and severe disability.

**Crush injury** is associated with severe trauma and most commonly occur in multiple casualty disasters, such as bombings, earthquakes, building collapse, train accidents and mining accidents. It is the result of prolonged compression or pressure on various parts or all of the human body. Crush injuries may result in fatal injury or severe metabolic abnormalities that may result in death. Careful monitoring of these patients is essential.

**Compartment syndrome** is usually due to a crush injury and is a surgical emergency. It occurs most commonly in the forearm and leg, gluteal region, thigh, and lumbar paraspinal muscles. Compartment syndrome may result in ischemic swelling, muscle infarction, nerve injury and permanent loss of extremity function.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety, including safety for the patient(s) and rescuer(s), if indicated.
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Determine patient's hemodynamic stability and symptoms using O-P-Q-R-S-T model. Continually assess Level of Consciousness, ABCs and Vital Signs.
6. Treat all life threatening conditions as they become identified.
7. Assess the function of the injured area above and below the injury site: check pulses, sensation, and motor function distal to the injury. Splint/immobilize injured areas as indicated. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate.
8. Prevent / treat for shock.
9. When multiple patients are involved, they need to be appropriately triaged.
10. Obtain appropriate S-A-M-P-L-E history related to event.
11. Monitor and record vital signs and ECG.
12. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

## 4.6 SOFT TISSUE / CRUSH INJURIES

### TREATMENT

#### BASIC PROCEDURES

1. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
2. Place dry sterile dressing on all open wounds and bandage as needed:
  - If wound is grossly contaminated, irrigate with sterile water or normal saline.
  - Stabilize all protruding foreign bodies (impaled objects) if noted.
3. If suspect severe crushing injury/compartment syndrome:
  - Remove all restrictive dressings.
  - Close monitoring of distal pulse, sensation, and motor function (CSM).
4. Splint/immobilize injured areas as indicated.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. Notify receiving hospital.

#### INTERMEDIATE PROCEDURES

##### 1 ALS STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus(es) of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Administer additional IV Normal Saline 250 ml bolus(es) wide open or titrated to patient's hemodynamic status.

#### PARAMEDIC PROCEDURES

##### 1 ALS-P STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. After patient assessment consider using the pain management protocol.
  - c. Initiate IV Normal Saline if indicated and titrate to patient condition.
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. IV Normal Saline 250 ml -500 ml bolus(es), wide open or titrate to patient's hemodynamic status.

## 4.7 SPINAL COLUMN / CORD INJURIES

Spinal cord injury may be the result of direct blunt and/or penetrating trauma, compression forces (axial loading), abnormal motion (hyper-flexion, hyperextension, hyper-rotation, lateral bending and distraction, i.e., hanging). Most spinal injuries result from motor vehicle crashes, falls, firearms, and recreational activities.

Spinal injuries may be classified into sprains, strains, fractures, dislocations and/or actual cord injuries. Spinal cord injuries are classified as complete or incomplete and may be the result of pressure, contusion or laceration of the cord.

When evaluating for possible spinal injury and the need for immobilization, consider the following factors as high-risk:

- altered mental status due to injury, intoxication, or other causes;
- history of cervical spine injury or abnormality;
- evidence of *SIGNIFICANT* trauma above the clavicles;
- posterior neck pain;
- paresthesias or loss of sensation in extremities;
- weakness or paralysis of extremities;
- distracting injury (such as long-bone fracture);
- age under 8 years or over 65 years;
- concerning mechanism
  - fall from over 3 feet, including adult fall from standing, or 5+ stair steps
  - MVC at 30+ mph, or rollover or ejection
  - Motorcycle, bicycle, or pedestrian-vehicle accident
  - Diving or axial load
  - Electric shock

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway using spinal precautions and assist ventilations as needed. Assume spinal injury and provide spinal immobilize accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms using O-P-Q-R-S-T model. Continually assess Level of Consciousness (AVPU/Glasgow Coma Scale), ABCs, disability and Vital Signs. Examine head for presence of lacerations, depressions, swelling, Battle's Sign, Cerebrospinal Fluid (CSF) from ears/nose, and foreign (impaled) objects. Treat all life threatening conditions as they become identified.

## 4.7 SPINAL COLUMN / CORD INJURIES (con't)

5. Obtain appropriate S-A-M-P-L-E history related to event, including mechanism of injury. NOTE: Family and friends may be useful during the assessment to determine normal or abnormal mental status.
6. Prevent / treat for shock.
7. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
8. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
9. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. See **Air Ambulance** protocol.
10. Monitor and record vital signs.

### TREATMENT

#### BASIC PROCEDURES

1. Hyperventilation with 100% oxygen with B-V-M *if* associated with a significant closed head injury and signs of herniation syndrome.
2. Control/stop any identified life-threatening hemorrhage (direct pressure, pressure points, etc.).
3. Determine presence or absence of significant neurologic signs and symptoms: motor function, sensory function, reflex responses, visual inspection, bradycardia, priapism, hypotension, loss of sweating or shivering and loss of bladder/bowel control.
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
7. Notify receiving hospital of patient's status.

\* See Spinal Stabilization/Immobilization Summary in this protocol.

#### INTERMEDIATE PROCEDURES

##### 1. ALS STANDING ORDERS

- a. Provide advanced airway management if indicated.
  - b. Hyperventilation with 100% oxygen with BVM *if* associated with a significant closed head injury and signs of herniation syndrome.
  - c. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
- CAUTION: DO NOT over-hydrate patient with suspected neurogenic shock.

##### 2. Contact **MEDICAL CONTROL**. Medical Control may order:

- a. Additional Normal Saline 250 ml - 500 ml bolus(es), wide open or titrated to patient's hemodynamic status.



**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management if indicated.
- b. Cardiac monitor and if feasible 12 lead ECG - manage dysrhythmias per protocol.

NOTE: Bradydysrhythmias are commonly seen in high level spinal injuries.

- c. Initiate IV Normal Saline (KVO) enroute to the hospital.
- d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

CAUTION: DO NOT over-hydrate patient with suspected neurogenic shock.

**2. Contact MEDICAL CONTROL.** Medical Control may order:

- a. Additional Normal Saline 250 ml - 500 ml bolus(es), wide open or titrated to patient's hemodynamic status.
- b. For suspected neurogenic shock (without hypovolemia):
  - Dopamine 2-20 µg/kg/minute.

**\*SPINAL STABILIZATION / IMMOBILIZATION SUMMARY**

General principles:

- Provide manual in-line immobilization.
- Evaluate patient's responsiveness, ABCs, need for immediate resuscitation and check motor, sensory and distal pulses in all four extremities.
- Examine the patient's neck and apply cervical collar.
- Immobilize the patient's torso to the selected immobilization device such that the torso cannot move up, down, left or right.
- Evaluate torso straps and adjust as needed.
- Place an appropriate amount of padding behind head and/or neck and small of back, if needed for adult patients and under the thorax and/or neck for pediatric patients (age 7 yrs. or under) to maintain in-line spinal immobilization.
- Immobilize the patient's head.
- Once patient is immobilized, secure patient's arms and legs to the board or immobilization device.
- Reevaluate patient's responsiveness, ABCs, need for immediate resuscitation and check motor, sensory and distal pulses in all four extremities.
- Reminder: seated patients **MUST** be immobilized using a short spineboard or commercial equivalent (KED, LSP, Greene, etc.), before being moved onto a long spineboard. The only circumstances in which the use of a short spineboard may be omitted include:\*
- You or the patient are in imminent danger;
- You need to gain immediate access to other patient(s);
- The patient's injuries justify urgent removal.

\* See AAOS, "Emergency Care & Transportation", 7<sup>th</sup> Edition.  
Mosby, "Paramedic Textbook, 2<sup>nd</sup> Edition  
Mosby, "PHTLS: Basic & Advanced", 4<sup>th</sup> Edition

## 4.8 THORACIC TRAUMA

Chest injuries are the result of blunt trauma, penetrating trauma or both and most commonly result from motor vehicle crashes (e.g. deployed air bags), blast injuries, falls from heights, blows to the chest, chest compression, gunshot and stab wounds. Thoracic injuries include skeletal, pulmonary, heart, great vessels and/or diaphragm. A number of potentially lethal injuries can occur with significant chest trauma. These include flail chest, hemothorax, pneumothorax, tension pneumothorax, myocardial contusion, sucking chest wound, cardiac tamponade, aortic rupture and/or diaphragmatic rupture. In general these patients are managed under the multisystem trauma protocol in most circumstances. However, specific interventions may be life saving for the conditions noted above.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess Level of Consciousness, ABCs and Vital Signs. Treat all life threatening conditions (tension pneumothorax, open pneumothorax, flail chest) as they become identified.
5. When multiple patients are involved, they need to be appropriately triaged.
6. Obtain appropriate S-A-M-P-L-E history related to event.
7. Prevent / treat for shock.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
9. If the scene time and/or transport time will be prolonged, and a landing site is available, consider transport by air ambulance from the scene to an appropriate **Trauma Center**. See **Air Ambulance** protocol.
10. Monitor and record vital signs and ECG.
11. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Provide appropriate management for identified thoracic injuries:
  - a. **open pneumothorax:**
    - immediately apply an occlusive dressing sealing 3 sides.
    - monitor patient closely for evidence of developing tension pneumothorax.
  - b. **tension pneumothorax:** (increasing ventilatory impairment, distended neck veins, unilateral decreased breath sounds, tracheal deviation away from the side without breath sounds.)

- if present following closure of open pneumothorax, release occlusive dressing temporarily, then reseal.
  - Activate paramedic level ALS intercept if available for pleural decompression.
- c. **flail chest:** (paradoxical movement of portion of chest wall)
- position patient with injured side down, unless contraindicated.
  - provide manual stabilization of the flail segment; or splint as needed.
- NOTE: Assisted positive pressure ventilations using a bag-valve-mask device may be indicated and may also serve as an “internal splinting” of the flail segment due to lung expansion.**
2. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
  3. Activate ALS intercept, if deemed necessary and if available.
  4. Initiate transport as soon as possible with or without ALS.
  5. If patient’s BLOOD PRESSURE drops below 100 systolic: treat for shock.
  6. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

1. Provide appropriate management for identified thoracic injuries:
  - a. **open pneumothorax:**
    - immediately apply an occlusive dressing sealing 3 sides.
    - monitor patient closely for evidence of developing tension pneumothorax.
  - b. **tension pneumothorax:** (increasing ventilatory impairment, distended neck veins, unilateral decreased breath sounds, tracheal deviation away from the side without breath sounds.)
    - if present following closure of open pneumothorax, release occlusive dressing temporarily, then reseal.
    - Activate Paramedic intercept if deemed necessary and if available for pleural decompression.
  - c. **flail chest:** (paradoxical movement of portion of chest wall)
    - position patient with injured side down, unless contraindicated.
    - provide manual stabilization of the flail segment; or splint as needed.

**NOTE: Assisted positive pressure ventilations using a bag-valve-mask device may be indicated and may also serve as an “internal splinting” of the flail segment due to lung expansion. Endotracheal intubation is the preferred method to provide assisted positive pressure ventilations.**

## 2. ALS STANDING ORDERS

- a. Provide advanced airway management (if indicated).
- b. Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.  
If patient’s BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient’s hemodynamic

**3. Contact MEDICAL CONTROL, who may order:**

- a. Additional IV Normal Saline 250 ml - 500 ml bolus(es), wide open or titrated to patient's hemodynamic status.

**PARAMEDIC PROCEDURES****1. Provide appropriate management for identified thoracic injuries:**

- a. **open pneumothorax:**
  - immediately apply an occlusive dressing sealing 3 sides
  - monitor patient closely for evidence of developing tension pneumothorax
- b. **tension pneumothorax:** (increasing ventilatory impairment, distended neck veins, unilateral decreased breath sounds, tracheal deviation away from the side without breath sounds.)
  - if present following closure of open pneumothorax, release occlusive dressing temporarily, then reseal.
  - Perform needle chest decompression, if indicated.
- c. **flail chest:** (paradoxical movement of portion of chest wall)
  - position patient with injured side down, unless contraindicated.
  - provide manual stabilization of the flail segment; or splint as needed.

**NOTE: Assisted positive pressure ventilations using a bag-valve-mask device may be indicated and may also serve as an “internal splinting” of the flail segment due to lung expansion. Endotracheal intubation is the preferred method to provide assisted positive pressure ventilations.**

**2. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO) enroute to the hospital.
- c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

**9. Contact MEDICAL CONTROL who may order:**

- a. Needle chest decompression if indicated and if not already performed.
- b. Additional Normal Saline 250 ml - 500 ml bolus(es), wide open or titrate to patient's hemodynamic status.

## **4.9 TRAUMATIC CARDIOPULMONARY ARREST (and POST-RESUSC CARE)**

Cardiopulmonary arrest due to trauma, especially penetrating trauma, may occasionally be reversible with prompt aggressive therapy. Patients found in arrest, without any signs of life (i.e. pulseless), by first-arriving EMS personnel have little probability of survival. Therefore, resuscitation of these patients should be considered only in situations where witnessed signs of life shortly before EMS arrival were noted or in exceptional circumstances (penetrating chest trauma, hypothermia, etc.). Management of the few potentially salvageable patients will require rapid assessment, stabilization and transportation. Activate air transport services only in the rare circumstances that they are appropriate (usually only the resuscitated arrest). NOTE: The use of a cardiac monitor and/or AED device should be considered in those situations of traumatic arrest wherein time allows for this procedure without compromising patient care and time of transport. (Rare instances do exist of cardiac arrest secondary to trauma to the chest wall (commotio cordis), and should be appropriately managed per VF or V-Tach protocol).

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Initiate cardiopulmonary resuscitation (CPR).
4. Consider all potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.).
5. Maintain an open airway and ventilate the patient. Assume spinal injury and treat accordingly.
6. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
7. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
8. When multiple patients are involved, they need to be appropriately triaged.
9. Obtain appropriate S-A-M-P-L-E history related to event.
10. Treat for shock.
11. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
12. Monitor and record vital signs and ECG.
13. Initiate transport as soon as possible, with or without ALS.

### **TREATMENT BASIC PROCEDURES**

1. Activate ALS intercept, if deemed necessary and if available.
2. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
3. Initiate transport as soon as possible, with or without ALS.

4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management.
  - b. Initiate 1-2 IV (s) Normal Saline (KVO) **enroute** to the hospital.
  - c. If patient's BLOOD PRESSURE remains below or drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Additional IV Normal Saline 250 ml -500 ml bolus or wide open titrated to patient's condition.

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide appropriate management for identified injuries:
    - Head Injuries (see protocol).
    - Thoracic Injuries (see protocol).
    - Abdominal Injuries (see protocol).
  - b. Manage dysrhythmias per appropriate protocol en route.
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - Use of 2.5-5.0 mg IV of Midazolam to facilitate intubation
    - Specific procedures as indicated (i.e. chest decompression, needle cricothyroidotomy).

## 4.10 TRAUMATIC AMPUTATIONS

The partial or complete severance of a digit or limb is most commonly the result of an industrial/machine operation accident. The amputated part, or the skin of the amputated part, may be utilized by the re-implantation surgical team. Careful management of the patient and their amputated part(s) will reduce the possibility of infection and increase the likelihood of successful re-implantation.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms, using O-P-Q-R-S-T model. Continually assess Level of Consciousness, ABCs and Vital Signs.
5. Treat all life threatening conditions as they become identified.
6. Obtain appropriate S-A-M-P-L-E history related to event. Assess and treat pain.
7. Prevent / treat for shock.
8. Patient transport must not be unnecessarily delayed in an effort to find avulsed tissue and/or body parts, if they are not readily available. Other EMS/law enforcement providers may transport these tissues and/or body parts to the receiving facility at a later time.
9. Monitor and record vital signs and ECG.
10. Initiate transport as soon as possible, with or without ALS. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.). Tourniquets should be avoided if at all possible, except when absolutely required to prevent death due to life-threatening hemorrhage.
2. **Management of injured tissue:**
  - a. **Tissue still attached to body:**
    - clean wound surface with sterile water or Normal Saline.
    - gently return skin to normal position if possible.
    - control bleeding and bandage wound with bulky pressure dressings.
  - b. **Complete amputation:**
    - clean wound surface with sterile water or Normal Saline.
    - control bleeding and bandage wound.
    - retrieve amputated tissue/part(s) if possible.
    - wrap amputated tissue/part(s) in sterile gauze moistened with sterile water or Normal Saline.

- place amputated tissue/part(s) in a plastic bag.
  - place sealed bag into a cool/cold water immersion. **NOTE:** ice cubes may be in the outer bag of water but no direct contact between injured tissue/part(s) and ice should occur.
3. Activate ALS intercept, if deemed necessary and if available.
  4. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
  5. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS:**
  - a. Provide advanced airway management if indicated due to other injuries and/or illness.
  - b. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - c. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
2. Activate Paramedic intercept, if deemed necessary and if available.
3. Contact **MEDICAL CONTROL**. Medical control may order:
  - a. Additional IV Normal Saline 250 ml- 500 ml bolus or wide open or titrate to patient's hemodynamic status.

## PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management if indicated due to other injuries and/or illness.
  - b. Assess and treat for pain according to the pain management protocol.
  - c. Initiate IV Normal Saline (KVO) enroute to the hospital.
  - d. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 ml bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
8. Contact **MEDICAL CONTROL**. Medical control may order:
  - a. Additional Normal Saline 250 ml - 500 ml bolus or wide open titrated to patient's condition.



## 5. PEDIATRIC EMERGENCIES

### 5.1 NEWBORN RESUSCITATION

Infants born in the prehospital setting are at greater risk of complications due to respiratory distress, hypoxia, prematurity, infection, acidosis and hypothermia. Anticipation, adequate preparation, accurate evaluation, and prompt initiation of resuscitation steps are critical to successful outcome of a neonatal resuscitation. It is essential to prevent heat loss in newborns; it is important to rapidly dry the infant, cover the head, and wrap the child to avoid a drop in body temperature.

#### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions
2. Maintain open airway, remove secretions and meconium (suction as needed) and assist ventilations as needed. NOTE: The newborn should be evaluated for *central* cyanosis. Peripheral cyanosis is common and may not be a reflection of inadequate oxygenation. If central cyanosis is present in a breathing newborn during stabilization, early administration of 100% oxygen is important while the neonate is being assessed for need of additional resuscitative measures.
3. Evaluate heart rate by one of several methods: auscultate apical beat with a stethoscope or palpate the pulse by lightly grasping the base of the umbilical cord. NOTE: Pallor may be a sign of decreased cardiac output, severe anemia, hypovolemia, hypothermia or acidosis.
4. APGAR scoring system provides a mechanism for documenting the newborn's condition at specific intervals after birth. The five objective signs are assessed at one (1) and five (5) minutes of age.

NOTE: The APGAR score should be documented but should not be used to determine need for resuscitation because resuscitative efforts, if required, should be initiated promptly after birth.

#### APGAR

SIGN	0 POINTS	1 POINT	2 POINTS
HEART RATE	ABSENT	< 100	> 100
RESPIRATORY EFFORT	ABSENT	WEAK CRY	STRONG CRY
MUSCLE TONE	FLACCID	SOME FLEXION	ACTIVE MOTION
REFLEX IRRITABILITY	NO RESPONSE	GRIMACE	COUGH, SNEEZE OR CRY
COLOR	BLUE, PALE	BODY: PINK EXTREMITIES: BLUE	FULLY PINK

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**5.1 NEWBORN RESUSCITATION****ASSESSMENT / TREATMENT PRIORITIES (continued)**

5. Establish pertinent medical (S-A-M-P-L-E) history, including maternal prenatal care, medications or drug use, illness and time of rupture of membranes.
6. Monitor and record vital signs and ECG of infant and mother.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

**TREATMENT  
BASIC PROCEDURES**

1. Maintain an open airway and suction the mouth, then nose. If meconium (brown stained fluid) is present, suction the hypopharynx (Contact ALS immediately if available for possible need of endotracheal intubation).
2. Dry the infant, place on a dry blanket, cover the head and keep the infant warm.
3. If the infant is ventilating adequately, administer free flow (blow-by) 100% oxygen at a minimum of 15 liters per minute close to the face. If ventilations are inadequate or if the chest fails to rise, reposition the head and neck, suction, and initiate positive pressure (bag-valve-mask) ventilations with 100% oxygen at 40-60 breaths per minute, using appropriate oxygen delivery device, as clinically indicated.
4. For heart rate **less than 60**, institute positive pressure manual ventilation and chest compressions.
5. Activate ALS Intercept if available.
6. Initiate transport as soon as possible with or without ALS.
7. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix ), treat for shock.
8. Notify receiving hospital.

## 5.1 NEWBORN RESUSCITATION

### INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS** (heart rate less than 60 and inadequate ventilations)
  - a. Advanced Airway management if indicated.
  - b. Initiate IV Normal Saline (KVO).
  - c. If patient demonstrates signs and symptoms of hypo-perfusion administer a 10 ml/kg bolus of IV normal saline, and treat for shock
  
8. Activate paramedic intercept if available and deemed necessary.

### PARAMEDIC PROCEDURES

1. If meconium is present, consider early endotracheal intubation and suctioning.  
(DO NOT SUCTION/INTUBATE NEONATE WITH A VIGOROUS CRY)
2. **ALS-P STANDING ORDERS**  
Newborn in distress and requiring emergency care:
  - For heart rate 60-80 and rapidly rising:**  
Continue manual ventilation and supplemental oxygen.  
Cardiac Monitor **12 lead ECG - Manage dysrhythmias per protocol**
  - For heart rate less than 60:**  
Initiate CPR as indicated.  
Continue manual ventilation with supplemental oxygen.  
Advanced airway management if not already done.  
Cardiac Monitor. **Manage dysrhythmias per protocol.**  
If defibrillation is indicated: initial energy level: 2 joules/kg subsequent: 4 joules/kg.  
If synchronized cardioversion is indicated: 0.5-1.0 joules/kg.  
Establish IV or IO access, if indicated. (Note: NALS-trained EMT-Paramedics may utilize umbilical lines when necessary). Treat for shock.
  
3. Contact **Medical Control**. The following may be ordered in addition to other appropriate pediatric procedures needed to treat specific newborn resuscitation emergencies:
  - a. **Epinephrine 1:1,000 (0.1 mg/kg) ET**; follow with 2.0 ml Normal Saline Solution; repeat every 3 - 5 minutes.
  - b. **Epinephrine 1:10,000 (0.01-0.03 mg/kg) IV push or intraosseous.**
  - c. **Epinephrine Infusion: 1:1,000, 0.1-1.0 µg/kg/min.**
  - d. **Atropine 0.02 mg/kg ET, IV, IO.**
  - e. **Naloxone HCL 0.1 mg/kg of a 1 mg/ml solution, IV, ET, or IO.** May repeat every two (2) to three (3) minutes as needed. If perfusion is adequate may give subcutaneously (SC) or intramuscularly (IM).
  - f. **Dextrose 10%, 0.5 g/kg IV or IO.**
  - g. **Normal saline fluid challenge, 10 ml/kg IV or IO.**
  - h. **Lidocaine 2%, 1 mg/kg ET, IV, or IO.**

## 5.2 PEDIATRIC ANAPHYLAXIS

Anaphylaxis is an acute and generalized antigen-antibody reaction that can be rapidly fatal. Management is based upon severity. Anaphylaxis in children is unusual. As in adults, there are multiple causes of anaphylaxis: injected substances or drugs such as penicillin, cephalosporins, sulfa; other causes include food sensitivities, vaccines, insect stings, virtually any chemical or other environmental allergens.

Hypotension in children is usually due to other causes such as shock from sepsis or dehydration. Wheezing, another feature of anaphylaxis, is most often due to reactive airway disease, infection or foreign body. Drooling, hoarseness and stridor signal upper airway compromise, which is usually due to infection in children. If these symptoms are present, follow the Pediatric Upper Airway Obstruction Protocol.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine presence of upper airway involvement (stridor) or lower airway symptoms (wheezing). These may coexist. Maintain an open airway, remove secretions, vomitus and assist ventilations as needed.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs. Determine if blood pressure, if obtained, is appropriate for age (See Appendix ).
5. Obtain appropriate S-A-M-P-L-E history related to event, including (prior allergies and/or anaphylaxis), or recent antigen exposure.
6. Determine if patient is in mild or severe distress:
  - a. **MILD DISTRESS:** itching, isolated urticaria, nausea, no respiratory distress.
  - b. **SEVERE DISTRESS:** poor air entry, flaring, grunting, cyanosis, stridor, bronchospasm, abdominal cramps, respiratory distress, tachycardia, shock, edema of lips, tongue or face and generalized urticaria.
7. Monitor and record ECG and vital signs.
8. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.
9. Prevent / treat for shock.

### TREATMENT BASIC PROCEDURES

1. Determine presence of upper airway involvement (stridor) or lower airway symptoms (wheezing). These may coexist. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning, or use of airway adjuncts (oropharyngeal airway) as indicated.
2. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
3. Activate ALS intercept, if deemed necessary and if available.

**4. BLS STANDING ORDERS**

- a. If patient presents in Severe Distress, as defined in Assessment Priorities, and patient is over 5 years old, administer Auto-Injector Epi-pen Jr. (**for pediatric patient with a body weight less than 30 kg/66 lbs.**). If body weight is over 30 kg/66 lbs. use Adult Auto-Injector. A second injection in 5 minutes may be necessary.
- b. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
- c. Monitor vital signs and keep patient warm.

**NOTE: EMTs must contact Medical Control prior to administration of epinephrine by auto-injector when patient is under age 5**

5. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. Activate Paramedic intercept, if deemed necessary and available.

**2. ALS STANDING ORDERS**

- a. Provide advanced airway management, if indicated.
- b. If patient presents in Severe Distress, as defined in Assessment Priorities, and patient is over 5 years old, administer Auto-Injector Epi-pen Jr. (**for pediatric patient with a body weight less than 30 kg/66 lbs.**). If body weight is over 30 kg/66 lbs. use Adult Auto-Injector. A second injection in 5 minutes may be necessary. Initiate IV Normal Saline (KVO). If patient demonstrates signs and symptoms of hypo-perfusion Administer a 10 ml/kg bolus of IV normal saline, and treat for shock

**NOTE: EMTs must contact Medical Control prior to administration of epinephrine by auto-injector when patient is under age 5**

3. Initiate transport as soon as possible with or without paramedics.
4. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Administration of additional fluid bolus(es) (expected fluid bolus will be in aliquots of 20 ml/kg).

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management (if indicated).
- b. Initiate IV Normal Saline (KVO).
- c. If patient demonstrates signs and symptoms of hypo-perfusion administer a 10 ml/kg bolus of IV normal saline, and treat for shock
- d. **SEVERE DISTRESS:**  
Epinephrine (1:1,000), 0.01 mg/kg **subcutaneously up to maximum single dose 0.3 mg.**  
**Large Bore IV normal saline, titrate to appropriate BP for age.**

Diphenhydramine HCL (Benadryl) 1.0 mg/kg up to maximum single dose of 50 mg via deep intramuscular injection (IM) or IV push.

2. Contact **MEDICAL CONTROL**. The following may be ordered:
    - a. **Epinephrine 1:1,000**; administer **0.01 mg/kg** subcutaneously up to maximum single dose 0.3 mg.
    - b. **Epinephrine 1:1,000**; administer **0.1 mg/kg** via ET followed by 2.0 ml sterile Normal Saline solution.
    - c. **Epinephrine infusion 1:1,000 (1 mg/ml)** administer **0.1 to 1.0 µg/kg/min**.
    - d. **Albuterol Sulfate 0.5%** (via nebulizer):
      - If age less than 2 years, 0.25 ml (1.25 mg) diluted with 2.5 ml sterile Normal Saline solution.**
      - If age 2 years or greater, 0.5 ml (2.5 mg) diluted with 2.5 ml sterile Normal Saline solution.**
      - **20 ml/kg** fluid bolus of Normal Saline.
- Epinephrine 1:10,000**; administer **0.01 mg/kg** IV Bolus up to maximum single dose 0.3 mg.
- Diphenhydramine HCL (Benadryl) 1.0 mg/kg** up to maximum single dose of 50 mg via deep intramuscular injection (IM) or IV push. For mild distress, 2 mg - 5 mg Benadryl IV push or IM may be administered.

## 5.3 PEDIATRIC BRADYDYSRHYTHMIAS

Primary heart block is rare in children. Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia and/or late shock. Bradycardia may be a late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, hyperglycemia and/or previous neurosurgery. Rarely, a toxic ingestion can cause bradycardia. Out of hospital treatment is directed to the symptomatic patient only. Heart rates that are normal in older patients may be bradycardia in children.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms using O-P-Q-R-S-T model. Continually assess level of Consciousness, ABCs and Vital Signs including capillary refill and determine if appropriate for age. (SEE APPENDIX)
5. Obtain appropriate S-A-M-P-L-E history related to event, including underlying congenital heart disease and/or surgery and substance exposure, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers, and/or digoxin preparations.
6. Severely symptomatic patients will have abnormally slow heart rates accompanied by decreased level of consciousness, weak and thready pulses, delayed capillary refill, and/or no palpable blood pressure.
7. Monitor and record vital signs and ECG.
8. Prevent / treat for shock.
9. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

### TREATMENT BASIC PROCEDURES

**NOTE:** Inasmuch as Basic-EMTs are unable to confirm the presence of bradycardias, check patient for a slow and /or irregular pulse. If present, treat according to the following protocol.

1. If pulse is less than 60 in a child, AND the patient is severely symptomatic, consider starting Cardiopulmonary Resuscitation (CPR).
2. Prevent / treat for shock.
3. Activate ALS intercept, if deemed necessary and if available.
4. Initiate transport as soon as possible with or without ALS.
5. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

**NOTE:** Inasmuch as EMT-I's are unable to recognize the presence of bradycardias, check patient for a slow and /or irregular pulse. If present, treat according to the following protocol.

1. Activate Paramedic intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without Paramedics.
3. **ALS STANDING ORDERS**
  - a. Advanced Airway Management, if indicated.
  - b. IV Normal Saline (KVO).
4. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Normal Saline bolus at discretion of Medical Control (expected fluid bolus is 20 ml/kg).

## PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Advanced airway management, if indicated.
  - b. IV Normal Saline (KVO). If hypovolemia component is suspected, administer a fluid bolus of 20 ml/kg.
  - c. If patient is severely symptomatic:
    - i. **Epinephrine 1:10,000, 0.01 mg/kg IV or IO (maximum single dose 0.5 mg), OR,**
    - ii. **Epinephrine 1:1,000, 0.1 mg/kg ET, followed by 2.0 ml sterile Normal Saline Solution. Subsequent ET dosages 0.1 to 0.2 mg/kg 1:1,000 every 3 - 5 minutes.**
    - iii. **Atropine sulfate 0.02 mg/kg IV or ET (minimum single dose 0.1 mg, maximum single dose 1.0 mg). If administered via ET, follow with 2.0 ml of sterile Normal Saline Solution.**
2. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Additional fluid boluses of Normal saline (20 ml/kg).
  - b. Transcutaneous (pediatric) pacing if available.
  - c. **Atropine sulfate 0.02 mg/kg IV Bolus or ET (minimum single dose 0.1 mg., maximum single dose 1.0 mg.)** If administered via ET, follow with 2.0 ml of sterile Normal Saline Solution.
  - d. **Epinephrine 1:1,000 :0.1 mg/kg** via ET; follow with 2.0 ml sterile Normal Saline Solution; repeat every 3 - 5 minutes.
  - e. **Epinephrine 1:10,000: 0.01-0.03 mg/kg (maximum single dose of 0.5 mg), IV or Intraosseous (IO).**
  - f. **Epinephrine Infusion: 1:1,000, 0.1-1.0 µg/kg/min.**
  - g. **Atropine 0.02 mg/kg ET, IV, IO.**
  - h. **Naloxone HCL 0.1 mg/kg of a 1-mg/ml solution: IV, ET, or IO.**  
**If age less than 5 years: 0.1 mg/kg.**  
**If age 5 years or greater: 2.0 mg. (NOTE: May repeat every two (2) to three (3) minutes as needed. If perfusion is adequate may give Subcutaneously (SC) or intramuscularly (IM). If given via ET, follow with 2.0 ml sterile Normal Saline solution.)**
  - i. **Normal Saline** fluid bolus 10-20 ml /kg IV or IO.
  - j. **Glucagon 0.1 mg/kg IV, IO, IM, SC** to max. 1.0 mg for suspected beta blocker toxicity.
  - k. **Calcium Chloride 10% solution 0.2 ml/kg IV, IO** slowly over 5 minutes for suspected calcium channel blocker toxicity.



**5.3****PEDIATRIC BRADYDYSRHYTHMIAS****PARAMEDIC PROCEDURES (continued)**

- i. **Glucagon 0.1 mg/kg IV, IO, IM, SC** to max. 1.0 mg for suspected beta blocker toxicity.
- m. **Calcium Chloride 10% solution 0.2 ml/kg IV, IO** slowly over 5 minutes for suspected calcium channel blocker toxicity.

## 5.4 PEDIATRIC BRONCHOSPASM / RESPIRATORY DISTRESS

Bronchospasm is defined as spasmodic narrowing of the lumen of a bronchus for whatever reason resulting in restricted airflow and the clinical sign of wheezing. Wheezing in children can occur from a variety of causes. Patients with asthma can suffer an attack in response to weather changes, stress, exercise, infection or allergy. Pneumonia, bronchitis and bronchiolitis are some of the infectious causes of wheezing. Other causes include foreign bodies and congenital abnormalities of mediastinal structures, including the heart, trachea and larynx. Unless cardiac problems are suspected, wheezing is treated with bronchodilating agents. Concurrent hypotension should raise concern regarding anaphylaxis or respiratory failure. If the patient has evidence of drooling, hoarseness or stridor, follow Pediatric Upper Airway Obstruction protocol.

**Mild distress** in children is evidenced by minor wheezing and good air entry.

**Severe distress** in children is evidenced by poor air entry, extreme use of accessory muscles, nasal flaring, grunting, cyanosis and/or altered mental status (weak cry, somnolence, poor responsiveness). **REMEMBER:** Severe bronchospasm may present without wheezes, if there is minimal air movement.

**Respiratory Distress** is defined as inadequate breathing in terms of rate, rhythm, quality and/or depth of breathing. Children who are breathing too fast or slow, or in an abnormal pattern or manner, may not be receiving enough oxygen to support bodily functions and may allow an increase in carbon dioxide to dangerous levels. Cyanosis is usually a late sign and requires immediate treatment.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway, remove secretions or vomitus, and assist ventilation as needed. Determine if patient is in mild or severe distress and presence of upper airway involvement (stridor) or lower airway findings (wheezing). These may coexist.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms using O-P-Q-R-S-T model. Continually assess Level of Consciousness, ABCs and vital signs. Evaluate capillary refill and determine if blood pressure is appropriate for age. (SEE APPENDIX)

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**5.4 PEDIATRIC BRONCHOSPASM / RESPIRATORY DISTRESS****ASSESSMENT / TREATMENT PRIORITIES (continued)**

5. Obtain appropriate S-A-M-P-L-E history related to event, including prior asthma, anaphylaxis, allergies, exposures to foreign body, (new) foods, medicines, chemicals or envenomation.
6. Monitor and record vital signs and ECG.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

**TREATMENT****BASIC PROCEDURES**

1. Activate ALS intercept, if deemed necessary and if available.
2. Initiate transport as soon as possible with or without ALS.

**3. BLS STANDING ORDERS**MILD DISTRESS

- a. The following may be considered if the patient has not taken the prescribed maximum dose of their own inhaler prior to the arrival of EMS, and the inhaler is present
  - i) Encourage and/or assist patient to self-administer their own prescribed inhaler medication if indicated or if not already done.
  - ii) If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
  - iii) Reassess vital signs.
4. Contact MEDICAL CONTROL. The following may be ordered
  - a. Repeat a second dose if required, and if prescribed maximum dose has not been administered.

**NOTE:** EMT-B administration of an inhaler is CONTRAINDICATED, if:

- a. The maximum dose has been administered prior to the arrival of the EMT.
- b. The patient cannot physically use the device properly. (Patient cannot receive inhalation properly.)
- c. The device has not specifically been prescribed for the patient.

**5. \*\*If properly trained and authorized to do so, use the BLS Albuterol Protocol to treat the patient.**

**NOTE: YOUR MEDICAL DIRECTOR MUST HAVE AUTHORIZED YOU AS AN EMT TO UTILIZE THIS PORTION OF THE PROTOCOL.**

6. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix ), treat for shock.
7. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. Activate Paramedic intercept, if deemed necessary and if available.
2. Initiate Transport as soon as possible with or without Paramedics.

**3. ALS STANDING ORDERS****MILD DISTRESS**

- a. The following may be considered if the patient has not taken the prescribed maximum dose of their own inhaler prior to the arrival of EMS **and the inhaler is present:**
    - i) Encourage and/or assist patient to self-administer their own prescribed inhaler medication if indicated or if not already done.
    - ii) If patient is unable to self-administer their prescribed inhaler, administer patient's prescribed inhaler.
    - iii) Reassess vital signs.
4. **Contact MEDICAL CONTROL. The following may be ordered**
    - a. Repeat a second dose if required, and if prescribed maximum dose has not been administered.

**NOTE:** EMT-I administration of an inhaler is CONTRAINDICATED, if:

1. the maximum dose has been administered prior to the arrival of the EMT.
2. the patient cannot physically use the device properly. (Patient cannot receive inhalation properly.)
3. the device has not specifically been prescribed for the patient.

5. **\*\*If properly trained and authorized to do so, use the BLS Albuterol Protocol to treat the patient.**

**NOTE: YOUR MEDICAL DIRECTOR MUST HAVE AUTHORIZED YOU AS AN EMT TO UTILIZE THIS PORTION OF THE PROTOCOL.**

- b. Provide advanced airway management if indicated.
- c. Consider establishing an IV of Normal Saline if in severe distress.
- d. If patient's BLOOD PRESSURE drops below 100 systolic: Treat for shock (See Appendix )

**PARAMEDIC PROCEDURES**

1. Cardiac monitoring. **Manage dysrhythmias per protocol.** 12 lead ECG if clinically appropriate.

**2. ALS-P STANDING ORDERS**

- a. If the pediatric patient's condition is not improving with administration of supplemental oxygen, consider the following:  
**Albuterol Sulfate 0.5%: 0.25 ml (1.25 mg) with Ipratropium Bromide (Atrovent), 0.02%, 1.25 ml, if less than 2 years of age via nebulizer.**  
**Albuterol Sulfate 0.5%: 0.5 ml (2.5 mg) with Ipratropium Bromide (Atrovent), 0.02%, 2.5ml if age 2 years or greater via nebulizer.**

**A second dose of Albuterol, with or without Atrovent, may be administered as necessary.**

- a. Consider Saline lock or IV Normal Saline if in severe distress.
  - b. For severe distress: **Epinephrine 1:1,000, 0.01 mg/kg** subcutaneously (maximum single dose 0.3 mg). Consider **magnesium sulfate** 25 mg/kg. IV over 5 min.
3. Contact **MEDICAL CONTROL**. The following may be ordered:
- a. **Albuterol Sulfate 0.5%** (repeat dosages as identified above) via nebulizer.
  - b. **Epinephrine 1:1,000, 0.01 mg/kg** subcutaneously (maximum single dose 0.3 mg).
  - c. **Magnesium sulfate** 25 mg/kg. Iv over 5 minutes.
  - d. If the pediatric patient's respiratory status worsens: go to **Pediatric Anaphylaxis Protocol**.

## **5.5 PEDIATRIC CARDIOPULMONARY ARREST: ASYSTOLE / AGONAL IDIOVENTRICULAR RHYTHM / PULSELESS ELECTRICAL ACTIVITY (PEA)**

Cardiopulmonary arrest in infants and children is usually the end result of deterioration in respiratory and circulatory function. Injury is the leading cause of death in children between 1 - 16 years. Other etiologies include, but are not limited to: severe dehydration, Sudden Infant Death Syndrome, congenital anomalies, airway obstruction, bacterial and/or viral infections, sepsis, asthma, hypothermia and drug overdose.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Maintain an open airway, remove secretions, vomitus, and initiate CPR. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Continually assess level of consciousness, ABCs and Vital Signs, including capillary refill.
5. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications. Observe for signs of child abuse
6. Symptomatic patients may have absent or abnormally slow or rapid heart rates accompanied by decreased level of consciousness, weak and thready pulses, delayed capillary refill, and/or no palpable BLOOD PRESSURE.
7. Every effort should be made to determine the possible cause(s) for PEA including medical and/or traumatic etiologies.
8. Monitor and record vital signs (if any) and perform 12-lead ECG.
9. Treat for shock.
10. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, or pediatric immobilization device appropriate to treatment(s) required.

### **TREATMENT**

#### **BASIC PROCEDURES**

1. If unable to ventilate child after repositioning of airway: assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
2. Initiate Cardiopulmonary Resuscitation (CPR).
3. **EARLY DEFIBRILLATION**
  - a. Perform CPR.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories

NOTE: AED use is dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. An AED should be used in compliance with manufacturer specific guidelines and Massachusetts treatment protocols and advisories.

4. Activate ALS intercept, if deemed necessary and if available.

5. Initiate transport as soon as possible; with or without ALS.
6. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

### 1. ALS STANDING ORDERS

Provide advanced airway management, if indicated.

Initiate IV Normal Saline KVO.

2. Activate Paramedic intercept, if available and deemed necessary.
3. Initiate transport with or without Paramedics.
4. Contact **MEDICAL CONTROL**. Medical Control may order:  
Normal Saline bolus IV (expected fluid bolus is 20 ml/kg).

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS

- a. Provide advanced airway management, if indicated.
- b. Initiate IV Normal Saline KVO.

**NOTE:** If a vein can be visualized or palpated, establish an IV of Normal Saline KVO. If unable to visualize or palpate a vein and child is less than six years old, establish an intraosseous infusion of Normal Saline. If unable to visualize or palpate a vein and the child is greater than six years old, attempt external jugular access.

#### a. Epinephrine:

**For Bradycardia: IV/IO: 0.01 mg/kg (1:10,000); ET: 0.1 mg/kg (1:1,000) followed by 2.0 ml of NS. Subsequent dosages: IV/IO repeat initial dose (0.01 mg/kg 1:10,000) every 3 - 5 minutes; subsequent ET dosages (0.1 - 0.2 mg/kg 1:1,000) every 3 - 5 minutes.**

#### **For Asystolic or PEA:**

- i. Initial Dose: IV/IO; 0.01 mg/kg (1:10,000); or ET 0.1 mg/kg (1:1,000) followed by 2.0 ml of NS.
  - ii. Subsequent doses every 3 - 5 minutes: IV/IO/ET: Repeat initial dose.
  - iii. Epinephrine infusion: initial dose 0.1 µg/kg/min. Titrate to desired effect to maximum dose of 1.0 µg/kg/min.
- b. Atropine:
- ET/IV/IO : 0.02 mg/kg (minimum dose 0.1 mg; maximum dose 0.5 mg in a child and 1.0 mg in an adolescent).

**ATROPINE NOT IN ECC – many use as “insurance”, maybe keep?**

### 2. Contact **MEDICAL CONTROL**. Medical Control may order.

- a. Fluid bolus(es) of Normal Saline IV/IO (**20 ml/kg**).

Sodium Bicarbonate **1 mEq/kg**: IV/IO.

All other treatment modalities based upon suspected etiology for cardiopulmonary arrest.

## **5.6 PEDIATRIC COMA / ALTERED MENTAL/ NEUROLOGICAL STATUS ~ DIABETIC IN CHILDREN**

Altered mental/Neurological/ Diabetic status in children covers a range of presentations. Coma is not difficult to recognize, but irritability, lethargy, changes in feeding or sleeping habits, and other subtle behavioral changes can all indicate a process impairing the normal functioning of the child's central nervous system. History from the caregiver is critical. The common causes of pediatric coma are injury, shock, metabolic disorders, ingestions and/or CNS infections. Pediatric shock, if suspected, should be treated according to the Pediatric Shock Protocol. Likewise, Pediatric Head Trauma, if suspected as the cause for altered mental/neurological status, should be treated according to the Pediatric Multiple Trauma Protocol. Remember that some forms of injury such as those associated with "shaken baby syndrome", can cause CNS trauma without external evidence of injury.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning and/or use of airway adjuncts (nasopharyngeal / oropharyngeal airway) as indicated. Assume spinal injury if associated with trauma and manage accordingly.
3. Evaluate capillary refill and determine if blood pressure is appropriate for age. (SEE APPENDIX ).
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs.
6. Obtain appropriate S-A-M-P-L-E history related to event, including diabetes, CNS disorders and/or injury, overdose, or trauma.
7. Monitor and record vital signs and ECG.
8. Prevent / treat for shock.
9. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.



## 5.6 PEDIATRIC COMA / ALTERED MENTAL/ NEUROLOGICAL STATUS ~ DIABETIC IN CHILDREN

### TREATMENT BASIC PROCEDURES

#### 1. BLS STANDING ORDERS

- a. If patient is a known diabetic (or is confirmed to be hypoglycemic) who is conscious and can speak and swallow, administer oral glucose or other sugar source as tolerated. One dose equals one tube. A second dose may be necessary.

**CAUTION: Do NOT administer anything orally if the patient does not have a reasonable level of consciousness and normal gag reflex.**

2. Activate ALS intercept if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. If patient is unconscious or seizing, transport on left side (coma position) or as needed if trauma is suspected. If patient is in or exhibits signs and/or symptoms of shock, (i.e. If patient's BLOOD PRESSURE drops below age appropriate pressure (**See Appendix**), treat for shock.
5. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

1. Activate Paramedic intercept, if deemed necessary and if available.
2. **ALS STANDING ORDERS**
  - a. Provide advanced airway management if indicated.
  - b. Consider IV Normal Saline.
8. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. **20 ml/kg Fluid bolus** of Normal Saline.

### PARAMEDIC PROCEDURES

#### 1. ALS-P STANDING ORDERS

- a. Advanced Airway Management if indicated.
- b. Initiate IV Normal Saline (KVO). If a hypovolemic etiology is suspected, administer fluid bolus at 20 ml/kg.
- c. Cardiac monitoring and consider 12 lead ECG – manage dysrhythmias per protocol
- d. Treatment for specific etiologies:
  - Known hypoglycemia (glucose <70 mg./dl.):**
    - i. **Dextrose 10% 0.5 gm/kg IV Bolus** (for neonates).
    - ii. **Dextrose 25% 0.5 gm/kg IV Bolus** (if estimated body weight is less than 50 kg).
    - iii. **Dextrose 50% 0.5 gm/kg IV Bolus** (if estimated body weight is greater than 50 kg).

- 
- iv. **Glucagon 0.1 mg/kg IV Push, IO, IM or SC up to maximum of 1.0 mg.**
- **Coma of Unknown Etiology:**
    - i. **If age less than 5 years:**
      - **Naloxone HCL: 0.1 mg/kg to max. dose of 2.0 mg, IV Push, ET, IO, IM, SC.**
      - **Dextrose as listed above.**
    - ii. **If age greater than 5 years:**
      - **Naloxone HCL: 2.0 mg IV Push, ET, IO, IM, SC.**
      - **Dextrose as listed above.**
2. Contact **MEDICAL CONTROL**. The following may be ordered:
- a. **Glucagon 0.1 mg/kg IV Push, IO, IM or SC up to maximum of 1.0 mg.**
  - b. **20 ml/kg Normal Saline fluid Bolus.**
  - c. **Dextrose:**
    - i. **Dextrose 10% 0.5 gm/kg IV Bolus (for neonates).**
    - ii. **Dextrose 25% 0.5 gm/kg IV Bolus (if estimated body weight is less than 50 kg).**
    - iii. **Dextrose 50% 0.5 gm/kg IV Bolus (if estimated body weight is greater than 50 kg).**
  - d. **Naloxone HCL:**
    - i. **If age less than 5 years: 0.1 mg/kg to max. dose of 2.0 mg IV Bolus, ET, IM, SC or IO.**
    - ii. **If age 5 years or greater: 2.0 mg IV Bolus, ET, IM, SC or IO. If given via ET, follow with 2.0 ml sterile normal saline solution.**
  - e. Additional fluid boluses of 20 ml/kg at intervals as needed.
  - f. If coma caused by specific drug overdose, physician may order:
    - i. **Atropine 0.02 mg/kg IV Bolus or ET (minimum dose 0.1 mg), or IO.**  
NOTE: If given via ET, follow with 2.0 ml sterile Normal Saline solution.
    - ii. **Sodium Bicarbonate 1-2 mEq/kg as slow IV Infusion. CAUTION:**  
Pediatric patients must have adequate ventilatory function prior to the administration of Sodium Bicarbonate.

## 5.7 PEDIATRIC SEIZURES

A seizure is a temporary alteration in behavior due to the inappropriate electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized (absence or tonic-clonic), partial-simple (motor only), or partial-complex (behavioral). The single most common cause of seizure disorder is idiopathic epilepsy. However, there are multiple other causes: hypoglycemia, head trauma, vascular disorders, meningitis, sepsis, metabolic abnormalities, poisoning, hypoxemia, tumors, and shock. The seizure may be followed by a post-ictal state or complete coma depending upon cause. The most common cause of seizure in children age 1 - 4 is "benign febrile seizure". These seizures usually last less than 5 minutes and are tonic-clonic (grand mal) and non-focal (generalized).

### ASSESSMENT/TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated or via blow-by method if seizure persists. Be certain that the oropharynx is clear of secretions and/or vomitus.
4. Obtain appropriate S-A-M-P-L-E history related to event, including possible ingestion or overdose of medications.
5. Question all witnesses or bystanders as to actual event.
6. The majority of seizures are self-limiting, followed by a gradual awakening. However, prolonged or recurrent seizures may indicate status epilepticus.
7. Monitor and record vital signs and ECG.
8. Prevent / treat for shock.
9. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Prevent patient from accidental self-harm. DO NOT use a bite block.
2. Activate ALS intercept if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix ), treat for shock.
5. Notify receiving hospital.

**INTERMEDIATE PROCEDURES**

1. Activate Paramedic intercept, if deemed necessary and if available.
2. **ALS STANDING ORDERS**
  - a. Provide advanced airway management if indicated.
  - b. Initiate IV Normal Saline (KVO), while en-route to hospital, if vein is visible and/or palpable.
3. Initiate transport as soon as possible with or without Paramedics.

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management, if indicated.
- b. Initiate IV Normal Saline (IV), in visualized or palpated vein.
- c. Determine Blood Glucose level with Dextrose stick.
  - If Glucose is less than **70mg/dL**, administer:
    - i. **Dextrose 10% 0.5 gm/kg IV Bolus** (for neonates).
    - ii. **Dextrose 25% 0.5 gm/kg IV Bolus** (if estimated body weight is less than 50 kg).
    - iii. **Dextrose 50% 0.5 gm/kg IV Bolus** (if estimated body weight is greater than 50 kg).

NOTE: Status epilepticus is considered to be occurring when it has been reported, or observed, that a patient has been seizing for 10 minutes, or greater. This will result in a standing order to provide diazepam or lorazepam, prior to contacting medical control.

**d. Seizures:**

- Diazepam 0.25 mg/kg, IV, IO to maximum single dose of 5-10 mg.\* or a RECTAL DOSE: 0.5 mg/kg unless contraindicated

**OR**

- Lorazepam 0.05-0.1 mg/kg IV, IO slowly (dilute 1:1 in normal saline), or IM to maximum single dose of 2 mg\*.

**2. Contact MEDICAL CONTROL.** The following may be ordered:**a. For Status Epilepticus**

- **Additional diazepam or lorazepam**
- Additional IV Dextrose per above protocol.
- Additional naloxone per above protocol.
- Normal Saline fluid challenge, if indicated 10-20 ml/kg.

**Diazepam** and **Lorazepam** should be used to treat only those children who suffer continuous tonic/clonic seizure activity for more than **10** minutes and who demonstrate signs of inadequate oxygenation, such as cyanosis. Apnea often follows intravenous administration of Diazepam; accordingly, field personnel should carefully monitor respiration and prepare to support ventilation with bag-valve-mask apparatus following administration of this agent. These drugs are relatively contraindicated in hypotension and head injury.

## 5.8 PEDIATRIC SHOCK

The most common cause of shock in children is acute volume loss. This can be due to: increased fluid loss (vomiting, diarrhea, hyperthermia, hemorrhage); decreased intake; or fluid-shift out of the vascular space. Regardless of etiology, treatment should be directed at rapid fluid replacement. **Severe shock** is present if the child exhibits a decreased level of consciousness, weak and thready pulses, no palpable BLOOD PRESSURE, or a capillary refill of more than 2 seconds.

Children are capable of developing significant sinus tachycardia in the face of dehydration, but if the heart rate is greater than 220/minute refer to the Pediatric Supraventricular Tachydysrhythmia Protocol.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. In case of suspected head/neck injury, Ensure cervical spine immobilization / stabilization.
3. Maintain open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated.
4. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
5. Control external bleeding sources and keep child warm.
6. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs. Evaluate capillary refill and determine if BLOOD PRESSURE is appropriate for age.
7. If in severe shock, position child 15° Trendelenburg (head down position).
8. Obtain appropriate S-A-M-P-L-E history related to event, such as recent illness, change in eating pattern, excessive exercise or heat exposure, and/or trauma.
9. Monitor and record vital signs and ECG.
10. Prevent / treat for shock.
11. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. Control external bleeding sources and keep child warm.
2. Activate ALS intercept, if deemed necessary and if available.
3. Initiate transport as soon as possible with or without ALS.
4. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management (endotracheal intubation ONLY), if indicated.
  - b. Initiate IV Normal Saline (KVO), while en-route to hospital if vein is visible and/or palpable.
2. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Normal Saline bolus at discretion of Medical Control (expected fluid bolus is 20 ml/kg).

## PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV Normal Saline. NOTE: If a vein can be visualized or palpated, establish an IV of Normal Saline KVO. If unable to visualize or palpate a vein and child is less than six years old, establish an intraosseous infusion of Normal Saline to keep the line open. If unable to visualize or palpate a vein and the child is greater than six years old, attempt external jugular access.
  - c. If severe shock is present, or suspect hypovolemic etiology, administer **20 ml/kg IV Bolus of normal saline** (unless known history of heart disease).
  - d. Cardiac Monitoring and if feasible 12 lead ECG - manage dysrhythmias per protocol
2. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Additional Normal Saline boluses IV at 20 ml/kg.
  - b. Intraosseous Infusion of Normal Saline if less than 6 years of age. Once established, administer a single bolus of 20 ml/kg of Normal Saline (may be repeated).
  - c. If known Cardiogenic Shock: **Dopamine (40 mg/ml solution) DOSE: 2-20 µg/kg/minute.**

## **5.9 PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA (SVT)**

Supraventricular tachycardia is the most common dysrhythmia producing cardiovascular instability during infancy, and it can occur throughout the pediatric years. It is critical that the rhythm be differentiated from sinus tachycardia, which is seen more often: some common causes of sinus tachycardia are dehydration, shock, hyperthermia, anxiety, pain and/or fear. Supraventricular Tachycardia in infants often produces a heart rate of 240 beats per minute and possibly up to 300 beats per minute. Wide QRS Pediatric Supraventricular Tachycardia is relatively uncommon in infants and children. Any wide-QRS tachycardia should be assumed to be of ventricular origin. Heart rates up to 220 bpm can be due to sinus tachycardia in children. Supraventricular Tachycardia in pediatric patients usually results from an abnormality of the cardiac conduction system. Although the heart rate can vary, it rarely needs treatment if under 220 in children.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs including capillary refill and determine if BLOOD PRESSURE is appropriate for age.
5. Obtain appropriate S-A-M-P-L-E history related to event, including prior episodes of Supraventricular Tachycardia, or underlying congenital heart disease and/or surgery, and/or possible ingestion or overdose of medications. Determine if there is a history of possible causes for sinus tachycardia, such as fluid loss, fever, shock, or bleeding.
6. Symptomatic patients will have heart rates greater than 220 bpm, and one of the following signs of hypoperfusion: decreased level of consciousness, weak and thready pulses, delayed capillary refill, or no palpable BLOOD PRESSURE.
7. Monitor and record vital signs and ECG.
8. Prevent / treat for shock.
9. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

## TREATMENT

### BASIC PROCEDURES

**Note:** Inasmuch as Basic EMTs are unable to confirm the presence of PSVT, check the patient for a rapid or thready pulse rate greater than 220 bpm and manage according to the following protocol:

1. If tachycardia is related to acute injury or volume loss, see Pediatric Shock Protocol.
2. Activate ALS intercept, if deemed necessary and if available.
3. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

**Note:** Inasmuch as Intermediate EMTs are unable to confirm the presence of PSVT, check the patient for a rapid or thready pulse rate greater than 220 bpm and manage according to the following protocol:

1. Activate Paramedic intercept, if deemed necessary and if available.
2. Initiate transport to appropriate medical facility as soon as possible with or without Paramedics.
3. **ALS STANDING ORDERS**
  - a. Advanced Airway Management if indicated.
  - c. IV Normal Saline (KVO), while en-route to hospital, if vein is visible and/or palpable.
4. Notify receiving hospital and **Contact MEDICAL CONTROL**. The following may be ordered:
  - a. Fluid boluses of Normal Saline IV (expected fluid bolus of 20 ml/kg).

### PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Advanced Airway Management if indicated.
  - b. IV Normal Saline (KVO). If hypovolemic component is suspected, administer **20 ml/kg IV Bolus of Normal Saline**.
2. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. Additional fluid boluses of Normal Saline (20 ml/kg).
  - b. Synchronized cardioversion **0.5 joules/kg** for symptomatic patients.\*  
Subsequent cardioversion may be done at up to 1.0 joule/kg. If cardioversion is warranted, consider administration of any of the following for sedation:
    - **Diazepam: if patient < 70 kg: 2.5 mg SLOW IV Push or,**
    - **Midazolam 0.5 mg - 2.5 mg SLOW IV push or,**
    - **Morphine Sulfate 2.0 mg - 5.0 mg IV or IM or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.**
  - c. **Adenosine 0.1 mg/kg IV Rapid IV push.** If no effect, repeat **Adenosine 0.2 mg/kg Rapid IV push. MAXIMUM** single dose of Adenosine must not exceed 12 mg.
  - d. **Consider** Vagal maneuvers (see **Reminder** below).

\*Synchronized cardioversion should be considered for only those children whose heart rate is in excess of 220, and who demonstrate one or more of the following signs of hypoperfusion: Decreased level of consciousness, weak and thready pulses, capillary refill time of more than 4 seconds, or no palpable BLOOD PRESSURE.

**REMINDER:** Vagal maneuvers may precipitate asystole and therefore should be employed with caution in the field and only in a cardiac-monitored child with IV access.



## 5.10 PEDIATRIC TRAUMA AND TRAUMATIC ARREST

**NOTE: For BURN/INHALATION, see protocol 4.2 which includes pediatric management.**

Injury is the most common cause of death in the pediatric population. Blunt injuries, which are usually motor vehicle related, are more common than penetrating injuries, but the latter are unfortunately becoming more common. If a child has multiple injuries or bruises in varying stages of resolution, consider child abuse as a possible etiology. The death rate from traumatic injury in children is two times that of the adult patient. To resuscitate a pediatric traumatic arrest victim, aggressive in-hospital management, often times open thoracotomy, is required. The more prolonged the field time and the transport to the medical facility, the less likely the child is to survive.

### ASSESSMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Maintain open airway and assist ventilations as needed. This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated. Assume spinal injury and treat accordingly.
4. Initiate Cardiopulmonary Resuscitation (CPR) if indicated.
5. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
6. Consider potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.)
7. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
8. Prevent / treat for shock.
9. When multiple patients are involved, they need to be appropriately triaged.
10. Obtain appropriate S-A-M-P-L-E history related to event, including Mechanism of Injury, and possible child abuse.
11. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by the **Department approved POE plans**
12. Monitor and record vital signs (if any) and ECG.
13. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

### TREATMENT

#### BASIC PROCEDURES

1. If patient is in cardiac arrest:
  - a. Perform CPR.
  - b. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories
2. Activate ALS intercept, if deemed necessary and if available.
3. Notify appropriate receiving hospital.

**INTERMEDIATE PROCEDURES****1. ALS STANDING ORDERS**

- d. Provide advanced airway management, if indicated.
  - e. Initiate IV Normal Saline KVO.
2. Contact **MEDICAL CONTROL**. Medical control may order:
    - a. Fluid bolus of Normal Saline (expected fluid bolus of 20 ml/kg). This order may be repeated at the discretion of medical control.
  3. Activate Paramedic intercept, if deemed necessary and if available.

**PARAMEDIC PROCEDURES****1. ALS-P STANDING ORDERS**

- a. Provide advanced airway management.
  - b. Initiate IV Normal Saline (1 - 2 large bore IVs).
  - c. Administer fluid bolus of Normal Saline (20 ml/kg) and titrate IV infusion rate to patient's hemodynamic status depending upon age/size/weight of child.
  - d. If the child is in cardiopulmonary arrest and unable to establish vascular access, and the child is less than 6 years old, establish an Intraosseous Infusion of Normal Saline and administer **20 ml /kg** fluid bolus.
  - e. If in cardiopulmonary arrest, no IV access and the child is greater than six years old, attempt external jugular access and administer **20 ml /kg** fluid bolus.
2. **Contact MEDICAL CONTROL.:**
    - a. In patients who require emergent intubation and cannot be intubated by conventional means, and the treating paramedic has been duly authorized by the Service's Medical Director in use of an alternative airway (e.g LMA or Combitube)

To facilitate intubation: Medical control may order:

(6 months- 5 years) Midazolam 0.05-0.1 mg/kg IV maximum dose of 5 mg.

(6-12 year old) Midazolam 0.1 mg/kg IV maximum dose of 8 mg.

- b. Needle cricothyroidotomy.
- c. Additional bolus(es) **20 ml /kg** of Normal Saline or wide open (depending upon child's age/size/weight).
- d. Needle decompression of the thorax if indicated.

## 5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

Airway obstruction can vary in severity from mild to life threatening and the child's condition may change suddenly. Common mechanical causes or contributing factors include: tongue-obstructed airway, foreign bodies in the oropharynx, trachea, or esophagus; allergic swelling of upper airway structures ("angioedema"), chemical burns, inhalation injuries; altered mental status, and congenital abnormalities (patients with small jaws or large tongues). Infectious causes are common with croup and epiglottitis being the most prevalent. Although epiglottitis is becoming less common due to immunization against Hemophilus Influenza B, it still occurs.

Children, especially 1 to 3 years of age, are at greatest risk for aspirating foreign objects, particularly when running and/or falling. The most common objects aspirated resulting in airway obstruction in children include coins, buttons, beads, pins, candy, nuts, hot dogs, chewing gum, grapes and sausages.

### ASSESSMENT / TREATMENT PRIORITIES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine presence of upper airway obstruction (stridor):
  - a. If the obstruction due to a foreign body is **complete** or is partial with **inadequate** air exchange: follow the American Heart Association (AHA) or American Red Cross (ARC) BCLS age appropriate guidelines for foreign body obstruction. Maintain an open airway, remove secretions, vomitus and assist ventilations as needed.
  - b. If **partial obstruction** due to a foreign body is suspected and the child has **adequate** air exchange: transport to appropriate medical facility. Do not attempt to remove foreign body in the field.
  - c. If suspected **croup** (barking cough, no drooling) or **epiglottitis** (stridor, drooling) but can maintain an open airway, place child in position of comfort and **avoid upper airway stimulation**.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Determine patient's hemodynamic stability and symptoms. Continually assess level of consciousness, ABCs and Vital Signs. Determine capillary refill status and if BLOOD PRESSURE is appropriate for age.
5. Obtain appropriate S-A-M-P-L-E history related to event, including recent infectious history (fever, cough, etc.) or exposure to allergens.
6. Monitor and record vital signs and ECG.
7. Prevent / treat for shock.
8. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, infant car seat or pediatric immobilization device, in position of comfort, or appropriate to treatment(s) required.

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**5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION****TREATMENT  
BASIC PROCEDURES**

1. Activate ALS intercept, if deemed necessary and if available.
2. Notify receiving hospital.

\* See Tracheostomy Tube Obstruction Management in this Protocol.

**INTERMEDIATE PROCEDURES**

1. Determine presence of upper airway obstruction (stridor):
  - a. If the obstruction due to a foreign body is **complete** or is partial with **inadequate** air exchange: follow the American Heart Association (AHA) or American Red Cross (ARC) BCLS guidelines for foreign body obstruction. Maintain an open airway, remove secretions, vomitus and assist ventilations as needed.
  - b. If **partial obstruction** due to a foreign body is suspected and the child has **adequate** air exchange: transport to appropriate medical facility. Do not attempt to remove foreign body in the field.
  - c. If suspected **croup** (barking cough, no drooling) or **epiglottitis** (stridor, drooling) maintain an open airway, place child in position of comfort and **avoid upper airway stimulation**.
  - d. If tracheostomy tube exists and there is evidence of obstruction resulting in inadequate air exchange; **CONTACT Medical Control** for further instructions. Medical control may provide instructions for emergent removal of the tracheostomy tube to establish an airway.\*

\* **See Tracheostomy Tube Obstruction Management in this Protocol.**

2. Activate Paramedic intercept, if deemed necessary and if available.
3. **ALS STANDING ORDERS**
  - a. Provide advanced airway management if indicated for **mechanical obstruction**: Perform direct laryngoscopy if foreign body suspected. If foreign body is visible and readily accessible, attempt removal with Magill forceps.
  - b. Provide positive pressure ventilations if needed.

**PARAMEDIC PROCEDURES**

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management if indicated for **mechanical obstruction**: Perform direct laryngoscopy if foreign body suspected. If foreign body is visible and readily accessible, attempt removal with Magill forceps. If unable to remove obstructing foreign body, continue BLS airway management by providing positive pressure ventilations.
  - b. If foreign body is removed proceed with endotracheal intubation if necessary.
  - c. IV Normal Saline titrated to appropriate BLOOD PRESSURE for age en route.

5. Initiate transport as soon as possible.
6. Contact **MEDICAL CONTROL**. The following may be ordered:
  - a. **Needle cricothyroidotomy** if unable to clear airway obstruction, unable to intubate as needed or unable to perform positive pressure ventilations.
  - b. Airway management under the difficult airway protocol.

\* See Tracheostomy Tube Obstruction Management in this Protocol.

### **Tracheostomy tube obstruction management:**

In the patient with an obstructed tracheostomy tube, in whom no effective ventilation/oxygenation is possible, the following are to be considered Standing Orders:

- wipe neck opening with gauze
- attempt to suction tracheostomy tube
- remove tracheostomy tube if necessary
- once airway is open, begin ventilations as necessary/possible
- Intermediates and Paramedics may attempt intubation of the patient if no other means of ventilating/oxygenating the patient are possible

Medical Control may order:

- in patients in whom the removed tracheostomy tube is noted to be plugged, on-line medical control may order clearing of the tube and re-insertion.

In patients who are being oxygenated or ventilated by the above criteria, Medical Control may order:

- wipe neck opening with gauze
- attempt to suction tracheostomy tube
- remove tracheostomy tube as necessary
- once airway is open, begin ventilations as possible/necessary
- Attempt to intubate the patient

Signs of inadequate oxygenation/ventilation are:

- falling pulse oximetry
- patient's color
- patient's vital signs
- inability to deliver oxygenation by all other means

## **5.12 PEDIATRIC VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA**

Cardiopulmonary arrest, as manifested by ventricular fibrillation or pulseless ventricular tachycardia, is quite rare in infants and children and is usually the end result of deterioration in respiratory and circulatory function. Common causes can be: sepsis, foreign body aspiration, SIDS, traumatic hemorrhages and meningitis. Primary cardiac insults are rare but may be due to: congenital heart disease, myocarditis or primary dysrhythmias.

### **ASSESSMENT / TREATMENT PRIORITIES**

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. Maintain an open airway, remove secretions, vomitus, and initiate CPR. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. Continually assess Level of Consciousness, ABCs and Vital Signs including capillary refill.
5. Obtain appropriate S-A-M-P-L-E history related to event. Observe for signs of child abuse.
6. Every effort should be made to determine the possible cause(s) of the infant's / child's presentation.
7. Prevent / treat for shock.
8. Basic and/or Intermediate providers should activate a paramedic intercept system (ACLS) as soon as possible, if available.
9. Initiate transport as soon as possible, with or without ALS. Properly secure to cot, or pediatric immobilization device, in position appropriate to treatment(s) required.

### **TREATMENT BASIC PROCEDURES**

1. Maintain an open airway and assist ventilations (ensure proper seal around the ventilation mask). This may include repositioning of the airway, suctioning to remove secretions and /or vomitus. Use airway adjuncts as indicated.
2. If indicated, treat spinal injury per protocol.
3. If unable to ventilate child after repositioning of airway, assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
4. DEFIBRILLATION
  - a. Use AED according to the standards of the American Heart Association or as otherwise noted in these protocols and other advisories

5. Activate ALS intercept, if deemed necessary and if available..
6. Initiate transport as soon as possible, with or without ALS.
7. Notify receiving hospital.

## INTERMEDIATE PROCEDURES

### 1. ALS STANDING ORDERS

- a. Provide advanced airway management, if indicated.
- b. Ventilate with 100% oxygen.
- c. Initiate IV Normal Saline KVO.
2. Activate Paramedic intercept, if available and deemed necessary.
3. Initiate transport with or without Paramedics.
4. Contact **MEDICAL CONTROL**: Medical Control may order:
  - a. Normal Saline fluid bolus(es) at expected 20 ml / kg.

## PARAMEDIC PROCEDURES

### 1. ALS-P STANDING ORDERS:

- a. Provide advanced airway management, if indicated.
- b. Ventilate with 100% oxygen.
- c. Initiate IV / IO Normal Saline, but do not delay defibrillation.
- d. Defibrillate once at 2J/kg.
- e. **Epinephrine:**
  - **Epinephrine IV / IO: 0.01 mg/kg (1:10,000, 0.1mL/kg).**
  - **Epinephrine ET: 0.1 mg/kg (1:1,000. 0.1mL/kg).**
- f. Defibrillate 4J/kg every 2 minutes.
- g. **Lidocaine 1 mg/kg IV / IO.**
- h. **Epinephrine (subsequent doses):**
  - **IV / IO / ET: as initial dose, repeat every 3-5 minutes.**
- j. **Amiodarone 5 mg./kg. IV/IO OR Lidocaine 1 mg/kg IV / IO.**
- k. Defibrillate 4J/kg 30-60 seconds after each medication.
2. Contact MEDICAL CONTROL. Medical Control may order:
  - a. Fluid bolus(es) of Normal Saline at expected rate of **20 ml/kg.**
  - b. **Sodium Bicarbonate 1 mEq/kg IV / IO.**
  - c. All other treatment modalities based upon suspected cause of VF / VT.

## 5.13 PEDIATRIC PAIN AND NAUSEA MANAGEMENT

In the pediatric patient with suspected long bone fractures, significant burns or other clearly painful injuries, pain management with analgesics should be considered utilizing the following protocol. The purpose of this protocol is to:

- Attempt to decrease and/or alleviate pain and minimize patient anxiety
- Facilitate positioning and splinting techniques
- Enhance communication with the patient
- Prevent further injury

### ASSESSMENT / TREATMENT PRIORITIES

1. Maintain appropriate body substance isolation precautions.
2. Maintain open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. Administer oxygen using appropriate oxygen delivery device, as clinically indicated.
4. As patient's condition suggests, continually assess level of Consciousness, ABC's and Vital Signs.
5. Treat all life threatening conditions as they become identified.
6. Prevent / treat for shock.
7. When multiple patients are involved, they need to be appropriately triaged.
8. Obtain appropriate S-A-M-P-L-E history related to event, including Mechanism of Injury, and possible child abuse.
9. Patient care activity must not unnecessarily delay patient transport to the nearest appropriate facility as defined by the **Department approved POE plans**.
10. Initiate transport as soon as possible with or without ALS. Properly secure to cot, or pediatric immobilization device, in position of comfort or appropriate to treatment(s) required.
11. Monitor and record vital signs.

### BASIC PROCEDURES

1. Notify receiving hospital.

### INTERMEDIATE PROCEDURES

1. **ALS STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV normal saline KVO
2. Contact **MEDICAL CONTROL**. Medical Control may order:
  - a. Fluid bolus of Normal Saline (expected fluid bolus of 20 ml/kg). This order may be repeated at the discretion of Medical Control.



3. Activate paramedic intercept, if deemed necessary and available.

## PARAMEDIC PROCEDURES

1. **ALS-P STANDING ORDERS**
  - a. Provide advanced airway management, if indicated.
  - b. Initiate IV normal saline KVO Estimate weight using Length Based Tape (e.g. See Appendix or Use Broselow Tape)
  - c. **If IV access obtained, Morphine 0.1 mg/kg IV/IM/SC/IO (maximum individual dose 5.0 mg) or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.**
  - d. **If NO IV access, Morphine 0.1 mg/kg IM/SC (maximum individual dose 5.0 mg)**
2. **Contact MEDICAL CONTROL** who may also order:
  - a. Fluid Bolus: Normal Saline 20 ml/kg IV
  - b. **Morphine 0.1 mg/kg IV/IM/SC** or Fentanyl 1 mcg/kg. to max. 150 mcg. slow IV push.
  - c. Naloxone HCL 0.1 mg/kg of a **1.0** mg/ml solution IV/ET/IO. If patient <5 years: 0.1 mg/kg. If patient > 5 years: 2.0 mg.
  - d. **Ondansetron**, for child under or up to 30 kg. 1 mg. IV; for a child over 30 kg., 2 mg. IV.
  - e. Use of IO access for any of the above medications.