EMERGENCY MEDICAL SERVICES PRE-HOSPITAL TREATMENT PROTOCOLS

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5. 1 Official Version

COMPLETE TEXT

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INTRODUCTION

INTRODUCTION TO STATEWIDE TREATMENT PROTOCOLS

The goal of any Emergency Medical Services System is to provide the finest out of hospital care to all the citizens and visitors of its jurisdiction in a timely and efficient manner. In this regard, the EMS system clearly functions with the intent to prevent and limit further complications from illness or injury during the critical time prior to arrival in the Receiving Facility. The treatment protocols found in this text, in addition to the ability to allow for reduction in ongoing morbidity and mortality in the out of hospital arena, are also 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 the Receiving Facility 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 by utilizing the knowledge and backgrounds of the Regional Medical Directors in addition to multiple textbooks for each level of EMT. A number of safety checks were utilized to ensure clinical accuracy for each protocol. The narrative format was utilized to ensure completeness and attention to detail such that the protocols may serve as a reference text by EMTs when needed.

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. In this fashion, the EMT has the immediate reference, if he/she wishes to access the potentially important aspects of the patient's overall management. The next section of the protocol emphasizes the assessment and treatment priorities for each illness or injury being addressed. This section clearly states those treatment measures surrounding a particular illness or injury that may be the most important aspects of patient management. Again, this allows a quick reference for the EMT at whatever level of training.

The treatment section of each protocol is divided into three levels: BASIC PROCEDURES, INTERMEDIATE PROCEDURES and PARAMEDIC PROCEDURES. As with any sequentially designed treatment protocol, the higher level EMT is expected to have complete mastery of each lower level of clinical management. Therefore, the skill levels, as evidenced by ever-increasing off-line standing orders, becomes more obvious from Basic to Intermediate to Paramedic clinical management. In several protocols, reference to other protocols in the text may be made. However, the need for this type of cross-reference was kept to a minimum in order to make each protocol more complete and user-friendly.

ROLES / RESPONSIBILITIES OF EMS PROVIDERS

Personnel and Training

Emergency Medical Technicians are trained to provide out of hospital care by utilizing equipment and procedures designed in cooperation with personnel, including physicians and nurses, experienced in out of hospital care. Emergency care providers may have 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 provide help at the First Responder or EMT level. In Massachusetts, EMTs are generally available at the Basic, Intermediate, and Paramedic levels with working interrelationships with First Responders who may or may not be AED authorized. 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 Regional EMS System in which they provide service. Proper use of adequate communications equipment is essential to 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 Run Form for each patient management situation is mandatory. A minimum Pre-Hospital Data set for each transport should be entered on the Run Form 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 reports 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. An Estimated Time of Arrival should be communicated on all calls to the Receiving Facility.

CATEGORIZATION OF GUIDELINES

The treatment protocols have been divided into groups for ease of utilization. The categories have been indexed such that any future change in a particular protocol may be rendered without difficulty. The format developed will also facilitate organization and rapid access to the correct protocol for a given situation. Moreover, 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 several 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

The Point-of-Entry designation for each Region is based on established Regional guidelines and are to be adhered to whenever possible. This document in no way supplants established Regional Point-of-Entry policies. The EMT must be familiar with Regional policy when providing patient care services in any particular Region. In general, the following policy should be followed in this regard: Patients should be transported to the nearest appropriate facility which can provide the care needed by the patient under the clinical circumstances. For example, Regionally established guidelines for the following particular situations must be adhered to by all EMT providers:

Trauma
Pediatric Trauma
Burns
Amputation
Obstetrics

The necessity to deviate from established Point-of-Entry guidelines may occur, from time to time, due to mitigating circumstances (such as a particular institution needing to go on a Bypass mode). Each Region must establish Bypass protocols to allow EMTs to fully understand Regional situations as they arise that would allow for proper patient entry into the EMS system without undue hardship or delay for the patient. These Point-of-Entry guidelines in each Region may specifically require that the Estimated Time of Arrival dictate where the point-of-entry will be for particular patient management situations. The use of Air Ambulance Services must also be established for each Region with guidelines for utilization and point-of-entry. The responsibility for these guidelines is with the Region. The responsibility to understand and follow these Regional guidelines remains with the EMT provider. A strong Oversight and Quality Assurance/Quality Improvement program for each Region would aid this process and allow for system improvement. This should remain one of the goals for all EMS systems.

GENERAL PROTOCOL POLICIES

1. Each and every protocol has, as its first procedural directive, the following words: "Maintain appropriate body substance isolation precautions. Assuring scene safety in all patient encounters must also be considered as a primary procedural directive." The importance of these directives cannot be over-emphasized. New Federal 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 at all times by EMT providers and provider services.

2. Each and every protocol emphasizes the importance of rapid transport to the nearest appropriate Treatment Facility. Delayed transport should never occur in a properly functioning EMS system. However, in rare circumstances, delayed transport may occur when treatment cannot be performed during transport.

3. Each and every protocol emphasizes the importance of Advanced Life Support backup notification and utilization whenever indicated. Each Region should strive to improve ALS services to its cities and towns wherever feasible.

4. Each and every protocol implies the roles and responsibilities of hospital personnel to the EMT and provider services:

   - Personnel who communicate via an established communication system with EMT field providers must have a working knowledge of the EMS system and be fully aware of the skills and capabilities of the EMT 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 whenever possible.

   - 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 Ensures that the system performs in an overall improved fashion whenever the need is identified.

5. In developing the protocols, a number of issues and Regional and EMS service provider variations have been discussed on many levels. Many of these issues and topics have been addressed and incorporated into the

GENERAL PROTOCOL POLICIES (continued)

protocols. However, several require special mention to clarify present situations and patient management issues:

- A number of ALS ambulance services allow for blood draw on 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 this policy and procedure 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, that will be utilized under standard procedure protocols or under approved pilot projects / demonstration projects. For example: taking and transmitting 12-lead EKGs; paralytic agents to aid in the management of the difficult airway patient; thrombolytic survey of the patient; the use of cetacaine spray, neosynephrine spray and 2% xylocaine 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 Directors of these EMS systems must be aware and responsible for the activities of his/her EMTs in such circumstances.

- Variation from the protocols: The informal section at the end of this text explains the methodology / process for variation from the protocols as written. The need for such a process is obvious: general consensus must be achieved before a new or controversial procedure / protocol can be adopted. This process includes medications such as Nitrous Oxide, TPA, nalbuphine, and other drugs that will come under review for inclusion or exclusion. The review process will be efficient and, as always, in the best interests of quality patient care.

- The new EMT-Basic assessment-based curriculum, in addition to the soon-to-be-published and promulgated Paramedic curriculum, required changes reflected in this edition of the protocols. The protocols, as written, will be in a dynamic state and will be adjusted or revised as necessary over the years as new modalities are introduced through these curricula.

- The new Comfort Care protocol was promulgated and implemented in 1997. This protocol has been added to the educational curricula for all levels of EMTs. The Comfort Care protocol is a program that will aid the EMT in recognizing the patient who is not to receive resuscitation measures as defined in the protocol, but will clearly allow for palliative care to all those patients deemed appropriate.

A separate protocol on cessation of resuscitation in the field will 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 is possible or likely.

- The Medication List is very 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 given 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 must be aware that certain basic measures to prevent / treat for shock must be initiated at a higher blood pressure, i.e., higher than the advanced life support measures that paramedics can initiate.

6. Each and every protocol assumes that the EMT will treat all life threatening conditions, as they become identified.

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 will be 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.

10. 12-Lead ECG "The AHA, in its ACLS Guidelines 2000, strongly recommends 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 within the next 2 years (**11/2003**) must 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.

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

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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)

- **O**nset: when did the symptoms begin and what was the patient doing at the time?;
- **P**rovocation: activities that change the pain / complaint;
- **Q**uality: sharp, dull, throbbing, crushing, constant vs. intermittent;
- **R**adiation: yes/no and to where?;
- **S**everity: rate on a scale of 1 to 10;
- **T**ime: how long has pain / complaint lasted?

Detailed Trauma Assessment: Check for presence of:

- **D**eformities
- **C**ontusions
- **A**brasions
- **P**unctures **/** penetrations
- **B**urns
- **T**enderness
- **L**acerations
- **S**welling

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 have been amended to 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 regional and state approved course for the administration of an ambulance services epinephrine auto-injector (Epi-pen ®), AND if 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, may use the services epinephrine auto-injector.

In many Protocols, the administration of oxygen is necessary**.** For the purposes of this text the protocols will indicate that the EMT should administer "high concentration oxygen". The 1994 Revised DOT EMT-B Curriculum teaches that this should be accomplished using a non-rebreather mask. It should be understood that a nasal cannula might be used only for patients who will not tolerate a mask, even via a blow-by method, despite coaching and advice. **(See revision; page 12 , #12 this section)**

Finally, whenever an EMT-Basic or EMT-intermediate administers, or assists in the administration of the medications allowed in these protocols**,** Paramedics shall be requested, when available.

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 recent 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.

CONCLUSION

The protocols established in this text are designed to facilitate and, hopefully, standardize out of hospital treatment modalities in the Commonwealth. They are not a substitute for a textbook or a training curriculum. The use of the narrative format is designed for completeness and readability. A decision tree format will be available for street use. As new treatment and patient management modalities are developed, they will be reviewed and placed in the Protocols Manual as they are identified.

Remember: the Protocols as promulgated in this manual are considered to be the most complete at this time. Protocols become Standards only if they are deemed to be the best management tools in place at the time and under the circumstances identified.

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* 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 due to prolonged periods of inadequate myocardial perfusion 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, the team leader must consider the differential diagnosis while beginning and maintaining CPR, Endotracheal Intubation, Epinephrine and Atropine, as one would treat PEA. In general, atropine is given to all asystolic patients but only to those patients with PEA who have bradydysrhythmias. Routine "shocking" of asystole should be discouraged. Rescuers should confirm asystole when faced with a "flat line" on the monitor. The use of transcutaneous pacing should be considered in those patients where the device can be applied very early in the course of the patient's management. The most common salvageable situations with the use of TCP include the following: bradydysrhythmic arrest, Stokes-Adams attacks, asystole due to vagal discharge, or myocardial "stunning" following prompt defibrillation. One should always consider the 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, 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.

1.1. ASYSTOLE (Cardiac Arrest)

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. **<u>Early defibrillation</u>**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.
6. Activate ALS intercept, if available.
7. Initiate transport as soon as possible, with or without ALS.
8. 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:

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Activate Paramedic intercept, if available.
6. **<u>Early defibrillation</u>**:
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.
7. Initiate transport as soon as possible, with or without Paramedics.
8. **ALS STANDING ORDERS:**
   a. Provide advanced airway management.
   b. Initiate IV Normal Saline KVO.
9. Notify receiving hospital.

1.1. ASYSTOLE (Cardiac Arrest)

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Attach cardiac monitor and confirm asystole in **<u>2 leads</u>**.
6. Initiate transport as soon as possible.
7. **ALS STANDING ORDERS:**
   a. Provide advanced airway management.
   b. Consider immediate **Transcutaneous Pacing,** if asystole arrest is witnessed by EMS personnel**.**
   c. Initiate IV Normal Saline.
   d. **Epinephrine (1:10,000) 1 mg IV push** every 3-5 minutes. Epinephrine may be given via Endotracheal Tube if IV not yet established. **(2-2.5 mg of Epinephrine 1:1,000** is preferred (ET), every 3-5 minutes)
   e. **Atropine 1 mg IV push** every 3-5 minutes to a total of 0.04 mg / kg. Atropine may be given via Endotracheal Tube if IV not yet established (**2.0 mg of Atropine via ETT** is preferred; maximum dose 0.08 mg / kg).
8. 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 /if known pre-existing hyperkalemia or known pre-existing bicarbonate-responsive acidosis or if overdose with tricyclic antidepressants.
      - Cessation of Resuscitation per protocol.

9. Notify receiving Hospital.

1.2. ATRIAL FIBRILLATION

Atrial fibrillation is a totally chaotic activity of the atrial muscle fibers manifested by an irregularly irregular 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 rate can be variable, itself a problem, but in addition 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 but symptomatic patient with a heart rate greater than 150 (palpitations, anxiety, chest discomfort) from the unstable patient with a blood pressure less than 100 and a variable ventricular rate that may be less than 150. Atrial Fibrillation is often the result of: Acute Myocardial Infarction, hypoxia, pulmonary embolus, electrolyte abnormalities, toxic effects due to medication (particularly digoxin or quinidine), and thyrotoxicosis. New onset Atrial Fibrillation can indicate a silent ischemic event, particularly in the elderly.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 **<u>100</u>** 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.

1.2. ATRIAL FIBRILLATION

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible, with or without ALS.
6. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible, with or without Paramedics.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. Initiate **IV Normal Saline** (KVO) enroute to the hospital.
   c. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock. Administer a **250 cc bolus of IV Normal Saline**, or titrate IV to patient's hemodynamic status.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

1.2. ATRIAL FIBRILLATION

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Cardiac monitor, 12 lead ECG / dysrhythmia recognition.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS**
   a) Provide advanced airway management if indicated (patient's condition deteriorates).
   b) Initiate **IV Normal Saline** (KVO) enroute to the hospital.
   c) **<u>If patient's BLOOD PRESSURE drops below 100 systolic. Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**.
   d) Vagal Maneuvers: Valsalva's and/or cough.
   e) If the patient's Systolic BLOOD PRESSURE is **unstable** (less than **<u>100</u>**): **Synchronized cardioversion** at **50 J**, **100 J, 200 J, 300J,** and **360 J**. Check rhythm and pulse between each attempted cardioversion.
   f) If Cardioversion is warranted, consider administration of any of the following for sedation:
      - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
      - **Versed 0.5 mg-2.5 mg SLOW IV Push or,**
      - **Morphine Sulfate 2.0 mg – 10 <u>.0</u> mg SLOW IV Push**
      - **<u>If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ</u>**

   f) Administration of **CARDIZEM® (Diltazem HCL)Lyo-Ject™**
      - 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**<u>.0</u>**-15**<u>.0</u> mg/hr**.

- **NOTE**: **5<u>.0</u> 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.**

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

1.2. ATRIAL FIBRILLATION

PARAMEDIC PROCEDURES (continued)

7. Contact **MEDICAL CONTROL**. The following may be ordered.
   a. Administration of **CARDIZEM® (diltiazem HCL) Lyo-Ject™:**
      - 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.

   b **If Systolic BLOOD PRESSURE is unstable (less than 100): Synchronized cardioversion** at **50 J**, **100 J, 200 J, 300J,** and **360 J**. Check rhythm and pulse between each attempted cardioversion.
   d. If Cardioversion is warranted, consider administration of any of the following for sedation:
      - **Valium if patient< 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
      - **Versed 0.5 mg-2.5 mg SLOW IV Push or**
      - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push or**
      - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

1.3. ATRIAL FLUTTER

Atrial Flutter is an "unstable" rhythm, which will almost always deteriorate into Atrial Fibrillation, or return to sinus rhythm, or another form of supraventricular tachycardia. For this reason, Atrial Flutter demands close clinical attention, especially in patients with ischemic heart disease. Atrial Flutter may produce a very rapid ventricular response. The 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 100 and a variable ventricular rate that may be less than 150. Atrial Flutter is often the result of: Acute Myocardial Infarction, hypoxia, pulmonary embolus, electrolyte abnormalities, toxic effects due to medication (particularly digoxin or quinidine), and thyrotoxicosis. New onset Atrial Flutter can indicate a silent ischemic event, particularly in the elderly.

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** 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.

1.3. ATRIAL FLUTTER

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without Paramedics.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. Initiate **IV Normal Saline (KVO)** enroute to the hospital.
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>
   d. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

1.3. ATRIAL FLUTTER

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Cardiac monitor, 12 lead ECG -dysrhythmia recognition.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. <u>Initiate IV Normal Saline (KVO) enroute to hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic. Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**
   d. Vagal Maneuvers: Valsalva's and/or cough.
   e. **If the patient's Systolic BLOOD PRESSURE is unstable (less than 100**):

   Synchronized cardioversion at **50 J, 100 J, 200 J, 300J,** and **360 J**. Check rhythm and pulse between each attempted cardioversion.

   e. If Cardioversion is warranted, consider administration of any of the following for sedation:
   - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
   - **Versed 0.5 mg - 2.5 mg SLOW IV Push or**
   - **Morphine Sulfate 2.0 mg – 10<u>.0</u> mg SLOW IV Push**
   - **<u>If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ</u>**

   f. Administration of **CARDIZEM® (Diltazem HCL)Lyo-Ject™**
   - 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**<u>.0</u>** 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.

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

1.3. ATRIAL FLUTTER

PARAMEDIC PROCEDURES (continued)

7. **MEDICAL CONTROL**. The following may be ordered.
   a. Administration of **CARDIZEM® (diltiazem HCL) Lyo-Ject™:**
      - 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 Regional Options: **Amiodarone 150 .0 mg IV slowly over 10 minutes.**

   b **If Systolic BLOOD PRESSURE is unstable (less than 100): Synchronized cardioversion** at **50 J**, **100 J, 200 J, 300J,** and **360 J**. Check rhythm and pulse between each attempted cardioversion.
   c If Cardioversion is warranted, consider administration of any of the following for sedation:
      - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
      - **Versed 0.5 mg-2.5 mg SLOW IV Push or**
      - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push, or**
      - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

1.4. BRADYDYSRHYTHMIAS

Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia and late shock. The following can all result in Bradycardia: vagal stimulation, intrinsic cardiac conduction system disease, acute myocardial infarction resulting in heart rates from sinus bradycardia to complete, “third degree" heart blocks. Bradycardia may be a late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, hyperglycemia and previous neurosurgery. Rarely, an ingestion can cause bradycardia. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

1.4. BRADYDYSRHYTHMIAS

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway with appropriate device(s), and **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
3. Remove secretions, vomitus, etc., be prepared to initiate CPR and assist ventilations as needed.
4. If pulse <60 and patient is symptomatic, and/or blood pressure falls below 100 systolic, place the patient supine, treat for shock.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway with appropriate device(s), and **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
3. Remove secretions, vomitus, etc., be prepared to initiate CPR and assist ventilations as needed.
4. If pulse <60 and patient is symptomatic, treat for shock.
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without Paramedics.
7. **ALS STANDING ORDERS**
   a. Advanced Airway Management if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

1.4. BRADYDYSRHYTHMIAS

PARAMEDIC PROCEDURES

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. Cardiac monitor, 12 lead ECG - dysrhythmia recognition
4. Remove secretions, vomitus, etc., be prepared to initiate CPR and assist ventilations as needed.
5 If pulse <60 and patient is symptomatic, treat for shock.
6. Initiate transport as soon as possible.
7. **ALS STANDING ORDERS**
   a. 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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status**
   d. If patient is symptomatic as defined in Assessment Priorities:
      - **Atropine sulfate 0.5 mg to 1.0 mg IV Push or ET every three (3) to five (5) minutes up to total dose 0.04 mg/kg. If administered via ET, 2.0 mg, followed by 2.0 ml of Normal Saline Solution.**
      - **Transcutaneous Pacing (TCP) if indicated.**
   e. If Transcutaneous Pacing (TCP) is warranted, consider administration of **Versed 0.5 mg to 2.5 mg IV push.**
8. Continue to monitor vital signs.
9. Contact **MEDICAL CONTROL**. The following may be ordered:
10. a. Additional Fluid Boluses of Normal Saline as indicated.
    b. **Dopamine 2 mg/kg to 20 mg/kg per minute. (Rate determined by physician)**
    c. **Epinephrine Infusion (mix 1 mg in 250 cc Normal Saline) Administer 2 mg to 10 mg per minute**
    d. **Glucagon 1.0 to 5.0 mg IM, SC or IV** for suspected beta-blocker toxicity.
    e. **Calcium Chloride 10% 2 - 4 mg/kg maximum of 1 gram IV slowly over five (5) minutes** for suspected calcium channel blocker toxicity.
    f. Sedation prior to transcutaneous pacing: administer **Versed 0.5 mg to 2.5 mg IV push**
11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
12. Notify receiving hospital.

1.5. CHEST PAIN

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; and/or nausea/vomiting, etc.) are often among the presenting complaint(s) of patients experiencing a myocardial infarction or an ischemic event of other etiology. All chest pain patients must be carefully monitored until a definitive diagnosis can be made at the hospital. All patients with chest pain 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 an 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. 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. Activate ALS, if available.
5. Initiate transport as soon as possible, with or without ALS.
6. **BLS STANDING ORDERS**
   a. **Determine patient's history of allergies, Administer aspirin (Dose= 162-325 mg Chewable preferred) if not contraindicated and if not already administered.**
   b. 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.
   c. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.

NOTE: Administration of Nitroglycerin is CONTRAINDICATED if the patient has taken Viagra™ (sildenafil) or similar drugs within the last 12 hours. If the patient has taken Viagra™ (sildenafil) or similar drugs within the last 24 hours, contact medical control prior to administration of Nitroglycerin.

1.5. CHEST PAIN

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if available.
5. Initiate transport as soon as possible, with or without ALS.

INTERMEDIATE STANDING ORDERS

6. a**. Determine patient's history of allergies, Administer aspirin (Dose= 162- 325 mg) if not contraindicated and if not already administered.**

   b. 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.

NOTE: Administration of N<u>itroglycerin</u> is CONTRAINDICATED, if the patient has taken Viagra™ <u>(sildenafil) or similar drugs</u> within the last 12 hours. If the patient has taken Viagra™ <u>(sildenafil) or similar drugs</u> within the last 24 hours, contact medical control prior to administration of Nitroglycerin.

   c. Provide advanced airway management if indicated (i.e., patient's condition deteriorates).

   d. **<u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>**

   e. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**

   f. Determine patient eligibility for fibrinolytic therapy. (See appendix)

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

8. Notify receiving hospital.

1.5. CHEST PAIN

PARAMEDIC PROCEDURES

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. Cardiac monitoring- 12 lead ECG - dysrhythmia recognition.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS:**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. Initiate IV Normal Saline (KVO) enroute to the hospital.
   c. **If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc 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. 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).

NOTE: If the patient has taken Viagra™ (sildenafil) or similar drugs within the last 24 hours, contact medical control prior to administration of Nitroglycerin.

   f. **Determine patient's history of allergies, Administer aspirin (Dose= 162-325 mg) if not contraindicated and if not already administered**.
   g. If patient has taken his/her N**itroglycerin** prior to your arrival, and you have determined that the pharmacologic potency of their N**itroglycerin** was normal (based upon standard side effects of N**itroglycerin**, i.e., headache/tingling sensation) without pain relief, contact **Medical Control** for other treatment options.

7. Contact **MEDICAL CONTROL.** The following may be ordered:
   a. Nitroglycerin 0.3 mg - 0.4 mg SL tablet or spray.
   NOTE: Administration of NitroglycerinTG is contraindicated if patient has taken Viagra™ (sildenafil) or similar drugs within the last 12 hours.
   b. **Morphine Sulfate 2.0 mg- 10..0 mg Slow IV PUSH**.
   c. Lidocaine 1.0 mg/kg - 1.5 mg/kg IV PUSH or
   d. If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ
   e. Repeat bolus of **Lidocaine 0.5 mg/kg -0.75 mg/kg**.
   f. If patient's BLOOD PRESSURE remains below 100 systolic in response to N**itroglycerin** or Morphine Sulfate, may order further IV Normal Saline.
   g. 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.
   h. Determine patient eligibility for fibrinolytic therapy. (See appendix)
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

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 the 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. Determine patient's hemodynamic stability and symptoms. Patient's responses to resuscitation vary widely. They may range from being alert with adequate spontaneous respirations and hemodynamic stability, to remaining comatose and apneic and/or having unstable circulation. Mandatory careful and frequently repeated assessments to establish cardiovascular, respiratory and neurological status are required.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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, hemo-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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway, assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Consider potential need for further CPR and/or defibrillation with AED for recurrent V-Fibrillation/ **<u>Ventricular Tachycardia</u>**.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible, with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
9. Notify receiving hospital.

1.6. POST-RESUSCITATION CARE

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway, assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Consider potential need for further CPR and/or defibrillation with AED for recurrent V-Fib/Ventricular Tachycardia.
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible, with or without Paramedics.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Cardiac Monitor 12 lead ECG - Dysrhythmia Recognition.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Initiate/**<u>maintain</u>** IV Normal Saline (KVO).
   c. Consider the potential need for further CPR and/or defibrillation.
   d. Manage dysrhythmias according to specific protocols.
   e. 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**<u>.0</u>** mg –4**<u>.0</u>** mg/minute unless contraindicated.
   <u>CONTRAINDICATIONS</u>: patients with ventricular escape rhythm.
   f. All other standing order treatment modalities as indicated per protocol for specific potential cause of initial cardiopulmonary arrest.

1.6. POST-RESUSCITATION CARE

PARAMEDIC PROCEDURES (continued)

7. Contact **MEDICAL CONTROL.** The following may be ordered:
   a. **Dopamine 2.0 mcg/kg to 20.0 mcg/kg per minute. (Rate determined by physician)**
   b. All other medical control treatment modalities as indicated.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

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.

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 an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. Notify receiving hospital.

1.7. PREMATURE VENTRICULAR COMPLEXES (PVCs)

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without paramedics.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Cardiac monitor 12 lead ECG - dysrhythmia recognition.
5. Determine if PVCs are present and if patient is **symptomatic**:
   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.).
6. Initiate transport as soon as possible.

1.7. PREMATURE VENTRICULAR COMPLEXES (PVCs)

PARAMEDIC PROCEDURES (continued)

7. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates)
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>

   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

   d. 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 Bradycardia Protocol.
   e. 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. **NOTE:** Lidocaine is not recommended as a prophylactic therapy.
   f. **Lidocaine Maintenance Infusion 2 mg/min.- 4 mg/min.**

8. **MEDICAL CONTROL** may order:
   a. **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).
   b. **Lidocaine Infusion 2 mg/min.- 4 mg/min**. (if not performed on standing orders).
   c. **Atropine 0.5 mg** IV push, repeat to **maximum dose of 0.04 mg/kg**.

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

10. Notify receiving hospital.

1.8. PULSELESS ELECTRICAL ACTIVITY (Cardiac Arrest)

Pulseless Electrical Activity (PEA) incorporates the following rhythm disturbances: electromechanical dissociation (EMD), pseudo-EMD, idioventricular rhythms, ventricular escape rhythms, post defibrillation idioventricular rhythms, and bradydysrhythmic rhythms. 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 critical rhythm disturbances. Differential Diagnosis known by the mnemonic "5Hs and 5Ts" should be considered Broad complex PEA can appear as a result of severe Hypovolemia, Hypoxia, Hydrogen ion-preexisting acidosis Hyper-/Hypo-kalemia, Hypothermia and Toxic overdose, of tricyclic antidepressant, beta-blockers, calcium channel blockers and digitalis can produce PEA with specific interventions possible. The one major action that must be taken in the presence of PEA is to search for possible causes especially when you suspect the following conditions resulting in electrical activity without measurable BLOOD PRESSURE: cardiac Tamponade, Tension pneumothorax, coronary Thrombosis (ACS), pulmonary Thrombosis (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, vomitus, initiate CPR, and **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Prior to PEA, symptomatic patients may have abnormally slow or rapid heart rates accompanied by decreased level of consciousness, weak and thready pulses, and/or no palpable BLOOD PRESSURE.
7. Every effort should be made to determine the possible cause(s) for PEA including as differential diagnosis (5Hs and 5Ts) medical and/or traumatic etiologies.
8. Initiate transport as soon as possible, with or without ALS.

1.8. PULSELESS ELECTRICAL ACTIVITY (Cardiac Arrest)

TREATMENT

BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. **EARLY DEFIBRILLATION**.
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Every effort should be made to determine the possible cause(s) for PEA including as differential diagnosis (5Hs and 5Ts) medical and/or traumatic etiologies.
4. Initiate CPR.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. **EARLY DEFIBRILLATION**.
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.
7. Activate Paramedic intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without Paramedics.
9. **ALS STANDING ORDERS**
   a. Provide advanced airway management.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>
   d. Consider underlying causes for PEA (5Hs&5Ts)

10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

1.8. PULSELESS ELECTRICAL ACTIVITY (Cardiac Arrest)

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Every effort should be made to determine the possible cause(s) for PEA including as differential diagnosis (5Hs and 5Ts) medical and/or traumatic etiologies.
4. Initiate CPR.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. Initiate transport as soon as possible.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>
   d. Consider underlying causes for PEA: (5Hs&5Ts)

   - 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 Push** every 3-5 minutes. Epinephrine may be given via Endotracheal Tube **if IV is not established**. (**2 - 2.5 mg of Epinephrine 1:1,000 is preferred (ET) every 3-5 minutes**).
   - If absolute bradycardia (less than 60 Beats per minute) or relative bradycardia, administer **Atropine 1 mg IV Push** every 3-5 minutes to a total of 0.04 mg/kg. Atropine may be given via Endotracheal Tube if IV is not established. **(Atropine 2.0 mg via ET tube** is preferred)
8. 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

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

1.9. SUPRAVENTRICULAR TACHYCARDIA

Supraventricular Tachycardia (SVT) applies to all tachydysrhythmias in which the pacemaker site is originating above the ventricles. Examples of these are Paroxysmal Supraventricular Tachycardia (PSVT), Atrial Fibrillation, Atrial Flutter with a rapid ventricular response, and Junctional Tachycardia with a rapid ventricular response. Generally these groups of tachycardias identify narrow complex rhythm disturbances and should not be confused with Sinus Tachycardia, which is treated quite differently. Narrow complex SVT with heart rates greater than 150/min. requires immediate intervention under most circumstances.

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 using O-P-Q-R-S-T model, including Level of Consciousness, ABCs, and Vital signs.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 **<u>100</u>** shock, pulmonary congestion, congestive heart failure and/or acute myocardial infarction.

1.9. SUPRAVENTRICULAR TACHYCARDIA

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
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. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. Initiate transport as soon as possible with or without ALS.
9. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible, with or without Paramedics. **<u>Do not</u>** allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

8. Notify receiving hospital.

1.9. SUPRAVENTRICULAR TACHYCARDIA

TREATMENT
PARAMEDIC PROCEDURES

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. Cardiac monitor 12 lead ECG - dysrhythmia recognition.
5. Initiate transport as soon as possible. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated (patient's condition deteriorates).
   b. Initiate IV Normal Saline (KVO) enroute to the hospital.
   c. **If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**
   d. Vagal Maneuvers: **Valsalva's and/or cough.**
   e. If Systolic BLOOD PRESSURE is unstable (less than **100**): **Synchronized cardioversion at 50 J, 100 J, 200 J, 300 J and 360 J**. Check rhythm and pulse between each attempted cardioversion.
   f. If cardioversion is warranted, consider administration of any of the following for sedation:
      - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or**
      - **Versed 0.5 mg - 2.5 mg SLOW IV push or**
      - **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV push or**
      - **If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ**

   g. 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.

7. Contact **MEDICAL CONTROL**. The following may be ordered.
   Administration of **CARDIZEM® (diltiazem HCL) Lyo-Ject™:**
   - **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.

1.9 SUPRAVENTRICULAR TACHYCARDIA

PARAMEDIC PROCEDURES (continued)

OR

Amiodarone 150.0 mg IV slowly over 10 minutes.

b. **If Systolic BLOOD PRESSURE is unstable (less than 100): Synchronized cardioversion at 50 J, 100 J, 200 J, 300 J, and 360 J**. Check rhythm and pulse between each attempted cardioversion.

c If Cardioversion is warranted, Medical Control may order any of the following for sedation:
- **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or,**
- **Versed 0.5 mg-2.5 mg SLOW IV Push or,**
- **Morphine Sulfate 2.0 mg – 10.0 mg SLOW IV Push or**
- **If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ**

d. Administer IV Normal Saline 250 cc bolus(es) or titrate IV to patient's hemodynamic status.

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

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. **Note: See also Asystole Protocol.**

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, vomitus, initiate CPR, and **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. **Early defibrillation**
   a. Perform CPR until defibrillator is attached and operable.
   b. Follow AED Protocol.
   c. Resume CPR when appropriate.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Treat for shock.
9. Notify receiving hospital.

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

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. **Early defibrillation**:
   a. Perform CPR until defibrillator is attached and operable.
   b. Follow AED Protocol.
   c. Resume CPR when appropriate.
6. Activate paramedic intercept, if deemed necessary and available.
7. Initiate transport as soon as possible with or without Paramedics.
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

9. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Initiate CPR unless immediate defibrillation is available.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5 Initiate transport as soon as possible.

6. **ALS STANDING ORDERS**
   a. **Defibrillate** up to 3 times at 200J, 200-300J and 360 J as indicated.
   b. Resume CPR if indicated.
   c. Provide advanced airway management.
   d. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   e. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

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

PARAMEDIC PROCEDURES (continued)

6. **ALS STANDING ORDERS (continued)**
   e. Administer **Epinephrine (1:10,000) 1 mg** IV 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 is preferred (ET) every 3-5 minutes**).
   f. Defibrillate at 360J within 30-60 seconds if VENTRICULAR FIBRILLATION/ VENTRICULAR TACHYCARDIA is persistent:
   g. Resume CPR.
   h. **Administer Either**: **Lidocaine** 1.5 mg/kg IV; subsequent dosage: 0.5 to 0.75 mg/kg IV every 3 - 5 minutes to a total dose of 3 mg/kg IV 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.

OR

AMIODARONE 300 mg slow IV push.

   i. Defibrillate 30-60 seconds after each dose of medication (pattern should be drug-shock, drug-shock). If VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA is persistent:

   - Defibrillate at 360 J.
   - Resume CPR. If VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA is persistent:

   j. If dysrhythmia is successfully converted, consider IV infusion of Lidocaine 2-4 mg/min. and follow Post-Resuscitation Care protocol.

7. **MEDICAL CONTROL** may order:
   a. **Sodium Bicarbonate 1 mEq/kg**, IV push.
   b. **Magnesium Sulfate 1 - 2 grams** IV in Torsades de points or suspected hypomagnesemic state or severe refractory VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA.
   c. **Amiodarone 300 mg slow IV push** if not already given**.**
8. Notify receiving hospital.

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 anytime 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:

A. **PULSELESS**: in essence in Cardiopulmonary Arrest. See **Ventricular Fibrilation** Protocol.
B. **STABLE**: presents with pulses, conscious, without chest pain, Systolic BLOOD PRESSURE greater than **100.**
C. **UNSTABLE**: presents with pulses, but is symptomatic: chest pain, palpitations, shortness of breath (SOB), possible signs and symptoms of congestive heart failure (CHF), hypotension (systolic BLOOD PRESSURE less than **100.**), 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.

1.11. VENTRICULAR TACHYCARDIA WITH PULSES

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. 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 and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
9. 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. 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 and assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available
5. Initiate transport as soon as possible with or without Paramedics.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

1.11. VENTRICULAR TACHYCARDIA WITH PULSES

PARAMEDIC PROCEDURES

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 and assist ventilations as needed.
3. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
4. Initiate transport as soon as possible.
5. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**
   d. If Systolic BLOOD PRESSURE is unstable (less than **100**): **Synchronized cardioversion at 100 J, 200 J, 300 J and 360 J**. Check rhythm and pulse between each attempted cardioversion.
   e. If cardioversion is warranted, consider administration of any of the following for sedation:
      - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push, if patient > 70 kg: 5.0 mg SLOW IV Push or,**
      - **Versed 0.5 mg - 2.5 mg SLOW IV push or,**
      - **Morphine Sulfate 2.0 mg - 10 mg**
      - **If no IV access, Morphine Sulfate 2.0 mg – 10.0mg IM/SQ**
   f. If Systolic BLOOD PRESSURE is stable (greater than or equal to **100**), administer **Lidocaine 1.0-1.5 mg/kg** IV push.
   g. Repeat **Lidocaine** administration **0.5-0.75 mg/kg** IV push every 5-10 minutes, to a **maximum total dose 3 mg/kg.**
   h. **If dysrhythmia is successfully converted, consider IV infusion of Lidocaine 2.0-4.0 mg/min.**

6. **MEDICAL CONTROL** 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 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 cc Normal Saline, slow IV push over 1-2 minutes.**
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

ENVIRONMENTAL EMERGENCIES

2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

Drowning is defined as death that is the result of asphyxia due to airway obstruction secondary to laryngospasm and/or aspiration of liquid into the lungs after submersion and occurs within twenty-four (24) hours after submersion. **Near-Drowning** is defined as a submersion episode that results in survival (full or partial recovery) or temporary survival that ultimately leads to death after a period of twenty-four (24) hours.

Drowning begins with accidental or intentional submersion in any liquid, however, fresh and salt water drowning are the most common. 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 is not dead until he/she is warm and dead, unless the patient has been submerged 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 candidates for hyperbaric chamber therapy.

2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

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, or the administration of **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. 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 regional 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.

2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

TREATMENT
BASIC PROCEDURES

1. Ensure scene and rescuer safety. Call appropriate public safety agencies: police, fire, and/or rescue 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 and assist ventilations as needed, immediately upon obtaining access to patient. Ensure spinal stabilization and immobilization if indicated (i.e., unwitnessed event, unconscious patient, or mechanism of injury).
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 as indicated.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. Relieve gastric distension **ONLY** if it interferes with artificial ventilations.
7 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 and follow Asystole & AED protocol.
8. Obtain appropriate S-A-M-P-L-E history related to event. (length of exposure, temperature of liquid medium, potential for injury).
9. Activate ALS intercept, if deemed necessary and if available.
10 Initiate transport as soon as possible with or without ALS.
11 If suspected hypothermia: see **Hypothermia / Cold Emergencies** protocol.
12. Secure pulseless patient on cot in supine position. Secure patient with pulse in left lateral Trendelenburg position. Cover to prevent heat loss and treat for shock.
13. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
14. Notify receiving hospital.

Note: If near drowning incident involves a scuba diver, suggesting barotrauma, consider utilization of **hyperbaric treatment facility** and follow regional point-of-entry protocol.

2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

INTERMEDIATE PROCEDURES

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.
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed, immediately upon obtaining access to patient. Ensure spinal stabilization and immobilization if indicated (i.e., unwitnessed event, unconscious patient, or mechanism of injury).
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 as indicated.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Initiate CPR when appropriate and follow AED protocol

7. Obtain appropriate history related to event (length of exposure, temperature of liquid medium, potential for injury), including Past Medical History, Medications, Drug Allergies, and Substance abuse.

8. Activate Paramedic intercept, if deemed necessary and if available.
9. Initiate transport as soon as possible with or without Paramedics.

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

11. Obtain appropriate history related to event (length of exposure, temperature of liquid medium, potential for injury), including Past Medical History, Medications, Drug Allergies, and Substance abuse.
12. If suspected hypothermia: see **Hypothermia / Cold Emergencies** protocol.
13 Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
14. Notify receiving hospital.

Note: If near drowning incident involves a scuba diver, suggesting barotrauma, consider utilization of **hyperbaric treatment facility** and follow regional point-of-entry protocol.

2.1. DROWNING AND NEAR-DROWNING EMERGENCIES

PARAMEDIC PROCEDURES

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.
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed, immediately upon obtaining access to patient. Ensure spinal stabilization and immobilization if indicated (i.e., unwitnessed event, unconscious patient, or mechanism of injury).
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 as indicated and the administration of **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 history related to event (length of exposure, temperature of liquid medium, potential for injury), including Past Medical History, Medications, Drug Allergies, and Substance abuse.
7. Initiate transport as soon as possible.
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Initiate IV Normal Saline (KVO) **<u>enroute to the hospital</u>** in non-traumatic drowning/near drowning.
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**
   d. Cardiac Monitor 12 lead ECG - dysrhythmia recognition: **manage per protocols.**
9. Obtain appropriate history related to event (length of exposure, temperature of liquid medium, potential for injury), including Past Medical History, Medications, Drug Allergies, and Substance abuse.
10. If suspected hypothermia: see **Hypothermia / Cold Emergencies** protocol.

11. Contact **MEDICAL CONTROL**. Medical Control may order:
    a. Additional 250 cc - 500 cc fluid bolus(es), wide open or titrate to patient's hemodynamic status.
12. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

Note: If near drowning incident involves a scuba diver, suggesting barotrauma, consider utilization of **hyperbaric treatment facility** and follow regional point-of-entry protocol.

2.2. ELECTROCUTION / LIGHTNING INJURIES

Electrical injuries are a relatively common, complex and potentially devastating form of trauma. 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.

Therefore, 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. In general, lightning exposure/contact may result in the most severe form of electrical injury.

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 an 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
7. 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.
8. **<u>Apply AED to determine V-Fib.</u>**
9. 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.
10 Monitor and record vital signs and ECG.
11 Prevent / treat for shock.
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.

2.2. ELECTROCUTION / LIGHTNING INJURIES

TREATMENT
BASIC PROCEDURES

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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points,etc.)
6. If patient is in cardiopulmonary arrest:
   a. Initiate CPR with supplemental oxygen.
   b. Apply AED to determine V-Fib.
7. Activate ALS intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without ALS
9. 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.
10. Manage burn injuries and/or entrance and exit wounds as indicated. (See **Burn Protocol**.)
11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
12. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
13. Notify receiving hospital.

2.2. ELECTROCUTION / LIGHTNING INJURIES

INTERMEDIATE PROCEDURES

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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.)
6. If patient is in cardiopulmonary arrest:
   a. Initiate CPR with supplemental oxygen
   b. Apply AED to determine VF/VT
7. Contact Paramedic intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without Paramedics.
9. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Initiate large bore IV Lactated Ringers **or** Initiate IV Normal Saline (KVO).
   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. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

2.2 ELECTROCUTION / LIGHTNING INJURIES

INTERMEDIATE PROCEDURES (con't)

10. Manage burn injuries and or entrance and exit wounds as indicated. If extensive burns (moderate to severe) noted, manage patient according to **Burn Protocol**.

11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

12. Notify receiving hospital.

PARAMEDIC PROCEDURES

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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points,etc.)
6. Initiate transport as soon as possible.
7. **ALS 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 Lactated Ringers or Initiate IV Normal Saline (KVO). 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

2.2 ELECTROCUTION / LIGHTNING INJURIES

*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.

8. Manage burn injuries and or entrance and exit wounds as indicated. Manage burn injuries and or entrance and exit wounds as indicated. If extensive burns (moderate to severe) noted, manage patient according to **Burn Protocol**.

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

10. Notify receiving hospital.

2.3. HYPERTHERMIA / HEAT EMERGENCIES

Heat emergencies result from one of two primary causes: environmental (exogenous heat load when the temperature exceeds 32º C or 90º 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 103º F. Rapid recovery generally follows 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. This is a true medical emergency.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

2.3. HYPERTHERMIA / HEAT EMERGENCIES

TREATMENT
BASIC PROCEDURES

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. 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.

5. 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.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

2.3. HYPERTHERMIA / HEAT EMERGENCIES

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. 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.
   c. Use evaporation techniques if possible (fans, open windows).

5. 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.
6. Activate Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without Paramedics.

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

9. Contact **MEDICAL CONTROL**. Medical control may order:
   - Additional IV Normal Saline 250 cc - 500 cc bolus (es), wide open or titrated to patient's hemodynamic status.
10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

2.3. HYPERTHERMIA / HEAT EMERGENCIES

PARAMEDIC PROCEDURES

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. 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
   c. Use evaporation techniques if possible (fans, open windows).

5. 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.
6. Initiate transport as soon as possible.

7. **ALS STANDING ORDERS**
   a. Provide advanced airway management (if indicated).
   b. Cardiac monitor: **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status**

8. Contact **MEDICAL CONTROL**. Medical control may order:
   - Additional IV Normal Saline 250 cc - 500 cc bolus(es), wide open or titrated to patient's hemodynamic status.
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

2.4. HYPOTHERMIA / COLD EMERGENCIES

Cold Emergencies include conditions such as 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). Frostbite most commonly involves the lower extremities and less commonly in the upper extremities, it may also affect ears, nose, and other unprotected body areas. 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 95ºF (35ºC). Mild hypothermia presents often 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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

2.4. HYPOTHERMIA / COLD EMERGENCIES

TREATMENT
BASIC PROCEDURES

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 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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
4. 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.
5. If patient is in cardiopulmonary arrest:
   a. Initiate CPR and **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
   b. Apply AED to determine V-Fib and defibrillate up to total of three shocks.

6. Whenever possible, use warmed, humidified oxygen (104°F - 107°F, 40°C - 42°C) by **non-rebreather mask,** during resuscitation procedures for hypothermic patients.
7. Remove wet clothing (by cutting clothing to limit patient movement) and prevent further heat loss with use of blankets.
8. 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.

9. Activate ALS intercept, if deemed necessary and if available.
10. Initiate transport as soon as possible with or without ALS.
11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
12. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
13. Notify receiving hospital.

2.4. HYPOTHERMIA / COLD EMERGENCIES

INTERMEDIATE PROCEDURES

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 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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
4. 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.
5. If patient is in cardiopulmonary arrest:
   a. Initiate CPR with supplement oxygen.
   b. Apply AED to determine VF/VT and defibrillate up to total of three shocks.
6. Activate Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without Paramedics.

8. **ALS 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**, **<u>or an appropriate oxygen delivery device, as clinically indicated,</u>** during resuscitation procedures for hypothermic patients.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**

9. Remove wet clothing (by cutting clothing to limit patient movement) and prevent further heat loss with use of blankets.
11. 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.
12. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

2.4. HYPOTHERMIA / COLD EMERGENCIES

PARAMEDIC PROCEDURES

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 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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
4. 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.
5. Initiate transport as soon as possible.

6. **ALS 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**, **<u>or an appropriate oxygen delivery device, as clinically indicated,</u>** 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 cc 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. **Thiamine 100 mg** IV Push or IM (unless patient is clearly suffering from hypoglycemia due to insulin shock).
   - f. **Determine Blood Glucose** level:
   - If glucose is greater than 100 mg/dL, Glucose administration is not necessary.
   - If glucose is less than 100 mg/dL, administer 25 gm of 50% Dextrose solution IV push.
   - g. Administer **Narcan 0.4 - 2.0 mg** IV Push, IM **<u>or Nasal via atomizer</u>** if obvious narcotic overdose.

Note: In general, IV drug administration to the severely hypothermic patient requires change in frequency of administration and should be given with medical control consult.

7. Remove wet clothing (by cutting clothing to limit patient movement) and prevent further heat loss with use of blankets.
8. Manage dysrhythmias or cardiac arrest according to protocol.
9. Contact **MEDICAL CONTROL:** Medical Control may order:
   a. Warmed Normal Saline IV Solution (104°F - 107°F, 40°C - 42°C) whenever possible.
10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

2.4. HYPOTHERMIA / COLD EMERGENCIES

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). Rescuers will need to place patient in a safe environment so the rescuers may administer care.
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

2.5. RADIATION INJURIES

TREATMENT
BASIC PROCEDURES

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 (HAZMAT TEAM) 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 decontaminated by appropriate personnel with the necessary protective gear. The patient then will need to be brought to a safe environment so the rescuers may administer care.**
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Manage burn injuries as indicated in the severely exposed patient.
6. Activate ALS intercept if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital. If severe radiation burns are noted, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center.

2.5. RADIATION INJURIES

INTERMEDIATE PROCEDURES

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 (HAZMAT TEAM) 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 decontaminated by appropriate personnel with the necessary protective gear. The patient then will need to be brought to a safe environment so the rescuers may administer care.**
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Manage burn injuries as indicated in the severely exposed patient.
6. Contact Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without Paramedics.

8. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital. If severe radiation burns are noted, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center.

PARAMEDIC PROCEDURES

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 (HAZMAT TEAM) 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 decontaminated by appropriate personnel with the necessary protective gear. The patient then will need to be brought to a safe environment so the rescuers may administer care.**
2. Maintain appropriate body substance isolation precautions.
3. Maintain an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.

2.5. RADIATION INJURIES

PARAMEDIC PROCEDURES (continued)

4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Manage burn injuries as indicated in the severely exposed patient.

6. Initiate transport as soon as possible.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
   d. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

8 Notify receiving hospital. If severe radiation burns are noted, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center.

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. For self-care, Mark 1, kits must be obtained via a prescription**
- **NOTE 3. EMT-Basic can now carry and use Mark 1 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 4. To administer the Mark 1™ 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.**

2.6 NERVE AGENT EXPOSURE PROTOCOL

ASSESSMENT / TREATMENT PRIORITIES

NOTE: Strict Observance of Scene Safety Must Remain a Priority. Due to rapid changes in establishing a safe scene, other agencies that may respond, may not follow the sequence (3-5) as listed below. The circumstances of the incident will dictate who needs to be contacted first.

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 kit to adult patient if evidence of nerve agent exposure and if kit is available.
    a. Administer 1 to 3 Mark-1 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)

SELF-CARE PROCEDURES

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

2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)

TREATMENT
EMT BASIC PROCEDURES

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. Maintain open airway, suction and ventilate as necessary using airway adjuncts (oropharyngeal airway, nasopharyngeal airway as indicated).
3. Attempt identification of offending agent, if possible
4. **Administer Oxygen** using appropriate oxygen delivery device, as clinically indicated.
5. Administer Mark-1 kit to adult patient if evidence of nerve agent exposure and if kit is available.
    a. Administer 1 to 3 Mark-1 kits based on the degree of symptoms.
6. Activate ALS intercept if necessary and available.
7. Initiate mass casualty/ disaster plan if necessary.
8. Monitor and record vital signs and respiratory status at frequent intervals; at least every five minutes as patient load permits.
9. Initiate transport as soon as possible.
10. Notify receiving hospital, unless disaster plan otherwise instructs.

- **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)**

INTERMEDIATE PROCEDURES

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. Maintain open airway, suction and ventilate as necessary using airway adjuncts (oropharyngeal airway, nasopharyngeal airway as indicated).
3. Attempt identification of offending agent, if possible
4. **Administer** 100% **Oxygen** by non-rebreather mask, or BVM as indicated.
5. Administer Mark-1 kit to adult patient if evidence of nerve agent exposure and if kit is available.
    a. Administer 1 to 3 Mark-1 kits based on the degree of symptoms.
6. Activate Paramedic intercept if necessary and available.
7. Initiate mass casualty/ disaster plan if necessary

ALS STANDING ORDERS

a. Provide advanced airway management (if indicated).
b. Obtain IV access if situation permits (low priority in disaster situation).

2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)

INTERMEDIATE PROCEDURES (con't)

c. Treat for shock as needed (blood pressure below 100 systolic).
d. Monitor and record vital signs and respiratory status at frequent intervals; at least every five minutes as patient load permits.

8. Initiate transport as soon as possible.
9. Notify receiving hospital, unless disaster plan otherwise instructs.

- **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)**

PARAMEDIC PROCEDURES

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. Maintain open airway, suction and ventilate as necessary using airway adjuncts (oropharyngeal airway, nasopharyngeal airway as indicated).
3. Attempt identification of offending agent, if possible
4. **Administer** 100% O2 by non-rebreather mask, or BVM as indicated.
5. Administer Mark-1 kit to adult patient if evidence of nerve agent exposure and if kit is available.
   a. Administer 1 to 3 Mark-1 kits based on the degree of symptoms.
6. Initiate mass casualty/ disaster plan if necessary.

7. **ALS 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 kits: Administer Mark 1 kit to adult patient if evidence of nerve agent exposure and if kit is available. (If not previously administered)
      i. Administer 1 to 3 Mark-1 kits based on degree of symptoms,

      OR

      ii. For multi-dose vial (See appendix)

8. **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 (i.e. bronchospasm management)

2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)

9. Monitor and record vital signs and respiratory status at frequent intervals; at least every five minutes as patient load permits.

10. Initiate transport as soon as possible.

11. Notify receiving hospital, unless disaster plan otherwise instructs.

- **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)**

- **NOTE : The first dose of Atropine is given IM. Additional doses of 1-2 mg Atropine IM or IV may be required.**

- **NOTE: Monitor ease of ventilation every 5 minutes for effects.**

- **NOTE : Pralidoxime Chloride IV should be infused over 30-60 minutes.**

2.6 NERVE AGENT EXPOSURE PROTOCOL (con't)

MILD SYMPTOMS:

BLS/ ALS STANDING ORDERS :

i. Administer One Mark I kits 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 Mark I 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** Mark I 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**.**

~ ~ ~

3. MEDICAL EMERGENCIES

3.1. ABDOMINAL PAIN (non-traumatic)

Acute abdominal pain may have a sudden onset and may present as mild to severe in nature. Abdominal pain may be the result of **hemorrhagic etiologies** (e.g., gastrointestinal ulcers, abdominal aortic aneurysm, ectopic pregnancy and esophageal varices) that may have immediate life threatening complications or **non-hemorrhagic etiologies** (i.e., herniation, obstructive and inflammatory conditions).

Abdominal emergencies may classified into three (3) primary categories: **Gastrointestinal** (upper & lower bowel hemorrhage, pancreatitis, cholecystitis, hepatitis, tumors, appendicitis, diverticulitis, perforated viscus and bowel obstruction), **Genitourinary** (kidney stones, urinary tract infections, pyelonephritis and acute & chronic renal failure) and **Reproductive** (**female:** pelvic inflammatory disease, ruptured ovarian cyst, dysfunctional uterine bleeding, endometriosis, tumors, and ectopic pregnancy; **male:** testicular torsion, epididymitis and prostatitis).

The **acute abdomen** refers to the relatively sudden onset of severe abdominal pain (although gradual onset of pain leading to an acute abdomen does occur) signifying a potential abdominal catastrophe. It is often associated with nausea, vomiting, guarding, rebound tenderness and abdominal distention. Prompt evaluation and management along with rapid transport can reduce morbidity and mortality.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

NOTE: It is unnecessary and potentially detrimental to attempt auscultation and/or percussion of the abdomen in the out of hospital setting.

3.1. ABDOMINAL PAIN (non-traumatic)

TREATMENT
BASIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient on cot in position of comfort. Flexion of the knees and hips may help reduce pain.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient exhibits signs and/or symptoms of shock (i.e. patient's BLOOD PRESSURE drops below 100 systolic), treat for shock**.**
9. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient on cot in a position of comfort. Flexion of the knees and hips may help reduce pain.
5. Activate Paramedic intercept if deemed necessary and if available.
6. Initiate transport as soon as possible with or without Paramedics.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management (if indicated).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

9. Contact **MEDICAL CONTROL**. **Medical Control** may order:
   a. administration of additional fluid
10. Notify receiving hospital.

3.1. ABDOMINAL PAIN (non-traumatic)

PARAMEDIC PROCEDURES

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** **<u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient on cot in a position of comfort. Flexion of the knees and hips may help reduce pain.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management (if indicated).
   b. Cardiac monitor **12 lead ECG** - dysrhythmia recognition. **Treat dysrhythmias per protocol**.
   d. Initiate **1-2 IVs** Normal Saline. **<u>enroute to the hospital.</u>**
   e. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
   7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

8. Contact **MEDICAL CONTROL**. **Medical Control** may order:
   a. administration of additional IV Saline 250 cc-500 cc or wide open titrated to patient's condition.

9. Notify receiving hospital.

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.

NOTE: To administer a patient's epinephrine auto-injector, EMTs must be certified as an EMT-Basic through completion of an initial EMT-B course, or an EMT-B Refresher or Transition course, and are operating with an ambulance service under a Medical Control Agreement.

To administer the ambulance services epinephrine auto-injector EMTs must be authorized through a state approved epinephrine auto-injector course and are operating with an ambulance service under a Medical Control Agreement.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

3.2. ALLERGIC REACTION / ANAPHYLAXIS

TREATMENT
BASIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. **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.

7. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without Paramedics.

6. **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.

3.2 ALLERGIC REACTION / ANAPHYLAXIS

INTERMEDIATE PROCEDURES (con't)

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.

6. Provide advanced airway management, if indicated.
7. **Initiate IV Normal Saline (KVO) enroute to the hospital.**
8. **If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status**
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Initiate transport as soon as possible.

5. **STANDING ORDERS**
   a. Provide advanced airway management (if indicated)
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>
   d. **Mild Distress:** monitor for signs of severe distress.
   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.**
      - **Benadryl 25 mg- 50 mg IV push or deep IM.**
      - **Albuterol 0.5% (0.5 ml 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.

3.2 ALLERGIC REACTION / ANAPHYLAXIS (CON'T)

PARAMEDIC PROCEDURES (con't)

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 ml mixed with 3 ml of Normal Saline) via nebulizer.
e. Benadryl 25 mg- 50 mg IV Push or deep IM.
f. Dopamine infusion 2 - 20 µg/Kg minute (Rate determined by physician)

7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

8. Notify receiving hospital.

3.3. ALTERED MENTAL/NEUROLOGICAL STATUS ~ DIABETIC

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 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 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.
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.

3.3 ALTERED MENTAL/NEUROLOGICAL STATUS ~ DIABETIC

TREATMENT
BASIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine immobilization.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.

7. 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.

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

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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine immobilization.

5. **<u>STANDING ORDERS</u>**
   a. If patient is a known diabetic who is **<u>conscious</u>** and can **<u>speak</u>** **<u>and swallow</u>**, **<u>administer oral glucose</u>** or other sugar source as tolerated. One dose equals one tube. A **<u>second dose (tube)</u>** may be necessary.

3.3 ALTERED MENTAL/NEUROLOGICAL STATUS ~ DIABETIC

INTERMEDIATE PROCEDURES (con't)

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

6. Activate Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without Paramedics.

8. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
   - d. Draw red top blood sample.

9. If patient is unconscious or seizing, transport on left side (coma position).
10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

PARAMEDIC PROCEDURES

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. Initiate transport as soon as possible.

5. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.**
   - d. Apply Cardiac Monitor: **12 lead ECG - Manage dysrhythmias per protocol**.
   - e. If obvious narcotic overdose:
     - **Narcan 0.4-2.0 mg IV Push or IM, SC, ET or Nasal via atomizer. Additional Narcan (0.4-2.0 mg) may be administered as necessary.**
   - f. **Thiamine 100 mg** IV or IM (unless patient is clearly suffering from hypoglycemia due to insulin shock)
   - g. Determine Blood Glucose level:
     - **If glucose is greater than 100 mg/dL, Glucose administration unnecessary.**

3.3. ALTERED MENTAL/ NEUROLOGICAL STATUS ~ DIABETIC

PARAMEDIC PROCEDURES (con't)
ALS STANDING ORDERS (con't)

- **If glucose is less than 100 mg/dL, administer Dextrose 50%, 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.

6. **MEDICAL CONTROL** may order:
   a. Dextrose 50%, 25 gm IV Push
   b. Narcan 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, toxic exposure: refer to specific protocols.
7. If patient is unconscious or seizing, transport on left side (coma position).
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

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 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), fluid build up, use of accessory muscles, and/or nasal flaring (especially in children) can also be signs of a serious medical problem. 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. 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 using appropriate airway adjuncts.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated</u>.**
4. Activate ALS intercept, if available.
5. Initiate transport as soon as possible with or without ALS.

6. BLS STANDING ORDERS

<u>MILD DISTRESS</u>

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: **<u>and the inhaler is present:</u>**

i) Encourage and/or assist patent 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) **<u>Contact MEDICAL CONTROL. The following may be ordered</u>**

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.

<u>If properly trained and authorized, use the EMS Assisted Albuterol Program Protocol to treat the patient.</u>**

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

3.4. BRONCHOSPASM / RESPIRATORY DISTRESS (con't)

7. Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.
8. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
9. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 ventilation as needed using appropriate adjuncts.
3. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
4. Activate Paramedic intercept, if available.
5. Initiate transport as soon as possible with or without Paramedics.

6. **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 patent 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 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 (cont)

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

10 Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.
11. Notify receiving hospital.

PARAMEDIC PROCEDURES

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. Cardiac Monitoring **12 lead ECG** - **Manage dysrhythmias per protocol**
5. Initiate transport as soon as possible.

6. **ALS STANDING ORDERS**
   a. **MILD DISTRESS**:
      - Administer Albuterol 0.5% **solution** 0.5 ml 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 ml mixed with 3 ml of Normal Saline via nebulizer. **Ipratropium Bromide (Atrovent), 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.**

7. Initiate IV Normal Saline (KVO) enroute to the hospital.
8. If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc 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. **Atrovent Inhalation Aerosol** (2 puffs) via metered dose inhaler with or without spacer device (e.g. - aerochamber).
   c. **Atrovent** 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.)

3.4 BRONCHOSPASM / RESPIRATORY DISTRESS (cont)

e. **Epinephrine 1:10,000 0.1 mg- 0. 5 mg IV push***
f. For patients with known cardiac disease: **Terbutaline Sulfate 0.25 mg** subcutaneous (SC). A second dose may be required.

8. Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.

9. Notify receiving hospital.

***CAUTION: The use of Epinephrine in patients over the age of 40 <u>or with known cardiac disease</u> 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. It is characterized by intense shortness of breath, cough, anxiety, cyanosis, diaphoresis, rales and/or wheezing. In extreme cases, patients will exhibit diaphoresis, restlessness, apprehension and may cough up pink frothy sputum.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient to cot in full sitting position, or position of comfort as tolerated.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

3.5. CONGESTIVE HEART FAILURE / PULMONARY EDEMA

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient to cot in full sitting position, or position of comfort as tolerated.
5. Activate paramedic ALS intercept, if available.
6. Initiate transport as soon as possible with or without paramedics**.**
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management (endotracheal intubation), if indicated.
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>
8. Contact **MEDICAL CONTROL**.
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Place patient in full sitting position, or position of comfort as tolerated.
5. Initiate transport as soon as possible.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management (endotracheal intubation), if indicated.
   b. **<u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>**
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
   d. Administer **Nitroglycerin (NTG) SL tablet; 0.4 mg (1/150 gr.) or NTG spray** if systolic BLOOD PRESSURE is greater than 100. N**itroglycerin** may be repeated in five (5) minute intervals times two (2) as dictated by patient's Blood Pressure.

<u>NOTE</u>: If the patient has taken Viagra™ <u>(sildenafil) or similar drugs</u> within the last 24 hours, contact medical control prior to administration of Nitroglycerin.

   e. **Furosemide (Lasix): 20<u>.0</u>- 40<u>.0</u> mg IV PUSH** if not currently on diuretics, **40<u>.0</u>-80<u>.0</u> mg IV PUSH** if patient is on diuretics. Contact **Medical Control** if systolic blood pressure is less than 100 mmHg.

3.5. CONGESTIVE HEART FAILURE / PULMONARY EDEMA

PARAMEDIC PROCEDURES (con't)

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 (Versed) 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**.

NOTE: Administration of Nitroglycerin is contraindicated if patient has taken Viagra™ (sildenafil) or similar drugs within the last 12 hours.

c. **1" Nitropaste** to anterior chest wall.
d. Repeat doses of **Furosemide (Lasix)**.
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. Vasopressors: Infusion rates determined by Medical Control.
   - **Dopamine infusion 2.0 – 20.0 mg/kg/minute.** (Rate determined by physician)
   - **Dobutamine infusion 2.0 – 20.0 mg/kg/minute**

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

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 is glaucoma. Sudden painless loss of vision secondary to arterial embolus is another treatable medical emergency. 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 regional point-of-entry protocols 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 PROCEDURES

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. Obtain appropriate S-A-M-P-L-E history related to event, including any Trauma (i.e. recent head trauma.
5. 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**:
      6. Puncture wound with no impaled object: Both eyes should be patched and protected.
      7. 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.

6. 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.
7. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
8. Secure patient on cot in position of comfort.
9. Activate ALS intercept, if deemed necessary and if available.
10. Initiate transport as soon as possible with or without ALS.
11. 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 in 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.**
12. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

3.6. EYE EMERGENCIES

INTERMEDIATE PROCEDURES

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. Obtain appropriate history related to event, including Past Medical History, Medications, Drug Allergies, Substance Abuse or Trauma (i.e., recent head trauma).
5. 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**:
      8. Puncture wound with no impaled object: Both eyes should be patched and protected.
      9. *If object impaled in the eye. NOTE: Objects penetrating the eye globe should only be removed in-hospital.
   d. **Thermal Burns:** Both eyes should be patched and protected.

6. 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.
7. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
8. Secure patient on cot in position of comfort.
9. Activate Paramedic intercept, if deemed necessary and if available.
10. Initiate transport as soon as possible with or without Paramedics.
11. 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 in 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.**

12. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

3.6. EYE EMERGENCIES

PARAMEDIC PROCEDURES

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. Obtain appropriate history related to event, including Past Medical History, Medications, Drug Allergies, Substance Abuse or Trauma (i.e., recent head trauma).
5. 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**:
      10. Puncture wound with no impaled object: Both eyes should be patched and protected.
      11. *If object impaled in the eye. NOTE: Objects penetrating the eye globe should only be removed in-hospital.
   d. **Thermal Burns:** Both eyes should be patched and protected.
6. 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.
7. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
8. Secure patient on cot in position of comfort.
9. Initiate transport as soon as possible.
10. 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 in 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.**

11. 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<u>. NOTE</u>: Cardiac (EKG) monitor <u>(12 lead ECG) is</u> required for this procedure (i.e., vagal stimulus: bradycardia<u>). CAUTION</u>: If Tetracaine has been administered, do not apply pressure to eye.**

3.6 EYE EMERGENCIES

PARAMEDIC PROCEDURES (cont)

12. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

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*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 emergencies may include any of the following conditions in the presence of a **diastolic** BLOOD PRESSURE greater than 115-130: myocardial ischemia, aortic dissection, pulmonary edema, hypertensive intracranial hemorrhage, toxemia of pregnancy and/or hypertensive encephalopathy.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

3.7. HYPERTENSIVE EMERGENCIES

TREATMENT
BASIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Secure patient on cot in position of comfort.
6. Initiate transport as soon as possible with or without ALS**.**
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Secure patient on cot in position of comfort.
6. Initiate transport as soon as possible with or without Paramedics.
7. **ALS STANDING ORDERS**
   - **a.** Provide advanced airway management (endotracheal intubation), if indicated.
   - **b.** **<u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>**
   - **c.** **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

3.7. HYPERTENSIVE EMERGENCIES

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Secure patient on cot in position of comfort.
5. Initiate transport as soon as possible.

6. **ALS STANDING ORDERS**
    a. Provide advanced airway management (endotracheal intubation), if indicated.
    b. **<u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>**
    c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
    d. Cardiac monitor **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. N**<u>itroglycerin</u>** 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: Administration of Nitroglycerin is contraindicated if patient has taken Viagra™ <u>(sildenafil) or similar drugs</u> within the last 12 hours.

    b. **Morphine Sulfate 2<u>.0</u> mg to <u>10.0</u> mg** IV push.
    c. **<u>If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ</u>**
    d. **Furosemide (Lasix) 0.5 mg/kg - 1.0 mg/kg** IV push (SLOWLY) for patients presenting with congestive heart failure (CHF) or pulmonary edema.

    CONTRAINDICATIONS: Presence of second or third degree heart blocks or evidence of recent cerebrovascular accident (CVA).

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

9. Notify receiving hospital.

3.8. OBSTETRICAL EMERGENCIES

There are a significant number of problems that may be classified as Obstetrical Emergencies. These emergencies include, but are not limited to the following: **abortion**, (spontaneous, threatened, inevitable, incomplete, criminal, therapeutic and elective), **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 resulting in bleeding disorders 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 regional point-of-entry protocols.
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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. See specific management protocols below and follow appropriate treatment procedures.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient’s BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

3.8. OBSTETRICAL EMERGENCIES

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without Paramedics.
7. See specific management protocols below and follow appropriate treatment procedures

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

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

   a. administration of additional IV Normal Saline

10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

3.8. OBSTETRICAL EMERGENCIES

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. Initiate transport as soon as possible.

<u>NOTE:</u> See specific management protocols below and follow appropriate treatment procedures.

7. **ALS STANDING ORDERS**
   a. Provide advanced airway management (if indicated).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**
   d. Cardiac monitor **12 lead ECG** - **Manage dysrhythmias per protocol**

8. Contact **MEDICAL CONTROL**. **Medical Control** may order:
   a. Administration of additional IV Normal Saline.

   b. Depending upon patient's condition, further treatment modalities may be required as listed below.
      - **Magnesium Sulfate 10% 1- 4 gm IV over three (3) minutes (i.e., for eclampsia).**
      - **Ativan (Lorazepam) 2mg-4mg slow IV push or Intramuscularly (IM) (i.e., for eclamptic seizures).**
      - **Valium (Diazepam) 2-4 mg slow IV push or Intramuscularly (IM) (i.e. for eclamptic seizures).**
      - **Calcium Chloride 10% 2 mg-4 mg/kg slow IV push over 5 minutes. (Antidote for Magnesium Sulfate).**
      - **Pitocin (Oxytocin) 10 units IM after delivery of placenta. (management of postpartum hemorrhage) NOTE: Consider possibility of multiple fetuses prior to administration of Pitocin.**

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

When administering emergency care for any of the following conditions, remember that you are treating a primary patient who may be embarrassed, apprehensive and frightened for herself and her unborn child. Therefore, it is important for you to treat her with respect and kindness and to provide her with emotional support. However, in actuality, you are treating two (2) patients.

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.

Treatment: Follow general treatment guidelines as indicated in protocols.

- Provide Airway management
- **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
- Keep patient warm and place patient in a left lateral recumbent position.
- Treat for shock
- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.
- If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

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.

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.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

ABRUPTIO PLACENTA: (con't)

Treatment: Follow general treatment guidelines as indicated in protocols.

- Provide Airway management
- **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
- Keep patient warm and place patient in a left lateral recumbent position.
- Treat for shock
- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.
- If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

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.

Treatment: Follow general treatment guidelines as indicated in protocols.

- Provide Airway management
- **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
- Keep patient warm and place patient in a left lateral recumbent position.
- Treat for shock
- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.
- If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

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.

Treatment: Follow general treatment guidelines as indicated in protocols.

- Provide Airway management
- **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
- Keep patient warm and place patient in a left lateral recumbent position.
- Treat for shock
- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.
- If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

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.

Treatment: Follow general treatment guidelines as indicated in protocols.

- Provide Airway management
- **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
- Keep patient warm and place patient in a left lateral recumbent position.
- Treat for shock
- Advanced procedures should include Initiate 1-2 IVs Normal Saline (KVO) enroute to the hospital.
- If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
- **12 lead ECG <u>and</u>** cardiac monitoring

<u>Medical Control may order:</u>

- **Magnesium Sulfate 10% 1 gm to 4 gm** IV over three (3) minutes.
- **Ativan (Lorazepam) 2mg-4mg** slow IV push or Intramuscularly (IM).**Antidote** for Magnesium Sulfate is **Calcium Chloride 10% 2 mg-4 mg/kg** slow IV push over 5 minutes.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

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 infants 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 so, clamp cord in two places and cut between clamps to release the cord).**

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

UNSCHEDULED NORMAL FIELD DELIVERY (continued)

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.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES

COMPLICATIONS OF LABOR

BREECH PRESENTATION

The largest part of the fetus (head) is delivered last. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Follow general treatment guidelines as indicated in Obstetrical Emergencies protocol.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. 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.
5. Determine need for imminent delivery or need for immediate transport.
6. Position mother for delivery.
7. Whenever possible, use sterile or aseptic technique.
8. 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.

9. 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.
10. 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.
11. Gently guide the infant upward to allow delivery of the posterior shoulder.
12. Gently guide the infant downward to deliver the anterior shoulder.
13. During a breech delivery, avoid having the fetal face or abdomen toward the maternal symphysis.
14. The head is often delivered without difficulty. However, be careful to avoid excessive head and spine manipulation or traction.
15. If the head does not deliver immediately, action must be taken to prevent suffocation of the infant.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES COMPLICATIONS OF LABOR (con't)

BREECH PRESENTATION (con't)

16. Place a gloved hand in the vagina with the palm toward the babies face.
17. With the index and middle fingers, form a "V" on either side of the infant's nose.
18. Gently push the vaginal wall away from the infant's face until the head is delivered.
19. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Position mother on her left side in a dorsal-knee-chest position to increase the diameter of the pelvis.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Attempt to guide the infant's head downward to allow the anterior shoulder to slip under the symphysis pubis.
5. Gently rotate the fetal shoulder girdle into the wider oblique pelvic diameter. The posterior shoulder usually delivers without resistance.
6. Complete the delivery as above.

SUPINE HYPOTENSIVE SYNDROME

This condition manifests itself when a woman is in her third trimester of pregnancy in the supine position. The combined weight and mass of the fetus, uterus and the placenta compresses the inferior vena cava resulting in a reduced blood return to the heart which subsequently reduces cardiac output and therefore, will cause a drop in BLOOD PRESSURE. Unless there is another reason for hypotension (i.e., blood loss, or dehydration) this condition is self-correcting if the patient is placed in a **left lateral recumbent position**. If severe hypotension is present: assume possibility of significant internal hemorrhage and treat patient per **Shock Protocol**.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES COMPLICATIONS OF LABOR (con't)

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Position the mother in Trendelenburg or knee-chest-position to relieve pressure on the cord.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Instruct the mother to "pant" with each contraction to prevent her from bearing down.
5. 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.
6. If assistance is available, apply moist sterile dressings to the exposed cord.
7. 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Follow standard hemorrhagic shock protocol.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Do not attempt to detach the placenta or pull on the cord.
5. 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.

3.8. SPECIAL CONSIDERATIONS FOR OBSTETRICAL EMERGENCIES COMPLICATIONS OF LABOR (con't)

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 <u>using appropriate oxygen delivery device, as clinically indicated</u>.** Advanced procedures should include **1-2 IVs of Normal Saline** (recommended during transport) followed by a 250 cc - 500 cc fluid bolus of **Normal Saline**. Titrate IV flow rate to patient's hemodynamic status. Medical control may order: **Pitocin (Oxytocin) 10 units** IM after placenta delivers, **or** mix 10-40 units in 1,000 ml of Normal Saline (check administration dosage).

CAUTION: Consider possibility of multiple fetuses before administration of Pitocin.

3.9 SEIZURES

A seizure is a temporary alteration in behavior due to the massive electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized or grand mal seizure, partial/ simple, partial/complex or petit mal seizure. 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 all witnesses or bystanders as to actual event.
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.

TREATMENT BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. In cases of suspected head/neck injury, ensure cervical spine immobilization.
3. Maintain an open airway and assist ventilations as needed. Consider nasopharyngeal airway. Protect patient from injury and secure airway as opportunity arises.
4. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.** Be certain that the oropharynx is clear of secretions and/or vomitus.
5. 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.

3.9 SEIZURES

TREATMENT
BASIC PROCEDURES (continued)

6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. In cases of suspected head/neck injury, ensure cervical spine immobilization.
3. Maintain an open airway and assist ventilations as needed. Consider nasopharyngeal airway. Protect patient from injury and secure airway as opportunity arises.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>** Be certain that the oropharynx is clear of secretions and/or vomitus.
5. 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.

6. Activate Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without Paramedics.
8. **ALS STANDING ORDERS**:
   a. Provide advanced airway management (if indicated).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

PARAMEDIC PROCEDURES

<u>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. The change to the patient treatment under the paramedic treatment section will be as a standing order to provide diazepam, prior to contacting medical control."</u>

3.9 SEIZURES

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. In cases of suspected head/neck injury, ensure cervical spine immobilization.
3. Maintain an open airway and assist ventilations as needed. Consider nasopharyngeal airway. Protect patient from injury and secure airway as opportunity arises.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated</u>.** Be certain that the oropharynx is clear of secretions and/or vomitus.

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

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

   g. If patient is in **<u>Status Epilepticus</u>**, <u>administer the following:</u>
      · **<u>Valium (Diazepam) 5 mg - 10 mg slow IV push, unless contraindicated</u>.**
   h. If no IV access, administer **Glucagon 1-2 mg** IM for suspected/known hypoglycemia.
6. Initiate transport as soon as possible.
7. Contact **MEDICAL CONTROL**. The following may be ordered:
   a. For Status Epilepticus:
      · **Ativan (Lorazepam) 2 mg - 4 mg slow IV push or IM.**
      · **CAUTION: In patients with head injury or hypotension, the use of Valium and/or Ativan may be contraindicated.**
   b. Additional **Dextrose 50%** IV push.
   f. **Narcan 0.4 - 2.0 mg** IV push, IM, ET, **<u>or Nasal via atomizer</u>**
   g. **Magnesium Sulfate 1-4 grams** IV over three (3) minutes if suspect eclampsia of pregnancy.

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

9. Notify receiving hospital.

3.10 SHOCK (HYPOPERFUSION) OF UNKNOWN ETIOLOGY

Shock is defined as a condition of 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 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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
2. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
6. Place patient in supine position with legs elevated, unless suspected respiratory compromise.
7. Activate ALS intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without ALS.

3.10 SHOCK (HYPOPERFUSION) OF UNKNOWN ETIOLOGY

TREATMENT
BASIC PROCEDURES (continued)

9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
11. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
6. Place patient in supine position with legs elevated, unless suspected respiratory compromise.
7. Activate Paramedic intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without Paramedics.

9. **ALS STANDING ORDERS**
    a. Provide advanced airway management (if indicated).
    b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
    c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**
    d. Initiate transport as soon as possible with or without ALS.

10. **MEDICAL CONTROL** may order:
    a. administration of additional fluid

11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

12. Notify receiving hospital.

3.10 SHOCK (HYPOPERFUSION) OF UNKNOWN ETIOLOGY

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
6. Place patient in supine position with legs elevated, unless suspected respiratory compromise.
7. Initiate transport as soon as possible.
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management (if indicated).
   b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**
   d. Cardiac Monitor: **12 lead ECG** - **Manage dysrhythmias per protocol** Initiate transport as soon as possible.

9. Attempt to identify the cause of shock and **Contact MEDICAL CONTROL:**
   MEDICAL CONTROL may ordered:
   a. Repeat fluid bolus(es).
   b. Establish a second IV of Normal Saline /Lactated Ringers.
   c. Vasopressors: unless contraindicated. Infusion rates determined by Medical Control.
   - **Dopamine infusion 2-20 mg/kg/minute* (<u>Rate determined by physician</u>)**
   - **Dobutamine infusion 2-20 mg/kg/minute***
   - **Norepinephrine infusion 0.5 to 1.0 mg/minute***

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

*** NOTE: Vasopressor medications are contraindicated for patients in hypovolemic shock. Primary efforts must be directed toward replacing circulatory volume and improving oxygenation.**

3.11ACUTE STROKE

The American Heart Association states that stroke is the third leading cause of death In the United States and the leading cause of brain injury in adults. Until recently, little was done for victims of stroke beyond supportive care and treatment of possible cardiac and respiratory complications associated with the stroke.

Traditionally, EMS providers have received little training in the recognition and treatment of stroke patients. Most EMS systems treat stroke under the altered mental/neurological status protocol, with little emphasis on the emergent nature of the brain injury.

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 **Boston Operation Stroke Scale* (BOSS)** should be utilized. The scale evaluates three major physical findings; facial droop, arm weakness and speech difficulties. *(See Appendix)

Once the diagnosis of acute stoke 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 diagnosis of suspected acute stroke makes the patient a “load and go” 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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated</u>.**
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. Property secure patient to cot in position of comfort or appropriate to treatment(s0 required.

3.11 ACUTE STROKE

TREATMENT

BASIC PROCEDURES

1. Maintain appropriate body substance isolation precautions.
2. Maintain an open airway. This may include repositioning of the airway, suctioning or use of airway adjuncts (OPA/NPA) as indicated. Assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, assure cervical spine immobilization.

5. **Use Pre-hospital Stroke Scale (See Appendix)** to assess patient.

6. Activate ALS intercept, if deemed necessary and available.
7. If patient is known diabetic who is conscious and can speak and swallow, do not administer oral glucose without contacting medical control.
8. If patient is unconscious or seizing, transport on left side (coma position)
9. If patient blood pressure drops below 100 systolic, treat for shock.
10. Initiate transport as soon as possible, with or without ALS, to nearest appropriate Facility.
11. Monitor and record vital signs every 5 minutes if unstable, or every 15 minutes if stable.
12. If patient is possible ischemic stroke victim use thrombolytic checklist (**See Appendix)** to determine if patient is candidate for ischemic stroke reperfusion.
13. Notify receiving facility.

INTERMEDIATE PROCEDURES

1. Maintain appropriate body substance isolation precautions.
2. Maintain an open airway. This may include repositioning of the airway, suctioning or use of airway adjuncts (OPA/NPA) as indicated. Assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, assure cervical spine immobilization.

5. **Use Pre-hospital Stroke Scale (See Appendix**) to assess patient.
6. Activate Paramedic intercept, if deemed necessary and available.
7. If patient is unconscious or seizing, transport on left side (coma position).

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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
d. Draw appropriate bloods

NOTE: If patient is known diabetic with suspected acute stroke an IV of D5W should not be used without consulting Medical Control.

3.11 Acute Stroke (con't)

INTERMEDIATE PROCEDURES (con't)

8. Initiate transport as soon as possible, with or without ALS, to nearest appropriate facility.
9. Monitor and record vital signs every 5 minutes if unstable, or every 15 minutes if stable.
10. If patient is possible ischemic stroke victim use thrombolytic check list (See Appendix) to determine if patient is candidate for ischemic stroke reperfusion.
11. Notify receiving facility.

PARAMEDIC PROCEDURES

1. Maintain appropriate body substance isolation precautions.
2. Maintain an open airway. This may include repositioning of the airway, suctioning or use of airway adjuncts (OPA/NPA) as indicated. Assist ventilations as needed.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, assure cervical spine immobilization.
5. Use Pre-hospital Stroke Scale (See Appendix) to assess patient.
6. If patient is unconscious or seizing, transport on left side (coma position).

ALS STANDING ORDERS

a. Provide advanced airway management (if indicated).

b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>

c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

d. Draw appropriate bloods

e. Determine Blood Glucose level:

- If glucose is less then 100mg/dl, contact Medical control prior to administration of D50%.

NOTE: If patient is known diabetic with suspected acute stroke an IV of D5W should not be used without consulting Medical Control.

7. Apply cardiac monitor: manage dysrhythmias per protocol.

8. Initiate transport as soon as possible to nearest appropriate facility.

9. Monitor and record vital signs every 5 minutes if unstable, or every 15 minutes if stable.

10. If patient is possible ischemic stroke victim use thrombolytic check list to determine if patient is candidate for ischemic stroke reperfusion.

11. Notify receiving facility.

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: **vasovagal** (simple faint), **hypovolemia** (orthostatic), **cerebrovascular disease** (TIA/CVA), **cardiac dysrhythmia**, **pulmonary embolism, carotid sinus sensitivity**, **metabolic causes** (intoxication, COPD, suffocation, hypoglycemia), **neuropsychologic** (seizure, hyperventilation, hysteria), and **medications** (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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 all 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

<u>BASIC PROCEDURES</u>

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. If suspected hypovolemia etiology (i.e. GI bleed, ectopic pregnancy) place patient supine, cover to prevent heat loss and elevate legs.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

3.12 SYNCOPE OF UNKNOWN ETIOLOGY (CON'T)

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**.
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. If suspected hypovolemia etiology (i.e. GI bleed, ectopic pregnancy) place patient supine, cover to prevent heat loss and elevate legs.

6. Activate Paramedic intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without paramedics.

8. **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 cc 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 or Lactated Ringers.

10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

11. Notify receiving hospital.

3.12 SYNCOPE OF UNKNOWN ETIOLOGY

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
5. If suspected hypovolemia etiology (i.e. GI bleed, ectopic pregnancy) place patient supine, cover to prevent heat loss and elevate legs.
6. Initiate transport as soon as possible.
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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.
   d. Cardiac monitoring: **12 lead ECG** - **Manage dysrhythmias per protocol**
   e. Determine **Blood Glucose** level with Dextrose stick and draw red top blood sample.
      - **If glucose is** greater **than 100 mg/dL, glucose administration unnecessary.**
      - **If glucose is** less **than 100 mg/dL: administer** Thiamine 100 mg **IV Push or IM. Followed with** 50% Dextrose (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: **Narcan 0.4-2.0 mg**. IV Push, IM, **<u>or Nasal via atomizer</u>** May repeat as necessary.

8. Contact **MEDICAL CONTROL**. The following may be ordered.
   a. additional **50% Dextrose** IV Push.
   b. **Narcan 0.4-2.0 mg** IV Push, IM **<u>or Nasal</u> <u>via atomizer</u>**
   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.

3.12 SYNCOPE OF UNKNOWN ETIOLOGY (con't)

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

10. Notify receiving hospital.

3.13. TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE

All toxicologic emergencies or **"poisonings"** involve some form of voluntary or accidental exposure to toxic substances (chemicals) or pharmacological substances. 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. Major toxicity due to serious poisoning is evident in five (5) clinical signs: coma, cardiac dysrhythmia, gastrointestinal disturbance, respiratory depression, and hypotension or hypertension. Therefore, clinical management should be directed toward managing these system disorders.

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., Narcan for narcotic overdose). Due to the complex nature of poisonings and substance abuse emergencies, it is strongly recommended that Medical Control/Poison Control Center 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 precautions for toxic chemicals and blood and body fluids (gloves, face mask etc.).
2. Ensure scene safety, 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.

3.13. TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE ASSESSMENT / TREATMENT PRIORITIES (continued)

3. Maintain an 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.
7. General management principles should be directed towards patient's clinical status and suspected cause for their clinical condition.
8. Envenomations: immobilize the extremity in a dependent position. May utilize cold packs and/or constricting bands, as indicated.
9. Monitor and record ECG and vital signs.
10. Prevent / treat for shock.
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. Ensure scene safety and maintain appropriate body substance isolation precautions for toxic chemicals and blood and body fluids (gloves, face mask etc.). If patient presents as an IV drug abuse/overdose, be cautious for needles and other drug paraphernalia and dispose of appropriately (legal implications may require EMS providers to give the drug paraphernalia to law enforcement authorities). Never place your hands in patient's pockets.
2. Maintain an open airway and assist ventilations as needed. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Identify offending agent and route of exposure.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
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)
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital..

3.13. TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions for toxic chemicals and blood and body fluids (gloves, face mask etc.). If patient presents as an IV drug abuse/overdose, be cautious for needles and other drug paraphernalia and dispose of appropriately (legal implications may require EMS providers to give the drug paraphernalia to law enforcement authorities). Never place your hands in patient's pockets.
2. Maintain an open airway and assist ventilations as needed. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Identify offending agent and route of exposure.
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without Paramedics.
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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status
   d. Draw red top blood sample.

8. 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)
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions for toxic chemicals and blood and body fluids (gloves, face mask etc.). If patient presents as an IV drug abuse/overdose, be cautious for needles and other drug paraphernalia and dispose of appropriately (legal implications may require EMS providers to give the drug paraphernalia to law enforcement authorities). Never place your hands in patient's pockets.
2. Maintain an open airway and assist ventilations as needed. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.

3.13. TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE PARAMEDIC PROCEDURES (continued)

3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Identify offending agent and route of exposure.
5. Initiate transport as soon as possible.

6. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status**
   d. Draw red top blood sample (at a minimum)
   e. ApplyCardiac Monitor: 12 lead ECG - Manage dysrhythmias per protocol.
   f. Administer **Narcan 0.4-2.0 mg** IV Push or IM, SC or ET. May be repeated as indicated.
   g. Administer **Thiamine 100 mg** IV or IM.
   h. Determine **Blood Glucose** level:
      - If glucose is **greater** than 100 mg/dL, Glucose administration unnecessary.
      - If glucose is **less** than 100 mg/dL, administer **Dextrose 50%, 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. **Narcan 0.4-2.0 mg** IV Push, IM, **<u>or Nasal via atomizer</u>**
   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. **Lasix 40 mg** IV bolus (i.e., pulmonary edema management).
   i. **Valium (Diazepam) 5 mg-10 mg** slow IV push or **Ativan (Lorazepam) 2mg-4mg** slow IV push.

3.13 TOXICOLOGY / POISONING / SUBSTANCE ABUSE / OVERDOSE PARAMEDIC PROCEDURES (continued)

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.

7. Contact **MEDICAL CONTROL**. Medical Control may order: (continued)

m. **CYANIDE ANTIDOTE KIT if available by EMS service and/or industrial site:**

- Two (2) **Amyl Nitrite** inhalants (as identified above).
- **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.

NOTE # 1. : **NOT recommended for pediatric or pregnant patients**.

n. **Glucagon 1.0 - 5.0 mg IM, SC, IV** for known or suspected beta-blocker overdose.

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.

9. Notify receiving hospital.

3.14 ADULT PAIN 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 recommend pain medication for these patient's.**

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

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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
5. Manage all Thermal/Chemical burns according to protocols
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock
9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

3.14 ADULT PAIN MANAGEMENT

INTERMEDIATE PROCEDURES

**** 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 recommend pain medication for these patient's.**

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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
5. Manage all Thermal/Chemical burns according to protocols
6. Activate paramedic intercept, if deemed necessary and available

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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

8. 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.

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.
10. As patient's condition suggests, continually assess Level of Consciousness, ABC's and Vital Signs.
11. Treat all life threatening conditions as they become identified.
12. Transport to the nearest appropriate facility
13. Notify receiving hospital.

3.14 ADULT PAIN MANAGEMENT

PARAMEDIC PROCEDURES

**** 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 recommend pain medication for these patient's.**

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. In cases of suspected head/neck injury, ensure cervical spine immobilization.
5. Manage all Thermal/Chemical burns according to protocols
6. Determine if patient is experiencing severe pain from a suspected long bone fracture or significant burn (using numerical scale or visual analog scale as appropriate See Appendix)

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 cc 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.

8. 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.
   b. Naloxone HCL 0.4 – 2 mg IV/IM.
   c. Morphine 0.1mg/kg to a maximum of 10mg IV/IM/SC

9. Initiate transport as soon as possible. Do not allow patients to exert themselves and properly secure to cot in position of comfort, or appropriate to treatment(s) required.
10. As patient's condition suggests, continually assess Level of Consciousness, ABC's and Vital Signs.
11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
12. Reassess patient using patient pain scale.
13. Treat all life threatening conditions as they become identified.
14. Transport to the nearest facility
15. Notify receiving hospital.

NOTE: When unable to establish an IV, Contact Medical Control- Medical Control may order IM or SC.

4. TRAUMA EMERGENCIES

4.1 ABDOMINAL/PELVIC TRAUMA

Abdominal injuries are the result of blunt trauma, penetrating trauma, or both, and most commonly result from motor vehicle crashes, blast injuries, falls from heights, blows to the abdomen, abdominal compression, gunshot and stab wounds. Abdominal injuries include skeletal, renal, splenic, hepatic, bladder, gastrointestinal, vascular, pancreatic and diaphragmatic. A number of potentially lethal injuries can occur with significant abdominal trauma. In general, these patients are managed under the multi-systems trauma protocol in most circumstances.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Determine patient's hemodynamic stability and symptoms, using O-P-Q-R-S-T assessment. 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.

4.1 ABDOMINAL/PELVIC TRAUMA

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. Cover eviscerations with sterile non-adherent material (saline or sterile water moistened).
5. If applicable, stabilize any impaled object(s).
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.

9. For both blunt and penetrating trauma with or without hemodynamic instability:
   a. place patient in supine position with legs elevated, with flexion at hips and knees (unless suspected respiratory compromise).

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

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

4.1 ABDOMINAL/PELVIC TRAUMA

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

5. Cover eviscerations with sterile non-adherent material (saline or sterile water moistened).
6. If applicable, stabilize any impaled object(s).
7. Activate Paramedic intercept, if deemed necessary and if available.
8 Initiate transport as soon as possible with or without Paramedics.
9. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
10. For both blunt and penetrating trauma with or without hemodynamic instability:
    a. place patient in supine position with legs elevated, with flexion at hips and knees (unless suspected respiratory compromise).

11. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

12. Contact **MEDICAL CONTROL**. Medical control may order:
    a. Additional IV Normal Saline bolus(es) 250 cc - 500 cc bolus or wide open titrated to patient's condition.

13. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

14. Notify receiving hospital.

4.1 ABDOMINAL/PELVIC TRAUMA

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Cover eviscerations with sterile non-adherent material (saline or sterile water moistened).
5. If applicable, stabilize any impaled object(s).
6. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
7. For both blunt and penetrating trauma with or without hemodynamic instability:
   a. place patient in supine position with legs elevated, with flexion at hips and knees (unless suspected respiratory compromise).
8. Initiate transport as soon as possible.
9. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

10. Contact **MEDICAL CONTROL**. Medical control may order:
    a. Additional IV Normal Saline bolus(es) 250 cc - 500 cc bolus or wide open titrated to patient's condition.
11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
12 Notify receiving hospital.

<u>NOTE</u>: 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.**

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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 **FIRE/RESCUE/HAZMAT** 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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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, using O-P-Q-R-S-T assessment, Level of Consciousness, ABCs and Vital Signs. **<u>Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate</u>**
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. Appropriately manage all Thermal/Chemical burns.

4.2 BURNS / INHALATION INJURIES

ASSESSMENT / TREATMENT PRIORITIES (continued)

10. If suspected severe Carbon Monoxide Poisoning, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center and/or Hyperbaric chamber availability.

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 scene safety, including safety for the patient(s) and rescuer(s). Call appropriate public safety agencies FIRE/RESCUE/HAZMAT 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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Appropriately manage all Thermal/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.

6. Activate ALS intercept if deemed necessary and if available.

4.2 BURNS / INHALATION INJURIES (con't)

7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.** If suspected severe Carbon Monoxide Poisoning, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center and/or Hyperbaric chamber availability.

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

INTERMEDIATE PROCEDURES

1. Ensure scene safety, including safety for the patient(s) and rescuer(s). Call appropriate public safety agencies **FIRE/RESCUE/HAZMAT** 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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

5. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.

   b. Initiate large bore IV Lactated Ringers **<u>or Normal Saline.</u>**. 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.

4.2 BURNS / INHALATION INJURIES (con't)

INTERMEDIATE PROCEDURES (con't)

6. Appropriately manage all Thermal/Chemical burns.
   a. **THERMAL**
      - Stop burning process 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 Lithium metals) **CAUTION**: Dry Lime/Lye and Phenol exposure: water irrigation is not recommended as primary treatment since water exposure may produce further chemical reactions. It is advised to contact **MEDICAL CONTROL** for further advice.

7. Activate Paramedic intercept, if deemed necessary and if available.
8. Initiate transport as soon as possible with or without Paramedics.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Contact **MEDICAL CONTROL**. Medical Control may order:
    - **Additional Lactated Ringers 250 cc - 500 cc bolus(es), wide open or titrated to patient's hemodynamic status**

    OR

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

11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
12. Notify receiving hospital.** If suspected severe Carbon Monoxide Poisoning, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center and/or Hyperbaric chamber availability.

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

4.2 BURNS / INHALATION INJURIES (con't)

PARAMEDIC PROCEDURES

1. Ensure scene safety, including safety for the patient(s) and rescuer(s). Call appropriate public safety agencies **FIRE/RESCUE/HAZMAT** 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 an open airway and assist ventilations as needed. Assume spinal and other potential traumatic injuries when appropriate and treat accordingly.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Cardiac monitor **12 lead ECG** - **Manage dysrhythmias per protocol**.
   c. Initiate large bore **IV Lactated Ringers <u>or Normal Saline</u>**. 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**.**

<u>d. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate. (See Appendix) After a complete and through patient assessment consider using the pain management protocol.</u>

6. Appropriately manage all Thermal/Chemical burns.
   a. **THERMAL**
   - Stop burning process 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

4.2 BURNS / INHALATION INJURIES (con't)

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 Lithium metals) **CAUTION**: Dry Lime/Lye and Phenol exposure: water irrigation is not recommended as primary treatment since water exposure may produce further chemical reactions. It is advised to contact **MEDICAL CONTROL** for further advice.

7. Initiate transport as soon as possible.
8. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
9. Contact **MEDICAL CONTROL**. Medical Control may order:
   - Additional **Lactated Ringers 250 cc - 500 cc bolus(es),** wide open or titrated to patient's hemodynamic status
   - **OR**
   - **Additional Normal Saline 250 cc - 500 cc bolus(es), wide open or titrated to patient's hemodynamic status**
   - **Morphine Sulfate 2.0- 10.0 mg SLOW IV PUSH or,**
   - **If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ**
10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

11. Notify receiving hospital.** If suspected severe Carbon Monoxide Poisoning, consider appropriate Point-of-Entry as defined by Regional capabilities, i.e., Burn Center and/or Hyperbaric chamber availability.

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

4.2 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 the regional medical control plan and 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 (brain) injury is the most frequent cause of vehicular death. Injury to the head occurs as a result of blunt or penetrating trauma. The primary concern in the out of hospital setting is awareness of the potential for brain injury and recognition of the signs and symptoms of head, neck and spinal injury early in patient assessment. These signs and symptoms may include but are not limited to the following: agitation, loss of consciousness, bradycardia and hypertension, seizures, paralysis, vomiting and airway occlusion.

Head trauma can be categorized into the following elements: **Superficial injury** involving scalp, fascia, and skull. **Internal injury** involving brain and spinal cord. **Sensory organ injury** involving the eye and the ear. **Neck injury** involving skeletal and soft tissue structures. For this reason, 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.). Due to all these factors, the treatment of head injury may require specialty care at a designated trauma center.

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. Hyperventilation with 100% oxygen at a rate no less than 24 / minute, if associated with a significant closed head injury and signs of herniation syndrome.
4. Determine patient's hemodynamic stability and symptoms. Continually assess, using O-P-Q-R-S-T model, Level of Consciousness (AVPU/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.

4.3 HEAD TRAUMA / INJURIES

ASSESSMENT / TREATMENT PRIORITIES (CONTINUED)

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.)
12. Monitor and record vital signs and ECG.
13. 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 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>** Ensure cervical spine stabilization and immobilization
3. Hyperventilation with 100% oxygen at a rate no less than 24 / minute, if associated with a significant closed head injury and signs of herniation syndrome.
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

5. Activate ALS intercept, if deemed necessary and if available.
6. Patient care activities must not unnecessarily delay transport to an appropriate facility.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital of patient's status. (AVPU / Glasgow Coma Scale).

4.3 HEAD TRAUMA / INJURIES

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Ensure cervical spine stabilization and immobilization. Airway management may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated. Hyperventilation with 100% oxygen at a rate no less than 24/ minute with B-V-M if associated with a significant closed head injury and signs of herniation syndrome.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

5. Activate Paramedic intercept, if deemed necessary and if available.
6. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
7. Initiate transport as soon as possible with or without Paramedics.
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Ventilate with 100% oxygen.
   c. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   d. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>
9 Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. Contact **MEDICAL CONTROL** to notify receiving hospital of patient's status. (AVPU / Glasgow Coma Scale).

4.3 HEAD TRAUMA / INJURIES

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Ensure cervical spine stabilization and immobilization. Airway management may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated. Hyperventilation with 100% oxygen at a rate no less than 24/ minute with B-V-M if associated with a significant closed head injury and signs of herniation syndrome.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

5. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
6. Initiate transport as soon as possible.

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

8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9 Contact **MEDICAL CONTROL** to notify receiving hospital of patient's status. (AVPU / Glasgow Coma Scale).

   - In patients who require emergent intubation
   - Cannot be intubated by conventional means
   - The treating paramedic has been duly authorized by the Services Medical Director in use of an alternative airway (LMA or Combitube)

4.3 HEAD TRAUMA / INJURIES

PARAMEDIC PROCEDURES (cont)

Medical Control may order:

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

10. Once the patient is intubated, the treating paramedic will:
    a. Document appropriate ETT placement. This will include at a minimum:
        - Visualization of the tube passing through the vocal cords
        - Appropriate bilateral breath sounds, lack of epigastric sounds
        - Rise and fall of chest wall with ventilations
        - Mist in the tube
        - Rising pulse oximeter
        - Positive ETCO2 device or Esophogeal Detector Device

    b. Secure the tube

    - Document ETT depth as measured at either the lip line or teeth

    c. Fill out optional intubation QA form as required by the service.

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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Determine patient's hemodynamic stability and symptoms. If indicated, continually assess using O-P-Q-R-S-T model, and the 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. **<u>Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate</u>**
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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

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 painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains and/or dislocations) involving joints, in the position found. Bones adjacent to each injured joint must be fully immobilized, as well as supporting and immobilizing the injured joint. Joints adjacent to each injured bone must be fully immobilized, as well as supporting and immobilizing the injured bone(s).
8. All jewelry should be removed from an injured extremity.
9. Activate ALS intercept, if deemed necessary and if available.
10. Initiate transport as soon as possible with or without ALS.
11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
12. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
13. Notify receiving hospital.

4.4 MUSCULOSKELETAL INJURIES

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

5. Assess the neurovascular status (motor, sensory and circulation) distal to the injury before and after proper immobilization.
6. If no palpable, distal pulse 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 painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains and/or dislocations) involving joints, in the position found. Bones adjacent to each injured joint must be fully immobilized, as well as supporting and immobilizing the injured joint. Joints adjacent to each injured bone must be fully immobilized, as well as supporting and immobilizing the injured bone(s).

8. All jewelry should be removed from an injured extremity.

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

10. Activate Paramedic intercept, if deemed necessary and if available.
11. Initiate transport as soon as possible with or without Paramedics.
12. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

13. Contact **MEDICAL CONTROL.** Medical Control may order:
    a. **<u>Administer additional IV Normal Saline 250 cc bolus(es) wide open or titrated to patient's hemodynamic status.</u>**

14. Notify receiving hospital.

4.4 MUSCULOSKELETAL INJURIES (con't)

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. 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. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

5. Assess the neurovascular status (motor, sensory and circulation) distal to the injury before and after proper immobilization.
6. If no palpable, distal pulse 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 painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains and/or dislocations) involving joints, in the position found. Bones adjacent to each injured joint must be fully immobilized, as well as supporting and immobilizing the injured joint. Joints adjacent to each injured bone must be fully immobilized, as well as supporting and immobilizing the injured bone(s).
8. All jewelry should be removed from an injured extremity.
9. **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 cc bolus(es) 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 a complete and through patient assessment consider using the pain management protocol.

10. Initiate transport as soon as possible.
11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
12. **MEDICAL CONTROL** may order:
    a. **Administer additional IV Normal Saline 250 cc bolus(es) wide open or titrated to patient's hemodynamic status.**
    b. Morphine Sulfate 2.0 – 10.0 mg SLOW IV Push for pain control related to an isolated long bone injury. May be repeated at discretion of Medical Control. **Contraindicated in multisystem trauma.**
    c. If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ
13 Notify receiving hospital.

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 regional point of entry guidelines. 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 an open airway and assist ventilations as needed. Ensure cervical spine stabilization and immobilization, when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. **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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. Activate ALS intercept, if deemed necessary and if available.
6. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
7. Initiate transport as soon as possible with or without ALS.
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. <u>Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.</u>
   c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status.</u>**
9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

INTERMEDIATE PROCEDURES (con't)

10. Contact **MEDICAL CONTROL**. The following may be ordered:
    a. IV Normal Saline 250 cc -500 cc bolus or wide open titrated to patient's condition.
11. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
6. Initiate transport as soon as possible.
7. **ALS STANDING ORDERS**
    a. Provide advanced airway management if indicated.
    b. **<u>Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.</u>**
    c. **<u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>**

8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

9. Contact **MEDICAL CONTROL**. Medical control may order:
    a. Additional IV Normal Saline 250 cc - 500 cc bolus or wide open titrated to patient's condition.
    b. In patients who require emergent intubation **<u>who</u>** Cannot be intubated by conventional means **<u>and</u>** The treating paramedic has been duly authorized by the Services's Medical Director in **<u>the</u>** use of an alternative airway (LMA or Combitube)
    c. Use of 2.5-5.0 mg IV of Midazolam to facilitate intubation.

10. Once the patient is intubated, the treating paramedic will:
    a. Document appropriate ETT placement. This will include at a minimum:
        - Visualization of the tube passing through the vocal cords
        - Appropriate bilateral breath sounds, lack of epigastric sounds
        - Rise and fall of chest wall with ventilations
        - Mist in the tube

4.5 MULTI-SYSTEM TRAUMA (con't)

PARAMEDIC PROCEDURES (con't)

- Rising pulse oximeter
- Positive ETCO2 device or Esophogeal Detector Device

b. Secure the tube
   - Document ETT depth as measured at either the lip line or teeth

c. Fill out optional intubation QA form as required by the service.

d. Specific procedures as indicated (i.e. chest decompression, needle cricothyroidotomy)

11. Notify receiving hospital.

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 paraspinous 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. **<u>Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate.</u>**
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. 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. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

6. 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.
7. If suspect severe crushing injury/compartment syndrome:
   - Remove all restrictive dressings.
   - Close monitoring of distal pulse, sensation, and motor function (CSM).
8 Splint/immobilize injured areas as indicated.
9. Activate ALS intercept, if deemed necessary and if available.
10. Initiate transport as soon as possible with or without ALS.
11. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
12. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
13. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.

4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
6 Place dry sterile dressing on all open wounds and bandage as needed:
   - If wound is grossly contaminated, irrigate with normal saline or lactated ringers solution.
   - Stabilize all protruding foreign bodies (impaled objects) if noted.

4.6 SOFT TISSUE / CRUSH INJURIES (con't)

INTERMEDIATE PROCEDURES (continued)

7. If suspect severe crushing injury/compartment syndrome:
   - Remove all restrictive dressings.
   - Close monitoring of distal pulse, sensation, and motor function (CSM).

8 **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 cc bolus(es) of IV Normal Saline, or titrate IV to patient's hemodynamic status

9 Splint/immobilize injured areas as indicated.
10. Activate Paramedic intercept, if deemed necessary and if available.
11. Initiate transport as soon as possible with or without Paramedics.
12. Contact **MEDICAL CONTROL.** Medical control may order:
    a. Administer additional IV Normal Saline 250 cc bolus(es) wide open or titrated to patient's hemodynamic status.

13. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
14. Notify receiving hospital.

4.6 SOFT TISSUE / CRUSH INJURIES (con't)

PARAMEDIC PROCEDURES

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. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
4. **Administer oxygen. using appropriate oxygen delivery device, as clinically indicated.**
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

6. Place dry sterile dressing on all open wounds and bandage as needed:
   - If wound is grossly contaminated, irrigate with normal saline or lactated ringers solution.
   - Stabilize all protruding foreign bodies (impaled objects) if noted.
7. If suspect severe crushing injury/compartment syndrome:
   - Remove all restrictive dressings.
   - Close monitoring of distal pulse, sensation, and motor function (CSM).

8. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate. (See Appendix) After a complete and through patient assessment consider using the pain management protocol.
   c. Initiate IV Normal Saline if indicated and titrate to patient condition.

9. Splint/immobilize injured areas as indicated.
10. Initiate transport as soon as possible.
11. Contact **MEDICAL CONTROL.** Medical control may order:
    a. IV Normal Saline 250 cc -500 cc bolus(es), wide open or titrate to patient's hemodynamic status.
    b. Morphine Sulfate 2.0 – 10.0 mg SLOW IV PUSH for pain control related to an isolated soft tissue/crush injury. May be repeated at discretion of Medical Control.
    Contraindicated in multisystem trauma.
    c. If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ

12. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

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 (hyperflexion, hyperextension, hyperrotation, 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. One should assume the presence of spine injury and/or unstable spinal column in the following circumstances: grand mal seizure activity, significant trauma and use of intoxicating substances, complaint of pain and/or paresthesia, unconsciousness subsequent to head injury, injury above the clavicle, a significant fall, a fall resulting in apparent fracture of both heels, neck tenderness and/or deformity, injury due to high speed, motor vehicle crash, or electrocution, and all non-extremity penetrating injuries.

Management of the patient with spinal column / cord injuries includes assessment of the patients airway, breathing and circulation. **Priority must be given to preserving spinal cord function and avoiding secondary injury to the spinal cord.**

REMEMBER: Patients that may have a spinal column / cord injury may be difficult to assess as they may not present with pain or other signs and symptoms of injury. Therefore, treatment (<u>spinal immobilization</u>) is recommended based upon the mechanism of injury alone.

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 using spinal precautions and assist ventilations as needed. Assume spinal injury and provide spinal immobilize accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.**
5. When multiple patients are involved, they need to be appropriately triaged.

4.7 SPINAL COLUMN / CORD INJURIES (con't)

6. 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.
7. Prevent / treat for shock.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
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.
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.

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Ensure spinal stabilization/immobilization.* Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Hyperventilation with 100% oxygen at a rate no less than 24/ minute with B-V-M if associated with a significant closed head injury and signs of herniation syndrome.
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
6. 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.
7. Activate ALS intercept, if deemed necessary and if available.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
9. Initiate transport as soon as possible with or without ALS.
10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
12. Notify receiving hospital of patient's status.

* See Spinal Stabilization/Immobilization Summary in this protocol.

4.7 SPINAL COLUMN / CORD INJURIES

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Ensure spinal stabilization/immobilization.* Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. 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.
6. Activate Paramedic intercept, if deemed necessary and if available.
7. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
8. Initiate transport as soon as possible with or without Paramedics.
9. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Hyperventilation with 100% oxygen at a rate no less than 24/ minute with BVM if associated with a significant closed head injury and signs of herniation syndrome.
   c. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   d. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

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

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. Contact **MEDICAL CONTROL**. Medical Control may order:
    a. Additional Normal Saline 250 cc - 500 cc bolus(es), wide open or titrated to patient's hemodynamic status.
12. Notify receiving hospital.

* See Spinal Stabilization/Immobilization Summary in this protocol.

4.7 SPINAL COLUMN / CORD INJURIES (con't)

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. Ensure spinal stabilization/immobilization.* Airway may include repositioning of the airway, suctioning or use of airway adjuncts (oropharyngeal airway / nasopharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Hyperventilation with 100% oxygen at a rate no less than 24/ minute with BVM if associated with a significant closed head injury and signs of herniation syndrome.
5. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc
6. 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.
7. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
8. Initiate transport as soon as possible.

9. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Cardiac monitor **12 lead ECG** - **Manage dysrhythmias per protocol**.

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

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

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

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. Contact **MEDICAL CONTROL.** Medical Control may order:
    a. Additional Normal Saline 250 cc-500 cc bolus(es), wide open or titrated to patient's hemodynamic status.
    b. For suspected neurogenic shock (without hypovolemia):
       - Dopamine (Intropin) 2-20 µg/kg/minute**.**
       - Titrate to patient's hemodynamic status. **<u>(Rate determined by physician)</u>**

    If Dopamine infusion exceeds 20 µg/kg per minute to maintain blood pressure:
    Norepinephrine IV Infusion is recommended @ 0.5-30 µg/minute (for systolic BP less than 70).

    c. **Methylprednisolone (Solumedrol)** 30 mg/kg IV infusion over thirty (30) minutes.
12. Notify receiving hospital.

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

4.7 SPINAL COLUMN / CORD INJURIES

*SPINAL STABILIZATION / IMMOBILIZATION SUMMARY

- 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”, 7th Edition.
Mosby, “Paramedic Textbook, 2nd Edition
Mosby, “PHTLS: Basic & Advanced”, 4th 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, Advanced Life Support intervention 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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. **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.

4.8 THORACIC TRAUMA

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. **Treat all life threatening conditions (tension pneumothorax, open pneumothorax, flail chest) as they become identified.**
5. 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.**
6. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).

7. Activate ALS intercept, if deemed necessary and if available.
8. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
9. Initiate transport as soon as possible with or without ALS.

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.

12. Notify receiving hospital.

4.8 THORACIC TRAUMA

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. 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.**

7. ALS STANDING ORDERS

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

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

9. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.
10. Initiate transport as soon as possible with or without Paramedics.

4.8 THORACIC TRAUMA (con't)

11. **Contact MEDICAL CONTROL**. **MEDICAL CONTROL** may order:

    a. Additional IV Normal Saline 250 cc - 500 cc bolus(es), wide open or titrated to patient's hemodynamic status.
12. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
13. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization. Airway 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Control/stop any identified life threatening hemorrhage (direct pressure, pressure points, etc.).
5. 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 pleural thoracotomy (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.

6. ALS STANDING ORDERS

a. Provide advanced airway management (if indicated).

b. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>

c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

4.8 THORACIC TRAUMA (con't)

7. Patient care activities must not unnecessarily delay patient transport to an appropriate facility.

8. Initiate transport as soon as possible.

9. **MEDICAL CONTROL** may order:
   a. Pleural thoracotomy (needle chest decompression) if indicated and if not already performed.
   b. Additional Normal Saline 250 cc - 500 cc bolus(es), wide open or titrate to patient's hemodynamic status.
10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

11. Notify receiving hospital.

4.9 TRAUMATIC CARDIOPULMONARY ARREST

Cardiopulmonary arrest due to trauma may be reversible with prompt aggressive therapy. In the traumatic arrest patient, rapid transport to the nearest trauma center has shown to be the most critical element in patient survivability. This is more likely to be possible with penetrating as opposed to blunt trauma. Patients found in arrest, without any signs of life, 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 trauma, hypothermia, etc.). Successful management of these patients will require rapid assessment, stabilization and transportation to an appropriate Trauma Center as defined by regional point-of-entry guidelines. Activate air transport services as appropriate. **NOTE: The use of a cardiac monitor <u>12 Lead ECG</u> 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 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

4.9 TRAUMATIC CARDIOPULMONARY ARREST

TREATMENT
BASIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
7. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
8. Treat all life threatening conditions as they become identified (i.e., life threatening hemorrhage).
9. Treat for shock.
10. Contact **MEDICAL CONTROL**
11. Activate ALS intercept and/or **air transport**, if deemed necessary and if available.
12. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
13. Initiate transport as soon as possible, with or without ALS.
14. Monitor and record vital signs.
15. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
7. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
8. Treat all life threatening conditions as they become identified (i.e., life threatening hemorrhage).

4.9 TRAUMATIC CARDIOPULMONARY ARREST (con't)

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

10. Activate Paramedic intercept and/or **air transport**, if deemed necessary and if available.
11. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
12. Initiate transport as soon as possible, with or without Paramedics.

13. Contact **MEDICAL CONTROL**. Medical control may order:
    a. Additional IV Normal Saline 250 cc -500 cc bolus or wide open titrated to patient's condition.

14. Notify receiving hospital.

4.9 TRAUMATIC CARDIOPULMONARY ARREST

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
7. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
8. Treat all life threatening conditions as they become identified (i.e., life threatening hemorrhage).
9. **ALS STANDING ORDERS**
   a. Provide advanced airway management.
   b. <u>Initiate 1-2 IV(s) Normal Saline (KVO) enroute to the hospital.</u>
   c. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>

   d. Provide appropriate management for identified injuries:
      - Head Injuries (see protocol).
      - Thoracic Injuries (see protocol).
      - Abdominal Injuries (see protocol).

   e. Manage dysrhythmias per appropriate protocol en route.

10. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility.
11. Initiate transport as soon as possible.
12. Activate **air transport**, if deemed necessary and if available.
13. Contact **MEDICAL CONTROL** : Medical control may order:
    a. In patients who require emergent intubation
       - Cannot be intubated by conventional means
       - The treating paramedic has been duly authorized by the Services's Medical Director in use of an alternative airway (LMA or Combitube)

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

14. Once the patient is intubated, the treating paramedic will:
    a. Document appropriate ETT placement. This will include at a minimum:
       - Visualization of the tube passing through the vocal cords
       - Appropriate bilateral breath sounds, lack of epigastric sounds
       - Rise and fall of chest wall with ventilations

4.9 TRAUMATIC CARDIOPULMONARY ARREST (CON'T)

- Mist in the tube
- Rising pulse oximeter
- Positive ETCO2 device or Esophogeal Detector Device

b Secure the tube

- Document ETT depth as measured at either the lip line or teeth

c. Fill out optional intubation QA form as required by the service.

- Specific procedures as indicated (i.e. chest decompression, needle cricothyroidotomy).

15. Notify receiving hospital.

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. It often results in the complete loss of the digit / limb. The amputated part, or the skin of the amputated part, may be utilized by the reimplantation surgical team. Major limb amputations may result in death due to uncontrolled hemorrhage. Careful management of the patient and their amputated part(s) will reduce the possibility of infection and increase the likelihood of successful reimplantation.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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. **Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate.**
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 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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. 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.

5. **Management of injured tissue:**
   a. **Tissue still attached to body (i.e., avulsion):**
      - 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 with bulky pressure dressing.
      - 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 water, however, no direct contact between injured tissue/part(s) and ice should occur.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below 100 systolic: treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. 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.

5. **Management of injured tissue:**
   a. **Tissue still attached to body (i.e., avulsion):**
      - clean wound surface with sterile 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 Normal Saline.
      - control bleeding and bandage wound with bulky pressure dressing.
      - retrieve amputated tissue/part(s) if possible.
      - wrap amputated tissue/part(s) in sterile gauze moistened with sterile 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 water, however, no direct contact between injured tissue/part(s) and ice should occur.

6 **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status**

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

8. Initiate transport as soon as possible with or without Paramedics.

9. Contact **MEDICAL CONTROL**. Medical control may order:
   a. Additional IV Normal Saline 250 cc - 500 cc bolus or wide open **or** titrate to patient's **hemodynamic status.**

10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

11. Notify receiving hospital.

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and assist ventilations as needed. In cases of suspected head/neck injury, ensure cervical spine stabilization/immobilization.
3. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
4. 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.
5. **Management of injured tissue:**
   a. Tissue still attached to body (i.e., avulsion):
   - clean wound surface with sterile 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 Normal Saline.
   - control bleeding and bandage wound with bulky pressure dressing.
   - retrieve amputated tissue/part(s) if possible.
   - wrap amputated tissue/part(s) in sterile gauze moistened with sterile Normal Saline.
   - place amputated tissue/part(s) in a plastic bag.

4.10 TRAUMATIC AMPUTATIONS (con't)

- place sealed bag into a cool/cold water immersion. NOTE: ice cubes may be in the water, however, no direct contact between injured tissue/part(s) and ice should occur.

6 **ALS STANDING ORDERS**

a. Provide advanced airway management if indicated due to other injuries and/or illness.

b. Determine if patient is experiencing severe pain using numerical scale or visual analog scale as appropriate. (See Appendix) After a complete and through patient assessment consider using 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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

7. Initiate transport as soon as possible.

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

a. Additional Normal Saline 250 cc - 500 cc bolus **(es)** or wide open titrated to patient's condition.

b. **Morphine Sulfate 2.0 – 10.0 mg SLOW IV PUSH, for pain control related to an isolated traumatic amputation. . May be repeated at discretion of Medical Control.**
Contraindicated in multisystem trauma.

c. If no IV access, Morphine Sulfate 2.0 mg – 10.0 mg IM/SQ

9 Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.

10. Notify receiving hospital.

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 assist ventilations as needed. **NOTE: The newborn should be evaluated for central cyanosis. (Remember: Peripheral cyanosis is common and is not 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

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. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. 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).
3. Dry the infant, place on a dry blanket, cover the head and keep the infant warm.
4. 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.**
5. For heart rate **60 - 80** and rapidly rising:
   - Continue manual ventilation.
6. For heart rate **less than 60, or between 60 - 80** and not rapidly rising:
   - Initiate CPR.

NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.

7. Activate ALS Intercept if available.
8. Initiate transport as soon as possible with or without ALS.
9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
11. Notify receiving hospital.

5.1 NEWBORN RESUSCITATION

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and suction the mouth, then nose. If meconium (brown stained fluid) is present, suction the hypopharynx (Contact Paramedics immediately if available for possible need of endotracheal intubation).
3. Dry the infant, place on a dry blanket, cover the head and keep the infant warm.
4. 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 oxygen at 40-60 breaths per minute, **using appropriate oxygen delivery device, as clinically indicated.**

5. For heart rate **60 - 80** and rapidly rising:
   - Continue manual ventilation.
6. For heart rate **less than 60, or 60-80** and not rapidly rising:
   - Initiate CPR.

NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.

7. **ALS STANDING ORDERS** (heart rate less than 60 and inadequate ventilations)
   a. 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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status

8. Activate ALS Intercept if available.
9. Initiate transport as soon as possible with or without Paramedics.
10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

5.1 NEWBORN RESUSCITATION

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Maintain an open airway and suction the mouth, then nose. If meconium (brown stained fluid) is present, suction the hypopharynx.

NOTE: If meconium is present, consider early endotracheal intubation and suctioning.

DO NOT SUCTION/INTUBATE NEONATE WITH A VIGOROUS CRY

3. Dry the infant, place on a dry blanket, cover the head and keep the infant warm.
4. 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 oxygen at 40-60 breaths per minute, **using appropriate oxygen delivery device, as clinically indicated.**

5. Cardiac monitor **12 lead ECG** - **Manage dysrhythmias per protocol**
6. Normal Newborn: initiate transport.
7. **ALS STANDING ORDERS**
   a. 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, or 60-80 and not rapidly rising:**
      - Initiate CPR.
      - Continue manual ventilation with supplemental oxygen.
      - Advanced airway management if not already done.
      - Cardiac Monitor **12 lead ECG - 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 while enroute. (Note: NALS-trained EMT-Paramedics may utilize umbilical lines when necessary). Treat for shock.
8. Initiate transport as soon as possible.

5.1 NEWBORN RESUSCITATION

PARAMEDIC PROCEDURES (continued)

9. 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 mg/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 cc/kg IV or IO.**
   h. **Lidocaine 2%, 1 mg/kg ET, IV, or IO.**
10. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

5.2 PEDIATRIC 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: 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, cephalosporin, 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.

Most reactions occur within thirty (30) minutes following allergen exposure, although the onset of symptoms can vary from several seconds to hours. As a rule, the earlier the onset of symptoms following antigenic exposure, the more severe will be the subsequent reaction. Virtually all body systems are affected in an anaphylactic reaction.

NOTE: To administer a patient's epinephrine auto-injector, EMTs must have completed training through an EMT-B Refresher or Transition course and are operating with an ambulance service under a Medical Control Agreement.
NOTE To administer the ambulance service's epinephrine auto-injector EMTs must be authorized through a state approved epinephrine auto-injector course and are operating with an ambulance service under a Medical Control Agreement.

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Determine patient's hemodynamic stability and symptoms. Continually assess using O-P-Q-R-S-T model, Level of consciousness, ABCs and Vital Signs. Determine if blood pressure 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. **<u>MILD DISTRESS</u>:** itching, isolated urticaria, nausea, no respiratory distress.

   b. **<u>SEVERE DISTRESS</u>:** poor air entry, flaring, grunting, cyanosis, stridor, bronchospasm, abdominal cramps, respiratory distress, tachycardia, shock, edema of lips, tongue or face and generalized urticaria.

5.2 PEDIATRIC ANAPHYLAXIS

ASSESSMENT / TREATMENT PRIORITIES (continued)

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. 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 and assist ventilations as needed. This may include repositioning of the airway, suctioning, or use of airway adjuncts (oropharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.

5. 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 every 5 minutes and keep patient warm.

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

6. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

5.2 PEDIATRIC ANAPHYLAXIS

INTERMEDIATE PROCEDURES

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 and assist ventilations as needed. This may include repositioning of the airway, suctioning, or use of airway adjuncts (oropharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

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

5. **INTERMEDIATE 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.
   c. <u>Initiate IV Normal Saline (KVO) enroute to the hospital.</u>
   d. <u>If patient's BLOOD PRESSURE drops below 100 systolic: Administer a 250 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status</u>
   e. Monitor vital signs every 5 minutes and keep patient warm.

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

6. Initiate transport as soon as possible with or without Paramedics.
7. Contact **MEDICAL CONTROL.** The following may be ordered:
   a. Administration of additional fluid bolus(es) (expected fluid bolus will be at intervals of 20 ml/kg).
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

5.2 PEDIATRIC ANAPHYLAXIS

PARAMEDIC PROCEDURES

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 and assist ventilations as needed. This may include repositioning of the airway, suctioning, or use of airway adjuncts (oropharyngeal airway) as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. **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 cc bolus of IV Normal Saline, or titrate IV to patient's hemodynamic status, appropriate BP for age.
   d. **<u>SEVERE DISTRESS</u>:**
      - 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.**
5. Initiate Transport as soon as possible.
6. 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 cc sterile Normal Saline solution.
   c. **Epinephrine infusion 1:1,000 (1 mg/ml)** administer **0.1 to 1.0 mg/kg/min**.
   d. **Albuterol Sulfate 0.5%** (via nebulizer):
      - **If age** less **than 2 years, 0.25 ml diluted with 2.5 ml sterile Normal Saline solution.**
      - **If age 2 years or** greater**, 0.5 ml diluted with 2.5 ml sterile Normal Saline solution.**
      - **20 ml/kg** fluid bolus of Normal Saline.
   e. **Epinephrine 1:10,000**; administer **0.01 mg/kg** IV Bolus up to maximum single dose 0.3 mg.
   f. **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.

7. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

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, an 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 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 Abuse, including possible ingestion or overdose of medications, specifically calcium channel blockers, beta-blockers, and/or digoxin preparations.
6. 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.

5.3 PEDIATRIC BRADYDYSRHYTHMIAS

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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. If pulse is **less than 60 in a child**, or is **less than 80 in an infant, AND** the **patient is symptomatic,** start Cardiopulmonary Resuscitation (CPR).
5. Prevent / treat for shock.
6. Activate ALS intercept, if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (See Appendix), treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. If pulse is **less than 60 in a child** or is **less than 80 in an infant** and the patient is symptomatic, start Cardiopulmonary Resuscitation (CPR).
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without Paramedics.
7. **ALS STANDING ORDERS**
   a. Advanced Airway Management, if indicated.
   b. IV Normal Saline (KVO).
8. Contact **MEDICAL CONTROL**. The following may be ordered:
   a. Normal Saline bolus at discretion of Medical Control (expected fluid bolus is 20 ml/kg).
9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

5.3 PEDIATRIC BRADYDYSRHYTHMIAS

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. If pulse is **less than 60 in a child** or is **less than 80 in an infant** and the patient is symptomatic, start Cardiopulmonary Resuscitation (CPR).

5. **ALS 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 symptomatic as defined in Assessment Priorities:
      i. **Epinephrine 1:10,000, 0.01 mg/kg IV Bolus or IO (maximum single dose 0.5 mg), or,**
      ii. **Epinephrine 1:1,000, 0.1 mg/kg ET, followed by 2.0 cc 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.**
6. Initiate transport as soon as possible.

7. 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 mg/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.
      4 If age less than 5 years: 0.1 mg/kg.
      5 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 challenge 10-20 cc/kg IV or IO.

PARAMEDIC PROCEDURES (continued)

7. Contact **MEDICAL CONTROL**. The following may be ordered: **(continued)**
   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.
8. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

5.4 PEDIATRIC 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. Wheezing in children can occur from a variety of causes. Patients with asthma can wheeze in response to weather changes, stress, exercise, infection or allergy. Pneumonia, bronchitis and bronchiolitis are some of the infectious causes of wheezing. Other causes of pediatric wheezing include foreign bodies (tracheal, bronchial and esophageal) 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 indicating minimal air movement.

Respiratory Distress is defined as inadequate breathing in terms of either rate, rhythm, quality and/or depth of breathing. Children who are breathing too fast or slow may not be receiving enough oxygen to support bodily functions and may allow an increase in carbon dioxide to dangerous levels. Irregular breathing 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, too deeply or too shallow, etc.), fluid build up, use of accessory muscles, and/or nasal flaring (especially in children) can also be signs of a serious medical problem. 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 symptoms (wheezing). These may coexist.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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)

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. **NOTE:** 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. 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 management, suctioning or use of airway adjuncts as indicated.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.

6. BLS STANDING ORDERS

<u>MILD DISTRESS</u>

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: **<u>and the inhaler is present</u>**
   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.

7. <u>Contact MEDICAL CONTROL. The following may be ordered</u>

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.

5.4 PEDIATRIC BRONCHOSPASM / RESPIRATORY DISTRESS

8. **If properly trained and authorized to do so, use the assisted nebulized medication for asthmatics in crisis 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.

9. Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.
10. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
11. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 management, suctioning or use of airway adjuncts as indicated.
3. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
4. Activate Paramedic intercept, if deemed necessary and if available.
5. Initiate Transport as soon as possible with or without Paramedics.

6. **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.

7. 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:

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.

5.4 PEDIATRIC BRONCHOSPASM / RESPIRATORY DISTRESS

8. **If properly trained and authorized to do so, use the assisted nebulized medication for asthmatics in crisis 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 IV Normal Saline (while enroute) if in severe distress.
d. If patient's BLOOD PRESSURE drops below 100 systolic: Treat for shock (See Appendix)

9. Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.

10. Notify receiving hospital.

PARAMEDIC PROCEDURES

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 management, suctioning or use of airway adjuncts as indicated.
3. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
4. Cardiac monitoring **12 lead ECG** - **Manage dysrhythmias per protocol**

5. **ALS 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 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, 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.**
   b. Consider Saline lock or IV Normal Saline if in severe distress.
   c. For severe distress: **Epinephrine 1:1,000, 0.01 mg/kg** subcutaneously **(maximum single dose 0.3 mg**).

6. Initiate transport as soon as possible.

5.4 PEDIATRIC BRONCHOSPASM / RESPIRATORY DISTRESS

7. 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. If the pediatric patient's respiratory status worsens: go to **Pediatric Anaphylaxis Protocol**.

8. **If patient's BLOOD PRESSURE drops below 100 systolic: Treat for shock (See Appendix**

9. Monitor and record vital signs every 5 minutes (at a minimum) if unstable, every 15 minutes (at a minimum) if stable.

10. Notify receiving hospital.

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 using O-P-Q-R-S-T model, 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.

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

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and if in cardiopulmonary arrest.
3. Maintain open airway and assist ventilations (ensure proper seal around the ventilation mask) with supplemental oxygen **using appropriate oxygen delivery device, as clinically indicated.** This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated. If indicated, treat spinal injury accordingly.
4. If unable to ventilate child after repositioning of airway: assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
5. Initiate Cardiopulmonary Resuscitation (CPR).
6. **EARLY DEFIBRILLATION:** If child is over **8 years old or over 25kg (55lb)**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.

7. **If authorized, and child is under 8 years of old and 25 kg (55 lbs)**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.

NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.

8. Activate ALS intercept, if deemed necessary and if available.
9. Secure patient on cot, or pediatric immobilization device, in supine position, or appropriate to treatment(s) required, prevent / treat for shock.
10. Initiate transport as soon as possible; with or without ALS.
11. Monitor and record vital signs (if any).
12. Notify receiving hospital.

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

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Maintain open airway and assist ventilations (ensure proper seal around the ventilation mask) with supplemental oxyge **using appropriate oxygen delivery device, as clinically indicated.**This may include repositioning of the airway, suctioning to remove secretions and/or vomitus, or use of airway adjuncts as indicated. If indicated, treat spinal injury accordingly.
4. If unable to ventilate child after repositioning of airway: assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
7. Initiate Cardiopulmonary Resuscitation (CPR).
8. **EARLY DEFIBRILLATION**: If child is **over 8 years old** or **over 25kg (55kg)**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.

9. **If authorized, and child is under 8 years of old and 25 kg (55 lbs)**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.

NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.

10. **ALS STANDING ORDERS**
    a. Provide advanced airway management, if indicated.
    b. Initiate IV Normal Saline KVO while enroute.
8. Activate Paramedic intercept, if available.
9. Initiate transport with or without Paramedics.
10. Contact **MEDICAL CONTROL**. Medical Control may order:
    a. Normal Saline bolus at discretion of Medical Control (expected fluid bolus is 20 ml/kg).
11. Monitor and record vital signs (if any).
12. Properly secure to cot, or pediatric immobilization device appropriate to treatment(s) required, prevent / treat for shock.
13. Notify receiving hospital.

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

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Maintain 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, or use of airway adjuncts as indicated. If indicated, treat spinal injury accordingly.
   Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>
4. If unable to ventilate child after repositioning of airway: assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
5. Initiate Cardiopulmonary Resuscitation (CPR).
6. **ALS 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 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. **Epinephrine:**
      - **<u>For Bradycardia</u>: IV/IO: 0.01 mg/kg (1:10,000); ET: 0.1 mg/kg (1:1,000) followed by 2.0 cc 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.**
      - **<u>For Asystolic or PEA</u>:**
        i. **Initial Dose: IV/IO; 0.01 mg/kg (1:10,000); ET 0.1 mg/kg (1:1,000) followed by 2.0 cc of NS.**
        ii. **Subsequent doses every 3 - 5 minutes: IV/IO/ET: 0.1 mg/kg (1:1,000) NOTE: Dosages as high as 0.2 mg/kg may be effective.**
        iii. **Epinephrine infusion: initial dose 0.1 mg/kg/min. Titrate to desired effect to maximum dose of 1.0 mg/kg/min.**
   d. **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).**
7. Initiate transport as soon as possible.
8. Contact **MEDICAL CONTROL**. Medical Control may order.
   a. Fluid bolus(es) of Normal Saline (**20 ml/kg)**.
   b. Sodium Bicarbonate **1 mEq/kg**: IV/IO.
   c. All other treatment modalities based upon suspected etiology for cardiopulmonary arrest.

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

9. Monitor and record vital signs (if any).
10. Properly secure to cot, or pediatric immobilization device appropriate to treatment(s) required, prevent / treat for shock.
11. Notify receiving hospital.

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

Altered mental/Neurological/ Diabetic status in children covers a range of behaviors and can be subtle. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Determine patient's hemodynamic stability and symptoms. Continually assess using O-P-Q-R-S-T model, 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. 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 airway/oropharyngeal airway) as indicated. Assume spinal injury if associated with trauma and manage accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. **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.

   CAUTION: Do NOT administer anything orally if the 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 is unconscious or seizing, transport on left side (coma position). 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.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. Notify receiving hospital.

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

INTERMEDIATE PROCEDURES

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 airway/oropharyngeal airway) as indicated. Assume spinal injury if associated with trauma and manage accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. If patient is a known diabetic who is conscious and can speak and swallow, give administer oral glucose or other sugar 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.

5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport to appropriate facility as soon as possible with or without Paramedics.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management if indicated.
   b. Consider IV Normal Saline (while enroute) if in severe distress.
8. Contact **MEDICAL CONTROL**. The following may be ordered:
   a. **20 ml/kg Fluid bolus** of Normal Saline.
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

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

PARAMEDIC PROCEDURES

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 airway/oropharyngeal airway) as indicated. Assume spinal injury if associated with trauma and manage accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. **ALS 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 **12 lead ECG** - **Manage dysrhythmias per protocol**
   d. Treatment for specific etiologies:
      - **Known Diabetic:**
        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.**
5. Initiate transport as soon as possible.

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

PARAMEDIC PROCEDURES (continued)

6. 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.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. Notify receiving hospital.

5.7 PEDIATRIC SEIZURES

A seizure is a temporary alteration in behavior due to the massive electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized or grand mal seizure, partial -simple, partial-complex or petit mal seizure. 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 postictal 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 nonfocal (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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**, 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. 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. (In case of suspected head/neck injury, ensure cervical spine immobilization.)
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

5.7 PEDIATRIC SEIZURES (con't)

4. Prevent the patient from harming his or herself. Place patient in left lateral recumbent position.
5. DO NOT use a bite block.
6. Activate ALS intercept if deemed necessary and if available.
7. Initiate transport as soon as possible with or without ALS.
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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. (In case of suspected head/neck injury, ensure cervical spine immobilization.)
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. Prevent the patient from harming his or herself. Place patient in left lateral recumbent position.
5. Do NOT use a bite block.
6. Activate Paramedic intercept, if deemed necessary and if available.
7. **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.
8. Initiate transport as soon as possible with or without Paramedics.
9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
11. Notify receiving hospital.

PARAMEDIC PROCEDURES

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. (In case of suspected head/neck injury, ensure cervical spine immobilization.)

5.7 PEDIATRIC SEIZURES (con't)

3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Prevent the patient from harming his or herself. Place patient in left lateral recumbent position.
5. DO NOT use a bite block.
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Initiate IV Normal Saline (IV), in visualized or palpated vein.
   c. Cardiac Monitor **12 lead ECG** - **Manage dysrhythmias per protocol**
   d. Determine Blood Glucose level with Dextrose stick.
      - If Glucose is greater than 100 mg/dL, glucose administration unnecessary.
      - If Glucose is less than 100 mg/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).
   e. 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**
      NOTE: If given via ET, follow with 2.0 ml sterile Normal Saline solution.

<u>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. The change to the patient treatment under the paramedic treatment section will be as a standing order to provide diazepam, prior to contacting medical control."</u>

<u>f. Valium (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</u>

7. Initiate transport as soon as possible.

8. Contact **MEDICAL CONTROL**. The following may be ordered:
   a. For **<u>Status Epilepticus</u>**:
      - **Ativan (Lorazepam) 0.05-0.2 mg/kg** IV, IO slowly (dilute 1:1 in Normal saline), or **IM to maximum single dose of 2-4 mg***.
      - Additional IV Dextrose per above protocol.
      - Additional Narcan (Naloxone) per above protocol.
      - Normal Saline fluid challenge, if indicated 10-20 ml/kg.

*** Valium (Diazepam)** and **Ativan (Lorazepam)** should be used to treat only those children who suffer continuous tonic/clonic seizure activity for more than 30 minutes and who demonstrate signs of inadequate oxygenation, such as cyanosis. Apnea often follows intravenous administration of Diazepam; accordingly, field personnel should

5.7 PEDIATRIC SEIZURES (con't)

carefully monitor respiration and prepare to support ventilation with bag-valve-mask apparatus following administration of this agent.

NOTE: Valium and/or Ativan are CONTRAINDICATED in patients with head injury or hypotension.

9. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
11. Notify receiving hospital.

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 shifts 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 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control external bleeding sources and keep child warm.
6. Determine patient's hemodynamic stability and symptoms. Continually assess using O-P-Q-R-S-T method including 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 15º Trendelenburg or head down.
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.

5.8 PEDIATRIC SHOCK

TREATMENT
BASIC PROCEDURES

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 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control external bleeding sources and keep child warm.
6. Activate ALS intercept, if deemed necessary and if available.
7. If in severe shock, position child 15 degrees Trendelenburg or head down.
8. Initiate transport as soon as possible with or without ALS.

9 Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

INTERMEDIATE PROCEDURES

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 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control external bleeding sources and keep child warm.
6. Activate Paramedic intercept if deemed necessary and if available.
7. If in severe shock, position child 15 degrees Trendelenburg or head down.
8. **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.
9. Initiate transport as soon as possible with or without Paramedics.

10. Contact **MEDICAL CONTROL.** The following may be ordered:
    a. Normal Saline bolus at discretion of Medical Control (expected fluid bolus is 20 ml/kg).

5.8 PEDIATRIC SHOCK

11. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
12. Notify receiving hospital.

PARAMEDIC PROCEDURES

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 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. Control external bleeding sources and keep child warm.
6. If in severe shock, position child 15 degrees Trendelenburg or head down.
7. **ALS 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 12 lead ECG **-** Manage dysrhythmias per protocol

8. Initiate transport as soon as possible.
9. Contact **MEDICAL CONTROL** and notify receiving hospital. The following may be ordered:
   a. Additional Normal Saline boluses 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: **Dobutamine (25 mg/ml solution)** DOSE: 2-20 µg/kg/minute.
   d. If known Cardiogenic Shock: **Dopamine (40 mg/ml solution)** DOSE: 2-20 µg/kg/minute. **<u>(Rate determined by physician</u>**)

NOTE: Vasopressor medications are never used in the treatment of hypovolemic shock unless adequate fluid replacement has been completed.

10. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
11. Notify receiving hospital.

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. However, 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. Treatment should be directed towards the underlying causes. 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 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 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. Determine patient's hemodynamic stability and symptoms. Continually assess using O-P-Q-R-S-T model, including 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.

5.9 PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA (SVT)

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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. If tachycardia is related to acute injury or volume loss, see Pediatric Shock Protocol.
5. Activate ALS intercept, if deemed necessary and if available.
6. Initiate transport as soon as possible with or without ALS.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
9. 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. 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. If tachycardia is related to acute injury or volume loss, see Pediatric Shock Protocol.
5. Activate Paramedic intercept, if deemed necessary and if available.
6. Initiate transport to appropriate medical facility as soon as possible with or without Paramedics.
7. **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.

5.9 PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA (SVT)

8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
10. Notify receiving hospital and **Contact MEDICAL CONTROL**. The following may be ordered:
    a. Fluid bolus of Normal Saline (expected fluid bolus of 20 ml/kg).

PARAMEDIC PROCEDURES

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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. If tachycardia is related to acute injury or volume loss, see Pediatric Shock Protocol.
5. **ALS 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.
6. Initiate transport to appropriate medical facility as soon as possible.
7. 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 cardioversions may be given up to 1.0 joules/kg. If cardioversion is warranted, consider administration of any of the following for sedation:
        - **Valium: if patient < 70 kg: 2.5 mg SLOW IV Push or,**
        - **Versed 0.5 mg - 2.5 mg SLOW IV push or,**
        - **Morphine Sulfate 2.0 mg - <u>5.0</u> mg IV or IM.**
    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. **<u>Consider</u>** Vagal maneuvers (see **Reminder** below).
8. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
9. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
10. Notify receiving hospital.

*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

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 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. Assume spinal injury and treat accordingly.
4. Initiate Cardiopulmonary Resuscitation (CPR) if indicated.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. Consider all 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. **Treat all life threatening conditions as they become identified.**
9. Prevent / treat for shock.
10. When multiple patients are involved, they need to be appropriately triaged.
11. Obtain appropriate S-A-M-P-L-E history related to event, including Mechanism of Injury, and possible child abuse.
12. Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by regional point of entry protocol.
13. Monitor and record vital signs (if any) and ECG.
14. 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.

5.10 PEDIATRIC TRAUMA AND TRAUMATIC ARREST

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. 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. **NOTE: Ventilate at a rate appropriate for age.** (See Appendix)
4. Assume spinal injury and treat accordingly.
5. Initiate treatment for shock (maintain supine position, elevate legs and keep child warm if possible) or initiate Cardiopulmonary Resuscitation (CPR) as indicated.

6. <u>If authorized, and child is under 8 years of old and 25 kg (55 lbs)</u>
   a. <u>Perform CPR until AED device is attached and operable.</u>
   b. <u>Follow AED protocol.</u>
   c. <u>Resume CPR when appropriate.</u>

<u>NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.</u>

Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>

7. Consider all potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.).
8. Activate ALS intercept, if deemed necessary and if available.
9. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
10. **Treat all life threatening conditions as they become identified.**
11. When multiple patients are involved, they need to be appropriately triaged.
12. Initiate transport as soon as possible with or without ALS.

    NOTE: Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by regional point of entry protocol.

13. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
14. Notify appropriate receiving hospital.

5.10 PEDIATRIC TRAUMA AND TRAUMATIC ARREST

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. 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.

NOTE: Ventilate at a rate appropriate for age. (See Appendix)

4. Assume spinal injury and treat accordingly.
5. Initiate treatment for shock (maintain supine position, elevate legs and keep child warm if possible) or initiate Cardiopulmonary Resuscitation (CPR) as indicated.

6. **If authorized, and child is under 8 years of old and 25 kg (55 lbs)**
   a. **Perform CPR until AED device is attached and operable.**
   b. **Follow AED protocol.**
   c. **Resume CPR when appropriate.**

NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.

7. **Administer oxygen using appropriate oxygen delivery device, as clinically indicated.**
8. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Initiate IV Normal Saline while enroute (KVO).
9. 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.
10. Consider all potential non-traumatic causes (i.e., hypothermia, overdose, other underlying medical conditions, etc.).
11. Activate Paramedic intercept, if deemed necessary and if available.
12. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
13. **Treat all life threatening conditions as they become identified.**
14. When multiple patients are involved, they need to be appropriately triaged.
15. Initiate transport as soon as possible with or without Paramedics.

NOTE: Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by regional point of entry protocol.

16. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
17. Notify appropriate receiving hospital.

5.10 PEDIATRIC TRAUMA AND TRAUMATIC ARREST

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness, absence of breathing and pulselessness.
3. 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.

NOTE: Ventilate at a rate appropriate for age. (See Appendix)

4. Assume spinal injury and treat accordingly.
5. Initiate treatment for shock (maintain supine position, elevate legs and keep child warm if possible) or initiate Cardiopulmonary Resuscitation (CPR) as indicated.
6. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

7. **ALS 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 cc/kg** fluid bolus. **NOTE: In general, the only medications that should be administered to a traumatic arrest patient are oxygen and IV fluids.**
   e. If in cardiopulmonary arrest, no IV access and the child is greater than six years old, attempt external jugular access and administer **20 cc/kg** fluid bolus.

8. **Contact MEDICAL CONTROL.**:
   a. In patients who require emergent intubation
      - Cannot be intubated by conventional means
      - The treating paramedic has been duly authorized by the Services's Medical Director in use of an alternative airway (LMA or Combitube)

   b. To facilitate intubation: Medical control may order:

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

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

9 Once the patient is intubated, the treating paramedic will:

a Document appropriate ETT placement. This will include at a minimum:

- Visualization of the tube passing through the vocal cords
- Appropriate bilateral breath sounds, lack of epigastric sounds
- Rise and fall of chest wall with ventilations
- Mist in the tube
- Rising pulse oximeter
- Positive ETCO2 device or Esophogeal Detector Device

b Secure the tube

- Document ETT depth as measured at either the lip line or teeth

c. Fill out optional intubation QA form as required by the service.

d. Needle cricothyroidotomy.

e. Additional bolus(es) **20 cc/kg** of Normal Saline or wide open (depending upon child's age/size/weight).

f. Needle decompression of the thorax if indicated.

10. Consider all potential non-traumatic causes (hypothermia, overdose, underlying medical conditions etc.)
11. As patient's condition suggests, continually assess Level of Consciousness, ABCs and Vital Signs.
12. **Treat all life threatening conditions as they become identified.**
13. When multiple patients are involved, they need to be appropriately triaged.
14. Initiate transport as soon as possible.

Note: Above activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by regional point of entry protocol.

15. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
16. Notify appropriate receiving hospital.

5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

This emergency can vary in severity from mild to life threatening and the child's condition may change suddenly. Common mechanical causes 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/Neurological 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) maintain an open airway, place child in position of comfort and **avoid upper airway stimulation**.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
4. Determine patient's hemodynamic stability and symptoms. Continually assess using O-P-Q-R-S-T method, including 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.

5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

TREATMENT
BASIC PROCEDURES

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) 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.*
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. Activate ALS intercept, if deemed necessary and if available.
5. Initiate transport as soon as possible with or without ALS.
6. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
7. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
8. Notify receiving hospital.

* See Tracheostomy Tube Obstruction Management in this Protocol.

5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

INTERMEDIATE PROCEDURES

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 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**.

3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. Activate Paramedic intercept, if deemed necessary and if available.
5. **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.
6. Initiate transport as soon as possible with or without Paramedics.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
9. Notify receiving hospital.

5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

PARAMEDIC PROCEDURES

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 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.*
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

4. **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. 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.
7. Monitor and record vital signs every 5 minutes at a minimum if unstable, or every 15 minutes if stable.
8. If patient's BLOOD PRESSURE drops below age appropriate systolic pressure (see Appendix), treat for shock.
9. Notify receiving hospital.

* See Tracheostomy Tube Obstruction Management in this Protocol.

5.11 PEDIATRIC UPPER AIRWAY OBSTRUCTION

*** 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 <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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.

5.12 PEDIATRIC VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA

TREATMENT
BASIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. 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.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
5. If indicated, treat spinal injury per protocol.
6. If unable to ventilate child after repositioning of airway, assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
7. **EARLY DEFIBRILLATION** If there are **no** contraindications:
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate

Contraindications: consciousness; respiratory arrest with pulses; obvious signs & symptoms of death; children **under 8** years of age and under or weighing **less than** 25 kg (55 lbs.); and/or while in a moving ambulance.)

<u>NOTE: Dependent upon provider having an AED with FDA clearance for pediatric use that is age and weight appropriate. They may use the AED in compliance with manufacturer specific guidelines and Massachusetts treatment protocols.</u>

8. **Contact Medical Control**.
9. Activate ALS intercept, if deemed necessary and if available.
10. Prevent / treat for shock.
11. Initiate transport as soon as possible, with or without ALS.
12. Monitor and record vital signs.
13. Notify receiving hospital.

INTERMEDIATE PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. Maintain an open airway and assist ventilations (ensure proper seal around the ventilation mask) with supplemental This may include repositioning of the airway, suctioning to remove secretions and /or vomitus. Use airway adjuncts as indicated. If indicated, treat spinal injury per protocol.
4. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated</u>**.
5. If unable to ventilate child after repositioning of airway, assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
6. **EARLY DEFIBRILLATION**: If child is **over 8 years old** or **over 25kg (55kg)**
   a. Perform CPR until AED device is attached and operable.
   b. Follow AED protocol.
   c. Resume CPR when appropriate.
7. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Hyperventilate with 100% oxygen.
   c. Initiate IV Normal Saline KVO **while en route.**
8. Activate Paramedic intercept, if available.
9. Initiate transport with or without Paramedics.
10. Contact **MEDICAL CONTROL**: Medical Control may order:
    a. Normal Saline fluid bolus(es) at expected 20 ml / kg.
11. Monitor and record vital signs.
12. Notify receiving hospital.

5.12 PEDIATRIC VENTRICULAR FIBRILLATION PULSELESS VENTRICULAR TACHYCARDIA

PARAMEDIC PROCEDURES

1. Ensure scene safety and maintain appropriate body substance isolation precautions.
2. Determine unresponsiveness and cardiopulmonary arrest.
3. 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. If indicated, treat spinal injury per protocol.
4. If unable to ventilate child after repositioning of airway, assume upper airway obstruction and follow Pediatric Upper Airway Obstruction Protocol.
5. Initiate Cardiopulmonary Resuscitation.
6. **ALS STANDING ORDERS:**
   a. Provide advanced airway management, if indicated.
   b. Hyperventilate with 100% oxygen.
   c. Initiate IV / IO Normal Saline, but do not delay defibrillation.
   d. Defibrillate up to 3 (three) times if needed: 2J/kg, 4J/kg, 4J/kg.
   e. **Epinephrine:**
      6 Epinephrine IV / IO: 0.01 mg/kg (1:10,000, 0.1mL/kg).
      7 Epinephrine ET: 0.1 mg/kg (1:1,000. 0.1mL/kg).
   f. Defibrillate 4J/kg 30-60 seconds after each medication.
   g. **Lidocaine 1 mg/kg IV / IO.**
   h. Defibrillate 4J/kg 30-60 seconds after each medication.
   i. **Epinephrine (subsequent doses):**
      8 IV / IO / ET: 0.1 mg/kg (1:1,000, 0.1 ml/kg). May repeat every 3-5 minutes. (IV/IO doses up to 0.2 mg/kg of 1:1,000 may be effective).
   j. **Lidocaine 1 mg/kg IV / IO.**
   k. Defibrillate 4J/kg 30-60 seconds after each medication.

7. Initiate transport as soon as possible.

8. 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.
9. Monitor and record vital signs.
   a. Notify receiving hospital.

5.13 PEDIATRIC PAIN 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 an open airway and assist ventilations as needed. Assume spinal injury when appropriate and treat accordingly.
3. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
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 regional point of entry protocols.
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 and perform **12 lead ECG** - **Manage dysrhythmias per protocol**

Treatment Basic Procedures

1. Assure scene safety, including safety for the patient(s) and rescuer(s).
2. Maintain an open airway and assist ventilations as needed.
3. If suspected spinal injury treat accordingly.
4. Initiate treatment to prevent shock.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. Appropriately manage all Thermal/Chemical burns according to protocol.
7. Activate ALS intercept if deemed necessary and if available.
8. Initiate transport as soon as possible with or without ALS.
9. Monitor and record vital signs every 5 minutes at a minimum, if unstable, or every 15 minutes if stable.
10. Notify receiving hospital.

5.13 PEDIATRIC PAIN MANAGEMENT (CON'T)

INTERMEDIATE PROCEDURES

1. Assure scene safety, including safety for the patient(s) and rescuer(s).
2. Maintain an open airway and assist ventilations as needed.
3. If suspected spinal injury treat accordingly.
4. Initiate treatment to prevent shock.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**
6. **ALS STANDING ORDERS**
   a. Provide advanced airway management, if indicated.
   b. Initiate IV normal saline KVO

7. 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.

8. Activate paramedic intercept, if deemed necessary and available.
9. As patient's condition suggests, continually assess Level of Consciousness, ABC's and Vital Signs.
10. Treat all life threatening conditions as they become identified.
11. When multiple patients are involved, they need to be appropriately triaged.
12. Initiate transport as soon as possible with or without Paramedics.

Note: Patient care activities must not unnecessarily delay patient transport to the nearest appropriate facility as defined by regional point of entry protocol.

13. Notify appropriate receiving hospital.

PARAMEDIC PROCEDURES

1. Assure scene safety, including safety for the patient(s) and rescuer(s).
2. Maintain an open airway and assist ventilations as needed.
3. If suspected spinal injury treat accordingly.
4. Initiate treatment to prevent shock.
5. **Administer oxygen <u>using appropriate oxygen delivery device, as clinically indicated.</u>**

6. Determine if patient is experiencing severe pain from a suspected long bone fracture or significant burn (using numerical scale or visual analog scale as appropriate to child's abilities)

7. **ALS 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)

5.13 PEDIATRIC PAIN MANAGEMENT

ALS STANDING ORDERS (CON'T)

c. If IV access obtained, **Morphine 0.1 mg/kg IV/IM/SC/IO (maximum individual dose 5.0 mg)**
d. If **NO** IV access, **Morphine 0.1 mg/kg IM/SC** (**maximum individual dose 5.0 mg)**

8. Reassess patient using patient pain scale.

9. **MEDICAL CONTROL** may also order:
   a. 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.
   b. Fluid Bolus: Normal Saline 20 ml/kg IV
   c. Morphine 0.1 mg/kg IV/IM/SC

10. As patient's condition suggests, continually assess Level of Consciousness, ABC's and Vital Signs.

12. Treat all life threatening conditions as they become identified.
13. Initiate transport as soon as possible.
14. Notify appropriate receiving hospital.

CHANGES TO THE:

STATEWIDE TREATMENT PROTOCOLS & APPENDIX
FIFTH EDITION

Version 5.1 Effective Date January 1, 2004 Posted 12/19/2003

1. Protocols and Appendix **COMBINED** in one Document
2. High Flow Oxygen Administration- Language Change
3. 12 lead ECG – Language Change
4. MAST/PASG- Language Removed
5. New Protocol: (2.6) Nerve Agent Exposure
6. New Protocol: (3.14) Adult Pain Management
7. New Medications: Nerve Agent Antidotes- (Autoinjectors)
8. Appendix D Rescue Airwar Protocol – Language Change
9. New Appendix - Required Skill Language Removed
10. New Appendix – Procedures
11. New Appendix -Adult Pain Management Assessment Guide
12. New Appendix - Nerve Agent Dosing & Reference Tables

~ ~ ~ APPENDIX A - MEDICATIONS LIST~ ~ ~

MEDICATIONS LIST FOR STATEWIDE TREATMENT PROTOCOLS

Required Medications:

Activated Charcoal
Adenosine (Adenocard)
Albuterol (Proventil, Ventolin)
Aspirin
Atropine
Atrovent Inhalation Aerosol
Calcium Chloride
Cetacaine Spray, Neo-Synephrine Spray, OR
2% Lidocaine Jelly
(To assist with nasotracheal intubation)
Dextrose D10, D25, and D50
Diazepam (Valium)
Diltiazem HCL (Cardizem, LyoJect)
Diphenhydramine (Benadryl)
Dopamine (Intropin)
Epinephrine (Adrenalin) (1:1000 and 1:10,000)
Epi-Pen
Furosemide (Lasix)
Glucagon; Oral glucose (Glucola, Intra-glucose)
Lidocaine
Magnesium Sulfate
Midizolam (Versed)
Morphine Sulfate
Naloxone(Narcan)
Nitroglycerin (Nitrostat)
Nitropaste (Nitro-Bid ointment)
Oxygen
Saline Flush
Sodium Bicarbonate
Terbutaline (Brethine) (subcutaneous)
Thiamine
IV Solutions (NS).

Interfacility Transfer Medications (in addition to required medications): Aminophylline drips; Intravenous Antibiotics; 10% Dextrose (D10); Intravenous Diltiazem infusions; Dobutamine (Dobutrex); Glycoprotein IIb / IIIa Inhibitors(Abciximab, Eptifibatide, Tirofiban) Intravenous Heparin; Insulin infusion (patients with DKA); Magnesium infusions; Mannitol infusions; Meperidine (Demerol); Midizolam (Versed); Morphine Sulfate infusions; Nitroglycerin infusion; Nitropaste(Nitro-Bid ointment); Potassium Chloride infusions; Procainamide (Pronestyl), *Sodium Bicarbonate Infusions,* Intravenous Steroids (Methylprednisolone; Solu-Cortef, etc.); Standard IV infusion fluids (1/2 NS, D5 1/2 NS, D5 1/4 NS, D5, LR, etc.); Total Parenteral Nutrition (TPN) (Central or peripheral IV lines).

NOTE: Although the sending facility may have initiated medication(s), Paramedics MUST be familiar with all of the above medications that the patient may be receiving at the time of transfer. Reminder: interfacility medications are not to be initiated by Paramedics (except under special project waiver).

Optional Medications:

Amiodarone (Cordarone)
Cyanide Antidote Kit (Amyl Nitrite, Sodium Nitrite, Sodium Thiosulfate)
Lorazepam (Ativan)
Metoprolol (Lopressor)
Nerve Agent Antidotes (Autoinjectors)
Pralidoxime (2-PAM)
Tetracaine
IV solutions (D5W and LR)

APPENDIX B

COMFORT CARE / DNR ORDER VERIFICATION PROTOCOL

INTRODUCTION

Emergency medical services (EMS) personnel (refers collectively to Emergency Medical Technicians - EMTs and First Responders) are required to provide emergency care and to transport patients to appropriate medical facilities. EMS personnel are further required to provide treatment to the fullest extent possible, subject to their level of training. However, more and more patients**,** where it is medically appropriate, are opting not to be resuscitated. Many patients arrange with their physician, nurse practitioner or physician's assistant[1] for Do Not Resuscitate (DNR) orders; an order directing that the individual not be resuscitated in the event of cardiac or respiratory arrest. However, since there is currently no uniform mechanism to enable EMS personnel to recognize DNR orders in out-of-hospital settings, EMS personnel have been obligated to perform full resuscitative measures when encountering a patient unable to convey directions regarding medical treatment.

While it is clear within the emergency medical services' community that a patient has the authority to determine his/her medical treatment, EMS personnel have been unable to consider a patient's wishes regarding resuscitation in the out-of-hospital setting where the patient is either not conscious or not competent, due to the difficulty of ascertaining the validity of these wishes in the field under emergency conditions. Usually there is no ongoing relationship between the emergency medical services personnel and the patient. Emergency conditions require an immediate response and accurate identification. Authentication of individuals and documents is difficult, if not impossible, under emergency field conditions.

This Comfort Care / DNR ("CC/DNR") Order Verification Protocol is designed to allow EMS personnel to honor a DNR order in an out-of-hospital setting. To date, there are no standardized documents by which EMS personnel can verify a DNR order in the field, under emergency conditions. This protocol provides for a state-wide, uniform DNR order verification, approved by the Department of Public Health (DPH), that EMS personnel can instantly recognize as an acceptable verification of an existing DNR order; thus, allowing EMS personnel to honor the patient's request for no resuscitation and to provide the patient with palliative care in conformance with the Comfort Care protocol.

PURPOSE

The purpose of this protocol is to: (1) provide a verification/authentication of DNR orders to enable EMS personnel to honor DNR orders in out-of-hospital settings; (2) clarify the role and

[1] **Certain nurse practioners and physician assistants can issue DNR orders. Since not all nurse practioners and physician assistants are authorized to issue DNR orders, this protocol refers to authorized nurse practioners or authorized physician assistants to distinguish that group, which is authorized to sign the Comfort Care/Do Not Resuscitate Order Verification. Only those nurse practioners or physician assistants as defined below are authorized to sign the verification forms.**

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COMFORT CARE / DNR ORDER VERIFICATION PROTOCOL (con't)

responsibilities of EMS personnel at the scene and/or during transport of patients who have a current, valid CC/DNR Order Verification; (3) avoid resuscitation of patients who have a current, valid CC/DNR Order Verification; and (4) provide palliative/comfort care measures for patients with a current, valid CC/DNR Order Verification. This protocol is not intended to alter the standard of practice in issuing DNR orders in any way, but only to provide a standardized mechanism for the verification of the DNR order so that it may be recognized in out-of-hospital settings.

DEFINITIONS

For purposes of this protocol, the following are defined:

1. Attending Physician: A physician, licensed pursuant to M.G.L. c.112, §2, selected by or assigned to a patient, who is responsible for the treatment and care of the patient, in whatever setting medical diagnosis or treatment is rendered. Where more than one physician shares such responsibility, any such physician may act as the attending physician for purposes of this protocol.

2. Authorized Nurse Practitioner ("Authorized NP"): A registered nurse in the Commonwealth with advanced nursing knowledge and clinical skills as required by M.G.L. c. 112, §80B and 244 CMR 4.00 et seq. A nurse practitioner may write a DNR order, where this activity is agreed upon by the nurse practitioner and the collaborating physician in written practice guidelines (244 CMR 4.22[1]). It is the obligation of the nurse practitioner, the collaborating physician, and the institution where the nurse practitioner is practicing at the time the CC/DNR is issued to ensure that the nurse practitioner is authorized under his/her written practice guidelines to write a DNR order and by extension to sign the Comfort Care Verification form.

3. Authorized Physician Assistant ("Authorized PA"): A person who meets the requirements for registration set forth in M.G.L. c. 112, §9I, and who may provide medical services appropriate to his or her training, experience and skills under the supervision of a registered physician. The Division of Registration provides that a physician assistant may write DNR orders if: (1) his/her supervising physician determines that issuing a DNR order is within the competence of the physician assistant given the physician assistant's level of training and expertise (263 CMR 5.04 [1]), and (2) with regard to DNR orders, the physician assistant must consult with his/her supervising physician prior to issuance. A physician assistant may properly review and renew a preexisting DNR order without prior consultation with his/her supervising physician. Since the Comfort Care/Do Not Resuscitate Order Verification is a verification of an existing valid DNR order, the signing of the verification is comparable to the renewal of a preexisting DNR order. It is the obligation of the physician assistant, his/her supervising physician, and the institution where the physician assistant is practicing at the time the CC/DNR is issued to ensure

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COMFORT CARE / DNR ORDER VERIFICATION PROTOCOL (con't)

that the physician assistant is authorized under his/her practice guidelines to write a DNR order and by extension to sign the Comfort Care Verification form.

4. Cardiopulmonary Resuscitation ("CPR"): Includes for purposes of this protocol, cardiac compression, artificial ventilation, oropharyngeal airway (OPA) insertion, advanced airway management such as endotracheal intubation, cardiac resuscitation drugs, defibrillation and related procedures.

5. Comfort Care / DNR Order Verification Bracelet ("bracelet"): A bracelet modeled after a hospital identification bracelet, which shall include the patient's name; date of birth; gender; date of expiration, if any, of the underlying DNR order; and the signature and telephone number of the attending physician, authorized nurse practitioner, or authorized physician assistant. The bracelet can only be issued to someone who has a valid CC/DNR Order Verification Form and must be issued by an attending physician, authorized nurse practitioner, or authorized physician assistant. Wearing the bracelet is voluntary; however, it is strongly recommended for individuals who remain mobile.

6. Comfort Care / DNR Order Verification Form ("form"): A standardized state-wide form for verification of DNR orders in the out-of-hospital setting, approved by the Department of Public Health. The CC/DNR Order Verification Form shall include the patient's name; date of birth; gender; address; date of issuance and date of expiration, if any, of the underlying DNR order; the signature and telephone number of an attending physician, authorized nurse practitioner, or authorized physician assistant; and the signature of the patient, guardian or health care agent. The CC/DNR Order Verification Form is the only DNR document that EMS personnel will be instructed to honor and can only be issued by an attending physician, authorized nurse practitioner, or authorized physician assistant.

7. Comfort Care / DNR Order Verification Protocol: A standardized state-wide patient care protocol to be followed by EMS personnel (EMTs and First Responders) when encountering a patient with a current, valid CC/DNR Order Verification Form and/or Bracelet. The protocol provides that the patient in respiratory or cardiac distress will receive palliative, comfort care consistent with the scope of the EMT's training and certification, but no resuscitative measures. The protocol applies to all emergency medical services personnel (Basic, Intermediate and Paramedic EMTs and First Responders) operating in an out-of-hospital setting and requires that they perform patient assessment and treatment in accordance with this protocol.

8. Emergency Medical Services Personnel: Any EMT certified pursuant to 105 CMR 170.000 et seq. and any First Responder as defined in 105 CMR 171.050.

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9. Guardian: An individual appointed by the court, pursuant to M.G.L. c. 201, §§ 6, 6A, or 6B, to make decisions for a person who is mentally ill, mentally retarded or unable to make or communicate informed decisions due to physical incapacity or illness, provided that the appointment as guardian includes the right to make health care decisions; or, a parent or other individual who is legally entitled to make decisions about the care and management of a child during his/her minority.

10. Health Care Agent: An individual authorized by a health care proxy to make health care decisions on behalf of the principal, pursuant to M.G.L. c. 201D. The authority of the health care agent becomes effective only upon a written determination of the attending physician, pursuant to M.G.L. c. 201D, § 6, that the principal lacks the capacity to make or to communicate health care decisions.

11. Life-sustaining procedure: Cardiopulmonary resuscitation, as defined in number 4 above. Life-sustaining procedures shall not include any medical procedure or intervention considered necessary by the attending physician, EMS personnel, or the medical control physician to provide comfort care or to alleviate pain.

12. Medical Control Physician: A physician designated within the EMS system to provide on-line and off-line medical direction to EMS personnel.

13. Palliative care: Comfort care that eases or relieves symptoms without correcting the underlying cause or disease.

14. Out-of-hospital: Any setting outside a hospital where EMS personnel may be called and may encounter patients with CC/DNR Order Verifications including, but not limited to, long-term care, hospice, assisted living, private homes, schools, inter-facility transport, and other public areas.

AUTHORITY

It is well settled in Massachusetts that individuals, while competent, have the right to determine the course of their medical treatment, including the right to refuse medical treatment and to make end of life decisions. Norwood Hospital v. Munoz, 409 Mass. 116, 564 N.E.2d 1017 (1991); Brophy v. New England Sinai Hospital, 398 Mass. 417, 497 N.E.2d 626 (1986); Lane v. Candura, 6 Mass. App. Ct. 377, 376 N.E.2d 1232 (1978); and Superintendent of Belchertown State School v. Saikewicz, 373 Mass. 728, 370 N.E.2d 417 (1977). Similarly, it is recognized that incompetent individuals have the same right to determine the course of their medical treatment as well as to refuse medical treatment. Brophy v. New England Sinai Hospital, supra; Saikewicz, supra; Matter of Spring, 380 Mass. 629, 405

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N.E.2d 115 (1980). See also, Matter of Dinnerstein, 6 Mass. App. Ct. 466, 380 N.E.2d 134 (1978); and Care and Protection of Beth, 412 Mass. 188, 587 N.E.2d 1377 (1992).

As an extension of the health profession into the field, the emergency medical system has the same obligation to recognize an individual's right to refuse medical treatment in an out-of-hospital setting, where the authenticity of the documentation can be validated.

Further authority: M.G.L. c. 111C and 105 CMR 170.000 et seq.; M.G.L. c. 111 § 201 and 105 CMR 171.000 et seq.

IMPLEMENTATION PROCEDURES

ELIGIBILITY: Anyone with a current valid DNR order is eligible for a CC/DNR Order Verification (Form and/or Bracelet), including minors.

A DNR order is an order, executed by a physician, authorized nurse practitioner, or authorized physician assistant, issued according to the current standard of care. The standard for issuing the DNR order is neither defined nor changed by this protocol. This protocol simply serves to verify, for EMS personnel, a DNR Order issued by a physician.

VALIDITY: To assure that a DNR order is recognized in any out-of-hospital setting, an attending physician, authorized nurse practitioner, or authorized physician assistant must provide a patient, who has a current DNR order, with a fully executed CC/DNR Order Verification. Pursuant to this protocol, EMS personnel will be instructed to honor a current valid CC/DNR Order Verification Form or CC/DNR Order Verification Bracelet. Patients without CC/DNR Order Verification Form or Bracelet will be resuscitated by EMS personnel in accordance with standard EMS protocols.

CONTENT: The CC/DNR Order Verification Form shall include:

- the name, date of birth, gender, and address of the patient;
- the name of the guardian or health care agent, if any;
- the signature of the patient or of the guardian or health care agent;
- verification by the attending physician, authorized nurse practitioner, or authorized physician assistant, of the existence of a current valid DNR order;
- the signature and telephone number of the attending physician, authorized nurse practitioner, or authorized physician assistant. If the signature is of an authorized nurse practitioner, or authorized physician assistant, the name (signature not required) of the collaborating or supervising physician shall also be included.;
- the issuance date and expiration date, if any, of the DNR order; and,
- authorization of EMS personnel to act pursuant to the Comfort Care protocol.

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The CC/DNR Order Verification Bracelet shall include:

- the name, date of birth, and gender of the patient;
- the expiration date of the DNR order, if any; and,
- the printed name, signature and telephone number of the attending physician, authorized nurse practitioner, or authorized physician assistant. If the signature is of an authorized nurse practitioner, or authorized physician assistant, the name (signature not required) of the collaborating or supervising physician shall also be included.

EXPIRATION: To the extent that the DNR order written by the physician has an expiration date, the CC/DNR Order Verification Form and CC/DNR Order Verification Bracelet, if issued, shall have an identical expiration date. This protocol does not prescribe an expiration date, but rather leaves the expiration date up to the physician, authorized nurse practitioner, or authorized physician assistant.

If the DNR order is revoked by the physician, authorized nurse practitioner, or authorized physician assistant, patient, guardian or authorized health care agent, the CC/DNR Order Verification Form and CC/DNR Order Verification Bracelet, if any, shall be similarly revoked.

ACCESS: This protocol is implemented solely through physicians. Only physicians can request and receive forms from the Department of Public Health; however a physician may distribute forms to an authorized nurse practitioner, or authorized physician assistant for whom the physician is a collaborating or supervising physician.

This protocol is activated when EMS personnel encounter a CC/DNR Order Verification Form or Bracelet. EMS personnel must:

- confirm the identity of the individual with the CC/DNR Order Verification Form or Bracelet; and,
- confirm that the CC/DNR Order Verification Form is an original and is current and valid[2] , or that the patient is wearing a current and valid CC/DNR Order Verification Bracelet.

If there is a CC/DNR Order Verification Form and/or a Bracelet, and either indicates a revocation or expiration of the CC/DNR Order Verification, EMS personnel shall resuscitate.

PATIENT CARE: Upon confirmation of a current, valid CC/DNR Order Verification Form or Bracelet, EMS personnel shall follow the following procedures:

[2] It is not the responsibility of the EMT to confirm the validity of the signature of the physician, authorized nurse practioner, or authorized physician assistant, nor is it the EMT's responsibility to determine whether the physician signing the verification is an attending physician, or the nurse practioner, or physician assistant authorized to sign the verification. Provided that the form is the original, is intact and is fully executed, it shall be presumed valid by the EMT unless there is information presented to the contrary.

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- If the patient is not in respiratory or cardiac arrest and the patient's heart beat and breathing are adequate, but there is some other emergency illness or injury, the EMS personnel shall provide full treatment and transport, as appropriate, within the scope of their training and level of certification.

- If the patient is in full respiratory or cardiac arrest, the EMS personnel shall not resuscitate, which means:
  - ⇒ do not initiate CPR;
  - ⇒ do not insert an oropharyngeal airway (OPA);
  - ⇒ do not provide ventilatory assistance;
  - ⇒ do not artificially ventilate the patient (mouth-to-mouth, bag valve mask, positive pressure, etc.);
  - ⇒ do not administer chest compressions;
  - ⇒ do not initiate advanced airway measures such as endotracheal intubation;
  - ⇒ do not administer cardiac resuscitation drugs; and,
  - ⇒ do not defibrillate.

- If the patient is **not** in full respiratory or cardiac arrest, but the patient's heart beat or breathing is inadequate, EMS personnel shall not resuscitate but shall provide, within the scope of their training and level of certification, full palliative care and transport, as appropriate, including:
  - ⇒ emotional support;
  - ⇒ suction airway;
  - ⇒ **administer oxygen**;
  - ⇒ application of cardiac monitor;
  - ⇒ control bleeding;
  - ⇒ splint;
  - ⇒ position for comfort;
  - ⇒ initiate IV line; and,
  - ⇒ contact Medical Control, if appropriate, for further orders, including necessary medications.
- If EMS personnel have any question regarding the applicability of the CC/DNR Order Verification with regard to any specific individual, the EMS personnel shall:
- verify with the patient, if the patient is able to respond;
- provide full treatment; or,
- contact Medical Control for further orders.

- If efforts are initiated prior to confirmation of the valid CC/DNR Order Verification, discontinue the following resuscitative measures upon verification:
  - ⇒ CPR;

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COMFORT CARE / DNR ORDER VERIFICATION PROTOCOL (con't)

⇒ ventilatory assistance;
⇒ cardiac medications; and,
⇒ advanced airway measures.

Established IV lines and advanced airways should remain in place.

DOCUMENTATION: When a CC/DNR Order Verification Form and/or Bracelet is encountered by EMS personnel, it shall be documented. EMS personnel must also document palliative care provided to the patient and that the CC/DNR Order Verification Form or Bracelet is current and valid. Ambulance service personnel must document the presence of the CC/DNR Order Verification on the ambulance trip record.

REVOCATION: EMS personnel are not to honor any DNR request where the CC/DNR Order Verification Form or Bracelet, if present, is void or not intact. If there is a CC/DNR Order Verification Form and Bracelet, and either indicates a revocation, EMS personnel shall resuscitate.

- The CC/DNR Order Verification may be revoked by the patient at any time, regardless of mental or physical condition, by the destruction or affirmative revocation of the CC/DNR Order Verification, or by his or her direction that the CC/DNR Order

- Verification not be followed by out-of-hospital providers or be destroyed. Patients shall be instructed, upon revocation, to destroy the CC/DNR Order Verification From, CC/DNR Order Verification Bracelet, if issued, and the underlying DNR order.

- If an individual identifying him/herself as the health care agent or guardian revokes the CC/DNR Order Verification, EMS personnel shall resuscitate, as this raises an issue of doubt as to the validity of the CC/DNR Order Verification.

- EMS personnel, upon witnessing or verifying a revocation, shall communicate that revocation in writing to the hospital to insure its inclusion in the patient's medical record. Ambulance service personnel shall document the revocation on the ambulance trip record.

- **In any situation where EMS personnel have a good faith basis to doubt the continued validity of the CC/DNR Order Verification, EMS personnel shall resuscitate.**

Date: April 9, 1999

APPENDIX C: CESSATION OF RESUSCITATION (PENDING)

APPENDIX D: RESCUE AIRWAY PROTOCOLS (ADULT & PEDIATRIC)

RESCUE AIRWAY PROTOCOL ~ ADULT

The Rescue Airway Protocol (RAP) may be used in conjunction with any other protocol requiring airway control by those authorized to perform endotracheal intubation. When confronted with an airway that is evaluated as **unstable* (e.g., *unsuccessful intubation after a total of 3 attempts, unable to clear a foreign body airway obstruction, airway grading** suggests intubation unlikely*)**, advanced providers should utilize alternate equipment and training to gain control of the airway. Additionally, if the Emergency Medical Technician is unable to ventilate the patient, a determination should be made as to whether this inability is due to a manageable cause (e.g., *poor technique, equipment failure, mask size, mask seal*) and corrective measures applied, when applicable.

****Grade: Assessment of patient's airway to determine if there is expected difficulties with regard to intubation. i.e. anatomical alignment of the airway for ventilation."**

ASSESSMENT / TREATMENT PRIORITIES

1. Determine if the patient's airway is unstable***.**
2. Ensure scene safety and maintain appropriate body substance isolation precautions.
3. Maintaining grading** of the patient's airway.
4. Continue Bag-Valve-Mask (BVM) management with supplemental oxygen with oropharyngeal or nasopharyngeal adjuncts, (OPA or NPA) in place.
5. Initiate transport as soon as possible
6. Follow AHA & ARC guideline for management of the adult FBAO.

TREATMENT

INTERMEDIATE PROCEDURES

STANDING ORDERS

1. Arrange for Advanced Life Support (ALS) for intercept

2. After completing your assessment as listed above:
   a. Provide Rescue Airway Management.
   b. If BVM failure is the result of a manageable cause.
      - Apply countermeasures if applicable
   c. If the airway is unstable and the adult patient can be ventilated.
      - Insert the Laryngeal Mask Airway (LMA) or Combi-Tube
   d. Initiate IV Normal Saline while in transport.
   e. Notify receiving hospital.

APPENDIX D RESCUE AIRWAY PROTOCOL ~ ADULT (con't)

PARAMEDIC PROCEDURES

STANDING ORDERS

1. After completing your assessment as listed above:
    a. Provide Rescue Airway Management.
    b. If BVM failure is the result of a manageable cause.
        - Apply countermeasures if applicable
    c. If the airway is unstable and the adult patient can be ventilated.
        - Insert the Laryngeal Mask Airway (LMA) or Combi-Tube
    d. If the airway is unstable and the patient cannot be ventilated **perform a needle cricothyrotomy and provide oxygen via jet ventilation.**
    e. Contact Medical Control for further orders:
    f. Initiate IV Normal Saline while in transport.
    g. Notify receiving hospital.

The Rescue Airway Protocol (RAP) may be used in conjunction with any other protocol requiring airway control by those authorized to perform endotracheal intubation. When confronted with an airway that is evaluated as **unstable* (e.g., *unsuccessful intubation after a total of 3 attempts, unable to clear a foreign body airway obstruction, airway grading** suggests intubation unlikely*)**, advanced providers should utilize alternate equipment and training to gain control of the airway. Additionally, if the Emergency Medical Technician is unable to ventilate the patient, a determination should be made as to whether this inability is due to a manageable cause (e.g., *poor technique, equipment failure, mask size, mask seal*) and corrective measures applied, when applicable.

****Grade: Assessment of patient's airway to determine if there is expected difficulties with regard to intubation. i.e. anatomical alignment of the airway for ventilation."**

ASSESSMENT / TREATMENT PRIORITIES

1. Determine if the patient's airway is unstable***.**
2. Ensure scene safety and maintain appropriate body substance isolation precautions.
3. Maintaining grading** of the patient's airway.
4. Continue Bag-Valve-Mask (BVM) management with supplemental oxygen with oropharyngeal or nasopharyngeal adjuncts, (OPA or NPA) in place.
5. Initiate transport as soon as possible
6. Follow AHA & ARC guideline for management of the adult FBAO.

APPENDIX D RESCUE AIRWAY PROTOCOL ~ ADULT (con't)

TREATMENT

INTERMEDIATE PROCEDURES

STANDING ORDERS

1. Arrange for Advanced Life Support (ALS) for intercept

2. After completing your assessment as listed above:
   a. Provide Rescue Airway Management.
   b. If BVM failure is the result of a manageable cause.
      - Apply countermeasures if applicable
   e. If the airway is unstable and the adult patient can be ventilated.
      - Insert the Laryngeal Mask Airway (LMA) or Combi-Tube
   f. Initiate IV Normal Saline while in transport.
   g. Notify receiving hospital.

PARAMEDIC PROCEDURES

STANDING ORDERS

1. After completing your assessment as listed above:
   a. Provide Rescue Airway Management.
   b. If BVM failure is the result of a manageable cause.
      - Apply countermeasures if applicable
   c. If the airway is unstable and the adult patient can be ventilated.
      - Insert the Laryngeal Mask Airway (LMA) or Combi-Tube

   d. If the airway is unstable and the patient cannot be ventilated **perform a needle cricothyrotomy and provide oxygen via jet ventilation.**

   e. Contact Medical Control for further orders:

   f. Initiate IV Normal Saline while in transport.
   g. Notify receiving hospital.

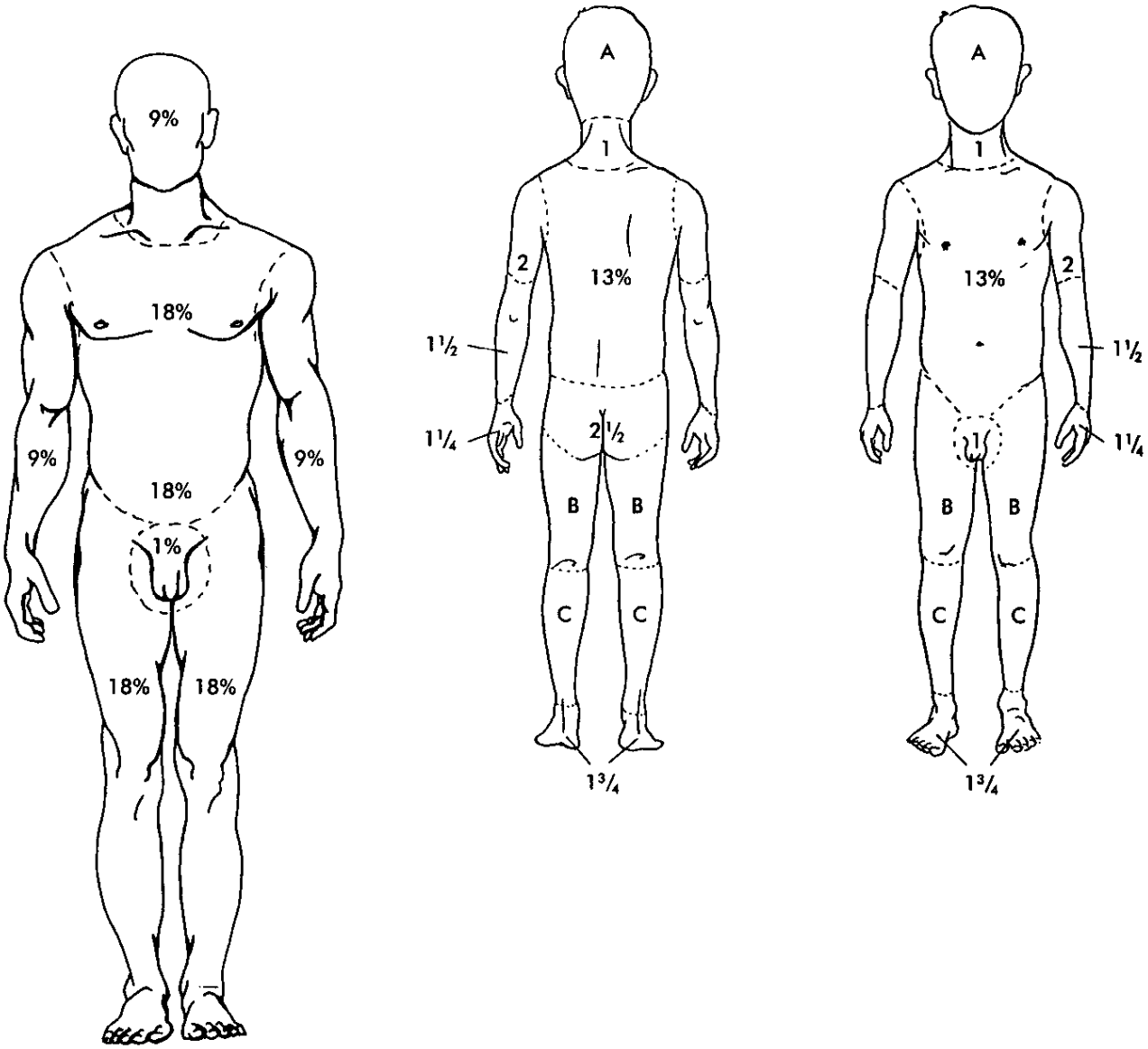
APPENDIX E - ENDOTRACHEAL TUBE SIZES

Suggested Sizes for Endotracheal (ET) Tubes:

Age	Internal Diameter of Tube in mm
Newborn	3.0
6 Months	3.5
18 Months	4.0
3 Years	4.5
5 Years	5.0
6 Years	5.5
8 Years	6.0
12 Years	6.5
16 Years	7.0

APPENDIX F - BURN CHART (ADULT & PEDIATRIC)

Lund & Browder Chart



Estimation of Burn Size (Children)

Area	Age 0	1 yr.	5 yr.	10 yr.	15 yr.
A - 1/2 of head	9 1/2 %	8 1/2 %	6 1/2 %	5 1/2 %	4 1/2 %
B - 1/2 of one thigh	2 3/4 %	3 1/4 %	4 %	4 1/4 %	4 1/2 %
C - 1/2 of one leg	2 1/2 %	2 1/2 %	2 3/4 %	3 %	3 1/4 %

APPENDIX G - TRAUMA SCORES

GLASGOW COMA SCORE	
Eye Opening:	
Spontaneous	4
To Voice	3
To Pain	2
None	1
Verbal Response:	
Oriented	5
Confused	4
Inappropriate Words	3
Incomprehensible Words	2
None	1
Motor Response:	
Obeys Command	6
Localizes Pain	5
Withdrawn (Pain)	4
Flexion (Pain)	3
Extension (Pain)	2
None	1
Total GCS Score:	3 - 15

Total GCS Points	
14 - 15	5
11 - 13	4
8 - 10	3
5 - 7	2
3 - 4	1

Revised Trauma Score

GCS	SBP	RR	Coded Values
13 - 15	>89	10 - 29	4
9 - 12	76 - 89	>29	3
6 - 8	50 - 75	6 - 9	2
4 - 5	1 - 49	1 - 5	1
3	0	0	0

SBP = Systolic Blood Pressure, RR = Respiratory Rate

APPENDIX G - TRAUMA SCORES

CALCULATION OF TRAUMA SCORE USING THE GLASGOW COMA SCALE

Glasgow Coma Scale

Eye Opening Response:	Spontaneous	4
	To Voice	3
	To Pain	2
	None	1
Best Verbal Response:	Oriented	5
	Confused	4
	Inappropriate Words	3
	Incomprehensible Sounds	2
	None	1
Best Motor Response:	Obey Command	6
	Localizes Pain	5
	Withdraws (Pain)	4
	Flexion (Pain)	3
	Extension (Pain)	2
	None	1
Total:	Apply this score to GCS portion of TS Below:	3 - 15

Trauma Score

GCS: (total points from above)	14 - 15	5
	11 - 13	4
	8 - 10	3
	5 - 7	2
	3 - 4	1
Respiratory Rate:	10 - 24 / Min.	4
	25 - 35 / Min.	3
	36 Min. or greater	2
	1 - 9 / Min.	1
	None	0
Respiratory Expansion:	Normal	1
	Retractive / None	0
Systolic Blood Pressure:	90 mm Hg or greater	4
	70 - 89 mm Hg	3
	50 - 69 mm Hg	2
	0 - 49 mm Hg	1
	No Pulse	0
Capillary Refill:	Normal	2
	Delayed	1
	None	0
Total Trauma Score:		1 - 16

Trauma Score	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Percentage Survival	99	98	96	93	87	76	60	42	26	15	8	4	2	1	0	0

APPENDIX G - TRAUMA SCORES

COMPONENTS OF THE PEDIATRIC TRAUMA SCORE

	Values		
Component	**+2**	**+1**	**-1**
Size	≥ 20 kg	10 - 20 kg	≤ 10 kg
Airway	Normal	Maintainable	Unmaintainable
CNS	Awake	Obtunded	Coma
SBP	≥ 90 mm Hg	50 - 90 mm Hg	≤ 50 mm Hg
Open Wound	None	Minor	Major
Skeletal Injuries	None	Closed Fracture	Open or Multiple Fractures

CNS: Central Nervous System, SBP: Systolic Blood Pressure

APPENDIX H – REQUIRED SKILL

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APPENDIX I– PROCEDURES

The following conditions must be met in order for your service to provide the following treatment as listed below:

1. **Your Medical Director Must Have Authorized You As An EMT To Utilize This Portion Of The Protocol Based On Your Level Of Certification.**

2. **You Ambulance Service Must Have A Current Signed MOA With The Hospitals Served.**

3. **The Minimum Standard Training Component must be achieved as outlined by OEMS.**

APPENDIX I– PROCEDURES

BLS: **a. Albuterol Administration via Nebulizer (Service Option)**

ALS: **a. Needle Cricothyroidotomy**

4. The approved training program can be obtained from the OEMS website at:

http://www.state.ma.us/dph/oems/emttrain.htm

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APPENDIX I– PROCEDURES

ALS: A. *Needle Cricothyrotomy* (Approved for Paramedics Only)

The following is a general description of one of several accepted techniques being used throughout the Commonwealth, and may be used as a guideline. Due to differences in medical devices used by individual systems, the procedure may vary slightly. Refer to your local and regional guidelines for the technique and equipment used in your system.

Note: Appropriate body substance isolation precautions are required whenever caring for the trauma patient.

Indications: The indications for performing a needle Cricothyrotomy on a patient will be:

1. **The patient is in imminent danger of death.**
2. **No alternative airway device/maneuver has been successful.**
3. **The patient cannot be oxygenated or ventilated by any other means**

The local EMS Medical Director has appropriately trained and authorized the treating EMT-Paramedics.

Examples of types of patients potentially meeting the above criteria include (but are not limited to):

1. **Patients suffering traumatic arrest**
2. **Patients suffering multiple traumatic injuries**
3. **Patients suffering an upper airway obstruction**

Recognizing the time critical nature of the emergency, Needle Cricothyrotomy will be a Standing Order for patients/systems/paramedics meeting all of the above criteria.(See Also Rescue Airway Protocol Appendix)

A. Assemble and prepare oxygen tubing by cutting a hole toward one end of the tubing. Connect the other end of the oxygen tubing to an oxygen source, capable of delivering 50 psi or greater at the nipple, and assure free flow of oxygen through the tubing.

B. Place the patient in a sitting position.

C. Assemble a #12- or 14-gauge, 8.5 cm, over-the-needle catheter to a 6- to 12-mL syringe.

D. Clean the neck with an aseptic technique, using antiseptic swabs.

E. Palpate the cricothyroid membrane, anteriorly, between the thyroid cartilage and cricoid cartilage. Stabilize the trachea with the thumb and forefinger of one hand to prevent lateral movement of the trachea during the procedure.

F. Puncture the skin midline with the needle attached to a syringe, directly over the cricothyroid membrane (i.e., mid-saggital).

G. Direct the needle at a 45 degree angle caudally, while applying negative pressure to the syringe.

H. Carefully insert the needle through the lower half of the cricothyroid membrane, aspirating as the needle is advanced.

I. Aspiration of air signifies entry into the tracheal lumen,

J. Remove the syringe and withdraw the stylet while gently advancing the catheter downward into position, being careful not to perforate the posterior wall of the trachea,

Needle Cricothyrotomy (con't)

K. Attach the oxygen tubing over the catheter needle hub (you may use a 4.0 ET tube connector), and secure the catheter to the patient's neck.

L. Intermittent ventilation can be achieved by occluding the open hole cut into the oxygen tubing with your thumb for one second and releasing it for four seconds. After releasing your thumb from the hole in the tubing, passive exhalation occurs. Note: Adequate PaO2, can be maintained for only 30 to 45 minutes.

M. Continue to observe lung inflations and auscultate the chest for adequate ventilation.

Complications of Needle Cricothyrotomy

1. Asphyxia
2. Aspiration
3. Cellulitis
4. Esophageal perforation
5. Exsanguinating hematoma
6. Hematoma
7. Posterior tracheal wall perforation
8. Subcutaneous and/or mediastinal emphysema
9. Thyroid perforation
10. Inadequate ventilations leading to hypoxia and death

APPENDIX J - AIR MEDICAL TRANSPORT PROTOCOLS

Statewide Trauma Triage Guidelines for
Air Medical Services
September, 1997

Introduction:

The use of air medical services has become the standard of care for many critically ill or injured patients who require transport to specialized medical facilities such as Trauma Centers.

The purpose of these Guidelines is to establish a clinical framework for prehospital EMS personnel upon which to make decisions regarding when to access air medical support services. The following constitute the philosophical foundation for these Guidelines.

- EMS personnel should consider requesting ground advanced life support (ALS) and air medical support when operational conditions listed below exist and the following patient conditions are present;

- Patients with an uncontrolled or compromised airway should be brought to the nearest appropriate facility unless advanced life support (ALS) service (by ground or air) can intercept in a more timely fashion; and:

- Patients in cardiac arrest subsequent to blunt trauma should be taken to the nearest facility.

These guidelines have been established so that air medical support does not require prior Medical Control approval. However, Medical Control contact should be considered whenever appropriate for patient management issues.

OPERATIONAL CONDITIONS:

1. When a patient meets patient criteria defined below and scene arrival time to estimated arrival time at the nearest appropriate hospital, including extrication time, exceeds 20 minutes:
2. Patient location, weather or road conditions preclude the use of standard ground ambulance; or
3. Multiple casualties / patients are present which will exceed the capabilities of local hospital and agencies.

APPENDIX J - AIR MEDICAL TRANSPORT PROTOCOLS (Con't)

PATIENT CONDITIONS:

1. Physiologic Criteria:

a. Unstable Vital Signs
-Blood Pressure less than 90.
-Respiratory Rate greater than 30 or less than 10.

2. Anatomic Injury:

a. Evidence of Spinal Cord injury including paralysis or paresthesia.
b. Severe Blunt Trauma:
-head injury (Glascow Coma Scale of twelve [12] or less)
-severe chest or abdominal injury.
-severe pelvic injury excluding simple hip fractures.
c. Burns:
- greater than 20% Body Surface Area (BSA) second or third degree burns;
- evidence of airway or facial burns;
- circumferential extremity burns; or
- burns associated with trauma.
d. Penetrating injuries of head, neck, chest, abdomen or groin.
e. Amputations of extremities, excluding digits.

Special Conditions: The following should be considered in deciding whether to request air medical transport, but are **not** automatic or absolute criteria:

1. **Mechanism of Injury**
   a. -Motor Vehicle Crash:
      -patient ejected from vehicle.
      -death in same passenger compartment.
   b. Pedestrian struck by a vehicle and thrown more than 15 feet, or run over by a vehicle.

2. **Significant Medical History**
   a. -Age greater than 55 or less than 10.
   b. -Significant coexistent illness.
   c. -Pregnancy.

APPENDIX K - PROCESS FOR CHANGES TO THE STATEWIDE TREATMENT PROTOCOLS

All changes (any addition, deletion, or any other type of amendment) to the Massachusetts Statewide Pre-Hospital Treatment Protocols, including the ALS Interfacility Transfer Guidelines (Appendix N: A/R 5-509)[1] , require statewide dissemination and often require training of EMTs and Medical Control physicians prior to implementation. Therefore, to ensure a thorough review and orderly implementation, all protocol changes shall be approved and implemented on an annual basis, with the exception of those arising out of procedures described in Part B below.

Any protocol change must be approved pursuant to the following Procedures.

PART A
Procedures for Annual Protocol Changes

1. All requests for protocol changes shall be submitted by at least one Regional Medical Director to the Medical Services Committee on or before March 1, each year. The request for a protocol change shall include the following:
    a. A detailed description of the proposed change;
    b. A formal written endorsement from the Region(s) of origin for the proposed change;
    c. The results of a literature search documenting the risk/benefit of the proposed change in the pre-hospital arena. A literature search related to proposed changes in the interfacility transfer guidelines shall document the validity and accepted use of the proposed change in acute care facilities as well as in interfacility transport. All literature identified, both pro and con, shall be included, accompanied by a summary of the literature;
    d. Training standards for the proposed change, if appropriate.
    e. **Submit 1 written and 1 electronic version of changes to protocols in PC format**.

2. The Medical Services Committee shall review and make a recommendation regarding each proposed change to the protocols. Requests for protocol changes may be submitted to and reviewed by the Medical Services Committee throughout the year on a rolling basis; however, proposed changes shall only be submitted as a complete package for EMCAB Executive Committee review and approval after the March 1 submission deadline. Where training is required for implementation of the protocol change, the Medical Services Committee shall timely distribute the approved protocol changes to the Training Committee for its approval of the training component.

[1] Hereinafter the Massachusetts Statewide Pre-Hospital Treatment Protocols and the Interfacility Transfer Guidelines shall be referred to collectively as protocols.

APPENDIX K - PROCESS FOR CHANGES TO THE STATEWIDE TREATMENT PROTOCOLS (CON'T)

3. All protocol changes approved by the Medical Services Committee, with Training Committee approval of training if appropriate, shall be forwarded to the Executive Committee by March 15 of each year. The EMCAB Executive Committee shall review the proposed protocol changes and make a final determination at its April committee meeting.

4. A presentation of the approved changes shall be made at the first meeting of the full EMCAB following the April Executive Committee approval.

5. OEMS shall timely notify all providers of approved protocol changes and any requirements regarding implementation (i.e. training and implementation date).

PART B
Procedures for Protocol Changes Allowable Other Than on an Annual Basis

1. The State Medical Director shall have the discretion to implement immediate protocol changes when such emergency action is deemed by the Department to be necessary for the protection of public health and safety.
    a. The State Medical Director shall base such emergency action on a thorough review of relevant literature, any applicable national and/or state standard(s) and, when feasible, consultation with EMS Regional Councils, the Medical Services Committee and/or the EMCAB Executive Committee.
    b. When feasible, the State Medical Director shall convene an emergency meeting of the Medical Services Committee. The Medical Services Committee shall recommend any change to the protocols, and refer its recommendation and all supporting documents relating to the proposed change to the EMCAB Executive Committee for action. The EMCAB Executive Committee shall review the recommendation and make a final determination.
    c. OEMS shall, in its discretion, establish reasonable time frames for said implementation, particularly if a change requires training, and shall timely disseminate such a protocol change and any relevant implementation requirements.

APPENDIX K - PROCESS FOR CHANGES TO THE STATEWIDE TREATMENT PROTOCOLS (CON'T)

2. OEMS shall have the discretion to make changes to bring the protocols into compliance with national standards of care.
    a. This shall be done, when feasible, in consultation with Regional EMS Councils, the Medical Services Committee, and/or EMCAB Executive Committee.
    b. OEMS shall, in its discretion, establish reasonable time frames for said implementation, particularly if a change requires training, and shall timely disseminate such a protocol change and any relevant implementation requirements.

APPENDIX L - MULTIPLE CASUALTY INCIDENTS (MCI) TRIAGE

Each MCI/Disaster scene presents its own unique hazards and difficulties. This plan is a general guide to the management of MCIs. It should be understood that modifications may need to be made by command personnel on scene as such changes are needed.

A multiple casualty incident (MCI) is any situation where the number of sick or injured patients exceeds the available local, regional or state EMS system resources to provide adequate care in a timely manner to minimize injury and death. An MCI may be the result of a man made disaster or a natural event. Successful management of an MCI will require preplanning and organization of local, regional and state EMS, fire, law enforcement and civil defense resources. Hospital resources and specialized care services must also be included in preparing your MCI plan.

MCI management process is defined in the Incident Command System (ICS). In general, the Fire Department establishes the overall command and designates the incident commander (IC). **NOTE:** Other agencies may function as the IC, for example, Law Enforcement agencies at a crime scene or hostage situation. Other agencies may assist the IC. Clear precise inter-agency communication networks must be established for successful MCI management.

Levels of response to an MCI can be developed and will dictate which personnel and resources will be required at the scene. These levels include:

Level I Response: A localized MCI that can be managed by local EMS and Rescue personnel without the need for mutual aid from outside organizations.
Level II Response: An MCI that overwhelms or severely taxes local EMS and Rescue personnel that requires the need for mutual aid and interagency coordination. Typically a large number of patients are involved.
Level III Response: An MCI that overwhelms both local and regional EMS and rescue resources. Multiple patients spread over multiple sites are often involved. Significant inter-agency coordination is required.

TRIAGE

Triage is a special process of sorting patients by the severity of injury or illness to determine the need of emergency care and transportation. This needs to be a continuous process throughout the management of an MCI. The initial triage process should be performed by the first crew to arrive on scene and needs to be continuously reevaluated since the patient's triage status may change. Presently there are no national standard guidelines established for triage. Therefore, a suggested method of triage may be performed by either the METTAG (triage tagging system) or the START Field Guide (Simple Triage And Rapid Transportation) triage systems.

APPENDIX L - MULTIPLE CASUALTY INCIDENTS / TRIAGE (con't)

A suggested approach to treatment prioritization of victims is that found in the **METTAG** system. The treatment priorities are defined as:

Zero priority (BLACK): Deceased or live patients with obvious fatal and non-resuscitatable injuries

First priority (RED): Severely injured patients requiring immediate care and transport. (e.g., respiratory distress, thoracoabdominal injury, severe head or maxillofacial injuries, shock/severe bleeding, severe burns)

Second priority (YELLOW): Patients with injuries that are determined not to be immediately life threatening. (e.g., abdominal injury without shock, thoracic injury without respiratory compromise, major fractures without shock, head injury/cervical spine injury, and minor burns)

Third priority (GREEN): Patients with minor injuries that do not require immediate stabilization. (e.g., soft tissue injuries, extremity fractures and dislocations, maxillofacial injuries without airway compromise and psychological emergencies)

The **START Field Guide** consists of a sixty (60) second patient assessment that evaluates ventilation, perfusion, and mental status to classify the victims as needing immediate or delayed transport or are non-salvageable or dead. This allows rescuers to quickly identify victims that are at greatest risk of early death or if they may require delayed transport. The METTAG or similar color coded tagging systems may be used as part of the START Field Guide.

SCENE ASSESSMENT AND TRIAGE PRIORITIES

1. Maintain universal blood and body fluid precautions.
2. The initial response team should assess the scene for potential hazards, safety and number of victims to determine the appropriate level of response.
3. Notify central dispatch to declare an MCI and need for interagency support as defined by incident level.

SCENE ASSESSMENT AND TRIAGE PRIORITIES (cont.)

4. Identify and designate the following positions as qualified personnel become available:
    - Incident Command Officer
    - Communications Officer
    - Extrication / Hazards Officer
    - Primary Triage Officer
    - Secondary Triage Officer
    - Treatment Officer
    - Loading/Transportation Officer
5. Identify and designate sector areas of MCI
    - Incident Command/Communication Sector
    - Support Sector (supplies and resources)
    - Staging Sector
    - Extrication / Hazards Sector
    - Triage Sector
        - Primary Treatment Sector
        - Secondary Treatment Sector
        - Transportation Sector
6. Post incident MCI Plan
    - Critical Incident Stress Debriefing (CISD)
    - Post incident Critique

BASIC, INTERMEDIATE AND PARAMEDIC MCI PROCEDURE SUMMARY

All EMT level personnel will eventually be involved in the management of an MCI. It is imperative that all EMTs implement the above incident command system (ICS) in all MCI situations. Every EMT must be aware and have a thorough knowledge of their particular role and responsibilities in the rescue effort.

Due to the many complexities of MCI/Disaster situations, it is recommended that all EMTs should participate and receive additional training in MCI/Disaster management.

APPENDIX M - PEDIATRIC VITAL SIGNS CHART

PEDIATRIC EMERGENCY REFERENCE

Age Years	Weight Kg	Resp Rate	Heart Rate	Systolic Blood Pressure	Resus. Mask	Self Inflating Bag	Laryngo-scope Blade	ET Tube Size mm	ET Tube Lip Line cm	Suction Cath. Fr.	Naso/Oro Gastric Tube	BP Cuff cm
Newborn	3 - 5	30-60	100 - 160	60-80	Infant 0-1	Pediatric	O Miller	3.0	9.0	6	8	5
6 mos.	7	25-40	90-120	80-100	1	Pediatric	1 Miller	3.5	10.5	8	8	5
1 yr.	10	20-30	90-120	80-100	1-2	Pediatric	1 Miller	3.5	10.5	8	8	5
18 mos.	12	20-30	80-120	80-110	2	Pediatric	1 Miller	4.0	11.5	10	8	5
3 yrs.	15	20-30	80-120	80-110	3	Pediatric	2 Miller	4.5	14.0	10	10	5
5 yrs.	20	18-24	70-110	80-110	3	Pediatric	2 Miller	5.0	15.0	10	10	7
6 yrs.	20	18-24	80-100	80-110	3	Pediatric	2 Miller	5.5	16.5	10	10	7
8 yrs.	25	18-24	70-110	80-110	3	Adult	2 Miller	6.0	18.0	14	10	9.5
10 yrs.	30	16-20	70-110	90-120	3	Adult	2 Miller	6.0	18.0	14	12	9.5
12 yrs.	40	16-20	60-110	90-120	4	Adult	2 Miller 2 Mac	6.5	19.5	14	12	9.5
14 yrs.	50	16-20	60-105	90-120	4-5	Adult	3 Miller 3 Mac	7.0	21.0	14	14	Adult
16 yrs.	60	16-20	60-80	80-120	4-5	Adult	3 Miller 3 Mac	7.5	21.5	14	14	Adult
18 yrs.	70	16-20	60-80	80-120	5	Adult	3 Miller 3 Mac	7.5	21.5	16	16	Adult

APPENDIX M - PEDIATRIC VITAL SIGNS CHART

PEDIATRIC EMERGENCY REFERENCE

PEDIATRIC TRAUMA SCORE

Component	+2	+1	-1
Size	>20kg	10-20kg	<10kg
Airway	Normal	Maintable	Unmaintable
CNS	Awake	Obtunded	Comatose
Systolic BP	>90 mmHg	90-60 mmHg	<50 mmHg
Open Wound	None	Minor	Major/Penetrating
Skeletal	None	Closed	Open/Multiple Fx

*** Pediatric Trauma Center if PTS is 8 or less.**

AIRWAY MANAGEMENT

ABCs, 100% Oxygen
Bag-Valve-Mask
Suction with rigid catheter
Oropharyngeal airway
Laryngoscope with blade
Endotracheal tube/Stylet
SaO_2
End-tidal CO_2

LEVEL OF RESPONSE

A =Alert
V =Responds to Voice
P =Responds to Pain
U =Unresponsive

PUPILLARY ASSESSMENT

Pupil size in mm/reaction

N = Normal S =Sluggish F =Fixed

3mm 4mm 5mm 6mm 7mm 8mm

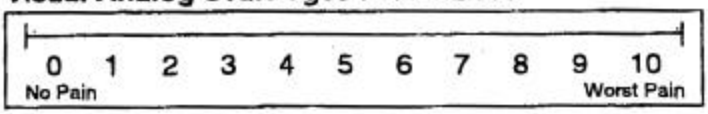
APPENDIX M PEDIATRIC EMERGENCY REFERENCE (con't)

Wong-Baker Faces Pain Rating Scale

FLACC Scale

Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractable	Difficult to console or comfort
Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten.			

Visual Analog Scale *ages 7 and above*



APPENDIX N - INTERFACILITY TRANSFER GUIDELINES

The Executive Committee of the Emergency Medical Care Advisory Board (EMCAB) voted final approval of the attached Administrative Requirement (A/R) 5-509 at their meeting on Monday, May 11, 1998.

A/R 5-509 re-defines policies and procedures regarding the provision of Advanced Life Support during transport of stable patients from one health care facility to another. The attached A/R replaces previous policy documents, particularly the Department's "ADVISORY LETTER, Ambulance Transport of Inter-Hospital Transfer Patients," dated March 25, 1991.

This A/R has an effective date of May 11, 1998. **It is important to note, however, that ambulance services may not implement the provisions of A/R 5-509 until EMTs have successfully completed the required minimum training**. Ambulance services may implement A/R 5-509 once staff is appropriately trained and the service has documented that training to the relevant regional council(s).

By no later than January 1, 1999, ambulance services providing ALS during interfacility transfers must do so in compliance with the provisions of A/R 5-509.

In the interim, until documentation of completion of personnel training is provided to the appropriate region(s), ambulance services must provide ALS Inter-hospital transfers in conformance with current Department policies and prevailing Regional ALS interfacility transfer protocols.

A/R 5-509

OFFICE OF EMERGENCY MEDICAL SERVICES

Administrative Requirements Manual

Effective: 05/01/98 Authorization: Page: 1 of 7
Revised: 05/26/99
A/R Title: ALS INTERFACILITY TRANSFERS

Supersedes: Advisory Letter, Ambulance Transport of Inter-hospital Transfer Patients; March 25, 1991

Purpose:

1. To establish statewide **minimum standards** for the provision of Advanced Life Support (ALS) to stable patients requiring medical transport from one health care facility to another by ambulance services currently licensed in Massachusetts and by Emergency Medical Technicians (EMTs) - Paramedics (Paramedics) currently certified in Massachusetts.

2. To amend current minimum standards for ALS Inter-Hospital Transfers promulgated in the Department's "ADVISORY LETTER, Ambulance Transport of Inter-Hospital Transfer Patients," dated March 25, 199, relative to the following:

   (a) inclusion of the transfer of patients from health care facilities other than licensed, acute care hospitals;
   (b) expansion of the scope of services provided by duly licensed ambulance services and certified EMTs during inter-facility transfers;
   (c) establishment of minimum requirements for the training of EMTs involved in the provision of ALS services to patients during inter-facility transfers;
   (d) establishment of minimum requirements for Quality Assurance/Quality Improvement of ALS Inter-Facility Transfers;
   (e) definition of procedures to be followed in carrying out ALS Inter-Facility Transfers.

Relevant Documents:

1. Massachusetts Emergency Medical Services (EMS) Regulations (105 CMR 170.000);
2. "Non-Emergency Inter-Facility Transfer" Protocol;
3. Massachusetts Statewide EMS Treatment Protocols;
4. Administrative Requirement 5-510: Hospital-Based Physician Medical Direction;
5. Administrative Requirement 5-255: ALS Inter-Facility Staffing Waiver;
6. The Emergency Medical Treatment and Active Labor Act, 42 USCS ss. 1395dd (EMT ALA);
7. Regional Uniform Treatment Protocols;
8. Medication & Equipment List (Attachment A); and
9. Guidelines: ALS Interfacility Training Programs (Attachment B).

A/R 5-509 ALS INTERFACILITY TRANSFERS

Definitions:

For the purpose of this Administrative Requirement, the following definitions shall apply:

1. "ALS Inter-Facility Transfer"
   The transport by ambulance from one health care facility to another of a sick or injured patient who does **not** require emergency response and transport but requires medical treatment and/or monitoring of an on-going medical treatment, consistent with the scope of practice (See Attachment A) of EMT-Intermediates and/or EMT-Paramedics, and/or EMT-Basics if there is a waiver of staffing requirements pursuant to A/R 5-255.

2. "Health Care Facility"
   Any health care setting where patients will be stabilized such that an emergency ambulance response is not required. This will require the supervision and/or on-site presence of a physician and other individuals trained and equipped to provide such care.

3. "Stable Patient"
   Patients must either be evaluated and determined to be stable by a physician on-site at the sending facility or deemed to be stable for ambulance transport by the attending physician. A patient shall be considered stable if (1) at the time the transfer decision is made, the patient's medical condition does not exceed the care capability of the transferring ambulance, **and** (2) deterioration of the patient's medical condition to a level that exceeds the care capability in the transferring ambulance is **not** anticipated during the transport.

Authority:

The Massachusetts EMS Regulations provide for scheduled ambulance transfers, including the transfer of patients by ambulance between health care facilities, as well as for emergency response (170.001 and 17.256). The minimum standards for the provision of ALS (170.985-107.999) address scope of practice, affiliation agreements, operating policies and procedures, vehicles, equipment, supplies, registration with Massachusetts Division of Food and Drugs, communications, personnel, training and staffing. These standards apply to scheduled, non-emergency transport, including the ambulance transport of patients between health care facilities who require ALS services that duly licensed ambulance services and their duly certified EMTs provide.

Minimum Standards for ALS Inter-Facility Transfers:

1. Staffing, Training

   Minimum staffing at the Intermediate level requires one EMT-Basic and one EMT-Intermediate. Minimum staffing at the Paramedic level requires two EMT-Paramedics, except when a waiver is issued by the Department as follows:
   a. to allow Paramedic level staffing with one EMT-Paramedic and EMT-Intermediate pursuant to 105 CMR 170.999(C), or

b. to allow Paramedic level staffing with one EMT-Paramedic and one EMT-Basic pursuant to 105 CMR 170.999 (C) (1) (c) and in conformance with Administrative Requirement 5-255.

Recommendations for EMT staffing on Inter-Facility Transfers, developed by the Medical Services Standing Committee of the Emergency Medical Care Advisory Board (EMCAB) are included below, (4. Scope of Practice).

EMT personnel involved in providing ALS services to patients during Inter-Facility Transfers must meet the following requirements:

a. be currently certified as an EMT in Massachusetts; and
b. have completed Department approved supplemental training that is specific to and consistent with the levels of certification of involved EMTs and includes
   - expanded roles and responsibilities;
   - additional, approved treatment modalities, equipment, devices and technologies; and
   - ambulance service policies and procedures regarding ALS Inter-Facility Transfers.

Guidelines for the approval of ALS Inter-Facility training programs shall be issued separately by the Department (See Attachment B). It shall be the responsibility of the transferring ambulance service to ensure and to verify appropriate training of its personnel providing ALS Inter-Facility Transfers.

2. Affiliation Agreements; Medical Control

An ambulance service must be licensed at an ALS level by the Department to provide ALS care during Inter-Facility Transfers, and it must maintain an agreement for Medical Control, on-line medical direction and quality assurance with a hospital with an emergency department staffed by physicians twenty-four hours each day (105 CMR 170.986).

Administrative Requirement 5-510 clarifies what is meant by “a hospital based physician”. While the physician is not required to be physically present in the hospital when giving medical direction for ALS inter-facility transfers, the physician must be responsible to and an agent of the hospital when functioning as a Medical Control physician. The physician must function within the hospital’s existing quality assurance / quality improvement structure.

The Medical Services Standing Committee makes the following recommendations regarding qualifications for physicians providing Medical Control / Medical Direction for ALS inter-facility transfers:

- currently licensed as a physician and in the active practice of medicine in Massachusetts;
- emergency physician with demonstrated knowledge and experience in the EMS system and pre-hospital medical care;
- experienced in providing medical control to paramedic level ambulance service (in some cases, state and/or regional guidelines may permit certain physician critical care specialists with proven EMS experience);
- additional education in and familiarity with EMT ALA legislation;

- credentialled by the ambulance service's affiliate hospital to provide on-line medical direction'
- provides medical control/medical direction under the auspices of the ambulance service's affiliate hospital;
- continuing medical control relationship with the transferring ambulance service, its paramedics, and medical director; and
- commitment to prompt and consistent availability to intervene or otherwise communicate with paramedics or staff from transferring and, if appropriate, receiving facilities when questions and/or problems arise, including at a minimum:
    - ◊ the clinical situation of the patient;
    - ◊ appropriateness of the transfer including, at a minimum, denials of transfer;
    - ◊ need for additional personnel or equipment; and
    - ◊ issues related to EMT ALA.

3. Communications:

A 1991 amendment to the Statewide EMS Communications Plan supports the use of alternative methods of ambulance-to-hospital communication, such as cellular telephones, for inter-facility transfers. Provisions for using radio medical control are specified in the state Communication Plan. Ambulance services choosing to communicate via cellular telephone, or other acceptable alternative, must document communications between ambulance and medical control physician, for example, by tape recording all medical communications.

4. Scope of Practice:

Section 170.256.A of the EMS Regulations states, "No ambulance service or agent thereof shall transport a patient between health care facilities who is receiving medical treatment that is beyond the training and certification capabilities of the EMTs staffing the ambulance unless an additional health care professional with that capability accompanies the patient..."
The scope of practice for each EMT level is defined (1) in regulation (sections 170.810, 170.820 and 170.840), (2) through established training programs approved by the Department, and (3) through Regional Uniform Treatment Protocols. The care that may be rendered to a patient in an ambulance during an inter-facility transfer, shall be consistent with the "Non-Emergency Inter-Facility Transfer" protocol which shall be promulgated as a component of the Statewide EMS Treatment Protocols.

NOTE: Under the provisions of the EMT ALA, the transfer of a patient from one hospital to another health care facility is appropriate only if the patient is accompanied by qualified personnel using qualified equipment. IT IS THE OBLIGATION OF THE TRANSFERRING HOSPITAL TO DETERMINE WHAT A PATIENT'S NEEDS ARE AND TO ASSURE THAT THE PATIENT'S NEEDS WILL BE MET DURING TRANSFER. The provisions of EMT ALA apply only to a hospital's obligation for an appropriate transfer; not to other health care facilities.

The Medical Services Standing Committee of the Emergency Medical Care Advisory Board (EMCAB) developed the following patient condition classifications and corresponding requirements for EMT personnel during ambulance transport:

A/R 5-509 ALS INTERFACILITY TRANSFERS

a. Routine, scheduled transport. Patient clearly stable with no requirement for airway management, IV maintenance and/or cardiac monitoring.

   Minimum Staffing: BLS licensed ambulance service; two EMT-Basics.

b. Patient clearly stable (as above) who, however, has a "maintenance" IV running without medications in the solution; for example, cancer patient transported for radiation therapy, with unadulterated IV solution running.

   Minimum Staffing: ALS-Intermediate licensed ambulance service; one EMT-Intermediate and one EMT-Basic.

c. Patient with an acute or subacute problem, who is either completely or at least, to the best of an institution's ability, stabilized; who has the potential to become less stable during transportation. Instrumentation or medication running MUST be consistent with "Non-Emergency Inter-Facility Transfer" protocol.

   Minimum Staffing: ALS- Paramedic licensed ambulance service; two EMT-Paramedics; or, if the ambulance service has been issued the appropriate staffing waiver, one EMT-Paramedic and one EMT-Intermediate or one EMT-Basic.

d. Patient with an acute problem with high potential to become unstable. Critical care patient with multiple IVs with any other instrumentation or medication running that is NOT included in the "Non-Emergency Inter-Facility Transfer" protocol.

   Minimum Staffing: Appropriate additional medical personnel (per 170.256(a)) must accompany the patient during transfer; any level of ambulance service licensure; two EMT-Basics.

Under no circumstances shall EMTs function or be assigned to transfers beyond, or potentially beyond, the scope of their training and level of certification. The scope of practice for all EMTs is limited to the levels of EMT certification and training and by licensure level of the ambulance service by which they are employed.

If (1) a patient's medical condition necessitates immediate transport to another health care facility and (2) the patient's medical treatment during transport will exceed the level of licensure of the transferring ambulance service and/or level of certification of the transferring ambulance's personnel, and (3) the transferring facility will not provide appropriate additional personnel pursuant to 105 CMR 170.256(a), the transferring ambulance service shall be required to activate an emergency ambulance response.

The transferring facility may at any time opt to exceed these minimum requirements by transferring patients in BLS ambulances with appropriate medical personnel as defined in 170.256(a).

A/R 5-509 ALS INTERFACILITY TRANSFERS

5. Quality Assurance/Quality Improvement

Ambulance services providing ALS inter-facility transfers shall be required to have quality assurance / quality improvement policies specific to ALS inter-facility transfers in conjunction with both Medical Control physicians and their ambulance service medical directors.

Ambulance services shall report to the Department any violations of 105 CMR 170.000, this Administrative Requirement and/or prevailing treatment protocols as they relate to ALS inter-facility transfers.

EMT skill maintenance and didactic knowledge will be continually assessed and appropriate measures taken to ensure quality of patient care by Medical Control physicians and by ambulance service Medical Directors.

Patient ALS Transfer Procedure

Once an ALS Inter-Facility Transfers has been deemed appropriate by the transferring ambulance service (see “Scope of Practice” above), paramedic staff, upon arrival at the transferring facility, will (1) receive a report from the staff of the transferring facility, (2) assess the patient and (3) provide a concise, complete and accurate patient report to the Medical Control physician. The report should include, at a minimum, the following information:

- names of transferring and receiving facilities;
- patient’s diagnosis;
- reason(s) for transfer;
- brief history of present illness and any intervention(s) which has occurred to date;
- pertinent physical findings;
- vital signs;
- current medications and IV infusions;
- presence of or need for additional medical personnel;
- anticipated problems during transport, if any; and
- staffing configuration of the transporting ambulance.

One crew member will begin patient preparation for transport while the other contacts the Medical Control physician.

The Medical Control physician and paramedic will discuss with the transferring physician the orders for maintenance of existing and/or addition of new therapies according to the needs of the patient, within the scope of existing treatment protocols and EMT scope of practice.

In the case of an unstable patient, or lack of availability of the transferring physician, the Medical Control physician may recommend to the transferring facility additional therapies prior to the transfer of the patient in the interest of patient safety and quality care.

In some situations, consistent with the intent of EMT ALA provisions, the transfer of an unstable patient may be preferable to keeping that patient at a facility incapable of providing stabilizing care. If the transferring facility cannot provide appropriate medical personnel, an emergency ambulance response, including contacting the local designated emergency provider, must be activated.

A/R 5-509 ALS INTERFACILITY TRANSFERS

When a facility sends its own staff with the patient during a transfer (additional medical personnel) and the patient decompensates enroute, the Paramedic shall notify the Medical Control physician for guidance and/or orders.

If the accompanying staff is an RN s/he will maintain patient care responsibility, functioning within his/her scope of practice and under the orders of the transferring physician. The Paramedic and the RN will work collaboratively in the provision of patient care. If the patient's condition deteriorates enroute, the Paramedics may assume full responsibility in conjunction with the Medical Control physician for care that exceeds the RN's scope of practice and/or the transferring physician's medical orders.

If the accompanying staff includes a physician from the transferring facility, that physician shall be in charge of patient care. Coordination of patient care between the physician-in-charge and the Paramedic's treatment protocols and lines of command shall be effected prior to transfer.

Paramedics MUST contact their Medical Control physician in all circumstances.

Interstate ALS Inter-Facility Transfers

Interstate transfers are permitted. Paramedics must obtain Medical Control through normal channels, through the Affiliation Agreement for Medical Control of the ambulance service for whom they are working. Appropriate provisions for re-contacting the Medical Control physician enroute, if necessary, should be made prior to departure from the transferring facility. If a transfer originates out of state and no contact with Medical Control physician is possible, the transfer should be made at the BLS level only with appropriate additional personnel provided by the transferring facility.

MEDICATION & EQUIPMENT LIST

(EMT-P Expanded Scope of Practice)

Any of the following **Medications**, not currently part of the EMT-Paramedic Statewide Treatment Protocols, may be used in the Interfacility Transfer mode, if they have been instituted by the sending facility. Otherwise stated, the transfer paramedics may **continue** and **monitor**, but not **institute** these medications and infusions, except as superseded by the Statewide Treatment Protocols.

IV Aminophylline Infusions
IV Antibiotics
10% Dextrose
IV Diltiazem Infusions
Dobutamine (Dobutrex)
Glycoprotein IIb / IIIa Inhibitors
IV Heparin
IV Insulin Infusions (**Patients in Diabetic Ketoacidosis**)
Lactated Ringers
Magnesium Sulfate Infusions
Mannitol Infusions
Meperidine (Demerol)
Midizolam (Versed)
Morphine Sulfate Infusions
IV Nitroglycerin
Nitropaste
Potassium Chloride Infusions
Procainamide
IV Sodium Bicarbonate infusions
All Standard IV Infusions (1/2 NS, D5 1/2 NS, D5 1/4 NS, D5W, LR, etc.)
IV Steroids
TPN administered through central or peripheral IV lines

The following additional **equipment / monitoring skills*** will be added:

Auto vents
PA lines (Swan Ganz)
Chest Tubes / Pleurivac
Femoral Sheath
Central lines
Feeding tubes
Infusion pumps

* Based upon accepted in-service training and certification and, as above, these skills are directed at the **continuation and monitoring** of these devices, and not their **institution** or **initiation**, which have been accomplished at the sending facility. (Note: Intra-aortic balloon pumps are specifically **excluded**, and will require appropriately trained / certified personnel for use during Interfacility transfer).

ALS INTERFACILITY TRAINING PROGRAMS

TOPIC: ALS Interfacility Transfers: Guidelines for training programs for the EMT-Paramedic doing ALS interfacility transfers.

OBJECTIVE: To enhance the EMT-Paramedic's understanding and ability to properly monitor/treat the patient during the ALS interfacility transfer.

GOALS: To provide, in a formal setting, an educational component to increase the skill and knowledge level of the field EMT-Paramedic.

To provide an introduction to the medications included in the expanded scope of practice of the EMT-Paramedic during an ALS interfacility transfer.

To introduce the working EMT-Paramedic to new equipment, its utilization and operation during ALS interfacility transfers.

To provide an overview of the state requirements and medical/legal ramifications of ALS interfacility transfers.

(Optional) To review techniques and interventions to be used in advanced skill scenarios as they pertain to the ALS interfacility transfer. This will include chest decompression, intraosseous infusions, needle cricothyroidotomy, and tracheal suctioning.

TEACHING METHODS:
Lecture/discussion
Video Presentation
Demonstration
Role Playing
Hands-on Practice

RESOURCE:
PHYSICIAN'S DESK REFERENCE 1997
EMERGENCY PARAMEDIC CARE, Brady 3rd Edition
EMERGENCY CARE IN THE STREETS, Caroline, 5th Edition
PULSE OXIMETRY IN PREHOSPITAL CARE, Ohmeda, 1990
CRITICAL CARE MANUAL, Wilson, 2nd Edition
Commonwealth of Massachusetts, Pre-Hospital Treatment Protocols, 1998
COBRA/EMTALA Regulations
ACEP Policy Statement for Interfacility Patient Transfer
ACEP Policy Statement for Physician Medical Direction of EMS Educational Programs

MEDICAL DIRECTOR: As per OEMS requirements and ACEP policy.

ASSISTING FACULTY: Nurse(s), pharmacist(s), EMT-Paramedic(s), and respiratory therapist(s) with experience and expertise in the specific subject matter of a given topic.

OUTLINE

A. Introduction 30 min.
The history of ALS Interfacility Transfer
The Interfacility Arena: Roles and Responsibilities

B. Medical/Legal Aspects 60 min.
1. Medical Direction: ACEP Position Paper - Medical Direction and Education Support
2. COBRA/EMT ALA (Consolidated Omnibus Budget Reconciliation Act, PL 88-272 Regulations/Examination and Treatment for Emergency Medical Conditions and Woman Labor Act)
3. Regional/State Regulations
4. ACEP Position Paper - ALS Transfer
5. Comfort Care

C. Review of Current Pre-hospital Care ALS 30 min.
1. Medications
2. Procedures
3. 911/ALS Transfer
4. Non-Emergency Department Physician - COBRA Required Education

D. Introduction/Review of Medication Commonly Utilized 240 min.
1. Medication Review
   - Classification
   - Actions/Interactions
   - Pharmacology
   - Administration/Dosage
   - Cautions/Side Effects
   - Protocols
   - Care Parameters/Ranges
2. Aminophylline Drips
3. Intravenous Antibiotics
4. Blood Products
5. Dextrose 10% (D10)
6. Intravenous Digoxin
7. Dilantin Infusions
8. Intravenous Dilitiazem Infusions
9. Dobutamine (Dobutrex)
10. Glycoprotein IIb / IIIa Inhibitors
11. Intravenous Heparin
12. Insulin Infusions (Pts. with DKA)
13. Magnesium Infusions
14. Mannitol Infusions
15. Meperidine (Demerol)
16. Midazolam (Versed)
17. Morphine Sulfate Infusions
18. Nitroglycerin Infusions
19. Nitropaste
20. Paralytic Agents (infusions and intermittent additional dose(s): Vecuronium, succinylcholine)
21. Potassium Chloride Infusions
22. Procainamide
23. Standard IV Infusions (1/2 NS, D5 1/2 NS, D5 1/4 NS, D5, NS, LR, etc.)
24. Intravenous Steroids (methylprednisolone, Solucortef, etc.)
25. Thrombolytic Agents; (Streptokinase, TPA, etc.)
26. Total/Partial Parenteral Nutrition (TPN/PPN) Central and/or Peripheral Lines

Any other medications approved by the state.

E. Continuous Quality Improvement 30 min.
1. Off-Line Medical Direction
2. Patient Care report Audits
3. Review and Audit of All Problematic Transport

F. ALS Skills - Review Lecture / Video Presentation 120 min.
1. Mandatory Skills
   a) Tracheal Suctioning
   b) Infusion Pumps
   c) Central Line Troubleshooting
      - PA Lines
      - Arterial Lines
   d) Nasogastric Tubes
   e) Auto Vents
   f) Chest Tubes / Pleurivac
2. Optional Skills
   a) End Tidal CO2 Detection
   b) Chest Decompression
   c) Intraosseous Infusions
   d) Needle Cricothyrotomy
   e) Pulse Oximetry
   f) Peak Flow Pressures

Any other skills approved by the state for interfacility patient transfers.

G. Practical Skill Lab 120 min.

Station 1: Tracheal Suctioning
Auto Vents
Pulse Oximetry
End Tidal CO2

Station 2: IV Infusion Pumps
Medication Administration
Central Lines (Monitor, Access & Troubleshooting)
Arterial Lines
Venous Access Devices
NG Tubes
Foley Catheter

Station 3: (Optional)
Chest Decompression
Intraosseous Infusions
Needle Cricothyrotomy

H. Case Studies of “Typical” ALS Interfacility Transfers 60 min.

I. Examination 30 min.

Minimum Total Time: 12 hours

APPENDIX O – SPECIAL PROJECTS

1. **OEMS supports the concept of pre-hospital clinical research projects. Any service that plan to conduct a study which will add to or alter the existing statewide treatment protocols, must apply for a special project waiver as outlined in the special project waiver administrative requirements (AR 5-211).**
2. **The AR 5-211 may be downloaded from the OEMS website at: http://www.state.ma.us/dph/oems/admin.htm**

Thank you.

APPENDIX P - APGAR SCORE

The 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.

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

APPENDIX Q THE BOSTON STROKE SCALE (BOSS)*:

(Modified from the Cincinnati Stroke Scale)

FACIAL DROOP (*Patient shows teeth or smiles)*

Normal: Both sides of face move equally

Abnormal: One side of face does not move as well as the other

ARM DRIFT (*Patient closes eyes and extend both arms straight out for 10 seconds.)*

Normal: There is no drift at all or both arms drift the same

Abnormal: One arm drifts/moves down compared to the other arm or one arm noticeably weaker than the other.

SPEECH *(Score first attempt: Patient repeats, e.g. "The sky is blue in Boston.")*

Normal: The Patient says the correct words with no slurring of words on first attempt.

Abnormal: The patient slurs words, says the wrong words or is unable to speak on first attempt

APPENDIX R FIBRINOLYTIC CHECKLIST

***Note:** This checklist is intended only as a tool for the pre-hospital identification of patients with significant contraindication(s) to the administration of fibrinolytics in the acute ST elevation M.I. (STEMI) setting. It is not intended to be a comprehensive list of all factors to be considered prior to administration of these agents. Significant contraindications may warrant the triage of these patients to facilities capable of percutaneous intervention (PCI).

Date: _____ Time: _____ Medic Unit: _____ Receiving Facility: _____

Patient Name: _____ Age: _____ Est. Wt.: _____lbs (_____kgs)

Duration of Chest Pain*: _____ Hours _____ Minutes *(>20 minutes and <12 Hours)

Exclusions _____ **(? = unknown)**

1. Is patient unconscious or exhibiting altered mental status? **Yes / No**
2. Is patient on oral anticoagulants? (e.g., Coumadin) **Yes / No / ?**
3. Is blood pressure consistently > 180/110 mm Hg.? **Yes / No**
4. GI or GU bleeding, or known bleeding condition, in past 2 weeks? **Yes / No / ?**
   (e.g., actively bleeding, black tarry stool, hematemesis, hematuria?)
5. Any history of esophageal varices or active peptic ulcer? **Yes / No / ?**
6. Recent major surgery, major trauma (incl. CPR) within last 2 weeks? **Yes / No / ?**
   (including open biopsy, puncture or catheterization of chest/neck vessel?)
7. History of AAA or known dissection or aneurysm of aorta? **Yes / No / ?**
   (pain radiating through to the back?)
8. Any history of CVA, TIA, cerebral bleeding, aneurysm, AVM or brain tumor? **Yes / No / ?**
9. Pregnancy? **Yes / No / ?**
10. Treatment with fibrinolytics in past 6 months? **Yes / No / ?**
    (**OR -** known allergy to fibrinolytic drugs in the past)

12-lead ECG: Time obtained: _____ Results: _____

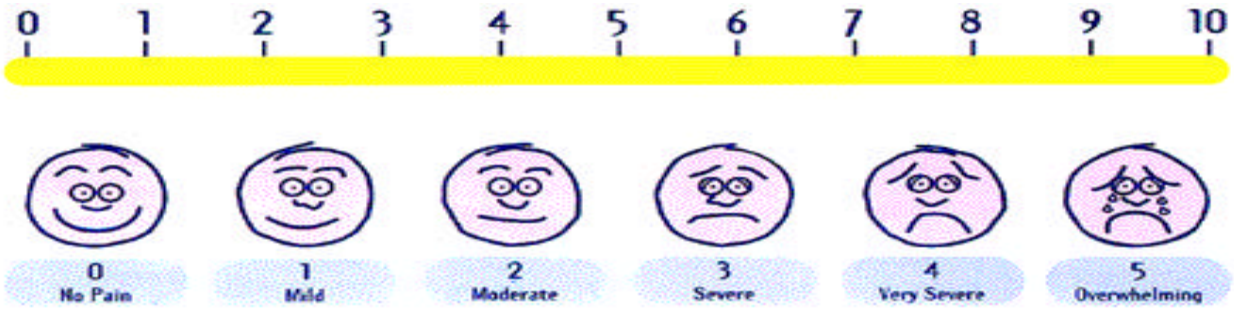
Compatible with AMI? (ST ↑ >1mm in 2 contiguous leads) **Yes / No / ?**

Is patient likely to be eligible for Fibrinolytic Therapy? **Yes / No / ?**

Receiving Physician: _____ Time: _____

Paramedic No. _____ Signature: _____

APPENDIX S ADULT PAIN MANAGEMENT ASSESSMENT GUIDE



PAIN ASSESSMENT GUIDE

TELL ME ABOUT YOUR PAIN

W ords to describe pain

aching	throbbing	shooting
stabbing	gnawing	sharp
tender	burning	exhausting
tiring	penetrating	nagging
numb	miserable	unbearable
dull	radiating	squeezing
crampy	deep	pressure

Pain in other languages

itami	Japanese	dolor	Spanish
tong	Chinese	douleur	French
dau	Vietnamese	boline	Russian

I ntensity (0-10)

If 0 is no pain and 10 is the worst pain imaginable, what is your pain now? ... in the last 24 hours?

L ocation

Where is your pain?

D uration

Is the pain always there?
Does the pain come and go? (Breakthrough Pain)
Do you have both types of pain?

A ggravating and Alleviating Factors

What makes the pain better?
What makes the pain worse?

How does pain affect

sleep	energy	relationships
appetite	activity	mood

Are you experiencing any other symptoms?

nausea/vomiting	itching	urinary retention
constipation	sleepiness/confusion	weakness

Things to check

vital signs, past medication history, knowledge of pain, and use of noninvasive techniques

REFERENCES: Jacox A, Carr DB, Payne R, et al. Management of Cancer Pain. Clinical Practice Guideline No. 9. AHCPR Publication No. 94-0592. Rockville, MD: Agency for Health Care Policy and Research, U.S. Department of Health and Human Services, Public Health Service, March 1994. Wong, D. and Whaley, L. Clinical Handbook of Pediatric Nursing, ed. 2. The C.V. Mosby Company, St. Louis, 1986, p. 371.

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http://mayday.coh.org/pain_assessment.asp

City of Hope and
Beckman Research Institute
1500 E. Duarte Road
Duarte, CA 91010-3000
1-800-423-7119
www.cityofhope.org

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APPENDIX T NERVE AGENT DOSING & REFERENCE TABLES

NOTE: Be familiar with other agents. They may present with similar Signs & Symptoms as those of Nerve Agents.

Table Signs and Symptoms for Specific Agents

Sign/Symptom	Nerve Agent	Vesicant	Pulmonary Agent	Cyanide
Immediate cardiac arrest	X			X
Sudden syncope, seizures, or coma	X		X	X
Apnea without cyanosis				X
Cyanosis	X		X	X
Immediate difficulty breathing, wheezing, or gasping			X	
Rapid respiratory rate				X
Delayed dyspnea (hours)			Phosgene Phosgene oxide	
Nausea, vomiting, diarrhea, abdominal cramps	X			
Fasciculations and twitching	X			
Copious sweating	X			
Copious oral,nasal, or pulmonary secretions	X	X	X	
Incontinence	X			X
Pinpoint pupils	X			
Dilated pupils	X			X
Immediate eye and nose irritation		Lewisite	Chlorine Phosgene Phosgene oxide	
Delayed eye irritation (2-12 hrs)		Mustard		
Immediate skin burns, nonthermal		Lewisite		
Delayed skin burns, nonthermal		Mustard		
Exposure to burning plastic				X
Exposure to hot chlorinated hydrocarbons			Phosgene Phosgene oxide	
Bitter almond odor				X

NOTE: In a mass casualty incident, use triage cards as appropriate, always checking patients for evidence of prior triage and treatment.

APPENDIX T NERVE AGENT DOSING & REFERENCE TABLES

SEVERITY	CHOLINERGIC AGENT SIGNS & SYMPTOMS	ADULT TREATMENT STANDING ORDERS
Mild	Runny nose Cough Pupils may be pinpoint Eye pain Lacramation	Decontaminate Administer 100% oxygen Administer **One** Mark I kit IM **OR** 2 mg atropine IM **only &** either: 600 mg IM pralidoxime **OR** 1 gm IV pralidoxime
Moderate	Runny nose Cough Sweating, twitching Nausea, abdominal cramping Weakness Localized sweating (seen with dermal exposure) Eye pain, trouble seeing Wheezing, shortness of breath	Decontaminate Administer 100% Administer **Two** Mark I kits IM **OR** 4 mg atropine IM **only &** either: 600-1200 mg IM pralidoxime **OR** 1 gm IV pralidoxime
Severe	All the above plus: Vomiting Diarrhea Drooling, copious respiratory secretions Significant weakness Seizures Decreased level of consciousness Apnea	Decontaminate Administer 100% oxygen Administer **Three** Mark I kits IM **OR** 6 mg atropine IM **only &** either: **1200 -**1800 mg IM pralidoxime **OR** 1 gm IV pralidoxime **&** *one of the following:* Diazepam 10 mg IM Autoinjector (CANA kit) **OR**, Diazepam 10 mg IM/IV **OR**, Lorazepam 2-4 mg IM/IV **OR**, Midazolam 5-10 mg IM/IV

NOTE: Dermal absorption of nerve agents may lead to delayed symptom onset up to 18 hours after exposure. Initial symptoms/signs may only be local such as localized fasciculation and sweating.

NOTE: Do not administer an adult dose to a child < 50 kg

Pediatric Dosing for Nerve Agent Exposures

Kg		NERVE AGENT: IM, IV, IO				
		Atropine	**Pralidoxime**	**Midazolam**	**Diazepam**	**Lorazepam**
		0.02-0.05mg/kg	20-40mg/kg	0.1mg/kg	0.25 mg/kg	0.05-0.2 mg/kg
1	Premie	0.1 mg	20-40 mg	0.05-0.1 mg	0.25 mg	0.05-0.2 mg
2	Newborn	0.1 mg	40-80 mg	0.1-0.2 mg	0.5 mg	0.1-0.4 mg
5	3 mos	0.1-0.25 mg	100-200 mg	0.25-0.5 mg	1.25 mg	0.25-1 mg
10	12 mos	0.2-0.5 mg	200-400 mg	0.5-1 mg	2.5 mg	0.5-2 mg
15	2-3 yrs	0.3-0.75 mg	300-600 mg	1-1.5 mg	3.75 mg	0.75-3 mg
20	4-7 yrs	0.4-1 mg	400-800 mg	2 mg	5 mg	1-4 mg
25	6-9 yrs	0.5-1.25 mg	500 mg-1 g	2.5 mg	6.25 mg	1.25-4 mg
30	7-11 yrs	0.6-1.5 mg	600 mg-1 g	3 mg	7.5 mg	1.5-4 mg
35	8-13 yrs	0.7-1.75 mg	700 mg-1 g	3.5 mg	8.75 mg	1.75-4 mg
40	9-14 yrs	0.8-2 mg	800 mg-1 g	4 mg	10 mg	2-4 mg
45	10-16 yrs	0.9-2 mg	900 mg-1 g	4.5 mg	10 mg	2.25-4 mg
50	11-18 yrs	1-2 mg	1 g	5 mg	10 mg	2.5-4 mg
55	12-18 yrs	1.25-2 mg	1 g	5 mg	10 mg	2.75-4 mg
60	13-18 yrs	1.5-2 mg	1 g	5 mg	10 mg	3-4 mg
65	14-18 yrs	2 mg	1 g	5 mg	10 mg	3.25-4 mg
70	16-18 yrs	2 mg	1 g	5 mg	10 mg	3.5-4 mg

Berlin DM Jr. Pediatrics 1970, 40:793

APPENDIX T NERVE AGENT DOSING & REFERENCE TABLES

PEDIATRIC ATROPENS

Pediatric Atropine Dosing for Nerve Agent Toxicity Using Pediatric Atropens

Weight	Mild	Moderate	Severe
15-40 lb (7-18 kg)	1 x 0.5 mg Atropen	1 x 1 mg Atropen	3 x 0.5 mg Atropen
40-90 lb (18-41 kg)	1 x 1 mg Atropen	1 x 2 mg Atropen	3 x 1 mg Atropen
>90 lb (41 kg)	1 x 2 mg Atropen	2 x 2 mg Atropen	3 x 2 mg Atropen

Note: Pralidoxime reduced dose pediatric autoinjectors are not available

~ ~ ~

ADULT AUTOINJECTORS

Pediatric Dosing for SEVERE Nerve Agent Toxicity Using Adult Autoinjectors

(I.E. seizures, hypotension, coma, cardiac arrest)

Use only if Pediatric Atropen or when Atropine/Pralidoxime vials are not available

Approximate age	Approximate weight	Number of autoinjectors (each type)	Atropine dosage range (mg/kg)	Pralidoxime dosage range (mg/kg)
3-7 yrs	13-25 kg	1	0.08-0.13	24-46
8-14 yrs	26-50 kg	2	0.08-0.13	24-46
>14 yrs	>51 kg	3	0.11 or less	35 or less

- **NOTE: Mark I kits are not approved for pediatric use, however, they should be used as initial therapy in circumstances for children with severe life-threatening nerve agent toxicity when IV therapy is not available. This assumes 0.8 inch needle insertion depth**.

- **NOTE: Potential high dose of atropine and pralidoxime for age/weight. However, these numbers are within the general guidelines recommended for the first 60-90 minutes of therapy after a severe exposure.**

- **NOTE**: **Administer injection in large muscle mass. Avoid deltoid. Suggest using thigh.**

- **REFERENCE**: Pediatric Preparedness for Disasters and Terrorism: A National Consensus Conference, Executive summary 2003. Markenson D, Redlener I.. AHRQ, DHHS, EMSC Program of the Maternal and Child Health Resources Services Administration

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PREGNANCY CATEGORY RATINGS FOR DRUGS

Drugs have been categorized by the Food and Drug Administration (FDA) according to the level of risk to the fetus. These categories are listed for each herein under "Pregnancy Safety" and are interpreted as follows:

- **Category A**: Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester, and there is no evidence of risk in later trimesters; the possibility of fetal harm appears to be remote.

- **Category B**: Either (1) animal reproductive studies have not demonstrated a fetal risk but there are no controlled studies in women or (2) animal reproductive studies have shown an adverse effect (other than decreased fertility) that was not confirmed in controlled studies on women in the first trimester and there is no evidence of risk in later trimesters.

- **Category C**: Either (1) studies in animals have revealed adverse effects on the fetus and there are no controlled studies in women or (2) studies in women and animals are not available. Drugs in this category should be given only if the potential benefit justifies the risk to the fetus.

- **Category D**: There is positive evidence of human fetal risk, but the benefits for pregnant women may be acceptable despite the risk, as in life-threatening diseases for which safer drugs cannot be used or are ineffective. An appropriate statement must appear in the "Warnings" section of the labeling of drugs in this category.

- **Category X**: Studies in animals and humans have demonstrated fetal abnormalities, there is evidence of fetal risk based on human experience, or both; the risk of using the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are or may become pregnant. An appropriate statement must appear in the "Contraindications" section of the labeling of drugs in this category.

CLASSIFICATION OF THERAPEUTIC INTERVENTIONS IN CPR AND ECC

A system of classifying recommendations based on strength of the supporting scientific evidence was used.

- **Class I** - A therapeutic option that is usually indicated, always acceptable, and considered useful and effective.
- **Class II** - A therapeutic option that is acceptable, is of certain efficacy, and may be controversial.
- **Class IIa** - A therapeutic option for which the weight of evidence is in favor of its usefulness and efficacy.
- **Class IIb** - A therapeutic option that is not well established by evidence but may be helpful and probably is not harmful.
- **Class III** - A therapeutic option that is inappropriate, is without scientific supporting data, and may be harmful.

ACTIVATED CHARCOAL

Class

Adsorbent

Mechanism of Action

Adsorbs toxic substances from the GI Tract; Onset of action is immediate.

Indications

Most oral poisonings and medication overdoses; can be used after evacuation of poisons.

Contraindications

Oral administration to comatose patient; after ingestion of corrosives, caustics or petroleum distillates (ineffective and may induce vomiting); simultaneous administration with other oral drugs.

Adverse Reactions

May induce nausea and vomiting; may cause constipation; may cause black stools.

Drug Interactions

Bonds with and generally inactivates whatever it is mixed with, e.g., syrup of ipecac.

How supplied

25 gm (black powder) / 125 ml bottle (200 mg/ml)
50 gm (black powder) / 250 ml bottle (200 mg/ml)

Dosage and Administration

Note, if not **in Pre-mixed** slurry, dilute **with 1-part charcoal/ 4 parts water.**

Adult: 1-2 gm/kg PO or via NGT

Pediatric: 1-2 gm/kg PO or via NGT

Duration of action

depends upon GI function; will act until excreted.

Special Considerations

Often used in conjunction with magnesium citrate
Must be stored in a closed container
Does **not** adsorb cyanide, lithium, iron, lead and arsenic.

ADENOSINE (ADENOCARD)

Class

Endogenous Nucleotide

Mechanism of action

Slows conduction time through the AV Node; can interrupt re-entrant pathways; slows heart rate; acts directly on sinus pacemaker cells. Is drug of choice for PSVT. Can be used diagnostically for stable, wide-complex tachycardias of unknown type after two doses of Lidocaine.

Indications

Conversion of **PSVT to sinus rhythm. May convert PSVT due to Wolff-Parkinson-White syndrome.**

Not effective m converting atrial fibrillation / flutter.

Contraindications

Second or third-degree " block or Sick Sinus Syndrome
Atrial flutter / atrial fibrillation
Ventricular Tachycardia
Hypersensitivity to adenosine

Adverse Reactions

Facial flushing, shortness of breath, chest pain, headache, paresthesia, diaphoresis, palpitations, hypotension, nausea, metallic taste.

Drug Interactions

Methylxanthines (theophylline-like drugs) antagonize the effects of adenosine.
Dipyridamole (Persantine) potentiates the effects of adenosine
Carbamazepine (Tegretol) may potentiate the AV Node blocking effects of adenosine.
May cause bronchoconstriction in asthmatic patients.

How Supplied

Three mg/ml in 2-ml flip-top vials for IV injection

Dosage and Administration

Adult: 6 mg over 1-3 seconds; If no response after 1-2 minutes, administer 12 mg over 1-3 seconds, Maximum total dose = 30 mgs.

Pediatric: 0.1 - 0.2 mg/kg rapid IV; maximum single dose = 12 mgs.

Duration of action

Onset and peak effects in seconds; duration 12 seconds.

Special Considerations

Short half-life limits side effects in most patients.
Pregnancy safety: Category C.

ALBUTEROL (PROVENTIL, VENTOLIN)

Class

Sympathomimetic, bronchodilator.

Mechanism of **Action**

Selective b-2 agonist which stimulates adrenergic receptors of the sympathomimetic nervous system resulting in smooth muscle relaxation in the bronchial tree and peripheral vasculature.

Indications

Treatment of bronchospasm in patients with reversible obstructive airway disease **(COPD/asthma).** Prevention of exercise-induced bronchospasm.

Contraindications

Known prior hypersensitivity reactions to Albuterol.
Tachycardia dysrhythmias, especially those caused by digitalis.
Synergistic with other sympathomimetics

Adverse Reactions

Often dose-related and include restlessness, tremors, dizziness, palpitations, tachycardia, nervousness, peripheral vasodilatation, nausea, vomiting, hyperglycemia, increased blood pressure and paradoxical bronchospasm

Drug Interactions

Tricyclic antidepressants may potentiate vasculature effects.
Beta-blockers are antagonistic.
May potentiate hypokalemia caused by diuretics.

How Supplied

Solution for aerosolization: 0.5% (5 mg/ml)
Metered Dose Inhaler: 90 mcg/metered spray (17 gm canister with 200 inhalations)
Syrup: 2 mg/5 ml

Dosage and Administration

Adult: Administer 2.5 mg. Dilute 0.5 ml of 0.5% solution for inhalation with 2.5 ml normal saline in nebulizer and administer over 10-15 minutes.
MDI: 1-2 inhalations (90-180 mcg). Five minutes between inhalations
Pediatric: Administer solution of 0.01 - 0.03 ml (0.05 - 0.15 mg/kg/ dose diluted in 2 ml of 0.9% Normal Saline. May repeat every 20 minutes three times.

Duration of Action

Onset in 5-15 minutes with peak effect in 30-minutes - two hours and duration of 3-4 hours.

Special Considerations

Pregnancy Safety: Category C.
Antagonized by beta-blockers (e.g., Inderal, Lopressor).
May precipitate angina pectoris and dysrhythmias.
Should only be administered by inhalation methodology in pre-hospital management.

AMINOPHYLLINE

Class

Xanthine bronchodilator (theophylline derivative).

Mechanism of Action

Respiratory stimulator and bronchodilator.

Indications

Limited usefulness in EMS arena although may be used in refractory COPD patients; interfacility transfers; bronchospasm.

Contraindications

Allergy to xanthines, e.g., caffeine; cardiac dysrhythmias.

Adverse Reactions

Tachycardia, palpitations, PVCs, Angina pectoris, headache, seizure, nausea and vomiting.

Drug Interactions

Beta blockers may oppose effects; Barbiturates and phenytoin may decrease theophylline levels.

How Supplied

500 mg / 10 ml ampule; 500 mg / 20 ml ampule (preload) 25 mg/ml; 250 mg / ml ampule (preload).

Dosage and Administration

Loading dose (Adult): 5-6 mg / kg in 60-100 ml of diluent over 30 min. IV infusion not to exceed 20 mg/min.;

Loading dose (Pediatric): 5-6 mg / kg in 50-100 ml; diluent IV infusion.

Maintenance infusion

Adult: First 12 hours: 0.5-0.7 mg/kg/hour (lower doses for elderly, CHF, liver disease). Subsequent: 0.1-0.5 mg/kg/hour (based on serum aminophylline levels)

Pediatric: 1.0 mg/kg/hour.

Duration of Action

Onset less than 15 minutes; Duration 4.5 hours.

Special Considerations

Pregnancy safety: Category C;

Use with caution in patients with cardiovascular disease., hypertension or hepatic/renal disease.

Doses should be halved in patients already taking theophylline preparations.

Therapeutic to toxic ratio is narrow!

AMIODARONE (CORDARONE)

Class

Antidysrhythmic.

Mechanism of Action

Prolongation of Action Potential; non-competitive alpha and beta sympathetic blocking effects; Calcium channel blocking effects.

Indications

Suppression of Ventricular Fibrillation refractory to defibrillation and Lidocaine.
Suppression of Ventricular Tachycardia refractory to cardioversion and Lidocaine.

Contraindications

Second or Third Degree heart block..
Medication-induced Ventricular dysrhythmias.
Hypotension, Bradycardia, Torsades de Pointes.
Profound Sinus Bradycardia.

Adverse Reactions

Hypotension, Bradycardia, Pulseless Electrical Activity, Congestive Heart Failure.
Nausea, fever, abnormal Liver Function Tests, Thrombocytopenia.

Drug Interactions

Will precipitate with Sodium Bicarbonate: incompatible.
Compatible with: Dopamine, Dobutamine, Isoproterenol, Lidocaine, NTG, Norepinephrine, Phenylephrine, KCL, Procainamide.

How Supplied:

150 mg in 3 ml vials.

Dosage and Administration

Adult: *300* mg slow IV Push over 1-2 minutes in 10 cc Normal Saline, (For ACLS VF/ Pulseless VT)

IV Drip 0.5-1mg per minute. (For malignant ventricular arrhythmias) per ordering physician.

Duration of Action:

Onset: Within 5-15 minutes.
Peak Effect: Variable.
Duration: Variable

Special Considerations

Pregnancy safety: Category C
Maintain at room temperature and protect from light in storage (light protection not required during administration).
Hypotension usually responsive to slowing infusion rate, IV Normal Saline.
Administer cautiously in patients with Heart Failure or poor systolic function.
May be especially effective in high-risk patients with recent acute MI.

AMYL NITRITE, SODIUM NITRITE, SODIUM THIOSULFATE (CYANIDE ANTIDOTE KIT)

Class

Antidote

Mechanism of Action

Amyl Nitrite: affinity for cyanide ions; reacts with hemoglobin to form methemoglobin (low toxicity)

Sodium Nitrite: same as amyl nitrite

Sodium Thiosulfate: produces thiocyanate, which is then excreted

Indications

Cyanide or hydrocyanic acid poisoning.

Contraindications

Not applicable.

Adverse reactions

Excessive doses of amyl nitrite and sodium nitrite can produce severe, life-threatening methemoglobinemia. Use only recommended doses.

Drug Interactions

None.

How supplied

Amyl nitrite: in pledgettes similar to ammonia capsules.

Dosage and administration

Adult: Amyl nitrite: breathe 30 seconds out of every minute. Sodium Thiosulfate and sodium nitrite: IV per antidote kit directions.

Pediatric: Same as adult.

Duration of Action

Variable.

Special Considerations

Cyanide poisoning must be recognized quickly and treated quickly; if pulse persists, even in presence of apnea, prognosis is good with treatment. The antidote kit must be used in conjunction with administration of oxygen.

ASPIRIN

Class:

Platelet inhibitor, anti-inflammatory agent.

Mechanism of Action:

Prostaglandin inhibition.

Indications:

New onset chest pain suggestive of Acute Myocardial Infarction.
Signs and symptoms suggestive of recent cerebrovascular accident.

Contraindications:

Hypersensitivity.
Gastrointestinal bleeding.

Adverse Reactions:

Heartburn.
GI bleeding.
Nausea, vomiting.
Wheezing in allergic patients.
Prolonged bleeding.

Drug Interactions:

Use with caution in patients allergic to NSAIDS.

How Supplied:

160 mg or 325 mg tablets (chewable and standard).

Dosage and Administration:

160 mg or 325 mg PO.

Duration of Action:

Onset: 30-45 minutes.
Peak effect: variable.
Duration: Variable.

Special Considerations:

Pregnancy Safety: Category D.
Not recommended in pediatric population.

ATROPINE SULFATE

Class:

Anticholinergic agent.

Mechanism of Action:

Parasympatholytic: inhibits action of acetylcholine at postganglionic parasympathetic neuroeffector sites.

Increases heart rate in life-threatening bradydysrhythmias.

Indications:

Hemodynamically significant bradycardia.

Asystole.

Drug of choice for organophosphate poisoning.

Bronchospastic pulmonary disorders.

Contraindications:

Tachycardia.

Hypersensitivity.

Unstable cardiovascular status in acute hemorrhage and myocardial ischemia.

Narrow-angle glaucoma.

Adverse Reactions:

Headache, dizziness, palpitations, nausea and vomiting.

Tachycardia, dysrhythmias, anticholinergic effects (blurred vision, dry mouth, urinary retention).

Paradoxical bradycardia when pushed slowly or at low doses.

Flushed, hot dry skin.

Drug Interactions:

Potential adverse effects when administered with digoxin, cholinergics, physostigmine.

Effects enhanced by antihistamines, procainamide, quinidine, antipsychotics, benzodiazepines and antidepressants.

How Supplied:

Prefilled syringes: 1.0 mg in 10 ml of solution.

Nebulizer: 0.2% (1 mg in 0.5 ml) and 0.5% (2.5 mg in 0.5 ml).

Injection Solution as Sulfate: 0.5mg/ml (1ml); 1mg/ml (1ml); 0.1mg/ml (5ml,10ml); 0.4mg/ml (1ml, 20ml)

Autoinjectors: (See Nerve Agent Antidote)

Dosage and Administration:

Adult:

- **Bradydysrhythymias**: **0.5 - 1.0 mg IV every 3-5 minutes as needed to maximum total dose of 0 .0 4 mg / kg. (may be given Endotracheally if IV not established: 2.0 mg followed by 2.0 ml of Normal Saline Solution).**
- **Asystole: 1.0 mg IV push every 3-5 minutes as needed to maximum total dose of 0.04 mg / kg (may be given Endotracheally if IV not yet established: 2.0 mg followed by 2.0 ml Normal Saline Solution).**

Pediatric:

ATROPINE SULFATE (cont.)

- **Bradydysrhythmias: 0.2 mg / kg IV / ET / IO (minimum single dose 0.1 mg, maximum single dose 1.0 mg). If administered via ET, follow with 2.0 ml sterile Normal Saline Solution.**

- **Asystole: Same as for Bradydysrhythmias: minimum dose 0.1 mg; maximum dose 0.5 mg for a child and 1.0 mg for adolescent.**

Duration of Action:

Onset: Immediate.
Peak Effect: Rapid to 1-2 minutes.
Duration: 2-6 hours.

Special Considerations:

Pregnancy Safety: Category C.
Moderate doses dilate pupils.

ATROVENT â (IPRATROPIUM BROMIDE)

Class: Bronchodilator

Mechanism of Action: Blocks the action of acetycholine at the parasympathetic sites in bronchial smooth muscle causing bronchodilitation.

Indications: Used in bronchospasm especially associated with COPD, and emphysema.

Contraindications: Hypersensitivity to atropine or its derivatives**.**

Adverse Reactions:

Ipratropium is poorly absorbed from the lung, so systemic effects are rare.

>10% CNS: Dizziness, Headache, Nervousness
Respiratory: Cough

1-10% Cardiac: Hypotention, palpitations

How Supplied: Nebulizing Ampule: 0.02% (2.5ml)
Inhaler: 18mcg/actuation

Dosage and Administration:

Adult: 2-3 puffs via metered dose inhaler (MDI) tid-qid; maximum 12 puffs/day.
ALT: 500mcg **NEB** q 6-8hrs (may mix neb solution with Albuterol if used within 1 hour)

Pediatric: < 12 yo: 1-2 puffs(MDI) tid-qid; max: 8 puffs
ALT: 250mcg **NEB** q 6-8hrs (may mix neb solution with Albuterol if used within 1 hour)

Kinetics:

Onset: 1-3 minutes after administration
Peak effects: Within 1.5- 2 hours
Duration of Action: Up to 4-6 hours
T1/2: 2 hrs after inhalation

Special Considerations

Pregnancy Safety: Category B.

CALCIUM CHLORIDE / CALCIUM GLUCONATE

Class

Electrolyte.

Mechanism of Action

Increases cardiac contractile state (positive inotropic effect).

May enhance ventricular automaticity.

Indications

Hypocalcemia, magnesium sulfate overdose, hyperkalemia, calcium channel blocker toxicity.

Adjunctive therapy in treatment of insect bites and stings.

Contraindications

Hypercalcemia, VF during cardiac resuscitation; digitalis toxicity.

Adverse Reactions

Bradycardia, asystole, hypotension, peripheral vasodilation, metallic taste, local necrosis, coronary and cerebral artery spasm, nausea, vomiting.

Drug Interactions

May worsen dysrhythmias secondary to digitalis.

May antagonize effects of Verapamil.

Flush line before and after administration of sodium bicarbonate.

How Supplied

10% solution in 10 ml ampules, vials and prefilled syringes (100 mg/ ml).

Dosage and Administration

Adult: 2-4 mg/kg of 10% solution slowly IV over 5 minutes; may repeat in 10 minutes. (maximum: 1 gm dose)

Pediatric: 20 mg/kg/dose of 10% solution slow IV/ IO (maximum: 1 gm dose); (may repeat in 10 minutes.)

Duration of Action

Onset: 5-15 minutes.

Peak effects: 3-5 minutes.

Duration: 15-30 minutes but may persist for 4 hours (dose dependent).

Special Considerations

Pregnancy safety: Category C.

For pediatrics: if calcium gluconate is unavailable, 1-2 ml of 10% calcium chloride solution, diluted with IV fluid, may be substituted.

DEXAMETHASONE SODIUM PHOSPHATE (DECADRON, HEXADROL)

Class

corticosteroid.

Mechanism of Action

Suppresses acute and chronic inflammation; immunosuppressive effects.

Indications

Anaphylaxis, asthma, spinal cord injury, croup, elevated intracranial pressure (prevention and treatment), as an adjunct to treatment of shock.

Contraindications

Hypersensitivity to product.

Adverse Reactions

Hypertension, sodium and water retention, GI bleeding, TB.
None from single dose.

Drug Interactions

Calcium
Metaraminol.

How Supplied

100 mg/ 5 ml vials or 20 mg/1 ml vials.

Dosage and Administration

Adult: 10-100 mg IV (1 mg/kg slow IV bolus). (considerable variance through Medical Control).
Pediatric: 0.25-1.0 mg/kg/dose IV, IO, IM.

Duration of Action

Onset: Hours.
Peak effects: 8-12 hours.
Duration of action: 24-72 hours.

Special Consideration

Pregnancy safety: unknown.
Protect medication form heat.
Toxicity and side effects with long-term use.

DEXTROSE

Class

Carbohydrate, hypertonic solution.

Mechanism of Action

Rapidly increases serum glucose levels.
Short-term osmotic diuresis.

Indications

Hypoglycemia, altered level of consciousness, coma of unknown etiology, seizure of unknown etiology, status epilepticus (controversial).

Contraindications

Intracranial hemorrhage, delirium tremens, ineffective without thiamine,

Adverse Reactions

Extravasation leads to tissue necrosis.
Warmth, pain, burning, thrombophlebitis, rhabdomyositis.

Drug Interactions

Sodium bicarbonate, coumadin.

How Supplied

25 gm/ 50 ml pre-filled syringes (500 mg/ml)

Dosage and Administration

Adult: 12.5-25 gram slow IV; may be repeated as necessary.
Pediatric: 0.5-1 gm/kg/dose slow IV; may be repeated as necessary.

Duration of Action

Onset: less than 1 minute.
Peak effects: variable.
Duration: Variable.

Special Considerations

Administer thiamine prior to D50 in known alcoholic patients.
Draw blood sugar before administering.
Do not administer to patients with known CVA unless hypoglycemia documented.

DIAZEPAM (VALIUM)

Class

Benzodiazepine, sedative-hypnotic, anticonvulsant.

Mechanism of Action

Potentiates effects of inhibitory neurotransmitters.
Raises seizure threshold.
Induces amnesia and sedation.

Indications

Acute anxiety states, acute alcohol withdrawal, muscle relaxant, seizure activity, agitation.
Analgesia for medical procedures (fracture reduction, cardioversion).
Delirium tremens.

Contraindications

Hypersensitivity, glaucoma. coma, shock, substance abuse, head injury.

Adverse Reactions

Respiratory depression, hypotension, drowsiness, ataxia, reflex tachycardia, nausea, confusion, thrombosis and phlebitis.

Drug Interactions

Incompatible with most drugs, fluids.

How Supplied

10 mg/5 ml prefilled syringes, ampules, vials and Tubex..

Dosage and Administration

Seizure activity: Adult: 5-10 mg IV q 10-15 minutes prn (5 mg over 5 min.)(maximum dose = 30 mgs.)
Seizure activity: Pediatric: 0.2-0.3 mg/kg/dose IV every 15-30 minutes (no faster than 3 mg over 5 minutes) (max. = 10 mg/kg). Rectal diazepam: 0.5 mg/kg via 2" rectal catheter and flush with 2-3 ml air after administration.
Sedation for cardioversion: 5- 15 mg IV over 5-10 minutes prior to cardioversion.

Duration of Action

Onset: 1-5 minutes.
Peak effect: minutes.
Duration: 20-50 minutes.

Special Considerations

Pregnancy safety: Category D
Short duration of anticonvulsant effect.
Reduce dose 50% in elderly patient.

DIAZOXIDE (HYPERSTAT)

Class

Vasodilator.

Mechanism of Action

Non-diuretic antihypertensive; arteriolar vasodilatation.

Indications

Hypertensive crisis, especially in pre-eclampsia.

Contraindications

Hypotension, dissecting aortic aneurysm, labor.

Adverse Reactions

Reflex tachycardia, angina, cerebral ischemia, CVA, dysrhythmia, hyperglycemia, nausea, vomiting.

Drug Interactions

Incompatible with heat, light or acid solutions.

How Supplied: 5 mg/ml 20 ml ampules.

Dosage and Administration

Adult: 5 mg/kg IV push over 10-30 seconds.

Pediatric: 5 mg/kg IV push over 10-30 seconds.

Duration of Action

Onset: Immediate.

Peak effects: 5 minutes.

Duration of action: 3-12 hours.

Special Considerations

Administer only to patient in supine position.

Extravasation can cause tissue necrosis.

DIGOXIN (LANOXIN)

Class

Inotropic Agent.

Mechanism of Action

Rapid-acting cardiac glycoside with direct and indirect effects which increase force of myocardial contraction, increase refractory period of AV node and increase Total Peripheral Resistance.

Indications

Congestive Heart Failure.
PSVT, especially Atrial Flutter and Atrial Fibrillation.

Contraindications

Ventricular Fibrillation.
Ventricular Tachycardia.
Digitalis Toxicity.
Hypersensitivity to Digoxin.

Adverse Reactions

Headache, weakness, blurred yellow or green vision, confusion, seizures, Dysrhythmias, nausea, vomiting, skin rash.

Drug Interactions

Amiodarone, Verapamil, and Quinidine may increase serum Digoxin concentrations by 50-70%.
Concurrent use of Digoxin and Verapamil may lead to severe Heart Block.
Diuretics may potentiate cardiac toxicity.

How Supplied

2 ml ampules of 0.5 mg Digoxin; also: Tablets, capsules and elixirs.

Dosage and Administration

Adult: 0.25 - 0.5 mg slow IV Push.
Pediatric: 25-40 mcg /kg slow IV Push.

Duration of Action:

Onset: IV: 5-30 minutes; P.O.: 30-120 minutes.
Duration: several days.

Special Considerations

Pregnancy Safety: category A.
Patients receiving IV Digoxin must be on monitor.
Patients with known renal failure are prone to Digoxin Toxicity.
Hypokalemia, hypomagnesemia and hypercalcemia potentiate Digitalis Toxicity.
Use carefully in patients with Wolff-Parkinson-White Syndrome. (Ventricular Dysrhythmias).

DILTIAZEM HCL (CARDIZEM, LYO-JECT)

Class:

Calcium channel blocker.

Mechanism of Action:

Block influx of calcium ions into cardiac muscle: prevents spasm of coronary arteries.
Arterial and venous vasodilator.
Reduces preload and afterload.
Reduces myocardial oxygen demand.

Indications:

Control of rapid ventricular rates due to atrial flutter, atrial fibrillation, PSVT.
Angina pectoris.

Contraindications:

Hypotension, sick sinus syndrome, second or third degree AV block
Cardiogenic shock.
Wide-complex tachycardias.

Adverse Reactions:

Bradycardia, second or third-degree AV blocks, chest pain, CHF, syncope.
V-Fib, V-tach, nausea, vomiting, dizziness, dry mouth, dyspnea, headache.

Drug Interactions:

Caution in patients using medications that affect cardiac contractility.
In general, should not be used in patients on Beta-blockers.

How Supplied:

25 mg / 5 ml vial; 50 mg / 10 ml vial.
Non - refrigerated: LYO-JECT syringe.

Dosage and Administration:

Adult: Initial bolus: 0.25 mg/ kg (average dose 20 mg) IV over two (2) minutes. If inadequate response, may re-bolus in 15 minutes: 0.35 mg / kg IV over two (2) minutes. Maintenance infusion of 5-15 mg / hour.
Pediatric: not recommended.

Duration of Action:

Onset: 2-5 minutes.
Peak effect: Variable.
Duration: 1-3 hours.

Special Considerations:

Pregnancy safety: category C.
Use in caution in patients with renal or hepatic dysfunction.
PVCs may be noted at time of conversion of PSVT to sinus rhythm.

DIPHENHYDRAMINE (BENADRYL)

Class

Antihistamine; anticholinergic.

Mechanism of Action

Blocks cellular histamine receptors; decreases vasodilation; decreases motion sickness. Reverses extrapyramidal reactions.

Indications

Symptomatic relief of allergies, allergic reactions, anaphylaxis, acute dystonic reactions (phenothiazines).

Blood administration reactions; used for motion sickness, hay fever.

Contraindications

Asthma, glaucoma, pregnancy, hypertension, narrow angle glaucoma, infants, patients taking

Monoamine Oxidase Inhibitors.

Adverse Reactions

Sedation, hypotension, seizures, visual disturbances, vomiting, urinary retention, palpitations, dysrhythmias, dry mouth and throat, paradoxical CNS excitation in children.

Drug Interactions

Potentiates effects of alcohol and other anticholinergics, may inhibit corticosteroid activity, MAOIs prolong anticholinergic effects of diphenhydramine.

How Supplied

Tablet: 25, 50 mg; Capsules: 25, 50 mg.

50 or 100 mg prefilled syringes, vials (IV or IM); elixir 12.5 mg/5 ml.

Dosage and Administration

Adult: 25 - 50 mg IM or IV or P.O.

Pediatric: 1-2 mg/kg IV, IO slowly or IM. If given PO: 5 mg./ kg./ 24 hours.

Duration of Action

Onset: 15-30 minutes.

Peak effect: 1 hour.

Duration: 3-12 hours.

Special Considerations

Not used in infants or in pregnancy: Category B.

If used in anaphylaxis, will be in conjunction with epinephrine, steroids.

DOBUTAMINE (DOBUTREX)

Class

Sympathomimetic, inotrope.

Mechanism of Action

Synthetic catecholamine. Increased myocardial contractility and stroke volume, increased cardiac output. Minimal chronotrope activity. Increases renal blood flow.

Indications

Cardiogenic shock, CHF, left ventricular dysfunction.
Often used in conjunction with other drugs.

Contraindications

Tachydysrhythmias, IHSS, severe hypotension.

Adverse Reactions

May increase infarct size in patient with MI, headache, dysrhythmias, hypertension, PVCs.

Drug Interactions

Incompatible with sodium bicarbonate and Furosemide.
Beta-blockers may blunt inotropic effects.

How Supplied

250 mg / 20 ml vials.

DOSAGE AND ADMINISTRATION

Adult: IV infusion at 2 - 20 mcg / kg / min. titrated to desired effect.
Pediatric: 2-20 mcg / kg / min. titrated to desired effect.

Duration of Action

Onset: 2 minutes.
Peak Effect: 10 minutes.
Duration: 1-2 minutes after infusion discontinued.

Special Considerations

Pregnancy safety: not well established.
Monitor blood pressure closely.

DOPAMINE (INTROPIN)

Class

Sympathomimetic, inotropic agent.

Mechanism of Action

Immediate metabolic precursor to Norepinephrine. Increases systemic vascular resistance, dilate renal and splanchnic vasculature. Increases myocardial contractility and stroke volume.

Indications

Cardiogenic, septic or spinal shock, hypotension with low cardiac output states. Distributive shock.

Contraindications

Hypovolemic shock, pheochromocytoma, tachydysrhythmias, VF.

Adverse Reactions

Cardiac dysrhythmias, hypertension, increased myocardial oxygen demand, extravasation may cause tissue necrosis.

Drug Interactions

Incompatible in alkaline solutions.
MAOIs will enhance effects of dopamine.
Beta blockers may antagonize effects of dopamine.
When administered with Phenytoin: may cause hypotension, bradycardia and seizures.

How Supplied

200 mg / 5 ml - 400 mg / 5 ml prefilled syringes, ampules for IV infusion.
400 mg in 250 ml D5W premixed solutions.

Dosage and Administration

Adult: 2- 20 mcg / kg / min. <u>(Rate determined by physician).</u>
Pediatric: 2 - 20 mcg / kg / min. <u>(Rate determined by physician).</u>

Duration of Action

Onset: 1-4 minutes.
Peak Effect: 5-10 minutes.
Duration: Effects cease almost immediately after infusion shut off.

Special Considerations

Pregnancy safety not established.
Effects are dose-dependent
Dopaminergic response: 2-4 mcg / kg / min.: dilates vessels in kidneys; inc. urine output.
Beta-adrenergic response: 4- 10 mcg / kg / min.: Increased chronotropy and inotropy
Adrenergic response: 10-20 mcg / kg / min.: Primarily alpha stimulant / vasoconstriction.
Greater than 20 mcg / kg / min.: reversal of renal effects / override alpha effects.
Always monitor drip rate.
Avoid extravasation injury.

EPINEPHRINE (ADRENALIN)

Class: Sympathomimetic.

Mechanism of Action

Direct acting alpha and beta agonist
Alpha: bronchial, cutaneous, renal and visceral arteriolar vasoconstriction.
Beta 1: positive inotropic and chronotropic actions, increases automaticity.
Beta 2: bronchial smooth muscle relaxation and dilation of skeletal vasculature
Blocks histamine release.

Indications

Cardiac arrest, asystole, PEA, VF unresponsive to initial defib.
Severe bronchospasm, asthma, bronchiolitis.
Anaphylaxis, acute allergic reactions.

Contraindications

Hypertension, hypothermia, pulmonary edema, coronary insufficiency, hypovolemic shock.

Adverse Reactions

Hypertension, dysrhythmias, pulmonary edema, anxiety, psychomotor agitation, nausea, angina, headache, restlessness.

Drug Interactions

Potentiates other sympathomimetics.
Deactivated by alkaline solutions.
MAOIs may potentiate effects of epinephrine.

How Supplied

1 mg / ml (1:1,000) ampules and 0.1 mg / ml (1:10,000) prefilled syringes.
Auto-injectors: EPI-Pen: 0. 3 mg / ml
EPI-Pen Jr.: 0.15mg/ml

Dosage and Administration

Adult

Allergic reactions and asthma: 0.3 - 0.5 mg (0.3 - 0.5 ml 1:1000) SC
Anaphylaxis: 0.3 - 0.5 mg (3- 5 ml 1:10,000) IV

Cardiac: (asystole, PEA, VF)
1 mg IV push (1:10,000) every 3- 5 minutes
Endotracheal: 2.0- 2.5 mg (1:1,000) every 3- 5 minutes in 10ml NS

Pediatric

Allergic reactions and asthma: 0.01 mg/kg (0.01 mL/kg 1:1000) SC to maximum of 0.5 mg.
Cardiac: (asystole, PEA, VF)
IV, IO: Standard initial dose: 0.01 mg/kg (1:10,000, 0.1mL/kg)
ET: 0.1 mg/kg (1:1,000, 0.1mL/kg)
Second and subsequent doses: 0.1 mg/kg (1:1000, 0.1mL/kg)

EPINEPHRINE (ADRENALIN) (cont.)

Duration of Action

Onset: Immediate.
Peak Effects: Minutes.
Duration: Several minutes.

Special Considerations

Pregnancy safety: category C.
Syncope in asthmatic children.
If given ET, may dilute in sterile NS (10 ml in adults).

EPINEPHRINE RACEMIC (MICRONEFRIN, VAPONEFRIN)

Class

Sympathomimetic.

Mechanism of Action

Stimulates beta -2 receptors in lungs: bronchodilatation with relaxation of bronchial smooth muscles. Reduces airway resistance. Useful in treating laryngeal edema; Inhibits histamine release.

Indications

Bronchial asthma, prevention of bronchospasm.
Croup: laryngotracheobronchitis.
Laryngeal edema.

Contraindications

Hypertension, underlying cardiovascular disease, Epiglottitis.

Adverse Reactions

Tachycardia, dysrhythmias.

Drug Interactions

MAOIs may potentiate effects.
Beta-blockers may blunt effects.

How Supplied

MDI: 0.16-0.25 mg/ spray.
Solution: 7.5, 15, 30 ml in 1%, 2.25% solutions

Dosage and Administration

Adult:

MDI: 2-3 inhalations, repeated every 5 minutes PRN.
Solution: dilute 5 ml (1%) in 5.0 ml NS, administer over 15 minutes.

Pediatric:

Solution: Dilute 0.25 ml (0.1%) in 2.5 ml NS (if less than 20 kg);
Dilute 0.5 ml in 2.5 ml NS (if 20-40 kg);
Dilute 0.75 ml in 2.5 ml NS (if greater than 40 kg)
Administer by aerosolization.

Duration of Action

Onset: within 5 minutes.
Peak effect: 5- 15 minutes.
Duration: 1-3 hours.

Special Considerations

May cause tachycardias and other dysrhythmias.
Monitor Vital Signs.
Excessive use may cause bronchospasm.

FUROSEMIDE (LASIX)

Class

Loop diuretic.

Mechanism of Action

Inhibits electrolyte reabsorption and promotes excretion of sodium, potassium, chloride.

Indications

CHF; Pulmonary edema, hypertensive crisis.

Contraindications

Hypovolemia, anuria, hypotension (relative contraindication); hypersensitivity, hepatic coma.

Adverse Reactions

May exacerbate Hypovolemia, hypokalemia, ECG changes, dry mouth, hypochloremia, hyponatremia, hyperglycemia (due to hemoconcentration).

Drug Interactions

Lithium toxicity may be potentiated by sodium depletion.
Digitalis toxicity may be potentiated by potassium depletion.

How Supplied

100 mg / 5 ml, 20 mg / 2 ml, 40 mg / 4 ml vials.

Dosage and Administration

Adult: 0.5-1.0 mg / kg injected slowly IV.
Pediatric: 1 mg / kg / dose IV, IO.

Duration of Action

Onset: 5 minutes.
Peak Effects: 20-60 minutes.
Duration: 4-6 hours.

Special Considerations

Pregnancy safety: Category C.
Ototoxicity and deafness can occur with rapid administration.
Should be protected from light.

GLUCAGON

Class

Hyperglycemic agent, pancreatic hormone, insulin antagonist.

Mechanism of Action

Increases blood glucose by stimulating glycogenesis.
Unknown mechanism of stabilizing cardiac rhythm in beta-blocker overdose.
Minimal positive inotrope and chronotrope.
Decreases GI motility and secretions.

Indications

Altered level of consciousness when hypoglycemia is suspected.
May be used as inotropic agent in beta-blocker overdose.

Contraindications

Hyperglycemia, hypersensitivity.

Adverse Reactions

Nausea, vomiting.
Tachycardia, hypertension.

Drug Interactions

Incompatible in solution with most other substances.
No significant drug interactions with other emergency medications.

How Supplied

1 mg ampules (requires reconstitution with diluent provided)

Dosage and Administration

Adult: 0.5 - 1 mg IM, SC, or slow IV; may repeat q 20 minutes PRN.
Pediatric: 0.03 - 0.1 mg / kg / dose (not to exceed 1 mg) q 20 min. IM, IO, SC, slow IV.

Duration of Action

Onset: I minute.
Peak effect: 30 minutes.
Duration: Variable (generally 9-17 minutes).

Special Considerations

Pregnancy safety: Category C.
Ineffective if glycogen stores depleted.
Should always be used in conjunction with 50% dextrose whenever possible.
If patient does not respond to second dose glucagon, 50% dextrose must be administered.

GLUCOSE - ORAL (GLUCOLA, INTRA-GLUCOSE)

Class

Hyperglycemic.

Mechanism of Action

Provides quickly absorbed glucose to increase blood glucose levels.

Indications

Conscious patients with suspected hypoglycemia.

Contraindications

Decreased level of consciousness, nausea, vomiting.

Adverse Reactions

Nausea, vomiting.

Drug Interactions

None.

How Supplied

Glucola: 300 ml bottles.

Glucose pastes and gels in various forms.

Dosage and Administration

Adult: Should be sipped slowly by patient until clinical improvement noted.

Pediatric: Same as adult.

Duration of Action

Onset: Immediate.

Peak Effect: Variable.

Duration: Variable.

Special Considerations

As noted in indications section.

GLYCOPROTEIN IIb / IIIa INHIBITORS (Abciximab, Eptifibatide, Tirofiban)

Class

Chimeric monoclonal antibody fragment specific for platelet glycoprotein IIb/IIIa receptors.

Mechanism of Action

Blocks Platelet aggregation and thrombus formation

Indications

Adjunct to percutaneous transluminal angioplasty.
Adjunct to thrombolytic agents.
Unstable angina not responsive to conventional medical therapy when percutaneous angioplasty is planned within 24 hours.

Contraindications

Active internal hemorrhage.
Clinically significant hemorrhage (GI, GU) within last 6 weeks.
Cerebrovascular accident within past 2 years.
Bleeding disorders.
Thrombocytopenia (low platelets / < 100,000)
Major surgery or trauma within last 6 weeks.
Intracranial tumor, A/V malformation or aneurysm.
Severe Hypertension, Vasculitis.
Use of Dextran before PTCA or intent to use Dextran during PTCA.
Hypersensitivity.

Adverse Reactions

Major bleeding.
Intracranial bleeding.
Thrombocytopenia.

Drug Interactions

Oral anticoagulants contraindicated.
Concurrent Dextran contraindicated.
Concurrent Heparin will increase risk of bleeding.

How Supplied

Intravenous doses (bolus / infusion), variable depending upon Brand utilized.

Dosage and Administration

Variable depending upon Brand utilized.

Duration of Action

Onset: Variable: 1.5 - 2.5 Hours.
Peak Effect: Variable: 2 - 3 Hours.
Duration: 2 Hours - 2 Days.

Special Considerations

Major bleeding in 14% of coronary angioplasty patients.
Bleeding from open areas may occur (catheter site).
Pregnancy Category: C

HALOPERIDOL (HALDOL)

Class

Tranquilizer, antipsychotic.

Mechanism of Action

Inhibits CNS catecholamine receptors: strong anti-dopaminergic and weak anticholinergic.

Acts on CNS to depress subcortical areas, mid-brain and ascending Reticular Activating System

Indications

Rarely used in pre-hospital arena.

Acute psychotic episodes.

Contraindications

Agitation secondary to shock or hypoxia.

Hypersensitivity.

Adverse Reactions

Extrapyramidal signs and symptoms, restlessness, spasms, Parkinson-like symptoms, drooling, dystonia, hypotension, orthostatic, hypotension, nausea, vomiting, blurred vision.

Drug Interactions

Enhanced CNS depression and hypotension in combination with alcohol.

Antagonized amphetamines and epinephrine.

Other CNS depressants may potentiate effects.

How Supplied

5 mg / ml ampule.

Dosage and Administration

Adult: 2-5 mg IM every 30-60 minutes until sedation achieved.

Pediatric: Not recommended.

Duration of Action

Onset: 10 minutes.

Peak effect: 30-45 minutes.

Duration: Variable (generally 12-24 hours).

Special Considerations

Pregnancy safety: Not established.

Treat hypotension secondary to Haldol with fluids and norepinephrine, not epinephrine.

Patient may also be taking Cogentin (benztropine mesylate) if on long-term therapy with Haldol.

HEPARIN SODIUM

Class

Anticoagulant.

Mechanism of Action

Prevents conversion of fibrinogen to fibrin and affect clotting factors: IX, XI, XII, plasmin.

Does not lyse existing clots.

Indications

Prophylaxis and treatment of : venous thrombosis, pulmonary embolus, coronary occlusion, disseminated intravascular coagulation (DIC), post-operative thrombosis.

To maintain patency of IV injection devices and indwelling catheters.

Contraindication

Hypersensitivity.

Patients on antiplatelet drugs (relative contraindication).

Adverse Reactions

Hemorrhage, thrombocytopenia, allergic reactions (chills, fever, back pain).

Drug Interactions

Salicylates, some antibiotics and quinidine may increase risk of bleeding.

How Supplied

Heparin lock flush solutions in 10 and 100-unit / ml ampules and prefilled syringes.

1,000 - 40,000 units / ml ampules.

Dosage and Administration

Adult: Loading dose: 80 units / kg IV; maintenance dose: 18 units / kg / hour IV.

Pediatric: Loading dose: 50 u / kg IV; maintenance dose: 7.5 units / kg / hour IV.

Duration of Action

Onset: Immediate.

Peak Effect: Variable.

Duration: 4 hours after continuous infusion discontinued.

Special Considerations

May be neutralized with protamine sulfate at 1 mg protamine / 100 u Heparin: give slowly IV over 1-3 minutes.

HYDRALAZINE (APRESOLINE)

Class

Vasodilator, antihypertensive.

Mechanism of Action

Decreases systemic vascular resistance by affecting arteriolar smooth muscle.
Decreases diastolic blood pressure more than systolic.
Increases cardiac output and stroke volume.

Indications

Moderate to severe hypertension (hypertensive crisis); (rarely required in pre-hospital setting).
Pre-eclampsia and eclampsia.

Contraindications

Hypotension, elevated intracranial pressure., known coronary artery disease, dissecting aneurysm.

Adverse Reactions

Hypotension, headache, reflex tachycardia, angina, MI, anxiety, diaphoresis, nausea, vomiting.

Drug Interactions

Concurrent use with diazoxide may result in severe hypotension.

How Supplied

20 mg / ml, 1 or 2 ml ampules

Dosage and Administration

Adult: 10-40 mg IM or IV (slow over 1-2 minutes); may be repeated in 10 minutes PRN. Infusion: 20 mg in 250 ml NS at 5-20 mg / hr titrated to effect.
Pediatric: 0.1 - 0.2 mg / kg / dose q 4-6 hours IM, IV; may be repeated PRN. 0.75 - 3.0 mg / kg / q 6-12 hours, not to exceed 20 mg / day.

Duration of Action

Onset: 5-10 minutes IV; 10-40 minutes IM.
Peak Effect: 10-80 minutes.
Duration: 2-6 hours.

Special Considerations

Pregnancy safety: category C.
Hepatic or renal failure will prolong drug action.
ECG and BP require continuous monitoring during administration.

HYDROCORTISONE SODIUM SUCCINATE (SOLU-CORTEF)

Class

Corticosteroid.

Mechanism of Action

Anti-inflammatory and immunosuppressive with salt-retaining actions.

Indications

Shock due to acute adrenocortical insufficiency.

Contraindications

None if given as single dose.

Adverse Reactions

Only for long-term use.

Drug Interactions

Incompatible with heparin and metaraminol.

How Supplied

Vials with 100 mg, 250 mg, or 500 mg.

Dosage and Administration

Adult: 4 mg / kg slow IV bolus.

Pediatric: 0.16-1.0 mg / kg slow IV bolus.

Duration of Action

Onset: 1 hour.

Peak Effect: Variable.

Duration: 8-12 hours.

Special Considerations

May be used in status asthmaticus as a second line drug.

HYDROXYZINE (ATARAX, VISTARIL)

Class

Antihistamine, antiemetic, antianxiety agent.

Mechanism of Action

Potentiates effects of analgesics. Calming effect without impairing mental alertness.

Indications

To potentiate the effects of analgesics.
To control nausea and vomiting, anxiety reactions and motion sickness.
Preoperative and postoperative sedation.

Contraindications

Hypersensitivity.

Adverse Reaction

Dry mouth and drowsiness.

Drug Interactions

Potentiates the effects of CNS depressant such as narcotics, barbiturates and alcohol.

How Supplied

25, 50 mg / ml in 1 ml vials.

Dosage and Administration

Adult: 25-100 mg IM.
Pediatric: 0.5 - 1.0 mg / kg / dose IM.

Duration of Action

Onset: IM: 15- 30 minutes.
Peak Effect: 45 minutes to 1.5 hours.
Duration: 4-6 hours.

Special Considerations

Should be given by IM injection only.
Localized burning at injection is common complaint.

INSULIN (REGULAR INSULIN, NPH, ULTRALENTE, HUMULIN, OTHERS)

Class

Antidiabetic.

Mechanism of Action

Allows glucose transport into cells of all tissues; converts glycogen to fat; produces intracellular shift of potassium and magnesium to reduce elevated serum levels of these electrolytes.

Indications

Not used in emergency pre-hospital setting.
Diabetic ketoacidosis or other hyperglycemic state.
Hyperkalemia. (Insulin and D50 used together to lower hyperkalemic state).
Non-ketotic hyperosmolar coma.

Contraindications

Hypoglycemia, hypokalemia.

Adverse Reactions

Hypokalemia, hypoglycemia,, weakness, fatigue, confusion, headache, tachycardia, nausea, diaphoresis.

Drug Interactions

Incompatible in solution with all other drugs..
Corticosteroids, dobutamine, epinephrine and thiazide diuretics decrease the hypoglycemic effects of insulin.
Alcohol and salicylates may potentiate the effects of insulin.

How Supplied

10 ml Vials of 100 Units / ml.

Dosage and Administration

Dosage adjusted relative to blood sugar levels.
May be given SC, IM or IV.
Standard doses for diabetic coma

Adult: 10-25 units Regular insulin IV, followed by infusion of 0.1 units / kg / hour.
Pediatric: 0.1 - 0.2 units / kg / hour IV or IM followed by infusion: 50 units of regular insulin mixed in 250 ml of NS (0.2 units / ml), at a rate of 0.1 - 0.2 units / kg / hour.

Duration of Action

Onset: Minutes
Peak Effect: Approximately 1 hour (short-acting); 3-6 hours (intermediate-acting); 5-8 hours (long-acting).
Duration: Approximately 6-8 hours (short-acting); 24 hour (intermediate-acting); 36 hour (long-acting).

Special Considerations

Insulin is drug of choice for control of diabetes in pregnancy.
Usually require refrigeration.
Most rapid absorption if injected in abdominal wall; next most rapid absorption: arm; slowest absorption if injected into the thigh.

ISOETHARINE (BRONCHOSOL, BRONKOMETER)

Class

Sympathomimetic.

Mechanism of Action

Beta-2 agonist; relaxes smooth muscle of bronchioles.

Indications

Acute bronchial asthma, bronchospasm (especially in COPD patient).

Contraindications

Use with caution in patients with Diabetes, hyperthyroidism, cardiovascular and cerebrovascular disease.

Adverse Reactions

Dose-related tachycardia, palpitations, tremors, nervousness, nausea.
Multiple doses can cause paradoxical bronchoconstriction.

Drug Interactions

Additive adverse effects if given with other beta-2 agonist drugs.

How Supplied

MDI; 2 ml unit-dose of 1% solution.

Dosage and Administration

Adult: 1-2 inhalations with MDI. COPD: 2.5 - 5.0 mg (0.25 ml - 0.5 ml) diluted in 3 ml NS and nebulized.
Pediatric: 0.01 ml / kg; maximum dose: 0.5 ml diluted in 3 ml NS and nebulized.

Duration of Action

Onset: immediate.
Peak Effect: 5-15 minutes.
Duration: 1-4 hours.

Special Considerations

None.

ISOPROTERENOL (ISUPREL)

Class

Sympathomimetic, synthetic catecholamine..

Mechanism of Action

Beta-agonist, especially beta-1: positive inotropy and chronotropy.
Bronchodilation (not used as such in pre-hospital setting.

Indications

Hemodynamically stable bradycardia resistant to atropine.
Heart blocks with palpable pulse.
Management of Torsades de pointes.

Contraindications

V-tach, VF, hypotension, pulseless idioventricular rhythm, ischemic heart disease, cardiac arrest.

Adverse Reactions

Tachycardias, dysrhythmias, angina pectoris, MI, tremors, anxiety, facial flushing.

Drug Interactions

MAOIs may potentiate effects.
Beta-adrenergic drugs may blunt effects.
Sympathomimetics may potentiate effects.

How Supplied

1 mg in 1 ml or 5 ml ampule and prefilled syringes.

Dosage and Administration

Adult: Infusion at 2-10 mcg / min. or until desired heart rate is obtained.
Pediatric: 0.05-1.5 mcg / kg / min. IV infusion, titrated to patient response.

Duration of Action

Onset: Immediate.
Peak effect: Minutes.
Duration: Minutes after infusion is discontinued.

Special Considerations

Pregnancy safety: Category C.
Increases myocardial consumption and can precipitate V-tach and VF.
May exacerbate tachydysrhythmias caused by digitalis toxicity.
Newer inotropes have replaced Isuprel in most clinical settings.
If electronic pacing available, it should be used in lieu of Isuprel or as soon as possible after drug has been initiated.

KETOROLAC TROMETHAMINE (TORADOL IM)

Class

Nonsteroidal anti-inflammatory (NSAID) Analgesic.

Mechanism of Action

NSAID that also exhibits peripherally acting non-narcotic analgesic activity by inhibiting prostaglandin synthesis.

Indications

Short-term management of moderate to severe pain.

Contraindications

Allergy to salicylates or other NSAIDs,.
Patients with history of asthma.
Bleeding disorders, especially GI related (peptic ulcer disease).
Renal failure.

Adverse Reactions

Anaphylaxis due to hypersensitivity.
Nausea, GI bleeding, Sedation, hypotension or hypertension, rash, headache, edema.

Drug Interactions

May increase bleeding time in patients taking anticoagulants.

How supplied

15 or 30 mg in 1 ml or 60 mg in 2 ml vials.

Dosage and Administration

Adult: 30-60 mg IM.
Pediatric: Not recommended.

Duration of Action

Onset: 10 minutes.
Peak effect: 1-2 hours.
Duration: 2-6 hours.

Special Considerations

Pregnancy safety: Category C.
Use with caution in elderly patient.
May be given IV in lower dosage (15-30 mg).

LABETALOL (NORMODYNE, TRANDATE)

Class

Selective Alpha and non-selective beta adrenergic blocker.

Mechanism of Action

Blood presser reduced without reflex tachycardia; total peripheral resistance reduced without significant alteration in cardiac output.

Indications

Moderate to severe hypertension.

Contraindications

Bronchial asthma.
CHF, Cardiogenic Shock.
Second and third-degree heart block, bradycardia.

Adverse Reactions

Headache, dizziness, ventricular dysrhythmias, hypotension, dyspnea, facial flushing.
postural hypotension, diaphoresis, allergic reaction.

Drug Interactions

Labetalol may block bronchodilator effects of beta-adrenergic agonists.
NTG may augment hypotensive effects of Labetalol.

Dosage and Administration

Adult: 5-20 mg slow IV over 2 minutes; (additional injections of 10-40 mg can be given at 10 minute intervals); Infusion: 2 mg / min. titrated to acceptable supine blood pressure.
Pediatric: safety not established.

Duration of action:

Onset: less than 5 minutes.
Peak effect: variable.
Duration: 3-6 hours.

Special Considerations

Pregnancy safety: Category C.
Continuous monitoring of BP, Heart Rate and ECG.
Observe for signs of CHF, Bradycardia, bronchospasm.
Should only be administered with patient in supine position.

LACTATED RINGERS

Class: Isotonic crystalloid

Mechanism of Action: Volume Replacement

.

Indications: Hypovolemic Shock

Contraindications: Congestive Heart failure, Renal Failure

Adverse Reactions: Rare

Drug Interactions: None

HOW SUPPLIED: IV INFUSION

Dosage and Administration:

Adult: (Systolic <90 mmHG) Infuse wide open until systolic pressure of 100mmHG is obtained.
(Systolic 100 or > infuse at a rate of 100 ml/hr.

Pedi: 20 ml/kg repeated as required based on hemodynamic response

LIDOCAINE HCL (2%)

Class

Antidysrhythmic.

Mechanism of Action

Decreases automaticity by slowing the rate of spontaneous Phase 4 depolarization.

Indications

Suppression of ventricular dysrhythmias (V-tach, VF, PVCs).
Prophylaxis against recurrence after conversion from V-tach, VF.

Contraindications

Second degree and third degree blocks in absence of artificial pacemaker).
Hypotension.
Stokes Adams Syndrome.

Adverse Reactions

Slurred speech, seizures, altered mental status, confusion, lightheadedness, blurred vision, bradycardia.

Drug Interactions

Apnea induced with succinylcholine may be prolonged with high doses of Lidocaine.
Cardiac depression may occur in conjunction with IV Dilantin.
Procainamide may exacerbate the CNS effects.
Metabolic clearance decreased in patients with liver disease or those patients taking beta-blockers.

How Supplied

100 mg in 5 ml solution prefilled syringes.
1 and 2 gram additive syringes.
100 mg in 5 ml solution ampules.
1 and 2 gram vials in 30 ml of solution.

Dosage and Administration

Adult:
Cardiac arrest VT/ VF: 1.5 mg / kg IV push; repeat q 3-5 minutes to maximum dose of 3 mg/kg. After conversion to NSR, begin drip at 2-4 mg / min.
VT with pulse: 1-1.5 mg / kg IV Push; then 0.50 - 0.75 mg / kg q 5-10 min. to max. of 3 mg/kg. Start drip at 2-4 mg/min. ASAP.
PVCs with pulse: 0.5-1.5 mg/kg IV Push; additional boluses of 0.5-1.5 mg/kg q 5-10 min. to max. of 3 mg/kg. Start drip at 2-4 mg/ min. ASAP.
VF prophylaxis: 0.5 mg/kg IV Push; additional boluses 0.5 mg/kg in 8-10 minutes up to 2 mg/kg. Start drip at 2-4 mg/min. ASAP.
IM dose: 300 mg (4 mg/kg) of 10% solution.
Pediatric:
VF or Pulseless V-tach: 1 mg/kg IV / IO per dose. Infusion: 20-50 mcg/kg/min.
PVCs with pulse: 1 mg/kg IV / IO per dose. Infusion: 20-50 mcg/kg/min.

Duration of Action

Onset: 1-5 minutes.
Peak Effect: 5-10 minutes.
Duration: Variable. (15 min. - 2 hours).

LIDOCAINE HCL (2%) (cont.)

Special Considerations

Pregnancy safety: Category B.
Reduce maintenance infusions by 50% if patient is over 70 years of age, has liver disease, or is in CHF or shock.
A 75-100 mg bolus maintains levels for only 20 minutes.
If bradycardia occurs with PVCs, always treat the bradycardia with atropine, Isoproterenol or both.
Exceedingly high doses of Lidocaine can result in coma or death.
Avoid Lidocaine for reperfusion dysrhythmias after thrombolytic therapy.
Cross-reactivity with other forms of local anesthetics.

LORAZEPAM (ATIVAN)

Class

Benzodiazepine; sedative; anticonvulsant.

Mechanism of Action

Anxiolytic, anticonvulsant and sedative effects; suppresses propagation of seizure activity produced by foci in cortex, thalamus and limbic areas.

Indications

Initial control of status epilepticus or severe recurrent seizures.
Severe anxiety.
Sedation.

Contraindications

Acute narrow-angle glaucoma.
Coma, shock or suspected drug abuse.

Adverse Reactions

Respiratory depression, apnea, drowsiness, sedation, ataxia, psychomotor impairment, confusion.
Restlessness, delirium.
Hypotension, bradycardia.

Drug Interactions

May precipitate CNS depression if patient is already taking CNS depressant medications.

How Supplied

2 and 4 mg / ml concentrations in 1 ml vials.

Dosage and Administration

Note: When given IV or IO, must dilute with equal volume of sterile water or sterile saline; When given IM, Lorazepam is not to be diluted.
Adult: 2-4 mg slow IV at 2 mg / min. or IM; may repeat in 15-20 minutes to maximum dose of 8 mg. For sedation: 0.05 mg / kg up to 4 mg IM.
Pediatric: 0.05 - 0.20 mg / kg slow IV, IO slowly over 2 minutes or IM; may repeat in 15-20 minutes to maximum dose of 0.2 mg / kg.

Duration

Onset of action: 1-5 minutes.
Peak effect: variable.
Duration of action: 6-8 hours.

Special Considerations

Pregnancy safety: Category D.
Monitor BP and respiratory rate during administration.
Have advanced airway equipment readily available.
Inadvertent arterial injection may result in vasospasm and gangrene.
Lorazepam expires in 6 weeks if not refrigerated.

Note From Drug Control Program: Re: Storage of Lorazepam.
According to stability information, Lorazepam injection requires refrigeration and should be stored at 2 - 8º C (35 - 45º F). Lorazepam injection should be protected from light, which can be accomplished by retaining the vial in the carton until ready for use. In addition, freezing of the injection should be avoided. Lorazepam should not be used if the solution is discolored or contains a precipitate.
Ambulances are required to ensure stability of all drug products stored on site. Those ambulances unable to meet the above-mentioned storage conditions should refrain from using Lorazepam. For further information, contact the Drug Control Program at (617) 983-6700 or the Office of Emergency Medical Services at (617) 284-8300.

MAGNESIUM SULFATE

Class

Electrolyte.

Mechanism of Action

Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholinesterase release at the myoneural junction; manages seizures in toxemia of pregnancy; induces uterine relaxation; can cause bronchodilation after beta-agonists and anticholinergics have been used.

Indications

Seizures of eclampsia (Toxemia of pregnancy).
Torsades de Pointes.
Hypomagnesemia.
TCA overdose-induced dysrhythmias.
Digitalis-induced dysrhythmias.
Class IIa agent for refractory VF and VT after administration of Lidocaine doses.

Contraindications

Heart blocks.
Renal diseases.

Adverse Reactions

Respiratory and CNS depression.
Hypotension, cardiac arrest and asystole may occur.
Facial flushing, diaphoresis, depressed reflexes.
Circulatory collapse.

Drug Interactions

May enhance effects of other CNS depressants.
Serious changes in overall cardiac function may occur with cardiac glycosides.

How Supplied

2 ml and 20 ml vials of a 50% solution.

Dosage and Administration

Adult: Seizure activity associated with pregnancy: 1-4 gm IV push over 3 minutes. For Torsades de Pointes or Refractory VF/VT: 1-2 grams IV push over 1-2 minutes.
Pediatric: Not recommended.

Duration of Action

Onset: Immediate.
Peak effect: variable.
Duration: 3-4 hours.

Special Considerations

Pregnancy safety: Recommended that drug not be given in the 2 hours before delivery, if possible.
IV calcium gluconate or calcium chloride should be available as antagonist if needed.
The “cure” for toxemia is delivery of the baby.
Use with caution in patients with renal failure.
Magnesium sulfate is being used for acute MI patients in some systems under Medical Direction.

MANNITOL 20% (OSMITROL)

Class

Osmotic diuretic.

Mechanism of Action

Promotes the movement of fluid form the intracellular space to the extracellular space.
Decreases cerebral edema and intracranial pressure.
Promotes urinary excretion of toxins.

Indications

Cerebral edema.
Reduce intracranial pressure for certain cause (space-occupying lesions).
Rhabdomyolysis (myoglobinuria).
Blood transfusion reactions.

Contraindications

Hypotension, renal failure, electrolyte depletion, dehydration, intracranial bleeding.
Severe CHF with pulmonary edema
hyponatremia.

Adverse Reactions

CHF, pulmonary edema, hypertension, nausea, vomiting, headache, seizures, chest pain, tachycardia. Electrolyte depletion, dehydration, hypotension, sodium depletion.

Drug Interactions

May precipitate digitalis toxicity in when given concurrently.

How Supplied

250 ml and 500 ml of a 20% solution for IV infusion (200 mg / ml)
25% solution in 50 ml for slow IV push.

Dosage and Administration

Adult: 0.50g - 2 g / kg IV infusion over 15-30 minutes; may repeat after 5 minutes if no effect.
Pediatric: 0.5 - 1g / kg / dose IV, IO infusion over 30-60 minutes; may repeat after 30 minutes if no effect.

Duration of Action

Onset: 1-3 hours for diuretic effect; 15 minutes for reduction of intracranial pressure.
Peak effect: variable.
Duration: 4-6 hours for diuretic effect; 3-8 hours for reduction of ICP.

Special Considerations

Pregnancy safety: Category C.
May crystallize at temperatures below 7.8 degrees Centigrade.
In-line filter should always be used.
Effectiveness depends upon large doses and an intact blood-brain barrier.
Usage and dosages in emergency care are controversial.

MEPERIDINE (DEMEROL)

Class

Opioid Analgesic

Mechanism of Action

Synthetic opioid agonist that acts on opioid receptors to produce analgesia, euphoria, respiratory and physical depression; a schedule II drug with potential for physical dependency and abuse.

Indications

Analgesia for moderate to severe pain.

Contraindications

Hypersensitivity to narcotic agents.
Diarrhea caused by poisoning.
Patients taking MAOIs.
During labor or delivery of a premature infant.
Undiagnosed abdominal pain or head injury.

Adverse Reactions

Respiratory depression, sedation, apnea, circulatory depression, dysrhythmias, shock.
Euphoria, delirium, agitation, hallucinations, visual disturbances, coma.
Seizures, headache, facial flushing.
Increased ICP, nausea, vomiting.

Drug Interactions:

Do not give concurrently with MAOIs (even with a dose in the last 14 days!).
Exacerbates CNS depression when given with these medications.

How Supplied

50 / ml in 1 ml pre-filled syringes and Tubex.

Dosage and Administration

Adult: 50-100 mg IM, SC or 25 - 50 mg slowly IV.
Pediatric: 1-2 mg / kg / dose IV, IO, IM, SC.

Duration of Action

Onset: IM: 10-45 minutes; IV: immediate.
Peak effect: 30-60 minutes.
Duration: 2-4 hours.

Special Considerations

Pregnancy safety: Category C.
Use with caution in patients with asthma and COPD.
May aggravate seizures in patients with known convulsive disorders.
Naloxone should be readily available as antagonist.

METAPROTERENOL 5% (ALUPENT)

Class

Sympathomimetic Bronchodilator.

Mechanism of Action:

Beta-2 Agonist acts directly on bronchial smooth muscle causing relaxation of the bronchial tree and peripheral vasculature.

Indications

Bronchial asthma.
Reversible bronchospasm secondary to bronchitis, COPD.

Contraindications

Tachydysrhythmias.
Hypersensitivity.
Tachycardias due to digitalis toxicity.

Adverse Reactions

Tachydysrhythmias, anxiety, nausea, vomiting, restlessness, apprehension, palpitations.
Hypotension, coughing, facial flushing, diaphoresis.

Drug Interactions

Other sympathomimetics may exacerbate cardiovascular effects.
MAOIs may potentiate hypotensive effects.
Beta blockers may antagonize metaproterenol.

How Supplied

MDI: 0.65 mg / dose/ spray (15 ml inhaler).
Solution: 5% Solution in bottles of 10 and 30 ml with calibrated dropper;
Alupent Inhalation solution Unit-Dose vial 0.4% or 0.6%.

Dosage and Administration

Adult:

MDI: 2-3 inhalations every 3-4 hours (2 minutes between inhalations).
Inhalation solution 5%: Via HHN 0.2 - 0.3 ml diluted in 2.5 ml saline.
Inhalation solution unit-dose 0.4% or 0.6% vials: IPPB Device only: one vial /treatment.

Pediatric:

MDI: not recommended.
Inhalation Solution 5%: Age 6-12 years: 0.1-0.2 ml diluted in 3 ml saline.

Duration of Action

Onset: 1 minute after inhalation.
Peak effect: 45 minutes.
Duration: 3-6 hours.

Special Considerations

Pregnancy safety: category C.
Monitor for hypotension or tachycardia.
Use with caution in patients with Diabetes mellitus and coronary artery disease.

METHYLPREDNISOLONE (SOLU-MEDROL)

Class

Anti-inflammatory glucocorticoid.

Mechanism of Action

Synthetic steroid that suppresses acute and chronic inflammation; potentiates vascular smooth muscle relaxation by beta-adrenergic agonists;

Indications

Acute Spinal cord trauma.
Anaphylaxis
Bronchodilator for unresponsive asthma.

Contraindications

Premature infants.
Systemic fungal infections.
Use with caution patients with GI bleeding.

Adverse Reactions

Headache, hypertension, sodium and water retention.
CHF, hypokalemia, alkalosis, peptic ulcer disease, nausea, vomiting.

Drug Interactions

Hypoglycemic responses to insulin and hypoglycemic agents may be blunted.
Potassium-depleting agents may exacerbate hypokalemic effects.

How Supplied

40, 125, 500 and 1,000 mg vials.

Dosage and Administration

Adult: Acute spinal cord injury: 30 mg / kg IV over 30 minutes followed by infusion: 5.4 mg/kg/hr. Asthma, COPD: 1-2 mg / kg IV.

Pediatric: Acute spinal cord trauma: 30 mg / kg IV over 30 minutes; infusion: 5.4 mg / kg / hr. Asthma: 1-2 mg / kg / dose IV.

Duration of Action

Onset of action: 1-2 hours.
Peak effects: Variable.
Duration of action: 8-24 hours.

Special Considerations

Pregnancy safety: not established.
Not effective if spinal cord injury greater than 8 hours.
Crosses the placenta and may cause fetal harm.

METOPROLOL (Lopressor, Toprol-XL)

Class: Antianginal; Antihypertensive Agent; Beta Blocker

Mechanism of Action: Selective inhibitor of beta1-adrenergic receptors; completely blocks beta1 receptors , with little or no effect on beta 2 receptors at doses <100 mg;

Indications: Treatment of hypertension and angina pectoris; prevention of myocardial infarction, atrial fibrillation, flutter, symptomatic treatment of hypertrophic subaortic stenosis; to reduce increased sympathetic stimuli in acute MI.

Contraindications: Hypersensitivity to metoprolol or any component of the formulation; sinus bradycardia; heart block greater than first degree (except in patients with a functioning artificial pacemaker); cardiogenic shock; uncompensated cardiac failure; pregnancy (2nd and 3rd trimesters)

Adverse Reactions:

Respiratory: Bronchospasm
Cardiovascular: Bradycardia, palpitations, edema, congestive heart failure, reduced peripheral circulation.
Central nervous system: Drowsiness, insomnia.

Drug Interactions: Drugs which slow AV conduction (**digoxin**): effects may be additive with beta-blockers.
Glucagon: Metoprolol may blunt the hyperglycemic action of glucagon. **Verapamil or diltiazem** may have synergistic or additive pharmacological effects when taken concurrently with beta-blockers; avoid concurrent I.V. use.

How Supplied: Metoprolol tartrate, is a selective beta$_1$-adrenoreceptor blocking agent, available as 50- and 100-mg tablets for **oral** administration and in 5-ml (1mg/ml) ampuls for **intravenous** administration.

Dosage and Administration:

Adults:

I.V.: **Hypertension**: Has been given in dosages 1.25-5 mg every 6-12 hours in patients unable to take oral medications
Myocardial infarction (acute): I.V.: 5 mg every 5-10 minutes up to 3 doses in early treatment of myocardial infarction.

Duration of Action: Peak antihypertensive effect:
Oral: Within 1.5-4 hours
Duration: 10-20 hours
Half-life: 3-4 hours; End-stage renal disease: 2.5-4.5 hours

Special Considerations:
Pregnancy Safety: Category C (manufacturer); D (2nd and 3rd trimesters - expert analysis)

Not recommended in pediatric population. The safety and effectiveness of Lopressor have not been established in children

MIDAZOLAM (VERSED)

Class

Short-acting benzodiazepine CNS depressant.

Mechanism of Action

Anxiolytic and sedative properties similar to other benzodiazepines.
Memory impairment.

Indications

Sedation, Anxiolytic prior to endotracheal or nasotracheal intubation.
Administer for conscious sedation.

Contraindications

Glaucoma, shock, coma, alcohol intoxication, overdose patient.
Depressed vital signs.
Concomitant use with other CNS depressants, barbiturates, alcohol, narcotics.

Adverse Reactions

Hiccough, cough, over-sedation, nausea, vomiting, injection site pain, headache, blurred vision.
Hypotension, respiratory depression and arrest.

Drug Interactions

Should not be used in patients who have taken CNS depressant.

How Supplied

2, 5, 10 ml vials (1 mg / ml).
1, 2 , 5, 10 ml vials (5 mg/ ml).

Dosage and Administration

Adult: 0.5 - 2.5 mg slow IV push;
(may be repeated to total maximum: 0.1 mg / kg).

Pediatric: To facilitate intubation: Medical control may order:

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

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

WMD: (See APPENDIX Dosing Table)

Duration of Action

Onset: 1-3 minutes IV and dose dependent.
Peak effect: variable.
Duration: 2-6 hours and dose dependent.

Special Considerations

Pregnancy safety: category D.
Administer immediately prior to intubation procedure.
Requires continuous monitoring of respiratory and cardiac function.
Never administer as IV bolus.

MORPHINE SULFATE (ASTRAMORPH/PF AND OTHERS)

Class

Opioid analgesic. (Schedule II drug).

Mechanism of Action

Alleviates pain through CNS actions
Suppresses fear and anxiety centers in brain.
Depresses brain stem respiratory centers.
Increases peripheral venous capacitance and decreases venous return.
Decreases preload and afterload, decreasing myocardial oxygen demand.

Indications

Analgesia for moderate to severe acute and chronic pain (use with caution).
Severe CHF, pulmonary edema.
Chest pain associated with acute MI.

Contraindications

Head injury, exacerbated COPD, depressed respiratory drive, hypotension.
Undiagnosed abdominal pain, decreased level of consciousness.
Suspected hypovolemia.
Patients who have taken MAOIs within past 14 days.

Adverse Reactions

Respiratory depression, hypotension, decreased level of consciousness, nausea, vomiting.
Bradycardia, tachycardia, syncope, facial flushing, euphoria, bronchospasm, dry mouth.

Drug Interactions

Potentiates sedative effects of phenothiaxines.
CNS depressant may potentiate effects of morphine.
MAOIs may cause paradoxical excitation.

How Supplied

10 mg in 1 ml of solution, ampules and Tubex syringes.

Dosage and Administration

Adult: 1-3 mg IV, IM, SC every 5 minutes titrated to maximum of 10 mg.
Adult: **Morphine 0.1mg/kg to a maximum of 10mg IV/IM/SC**

~

Pediatric: 0.1 - 0.2 mg / kg / dose IV, IO, IM, SC every 5 minutes titrated to max. of 5 mg.

Duration of Action

Onset: Immediate.
Peak effect: 20 minutes.
Duration: 2 - 7 hours.

Special Considerations

Pregnancy safety: Category C.
Morphine rapidly crosses the placenta.
Safety in neonate not established.
Use with caution in geriatric population and those with COPD, asthma.
Vagotonic effect in patient with acute inferior MI (bradycardia, heart block).
Naloxone should be readily available as antidote.

NALBUPHINE (NUBAIN)

Class

Opioid analgesic.

Mechanism of Action

Activates opiate receptor in limbic system of CNS.
Analgesic similar to morphine on a milligram for milligram basis.
Agonist and antagonist properties.
May be preferred for chest pain in setting of acute MI as it reduces the myocardial oxygen demand without reducing the blood pressure.

Indications

Chest pain associated with acute MI.
Moderate to severe acute pain.
Pulmonary edema, with or without associated chest pain. (morphine remains first line).

Contraindications

Head injury or undiagnosed abdominal pain.
Diarrhea caused by poisoning.
Hypovolemia, hypotension.

Adverse Reactions

Hypotension, bradycardia, facial flushing.
Respiratory depression, CNS depression, euphoria, paradoxical CNS stimulation.
Blurred vision.

Drug Interactions

CNS depressant may potentiate effects.

How Supplied

10 mg in 1 ml ampule (10 mg / ml).
20 mg in 1 ml ampule.

DOSAGE AND ADMINISTRATION

Adult: 2-5 mg slowly IV; may repeat 2 mg doses PRN to maximum 10 mg.
Pediatric: Not recommended.

Duration of Action

Onset: 2-3 minutes.
Peak effect: variable.
Duration: 3-6 hours.

Special Considerations

Pregnancy safety: Category B.
Use with caution in patients with impaired respiratory function.
May precipitate withdrawal syndromes in narcotic-dependent patients.
Naloxone should be readily available.

NALOXONE (NARCAN)

Class

Narcotic antagonist.

Mechanism of Action

Competitive inhibition at narcotic receptor sites.
Reverse respiratory depression secondary to depressant drugs.
Completely inhibits the effect of morphine.

Indications

Opiate overdose, coma.
Complete or partial reversal of CNS and respiratory depression induced by opioids
- Narcotic agonist
  - Morphine, heroin, hydromorphone (Dilaudid), methadone.
  - Meperidine (Demerol), Paregoric, Fentanyl (Sublimase).
  - Oxycodone (Percodan), codeine, propoxyphene (Darvon).
- Narcotic agonist and antagonist
  - Butorphanol (Stadol).
  - Pentazocine (Talwin).
  - Nalbuphine (Nubain).

Decreased level of consciousness.
Coma of unknown origin.

Contraindications

Use with caution in narcotic-dependent patients.
Use with caution in neonates of narcotic-addicted mothers.

Adverse Reactions

Withdrawal symptoms in the addicted patient.
Tachycardia. hypertension, dysrhythmias, nausea, vomiting, diaphoresis.

Drug Interactions

Incompatible with bisulfite and alkaline solutions.

How Supplied

0.02 mg / ml (neonate); 0.4 mg/ml, 1 mg/ml ; 2.0 mg / 5 ml ampules; 2 mg/5 ml prefilled syringe.

Dosage and Administration

Adult: 0.4 - 2.0 mg IV, IM, SC, or ET (diluted); min. recommended = 2.0 mg.; repeat at 5 minute intervals to 10 mg maximum dose. (Medical Control may request higher amounts). Infusion: 2 mg in 500 ml of D5W (4 mcg/ml), infuse at 0.4 mg / hr (100 ml/hour).

Pediatric: 0.1 mg / kg / dose IV, IM, SC, ET (diluted); maximum of 0.8 mg; if no response in 10 minutes, administer an additional 0.1 mg / kg /dose.

Duration of Action

Onset: within 2 minutes.
Peak effect: variable.
Duration: 30-60 minutes.

Special Considerations

Pregnancy safety: category B.
Seizures without causal relationship have been reported.
May not reverse hypotension.
Use caution when administering to narcotic addicts (violent behavior, etc.).

NERVE AGENT ANTIDOTES (AUTO-INJECTORS)

1. MARK 1 KIT: Nerve Agent Antidote Kit

Each **MARK 1 KIT** contains 1- Atropine, (2 mg/0.7 ml) and 1- Pralidoxime Chloride (600-mg/2 cc) (2-PAMCL)

2. DIAZEPAM AUTO-INJECTOR: CONVULSANT ANTIDOTE NERVE AGENT (CANA): Each **CANA Autoinjector** contains 10mg diazepam in 2ml.

Meridian Medical Technologies, Inc.

NERVE AGENT ANTIDOTES (AUTO-INJECTORS)

3. Pediatric AtroPen® Autoinjector: Three strengths of ATROPEN are available in color coded containers: 0.5mg (blue); 1.0mg (Dark Red) **or** 2.0 mg (Green) Each ATROPEN delivers atropine in in 0.7 ml. of sterile solution.

Adults and children weighing over 90 lbs (generally over 10 years of age) 2 mg AtroPen® (GREEN LABEL)
Children weighing 40 lbs to 90 lbs (generally 4 to 10 years of age) 1 mg AtroPen® (DARK RED LABEL)
Children weighing 15 lbs to 40 lbs (generally 6 months to 4 years of age) 0.5 mg AtroPen® (BLUE LABEL)

Meridian Medical Technologies, Inc.

Intramuscular solution from 1 gram vial of pralidoxime chloride (2-PAM). 3 ml of sterile water or normal saline for a concentration of 300 mg/ml.

Intravenous: 1 gram vial of pralidoxime (2-PAM) diluted with 20 ml of sterile water or normal saline. Add to 100 ml IV bag of normal saline. Adult dosing is 1 gram infused over at least 30 minutes. More rapid dosing is associated with hypertension and paralysis. Slow infusion if hypertension develops.

PREPARATION OF WEIGHT BASED DOSING USING MARK I KITS

Under sterile conditions, clean 10 ml sterile water or sterile saline vial top with isopropyl alcohol. Withdraw entire contents of vial and discard. Swab injection surface of the autoinjector with isopropyl alcohol wile autoinjector is still in protective plastic safety case to prevent inadvertent firing. Remove autoinjector and firmly press autoinjector against surface of emptied sterile vial until all contents are discharged. Label vial as atropine or pralidoxime. One vial will now contain 2 mg atropine in 0.7 ml dilutent (2.9 mg/ml) and the other has 600 mg pralidoxime in 2ml dilutent (300 mg/ml). The pediatric dose should then be drawn up in a syringe with a filter needle (autoinjector may discharge a plug of rubber into the vial) and needle changed for injection.

NITROGLYCERIN (NITROSTAT, TRIDIL AND OTHERS)

Class

Vasodilators.

Mechanism of Action

Smooth muscle relaxant acting on vascular, bronchial, uterine and intestinal smooth muscle.

Dilation of arterioles and veins in the periphery, reduces preload and afterload, decreases the work load of the heart and, thereby, myocardial oxygen demand.

Indications

Acute angina pectoris.

Ischemic chest pain.

Hypertension.

CHF, pulmonary edema.

Contraindications

Hypotension, hypovolemia.

Intracranial bleeding or head injury.

Adverse Reactions

Headache, hypotension, syncope, reflex tachycardia, flushing.

Nausea, vomiting, diaphoresis, muscle twitching.

Drug Interactions

Additive effects with other vasodilators.

Incompatible with other drugs IV.

How Supplied

Tablets: 0.15 mg (1/400 grain); 0.3 mg (1/200 grain); 0.4 mg (1/150 grain); 0.6 mg (1/100 grain).

NTG spray: 0.4 mg - 0.8 mg under the tongue.

NTG IV (TRIDIL).

Dosage and Administration

Adult:

Tablets: 0.3 - 0.4 mg SL; may repeat in 3-5 minutes to maximum of 3 doses.

NTG spray: 0.4 mg under the tongue; 1-2 sprays.

NTG IV infusion: 5 ug / min.; increase by 5-10 ug / min. every 5 minutes until desired effect.

Pediatric: not recommended.

Duration of Action

Onset: 1-3 minutes.

Peak effect: 5-10 minutes.

Duration: 20-30 minutes or. if IV, 1-10 minutes after discontinuation of infusion.

Special Considerations

Pregnancy safety: category C.

Hypotension more common in geriatric population.

NTG decomposes if exposed to light or heat.

Must be kept in airtight containers.

Active ingredient may have a stinging effect when administered SL.

NITROPASTE (Nitro-Bid, Nitrol OINTMENT)

Class: Vasodilator

Mechanism of Action: Smooth muscle relaxant acting on vascular, bronchial, uterine and intestinal smooth muscle. Dilation of arterioles and veins in the periphery, reduces preload and afterload, decreases the work load of the heart and, thereby, myocardial oxygen demand.

Indications: Angina pectoris and chest pain associated with acute MI, CHF/PE; Hypertension (HTN).

Contraindications: Hypotension, hypovolemia, Intracranial bleeding or head injury.

Adverse Reactions: Headache, hypotension, syncope, reflex tachycardia, flushing. Nausea, vomiting, diaphoresis, muscle twitching.

How Supplied: Topical Ointment: (Nitrol â) 2% [20 mg/g] (30g, 60g)

Dosage and Administration

Adult: For CHF/PE; HTN

Paste: Apply 1 inch, cover with plastic wrap and secure with tape.

Pediatric: not recommended.

Duration of Action

Onset: 30 minutes.
Peak effect: Variable.
Duration: 18-24 hours.

Special Considerations

Pregnancy safety: Category C.

Apply in thin uniform layer on non-hairy area.
1 inch equals approximately 15 mg nitroglycerin.
Avoid using fingers to spread paste.
Store past in cool place with tube tightly capped.
Erratic absorption rates quite common.

NITROUS OXIDE: OXYGEN (50:50), (NITRONOX)

Class

Gaseous analgesic and anesthetic.

Mechanism of action

Exact mechanism unknown; effects CNS phospholipids.

Indications

Moderate to sever pain.
Anxiety, apprehension.

Contraindications

Impaired level of consciousness, head injury, inability to comply with instructions.
Decompression sickness (nitrogen narcosis, air embolism, air transport).
Undiagnosed abdominal pain or marked distention, bowel obstruction.
Hypotension, shock, COPD (with history / suspicion of CO2 retention).
Cyanosis.
Chest trauma with pneumothorax.

Adverse Reactions

Dizziness, apnea, expansion of gas-filled pockets.
Cyanosis, nausea, vomiting, malignant hyperthermia, drowsiness, euphoria.

Drug Interactions

None of significance.

How Supplied

D and E cylinders (blue and green); of 50% Nitrous Oxide and 50% oxygen compressed gas.

Dosage and Administration

Adult: (Note: Invert cylinder several times before use); Instruct the patient to inhale deeply through demand valve and mask or mouthpiece.
Pediatric: Same as adult.

Duration of Action

Onset: 2-5 minutes.
Peak effect: Variable.
Duration: 2-5 minutes.

Special Considerations

Pregnancy safety: Nitrous oxide increases the incidence of spontaneous abortion.
Ventilate patient area during use.
Nitrous oxide is a non-flammable and non-explosive gas.
Nitrous oxide is ineffective in 20 % of the population.

NOREPINEPHRINE (LEVOPHED, LEVARTERENOL)

Class

Sympathomimetic.

Mechanism of Action

Potent alpha agonist resulting in intense vasoconstriction; positive chronotrope and increased inotrope (from 10% beta effects) with increased cardiac output.

Indications

Cardiogenic shock.
Neurogenic shock.
Inotropic shock.

Contraindications

Hypotensive patients with hypovolemia.
Pregnancy (relative contraindication).

Adverse Reactions

Headache, dysrhythmias, tachycardia, reflex bradycardia.
Angina pectoris, hypertension.
Decreased blood flow to GI tract, kidneys, skeletal muscle and skin.

Drug Interactions

Can be deactivated by alkaline solutions
Sympathomimetics and phosphodiesterase inhibitors may exacerbate dysrhythmias.

How Supplied

1 mg / ml, 4 ml ampules.

Dosage and Administration

Adult: Dilute 8 mg in 500 ml of D5W or 4 mg in 250 ml of D5W (16 mg / ml); Infuse by IV piggyback at 0.5 - 1.0 mcg / minute, titrated to patient response.
Pediatric: 0.1 - 1.0 mcg / minute IV infusion, titrated to patient response.

Duration of Action

Onset: 1-3 minutes.
Peak effect: Variable.
Duration: 5-10 minutes and last only 1 minute after infusion discontinued.

Special Considerations

Pregnancy safety: not established.
May cause fetal anoxia when used in pregnancy.
Must be infused through large stable vein to avoid tissue necrosis. (antidote: local phentolamine injection).
Often used with low-dose dopamine to spare renal and mesenteric blood flow.

OXYGEN

Class

Naturally occurring atmospheric gas.

Mechanism of Action

Reverses hypoxemia.

Indications

Confirmed or expected hypoxemia.
Ischemic chest pain.
Respiratory insufficiency.
Prophylactically during air transport.
Confirmed or suspected carbon monoxide poisoning.
All other causes of decreased tissue oxygenation.
Decreased level of consciousness.

Contraindications

Certain patients with COPD, emphysema who will not tolerate Oxygen concentrations over 35%.
Hyperventilation.

Adverse Reactions

Decreased level of consciousness and respiratory depression in patients with chronic CO2 retention.
Retrolental fibroplasia if given in high concentrations to premature infants. (maintain 30-40% 02)

Drug Interactions

None.

How Supplied

Oxygen cylinders (usually green and white) of 100% compressed oxygen gas).

Dosage and Administration

Adult:

Cardiac arrest and Carbon Monoxide poisoning: 100%.
Hypoxemia: 10-15 L/ min. via non-rebreather.
COPD: 0-2 L/ min. via nasal cannula or 28-35% venturi mask. Be prepared to provide ventilatory support if higher concentrations of oxygen needed.

Pediatric: Same as for adult with exception of premature infant.

Duration of Action

Onset: Immediate.
Peak effect: not applicable.
Duration: Less than 2 minutes.

Special Considerations

Be familiar with liter flow and each type of delivery device used.
Supports possibility of combustion.

OXYTOCIN (PITOCIN)

Class

Hormone.

Mechanism of Action

Increases uterine contractions

Indications

Postpartum hemorrhage after infant and placental delivery.

Contraindications

Presence of second fetus.
Unfavorable fetal position.
Hypersensitivity.

Adverse Reactions

Hypotension, hypertension, tachycardia, dysrhythmias, angina pectoris.
Anxiety, seizures, nausea, vomiting, uterine rupture.
Anaphylaxis.

Drug Interactions

Other vasopressors may potentiate hypertension.

How Supplied

10 USP units / 1 ml ampule (10 U/ml) and prefilled syringe.
5 USP units / 1 ml ampule (5 U/ml) and prefilled syringe.

Dosage and Administration

IM Administration: 3-10 units after delivery of placenta.
IV Administration: Mix 5020 units in 500 ml of D5W, NS, or LR: Infuse at 20-40 milliunits / min., titrated to severity of bleeding and uterine response.

Duration of Action

Onset: IM: 3-5 minutes; IV: Immediate.
Peak Effect: Variable.
Duration: IM; 30-60 minutes; IV: 20 minutes after infusion discontinued.

Special Considerations

Pregnancy safety: not applicable.
Monitor Vital Signs, including fetal heart rate and uterine tone closely.

PANCURONIUM (PAVULON)

Class

Nondepolarizing neuromuscular blocker / paralytic.

Mechanism of Action

Binds to the receptor for acetylcholine at the neuromuscular junction.

Indications

Induction or maintenance of paralysis after intubation to assist ventilations.

Contraindications

Hypersensitivity.
Inability to control airway and support ventilations with oxygen and positive pressure.
Neuromuscular disease (myasthenia gravis).
Hepatic or renal failure.

Adverse Reactions

Apnea, weakness, salivation, PVCs, tachycardia.
Transient hypotension, increased blood pressure.
Pain, burning at injection site.

Drug Interactions

Positive chronotropic drugs may potentiate tachycardia.

How Supplied

4 mg / 2 ml ampule.

Dosage and Administration

Adult: 0.1 mg / kg slow IV; repeat every 30 - 60 minutes PRN.
Pediatric: 0.1 mg / kg slow IV, IO.

Duration of Action

Onset: 30 seconds.
Peak Effect: Paralysis in 3-5 minutes.
Duration: 45-60 minutes.

Special Considerations

Pregnancy safety: not established.
If patient is conscious, explain the effect of the mediation before administration and always sedate the patient before using pancuronium.
Intubation and ventilatory support must be readily available.
Monitor the patient carefully.
Effects may be reversed with neostigmine (Prostigmin) 0.05 mg / kg and should be accompanied by atropine (0.5-1.2 mg IV).
Pancuronium has no effect on consciousness or pain.
Will not stop neuronal seizure activity.
Heart rate, cardiac output are increased.
Decrease doses for patients with renal disease.

PHENOBARBITAL (LUMINAL)

Class

Barbiturate, anticonvulsant

Mechanism of Action

Generally unknown but believed to reduce neuronal excitability by increasing the motor cortex threshold to electrical stimulation.

Indications

Prevention and treatment of seizure activity..
Prophylaxis for febrile seizures.
Anxiety, apprehension.
Status epilepticus.

Contraindications

Patients with porphyria.
Hypersensitivity.
Sever liver or respiratory diseases.

Adverse Reactions

Respiratory depression, hypotension, coma, bradycardia, nausea, vomiting.
CNS depression, ataxia, nystagmus, pupillary constriction.
Burning at injection site.

Drug Interactions

Effects potentiated by other CNS depressants, anticonvulsants and MAOIs.
Incompatible with all other drugs; flush line before and after use.

How Supplied

Elixir: 20 mg / 5 ml/
Tablets: 8, 15, 30, 60, 90 , 100 mgs.
Parenteral: 65 mg, 130 mg / ml ampule; dose may be diluted with 9 ml of D5W (6.5, 13 mg // ml).

Dosage and Administration

Adult: 100-250 mg slow IV, or IM; may repeat as needed in 20-30 minutes.
Pediatric: 10-20 mg / kg IV, IO, (less than 1 mg/kg/min.) or IM; repeat as needed in 20-30 minutes.

Duration of Action

Onset: 3-30 minutes.
Peak effect: 30 minutes
Duration: 4-6 hours.

Special Considerations

Pregnancy safety: Category B.
Potential for abuse.
Carefully monitor vital signs.
Use with caution in patients with pulmonary, cardiovascular, hepatic, or renal insufficiency.
Use a large, stable vein for injection.

PHENYTOIN (DILANTIN)

Class Anticonvulsant.

Mechanism of Action

Promotes sodium efflux from neurons, thereby stabilizing the neuron's threshold against excitability caused by excess stimulation; in similar fashion, decreases abnormal ventricular automaticity and decreases the refractory period in the myocardial conduction system.

Indications

Prophylaxis and treatment of major motor seizures.
Digitalis-induced dysrhythmias.

Contraindications

Hypersensitivity.
Bradycardia.
Second and third-degree heart block.

Adverse Reactions

Hypotension with too rapid IV push.
Heart block, dysrhythmias, cardiovascular collapse.
Nausea, vomiting, ataxia, CNS depression, nystagmus.
Pain at injection site.
Respiratory depression.

Drug Interactions

Serum Dilantin levels increased by: anticoagulants, tagamet, sulfonamides, salicylates.
Metabolism increased by chronic alcohol usage.
Cardiac depressant effects increased by Lidocaine, propranolol and other beta blockers.
Precipitation may occur when mixed with D5W.
Incompatible with many solutions and medications.

How Supplied:

50 mg / ml in 2- and 5- ml ampules, 2 ml prefilled syringes.
May be diluted in NS (1-10 mg / ml); use in-line filter.
NOTE: IV line should be flushed with 0.9% NS before and after drug administration.

Dosage and Administration

Adult:

Seizures: 10-20 mg / kg slow IV, not to exceed 1 gram or rate of 50 mg/min.).
Dysrhythmias: 50-100 mg (diluted) slow IV every 5-15 min. PRN; max. = 1 gram.

Pediatric:

Seizures: 10-20 mg / kg slow IV (1-3 mg/kg/min.).
Dysrhythmias: 5 mg / kg slow IV; max. = 1 gram.

Duration of Action

Onset: 20-30 minutes for seizure disorder
Peak effect: 1-3 hours.
Duration: 18-24 hours but as long as 15 days reported.

Special Considerations

Pregnancy safety: not established.
Carefully monitor vital signs.
Venous irritation may occur (use large stable vein).

PRALIDOXIME CHLORIDE (2-PAM CHLORIDE, PROTOPAM)

Class

Cholinesterase reactivator.

Mechanism of Action

Reactivation of cholinesterase to effectively act as an antidote to organophosphate pesticide poisoning. This action allows for destruction of accumulated acetylcholine at the neuromuscular junction.

Indications

As an antidote in the treatment of poisoning by organophosphate pesticides and chemicals.

In the pre-hospital arena, is used when atropine is or has become ineffective in management of organophosphate poisoning.

Contraindications

Use with caution in patients with reduced renal function.

Patients with myasthenia gravis and organophosphate poisoning.

Adverse Reactions

Dizziness, blurred vision, diplopia, headache, drowsiness, nausea, tachycardia, hyperventilation, muscular weakness, excitement and manic behavior

Drug Interactions

No direct drug interactions, however, patients with organophosphate poisoning should not be given barbiturates, morphine, theophylline, aminophylline, succinylcholine, reserpine and phenothiazines.

How Supplied

Emergency Single Dose Kit containing:

One 20 ml vial of 1 gram sterile Protopam Chloride.
One 20 ml ampule of sterile diluent.
Sterile, disposable 20 ml syringe.
Needle and alcohol swab.

Dosage and Administration

NOTE: If Protopam is to be used, it should be administered almost simultaneously with atropine.

Adult: Initial dose of 1-2 grams as an IV infusion with 100 ml saline over 15-30 minutes.

Pediatric: 20-40 mg / kg as IV infusion over 15-30 minutes.

Doses may be repeated every 1 (one) hour if muscle weakness persists.

If IV administration is not feasible, IM or SC injection may be utilized.

Duration of Action

Onset: Minutes
Peak effects: Variable.
Duration: Variable

Special Considerations

Pregnancy safety: unknown.

Treatment will be most effective if given within a few hours after poisoning.

Cardiac monitoring should be considered in all cases of severe organophosphate poisoning.

PROCAINAMIDE (PRONESTYL)

Class

Antidysrhythmic Class Ia.

Mechanism of Action

Suppresses phase IV depolarization in normal ventricular muscle and Purkinje fibers, reducing automaticity of ectopic pacemakers; suppresses reentry dysrhythmias by slowing intraventricular conduction.

Indications

Suppress PVCs refractory to Lidocaine.
Suppress VT with a pulse refractory to Lidocaine.
PSVTs with wide-complex tachycardia of unknown origin (drug of choice when associated with WP).

Contraindications

Second and Third Degree block.
Torsades de Pointes.
Lupus.
Digitalis toxicity.
Myasthenia gravis.

Adverse Reactions

PR, QRS, and QT widening, AV Block, cardiac arrest, hypotension, seizures.
Nausea, vomiting, reflex tachycardia, PVCs, VT, VF.
CNS depression, confusion.

Drug Interaction

None with other emergency drugs.

How Supplied

1 gram in 10 ml vial (100 mg / ml).
1 gram in 2 ml vials (500 mg / ml) for infusion.

Dosage and Administration

Adult: 20-30 mg / min.; maximum total dose is 17 mg / kg. Maintenance infusion: 1-4 mg / min.
Pediatric: 2-6 mg / kg IV, IO at less than 20 mg / min.; maximum dose is 17 mg / kg. Maintenance infusion: 20-80 micrograms/kg/min.

Duration of Action

Onset: 10-30 minutes.
Peak effect: Variable.
Duration: 3-6 hours.

Special Considerations

Discontinue infusion if hypotension develops, the QRS complex widens by 50% of its original width or a total of 17 mg / kg has been administered or if the dysrhythmia is suppressed.
Pregnancy safety: Category C.
Potent vasodilating and inotropic effects.
Hypotension with too rapid an infusion.
Carefully monitor vital signs and ECG.
Administer cautiously to patients with renal, hepatic or cardiac insufficiency.
Administer cautiously to patients with asthma or digitalis-induced dysrhythmias.

PROMETHAZINE (PHENERGAN)

Class

Antihistamine.

Mechanism of Action

H-1 Receptor antagonist; blocks action of histamine; possesses sedative, anti-motion, antiemetic and anticholinergic activity; potentiates the effects of narcotics to induce analgesia.

Indications

Nausea, vomiting, motion sickness.
Sedation for patient in labor.
Potentiation of analgesic effects of narcotics.

Contraindications

Hypersensitivity.
Coma, CNS-depressed patients from alcohol, barbiturates, narcotics.
Reye's Syndrome.

Adverse Reactions

Sedation, dizziness, impairment of mental and physical ability.
Dysrhythmias, nausea, vomiting, hyperexcitability.
Hallucinations, convulsions and sudden death when used in children.

Drug Interactions

Additive with other CNS depressants.
Increased extrapyramidal effects with MAOIs.

How Supplied

25 and 50 mg / ml in 1 ml ampules and Tubex syringes.

Dosage and Administration

Adult: 12.5 -25.0 mg IV or deep IM.
Pediatric: 0.5 - 1.0 mg / kg / dose IM.

Duration of Action

Onset: IV: immediate.
Peak effect: 30-60 minutes.
Duration: 4-6 hours.

Special Considerations

Pregnancy safety; Category C.
Use cautiously in patients with asthma, peptic ulcer disease and bone marrow suppression.
Do not use in children with vomiting of unknown etiology.
Avoid intraarterial injection.
IM injection is preferred route.

PROPRANOLOL (INDERAL)

Class

Beta-adrenergic blocker, antidysrhythmic (Class II).

Mechanism of Action

Non-selective beta-adrenergic blocker that inhibits chronotropic, inotropic and vasodilator response to beta-adrenergic stimulation.

Indications

Hypertension, angina pectoris,
VT and VF refractory to Lidocaine.
Selected Supraventricular tachycardias.

Contraindications

Sinus bradycardia, second or third degree AV block.
Asthma, CHF, COPD.

Adverse Reactions

Bradycardia, heart blocks, angina pectoris, palpitations, syncope.
Bronchospasm, dyspnea, hallucinations, anxiety, nausea, vomiting, visual disturbances.

Drug Interactions

Verapamil may worsen AV conduction abnormalities.
Succinylcholine effects may be enhanced.
Effects may be reversed by isuprel, norepinephrine, dopamine.

How Supplied

Solution of 1 mg / ml vials.

Dosage and Administration

Adult: Dilute 1-3 mg in 10-30 ml of D5W; administer slowly IV at rate of 1 mg/min.; max. = 5 mg.
Pediatric: 0.01-0.05 mg / kg /dose slow IV over 10 minutes; maximum dose 3 mg.

Duration of Action

Onset: 15-60 minutes.
Peak effect: Variable.
Duration: 6-12 hours.

Special Considerations

Pregnancy safety: Category C.
Closely monitor patient during administration.
Use cautiously in geriatric population.
Atropine should be readily available.

SODIUM BICARBONATE 8.4%

Class Buffer, alkalinizer.

Mechanism of Action

Reacts with hydrogen ions to form water and carbon dioxide thereby acting as a buffer for metabolic acidosis.

Indications

Known pre-existing bicarbonate-responsive acidosis.
Upon return of spontaneous circulation after long arrest interval.
TCA overdose.
Hyperkalemia.
Phenobarbital overdose.
Alkalinization for treatment of specific intoxications.

Contraindications

Metabolic and respiratory alkalosis.
Hypocalcemia and hypokalemia.
Hypocloremia secondary to GI loss and vomiting.

Adverse Reactions

Metabolic alkalosis, hypokalemia, hyperosmolarity, fluid overload.
Increase in tissue acidosis.
Electrolyte imbalance and tetany, seizures.
Tissue sloughing at injection site.

Drug Interactions

May precipitate in calcium solutions.
Half-lives of certain drugs may increase through alkalinization of the urine.
Vasopressors may be deactivated.

How Supplied

50 mEq in 50 ml of solvent.

Dosage and Administration

Adult: 1 mEq / kg IV; may repeat with 0.5 mEq / kg every 10 minutes.
Pediatric: same as for adult.

Adult infusion: 1 – 4 amps in 1 litre D5W or NS, rate determined by sending physician.
Pediatric infusion: same as for adult.

Duration of Action

Onset: 2-10 minutes.
Peak effect: 15-20 minutes.
Duration: 30-60 minutes.

Special Considerations

Pregnancy safety: Category C.
Must ventilate patient after administration.
Whenever possible, blood gas analysis should guide use of bicarbonate.
Intracellular acidosis may be worsened by production of carbon dioxide.
May increase edematous states.
May worsen CHF.

STREPTOKINASE (STREPTASE)

Class Thrombolytic agent.

Mechanism of Action

Combines with plasminogen to produce an activator complex that converts free plasminogen to the proteolytic enzyme plasmin. Plasmin degrades fibrin threads as well as fibrinogen, causing clot lysis.

Indications

Acute evolving MI.
Massive pulmonary emboli.
Arterial thrombosis and embolism.
To clear arteriovenous cannulas.

Contraindications

Hypersensitivity.
Active bleeding, recent surgery (within 2-4 weeks), recent CVA.
Prolonged CPR.
Intracranial or intraspinal neoplasm, arteriovenous malformation or surgery.
Recent significant trauma (particularly head trauma).
Uncontrolled hypertension.

Adverse Reactions

Bleeding (GU, GI, intracranial, other sites).
Allergic reactions, hypotension, chest pain.
Reperfusion Dysrhythmias.
Abdominal pain.

Drug Interactions

Aspirin may increase risk of bleeding as well as improve outcome..
Heparin and other anticoagulants may increase risk of bleeding as well as improve outcome.

How Supplied

250,000, 750,000, 1.5 Million IU vials.

Dosage and Administration

NOTE: Reconstitute by slowly adding 5 ml sodium chloride or D5W, directing stream to side of vial instead of into powder. Gently roll and tilt vial for reconstitution; Dilute slowly to 45 ml total.
Adult: 500,000 - 1,500,000 IU diluted to 45 ml IV over one (1) hour.
Pediatric: safety not established.

Duration of Action

Onset: 10 - 20 minutes. (fibrinolysis 10-20 minutes; clot lysis: 60 - 90 minutes).
Peak effects: Variable.
Duration: 3-4 hours (prolonged bleeding times up to 24 hours).

Special Considerations

Pregnancy safety: Category A.
Do not administer IM injections to patients receiving thrombolytics.
Obtain blood sample for coagulation studies prior to administration.
Carefully monitor vital signs.
Observe patient for bleeding.

SUCCINYLCHOLINE (ANECTINE)

Class

Depolarizing neuromuscular blocker, paralyzing agent.

Mechanism of Action

Bind to the receptors for acetylcholine.

Indications

To facilitate intubation.
To terminate laryngospasm.
To promote muscle relaxation.
To facilitate electroconvulsive shock therapy.

Contraindications

Acute narrow angle glaucoma.
Penetrating eye injuries.
Inability to control airway or support ventilations with oxygen and positive pressure.

Adverse Reactions

Apnea, malignant hyperthermia, dysrhythmias, bradycardia, hypertension, hypotension, cardiac arrest.
Hyperkalemia, increased intraocular pressure, fasciculations.
Exacerbation of hyperkalemia in trauma patients.

Drug Interactions

Effects potentiated by Oxytocin, beta blockers and organophosphates.
Diazepam may reduce duration of action.

How Supplied

40 mg in 2 ml ampule (20 mg / ml).
100 mg in 5 ml ampule (20 mg / ml).
Multidose vial.

Dosage and Administration

Adult: 1-2 mg / kg rapid IV; repeat once if needed.
Pediatric: 1 - 1.5 mg / kg dose rapid IV, IO.; repeat once if needed.

Duration of Action

Onset: 1 minute.
Peak effect: 1-3 minutes.
Duration: 5 minutes.

Special Considerations

Pregnancy safety: Category C.
EMS use primarily to facilitate endotracheal intubation.
If the patient is conscious, explain the effects of the drug before administration.
Consider premedication with atropine, particularly in pediatric age group.
Premedication with Lidocaine may blunt any increase in intracranial pressure during intubation.
Diazepam or midazolam should be used in any conscious patient undergoing neuromuscular blockade.

TERBUTALINE (BRETHINE)

Class

Sympathomimetic bronchodilator.

Mechanism of Action

Selective beta-2 adrenergic receptor activity resulting in relaxation of smooth muscles of the bronchial tree and peripheral vasculature. Minimal cardiac effects.

Indications

Bronchial asthma.

Reversible bronchospasm associated with exercise, chronic bronchitis, and emphysema.

Contraindications

Hypersensitivity.

Tachydysrhythmias.

Adverse Reactions

Usually transient and dose-related, restlessness, apprehension, palpitations, tachycardia.

Chest pain, coughing, bronchospasm, nausea, facial flushing.

Drug Interactions

Cardiovascular effects exacerbated by other sympathomimetics.

MAOIs may potentiate dysrhythmias.

Beta blockers may antagonize terbutaline.

How Supplied

MDI: 200 mcg / metered spray.

Parenteral: 1 mg / ml ampule.

Dosage and Administration

Adult: 0.25 mg SC; may repeat in 15-30 minutes to maximum dose of 0.5 mg in 4 hours period. 400 mcg (two inhalations by MDI) every 4-6 hours; allow 1-2 minutes between inhalations.

Pediatric: Not recommended for children under 12 years of age. 0.01 mg / kg / dose SC every 15-20 minutes PRN to maximum 0.25 mg dose. 0.03 - 0.05 mg / kg in 1.25 ml saline for aerosolization every 4 hours.

Duration of action

Onset: SC: 15-30 minutes; MDI 5-30 minutes.

Peak effect: Variable.

Duration: SC: 1.5-4 hours; MDI: 3-6 hours.

Special Considerations

Pregnancy safety: Category B.

Carefully monitor vital signs.

Use with caution in patients with cardiovascular disease or hypertension.

Patient should receive oxygen before and during bronchodilator administration.

TETRACAINE (PONTOCAINE â)

Class: Local Anesthetic

Mechanism of Action: Blocks the initiation and conduction of nerve impulses

Indications: Topically applied local anesthetic for eye examination

Contraindications: Hypersensitivity to ester anesthetics; Not to be applied in large amounts or to Infants of less than 1 year old.

Adverse Reactions: 1-10% Dermal: Angioedema, burning, contact dermatitis, stinging.
< 1% : Methemoglobinemia in infants

How Supplied: Ophthalmic: 0.5% [5mg/ml] (1ml, 2ml, 15ml)

Dosage and Administration:

Adult: Ophthalmic Solution: Instill 1-2 drops

Pediatric: Safety and efficacy have not been established.

Kinetics:
Onset: Within 60 seconds.

Special Considerations

Pregnancy category C

Storage Store in a light resistant container

Stability: Lasts 6 months refrigerated; Lasts 4 weeks at room temperature: Discard if solution discolors (should be clear)

Caution in Child < 6 years old

THIAMINE

Class

Vitamin (B1)

Mechanism of Action

Combines with ATP to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. The brain is extremely sensitive to thiamine deficiency.

Indications

Coma of unknown origin.
Delirium tremens.
Beriberi.
Wernicke's encephalopathy.

Contraindications

None

Adverse Reactions

Hypotension from too rapid injection or too high a dose.
Anxiety, diaphoresis, nausea, vomiting.
Rare allergic reaction.

Drug Interactions

Give thiamine before glucose under all circumstances.

How Supplied

1,000 mg in 10 ml vial (100 mg / ml).

Dosage and Administration

Adult: 100 slow IV or IM.
Pediatric: 10-25 mg slow IV or IM.

Duration of Action

Onset: Rapid.
Peak effects: variable.
Duration: Dependent upon degree of deficiency.

Special Considerations

Pregnancy safety: Category A.
Large IV doses may cause respiratory difficulties.
Anaphylaxis reactions reported.

TISSUE PLASMINOGEN ACTIVATOR (T-PA, RECOMBINANT ALTPEPLASE)

Class

Thrombolytic agent.

Mechanism of Action

Binds to fibrin-bound plasminogen at the clot site, converting plasminogen to plasmin. Plasmin digests the fibrin strands of the clot restoring perfusion.

Indications

Acute evolving myocardial infarction.
Massive pulmonary emboli.
Arterial thrombosis and embolism.
To clear arteriovenous cannulas.

Contraindications

Recent sugary (within three weeks).
Active bleeding, recent CVA, prolonged CPR,, intracranial or intraspinal surgery.
Recent significant trauma, especially head trauma.
Uncontrolled hypertension (generally BP over 200 mm Hg.).

Adverse Reactions

GI, GU intracranial and other site bleeding.
Hypotension, allergic reactions, chest pain, abdominal pain, CVA.
Reperfusion dysrhythmias.

Drug Interactions

Acetylsalicylic acid may increase risk of hemorrhage.
Heparin and other anticoagulants may increase risk of hemorrhage.

How Supplied

20 mg with 20 ml diluent vial.
50 mg with 50 ml diluent vial.

Dosage and Administration

Adult: 10 mg bolus IV over 2 minutes; then 50 mg over one hour, then 20 mg over the second hour and 20 mg over the third hour for a total dose of 100 mg. (other doses may be prescribed through Medical Direction.
Pediatric: safety not established.

Duration of Action

Onset: clot lysis most often within 60-90 minutes.
Peak effect: variable.
Duration: 30 minutes with 80% cleared within 10 minutes.

Special Considerations

Pregnancy safety: contraindicated.
Closely monitor vital signs.
Observe for bleeding.
Do not give IM injection to patient receiving T-PA.

VECURONIUM (NORCURON)

Class Paralytic agent.

Mechanism of Action

Non-depolarizing neuromuscular blocking agent, paralytic.

Indications

To facilitate intubation.
To terminate laryngospasm.
To promote muscle relaxation.
To facilitate electroconvulsive shock therapy.

Contraindications

Acute narrow angle glaucoma.
Penetrating eye injuries.
Inability to control airway or support ventilations with oxygen and positive pressure.
Newborns.
Myasthenia gravis.
Hepatic or renal failure.

Adverse Reactions

Apnea, weakness, salivation, PVCs, tachycardia.
Transient hypotension, increased blood pressure.

Drug Interaction

Use of inhalational anesthetics will enhance neuromuscular blockade.

How Supplied

10 mg / 10 ml vecuronium bromide vials with diluent.
20 ml vials (20 mg vecuronium) without diluent.

Dosage and Administration

Adult: 0.1 mg / kg IV Push; maintenance dose within 25-40 minutes: 0.01 - 0.05 mg/kg IV push.
Pediatric: 0.1 mg / kg IV, IO. maintenance dose within 20-35 minutes: 0.01- 0.05 mg/kg IV push.

Duration of Action

Onset: 30 seconds.
Peak effects: 2..5 - 3.0 minutes.
Duration: 25-30 minutes.

Special Considerations

Pregnancy safety: Category C.
If patient is conscious, explain the effect of the medication before administration and always sedate the patient before using vecuronium.
Intubation and ventilatory support must be readily available.' Monitor the patient carefully.
Vecuronium has no effect consciousness or pain.
Will not stop neuronal seizure activity.
Heart rate, cardiac output are increased.
Decrease doses for patients with renal disease.

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