Florida Regional Common
EMS Protocols

Section 1

General Protocols

General Section Table of Contents

1.1 Intent and Use of Protocols
1.2 Behavioral Emergencies
1.3 Critical Incident Stress Management (CISM)
1.4 Death in the Field
1.5 Emergency Worker Rehabilitation
1.6 Helicopter Safety
1.7 Medical Communications
1.8 Refusal of Care
1.9 Mass Casualty Incidents
   1.9.1 MCI Organizational Chart
   1.9.2 Active Assailant Organizational Chart
1.10 Crime Scene Management
1.11 Protocol Revision Procedure
1.1 Intent and Use of Protocols

These medical treatment protocols have been developed as a part of the medical direction program for participating Emergency Medical Services (EMS) agencies. The medical director of an individual EMS provider may choose to modify certain treatment recommendations. In addition, some patients may require therapy not specified in these protocols. The treatment protocols should not be construed as prohibiting such flexibility. The paramedic/EMT must use his/her judgment in administering treatment in the following manner:

- The paramedic may determine that no specific treatment is needed; or
- The paramedic may consult medical direction before initiating any specific treatment; or
- The paramedic may follow the appropriate treatment protocol and then consult medical direction.
- The paramedic/EMT may contact medical direction at any time he/she deems necessary.

When the paramedic/EMT is unable to make contact with other forms of medical direction, he/she may contact the receiving hospital for consultation with the emergency department physician. It is recommended that the paramedic/EMT make contact with the physician for consultation on complicated patients whenever possible. When the paramedic is unable to make contact with a physician for medical direction, the paramedic may administer BLS treatment according to his/her judgment. In this instance, the paramedic may administer ALS treatment only as authorized in the treatment protocols.

Transport destination determination may include hospital and Free Standing Emergency Department (FSED), refer to the Hospital Capability Form in Section 6 and on-line forms.

The definition of pediatric patients will be described below. It is imperative to understand that the medical decision making for a pediatric patient should be based on the definitions provided below. Transport (destination) decisions should be made using the Hospital Capability Form in Section 6.

**Pediatric Medical Decision Definitions:**

- **Newborn:** A patient who has just been delivered.
- **Neonate:** A patient who is younger than 6 weeks of age.
- **Infant:** A patient who is under 1 year of age.
- **Child:** A patient ranging from 1 year of age to puberty (pubic hair, facial hair, breast development)
- **Adolescent:** A patient who has reached puberty. Treat these patients using adult protocols.

**Transport Decision Definitions:**

- **Pediatric:** Trauma patient -15 years of age or younger
  - Medical patients - 17 years of age or younger.

The treatment protocols are divided into adult and pediatric sections, each with three parts:

**Supportive Care:** Actions authorized for the EMT or paramedic that are supportive in nature. EMT (BLS) and paramedic (BLS and ALS) actions are specified within each of these protocols.

**ALS Level 1:** Actions authorized for the paramedic or the EMT (only with specific Medical Director approval, i.e. establishing an IV), prior to physician contact.

**ALS Level 2:** Actions authorized only for the paramedic that require a physician consult. Authorization of procedures prior to physician contact in Level 1 allows the paramedic to initiate care promptly while getting a better idea of the patient’s condition and evaluating his/her response to initial treatment.
1.1 Intent and Use of Protocols (continued)

The general protocols outline care for a typical case. As the protocol continues, the assumption is usually made that previous steps were ineffective. For example, the protocol for ventricular fibrillation authorizes three unstacked countershocks; however, the second countershock and third countershock are given only if the previous countershock was unsuccessful and the patient remains in ventricular fibrillation. If the patient went into asystole/PEA following the first countershock, the second countershock would not be given. The paramedic would then use the asystole/PEA protocol to guide further treatment. In this or other situations where a switch is made to a different protocol during the course of care, the paramedic’s judgment must determine where entry into the new protocol sequence is appropriate.

It would be impractical to write protocols that specify every possible sequence of events. The order of treatment listed here may not be appropriate for all situations. In fact, not all treatment options may be indicated in every situation. The paramedic’s judgment must be relied upon to determine which of the authorized treatment procedures are appropriate for a given situation. The treatment guidelines are given in bulleted list form as a general order of the steps necessary to treat the patient; however, it is assumed that interventions such as patient assessment, airway management, establishing medication access, applying AED/heart monitor, and so forth can be performed simultaneously.

Orders listed in ALS Level 2 may be expected from the physician. They may or may not be the orders that are actually given, however. The intention in listing ALS Level 2 orders is to allow for appropriate preparation and to guide the paramedic who wishes to request specific orders. The physician directing care in the field retains discretion in ordering specific treatment, even if that treatment conflicts with these protocols. ALS Level 2 orders require consultation with a physician.

The name of the physician authorizing ALS Level 2 orders must be documented in the patient care report (PCR). Physicians authorized to approve ALS Level 2 orders include the following individuals:

1. EMS provider’s medical director (a).
2. Receiving hospital emergency department physician (a).
3. Physician present in his/her own office (b).
4. Online medical control physician (a).
5. Bystander physician personally known to the paramedic (c).
6. Bystander physician who presents a valid M.D. or D.O. (c).
7. Poison information center (d).

Note:
(a) Contact for ALS Level 2 orders by the EMS provider’s medical director, online medical control physician, or emergency department physician should be initiated in the following order:
1. Medcom.
2. Telephone.
3. Relay of information via dispatch.
(b) Only verbal or written orders that are signed by the physician that are given directly to the paramedic by a physician in his/her office are acceptable.
1.1. Intent and Use of Protocols (continued)

(c) A bystander physician, as described above, must accept full responsibility for patient care and accompany the patient in the ambulance to the hospital to give Level 2 orders.

(d) The Poison Information Center is authorized to direct all medical care (Supportive Care, ALS Level 1, and ALS Level 2) for the toxicology and hazardous material exposure patient. The Poison Information Center must be contacted via telephone at 800-222-1222.

This policy is intended to provide emergency departments with sufficient notification of incoming patients to allow appropriate preparations to be made. Direct contact with the physician in the emergency department needs be made only when seeking consultation or authorization for ALS Level 2 orders.

An EMT or paramedic should evaluate all patients on responses to 911 emergencies, as deemed appropriate by the individual EMS provider’s medical director.

The treatment protocols have been designed as clinical guides, not as educational documents. The therapeutic rationale behind the treatment protocols reflects the general principles of field care outlined in the following standard EMS references.

Standard List of EMS Resources
Nancy Caroline’s Emergency Care in the Streets current edition
American Heart Association, “2015 Guidelines for CPR and ECC,” Supplement to Circulation
Garcia, T. Miller, G; Arrhythmia Recognition, Jones and Bartlett, Sudbury Massachusetts.
Campbell JE: Basic Trauma Life Support, Advanced Pre-hospital Care, 5th edition, Brady, Englewood Cliffs, NJ.
Toxicology and Hazardous Materials Exposure, State of Florida Hazardous Material Protocols Additional educational materials, supplementary to these references, are included in this manual as Chapter 4 Medical Procedures.
Chapter 5 contains Drug Summaries for each of the drugs authorized in the treatment protocols. These documents are provided to clarify protocol items and issues that might differ from the preceding references, or in which conflicts between references may occur.
1.1. Intent and Use of Protocols (continued)

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1.2 Behavioral Emergencies

GUIDING PRINCIPLES
1. Respect the dignity of the patient.
2. Assure physical safety of the patient and EMS personnel.
3. Diagnose and treat organic causes of behavioral disturbances such as hypoglycemia, hypoxia, or poisoning.
4. Use reasonable physical restraint only if attempts at verbal control are unsuccessful. Every attempt should be made to avoid injury to the patient when using physical restraint (Medical Procedure 4.23).
5. Teamwork between EMS personnel and law enforcement will improve patient care.

GENERAL APPROACH
1. Communicate in a calm and nonthreatening manner.
2. Offer your assistance to the patient.
3. Use reasonable physical force via law enforcement if the patient is a threat to themselves or to others.

USE OF RESTRAINTS
1. Physical.
   a. Use standard restraining techniques and devices (Medical Procedure 4.23, Physical Restraints).
      Use sufficient padding on extremity restraints on elderly patients or others with delicate skin.
2. Chemical.
   a. Use chemical restraints in conjunction with physical restraints if the latter are unsuccessful in controlling violent behavior.
3. Any type of restraints.
   a. Constantly monitor and observe the patient to prevent injury. If physical and/or chemical restraints are used, place the patient on an ECG monitor and pulse oximeter.
   b. Carefully document the rationale for the use of restraints.

TREATMENT PROTOCOL
See Adult Protocol 2.5.2, Violent and/or Impaired Patient, for specific treatment protocols.
It may be appropriate for law enforcement to execute an involuntary certificate for psychiatric examination (Baker Act - FS Chapter 394.463). However, such a certificate shall not be an absolute condition for hospital transport.

TRANSPORTATION
1. All individuals being transported for psychological evaluation under the premises of the Baker Act should be accompanied by a police officer. The paramedic in charge shall determine whether the police officer will ride in the back or follow behind the Rescue Unit.
2. In those situations where a female patient is being transported and a female is not part of the rescue crew, the paramedic should attempt to have a female police officer accompany the patient to the hospital. (This is imperative in situations such as possible rape.) Also document the beginning and ending mileages with dispatch via radio communication.

BAKER ACT
Florida Statute Chapter 394.463—Mental Health relates to the authorization of police, physicians, and the courts to dictate certain medical care for persons who pose a threat to themselves or to others

INCAPACITATED PERSONS LAW
Florida Statute Chapter 401.445 allows for examination and treatment of incapacitated persons in emergency situations. (Patients who are not capable of informed consent as provided in FS Chapter 766.103 cannot refuse medical care.) Florida Statutes may be viewed online at www.leg.state.fl.us/statues
1.3 Critical Incident Stress Management

PURPOSE
Critical Incident Stress Management (CISM) is a comprehensive, integrated, multicomponent, systematic program of crisis intervention. Its purpose is to provide education, support, assessment, and intervention for emergency service personnel who are often exposed to and/or affected by critical incidents. CISM was born out of emergency services and has become a world standard of care for first responders. Formulated and standardized by the International Critical Incident Stress Foundation (ICISF), CISM has proven to be effective in mitigating many of the common symptoms of critical incident stress. The goal when applying any of the CISM components is to assess, educate, and intervene as necessary and return individuals to their work with the tools and support needed to reduce the effects of a critical incident. The benefits of the intervention include a reduction in symptoms of post-traumatic stress, quicker return to normal productive functioning, increased job satisfaction, reduced workers’ compensation claims, reduced absenteeism and presenteeism, reduced errors, enhanced group cohesion, increased personal confidence and extended longevity.

OVERVIEW
The Broward County CISM Team (Broward Region X CISM) is made up of trained and credentialed members of law enforcement, fire/rescue, corrections, communications, and others, as well as trained, credentialed, and licensed mental health professionals, all of whom have completed at least three (3) of the core ICISF courses. Broward’s CISM Team is independent of any other organization or department in Broward County. The team is designed and organized to respond to any incident that occurs in any emergency services department or agency in Broward County on a 24 × 7 × 365 basis, within a maximum of two (2) hours after a critical incident has occurred and CISM services are requested. The team meets on a periodic basis for additional training and information.

CONFIDENTIALITY
Florida Statute 401.30(4) (e) protects the discussions held during a CISM intervention as being “confidential and privileged communication under section 90.503.” Therefore, all information shared during any part of a CISM intervention is held in the strictest of confidence.

CISM SERVICES
The following types of services can be provided by the Broward CISM Team.
A. Pre-event planning and preparation.
   1. Educational and informational programs about CISM.
   2. Pre-incident planning and education.
B. Strategic planning and assessment.
   1. Pre- and post-incident assessment of needs.
   2. Development and implementation of a strategic plan for major events.
C. Individual intervention.
   1. One-on-one services with a qualified CISM team member.
   2. Individual support and follow-up.
1.3 Critical Incident Stress Management (continued)

D. Small group defusing.
   1. Recommended within the first 12 hours after a critical incident occurs.
   2. Best delivered as soon as possible after a critical incident.
   3. Homogeneous groups.
   4. Assessment and education with possible referral and follow-up.

E. Small group debriefing.
   1. 12-72 hours post-critical incident.
   2. Prior to demobilization from extended deployment or upon return home from extended deployment.
   3. Events of significant personal loss (expanded-phase defusing within first 12 hours).

F. Crisis management briefing.
   1. Appropriate for large incidents, incidents with high media involvement, respite/rehab centers, and demobilizations.
   2. Best for large groups or mixed groups.
   3. Primary focus on assessment and information.

G. Family crisis intervention.

H. Organizational consultation.

I. Assessment of organizational needs.

J. Development and recommendation for coordination and delivery of services.

K. Pastoral/spiritual crisis intervention.

L. Referral and follow-up.

CISM CALL-OUT BASIS
A critical incident is any situation that is either out of the norm or that challenges or would appear to challenge a person’s normal coping mechanisms. Examples include the following situations:

- Pediatric injury or death
- Multiple youth fatalities
- Events with severe operational challenges
- Line-of-duty death or line-of-duty injury
- Officer involved in a shooting
- Off-duty death, suicide, homicide, or injury
- Events with multiple or mass casualties
- Prolonged events with loss of life
- Events when the victim(s) is (are) known
- Events with excessive media interest
- Any incident that could perceptibly cause emotional impact

Emergency responders work under stressful conditions and situations. Training and continuing education about stress management contribute to the development and maintenance of improved emotional health, stress resistance, and resilience. Statistics demonstrate significantly higher instances of drug and alcohol abuse, marital and family strife, intimate-partner and domestic violence, heart attack, and suicide rates among emergency services personnel compared to the general population. These facts underscore the need for CISM services in any situation similar to those in the preceding list. Because one of the positive benefits of a group intervention is stronger group cohesion, all members of the group are encouraged to be present.
1.3 Critical Incident Stress Management (continued)

**CISM ACTIVATION PROCESS EXAMPLE (BROWARD COUNTY)**

A. Requesting agency officer contacts the Communications Captain on duty at the Broward Regional Communications Center, requesting a CISM Team response.

B. Communications Center number: 954-476-4720

C. Requesting agency shall supply the following information:
   1. Agency name.
   2. Type of incident.
   3. Number of members involved.
   4. Call-back contact number or pager number.

D. The Communications Captain shall page out the on-call CISM Team Leader.

**CISM CALL-OUT PROCEDURE**

1. When a critical incident event occurs or when an on/off scene command determines that an incident may or could have an emotional impact on the responding personnel, department, or agency, any person authorized to do so shall contact the NORTH Regional Communication Center at 954-476-4720 and ask for the Duty Officer to requests a CISM response, giving a brief description of the event, the caller’s name, and his/her contact information. The Regional Communication Center shall contact the on-call CISM Team coordinator and, at the same time, pages and/or sends a text message to all members on the CISM Team list.

2. The Broward Regional Communication Center shall contact the on-call CISM Team coordinator and, at the same time, pages and/or sends a text message to all members on the CISM Team list.

3. The CISM Team Coordinator contacts the CISM Team Clinical Director or designee and provides the incident contact name and number. The CISM Team Coordinator then begins assembling peer team members for a response. No team member from the affected department, agency, or organization will be part of the responding CISM Team.

4. The CISM Clinical Director contacts the site or incident contact person, receives details about the incident, and advises the contact of the appropriate type and timing of the response.

5. Once the type, timing, and location of the response are determined, the Clinical Director contacts the Team Coordinator with the information necessary to conduct the appropriate intervention. The Clinical Director then contacts mental health members for the intervention as needed.

6. Upon arrival at the determined site, the CISM Team members assemble for a briefing with the Team Leader and then meet with the contact person or designee.

7. Personnel are assembled according to type, in a quiet and secure location. All personnel shall be either off-duty or out of service for the duration of the intervention and related services.

8. In the case of a critical incident stress defusing or debriefing, personnel are assembled according to rank, involvement in the incident, proximity to the incident, as determined by the responding Team Leader.

9. No written, audio, or video recording of the intervention shall be permitted.

10. The CISM Team consults with the contact person to provide general recommendations or for possible follow-up.

11. The CISM Team gathers for a team debriefing.
This protocol is divided into separate sections that cover the different situations involving death in the field that the paramedic will encounter. All patients found in cardiac arrest will receive cardiopulmonary resuscitation unless an exception is met as outlined in the following sections:

I. Advanced Directives/Do Not Resuscitate Orders (DNRO).
II. Determination of Death.
III. Discontinuance of CPR.
IV. Documentation

I  ADVANCED DIRECTIVES/DO NOT RESUSCITATE ORDERS (DNRO)

1.IV.1 Legislative authority. Under Florida Administrative Code (FAC) 64J-2.018. Do Not Resuscitate Order (DNRO) Form and Patient Identification Device. The Florida DNRO form is the only form approved in the State of Florida. If there is a DNRO/POLST/MOST/MOLST (see 1.8) form from another State presented by the patient or family, contact Medical Control as soon as possible for direction.

1.IV.2 An EMT or paramedic shall withhold or withdraw cardiopulmonary resuscitation:

1.IV.2.1.1 Upon the presentation of an original or a completed copy of DH Form 1896, Florida Do Not Resuscitate Order Form, December 2004, which is incorporated by reference and available from DOH at no cost, or, any previous edition of DH Form 1896; or

1.IV.2.1.2 Upon the presentation or observation, on the patient, of a Do Not Resuscitate Order patient identification device.

1.IV.3 The Do Not Resuscitate Order:

a. Form shall be printed on yellow paper and have the words “DO NOT RESUSCITATE ORDER” printed in black and displayed across the top of the form. DH Form 1896 may be duplicated, provided that the content of the form is unaltered, the reproduction is of good quality, and it is duplicated on yellow paper. The shade of yellow does not have to be an exact duplicate;

b. Patient identification device is a miniature version of DH Form 1896 and is incorporated by reference as part of the DNRO form. Use of the patient identification device is voluntary and is intended to provide a convenient and portable DNRO which travels with the patient. The device is perforated so that it can be separated from the DNRO form. It can also be hole-punched, attached to a chain in some fashion and visibly displayed on the patient. In order to protect this device from hazardous conditions, it shall be laminated after completing it. Failure to laminate the device shall not be grounds for not honoring a patient’s DNRO order, if the device is otherwise properly completed.

1.IV.4 The DNRO form and patient identification device must be signed by the patient’s physician. In addition, the patient, or, if the patient is incapable of providing informed consent, the patient’s health care surrogate or proxy as defined in Section 765.101, F.S., or court appointed guardian or person acting pursuant to a durable power of attorney established pursuant to Section 709.08, F.S., must sign the form and the patient identification device in order for them to be valid. The form does not need to be notarized, once signed the form does not expire.

1.IV.5 An EMT or paramedic shall verify the identity of the patient who is the subject of the DNRO form or patient identification device. Verification shall be obtained from the patient’s driver license, other photo identification, or from a witness in the presence of the patient. If a witness is used to identify the patient, this fact shall be documented in the EMS Run Report, which must include the following information:

a. The full name of the witness.
b. The address and telephone number of the witness.
c. The relationship of the witness to the patient
1.4 Death in the Field (continued)

1.IV.6 During each transport, the EMS provider shall ensure that a copy of the DNRO form or the patient identification device accompanies the live patient. The EMS provider shall provide comforting, pain-relieving and any other medically indicated care, short of respiratory or cardiac resuscitation.

1.IV.7 A DNRO may be revoked at any time by the patient, if signed by the patient, or the patient’s health care surrogate, or proxy or court appointed guardian or person acting pursuant to a durable power of attorney established pursuant to Section 709.08, F.S. Pursuant to Section 765.104, F.S., the revocation may be in writing, by physical destruction, by failure to present it, or by orally expressing a contrary intent.

1.IV.8 Oral orders from nonphysician staff members or telephoned requests from an absent physician do not adequately assure EMT/paramedics that the proper decision-making process has been followed and are NOT acceptable.

1.IV.9 In the near future Florida will be adopting POLST (Physician Orders for Life Sustaining Treatment Paradigm) The National POLST Paradigm is an approach to end-of-life planning that emphasizes patients’ wishes about the care they receive. The POLST Paradigm is an approach to end-of-life planning emphasizing: (i) advance care planning conversations between patients, health care professionals and loved ones; (ii) shared decision-making between a patient and his/her health care professional about the care the patient would like to receive at the end of his/her life; and (iii) ensuring patient wishes are honored. As a result of these conversations, patient wishes may be documented in a POLST form, which translates the shared decisions into actionable medical orders. The POLST form assures patients that health care professionals will provide only the care that patients themselves wish to receive, and decreases the frequency of medical errors. POLST is not for everyone. Only patients with serious illness or frailty should have a POLST form. For these patients, their current health status indicates the need for standing medical orders. For healthy patients, an Advance Directive is an appropriate tool for making future end-of-life care wishes known to loved ones. Several States use the POLST program and there several other forms used by these States, Medical Orders for Life Sustaining Treatment (MOLST), Medical Orders for Scope of Treatment (MOST) and the Physician Orders for Scope of Treatment (POST) form.

Specific Authority 381.0011, 401.45(3) FS. Law Implemented 381.0205, 401.45, 765.401 FS. History–New 11-30-93, Amended 3-19-95, 1-26-97, Formerly 10D-66.325, Amended 2-20-00, 11-3-02, 6-9-05, Formerly 64E-2.031.5.

II. DETERMINATION OF DEATH

The EMT or paramedic may determine that the patient is dead/non-salvageable and decide not to resuscitate the patient under the following guidelines.

A. The patient may be determined to be dead/non-salvageable and will not be resuscitated or transported if all four (4) presumptive signs of death and at least one (1) conclusive sign of death are identified.

1. The four presumptive signs of death that MUST be present are:
   a. Unresponsiveness.
   b. Apnea.
   c. Pulseless.
   d. Fixed dilated pupils.
2. In addition to the four presumptive signs of deaths, at least one (1) of the following conclusive signs of death MUST be present:
   a. Injuries incompatible with life (e.g., decapitation, massive crush injury, incineration).
   b. Tissue decomposition.
   c. Rigor mortis of any degree with warm air temperature. (Hardening of the muscles of the body, making the joints rigid).
   d. Liver mortis (lividity) of any degree, (venous pooling of blood in dependent body parts causing purple discoloration of the skin, which does blanch with pressure).
3. Patients with suspected hypothermia, barbiturate overdose, or electrocution require full ALS resuscitation unless they have injuries incompatible with life or tissue decomposition.
4. EMS personnel may contact medical direction for a “determination of death” whenever support in the field is desired. Clearly state the purpose for the contact as part of the initial hailing.
5. Children are excluded from this protocol unless EMS personnel make contact with medical direction for consultation. Only in cases of obvious, prolonged death should CPR not be started or discontinued on infants, children, or young adults, or in cases in which an unexpected death has occurred.

B. A trauma victim who does not meet the “Determination of Death” criteria listed above may be determined to be dead/non-salvageable based on the following criteria:
1. Pulselessness and apnea associated with asystole (confirmed in two leads) and
   a. Blunt trauma arrest.
   b. Prolonged extrication time (more than 15 minutes) where no resuscitative measures can be initiated prior to extrication.
   c. Arrest from primary brain injury or with no brain stem reflexes; arrest from blunt multiple injuries.
2. If there is any concern regarding leaving the patient at the scene, begin resuscitation and transport.
3. Consideration should be given for the possibility of organ harvest; however, this should not be the sole reason for resuscitation.

C. Absence of pulse or spontaneous respiration in a multiple-casualty situation where EMS resources are required for stabilization of living patients.

The local law enforcement agency that has jurisdiction will be responsible for the body once death has been determined. The body is to be left at the scene until a disposition has been made by the Medical Examiner’s Office or the local jurisdiction.
III. DISCONTINUANCE OF CPR
A. Resuscitation that is started in the field by EMS personnel cannot be discontinued without an order from online, EMS Medical Director or online medical control.
B. EMS personnel are not obligated to continue resuscitation efforts that were started inappropriately by others at the scene.
C. When there is a delay in presenting a DNRO to EMS personnel, resuscitation must be started. However, once the DNRO is presented to EMS personnel, the EMT or paramedic with an order from medical direction may terminate resuscitation.
D. A paramedic with an order from medical direction may terminate resuscitation provided the following criteria are met:
   1. Appropriate BLS and ALS have been attempted without restoration of circulation and breathing.
   2. Advanced airway (supraglottic or ET) has been successfully accomplished.
   3. Intravenous (IV, IO, ETT) medication and countershocks for ventricular fibrillation have been administered according to the appropriate treatment protocol(s) (Adult Protocols or Pediatric Protocols).
   4. Persistent asystole (20 minutes and ETCO2 less than 10mmHg) or agonal ECG patterns are present and no reversible causes are identified.
   5. Patients with suspected hypothermia, barbiturate overdose, or electrocution require full ALS resuscitation, unless they have injuries incompatible with life or tissue decomposition.
E. Provide appropriate grief counseling or support to the patient’s immediate family, bystanders, or others at the scene.
   1. Provide family members with appropriate referral information, if available.
F. Patient preparation.
   1. Once it has been determined that the patient has died and resuscitation will not continue, cover the body with a sheet or other suitable item. Do not remove any property from the body or the scene for any purpose.
   2. If the death is a suspected homicide (crime scene), do not cover the body (General Protocol 1.10).
   3. Immediately notify the appropriate law enforcement agency (if not done already), and remain on scene until their arrival.
   4. Advanced airway placement may be verified by two paramedics for patients who are determined to be dead in the field or for whom resuscitation measures have ceased. Improperly placed advanced airway tubes should be left in place and reported to the appropriate personnel. (Proper advanced airway tube placement must be confirmed prior to terminating resuscitation.).
   5. Consult the patient’s family for “organ donor” information, if appropriate.

IV. DOCUMENTATION
A. All death in the field patient reports need to have proper documentation on the EMS run report.
B. ECG rhythm documentation must be attached to the EMS Run Report.
C. The advanced airway should be left in place and its confirmation should be recorded on the EMS Run Report.
1.5 Emergency Worker Rehabilitation

MEDICAL EVALUATION OF EMERGENCY WORKERS ON EMERGENCY INCIDENTS OR TRAINING EVOLUTIONS

A. Purpose: Emergency operations require significant physical activity, but no rescuer will be required to perform emergency operations beyond safe levels of physical or mental endurance. This protocol is intended to examine and evaluate the physical and mental status of emergency workers working on an emergency incident or a training exercise and determine which treatment, if any, is necessary. Personnel rehabilitation using appropriate protocols in this area will decrease injury risk and enhance recovery for later emergency operations.

B. Implementation: A Rehabilitation Area (Rehab Area) will be set up at the discretion of the Incident Commander. It is recommended that a Rehab Area be utilized at all working incidents to provide a staging area for on-scene personnel, as well as an immediate source of personnel for rescue or aid, and an area for recovery and rehabilitation of emergency workers. When a Rehab Area has been deemed necessary by the Incident Commander (IC), the first available EMS unit will be responsible for the management and coordination of the Rehab Area.

C. Location: Establish a Rehab Area away from environmental hazards (e.g., in a shady, cool place that is, upwind and away from smoke and traffic) that is readily accessible to rescue personnel for transport and supplies. Air truck and canteen service will be stationed in this area. Multiple Rehab Areas may be needed on large incidents. If a specific location has not been designated by the IC, the Rehab Officer shall select an appropriate location based on the following site characteristics:

1. The Rehab Area should be in a location that will provide physical rest by allowing the body to recuperate from the demands and hazards of the emergency operation or training evolution.
2. It should be far enough away from the scene that members may safely remove their turnout gear and self-contained breathing apparatus (SCBA) and be afforded mental rest from the stress and pressure of the emergency operation or training evolution.
3. It should provide suitable protection from the prevailing environmental conditions. During hot weather, it should be in a cool, shaded area. During cold weather, it should be in a warm, dry area.
4. It should enable members to be free of exhaust fumes from apparatus, vehicles, or equipment (including those involved in the rehabilitation group operations).
5. It should be easily accessible by EMS units.
6. It should allow prompt reentry back into the emergency operation upon complete recuperation.

D. Resources: The Rehab Officer shall secure all necessary resources required to adequately staff and supply the rehabilitation area. The supplies should include the following items:

1. Fluids—water, activity beverages, oral electrolyte solutions, and ice.
2. Food (for extended operations where crews are engaged for 3 hours or more) soup, broth, or stew in hot/cold cups.
3. Medical equipment—blood pressure cuffs, stethoscopes, oxygen administration devices, cardiac monitors, intravenous solutions, thermometers, and pulse oximeters (which include the ability to monitor SpCO).
4. Other - awnings, “cool zone” misting fans, cooling chairs, heaters (according to climate), towels, and tarps.

E. Staffing: Assign a minimum of two rescue personnel to monitor and assist fire fighters in the Rehab Area. An appointed Rehab Officer shall oversee the rehab operations. Their responsibility is to oversee provision of food, fluids, medical monitoring, establish and maintain an appropriate environment for rehab and rehabilitation operations in the area. These personnel will oversee the rehabilitation and availability for work of all emergency responders placed in this area.

F. Medical evaluations: When the Incident Commander has established a Rehab Area, fire fighters and other emergency responders shall be evaluated following (a):

1. The use of two SCBA bottles and/or 30 minutes of strenuous activity (e.g., use of chemical PPE, advancing hose lines, forcible entry, ventilation) (b).
2. SCBA failure.
3. Weakness, dizziness, chest pain, muscle cramps, nausea/vomiting, altered mental status, difficulty breathing, and other stress-related symptoms (c).
4. At the discretion of the Incident Commander, Rehab Officer, Safety Officer, CISM Coordinator, and Company Officer.

Note:

(a) A medical evaluation form shall be completed on all personnel entering the Rehab Area and before they return to emergency work.
(b) This does not preclude an officer from having a team member evaluated if he/she deems it appropriate. A member may be evaluated any time he/she feels it necessary.
(c) All personnel receiving ALS treatment and transport will have a patient care report completed for them.

G. Examination: EMS personnel should evaluate persons arriving to the Rehab Area as they appear. Arriving emergency workers must be questioned regarding any medical symptoms, be asked about any injury resulting from incident work, and have assessment of appropriate vital signs. Examination shall occur at 10-minute intervals and will involve a minimum of:

1. Glasgow Coma Scale (GCS) score.
2. Pupillary response.
4. ECG (if applicable).
5. Lung sounds.
6. Skin condition.
7. Signs and symptoms.
8. Oral temperature.
   a. Arterial oxygen saturation (SpO₂).
   b. Carboxyhemoglobin saturation (SpCO).

An EMS Run Report and a Casualty Report shall be completed for each fire fighter or other emergency worker who is not routinely returned to emergency operations.
1.5 Emergency Worker Rehabilitation (continued)

H. Guidelines for rehab: The following will occur: REVIEW AGAINST FORM

1. Normal presentations: The emergency responder will rehydrate and rest before reporting to Manpower. Rest shall not be less than 15 minutes.

2. Abnormal presentations:
   a. Blood pressure values that are higher or lower than the person’s usual level.
   b. SpO2 values less than 94%.
   c. Values for the pulse rate in an emergency responder will normally be less than 100 beats per minute (BPM) at rest and less than 120 BPM at a working incident. At no time should the pulse exceed 180 BPM.
   d. Values for carbon monoxide (CO) oximetry will normally be 5% for a nonsmoker and less than 8% for a smoker. A CO oximetry reading of more than 12% indicates moderate CO inhalation; a reading of more than 25% indicates severe inhalation of CO.

3. Body temperature greater than 100.6 F

   a. The emergency responder will rehydrate and rest. The emergency responder will report to Manpower when presentations are normal. Presentations should return to normal within 15 minutes.
   b. If a team member’s heart rate exceeds 110 BPM, an oral temperature should be taken. If the oral temperature exceeds 100.6 F, the member should not be permitted to wear protective equipment and should be treated for heat stress and monitored for worsening of the heat emergency (i.e., heat exhaustion and heat stroke).
   c. The emergency responder will receive ALS treatment and transport if presentations are abnormal for more than 15 minutes. Abnormal presentation includes the following signs and symptoms:
      1) SpO2 value less than 94%.
      2) Persistent heart rate greater than 120 BPM (lasting for 15 minutes or longer).
      3) Any emergency worker with a CO oximetry reading of more than 8% but less than 15% must be given the opportunity to breathe ambient air for 5 minutes.
      4) If the CO oximetry reading is still higher than 8%, the emergency worker should be given oxygen via mask until the value drops below 5%. Any worker with a CO oximetry reading of more than 25% must be completely evaluated and removed to a hospital, preferably one that has a hyperbaric chamber. No emergency worker should leave the Rehab Area until his/her CO level is less than 8%.
      5) Blood pressure above or below the emergency worker’s normal level.
      6) Symptoms of heat stroke.
      7) Oral temperature greater than 100.6 F, lasting longer than 15 minutes (after oxygen administration).
   d. Any emergency responder with chest pain, difficulty breathing, and altered mental status will receive immediate ALS treatment and transport.
   e. Any other abnormal presentation not specified herein, where the examining paramedic’s judgment determines a need for treatment and transport will be managed accordingly.
1.5 Emergency Worker Rehabilitation (continued)

F. Treatment: Treatment will consist of one or more of the following measures. Prior to taking anything orally, the emergency responder will clean his/her hands and face. On-scene rescue personnel will provide water and a cleaning agent.
1. Remove bunker gear
2. Rest
3. Oral rehydration and nutrition (air truck, canteen service); minimum of 1 to 2 quarts of fluids over a 15-minute time period (water then full strength electrolyte drink). Avoid any substance containing caffeine (e.g., sodas, coffee, tea).
   a. Members should consume at least 1 quart of water per hour.
   b. Members shall rehydrate with at least 8 ounces of fluid while SCBA cylinders are being changed.
4. Oxygen.
5. Cool environment utilizing “cool zone” fans and/or “cooling chairs” if available (e.g., shade, electric fan, air conditioning, showers).
6. For extended operations lasting 3 or more hours, the Rehab Area should provide food such as soup, broth, or stew; these items are digested much faster than sandwiches and fast-food products. In addition, foods such as apples, oranges, and bananas provide supplemental forms of energy replacement. Fatty and/or salty foods should be avoided.

G. Return to emergency duties: Members assigned to the rehabilitation group shall enter and exit the Rehab Area as a crew. The crew designation, number of crew members, and the times of entry to and exit from the Rehab Area shall be documented by the Rehab Officer or his/her designee on the check-in/out sheet. Crews shall not leave the Rehab Area until authorized to do so by the Rehab Officer. Report to Manpower or Incident Commander when the following criteria have been met:
   a) Vital signs within normal limits.
   b) Absence of abnormal signs and symptoms.
   c) Minimum period of 15 minutes for rest and rehydration.
   d) Released by Rehab Officer.

H. Documentation: A Rehab Medical Evaluation Form shall be completed for all personnel evaluated in the Rehab Area and forwarded to the appropriate Rescue (EMS) Division following all applicable patient confidentiality guidelines (e.g., HIPAA). A complete patient care report (PCR) shall be completed for any member who receives treatment/transport.

See Section 6 or Online Forms for the Emergency Worker Rehabilitation Form
1.6 Helicopter Safety

COMMUNICATION PROCEDURES
The standard dispatch for an Air Rescue assignment should be one (1) engine company and one (1) rescue. The need for additional units should be dictated by the incident circumstances. It should be kept in mind that the unit assigned as the heli-spot (HS) group may need all of its personnel to properly secure the HS site. This may create the need for additional units to address patient care needs. Dispatchers should not take it upon themselves to modify this assignment, nor should they suggest modification of the assignment. As with any Fire Department assignment, the only personnel who can modify the assignment are Uniformed Fire Department Officers.


HELI-SPOT PROCEDURES
Rescue Units, when requesting an Air Rescue assignment, should not concern themselves with an HS unless they know of one at or very near the incident site. The rescue personnel should concern themselves with proper and rapid patient packaging. In the event that the unit assigned as the HS group experiences difficulties in finding an HS, they should wait until Air Rescue arrives. Air Rescue has a better vantage point in choosing an HS, and its personnel will advise the HS group.

In the event that the HS is remotely located and appears to be safe for landing, the Pilot in Command (PIC) may elect to land without the assistance of an HS sector. This does not mean that the unit assigned to the HS should be canceled. These team members will be utilized for security, safety, and patient loading once the helicopter is on the ground. The Pilot in Command (PIC) is both legally and operationally responsible for the safety of the aircraft. Therefore, the final decision of the suitability of the HS site is that of the PIC.

When setting up an HS, there are several things to keep in mind:
1. The HS should be set up as to facilitate takeoffs and landings into the wind. (Do not rely on dispatch for correct wind direction; use visual indicators.)
2. If the HS group Officer in Command (OIC) is not sure of the wind direction or the direction from which the helicopter should approach, then he/she should wait until the helicopter is in the area and confer with the Air Crew on this decision.
3. The approach and departure ends of the HS should be clear of obstacles (any object more than 40 feet tall that is within 100 feet of the HS).
4. Debris such as wood, cans, and plastic should be removed from the HS. Flying debris can do damage to both the helicopter and personnel on the ground.
5. To minimize the hazard of blowing sand and dust, the HS should be hosed down (may be hosed down as necessary).
6. Once the helicopter has landed, the Marshaller should post a minimum of one tail rotor guard (two, if available). This person should be someone other than the Marshaller. The Marshaller shall remain at his/her post until the aircraft departs.
7. No unauthorized personnel shall be permitted to approach the helicopter. This is the general responsibility of all Fire Department personnel, but it is most definitely the overall combined responsibility of the PIC and the HS group OIC.
8. The HS group should assure that the Rescue Unit personnel are supplemented with an appropriate number of personnel to assist in the safe and efficient loading of patients into the helicopter.

9. Once the helicopter has landed, the Marshaller should confer with the Air Crew as to the helicopter’s departure.

10. It is not necessary to have a hose line pulled and charged. In the event of a catastrophic event involving the helicopter, tactics and strategy will be left up to the Incident Commander.

The Marshaller is one of several tools that are at the disposal of the PIC for the accomplishment of a safe landing and departure. The PIC considers several factors when making an approach or departure into a confined area. As a consequence, he/she may not always follow the exact direction of the Marshaller. Note that most approaches will be to the ground, not to a hover. The PIC, at his/her discretion, may elect to land without the assistance of a Marshaller and may request that the Marshaller remain clear of the HS until after the helicopter has landed. If the PIC does not follow the exact direction of the Marshaller, be assured there are reasons for his/her actions.

REVIEW YOUR MARSHALLING HAND SIGNALS

A. Marshalling.

1. Positioning.
   a. The Marshaller will stand at the outer edge of the HS perimeter on the windward side, with his/her back to the wind.
   b. The Apparatus Lieutenant/Captain will have the primary responsibility for the marshalling duties.
   c. An additional fire fighter who is assigned to the Marshaller will maintain constant radio contact with the helicopter as well as visual and verbal contact with the Marshaller.
   d. Remain in eye contact with the pilot at all times.
   e. Do not approach the helicopter; remain vigilant at your post.

2. Equipment.
   a. Helmet with chin strap tightly secured.
   b. Goggles on or visor down.
   c. Gloves.
   d. Full bunker gear with collar up.
   e. Flash lights with wands for night operations.

3. Safety precautions and procedures.
   a. Stay well clear of the tail rotor area.
   b. Use caution when traversing uneven terrain.
   c. Approach the helicopter in the pilot’s field of vision and ONLY after an “All Clear” signal has been given by a helicopter crewmember.
   d. Use low crouch when approaching and departing the helicopter.
   e. Do not use road flares. Do not shine spotlights or headlights at the helicopter or into the HS. The pilot will utilize the “night sun” to light up the HS as needed. Shining lights or strobes at the HS may cause vertigo, night blindness, or seizures of the pilot.
RESCUE UNIT PROCEDURES

The Rescue Unit OIC has the primary responsibility of patient care and should not become overly concerned with the availability of an appropriate HS. The following points should be kept in mind when deciding on Air Rescue as the mode of transport for the patient:

1. Make the decision to transport by air early. Have Air Rescue dispatched by the Incident Commander. Even if you are not sure that a patient meets the established criteria for air transport, place Air Rescue on standby status. You can always cancel the standby.
2. It is imperative that the ground Rescue Unit contact the receiving facility prior to Air Rescue’s on-scene arrival. This will preclude any delay in transportation in the event the receiving facility cannot accept the patient. This early advisory is also necessary to allow the hospital time to prepare for an Air Rescue arrival. Air Rescue may monitor the medical channel and receive patient information while it is given to the receiving facility from the ground Rescue Unit.
3. Relaying information concerning HS location and any hazards is a priority (this information may be relayed to the Air Rescue team after they are airborne). The only patient information that the Rescue Unit needs to advise the Incident Commander about when requesting Air Rescue is the number of patients and the designated receiving facility. The ground Rescue Unit should not spend time advising Air Rescue of patient conditions over the incident frequencies. That time would be better spent communicating with the receiving facility.
4. There is no reason to provide the Air Rescue crew with a completed EMS Run Report. This may create an undue delay in the transportation of the patient. A “hard copy” of whatever information you do have should be provided to the Flight Medic.
5. All bandages and dressings shall be affixed securely.
6. The patient will be secured to a backboard with a minimum of three (3) straps, unless contraindicated by his/her medical condition. If the patient is unruly, place an additional strap above the knees. Having a patient lie on a backboard with the head immobilized and nothing securing the body is unacceptable. In the event that straps are not available, another method of securing the patient should be improvised.
7. A minimum of four (4) personnel, one of whom will be a member of the Air Rescue crew, will carry the stretcher. Each member of this team should have a helmet with face shield and chin strap in place when loading the patient.
8. If the patient is difficult to carry, a stretcher may be utilized, provided the sheets, pillow, and mattress are removed.
9. The key to saving a trauma patient who requires surgical intervention is speed. Do not delay transport for invasive procedures other than those necessary to maintain the patient’s airway. Most invasive procedures can be done while en route to the Trauma Center.
10. Be aware of the time you are on the scene with the patient. Attempts at certain procedures may be perceived as progressing at a rapid pace, but in reality they are taking an extended period of time that can better be used in moving the patient.
11. Advise the Air Rescue Unit if you have any need for additional equipment or assistance (e.g., for managing patient airway difficulties).

12. Remain at the incident side (or at least 100 feet from the HS) until the helicopter has landed.

13. Absolutely no personnel should approach the helicopter unless cleared “in” by an Air Rescue crew member.
   a. Do not approach the helicopter with a patient unless escorted by an Air Rescue crew member.
   b. It is the responsibility of all Fire/Rescue/EMS personnel to ensure that any and all unauthorized persons are prevented from approaching the helicopter. This is usually accomplished with visual and verbal warnings, but in some instances may require physical intervention.

14. In the event that the Air Rescue crew requires assistance with patient care, the ground paramedic in charge of patient care will accompany the patient during air transport. In this event, the ground paramedic, with Air Crew approval, will bring any equipment necessary to affect patient care during air transport. Any additional Fire/Rescue personnel will be determined by the Air Rescue crew and the ground paramedic in charge of patient care.

References
Broward County Aeromedical Transport Program
Miami-Dade Air Rescue Assignment Procedures
U.S. Coast Guard Helicopter Procedures

The heli-spot shall be a minimum of 100’ × 100’ (HS size may be increased by local protocol).
1.7 Medical Communications

Hospital prenotification of all BLS or ALS (Non-Interfacility) transported patients is recommended. On initial contact by the paramedic with the supervising emergency physician, the following information should be communicated in this sequence:

1. Priority code and receiving facility
2. Rescue number/paramedic’s name
3. Patient’s age/sex
4. Patient complaint or major problem/time of onset
5. Assessment: mental status, ROM, pupils, skin, BBS, BP, P, R, ECG, hemodynamic condition
6. Glasgow Coma Scale (GCS) score
7. Mechanism of injury
8. History of illness, medications used, allergies
9. Treatment given
10. Estimated time of arrival

MEDCOM PRIORITIES

Priority I: Critical
Used only for patients who present with an immediately life-threatening illness or critical injury. As outlined in Trauma Alert Protocol.

Priority II: Serious
Used for those patients who present with an illness or injury requiring immediate medical intervention and that has the potential for becoming life-threatening if not treated promptly.

Priority III: Stable
Used for those patients who present with an illness or injury not requiring immediate medical intervention or that is so easily managed that medical direction is not required. Also used for notification of impending patient arrival to the receiving facility.

Priority IV: Administrative Traffic (Optional)
Used for all transmissions not involving care of a patient, such as radio checks, calibration test, and administrative traffic.

MEDCOM CLASSIFICATIONS: Adult or Pediatric, Cardiac, Medical, OB, Trauma

TRAUMA PRE-ALERTS
A Trauma Pre-alert is communicated via Fire Dispatch after initial patient contact (a second contact must be made via Medcom en route to the hospital) and must include the following information:

1. Rescue number/paramedic’s name calling the alert.
2. Name of receiving trauma center.
3. Category (adult, pediatric, or obstetrical).
4. Trauma alert criteria.
5. Patient’s sex.
6. Number of patients.
7. Estimated time of arrival to the receiving facility, via ground or air.

See the County Uniform Trauma Telemetry (CUTT) Report located in section 6 and on-line forms.
POLICY
Any and all individuals who are involved as patients or potential patients should receive proper evaluation, treatment, and transportation to the appropriate medical facility. There may be times when this policy may not be carried out due to a refusal of care. The refusal of care procedure should be utilized in situations in which a patient refuses evaluation, treatment, and/or transportation by prehospital personnel. Persons should be presumed competent to make decisions affecting their medical care. In cases of minors, attention should be given to signs of child abuse (Appendix 6.2).

DEFINITIONS
A. Patients able to refuse care.
   1. A person can refuse medical care based on the following guidelines:
      a. Competent—defined by the ability to understand the nature and consequences of his/her actions by refusing medical care and/or transportation, and
      b. Adult - eighteen (18) years of age or older, except:
         1) An emancipated minor.
         i. A self-sufficient minor.
         ii. A married minor.
         iii. A minor in the military.
      2) A legal representative for the patient (parent or guardian). (Appendix 6.6, Consent for the Care of a Minor.)

B. Patients not able to refuse care.
   1. A person may be considered incompetent to refuse medical care and/or transportation if the severity of his/her medical condition prevents the patient from making an informed, rational decision regarding medical care. Therefore, the individual may not refuse medical care and/or transportation based on the following guidelines:
      a. Altered level of consciousness (e.g., head injury or under the influence of alcohol and/or drugs).
      b. Suicide (attempt or verbal threat).
      c. Severely altered vital signs.
      d. Mental retardation and/or deficiency.
      e. Not acting as “a reasonable person would do, given the same circumstances.”
      f. Younger than eighteen (18) years of age (except those persons outlined in A [1] [b]).

Implied consent.
1. If a person is determined to be incompetent, he/she may be treated and transported under the principle of “implied consent” (what the reasonable individual would consent to under the same circumstances). Also see General Protocol 1.2, Behavioral Emergencies.
2. If the patient is transported and/or treated on the basis of implied consent, field personnel should use reasonable measures to ensure safe transport to the closest appropriate facility.
1.8 Refusal of Care (continued)

REFUSAL PROCEDURE
A. Single patient.
   1. Determine that the individual is involved in the incident.
   2. Determine that the individual is refusing to allow the proper evaluation, or necessary treatment, or necessary transport to the appropriate medical facility.
   3. Determine the mental status and extent and history of injury, mechanism, or illness.
      a. Ensure that the patient is conscious, alert, and oriented and understands (mental reasoning) his/her condition (patient GCS = 15).
      b. Unless the patient specifically refuses, do a complete physical assessment.
   4. Inform the patient and/or responsible party (parent or guardian) of the potential consequences of the decision to refuse treatment and/or transport to a definitive-care facility (loss of life or limb, irreversible sequelae), and ensure that the patient and/or responsible party fully understands the explanation.
   5. All measures should be taken to convince the patient to consent, including enlisting the help of family or friends.
   6. If the patient continues to refuse, the patient and/or responsible party may then sign a “Refusal of Care” form. Ensure that the following information is provided:
      a. The release is against medical advice.
      b. The release applies to this instance only.
      c. EMS should be requested again if necessary or desired.
   7. After the “Refusal of Care” form is signed, it must be witnessed (including legibly printed name, contact information, and signature of witness).
   8. If the patient or responsible party will not sign the release, then document this refusal on the EMS Run Report. If available, witness signatures should be obtained.
   9. Where possible, patients should be left in the care of family, friends, or responsible parties.
   10. Carefully document the assessment and vital signs, including all issues and circumstances indicated.

B. Multiple patients.
   The protocol does not allow for more than one refusal on a single EMS Run Report. However, individuals who refuse ALL assistance, including proper evaluation, can be combined on a single report (e.g., all parties deny injury). Once an examination is begun on an individual, a separate EMS Run Report must be filled out to record the examination. Also, any later refusal of care requires following the complete protocol outlined previously. The use of multiple refusals of care is primarily designed for incidents that have numerous participants (potential patients) where it becomes evident that some participants are not injured at all or refuse to be examined when approached by EMS personnel.
   1. Complete Steps 1 through 10 in section A.
   2. Document all names, addresses, and witnesses.
1.8 Refusal of Care (continued)

C. Medical Direction: (The Physician at the destination facility or the agency's Medical Director).
   1. Medical direction should be contacted for consultation under the following circumstances (high risk refusal):
      a. A low-severity patient who is under 18 years of age.
      b. A patient whose refusal of care represents a significant risk to the patient or EMS system/agency.
      c. A patient who is not his/her own legal guardian.
      d. A patient who refuses transport after administration of any IV medication (also consider calling the Police Department for assistance).
   2. If any questions on the assessment of competency or refusal of care occur, contact medical direction for further guidance.

D. Refusal of transport or transport destination.
   1. Patients who refuse to be transported to the closest appropriate facility and are adamant about being transported to a different facility should be considered to be refusing transport. The local department’s supervisor should be contacted for further consultation on the transport destination according to local policy.
   2. When a patient refuses to be transported to any facility, medical direction should be considered for further consultation, when such refusal represents a significant risk to the patient or the EMS system/agency. Refer to local policy for further direction.
1.9 Mass-Casualty Incidents

PURPOSE
To efficiently triage, treat, and transport victims of mass/multiple-casualty incidents (MCIs). The following protocol is applicable to all multiple-victim situations. This protocol is intended for the everyday MCI when the number of injured exceeds the capabilities of the first-arriving unit as well as for large-scale MCIs.

PROCEDURE
A. The officer of the first-arriving unit will establish Command and:
   1. Perform a size-up, estimating the number of victims.
   2. Request a Level 1, 2, 3, 4, or 5 response, and request additional units and/or specialized equipment as required.
   3. Identify a staging area.
   4. If it is an active assailant incident or any tactical environment with a MCI establish a Unified Command (UC) with Law Enforcement (LE). Consider establishing Liaisons for FD and LE, the Liaisons can interact with each other allowing the transfer of info between agencies. Law Enforcement will make entry with their contact team and provide feedback to the UC and the decision may be made to establish a Rescue Task Force (team of LE officers providing forced protection for rescue personnel). The Rescue Task Force will initiate triage and provide immediate life saving treatment (i.e hemorrhage control).
   5. If the area is deemed safe to enter direct the remaining crew members and any additional personnel arriving to initiate triage.
   6. Triage will be performed in accordance with START or JumpSTART.
      Prioritize victims utilizing color-coded ribbons:
      - **Red**: Immediate care
      - **Yellow**: Delayed care
      - **Green**: Ambulatory (minor)
      - **Black**: Deceased (non-salvageable)
   7. Locate and direct the “walking wounded” to one location away from the incident, if possible. These victims need to be assessed as soon as possible. Assign someone to keep the walking wounded together.
   8. Active assailant incidents considerations: Be on high alert for suspicious individuals, packages, vehicles or potential IEDs. Integrated active assailant response should include the critical actions contained in the acronym THREAT
      - **Threat suppression**
      - **Hemorrhage control**
      - **Rapid Extrication to safety**
      - **Assessment by medical providers**
      - **Transport to definitive care**
1.9 Mass-Casualty Incidents (continued)

B. As additional units arrive, Command will designate the following officers:
   1. Triage (Initially the responsibility of the first-arriving officer).
   2. Treatment.
   3. Transport.
   4. Staging.

C. Additional branches/sections may be required depending on the complexity of the incident. These officers may include, but are not limited to:
   1. Medical Branch.
   2. Landing Zone/Heli-spot.
   3. Extrication.
   5. Rehabilitation.
   7. Public Information Officer (PIO).
   8. Medical Intelligence - to assist with suspected or known WMD (weapons of mass destruction) events for decontamination, antidotes, and treatment.

D. MCI: predetermined response plan.
   1. Considerations:
      a. An MCI shall be classified by different levels depending on the number of victims. The number of victims will be based on the initial size-up, prior to triage.
      b. Levels of response will augment the units already on the scene, and units enroute will be included in the assignment. The exception would be in conjunction with a Fire Alarm assignment i.e., a fire with multiple victims may be a Second Alarm with an MCI Level 3 response; this will be two separate assignments.
      c. Command can downgrade or upgrade the assignments at any time.
      d. All units will respond to the staging area emergency response unless otherwise directed by Command.
      e. When announcing an MCI, specify the general category (e.g., trauma, hazardous materials, smoke inhalation).
      f. Any victim meeting trauma transport criteria must be reported to a state-approved trauma center for determination as to transport destination. Trauma transport criteria will be determined during the secondary triage in the treatment phase. When the trauma center(s) are overwhelmed they will notify MedCom of the need for units to transport to other trauma centers or non-trauma centers.
      g. Consider the use of air transport for patients with special needs, mass-transit resources for multiple “walking wounded” patients, and private BLS transport units.
      h. Consider the use of mobile command vehicles, medical supply trailers, and communication trailers as needed.
      i. Upon notification of an MCI, Medical Control (Medcom/MRCC) will gather information about each hospital’s capability and relay this information to the Transport Officer or Medical Communication Officer.
      j. On a large-scale incident, consider sending a Hospital Coordinator to each hospital to assist with communications.
      k. Request law enforcement to set up a safety parameter.
1.9 Mass-Casualty Incidents (continued)

2. Definitions.
   a. Active assailant: The Department of Homeland Security’s (DHS) definition of an active assailant is a person actively engaged in killing or attempting to kill people in a confined, populated area; in most cases, active shooters use firearms and there is no pattern or method to their selection of victims.
   b. Active assailant Incident: Active assailant situations are unpredictable and evolve quickly; most are over within 10 to 15 minutes.
   c. Casualty Collection Point (CCP): A safe location(s) where fire rescue personnel can receive victims. Victims may have to be carried or dragged to the CCP. This may be inside a structure or exterior. This may be the same as the treatment area if located in the cold zone.
   d. Concealment: Concealment is a law enforcement term that represents an object that only provides protection from observation.
   e. Contact Team: Contact team is a law enforcement term used to designate the team of law enforcement officers that make entry with the specific intention of ONLY going after and neutralizing the perpetrator.
   f. Cover: Cover is a law enforcement term that represents an object or location that provides protection from direct gunfire.
   g. Improvised Explosive Device (IED): The Department of Defense (DOD) definition of an IED is a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military components, but is normally devised from nonmilitary components.
   h. Litter Bearer: A team of personnel assigned to Triage to move victims from the incident site to the treatment area or Transport Units.
   i. Rescue Task Force: Rescue personnel and Law Enforcement personnel formed to make entry into a structure to triage victims and provide life saving immediate treatment as needed i.e stopping hemorrhage.
   j. Strike Team: Five of the same type of units, including common communications and a leader (i.e., an ALS Transport Unit Strike Team would consist of five ALS Transport Units with a leader).
   k. Tactical Environment – Any environment that Law Enforcement has a tactical objective due to a threat assessment (which may require a Fire Rescue/EMS component).
   l. Task Force: Five different types of units, including common communications and a leader. MCI Task Force: May be two ALS Transport Units, two BLS Transport Units, and one Suppression Unit, including common communications and a leader.
   m. THREAT: acronym for Threat suppression, Hemorrhage control, Rapid Extrication, Assessment by medical providers, and transport to definitive care.
   n. Zones in relation to Active assailant/Mass Casualty Incidents:
      1. Hot Zone – Direct Threat Care/Care Under Fire - This zone shall be designated at the area of the structure that has not been cleared by law enforcement or the area that the perpetrator is currently in.
      2. Warm Zone – Indirect Threat Care/Tactical Field Care - This zone shall be designated at any area of the active assailant incident that has been declared available for entry by Fire Rescue/EMS personnel with armed LE coverage to perform immediate life saving treatment and triage to victims prior to their removal from the initial hazard.
      3. Cold Zone – Evacuation Care/Tactical Evacuation Care - This zone extends beyond the warm zone and is not reachable by the perpetrator. This zone shall encompass positions such as the command post, staging and other functional groups.
1.9 Mass-Casualty Incidents (continued)

MCI Level 1 (5-10 victims)
- 4 ALS Transport Units
- 2 Suppression Units
- 1 Shift Supervisor
- 1 EMS Supervisor

Note - The two hospitals and trauma center closest to the incident will be notified by Medical Control (Medcom or local communications center).

MCI Level 2 (11-20 victims) (any active assailant incident until an accurate victim count can be made)
- 6 ALS Transport Units
- 3 Suppression Units
- 2 Shift Supervisors
- 2 EMS Shift Supervisors

Note - The three hospitals and two trauma centers closest to the incident will be notified by Medical Control (Medcom or local communications center).

MCI Level 3 (21-100 victims)
- 8 ALS Transport Units
- 4 Suppression Units
- 3 Shift Supervisors
- 3 EMS Shift Supervisors
- Command Vehicle
- MCI Trailer
- Operations Chief

Note – The four hospitals and three trauma centers closest to the incident will be notified by Medical Control (Medcom or local communications center). The Warning Point will notify the Emergency Management Agency.

MCI Level 4 (101-1000 victims)
- 5 MCI Task Forces (25 units)
- 2 ALS Transport Strike Teams (10 units)
- 1 Suppression Unit Strike Team (5 units)
- 2 BLS Transport Strike Teams (10 units)
- 2 Mass Transit Buses
- 2 MCI Trailers
- Command Vehicle
- Communications Trailer
- 5 Shift Supervisors
- 3 EMS Shift Supervisors, 1 EMS Chief
- Operations Chief

Note - The 10 hospitals and 5 trauma centers closest to the incident will be notified by Medical Control. The Warning Point will notify the Emergency Management Agency.

In an ongoing, long-term MCI, the Metropolitan Medical Response System (MMRS) and the State Medical Assistance Response Team (SMRT), Medical Reserve Corp (MRC), Florida Advanced Surgical Team (FAST) Disaster Medical Assistance Team (DMAT) may be notified.
### MCI Level 5 (more than 1000 victims)
- 10 MCI Task Forces (50 units)
- 4 ALS Transport Strike Teams (20 units)
- 2 Suppression Unit Strike Teams (10 units)
- 4 BLS Transport Strike Teams (20 units)
- 4 Mass Transit Buses
- 2 Command Vehicles
- 4 Supply Trailers
- Communications Trailer
- 10 Shift Supervisors
- 6 EMS Shift Supervisors
- 2 EMS Chiefs
- 2 Operations Chiefs

Note - The 20 hospitals and 10 trauma centers closest to the incident will be notified by Medical Control. The Warning Point will notify the Emergency Management Agency. In an ongoing, long-term MCI, the MMRS, DMAT, SMRT, MRC, FAST and the International Medical and Surgical Response Team (IMSURT) may be notified.

Strike Team: Five of the same type of units, including common communications and leader.
Task Force: Five different types of units, including common communications and leader.
MCI Task Force: May be two ALS Transport Units, two BLS Transport Units, and one Suppression Unit, including common communications and leader.
OFFICER RESPONSIBILITIES - See Online Forms for Field Operating Guides.

A. Command.
   1. Established by the first arriving officer. Radio designation “Command.”
   2. Follow Field Operation Guide (FOG) #1.
   3. If active assailant or tactical environment incident get briefing from LE, establish a Unified Command and co-locate with LE. Consider establishing Liaisons for FD and LE, the Liaisons can interact with each other allowing the transfer of info between agencies.
   4. Remain in a safe, fixed, and visible location, uphill and upwind of the incident.
   5. Determine the MCI Level (1, 2, 3, 4, or 5). If unknown victims in an active assailant/tactical environment initiate a MCI level 2 until a count can be determined.
   6. Designate a staging area.
   7. Assign personnel to perform the functions of Triage, Rescue Task Force (if needed), Treatment, Transport, and Staging.
   8. Advise the Communications Center of the number of victims and their categories once triage is complete.
   9. During large-scale or complex MCIs (e.g., a fire with multiple victims/tactical environment incident), designate a Medical Branch to reduce the span of control.
   10. If the incident is due to a known or suspected weapon of mass destruction (WMD event), refer to WMD FOG #8 and designate a Medical Intelligence Officer to assist with decontamination, antidotes, and treatment of victims.
   11. If active assailant/tactical environment refer to FOG #9.
   12. Ensure proper security of the incident site, treatment area, and loading area; also provide for traffic control and access for emergency vehicles, including law enforcement.

B. Medical Branch.
   1. Radio designation “Medical.” Follow FOG #2.
   2. Assure Triage, Treatment, and Transport has been established. If established by Command, Triage, Rescue Task Force, Treatment, and Transport will now report to the Medical Branch.
   3. Work with Command, and direct and/or supervise on-scene personnel from agencies such as the Medical Examiner’s Office, Red Cross, private ambulance companies, and hospital volunteers.
   4. Ensure notification of Medical Control (Medcom/MRCC).
   5. If the incident is due to a known or suspected WMD, refer to WMD FOG #8 and designate a Medical Intelligence Officer to assist with decontamination, antidotes, and treatment of victims.
   6. If active assailant/tactical environment refer to FOG #9.
   7. Ensure proper security of incident site, treatment area, and loading area; also provide for traffic control and access for emergency vehicles, including law enforcement.
1.9 Mass-Casualty Incidents (continued)

C. Triage Officer.
Reports to Command or the Medical Branch. Supervises the Triage Personnel, Rescue Task Force (if needed) and Litter bearers. Also directs Medical Examiner personnel locate deceased victims.
2. Organize the Triage Team to begin initial triaging of victims. Assemble the walking wounded and uninjured in a safe area. Use bullhorns or a public address (PA) system if necessary.
3. Advise Command (or the Medical Branch, if established) as soon as possible if there is a need for additional resources.
4. Coordinate with Treatment to ensure that priority victims are treated first.
5. Ensure that all areas around the MCI scene have been checked for potential victims, walking wounded, ejected victims, and so forth.
6. Maintain security and control of the triage area. Request the assistance of law enforcement.
7. If a RTF is formed designate a Triage Aide to communicate with the RTF.
8. If there is more than one RTF team, designate the teams as RTF 1, RTF 2 etc.
9. Have the RTF mark the doors with the victim count using a grease pencil R=__, Y=__, G=__, B=__ (greens should have left the area but may stay to assist with care or supervision, i.e. a teacher).
10. Report to Command/Medical Branch upon completion of duties for further assignments.

D. Treatment Officer.
Reports to Command or the Medical Branch. Supervises the Treatment Managers of the Red, Yellow, and Green Areas. Coordinates the retriage and tagging of all victims and the on-site medical care. Directs the movement of victims to the loading area(s).
2. Consider assigning a Documentation Aide to assist with paperwork.
3. Direct personnel to either begin treatment on the victims where they lay or establish a centralized treatment area.
4. Considerations for a treatment area:
   a. Capable of accommodating the number of victims and equipment.
   b. Consider weather, safety, and the possibility of hazardous materials.
   c. Designate entrance and exit areas, which are readily accessible (funnel points).
   d. On large-scale incidents, divide the treatment area into three distinct areas based on priority. Designate a Treatment Manager for each area (Red, Yellow, Green). Use appropriate-color tarps if available.
5. Complete a Treatment Log as victims enter the area.
6. Ensure that all victims are triaged through a secondary exam and the assessment is documented on a triage tag (Disaster Management System [DMS] - All Risk Triage tag). The rescuer filling out the All Risk Triage tag will keep a corner of the tag for future documentation.
7. All red-tagged victims will be transported immediately as transport units become available. These victims should not be delayed in the treatment area.
8. Ensure that enough equipment is available to effectively treat all victims.
9. Establish communications with Transport to coordinate proper transport of the appropriate victims. Direct movement of victims to the ambulance loading areas.
1.9 Mass-Casualty Incidents (continued)

E. **Transport Officer.**
Reports to Command or the Medical Branch. Supervises the Medical Communication Coordinator and Documentation Aide(s). The Transport Officer is responsible for the coordination of victims and maintenance of records relating to victim identification, injuries, mode of transportation, and destination.

2. Assign a Documentation Aide with a radio to assist with paperwork and communications.
3. Assign a Medical Communication Coordinator to establish continuous contact with Medical Control (Medcom or MRCC).
4. Establish a victim loading area. Advise Staging of the location and direction of travel. Consider requesting law enforcement assistance for ensuring the security of the loading area.
5. Arrange for the transport of victims from the treatment area. Maintain a Hospital Transportation Log #5B. Keep a piece of the triage tag for future documentation.
6. Communicate with the Landing Zone (LZ)/Helipad Officer and relay the number of victims to be transported by air. Air-transported victims should be assigned to distant hospitals, unless the victims’ needs dictate otherwise (e.g., trauma center, burn unit).

F. **Medical Communications Coordinator.**
Reports to the Transport Officer and is responsible for maintaining communication with Medical Control to assure proper victim transport information and destination.

1. Radio designation “Communication.” Follow FOG #5A.
2. Establish communication with Medical Control (Medcom or MRCC\(^1\)). Advise Medical Control of the overall situation (e.g., smoke inhalation, trauma, burns, hazardous materials exposure) and the number and categories of victims. Medical Control will survey area hospitals to determine their capabilities and capacities and then relay this information to the field. Document this information on the Hospital Capability Worksheet #5C and maintain this document for the duration of the incident.
3. When units are prepared to transport, advise Medical Control and supply of the following information:
   a. The unit transporting.
   b. The number of victims to be transported.
   c. Their priority: Red, Yellow, or Green.
   d. Any victims with special needs (e.g., cardiac, burn, trauma).
4. The Medical Communication Coordinator, in conjunction with Medical Control, will determine the most appropriate facility. Ground-transported victims should be assigned to hospitals on a rotating basis.
5. Once Medical Control receives the information from the Medical Communication Coordinator, Medical Control will notify the appropriate hospital. Transporting units will not contact the individual hospital on their own, unless there is a need for medical direction/care outside of protocols.

\(^1\) Medical Resource Coordination Center (MRCC): The MRCC’s prime function is to maintain status information—that is, the number of victims and the hospital readiness status to accept victims, to coordinate transportation, and to direct patients to the appropriate hospital during a disaster or other situation characterized by a high demand for medical resources.
G. **Medical Supply Coordinator.**
   Reports to the Medical Branch and is responsible for acquiring and maintaining control of all medical equipment and supplies.
   2. Assure necessary equipment is available on the transporting vehicle.
   3. Provide an inventory of medical supplies at the staging area for use on scene.
   4. Assure support vehicles are requested. (Broward County has four MCI supply trailers and Region 7 has three large MCI supply trailers available for use during a large-scale MCI.)

H. **Staging Officer.**
   Reports to Command and is responsible for managing all activities within the staging area.
   2. Establish the location of a staging area and notify the Communication Center to direct any incoming units.
   3. Maintain a Unit Staging Log #7A.
   4. Ensure that all personnel stay with their vehicles unless otherwise directed by Command. If personnel are directed to assist in another function, ensure that the keys stay with each vehicle.
   5. Coordinate with the Transport Officer the designation of a location for victim loading and the best route to the area.
   6. Maintain a reserve of at least two transport vehicles. When the reserve is depleted, request additional units through Command.

**DOCUMENTATION**

A. The Incident Commander will, at the completion of the incident, coordinate the gathering of all pertinent documentation.

B. A Post-Incident Analysis (PIA) will be completed.
1.9 Mass-Casualty Incidents (continued)

**MCI Kits For Responder Vehicles**

Each unit should carry an MCI bag. The following items are recommended:

A. Two (2) triage packs recommend to have:
   1. Four (4) combine dressings
   2. Four (4) 4 × 4’s
   3. Gloves
   4. One (1) pediatric face mask
   5. Colored ribbons (Red, Yellow, Green & Black) either rolls or ribbons.
   6. Trauma Tourniquets (2)
   7. Hemostatic Dressing (2)
   8. Chest Decompression Needles (2)
   9. Chest Seals (2)

B. Fifty (50) triage tags—Disaster Management Systems (DMS) All Risk Triage tags.

C. Pencils/grease pencils and pens.

D. Additional tourniquets, hemostatic dressing, chest seals & chest decompression needles (10)

E. The following MCI FOGs, logs, and associated paperwork for each officer:
   1. Command FOG #1 - White
   2. Medical FOG #2 - Blue
   3. Triage FOG #3 - Yellow
   4. Treatment FOG #4 - Red
   5. Treatment Area Log #4A - Red
   6. Transport FOG #5 - Green
   7. Medical Communication FOG #5A - Green
   8. Hospital Transport Log #5B - Green. (10 logs)
   9. Hospital Capability Worksheet #5C - Green
   10. Medical Supply FOG #6 - Blue
   11. Staging FOG #7 - Orange
   12. Unit Staging Log #7A - Orange
   13. MCI-WMD/Terrorist Event FOG #8 - Beige

**MCI SUPERVISOR KIT**

A. Complete vest set with the following identification vests:
   1. White for Command.
   2. Blue for Medical Officer.
   3. Yellow for Triage Officer.
   4. Red for Treatment Officer.
   5. Green for Transport Officer.
   6. Green for Medical Communication Coordinator.
   7. Blue for Medical Supply Officer.
   8. Orange for Staging Officer.

B. Clipboard which contains paperwork for each officer, pens/pencils/grease pencils, and paper.

C. EMS Command Board.

D. Tarp set: red, yellow, green, black tarps.

E. Patient tracking device/Scanner (if available)

F. Bullhorn (if available)
1.9 Mass-Casualty Incidents (continued)

START SYSTEM OF TRIAGE
This procedure is based on the Simple Triage and Rapid Treatment (START) process for adult victims and the JumpSTART adaptation for pediatric victims.

PROCEDURE
A. Initial triage: Using the START or JumpSTART method (described in the following two sections):
   1. Locate and direct all of the walking wounded to one location away from the incident if possible. Assign someone to keep them together (Fire Rescue Department personnel, Law Enforcement officer, or capable bystander).
   2. Begin assessing all non-ambulatory victims where they are found.
   3. Utilize the triage ribbons tied to an upper extremity in a visible location.
   4. Independent decisions should be made for each victim. Do not base triage decisions on the perception of too many reds, not enough greens, and so forth.
   5. If borderline decisions are encountered, always triage to the most urgent priority (e.g., for a Green/Yellow patient, tag as Yellow).

B. Secondary triage.
   1. Performed on all victims during the Treatment phase. If a victim is identified in the initial Triage phase as a Red and transport is available, do not delay transport to perform a secondary assessment.
   2. Utilize a triage tag (Disaster Management System [DMS] All Risk Triage tag) and attempt to assess for and complete all information required on the tag (time permitting). Affix the tag to the victim and remove the ribbon.
   3. The triage priority determined in the Treatment phase should be the priority used for transport. If trauma-related, the trauma transport criteria will be applied to trauma victims during the secondary triage in the Treatment phase.

Remember the mnemonic RPM (Respiration, Perfusion, Mental status). The first assessment that produces a Red stops further assessment. Only correction of life-threatening problems, such as airway obstruction or severe hemorrhage, should be managed during the triage phase. Any major external bleeding should also be controlled at this time. Depending on the victim’s injuries (burns, fractures, bleeding), it may be necessary to prioritize as Yellow

<table>
<thead>
<tr>
<th>START modified 9/2015</th>
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<tbody>
<tr>
<td>Move the Walking Wounded</td>
</tr>
<tr>
<td>No Respiration after head tilt</td>
</tr>
<tr>
<td><strong>Control Severe Bleeding</strong></td>
</tr>
<tr>
<td>Respirations over 30/min/ Respiratory Distress</td>
</tr>
<tr>
<td>Perfusion (No radial pulse)</td>
</tr>
<tr>
<td>Mental Status (unable to follow commands)</td>
</tr>
<tr>
<td>Stable RPM/Walking</td>
</tr>
<tr>
<td>Stable RPM/Non ambulatory</td>
</tr>
<tr>
<td><strong>Conduct Secondary Triage in the Treatment Phase</strong></td>
</tr>
</tbody>
</table>
1.9 Mass-Casualty Incidents (continued)

**JUMPSTART TRIAGE**

Physiological differences in children necessitate adaptation of the standard START triage method in children 8 years of age or younger, or in those victims with the anatomical or physiological features of a child in the age group. The same parameters (RPM) are utilized, with the adaptations indicated here.

<table>
<thead>
<tr>
<th><strong>JumpSTART modified 9/2015</strong></th>
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</thead>
<tbody>
<tr>
<td>Move the Walking Wounded (access as soon as possible)</td>
<td><strong>GREEN</strong></td>
</tr>
<tr>
<td>No Respiration after head tilt/No peripheral pulse</td>
<td><strong>BLACK</strong></td>
</tr>
<tr>
<td><strong>Respirations</strong> 45/min or 15/min (Work of Breathing)</td>
<td><strong>RED</strong></td>
</tr>
<tr>
<td>No resp with pulse give 5 ventilations via barrier</td>
<td><strong>RED</strong></td>
</tr>
<tr>
<td>Respiration resume</td>
<td><strong>RED</strong></td>
</tr>
<tr>
<td>No spontaneous respirations</td>
<td><strong>BLACK</strong></td>
</tr>
</tbody>
</table>

**Control Severe Bleeding**

| Perfusion (No radial pulse) | **RED** |
| Mental Status (AVPU) Alert/Verbal | **YELLOW** |
| Pain/Unresponsive | **RED** |
| **Stable RPM/Walking** | **GREEN** |
| **Stable RPM/Non ambulatory** | **YELLOW** |

**Conduct Secondary Triage in the Treatment Phase**

Note -Infants who are developmentally unable to walk should be triaged using the JumpSTART algorithm either during initial triage or in the Green area if carried out by a nonrescuer. During triage, if the infant does not fulfill the criteria of a Red victim and has no other outward signs of significant injury; he/she may be triaged as a Green victim.

Note -The START Triage system was developed by Newport Beach Fire Rescue and Hoag Hospital. The JumpSTART Triage system was developed by Dr. Lou Romig.
1.9 Mass-Casualty Incidents (continued)

Above – Complex MCI Command Structure

Below - Active Assailant /Tactical Environment MCI Command Structure
1.10 Crime Scene Management

This protocol will be used when law enforcement personnel advise EMS that they have responded to a crime scene or EMS determines that a crime scene may exist.

A. Purpose: To ensure the protection of patient welfare as well as to ensure the ability to conduct an effective and thorough investigation.

B. Response/on-scene situations.
   1. Only those units assigned will respond to the call. Over-response tends to cause confusion at the crime scene and destruction of evidence.
   2. When approaching a potential crime scene that is being protected by law enforcement personnel, the paramedic/EMT may request entry into the area to determine the life status of the individual.
   3. If law enforcement personnel refuse access to the crime scene, do not become confrontational. Notify the EMS Agency Supervisor and complete an incident report as required.
   4. When personnel are allowed access into the scene, the minimum number of required EMS personnel should enter to minimize disturbance of the crime scene.
   5. Do not attempt resuscitation if the patient has no pulse, has no spontaneous respiration, and meets criteria outlined in General Protocol 1.4, Death in the Field.
   6. If treatment and/or resuscitation are warranted, follow the appropriate protocol.
   7. When on scene:
      a. Keep your medical equipment close to the victim.
      b. Stay close to the body.
      c. Keep your hands out of any blood that has pooled.
      d. Do not wander around the scene.
      e. Minimize destruction of the patient’s clothing. If the patient’s clothing has a puncture, do not use the hole in the clothing to start cutting. Begin cutting at another part of the garment. Removed clothing should be left with the patient or turned over to law enforcement personnel.
      f. Do NOT go through the victim’s personal effects, clean the body, or cover the body with a sheet or other material (if expired).
      g. Do NOT move, take, or handle any object at the scene or litter the crime scene with medical equipment, dressings, bandages, or other supplies.
      h. If resuscitation efforts are deemed necessary, transfer the victim from the scene to the vehicle expeditiously and stabilize the victim in the vehicle, when possible.
      i. If the patient relates any information relating to the crime while in transit to the medical facility, inform law enforcement personnel at once.
1.11 Protocol Revision Procedure

Any person may submit input for changes to the Common Protocols. The following procedure will be used to receive and process this input.

PROCEDURE (Electronic)
1. Any member of a participating EMS agency will be permitted to submit queries and suggestions regarding the Common Protocols via the electronic web based version of the protocols.
2. The protocols will be located on www.GBEMDA.org and a link will be located on the Broward EMS Council’s website www.Broward.org/BrowardEMS
3. Simply click on a protocol item and review its contents.
4. At the bottom right hand portion of the screen click on the “Make a Suggestion” link.
5. Fill out the required fields:
   a. Department
   b. Full Name
   c. Telephone Number
   d. Email address
   e. Protocol number
   f. Comments
6. Press Submit
7. Your comment will be sent via email to the Medical Director and EMS Chief for your particular EMS Agency
8. Medical Directors will meet yearly (or sooner if more emergent) to discuss the submitted items, reviewing their merit, and bringing substantiated items up for discussion and potential revision.
9. Once the changes to the Common Protocols have been implemented, the electronic protocols will be updated on the Broward EMS website and all hospitals will be notified.
10. It is the intent of this procedure that every EMS provider implements all approved changes to the Common Protocols.
11. The Medical Director of an individual EMS provider reserves the right to change portion of the protocols, however, if they are unique to that specific department, the information will be located on a department specific page within the PDF.
# Adult Section Table of Content

2.1 Adult Initial Assessment and Management  
   2.1.1 Initial Assessment  
   2.1.2 Airway Management  
   2.1.3 Medical Supportive Care  
   2.1.4 Trauma Supportive Care  
   2.1.5 Pain Management

2.2 Adult Respiratory Emergencies  
   2.2.1 Airway Obstruction  
   2.2.2 Asthma/Bronchospasm  
   2.2.3 Emphysema and/or Bronchitis  
   2.2.4 Pulmonary Edema (CHF)  
   2.2.5 Suspected Pneumonia

2.3 Adult Cardiac Dysrhythmias  
   2.3.1 Asystole/PEA  
   2.3.2 Bradycardia  
   2.3.3 Narrow Complex Tachycardia (Supraventricular Tachycardia)  
   2.3.4 Premature Ventricular Ectopy (PVC)  
   2.3.5 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia)  
   2.3.6 Wide Complex Tachycardia without a Pulse and Ventricular Fibrillation  
   2.3.7 Return of Spontaneous Circulation (ROSC)

2.4 Other Adult Cardiac Emergencies  
   2.4.1 Cardiogenic Shock  
   2.4.2 Angina /Suspected AMI  
   2.4.3 Hypertensive Emergencies

2.5 Adult Neurologic Emergencies  
   2.5.1 Altered Mental Status Unknown Etiology  
   2.5.2 Violent, Impaired Patient and/or Excited Delirium (ExDS)  
   2.5.3 Seizure Disorders  
   2.5.4 Suspected Stroke (CVA)  
   2.5.5 Syncopal Episode

2.6 Adult Toxicologic Emergencies  
   2.6.1 Bites and Stings  
   2.6.2 CNS Depressant Overdose  
   2.6.2.1 Benzodiazepines and Sedative Hypnotics  
   2.6.2.2 Opioid and Narcotic Overdose  
   2.6.3 CNS Stimulant Overdose  
   2.6.4 Digitalis Toxicity  
   2.6.5 Hallucinogen Overdose  
   2.6.6 Tricyclic Antidepressant Overdose  
   2.6.7 Unknown Toxicity
2.7 Adult OB/GYN Emergencies
   2.7.1 Complications of Labor and Delivery
   2.7.2 Normal Labor and Delivery
   2.7.3 Nontraumatic Vaginal Bleeding
   2.7.4 Toxemia of Pregnancy

2.8 Other Adult Medical Emergencies
   2.8.1 Allergic Reactions/Anaphylaxis
   2.8.2 Hypoglycemia/Hyperglycemia
   2.8.3 Nausea/Vomiting
   2.8.4 Nontraumatic Abdominal Pain
   2.8.5 Sickle Cell Anemia
   2.8.6 Sepsis
   2.8.7 Acute Adrenal Insufficiency

2.9 Adult Environmental Emergencies
   2.9.1 Barotrauma/Decompression Illness: Dive Injuries
   2.9.2 Cold-Related Emergencies
   2.9.3 Heat-Related Emergencies
   2.9.4 Drowning
   2.9.5 Electrical Emergencies
   2.9.6 Electronic Control Devices (TASER)

2.10 Adult Trauma Emergencies
   2.10.1 Head and Spine Injuries
   2.10.2 Eye Injuries
   2.10.3 Chest Injuries
   2.10.4 Traumatic Chest Pain
   2.10.5 Abdomino-Pelvic Injuries
   2.10.6 Extremity Injuries
   2.10.7 Traumatic Arrest
   2.10.8 Burn Injuries
   2.10.9 Crush/Compartment Syndrome

2.11 Adults with Special Healthcare Needs
   2.11.1 Home Mechanical Ventilator
   2.11.2 Tracheostomy
   2.11.3 Central Venous Lines
   2.11.4 Feeding Tubes
   2.11.5 VAD Patients
## 2.1 Adult Initial Assessment Management

### GENERAL GUIDELINES

<table>
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<tr>
<th>General Guidelines</th>
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Protocols in Section 2.1 are designed to guide the EMT or paramedic in his or her initial approach to assessment and management of adult patients. Supportive care is specified as being either EMT and Paramedic (BLS) or Paramedic Only (ALS).

Protocol 2.1.1 should be used on all adult patients for initial assessment. During this assessment, if the EMT or paramedic determines that there is a need for airway management, Protocol 2.1.2 should be used for the management of the adult airway. These protocols are frequently referred to by other protocols, which may or may not override them in recommending more specific therapy.

Protocol 2.1.3 presents the basic components of preparation for transport of medical patients. Due to the significant differences in priorities and packaging in the prehospital care of trauma and hypovolemia cases, a separate Trauma Supportive Care protocol has been developed. After following Protocol 2.1.1, this Medical Supportive Care protocol may be the only protocol used in medical emergency situations where a specific diagnostic impression and choice of additional protocols cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 2.1.4 presents the basic components of preparation for transport of trauma patients. Due to the significant differences in priorities and packaging in the prehospital care of medical cases, a separate Medical Supportive Care protocol has been developed. After following Protocol 2.1.1, this Trauma Supportive Care protocol may be the only protocol used in trauma or hypovolemia situations where a specific diagnostic impression and choice of additional protocols cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.
2.1.1 Initial Assessment

GENERAL GUIDELINES

EMT AND PARAMEDIC

I. Scene Size-up.
   A. Review the dispatch information.
   B. Assess the need for body substance isolation.
   C. Assess for scene safety.
   D. Determine mechanism of injury.
   E. Determine the nature of the illness.
   F. Determine the number and location of patients.
   G. Determine the need for additional resources.
   H. Consider c-spine immobilization.

II. Initial Assessment.
   A. General impression of the patient.
   B. Assess mental status; AVPU scale (Alert, Alert to Verbal, Responds to Pain, Unconscious); maintain spinal immobilization as needed.
   C. Assess circulation (rapid evaluation of pulse, major bleeding, skin color, and temperature). Assess need for defibrillation: VF/VT without pulse.
   D. Assess airway.
   E. Assess breathing.
   F. Assess disability: movement of extremities.
   G. Expose and examine the patient’s head, neck, chest, abdomen, and pelvis (check the back when the patient is rolled on his/her side).
   H. Identify priority patients.
      1. Poor general impression.
      2. Unresponsive patients.
      3. Responsive but does not or cannot follow commands.
      4. Difficulty breathing
      5. Hypoperfusion or shock
      6. Complicated child birth
      7. Chest pain with a systolic BP below 100 mm Hg.
      8. Uncontrolled bleeding
      9. Severe pain anywhere
     10. Multiple injuries

III. Initial Management. (Adult Protocol 2.1.3 or 2.1.4, Medical Supportive Care, or Trauma Supportive Care).

IV. Secondary Assessment
   A. Conduct a head-to-toe survey
   B. Conduct a neurological assessment
      1. Pupillary response
      2. Glasgow Coma Scale (GCS) score
### 2.1.1 Initial Assessment (continued)

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Assess vital signs</td>
</tr>
<tr>
<td>1. Respiration</td>
</tr>
<tr>
<td>2. Pulse</td>
</tr>
<tr>
<td>3. Blood pressure</td>
</tr>
<tr>
<td>4. Capillary refill</td>
</tr>
<tr>
<td>5. Skin condition</td>
</tr>
<tr>
<td>a. Color</td>
</tr>
<tr>
<td>b. Temperature</td>
</tr>
<tr>
<td>c. Moisture</td>
</tr>
<tr>
<td>6. Lung sounds</td>
</tr>
<tr>
<td>D. Obtain a medical history. (SAMPLE &amp; OPQRRRST)</td>
</tr>
<tr>
<td>a. O - Onset and location</td>
</tr>
<tr>
<td>b. P - Provocation</td>
</tr>
<tr>
<td>c. Q - Quality</td>
</tr>
<tr>
<td>d. R - Radiation</td>
</tr>
<tr>
<td>e. R - Referred</td>
</tr>
<tr>
<td>f. R - Relief</td>
</tr>
<tr>
<td>g. S - Severity</td>
</tr>
<tr>
<td>h. T - Time</td>
</tr>
<tr>
<td>2. A - Allergies</td>
</tr>
<tr>
<td>3. M - Medications</td>
</tr>
<tr>
<td>4. P - Past medical history</td>
</tr>
<tr>
<td>5. L - Last oral intake</td>
</tr>
<tr>
<td>6. E - Events leading to illness or injury</td>
</tr>
<tr>
<td>V. Other Assessment Techniques.</td>
</tr>
<tr>
<td>1. Cardiac monitoring</td>
</tr>
<tr>
<td>2. Pulse oximetry (Medical Procedure 4.22)</td>
</tr>
<tr>
<td>3. Glucose determination (Medical Procedure 4.17)</td>
</tr>
<tr>
<td>4. Monitor temperature</td>
</tr>
<tr>
<td>5. Capnography (EtCO2)</td>
</tr>
</tbody>
</table>
## 2.1.2 Airway Management

### TREATMENT GUIDELINES

**EMT AND PARAMEDIC**
- Initial Assessment Protocol 2.1.1.

If spontaneous breathing is present without compromise:
- Monitor breathing during transport.
- Administer oxygen as needed to maintain O2 saturation of 94% or greater.
- Avoid over oxygenation: Wean oxygen concentration as tolerated.

If spontaneous breathing is present with compromise:
- Maintain airway patency (Medical Procedure 4.1.3).
- Administer oxygen via non-rebreather mask (10-15 L/min).
- If unconscious, insert oropharyngeal, nasopharyngeal as needed (Medical Procedure 4.2).
- If patient accepts oropharyngeal airway, consider the need for a supraglottic device. EMT may insert the supraglottic device if he/she has been authorized by that department’s Medical Director (Medical Procedure 4.4).
- Assist ventilations with a bag-valve mask (BVM) device attached to supplemental oxygen at 15-25 L/min as needed (Medical Procedure 4.1.5).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
- Apply and monitor pulse oximeter (Medical Procedures 4.2).
- Apply and monitor capnography for wave form (Medical Procedure 4.10.1).

If spontaneous breathing is absent or markedly compromised:
- Maintain airway patency (Medical Procedure 4.1.3).
- Assist ventilation with a BVM device attached to supplemental oxygen at 15-25 L/min as needed (Medical Procedure 4.1.5). Maintain O2 saturation of 94% or greater. Avoid over oxygenation: Wean oxygen concentration as tolerated.
- If unconscious, insert oropharyngeal, nasopharyngeal as needed (Medical Procedure 4.2).
- If patient accepts oropharyngeal airway, consider the need for a supraglottic device. EMT may insert the supraglottic device if he/she has been authorized by that department’s Medical Director (Medical Procedure 4.4).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
- Apply and monitor pulse oximeter (Medical Procedures 4.2).
- Apply and monitor capnography for wave form (Medical Procedure 4.10.1)
2.1.2 Airway Management (continued)

TREATMENT GUIDELINES

ALS Level 1: Advanced Airway Management

- Insert an advanced airway and document the following (Medical Procedure 4.4)
  1. Confirm an advanced airway placement with an end-tidal CO$_2$ monitoring device.
  2. Additional confirmation methods may include the following options:
     a. Visualization of the tube passing through the vocal cords.
     b. Negative epigastric sounds.
     c. Positive bilateral breath sounds.
  3. Secure the advanced airway with a commercially available device.
     a. Application of a c-collar may be useful in preventing the advanced airway from becoming dislodged,
     b. For trauma patients or for patients with head/neck injury use full spinal immobilization
- If unable to insert the advanced airway and patient cannot be adequately ventilated by other means, perform cricothyroidotomy (Medical Procedure 4.5) and transport rapidly to the nearest appropriate facility.

ALS Level 2

- None

Note

- None
### 2.1.3 Medical Supportive Care

**TREATMENT GUIDELINES**

#### Supportive Care

**EMT AND PARAMEDIC**
- Initial Assessment Protocol 2.1.1.
- Airway Management Protocol 2.1.2.
- The EMT should apply the AED (Medical Procedure 4.1.1, AED)
- Establish hospital contact for notification of an incoming patient.

#### ALS Level 1

**PARAMEDIC**
- Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol. (Medical Procedure, Medication Delivery 4.18.5)
- In a critical medical patient, an intraosseous (IO) line may be considered (Medical Procedures 4.18.4)

**OR**
- Medication may be administered intranasal (IN) via the MAD device. (Medical Procedure, Medication Delivery 4.18.3)
- Monitor ECG as needed.

#### ALS Level 2

- The paramedic should obtain consultation for ALS Level 2 orders.

#### Note

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. A large-bore intracatheter should be used for unstable patients. Avoid use of access sites below the diaphragm.

(b) An IV lock or MAP may be used in lieu of an IV bag in some patients, when appropriate (Medical Procedure 4.18.5).
## 2.1.4 Trauma Supportive Care

### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>EMT AND PARAMEDIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initial Assessment Protocol 2.1.1. Initiate Trauma Alert; if applicable (General Protocol 1.10, Trauma Transport).</td>
</tr>
<tr>
<td>• Airway Management Protocol 2.1.2. (Manually stabilize c-spine as needed.)</td>
</tr>
<tr>
<td>• Correct any open wound/sucking chest wound (with an occlusive dressing).</td>
</tr>
<tr>
<td>• Control hemorrhage.</td>
</tr>
<tr>
<td>• Immobilize fractures.</td>
</tr>
<tr>
<td>• Determine if the patient is taking any anticoagulant such as warfarin (Coumadin) or antiplatelets such as dabigatran (Pradaxa). (b)</td>
</tr>
<tr>
<td>• Immobilize c-spine and secure the patient to a backboard as needed (Protocol 2.10.1. and Medical Procedure 4.24, Spinal Immobilization).</td>
</tr>
<tr>
<td>• Expedite transport.</td>
</tr>
</tbody>
</table>

The following steps should not delay transport.

- Complete bandaging, splinting, and packaging as needed.
- Establish hospital contact for notification of an incoming patient, and obtain consultation for Level 2 orders.

### PARAMEDIC ONLY

- Consider advanced airway to assist with the correction of a massive flail segment that causes respiratory compromise.
- Correct any tension pneumothorax (Medical Procedure 4.9, Chest Decompression).

### ALS Level 1 PARAMEDIC

- Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol. (Medical Procedure, Medication Delivery 4.18)
- In a critical trauma patient, an intraosseous (IO) line may be considered (Medical Procedure, Medication Delivery 4.18)
- Monitor ECG as needed.

### ALS Level 2

- None

### Note

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. Two IVs using large-bore intracatheters should be initiated in unstable patients. Avoid use of access sites below the diaphragm.

(b) If the exam reveals any new deficit, or if a witness actually saw the patient strike their head, consideration shall be given to transport to the nearest appropriate Trauma Center as a High Index of Suspicion Patient. Should the patient deteriorate enroute, to the point where they meet Trauma Alert criteria, an immediate upgrade should be called into the Trauma Center.
### 2.1.5 Pain Management

#### GENERAL GUIDELINES

**ISOLATED EXTREMITY FRACTURE**  
The purpose of this procedure is to manage pain associated with isolated extremity fractures.

**ACUTE BACK STRAIN**  
This procedure should be used in the isolated back strain.

**ABDOMINAL PAIN/RENAL COLIC**  
This procedure can be used for abdominal pain or with flank pain that is associated with kidney stones.

**SOFT-TISSUE INJURIES, BURNS, BITES, AND STINGS**  
This procedure is used for pain associated with multisystem trauma, soft-tissue injuries, burns, bites, and stings.

#### TREATMENT GUIDELINES

**Supportive Care**

For Isolated Extremity Fractures

- Any extremity fracture should be immobilized as described in Adult Protocol 2.10.6, Extremity Injuries.
- Extremity fractures should be elevated, if possible, and cold applied.
- Distal circulation, sensation, and movement in the injured extremity should be noted and recorded.

**ALS Level 1**

When treating patients with altered mental status use CAUTION when considering any pain management medication. Patients should be asked to quantify their pain on an analog pain scale (from 0 = least severe, to 10 = most severe). This number should be documented and used to measure the effectiveness of analgesia:

Nitrous Oxide-Nitronox:
Self-administered analgesia with nitrous oxide should be given special consideration for pain management during this procedure (Medical Procedure 4.20, Nitrous Oxide-Nitronox), if available.

**OR**

Morphine Sulfate
May be given via slow IV in 5 mg increments may repeat once, titrated to pain and BP above 100 mm Hg, up to a maximum of 10 mg.

**OR**

Fentanyl
May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg) (Medical Procedure 4.18, Medication Administration). Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.

**OR**

Ketamine - Adults **Must dilute** if using 100mg/ml concentration. 20 mg IV over 1 minute slow push. May repeat x 1 in 5 minutes.

**ALS Level 2**

- None

**Note**

- (a) When administering Morphine Sulfate or Fentanyl, closely monitor the patient’s respiratory status. In the event that the patient’s respirations/oxygenation is suppressed (SpO₂ less than 94%), utilize basic airway maneuvers (open airway), administer oxygen and if no improvement consider Narcan.
- (b) If Fentanyl was initially given IN and an IV is then established, then one IV dose of 50 mcg. can be given if needed.
- (c) Dilution instructions - add 20 mg (0.2 ml) to 0.8 ml Normal Saline
2.2 Adult Respiratory Emergencies

GENERAL GUIDELINES

Assessment of the adult patient in respiratory distress requires specific attention to the function of the respiratory system. The EMT’s and paramedic’s assessment should be more concentrated in this area, to include the following considerations:

1. Assessment of chest wall movement, including the rate and depth of ventilation as well as the presence of symmetrical rise and fall.
2. Assessment of accessory muscle use.
3. Auscultation of bilateral lung sounds.
4. Use of pulse oximetry.
5. Use of EtCO\textsubscript{2}, monitor wave form.

The paramedic must be able to determine the adequacy of ventilation and understand its relationship to respiration. If signs of hypoxia and respiratory distress are present, immediate airway and ventilatory management should be initiated. These signs include altered mental status, tachypnea, and use of accessory muscles, nasal flaring, pursed lips, abnormal lung sounds, tachycardia, and cyanosis. In addition, the general signs of shock may be seen. Other signs of respiratory insufficiency that should alert the paramedic to the need for immediate airway and ventilatory management, including placement of an advanced airway, are respiratory rate below 10/min or above 36/min, \textit{SpO}_2 below 94%, or EtCO\textsubscript{2} outside the normal range of 35-45mmHg.

In patients with chronic respiratory disease, the paramedic must be able to differentiate between what is chronic and what is acute, as it pertains to the respiratory assessment. Specific questions about the chief complaint and accompanying symptoms may prove to be invaluable in this setting. Assessment of lung sounds should be combined with patient history. For example, a patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” The paramedic must remember that patients with CHF may also present with wheezing. If this patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF.

Specific treatments for the different causes of respiratory distress are outlined in the following protocols. When the paramedic is unsure as to which protocol to follow, he/she should follow the protocols in Section 2.1 and contact medical control for further direction.
### 2.2.1 Airway Obstruction

#### GENERAL GUIDELINES

**General Guidelines**

Causes of upper airway obstruction include the tongue, foreign bodies, swelling of the upper airway due to angio-neurotic edema (see Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis), and trauma to the airway. Differentiation of the cause of upper airway obstruction is essential to determining the proper treatment.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3
- If air exchange is inadequate and there is a reasonable suspicion of foreign body airway obstruction (FBAO), apply abdominal thrusts until the patient becomes unresponsive then begin CPR, starting with chest compressions. Continue CPR with the addition of looking in the mouth before delivering breaths. (Medical Procedure 4.1.6) (a).

**ALS Level 1**

- If unable to relieve FBAO, visualize it with a laryngoscope and extract the foreign body with magill forceps.
- If the obstruction is due to trauma and/or edema, or if uncontrollable bleeding into the airway causes life-threatening ventilatory impairment, utilize an advanced airway (Medical Procedure 4.4, Advanced Airways).
- If unable to insert an advanced airway and the patient cannot be adequately ventilated by other means, perform a cricothyroidotomy (Medical Procedure 4.5, Needle Cricothyroidotomy).
- Establish an IV; give normal saline KVO.

**ALS Level 2**

- None

**Note**

(a) If air exchange is adequate with a partial airway obstruction, do not interfere; instead, encourage the patient to cough up the obstruction. Continue to monitor the patient for adequacy of air exchange. If air exchange becomes inadequate, continue with the protocol.
## 2.2.2 Asthma/Bronchospasms

### GENERAL GUIDELINES

**General Guidelines**
This protocol is used for patients who are complaining of dyspnea and having wheezing. A patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma) (Adult Protocol 2.2.4, Pulmonary Edema-CHF).

### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1, Airway Management 2.1.2
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.1.5).

**ALS Level 1**
- Establish an IV; give normal saline.
- Give Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment.
- Consider the need for advanced airway management (Medical Procedure 4.4).

If patient continues to have severe respiratory distress, consider the following:
- Administer the following steroid
  - Methylprednisolone sodium succinate (Solu-Medrol) 125mg IV, if IV cannot be established then administer IM, if available (Medical Procedure, Medication Delivery 4.18)
  - Administer Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18)(a).

If severe respiratory distress continues, consider the following:
- Administer Magnesium Sulfate 2 g IV (mixed in 50 mL or 100mL of D5W) given over 5-10 minutes.
- Repeat Epinephrine (1:1000) 0.3 mg IM, if the patient has not responded to the previous treatments (a) (Medical Procedure, Medication Delivery 4.18)
- Administer CPAP with 2.5-5 cm H2O PEEP (Medical Procedure 4.12).

**ALS Level 2**
- Repeat Epinephrine (1:1000) 0.3 mg IM (a).

**Note**
(a) When administering Epinephrine caution should be used when the patient is older than 40 years of age or has a history of hypertension or heart disease.
### 2.2.3 Emphysema and/or Bronchitis

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>This protocol is used for patients with a history of emphysema and/or chronic bronchitis (COPD) who complain of dyspnea. If at any point the patient’s respiratory status deteriorates, consider an advanced airway and administration of Albuterol via the ET tube nebulized, and transport the patient immediately.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
</table>
| - Initial Assessment Protocol 2.1.1.  
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.4). |

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
</table>
| - Establish an IV; give normal saline KVO.  
- Give Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.  
- If bronchodilators are administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol treatment.  
- Administer CPAP with 2.5-5 cm H2O PEEP (Medical Procedure 4.12).  
- Consider the need for advanced airway management (Medical Procedure 4.4). |

If patient has severe respiratory distress you may administer:  
- Methylprednisolone sodium succinate (Solu-Medrol) 125mg, IV push. If IV cannot be established then administer IM, if available. (Medical Procedure, Medication Delivery 4.18)

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
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<tr>
<th>Note</th>
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</table>
## 2.2.4 Pulmonary Edema (CHF)

### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>This protocol is used for patients who are exhibiting signs of pulmonary edema-CHF, including dyspnea with rales and/or wheezing (cardiac asthma). The patient may also have diminished air exchange. Other treatments for the causes of pulmonary edema-CHF should be considered (e.g., supraventricular tachycardia, myocardial infarction, and cardiogenic shock). A patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” The paramedic must remember that patients with CHF may also present with wheezing. If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma).</td>
</tr>
</tbody>
</table>

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.1.5).
- If the patient is hypotensive (systolic BP below 90 mm Hg), Adult Protocol 2.4.1, Cardiogenic Shock.

**ALS Level 1**

- If there is no improvement in the patient’s pulse oximetry, capnography, and mental status, consider use of an advanced airway (Medical Procedure 4.4).
- Establish an IV; give normal saline KVO.
- Do not administer nitroglycerin (NTG) if:
  - The patient’s systolic BP is below 100 mm Hg.
  - The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    - Stendra (Avanafil) – in the past 12 hours
    - Viagra (Sildenafil) – in the past 24 hours
    - Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours
- If the patient’s systolic BP is between 100 and 160 mm Hg, give nitroglycerin (Nitrostat® or Nitrolingual® spray) 0.4mg SL, prior to applying CPAP. May repeat every 3 to 5 minutes (maximum of two additional doses (0.4mg/each) if the patient is symptomatic and the systolic pressure is greater than 100 mmHg (b)).
- If the patient’s systolic BP is above 160 mm Hg, give nitroglycerin (Nitrostat® or Nitrolingual® spray) 0.8mg SL, prior to applying CPAP. May repeat as needed every 3 to 5 minutes (0.4mg/each) if the patient is symptomatic and the systolic blood pressure is greater than 160 mmHg (b) (c).
- Administer CPAP with **10 cm H₂O PEEP** (Medical Procedure 4.12) (a).
- Reevaluate the need for advanced airway management. If there is no improvement in the patient’s pulse oximetry, capnography, and mental status, consider use of advanced airway management (Medical Procedure 4.4, and Medical Procedure 4.10, Capnography).
### TREATMENT GUIDELINES

#### 2.2.4 Pulmonary Edema (CHF) (continued)

- None

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) The CPAP mask must be tight fitting. Some patients may not tolerate CPAP at 10 cm H$_2$O PEEP initially, in which case you may start with lower pressures (5 – 7.5 cm H$_2$O PEEP). CPAP should not be used if the patient’s systolic BP below 100 mm Hg.</td>
</tr>
<tr>
<td>(b) Consider withholding if the clinical presentation of the patient indicates signs of hypovolemia (e.g., poor skin turgor, decreased capillary refill, and elevated temperature).</td>
</tr>
<tr>
<td>(c) It is preferred to have an IV in place prior to NTG administration. However, if you are unable to establish IV access, NTG may be administered with caution.</td>
</tr>
</tbody>
</table>
### 2.2.5 Suspected Pneumonia

**GENERAL GUIDELINES**

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients complaining of dyspnea should be suspected of having pneumonia when they present with fever, productive cough, possible pleuritic chest pain, history of being bedridden, known immune-compromise, diabetes, elderly age, and lung sounds indicative of consolidation (rales and/or rhonchi with egophony over area of consolidation).</td>
</tr>
</tbody>
</table>

**TREATMENT GUIDELINES**

| Supportive Care |
|-----------------
| - Initial Assessment Protocol 2.1.1. |

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Establish an IV; If lungs sounds are clear administer 500mL normal saline</td>
</tr>
<tr>
<td>- Give albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.</td>
</tr>
<tr>
<td>- If bronchodilators are administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to albuterol nebulizer treatment.</td>
</tr>
<tr>
<td>- Avoid the use of diuretics.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
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</thead>
<tbody>
<tr>
<td>➢ None</td>
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<table>
<thead>
<tr>
<th>Note</th>
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</table>
## 2.3 Adult Cardiac Dysrhythmias

### GENERAL GUIDELINES

The paramedic should use these protocols to guide him/her through the treatment of cardiac patients with specific dysrhythmias and accompanying signs and symptoms. After stabilization of the patient, the paramedic may need to refer to additional protocols for continued treatment (e.g., other cardiac protocols).

In cardiac arrest, a major component of the primary and secondary survey is to consider the secondary, differential diagnosis and to think carefully about what could be causing the arrest. The “H’s and T’s” chart will assist in the recognition of a possible underlying cause.

<table>
<thead>
<tr>
<th>H’s Cause</th>
<th>Treatment</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Fluid challenge NS 500 mL IV/IO</td>
<td>Protocol 2.10</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Airway management</td>
<td>Protocol 2.1.2</td>
</tr>
<tr>
<td>Hydrogen ion-acidosis</td>
<td>Airway management, ventilate consider Sodium Bicarbonate</td>
<td>Protocol 2.1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drug Summary 5.31</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Consider Calcium Chloride 1 g</td>
<td>Drug Summary 5.9 and 5.31</td>
</tr>
<tr>
<td></td>
<td>Consider Sodium Bicarbonate 1 mEq/kg</td>
<td></td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Cold-related emergencies</td>
<td>Protocol 2.9.2</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>If less than 60, consider D$_{50}$ or Glucagon</td>
<td>Protocol 2.8.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drug Summary 5.9 and 5.16</td>
</tr>
<tr>
<td>Hypocalcemia</td>
<td>Consider Calcium Chloride 1 g</td>
<td>Drug Summary 5.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T’s Cause</td>
<td>Treatment</td>
<td>Protocol</td>
</tr>
<tr>
<td>Tablets</td>
<td>Consult poison control for specific therapy</td>
<td>Protocol 2.6</td>
</tr>
<tr>
<td>Tamponade, cardiac</td>
<td>Consider fluid challenge, Dopamine drip</td>
<td>Protocol 2.4.1</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Consider chest decompression</td>
<td>Procedure 4.9</td>
</tr>
<tr>
<td>Thrombosis, coronary</td>
<td>Consider AMI, cardiogenic shock</td>
<td>Protocol 2.4.2</td>
</tr>
<tr>
<td>Thrombosis, pulmonary</td>
<td></td>
<td>Protocol 2.4.1</td>
</tr>
<tr>
<td>Trauma</td>
<td></td>
<td>Protocol 2.10</td>
</tr>
</tbody>
</table>
2015 ADULT ASYSTOLE/PEA ALGORITHM

Adult Cardiac Arrest Algorithm—2015 Update

1. Start CPR
   • Give oxygen
   • Attach monitor/defibrillator

2. Rhythm shockable?
   Yes: VF/pVT
   No: Asystole/PEA

3. Shock
   CPR 2 min
   • IV/O access

4. Rhythm shockable?
   Yes: CPR 2 min
   • IV/O access
   • Epinephrine every 3-5 min
   • Consider advanced airway, capnography
   No: CPR 2 min
   • Amiodarone
   • Treat reversible causes

5. Shock
   CPR 2 min
   • IV/O access
   • Epinephrine every 3-5 min
   • Consider advanced airway, capnography

6. Rhythm shockable?
   Yes: CPR 2 min
   • IV/O access
   • Epinephrine every 3-5 min
   • Consider advanced airway, capnography
   No: CPR 2 min
   • Treat reversible causes

7. Shock
   CPR 2 min
   • IV/O access
   • Epinephrine every 3-5 min
   • Consider advanced airway, capnography

8. Rhythm shockable?
   Yes: CPR 2 min
   • IV/O access
   • Epinephrine every 3-5 min
   • Consider advanced airway, capnography
   No: CPR 2 min
   • Treat reversible causes

9. Asystole/PEA

10. CPR 2 min
    • IV/O access
    • Consider advanced airway, capnography

11. Rhythm shockable?
    Yes: CPR 2 min
    • Treat reversible causes
    No: CPR 2 min
    • Treat reversible causes

12. If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
    • If ROSC, go to Post–Cardiac Arrest Care

CPR Quality
• Push hard (at least 2 inches [5 cm] and fast [100-120/min] and allow complete chest recoil.
• Minimize interruptions in compressions.
• Avoid excessive ventilation.
• Rotate compressor every 2 minutes, or sooner if fatigued.
• If no advanced airway, 30:2 compression-ventilation ratio.
• Quantitative waveform capnography
  – If PETCO₂ <10 mm Hg, attempt to improve CPR quality.
• Intra-arterial pressure
  – If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
• Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J; if unknown, use maximum available). Second and subsequent doses should be equivalent; and higher doses may be considered.
• Monophasic: 360 J

Drug Therapy
• Epinephrine IV/O dose:
  1 mg every 3-5 minutes
• Amiodarone IV/O dose:
  First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
• Endotracheal intubation or supraglottic advanced airway
• waveform capnography or capnometry to confirm and monitor ET tube placement
• Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
• Pulse and blood pressure
• Abnormal sustained increase in PETCO₂ (typically ≥40 mm Hg)
• Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
• Hypovolemia
• Hypoxia
• Hyperglycemia (acidosis)
• Hyperkalemia
• Hypothermia
• Tension pneumothorax
• Tamponade, cardiac
• Toxins
• Thrombosis, pulmonary
• Thrombosis, coronary
### 2.3.1 Asystole/Pulseless Electrical Activity (PEA)

#### Supportive Care

- Consider criteria for death/no resuscitation (General Protocol 1.4).
- Initial Assessment Protocol 2.1.1.
- Look for no breathing or only gasping and check pulse (simultaneously)
- If no pulse, begin CPR using cycles of 30 compressions and 2 breaths for 2 minutes while monitor is being attached.
- Oxygenate with 15-25 L/min via bag-valve mask (BVM) with an appropriate airway adjunct (Airway Management Protocol 2.1.2) (a).
- Do not interrupt the 2 minutes of CPR to check the heart rhythm. **Continuous uninterrupted CPR is paramount to patient survival.**
- Check the heart rhythm; confirm asystole in two leads.
- Resume 2 minutes of CPR at a rate of 100-120 per minute; check the heart rhythm.
- Consider the H’s and T’s.

#### ALS Level 1

- Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at the hospital.
- Establish IV or IO access; give normal saline KVO. Consider infusing saline wide open in PEA.
- When IV or IO line is established:
  - Epinephrine (1:10,000) 1 mg IV/IO; repeat every 3-5 minutes.
  - Give 2 minutes of CPR, check the heart rhythm.
  - Search for and treat possible contributing factors; see the H’s and T’s charts.
- If the patient is taking a calcium-channel blocker or has known renal failure, give Calcium Chloride 10% 1 g IV or IO.
- As soon as the patient regains spontaneous circulation (Return of Spontaneous Circulation (ROSC) Protocol 2.3.7

#### ALS Level 2

- None

#### Note

(a) Provide a 30:2 compression to ventilation ratio.
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) If EtCO₂ less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO₂ = 12 - 25mm Hg: Goal during resuscitation.
   If EtCO₂ = 35 - 45mm Hg: Check for ROSC
(c) If ROSC achieved, wean down oxygen to maintain a SpO₂ equal to greater than 94%
2.3.2 Bradycardia

TREATMENT GUIDELINES

Supportive Care

Patients who present with a heart rate less than 50 and are symptomatic (a).

Consider the potential causes:
- Acute myocardial infarction
- Head injury
- Atrio-ventricular block
- Hypoxia
- Hypoglycemia
- Medications (beta blockers)
- Trauma

- Acute myocardial infarction
- Calcium-channel blockers
- Clonidine
- Digitalis (e)
- Toxins
- Sick sinus syndrome
- Spinal cord lesion

- Initial Assessment Protocol 2.1.1.
- Access the CABs and vital signs.
- Apply a SpO$_2$ monitor, and administer oxygen to maintain SpO$_2$ greater than or equal to 94% or assist with bag-valve mask (BVM) ventilations if indicated.
- Consider the H’s and T’s.

ALS Level 1

- Establish IV access; give normal saline KVO.
- Perform 12-lead ECG. If inferior wall MI is identified, perform additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI (b).

Unstable (e.g., acutely altered mental status, ischemic chest pain/discomfort, acute heart failure, hypotension (systolic BP below 100 mm Hg), dyspnea, heart blocks or ischemia/infarction on 12-lead ECG or other signs of shock that persist despite adequate airway and breathing),

- Atropine 0.5 mg IV/IO; repeat every 3 - 5 minutes, up to a maximum total dose of 3 mg (a) (b) (c).
  - If atropine is ineffective, consider pacing (e) (f)

OR
- Dopamine drip infusion 5–10 mcg/kg/min, titrate to maintain minimum systolic BP of 100 mm Hg and maximum systolic BP of 120 mm Hg

OR
- Epinephrine drip infusion 2-10 mcg per minute, titrate to maintain minimum systolic BP of 100 mm Hg and maximum systolic BP of 120 mm Hg

- Bradycardia with hypotension may be due to an inferior wall MI associated with right ventricular MI (confirmed on 12-lead ECG as a V4R ST elevation). If the patient has an acute inferior wall MI with hypotension and clear lungs, give normal saline 500 cc fluid challenge; may repeat once (Adult Protocol 2.4.2, Chest Pain—Suspected AMI).
  - When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin) and Morphine/Fentanyl.
  - If bradycardia and hypotension exist, pacing and IV fluids may improve the patient’s hemodynamic status; consider pacing and IV fluids prior to the use of Atropine. Also refer to Adult Protocol 2.4.2, Angina/Suspected AMI. (b)
If the patient has persistent hypotension/cardiogenic shock, give Dopamine 5–10 mcg/kg/min (1600 mcg/mL infusion concentration = 15-60 gtt/min). Titrate to maintain a minimum systolic BP of 100 mm Hg and maximum BP of 120 mm Hg. If pacing is chosen as the second-line treatment and it is also ineffective, begin an infusion of dopamine or epinephrine.

- If the patient is conscious and aware of the situation during pacing, administer one of the following benzodiazepines (d): (Medical Procedure, Medication Delivery 4.18).
  
  Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, to a maximum dose of 10 mg.  
  OR
  Midazolam (Versed) (5 to 10 mg) IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg (d).  
  OR
  Lorazepam (Ativan) 2 mg IV, IO, IM, or IN; may repeat once, to a maximum dose of 4 mg.

**ALS Level 2**

- None

**Note**

- (a) Consider pacing before giving the maximum dose of atropine.
- (b) For second-degree AV block type II and third-degree AV block, omit Atropine and use an external pacer.
- (c) Use atropine with caution in the presence of myocardial ischemia.
- (d) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
- (e) If suspected digitalis toxicity, Atropine improves AV nodal conduction. Caution should be used with pacing because it can lower the fibrillatory threshold and induce arrhythmias. Refer to Protocol 2.6.4 Digitalis Toxicity.
- (f) If pacing is chosen as the second-line treatment and it is also ineffective, begin an infusion of dopamine or epinephrine.
**2015 BRADYCARDIA ALGORITHM**

### Adult Bradycardia With a Pulse Algorithm

1. **Assess appropriateness for clinical condition.**
   Heart rate typically <50/min if bradyarrhythmia.

2. **Identify and treat underlying cause**
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. **Persistent bradyarrhythmia causing:**
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. **Monitor and observe**
   - **No**

5. **Atropine**
   - If atropine ineffective:
     - Transcutaneous pacing
     - **Dopamine** infusion
     - **Epinephrine** infusion

6. **Consider:**
   - Expert consultation
   - Transvenous pacing

---

**Doses/Details**

- **Atropine IV dose:**
  First dose: 0.5 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg.

- **Dopamine IV infusion:**
  Usual infusion rate is 2-20 mcg/kg per minute. Titrate to patient response; taper slowly.

- **Epinephrine IV infusion:**
  2-10 mcg per minute infusion. Titrate to patient response.

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2.3.3 Narrow Complex Tachycardia

**GENERAL GUIDELINES**

Patients suffering from tachycardia may or may not exhibit symptoms. It is important to note that narrow complex tachycardia has many origins. The atrial rate may be helpful in the differential interpretation of these types of tachycardia. The following rates should be considered:

- **Sinus tachycardia** ranges from 100 to 160 beats per minute.
- **Junctional tachycardia** ranges from 100 to 180 beats per minute.
- **Atrial tachycardia** ranges from 150 to 250 beats per minute (atrial rate).
- **Atrial flutter** ranges from 250 to 350 beats per minute (atrial rate).
- **Atrial fibrillation** starts at 350 beats per minute (atrial rate).

In addition, wide complex tachycardia (QRS greater than or equal to 0.12 seconds) should initially be considered as ventricular in origin, unless proven otherwise (e.g., documented QRS morphology consistent with preexisting BBB; refer to Adult Medical Protocol 2.3.6, Wide Complex Tachycardia with a Pulse).

Those patients who present with SVT may have evidence of cardiovascular dysfunction. Those patients who present with symptomatic signs and symptoms may be treated with medications. Those patients who present with “unstable” signs and symptoms should be cardioverted immediately.

The following table shows stable to unstable signs and symptoms:

<table>
<thead>
<tr>
<th>Symptomatic (Stable)</th>
<th>Critical (Unstable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert and oriented</td>
<td>Decreased level of consciousness</td>
</tr>
<tr>
<td>SBP equal to greater than 100 mm Hg</td>
<td>SBP below 100 mm Hg (shock)</td>
</tr>
<tr>
<td>Mild chest discomfort</td>
<td>Chest pain</td>
</tr>
<tr>
<td>Mild to Moderate Shortness of breath</td>
<td>Severe Shortness of breath</td>
</tr>
<tr>
<td></td>
<td>Diaphoresis</td>
</tr>
<tr>
<td></td>
<td>Pulmonary edema/CHF</td>
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</tbody>
</table>
### 2.3.3 Narrow Complex Tachycardia (Supraventricular Tachycardia) (continued)

#### GENERAL GUIDELINES

**NARROW COMPLEX TACHYCARDIAS**  
Heart Rate greater than 150 BPM

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Determine hemodynamic stability and symptoms.
- Consider the H’s and T’s.

**ALS Level 1**

STABLE SVT, HEART RATE greater than or equal to 150 BPM

- Apply the ECG monitor, record a rhythm strip, and obtain a 12-lead ECG.
- Establish IV access; give normal saline KVO.
- If the patient is asymptomatic, provide medical supportive care (Protocol 2.1.3) and transport immediately.
- If necessary, perform vagal maneuvers (Medical Procedure 4.26).
- If not resolved, administer Adenosine Triphosphate (Adenocard®) 12 mg rapid IVP, followed by rapid 10 mL NS flush.
- If not resolved, after 2 minutes Adenosine Triphosphate (Adenocard) 12 mg rapid IVP, followed by rapid 10 mL NS flush. (a).
- If available, administer Diltiazem (Cardizem) 0.25 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.25 mg/kg.
  - Stop the administration of Cardizem once the Heart Rate is less than 120 and/or SBP is less than 100mmHg.

**ALS Level 2**

- If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.35 mg/kg.

**Note**

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>Supportive Care</th>
<th>ALS Level 1</th>
<th>ALS Level 2</th>
</tr>
</thead>
</table>
| **NARROW COMPLEX TACHYCARDIAS** | • Initial Assessment Protocol 2.1.1.  
• Determine hemodynamic stability and symptoms.  
• Consider the H’s and T’s. | STABLE SVT, HEART RATE greater than or equal to 150 BPM  
- Apply the ECG monitor, record a rhythm strip, and obtain a 12-lead ECG.  
- Establish IV access; give normal saline KVO.  
- If the patient is asymptomatic, provide medical supportive care (Protocol 2.1.3) and transport immediately.  
- If necessary, perform vagal maneuvers (Medical Procedure 4.26).  
- If not resolved, administer Adenosine Triphosphate (Adenocard®) 12 mg rapid IVP, followed by rapid 10 mL NS flush.  
- If not resolved, after 2 minutes Adenosine Triphosphate (Adenocard) 12 mg rapid IVP, followed by rapid 10 mL NS flush. (a).  
- If available, administer Diltiazem (Cardizem) 0.25 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.25 mg/kg.  
  - Stop the administration of Cardizem once the Heart Rate is less than 120 and/or SBP is less than 100mmHg. | • If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.35 mg/kg. |
### 2.3.3 Narrow Complex Tachycardia (Supraventricular Tachycardia continued)

#### GENERAL GUIDELINES

**STABLE ATRIAL FIBRILLATION OR ATRIAL FLUTTER**
Heart rate greater than or equal to 150 BPM

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>TREATMENT GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Apply the ECG monitor, record a rhythm strip, and obtain a 12-lead ECG.</td>
<td></td>
</tr>
<tr>
<td>- Establish IV access; give normal saline KVO.</td>
<td></td>
</tr>
<tr>
<td>- If the patient is asymptomatic, provide medical supportive care (Protocol 2.1.3) and transport immediately.</td>
<td></td>
</tr>
<tr>
<td>- If the patient has borderline symptoms with a SBP of 100 mm Hg, then consider other causes of hypotension (e.g., hypovolemia or sepsis)</td>
<td></td>
</tr>
<tr>
<td>- If available, administer Diltiazem (Cardizem) 0.25 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.25 mg/kg.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Stop the administration of Cardizem once the Heart Rate is less than 120 and/or SBP is less than 100mmHg.</td>
</tr>
<tr>
<td>- If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.35 mg/kg IV.</td>
<td></td>
</tr>
</tbody>
</table>

#### ALS Level 2

- ➢

#### Note
### General Guidelines

**UNSTABLE NARROW COMPLEX TACHYCARDIAS**

This patient group includes individuals who are hypotensive with a systolic BP less than 100 mm Hg and a heart rate greater than or equal to 150 beats/min and who are symptomatic (clinical evidence of impending cardiac arrest) as evidenced by any of the following:

- Diaphoresis
- Shortness of breath
- Decreased level of consciousness
- Chest pain
- Pulmonary edema

### Treatment Guidelines

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Determine hemodynamic stability and symptoms.
- Consider the H’s and T’s.

#### ALS Level 1

- Provide advanced airway management, if necessary (c).
- Establish IV access; give normal saline KVO.
- Evaluate lung sounds. If they are clear, administer a fluid challenge of normal saline 500 mL IV.
- Perform synchronized cardioversion. Start at the lower dose and increase to the higher dose until appropriate clinical effect is obtained.
  - Narrow regular SVT, atrial flutter: 50-100 joules
  - Narrow irregular, atrial fibrillation: 120-200 joules (per manufacture recommendation)
- Escalate the second and subsequent shock doses as needed.
- If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines (d): (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN, maximum dose of 10 mg (e)
  - OR
  - Midazolam (Versed) 5 to 10 mg IV, IO, IM or IN (In concentration 10mg/2ml)
  - OR
  - Lorazepam (Ativan) 2 mg IV, IO, IM, or IN; may rpat once, up to a max dose of 4 mg (e).

#### ALS Level 2

- None

#### Note

(a) Adenosine Triphosphate should not be given to patients with known atrial flutter or atrial fibrillation.

(b) Do not give diltiazem (Cardizem®) to patients with a known history of Wolff-Parkinson-White (WPW) syndrome.

(c) Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at hospital.

(d) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
### 2.3.4 Premature Ventricular Ectopy (PVC)

**GENERAL GUIDELINES**

| General Guidelines | Treatment of ventricular arrhythmias after MI has been a controversial topic for two decades. Similarly, management of ventricular arrhythmias during the acute phase of MI continues to evolve as treatment strategies are reviewed in the context of new information and changing epidemiological data during the era of adjunctive medical and reperfusion therapy. At present, the treatment of asymptomatic premature ventricular ectopy (PVC) is not recommended. Current ACLS protocols recommend amiodarone for the treatment of hemodynamically stable VT and prevention of recurrent VF. |

**TREATMENT GUIDELINES**

| Supportive Care | • Initial Assessment Protocol 2.1.1.  
| | • Medical Supportive Care Protocol 2.1.3 |

| ALS Level 1 | ➢ None |

| ALS Level 2 | ➢ If the patient is symptomatic, contact the physician for further orders |

**Note**
## 2.3.5 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia)

### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>STABLE</th>
</tr>
</thead>
</table>

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Consider the H’s and T’s.

#### ALS Level 1

- Monitor the ECG.
- Establish IV access; give normal saline KVO.
- Give Amiodarone infusion of 150 mg in 50 mL or 100 mL of D₅W over 10 minutes IV
- If the patient has torsades de pointes, administer Magnesium Sulfate 2 g in 50 mL or 100 mL of D₅W infused over 5-10 minutes IV. If the Magnesium Sulfate successfully converts the rhythm, start Magnesium Sulfate maintenance infusion (1 g in 250 mL of D₅W) at 30-60 gtts/min. with a 60 gtts set.

#### ALS Level 2

- None

#### Note
### 2.3.5 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia continued)

#### General Guidelines

**UNSTABLE** - Heart rate greater than 150 beats/min and systolic blood pressure less than 100 mm Hg with one of the following signs and symptoms: chest pain, dyspnea, pulmonary edema, diaphoresis, and altered mental status.

#### Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- If necessary, oxygenate with 15-25 L/min via bag-valve mask (BVM) with an appropriate airway adjunct device at 10-12 BPM (Airway Protocol 2.1.2) (a).
- Confirm airway adjunct placement.
- Consider the H’s and T’s.

**ALS Level 1**

- Monitor the ECG.
- For unstable monomorphic perform synchronized cardioversion at 100, 200, 300, or 360 joules. If wide irregular/unstable or polymorphic and/or torsades: defibrillate at 200 joules (not synchronized). (c)(d)
- Establish IV or IO access; give normal saline KVO.
  - If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines (b): (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
  - Midazolam (Versed) 5 to 10 mg IV, IO, IM or IN (In concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a maximum dose of 4 mg

**ALS Level 2**

- None

#### Note

(a) Provide one breath every 5-6 seconds
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension. If an antiarrhythmic medication was not administered prior to cardioversion, then administer an. Give Amiodarone infusion of 150 mg in 50 mL or 100 mL of D5W over 10 minutes IV.
(c) IV if patient’s BP is above 100.
(d) If suspected digitalis toxicity, consider lowering initial cardioversion dose to 5-20 joules. Protocol 2.6.4 Digitalis Toxicity
### 2.3.6 Wide Complex Tachycardia Without a Pulse/Ventricular Fibrillation

**TREATMENT GUIDELINES**

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Determine the patient’s responsiveness or unresponsiveness.
- Look for no breathing or only gasping and check pulse (simultaneously).
- If no pulse, begin CPR using cycles of 30 compressions and 2 breaths for 2 minutes while monitor is being attached.
- Oxygenate with 15-25 L/min via a BVM with an appropriate airway adjunct device. (see Airway Protocol 2.1.2) (a) (e).
- Do not interrupt the 2 minutes of CPR to check heart rhythm. **Continuous uninterrupted CPR is paramount to patient survival.**
- Check the heart rhythm. Confirm the rhythm and shock accordingly (b).
- Perform a focused rapid assessment.
- Consider the H’s and T’s.

#### ALS Level 1

- Confirm placement of the airway adjunct with electronic EtCO₂ and wave-form while on scene, during transport, and during transfer at hospital.
- Establish IV or IO access; give normal saline KVO.
- Defibrillate at 200 joules (for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 300 joules for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- When an IV or IO line is established
  - Give Epinephrine (1:10,000) 1 mg IV/IO; repeat every 3-5 minutes for the duration of the arrest.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 360 joules for a biphasic. Continue CPR while the defibrillator is charging.
- Immediately CPR for 2 minutes.
- Administer Amiodarone 300 mg IV/IO once. If V-Fib/pulseless V-Tach continues after 3-5 minutes administer an additional 150 mg IV/IO once. Administer during CPR.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 360 joules for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm.
- If the patient has torsades de pointes, administer Magnesium Sulfate 2 g in 50 mL or 100 mL of D₅W infused over 5-10 IV/IO (c).
- Continue treatment until there is a return of spontaneous circulation (ROSC), a rhythm change, or termination of efforts.
- If the patient has Return of Spontaneous Circulation (ROSC), (Protocol 2.3.7).
2.3.6 Wide Complex Tachycardia Without a Pulse/Ventricular Fibrillation (continued)

TREATMENT GUIDELINES

Note

(a) Provide a 30:2 compression to ventilation ratio.
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) The EMT should apply the AED. The paramedic should proceed to ALS Level 1 defibrillation.
(c) If Magnesium Sulfate successfully converts the heart rhythm, start a Magnesium Sulfate maintenance infusion (1 g in 250 mL NS) at 30-60 gtts/min.
(d) If EtCO₂ is less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO₂ = 12-25mm Hg: Goal during resuscitation.
   If EtCO₂ = 35-45mm Hg: Check for ROSC
(e) For Zoll monitor biphasic device the manufacturer recommends the initial defibrillation at 120 joules and subsequent defibrillations at 150, 200 as the maximum.
Adult Cardiac Arrest Circular Algorithm—2015 Update

Start CPR
- Give oxygen
- Attach monitor/defibrillator

2 minutes

Return of Spontaneous Circulation (ROSC)

Check Rhythm

If VF/pVT Shock

Post-Cardiac Arrest Care

Drug Therapy
- IV/IO access
- Epinephrine every 3-5 minutes
- Amiodarone for refractory VF/pVT

Consider Advanced Airway
- Quantitative waveform capnography

Treat Reversible Causes

CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If PETCO$_2$ <10 mm Hg, attempt to improve CPR quality
  - Intra-arterial pressure.
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO dose: 1 mg every 3-5 minutes
- Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PETCO$_2$ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
### 2.3.7 Return of Spontaneous Circulation (ROSC)

#### GENERAL GUIDELINES

**General Guidelines**

Post-resuscitation is an extremely unstable period for the patient, so the patient should be monitored closely and reassessed frequently. The immediate goals of post-resuscitation care are as follows:

- Provide cardio-respiratory support to optimize tissue perfusion, especially to the brain.
- Institute antiarrhythmic therapy to prevent recurrence of the arrest.
- Attempt to identify the precipitating cause of the arrest.
- Rapidly transport the patient to the closest appropriate facility.

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Reassess the CABs and vital signs.

#### ALS Level 1

- Maintain an open airway with an appropriate airway adjunct device, administer 100% O₂ to maintain SpO₂ greater than or equal to 94%, and monitor with electronic EtCO₂ capnography/waveform. Ventilate at 10-12 BPM; **avoid hyperventilation** (d).
  - Determine the patient’s hemodynamic stability. If systolic blood pressure below 100 mm Hg:
  - If the patient’s lungs are clear, administer IV NS 500 mL; may repeat once to maintain systolic blood pressure above 100 mm Hg (a).

If systolic BP remains below 100 mm Hg:

- Give a Dopamine infusion at 5 – 10 mcg/kg/min; titrate to maintain minimum systolic BP of 100 mm Hg and a maximum systolic BP of 120 mm Hg

- Manage dysrhythmias according to the specific protocol.
- If the cardiac arrest was the result of VF or VT, manage the patient as follows:
  - If an antiarrhythmic medication was *not* used to convert the heart rhythm, administer Amiodarone 150 mg in 50 mL or 100 mL of D5W over 10 minutes IV/IO (b).
  - If Amiodarone was administered during resuscitation, do not administer additional Amiodarone.
  - If the patient is having frequent PVC or runs of VT, or if the transport time will exceed 30 minutes, start an Amiodarone drip (150 mg in 50 mL of D5W = 3:1 concentration). Using a 60 gtt/mL set, initiate the flow at 1 gtt every 3 seconds.

Transport the patient to the closest interventional cardiac facility (c).

#### ALS Level 2

- None

#### Note

- (a) If rales or crackles are auscultated in the lungs or the patient’s systolic blood pressure remains less than 90 mm Hg despite fluid therapy, proceed directly to dopamine administration.
- (b) Do not use Amiodarone if the patient has a heart rate less than 60, second-degree type II AV block, third-degree AV block or if patient is hypotensive
- (c) If the patient’s airway is compromised or crews are unable to manage the patient, transport the patient to the nearest facility.
- (d) If EtCO₂ is less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
  - If EtCO₂ = 12-25mm Hg: Goal during resuscitation.
  - If EtCO₂ = 35-45mm Hg: Check for ROSC
### 2.4.1 Cardiogenic Shock

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>TREATMENT GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>This protocol is used for the patient who is hypotensive (systolic BP less than 100 mm Hg) with signs and/or symptoms that are cardiac in origin (Adult Protocol 2.2.4, Pulmonary Edema-CHF; Adult Protocol 2.3, Adult Cardiac Dysrhythmias; and Adult Protocol 2.4.2, Angina/Suspected AMI).</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Supportive Care</strong></th>
<th><strong>ALS Level 1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initial Assessment Protocol 2.1.1.</td>
<td>• Monitor the ECG.</td>
</tr>
<tr>
<td>• Administer oxygen via non-rebreather mask (10-15 L/min). If the patient’s airway is compromised, assist ventilations by using the appropriate airway adjunct.</td>
<td>• Perform a 12-lead ECG, and initiate a Cardiac Alert if AMI is present.</td>
</tr>
<tr>
<td>• Consider possible causes (e.g., the H’s and T’s).</td>
<td>• Start IV/IO normal saline. If time permits, establish a second IV/IO line if possible.</td>
</tr>
<tr>
<td></td>
<td>• If the patient is not experiencing pulmonary edema, administer a fluid challenge of 500 mL normal saline. If this measure does not improve the patient’s systolic blood pressure, the fluid challenge may be repeated once (a).</td>
</tr>
<tr>
<td></td>
<td>• If the fluid challenge does not improve blood pressure, or if the patient is experiencing rales (or pulmonary edema), administer a Dopamine infusion at 5-20 mcg/kg/min (b).</td>
</tr>
<tr>
<td></td>
<td>• Titrate Dopamine to maintain a minimum systolic SBP of 100 mm Hg and a maximum systolic BP of 120 mm Hg.</td>
</tr>
<tr>
<td></td>
<td>• If the heart rate is slow, less than 60/min, Adult Protocol 2.3.2, Bradycardia.</td>
</tr>
<tr>
<td></td>
<td>• If the heart rate is fast, greater than 150/min, Adult Protocol 2.3.3, Narrow Complex Tachycardia, or Adult Protocol 2.3.6, Wide Complex Tachycardia with a Pulse, as appropriate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ALS Level 2</strong></th>
<th><strong>Note</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
<td>(a) Avoid giving fluids if an anterior wall MI is suspected (evidenced by ST elevations in leads I, AVL, V1 through V6).</td>
</tr>
<tr>
<td></td>
<td>(b) Dopamine 1600 mcg/mL infusion concentration = 15-60 gtt/min with a 60-gtt set. The maximum dose is 20 mcg/kg/min.</td>
</tr>
</tbody>
</table>
2.4.2 Angina/Suspected AMI

GENERAL GUIDELINES

This protocol is used for the patient who is experiencing chest pain or discomfort due to angina pectoris or suspected AMI. Other SS associated with acute coronary syndrome include dyspnea, diaphoresis, nausea/vomiting, and weakness/fatigue. If these additional signs and symptoms are present in the absence of chest pain or discomfort, AMI may still be present. If nontraumatic chest pain other than angina/AMI is suspected consider other potential causes; dissecting aortic aneurysm, pericarditis, spontaneous pneumothorax, pulmonary embolism, pneumonia, pleurisy, costochondritis, hiatal hernia, esophageal spasm, peptic ulcer, cholecystitis, pancreatitis, and cervical disk problem These conditions should not be treated under this protocol, refer to specific protocol and utilize Appendix 6.5, Chest Pain Differential.

TREATMENT GUIDELINES

Supportive Care

- Initial Assessment Protocol 2.1.1.
- Consider oxygen if the SpO2 is less than 94% and/or the patient is in respiratory distress. Maintain SpO2 of 94% (nasal cannula recommended).
- EMTs should:
  o Assist the patient in self-admission of previously prescribed Aspirin.
  o Assist the patient in self-administration of previously prescribed Nitroglycerin. The total dose should not exceed three doses (tablets or spray), including doses that the patient may have taken prior to your arrival. Do NOT administer Nitroglycerin if the SBP less than 100 mm Hg or The patient has taken erectile dysfunction medications within the last 24 hours (Viagra) or within the last 48 hours (Levitra or Cialis) The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    a. Stendra (Avanafil) – in the past 12 hours
    b. Viagra (Sildenafil) – in the past 24 hours
    c. Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours

ALS Level 1

- Monitor the ECG.
- If AMI is probable (c), initiate a Cardiac Alert and transport the patient to the appropriate cardiac interventional facility.
- Limit cardiac alert on scene time. (d)
- Establish IV access; give normal saline KVO.
- Give aspirin 162 mg, up to 324 mg PO (chewable), unless contraindicated (a).
- Perform a 12-lead ECG and transmit the results to the destination hospital, as soon as possible.
- If an inferior wall MI is identified, perform an additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI (b). (Medical Procedure 4.14)
- If the patient is hypotensive (SBP less than 100 mm Hg), see Adult Protocol 2.4.1, Cardiogenic Shock.
- If the patient is experiencing chest pain or discomfort and systolic BP above 100 mm Hg, administer Nitroglycerin (Nitrostat® or Nitrolingual® Spray) 0.4 mg SL; repeat every 3-5 minutes (maximum dose is 1.2 mg or 3 doses).
2.4.2 Angina/Suspected AMI (continued)

TREATMENT GUIDELINES

ALS Level 1 continued

- Do NOT administer Nitroglycerin if:
  - SBP less than 100 mm Hg.
  - Patient taking drug classification phosphodiesterase-5 inhibitor (PDE-5).
  - The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    a. Stendra (Avanafil) – in the past 12 hours
    b. Viagra (Sildenafil) – in the past 24 hours
    c. Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours

- If pain continues and the patient is normotensive (systolic BP greater than 100 mm Hg), administer
  - Morphine 5 mg IVP may repeat once in 5 - 10 min (maximum 10 mg) Titrated to pain and BP greater than or equal to 100 mm Hg, up to a maximum of 10 mg. Can also be given IM (Medical Procedure, Medication Delivery 4.18)
  - OR
    - Fentanyl may be given 100 mcg increments IN/IM, every 3-5 minutes to a maximum of 200 mcg IN/IM
  - OR
    - IV dose 1mcg/kg SLOW IV increments every 3-5 minutes up to a maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg. (Medical Procedure, Medication Delivery 4.18).
    - Second dose if needed, maximum total dose of 200mcg IV/IN/IM.
    - If Fentanyl was initially given IN/IM and an IV is then established, one IV dose (50mcq) can be given if needed.
- Treat dysrhythmia per specific protocol.

ALS Level 2

➤ None

Note

(a) Allergies to ASA should be suspected in patients with anaphylaxis signs and symptoms (e.g., flushed itchy skin, increased heart rate, dyspnea, or urticaria).

(b) Bradycardia with hypotension may be due to an inferior wall MI associated with right ventricular MI (confirmed on 12-lead ECG by ST elevation in lead V4R); (Adult Protocol 2.3.2, Bradycardia). When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin). If bradycardia and hypotension exist, pacing and IV fluids may improve the patient’s hemodynamic status.

(c) AMI is probable when there is:
  1. A minimum of 1mm ST elevation in two or more related leads on the 12-lead ECG with a history suggestive of AMI, signs and symptoms regardless of onset time.
  2. A “new onset” left bundle branch block (LBBB) on the ECG with signs/symptoms and history suggestive of AMI.
  3. Patients meeting the above criteria should be transported to the nearest cardiac center and pre-alert the hospital of a Cardiac Alert.

(d) Minimize the Cardiac Alert on-scene time to 10 minutes or less.
## 2.4.3 Hypertensive Emergencies

### GENERAL GUIDELINES

**General Guidelines**

Hypertensive emergencies are commonly defined as accelerated blood pressures (systolic greater than 220 mm Hg, diastolic greater than 120 mm Hg) with signs and symptoms of end organ failure. Neurologic end-organ damage due to uncontrolled BP may include hypertensive encephalopathy and cerebral vascular accident. Cardiovascular end-organ damage may include myocardial ischemia/infarction, acute left ventricular dysfunction, acute pulmonary edema, and aortic dissection. Other organ systems may also be affected by uncontrolled hypertension, which may lead to acute renal failure, and eclampsia.

Hypertension is rarely treated in the prehospital setting. Treatment should focus on the patient’s presentation and not the blood pressure by itself. Blood pressures that should not be treated in the prehospital setting include:

- Transient hypertension secondary to pain, anxiety, hypoxia, or drug intoxication. (treatment should be directed at the underlying causes, not antihypertensive medications).
- Chronic hypertension. (rapid reduction of blood pressure in asymptomatic patients may cause more harm than benefit)
- Thrombotic stroke. (elevated blood pressure is a normal physiologic response to brain ischemia, excessively lowering of blood pressure in these patients may extend the area of injury)

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3: Administer oxygen via nasal cannula at 4 L/min (use a non-rebreather mask at 15 L/min if SpO₂ less than 94%). If the patient is asymptomatic, contact medical control.

**ALS Level 1**

Symptomatic patients with accelerated blood pressures should be treated by the appropriate protocol based on their symptoms.

- Chest pain consistent with myocardial ischemia or infarction, (Angina/AMI Protocol 2.4.2)
- Shortness of breath with signs and symptoms of acute pulmonary edema, (CHF Protocol 2.2.4)
- Patients in the 2nd or 3rd trimester of pregnancy (over 20 weeks) or up to 6 weeks postpartum with accelerated hypertension and or seizures (Toxemia of Pregnancy Protocol 2.7.4)

**ALS Level 2**

- Labetolol (Normodyne® or Trandate ®) 10-20 mg IV over 2 minutes for hypertension not associated with CVA (a), if available. May repeat in 20 minutes. (0.25mg/kg)

**Note**

- (a) if available
### 2.5.1 Altered Mental Status Unknown Etiology

#### GENERAL GUIDELINES

This protocol is used for patients with altered mental status where the etiology is unknown (e.g., patients with a history of diabetes; Adult Protocol 2.8.2).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3: Consider the need for cervical spine immobilization.
- Consider restraining the patient (Medical Procedure 4.23, Physical Restraints).
- **Contact the Poison Information Center (1-800-222-1222).**

**ALS Level 1**

- Obtain O2 Sat above 94% and EtCO2
- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If blood glucose below 60 mg/dL, refer to Hypoglycemia/Hyperglycemia Protocol 2.8.2. (b)
- Administer Naloxone (Narcan) 0.4 – 2 mg IV/IO, IM, or IN to restore adequate ventilatory effort and/or improve mental status and titrate to effect. Usual doses should not exceed 10mg, Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. (c).
  - If administering Naloxone (Narcan) via IN, use concentration 2 mg/2 mL. (Medical Procedure, Medication Delivery 4.18).
  - If administering Naloxone (Narcan) via prepackaged product Nasal Spray the dose is 4mg/0.1 ml spray IN
- If administering Naloxone (Narcan) via nebulization must use concentration 2 mg/2 mL (add 2 mg of Narcan to 3 mL of saline) and titrate to effect.
- Reevaluate the need for an advanced airway (Medical Procedure 4.4).

**ALS Level 2**

- **None**

#### Note

(a) Use appropriate discretion regarding immediate placement of an advanced airway in patients who may quickly regain consciousness, such as hypoglycemic after administration of D$_{50}$ or opiate overdose cases after administration of Narcan. If the patient is conscious with control of the airway, oral glucose may be given

(b) To avoid infiltration and resultant tissue necrosis, Dextrose 50% should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.

(c) Administration of Narcan to patients with chronic use of narcotics may induce withdrawal and/or violent behavior.

(d) Recent increase of synthetic opioids may require higher initial doses of Naloxone. Consider starting at 2 mg initial dose.
## 2.5.2 Violent, Combative and/or Excited Delirium (ExDS) Patient

### General Guidelines

- This treatment protocol is used in conjunction with General Protocol 1.2, Behavioral Emergencies. There are many reasons for patient to be impaired or violent like psychiatric, drug overdose, CVA, ETOH, hypoxia, hypoglycemia.
- If patient is violent and an immediate threat to the patient, EMS crew or bystander safety exists, chemical and/or physical restraint should be used to prevent patient from harming him / herself or others.
- If patient is not violent, be observant for possibility of violence and avoid provoking patient.
- Particular caution should be exercised when evaluating and treating any patient that was subdued by a “non-lethal” law enforcement device with pepper spray or taser.
- Typical findings for any violent and/or impaired patient:
  - P – Psychological issues
  - R – Recent drug / alcohol use
  - I – Incoherent thought process
  - O – Off (clothes) and sweating
  - R – Resistant to presence / dialogue
  - I – Inanimate objects / shiny / glass – violent
  - T – Tough, unstoppable, superhuman strength
  - Y – Yelling
- Excited delirium syndrome is a state in which a person is in a psychotic and extremely agitated state. Mentally the patient is unable to focus and process any rational thought. The condition is brought on by overdose on stimulant or hallucinogenic drugs, drug withdrawal, or psychiatric patient not taking medication for significant amount of time.
- Typical signs and symptoms to suspect excited delirium are elevated temperature, nudity, profuse sweating, and change from aggressive behavior to “instant tranquility.” These patients should be closely observed for cardiac and respiratory changes.

### Supportive Care

- Initial Assessment Protocol 2.1.1. Monitor the patient’s glucose.
- Follow Medical Supportive Care Protocol 2.1.3
- Consult with Law Enforcement about placing patient under Baker Act or Impaired/Incapacitated Persons Act, and refer to the Impaired/Incapacitated Persons Act (see General Protocol 1.2).
- Rule out non-psychiatric causes (e.g., drug overdose, CVA, ETOH, hypoxia, hypoglycemia).
- Apply SpO2 and administer oxygen to maintain SpO2 greater than or equal to 94%.
- Perform glucose test with finger stick.
- Obtain body temperature.
- If appropriate, consider physically restraining patient. (Medical Procedure 4.23, Physical Restraints).
2.5.2 Violent, Combative and/or Excited Delirium (ExDS) Patient (continued)

TREATMENT GUIDELINES

**ALS Level 1**

- If patient has elevated temperature above 100 degrees, consider cooling patient using cold packs to patient’s head, axilla and groin; if surface is ineffective consider cold fluid challenges of 500mL normal saline in increments, to a maximum of 30mL/kg to a maximum of 2 liters (goal temperature less than 100 degrees F).

- Administer Ketamine 4mg/kg IM, or 2mg/kg IN (concentration 100mg/mL). May be repeated in 20 minutes if desired effects are not met.

**OR**

- Consider administration one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium®) 5 mg IV, IM or IN; may repeat to a max of 20 mg (a) (b).
  - Midazolam (Versed) 2 mg increments IV, IO, or IN, up to a maximum dose of 10 mg (a).
  - Lorazepam (Ativan®) 2 mg IV, IM, or IN; may repeat once (maximum dose of 4 mg)(a)

**OR**

- Administer Haloperidol (Haldol®) 5 mg IM or IV (a) (c).if available; Administer Haloperidol with Diphenhydramine (Benadryl) 50 mg IM or SLOW IV.
- Initiate cardiac monitoring.
- Once patient has been sedated establish an IV; give normal saline wide open.
- Treat dysrhythmias per specific protocol (see Adult Protocol 2.3).
- Expedite transport – Transport Code 3 to closest appropriate facility.

**ALS Level 2**

- None

**Note**

(a) In some instances, IV administration may present a safety concern; in this case, IM or IN administration of sedatives may be the more desirable route.
## 2.5.3 Seizure Disorders

### GENERAL GUIDELINES

**General Guidelines**

This protocol should be used when the patient has witnessed, continuous convulsions (generalized tonic-clonic seizure or grand mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation. Consider the underlying etiology, such as hypoglycemia, drug overdose, head injury, or fever. Other types of seizures include absence (petit mal), simple partial (focal motor and Jacksonian), complex partial (psychomotor or temporal lobe), atonic (drop attacks), and myoclonic. When the patient is continuously showing signs of these other types of seizures, Medical Supportive Care Protocol 2.1.3 should be initiated and the paramedic should contact medical control for further direction.

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.

**ALS Level 1**

- If the patient is an eclamptic female, administer Magnesium Sulfate 4 g IV (mixed in 50 mL or 100 mL of D5W given over 5-10 minutes). (Toxemia of Pregnancy Protocol 2.7.4) (a).
- Administer one of the following benzodiazepines: (Medical Procedure 4.18, Medication Administration)
  - Midazolam (Versed) 10 mg Intranasal as first line (5 mg/mL concentration only). Alternatively Midazolam (Versed) 5-10 mg increments IV, IO, IM every 3 - 5 minutes to a maximum dose of 10 mg. (b)
  - OR
  - Diazepam (Valium®) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg. (b)
  - OR
  - Lorazepam (Ativan®) 2 mg IV, IO, IM, or IN; may repeat once as needed, up to a maximum dose of 4 mg. (b)
- Perform a glucose test with a finger stick (Medical Procedure 4.17). If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia 2.8.2.

**ALS Level 2**

- For additional benzodiazepine contact Medical Control

**Note**

(a) Females in their second or third of pregnancy (over 20 weeks gestation) who are seizing should be assumed to have eclampsia. It should also be noted that eclampsia can occur postpartum (up to 6 weeks post partum).
(b) For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
2.5.4 Suspected Stroke (CVA)

GENERAL GUIDELINES

This protocol is used for those patients exhibiting signs consistent with acute stroke/cerebrovascular accident (CVA)/“brain attack,” such as altered mental status, slurred speech, loss of function of any body part, hemiplegia, loss of vision, weakness of facial muscles, loss of sensation, and drooling. Other causes should be ruled out (e.g., hypoglycemia, drug overdose, hypoxia).

### History

<table>
<thead>
<tr>
<th>Previous stroke/TIA</th>
<th>Impaired understanding of speech</th>
<th>TIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous neurological deficit</td>
<td>Aphasia/dysarthria  Weakness /hemiparesis</td>
<td>Seizure Hypoglycemia</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Facial droop</td>
<td>Drug ingestion</td>
</tr>
<tr>
<td>Heart disease</td>
<td>Poor coordination/balance</td>
<td>Tumor</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Loss of peripheral vision</td>
<td>Trauma</td>
</tr>
<tr>
<td>Anticoagulant medications</td>
<td>Syncope, dizziness/vertigo</td>
<td>Stroke:</td>
</tr>
<tr>
<td>Family history</td>
<td>Headache, vomiting, stiff neck seizures</td>
<td>● Ischemic</td>
</tr>
<tr>
<td>Smoking</td>
<td>● Hemorrhagic</td>
<td></td>
</tr>
</tbody>
</table>

**STROKE ALERT INCLUSION CRITERIA**

- Utilize the Rapid Arterial occlusion Evaluation (RACE) scale (Appendix 6.20 or online forms).
- Time last seen normal is less than 24 hours (Includes Wake Up Stroke)
- Deficit not likely due to head trauma, TIA or stroke mimic.
- Blood glucose is greater than 60 OR symptoms don’t resolve after correction of BGL.
- Paramedic judgment; altered mental status, vision (loss of vision or double vision), loss of sensation, poor coordination & balance, severe headache, nausea & vomiting, dizziness/severe vertigo, dysarthria/expressive aphasia.

**TREATMENT GUIDELINES**

- Initial Assessment Protocol 2.1.1.
- Determine and document the time of onset of stroke symptoms, defined as “the last time the patient was seen without symptoms”. If possible, get the witness name and contact numbers.
- If stroke is suspected, complete the RACE scale (Appendix 6.20 or online forms) to determine if the patient meets criteria for Stroke Alert. (a) (b)
- Limit Stroke Alert on scene time and transport the patient to the closest appropriate stroke center.
- If the patient is unconscious position the patient with head elevation of 30 degrees, unless the patient cannot tolerate this position, supine,
- Administer oxygen according to following criteria:
  - SpO₂ 94% or above do not administer O₂.
  - SpO₂ less than 94% administer O₂ by nasal cannula at 2 L/min.
  - If SpO₂ cannot be maintained at 94% with nasal cannula at 2 L/min and/or the patient is in respiratory distress, administer high-flow O₂ and assist ventilations with a bag-valve mask if indicated.
2.5.4 Suspected Stroke (CVA continued)

**TREATMENT GUIDELINES**

**ALS Level 1**

- If the patient has a decreased level of consciousness and does not have an intact gag reflex, insert an advanced airway (Medical Procedure 4.4), confirm tube placement and oxygenation, and monitor ventilations with EtCO₂.
- Establish IV access; give normal saline KVO.
- Perform a glucose test with a finger stick (Medical Procedure 4.17). If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia 2.8.2.
- If drug overdose is suspected, refer to Adult Protocol 2.6, Adult Toxicologic Emergencies.
- Perform a neurological exam, including assessment of the patient’s level of consciousness, Glasgow Coma Scale (GCS) score, and RACE scale score.
- Contact the stroke center, and advise its personnel of the time of symptom onset, baseline neurological examination findings, including the RACE scale and any changes found in reassessment. (b)

**ALS Level 2**

- Elevated blood pressure is commonly present with stroke. Severely elevated blood pressure may be lowered with a physician order (Hypertensive Emergencies 2.4.3).

**Note**

(a) Minimize the Stroke Alert on-scene time to 10 minutes or less.
(b) Continually reassess the patient to determine if his/her symptoms are worsening or improving, and advise the stroke center of any changes.
### 2.5.5 Syncopal Episode

#### GENERAL GUIDELINES

| General Guidelines | This protocol should be used for patients with a chief complaint of syncopal episode. Consider the patient’s history and the possibility of medication side effects, glucose imbalance, inner ear disorders, CVA, TIA, and MI. |

#### TREATMENT GUIDELINES

| Supportive Care | • Initial Assessment Protocol 2.1.1.  
• Medical Supportive Care 2.1.3 (refer to other protocols as appropriate): Treat the underlying cause, if it can be determined.  
• All patients with a known syncopal episode, or a syncopal episode that was witnessed by a reliable source, should be transported to the hospital via ambulance. |

| ALS Level 1 | • Perform a 12-lead ECG. If an inferior wall MI is identified, perform an additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI. Transmit the 12-lead ECG results to the destination hospital, if possible (a). If acute coronary syndrome is suspected, see Adult Protocol 2.4.2. |

| ALS Level 2 | ➜ None |

| Note | (a) Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular MI (confirmed on the 12-lead ECG by ST elevation in lead V4R); see Adult Protocol 2.3.2, Bradycardia. When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin). If bradycardia and hypotension exist, pacing and IV fluid may improve the patient’s hemodynamic status. |
2.6 Adult Toxicologic Emergencies

GENERAL GUIDELINES

This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure (e.g., drug overdose, snake bite). The protocols give specific considerations for each type of exposure as well as general treatment guidelines. Additional assistance may be necessary in certain cases (e.g., hazardous materials team for toxic exposure or police for scene control, including management of a violent and/or impaired patient; see Adult Protocol 2.5.2). If the toxic substance is unknown or cannot be readily determined, see Adult Protocol 2.6.7 Unknown Toxicity.

A history of the events leading to the illness or injury should be obtained from the patient and bystanders:

1. To which drugs, poisons, or other substances was the patient exposed? Consider exposure to multiple substances, especially on overdoses.
2. What was the route of exposure?
3. When did the exposure occur, and how much exposure was there?
4. What is the duration of symptoms?
5. Is the patient depressed or suicidal? Does he/she have a history of previous overdose (if applicable)?
6. Was the exposure accidental? What was the nature of the accident?
7. What was the duration of exposure (if applicable)?

Collect all pill bottles, empty or full, and check for “suicide notes” (if applicable). Transport any/all information or items that may assist in the treatment of the patient to the emergency department.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy.
2.6.1 Bites and Stings

GENERAL GUIDELINES

This protocol includes the treatment for snake bites, dog and cat bites, insect stings, and marine animal envenomations and stings. All bite victims should be transported to the hospital. Contact the Poison Information Center (1-800-222-1222) for treatment and transport decision and consultation in all cases involving bites and stings.

TREATMENT GUIDELINES

Supportive Care

- Initial Assessment 2.1.1
- Trauma Supportive Care Protocol 2.1.4.
- Contact the Poison Information Center (1-800-222-1222).
- See General Protocol 1.12, Infectious Disease Exposure and 1.10.1 Exposure Reference Sheet if needed

SNAKE BITES

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Splint the affected area.
- Place the patient supine, with extremities kept at a neutral level.
- Keep patient quiet.
- Remove and secure all jewelry.
- Wash the area of the bite with copious amounts of water.
- Attempt to identify the snake, if it is safe to do so.
- Check the patient’s temperature and pulse distal to the bite on an extremity, and mark the level of swelling and time with pen every 15 minutes.

DOG, CAT, AND WILD ANIMAL BITES

- Wound care: BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean the wound area with soap and water.
- Advise dispatch to contact animal control and the police department for identification and quarantine of the animal.

INSECT STINGS (INCLUDING CENTIPEDES, SCORPIONS, AND SPIDERS)

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Remove the stinger by scraping the patient’s skin with the edge of a flat surface (e.g., a credit card). Do not attempt to pull the stinger out, as this action may release more venom.
- Clean the wound area with soap and water.

MARINE ANIMAL ENVENOMATIONS: STINGRAY, SCORPIONFISH (LIONFISH, ZEBRAFISH, STONEFISH), CATFISH, WEEVERFISH, STARFISH, SEA URCHIN

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Immerse the punctures in nonscalding hot water to tolerance (110-113°F) to achieve pain relief (30-90 minutes). Transport should not be delayed for this measure; immersion in nonscalding hot water may be continued during transport.
- Remove any visible pieces of the spine(s) or sheath. Gently wash the wound with soap and water, and then irrigate it vigorously with fresh water (avoid scrubbing).
### 2.6.1 Bites and Stings (continued)

#### SUPPORTIVE CARE

**MARINE ANIMAL STINGS: JELLYFISH, MAN-OF-WAR, SEA NETTLE, IRUKANDJI, ANEMONE, HYDROID, FIRE CORAL**

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Rinse the skin with sea water. (Do not use fresh water; do not apply ice; do not rub the skin.)
- Apply soaks of acetic acid 5% (vinegar) until the pain is relieved. If vinegar is not available, use a paste of baking soda or unseasoned meat tenderizer.
- Remove large tentacle fragments using forceps (use gloves to avoid contact with your bare hands).
- Apply a lather of shaving cream or a paste of baking soda, and shave the affected area with the edge of a flat surface (e.g., a credit card).
- Apply Zerym Spray if agency available

**HUMAN BITES**

- Wound care: BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean the wound area with soap and water.
- Consider contacting the police department for investigation

#### ALS LEVEL 1

- Refer to Adult Protocol 2.1.5 for pain management guidelines.
- Consider OTC formulation for symptom relief (i.e. Zerym) (a)

#### ALS LEVEL 2

- None

#### Note

(a) Caution to patient of known mesothelioma
## 2.6.2 CNS Depressant Overdose – 2.6.2.1 Benzodiazepines and Sedative Hypnotics

### GENERAL GUIDELINES

Benzodiazepines are used for anxiety, seizures, insomnia, agitation, muscle spasms, and alcohol withdraw. Sedative hypnotics are used for inducing sleep. Signs and symptoms of overdose include:

- Altered mental status
- Slurred speech
- Hypotension
- Coma
- Dilated pupils (benzodiazepines)

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3 (refer to other protocols as appropriate): Treat the underlying cause, if it can be determined.
- Contact Poison Information Center (1-800-222-1222) for consultation.
- Obtain Pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.

#### ALS Level 1

- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL, refer to Adult Protocol 2.8.2 Hypoglycemia/Hyperglycemia.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 2 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hypotensive (systolic BP less than 90 mm Hg), administer a fluid challenge of 500mL.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

#### ALS Level 2

- None
## 2.6.2 CNS Depressant OD – 2.6.2.2 Opioid & Narcotic Overdose

### GENERAL GUIDELINES

**General Guidelines**

<table>
<thead>
<tr>
<th>Signs and symptoms of opioid and narcotic overdose include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Altered mental status</td>
</tr>
<tr>
<td>• Respiratory depression</td>
</tr>
<tr>
<td>• Constricted pupils</td>
</tr>
<tr>
<td>• Hypotension</td>
</tr>
<tr>
<td>• Bradycardia</td>
</tr>
<tr>
<td>• Coma</td>
</tr>
</tbody>
</table>

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3
- Contact Poison Information Center (1-800-222-1222) for consultation.
- Obtain Pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.

**ALS Level 1**

- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL, Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.
- Administer Narcan 0.4-2 mg IV/IO, IM, or IN (c), titrated to effect. Usual dose should not exceed 10mg. Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. Narcan can also be administered via nebulization (add 2 mg of Narcan to 3 mL of saline) and titrated to effect. (Medical Procedure, Medication Delivery 4.18).
- If the patient is experiencing chest pain, Adult Protocol 2.4.2, Angina/Suspected AMI.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 2 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of 500mL.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

**ALS Level 2**

- None

**Note**

(a) Use appropriate discretion regarding immediate intubation of patients who may quickly regain consciousness following treatment.
(b) If patient is a suspected opioid addict, the administration of Narcan should be titrated to increase respirations to normal levels without fully awakening patient to prevent hostile and confrontational episodes. Consider restraining patient. Narcan may need to be repeated in 20-30 minutes to maintain effect.
(c) If administering Naloxone (Narcan) via prepackaged product Nasal Spray then the dose is 4mg/0.1 ml spray IN.
### 2.6.3 CNS Stimulant Overdose

#### GENERAL GUIDELINES

**General Guidelines**

Signs and symptoms of CNS stimulant overdose include dilated pupils, agitation, paranoia, bizarre behavior, PVC, tachycardia, hypertension, hyperthermia, and seizures. The following is a partial list of CNS stimulants.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**

- If the patient is experiencing chest pain, see Adult Protocol 2.4.2, Chest Pain/Suspected AMI.
- Establish IV access; give normal saline.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hyperthermic (hot to the touch), aggressively cool the patient.
- If the patient is combative, consider the need for physical and chemical restraints (see Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

**ALS Level 2**

- Treat tachydysrhythmias as per physician order.

**Note**

(a) Beta blockers are contraindicated in cocaine overdose.
## 2.6.4 Digitalis Toxicity

### GENERAL GUIDELINES

**General Guidelines**

Digitalis toxicity should be suspected in patients who are taking digitalis and have signs and symptoms associated with digitalis toxicity - for example, bradycardia, AV blocks with rapid ventricular response, supraventricular tachycardias, ventricular ectopy, and other ECG changes: wide PR interval greater than 0.20, short QT interval (rate dependent), spoon-shaped ST segment, peaked T wave. Contact with the oleander tree can also cause a digitalis-type toxicity, which will cause the same type of dysrhythmias and requires the same treatment.

**DIGITALIS: GENERIC NAME (TRADE NAME)**

digoxin (Lanoxicaps, Lanoxin, Digoxin) digitoxin (Crystodigin)

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**

- Treat tachydysrhythmias with medication per specific protocol (Adult Protocol 2.3). Avoid the use of Calcium Chloride.
- If unstable tachycardia (heart rate greater than 150 beats/min), synchronize and cardiovert. Energy settings for synchronized cardioversion should be in the range of 5-20 joules.
- If the patient has unstable bradycardia with wide QRS (greater than 0.12 seconds), administer Sodium Bicarbonate 1 mEq/kg IV.

**ALS Level 2**

- None

**Note**
### 2.6.5 Hallucinogen Overdose

#### GENERAL GUIDELINES

**General Guidelines**

This protocol includes the hallucinogenic drugs: LSD (acid, microdot), mescaline and peyote (mesc, buttons, cactus), and similar agents (e.g., DET, EMT, psilocybin). Signs and symptoms of hallucinogen overdose include illusions and hallucinations, poor perception of time and distance, possible paranoia, anxiety, panic, unpredictable behavior, emotional instability, possible flashbacks, dilated pupils, and rambling speech.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3: “Talk down” the patient.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**

- Consider the need for ventilation assistance and advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, see Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.
- If respiration is depressed, administer Narcan 0.4-2 mg IV/IO, IM, or IN (c), titrated to effect. Usual dose should not exceed 10mg. Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. Narcan can also be administered via nebulization (add 2 mg of Narcan to 3 mL of saline) and titrated to effect. (Medical Procedure, Medication Delivery 4.18). If administering Naloxone (Narcan) via prepackaged product Nasal Spray the dose is 4mg/0.1 ml spray IN.
- If the patient is experiencing chest pain, see Adult Protocol 2.4.2, Angina/Suspected AMI.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

**ALS Level 2**

- Treat tachydysrhythmias as per physician order.
- Additional benzodiazepine

#### Note

(a) Use appropriate discretion regarding immediate placement of an advanced airway in patients who may quickly regain consciousness, such as hypoglycemias after D50 administration or opiate overdose patients after Narcan® administration.

(b) If the patient is a suspected opioid addict, the administration of Narcan® should be titrated to increase respiration to normal levels without fully awakening the patient, so as to prevent hostile and confrontational episodes. Consider restraining the patient (Medical Procedure 4.23, Physical Restraints).
## 2.6.6 Tricyclic Antidepressant/Barbiturates/SSRI Overdose

### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>Universally found EKG cases in all three classifications include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wide QRS complex greater than 0.12 seconds</td>
</tr>
<tr>
<td></td>
<td>ST and T wave changes</td>
</tr>
<tr>
<td></td>
<td>R waves in lead aVR</td>
</tr>
<tr>
<td></td>
<td>S waves in lead aVL and lead I</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barbiturates are used as sleep aids, antianxiety medications, and anticonvulsants. Signs and symptoms of overdose include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lethargy</td>
</tr>
<tr>
<td>Altered mental status</td>
</tr>
<tr>
<td>Respiratory depression</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tricyclic antidepressants are used as antidepressants. Signs and symptoms of overdose include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS depression</td>
</tr>
<tr>
<td>Tachycardia</td>
</tr>
<tr>
<td>Dilated pupils</td>
</tr>
<tr>
<td>Respiratory depression</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selective Serotonin Reuptake Inhibitors (SSRI) is used as antidepressants, antianxiety medications, and personality disorders. Signs and symptoms of overdose include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agitation</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
</tr>
<tr>
<td>Muscular rigidity</td>
</tr>
<tr>
<td>Teeth chattering</td>
</tr>
<tr>
<td>Dilated pupils</td>
</tr>
</tbody>
</table>
### 2.6.6 Tricyclic Antidepressant Overdose (continued)

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>- Medical Supportive Care 2.1.3: “Talk down” the patient.</td>
</tr>
<tr>
<td>- Contact the Poison Information Center (1-800-222-1222).</td>
</tr>
<tr>
<td>- Obtain pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Consider the need for ventilation assistance and advanced airway (Medical Procedure 4.4) (a).</td>
</tr>
<tr>
<td>- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, see Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.</td>
</tr>
<tr>
<td>- Perform 12 lead, if QRS is greater than 0.12 seconds, Sodium Bicarbonate 1 mEq/kg IV.</td>
</tr>
<tr>
<td>- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)</td>
</tr>
<tr>
<td>- Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.</td>
</tr>
<tr>
<td>- OR</td>
</tr>
<tr>
<td>- Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.</td>
</tr>
<tr>
<td>- OR</td>
</tr>
<tr>
<td>- Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.</td>
</tr>
<tr>
<td>- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>- None</td>
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</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
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</tbody>
</table>
## 2.6.7 Unknown Toxicity

### GENERAL GUIDELINES

This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure, where the toxic substance is unknown or cannot be readily determined.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. If the patient has an altered mental status, dyspnea, or SpO$_2$ is less than 94%, administer oxygen to maintain SpO$_2$ at or above 94%.

#### ALS Level 1

- If the patient has an altered mental status, see Adult Protocol 2.5.1.
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed (a).
- If Albuterol is administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to the Albuterol nebulizer treatment.
- Treat dysrhythmias with medication per specific protocol (Adult Protocol 2.3).
- If the patient has unstable bradycardia with wide QRS (greater than 0.12 second), administer Sodium Bicarbonate 1 mEq/kg IV (Adult Protocol 2.6.6).
- If the patient is hypotensive and not in pulmonary edema, administer a fluid challenge of normal saline 500 mL IV (Adult Protocol 2.4.1).
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.

#### ALS Level 2

- None

#### Note
### 2.7 Adult OB/GYN Emergencies

#### GENERAL GUIDELINES

The paramedic should use these protocols to guide him/her through the treatment of patients who are pregnant. These protocols cover complications of pregnancy and normal and abnormal labor delivery. In addition to these protocols, the paramedic may need to refer to other protocols (e.g., protocols for seizures). The assessment of these patients should follow the normal approach to patient assessment as well as ask specific questions related to the history of the pregnancy. Questions for pregnancy history include:

1. Number of previous pregnancies (gravida).
   a. Miscarriages.
2. Number of previous live births (para).
3. Expected date of delivery or due date.
4. When did contractions begin?
5. Any history of labor complications?
   a. Premature births?
   b. C-section?
   c. Multiple births?
6. What are the duration and frequency of contractions?
   a. Duration is timed from when the contraction starts to when the contraction stops (e.g., 45 seconds, 1 minute).
   b. Frequency is timed from the beginning of one contraction to the beginning of the next contraction (e.g., 2 minutes apart, 4 minutes apart).
7. Evidence of blood show or spotting?
8. Did the water break?
   a. When?
   b. What was the color (e.g., clear, greenish, brownish)?
   c. Did it have an unusual odor?
9. Does the patient have an urge to push?
10. Does the patient feel like she has to move her bowels? If the patient complains of uterine contractions, an external visual examination for crowning should be done to determine if the delivery is imminent.
### 2.7.1 Complications of Labor and Delivery

#### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Notify the nearest appropriate OB-capable hospital early and prepare for transport to an OB-capable hospital.

#### PROLAPSED CORD

- Place the mother in a knee-chest position or supine position with pillows under the buttocks.
- Do not attempt to push the cord back. Wrap the cord in a warm, sterile-saline-soaked dressing.
- With a gloved hand, palpate the cord for a pulse.
- If a pulse is absent in the umbilical cord, and positioning of the mother does not restore the pulse, insert a gloved hand into the vagina and lift the fetal head, or other presenting part, off of the umbilical cord while gently pushing the fetus into the uterus. With the other hand, press on the lower abdomen in an upward or cephalic direction. Push the fetus back only far enough to regain a pulse in the umbilical cord.
- Transport immediately, while maintaining fetal position so as to maintain umbilical pulse.

#### BREECH BIRTH

- Do not pull on the newborn. Allow the delivery to proceed normally, supporting the newborn with the palm of your hand and arm, and allowing the head to deliver.
- If the head does not deliver within 3 minutes, place a gloved hand in the vagina with your palm toward the newborn’s face. Form a “V” with your index and middle fingers on either side of the newborn’s nose, and push the vaginal wall away from the newborn’s face to create an airspace for the newborn until delivery of the head. Suction may be provided as needed.
- Transport immediately, while maintaining the airspace for the newborn.

#### LIMB PRESENTATION

- Place the mother in either a knee-chest position or a supine position with pillows under the buttocks.
- Transport immediately.

#### SHOULDER DYSTOCIA

- Determine the presence of shoulder dystocia as follows: The newborn’s head will deliver normally, and then it will retract back into the perineum because the shoulders are trapped between the symphysis pubis and the sacrum (the “turtle sign”).
- If this occurs, do not pull on the newborn’s head.
- Have the mother drop her buttocks off the end of the bed and flex her thighs upward to facilitate delivery.
- Apply firm pressure with an open hand immediately above the symphysis pubis.
- If delivery does not occur, transport immediately.

#### ALS Level 1

- None

#### ALS Level 2

- None
This protocol should be used when the paramedic encounters an imminent delivery prior to arrival at the hospital. Imminent delivery is evidenced by crowning at the vaginal opening.

**TREATMENT GUIDELINES**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Notify the nearest appropriate OB-capable hospital early and prepare for transport.
- Place the mother in a comfortable, supine position.
- Prepare the OB kit. (Also have a pediatric kit on standby.)
- Gently and carefully assist expulsion of the newborn from the birth canal in its natural descent. Do not pull or push the newborn.
- Upon complete presentation of newborn’s head:
  - Instruct the mother to stop pushing.
  - Inspect and palpate the newborn’s neck for the umbilical cord. If it is present, carefully unwrap the cord from the neck. If unable to remove the cord, apply two umbilical clamps and cut between the clamps to release the cord.
  - Once the newborn’s cord is free from around its neck, instruct the mother to push on her next contraction to complete delivery.
- Upon complete delivery of the newborn:
  - Keep the newborn at the level of the placenta (vagina) to prevent over- or under-transfusion of blood from the cord.
  - **Never “milk” the cord, after infant delivery wait at least 30 seconds up to 3 minutes or until the cord stops pulsating to clamp/cut the cord.** Apply two umbilical cord clamps (2 inches apart and at least 8 inches from the navel), and then cut the cord between the clamps.
  - Avoid holding the newborn by the legs, allowing the head to hang below the body, as this may cause cerebral hemorrhage to occur.
  - Only if the airway is compromised (obstructed), gently suction the newborn’s mouth and nose with the bulb syringe.
  - If meconium is noted in the airway, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
  - Dry and wrap the newborn in a blanket to preserve body heat. Be sure to cover the newborn’s head, as this is a major area of heat loss.
- Evaluate the newborn:
  - If the newborn is not breathing, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
  - Evaluate the APGAR scores at 1 and 5 minutes (Appendix 6.3).
  - If APGAR score is less than 7, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
- Following delivery of the newborn, the mother’s vagina will continue to ooze blood. Do not pull on the umbilical cord.
Supportive Care continued

- If active hemorrhage is noted from the vagina, apply firm continuous massage manually to the uterine fundus. If the mother wants to breastfeed, encourage her to do so; this will aid in the contraction of the uterus, which will help stop the bleeding and facilitate delivery of the placenta. (Do not attempt to examine the patient internally. Never pack the vagina to stop bleeding.) Apply a sanitary napkin to the vaginal opening.

- If the placenta does deliver, preserve it in a plastic bag and transport it with the mother. It is not necessary to delay transport to wait for the placenta to deliver.

- After delivery of the placenta, clean the perineal area and remove soiled drop sheets from under the mother’s buttocks. Visually inspect the perineal area for tears. If active bleeding is present, apply direct pressure with sterile gauze. Apply a sanitary napkin to vaginal opening.

ALS Level 1

- Administer Nitronox for pain control during a normal, uncomplicated delivery (Medical Procedure 4.20)

ALS Level 2

Note
## 2.7.3 Nontraumatic Vaginal Bleeding

### GENERAL GUIDELINES

**General Guidelines**

This protocol should be used for female patients who may or may not be pregnant and who present with nontraumatic vaginal bleeding. Examples of causes include antepartum hemorrhage (abruption placenta, placenta previa, and uterine rupture), postpartum hemorrhage, ruptured ectopic pregnancy, ruptured ovarian cyst, and spontaneous abortion.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Place all products of delivery (e.g., undeveloped fetus, placenta) in a plastic bag and transport with the patient to the hospital.

#### ALS Level 1

- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of 500 mL to start. Repeat as needed.

#### ALS Level 2

- None

### Note
# 2.7.4 Toxemia of Pregnancy

## GENERAL GUIDELINES

This protocol should be used for the patient in her second or third trimester of pregnancy (above 20 weeks gestation) who is exhibiting signs of pre-eclampsia or eclampsia. The signs of toxemia include proteinuria (dark-colored urine), excessive weight gain, and hypertension. The presence of two of these signs constitutes pre-eclampsia; the presence of all three constitutes eclampsia. The seizing patient in her second or third trimester of pregnancy should be assumed to be eclamptic and treated as specified below. However, consideration of another underlying etiology, such as hypoglycemia, drug overdose, head injury, or fever, should also be considered. Eclamptic seizures can also occur postpartum (≤ 6 week after giving birth). Witnessed continuous convulsions (generalized tonic-clonic seizure or grand mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation demonstrate a need for immediate treatment.

## TREATMENT GUIDELINES

### Supportive Care
- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care 2.1.4.

### ALS Level 1
- If the patient is seizing, administer Magnesium Sulfate 4 g IV (mixed in 50 mL or 100 mL of D₅W given over 5-10 minutes). May repeat once at 2 g IV (mixed in 50 mL or 100 mL of D₅W given over 5-10 minutes) as needed.
- If the patient continues to seize, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- Perform a glucose test with a finger stick (Medical Procedure 4.17) if glucose is less than 60 mg/dL refer to Hypoglycemia/Hyperglycemia Protocol 2.8.2.

### ALS Level 2
- None

### Note
2.8.1 Allergic Reactions/Anaphylaxis

GENERAL GUIDELINES

This protocol should be used for patients exhibiting signs and symptoms consistent with allergic reaction, as follows:

- Skin: flushing, itching, hives, swelling, cyanosis.
- Respiratory: dyspnea, sneezing, coughing, wheezing, stridor, laryngeal edema, laryngospasm, bronchospasm.
- Cardiovascular: vasodilation, increased heart rate, decreased blood pressure.
- Gastrointestinal: nausea/vomiting, abdominal cramping, diarrhea.
- CNS: dizziness, headache, convulsions, tearing.

Treatment is outlined here according to the severity of the allergic reaction (mild, moderate, and severe or anaphylaxis).

MILD REACTIONS

These reactions consist of redness and/or itching, stable vital signs with a systolic BP greater than 100 mm Hg without dyspnea.

MODERATE REACTIONS

These reactions are evidenced by edema, hives, dyspnea, wheezing, “lump in throat” feeling, difficulty swallowing, facial swelling, and stable vital signs with a systolic BP greater than 100 mm Hg.

SEVERE REACTIONS

Signs and symptoms include edema, hives, severe dyspnea and wheezing, unstable vital signs with a systolic BP less than 100 mm Hg, and possibly cyanosis and laryngeal edema.

TREATMENT GUIDELINES

For all Allergic Reactions and Anaphylaxis:

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4
- Remove offending agent, if possible

MILD REACTIONS

- Diphenhydramine HCl (Benadryl®) 50 mg IM or SLOW IV (Medical Procedure, Medication Delivery 4.18).
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). May be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment
- Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
- Consider the need for advanced airway management (Medical Procedure 4.4).
- SOLU MEDROL 125 mg IV/IM
- May repeat Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
MODERATE REACTIONS

- Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
- Diphenhydramine HCl (Benadryl®) 50 mg IM or SLOW IV (Medical Procedure, Medication Delivery 4.18).
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). May be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment
- Consider the need for advanced airway management (Medical Procedure 4.4).
- SOLU MEDROL 125 mg IV/IM
- May repeat Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).

SEVERE REACTIONS

- Administer Epinephrine 1:100,000 (0.1 mg/10 mL) IV diluted; To dilute Epinephrine from 1:10,000 to 1:100,000;
  - Remove 9 ml of Epi 1:10,000 from the 10 ml prefilled syringe
  - Fill the syringe back up with 9 mLs of normal saline, You now have Epi 1:100,000
  - Administer the 10 mL Epinephrine (1:100,000) solution IV slowly over 5-10 minutes, titrate to clinical effect and systolic BP greater than 90. Close hemodynamic monitoring is required when providing Epinephrine 1:100,000 IV

ALS Level 2
- None

Note
- (a) Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease.
- (b) The EpiPen® may be used if other means of Epinephrine administration are not available (Medical Procedure 4.18.1).
## 2.8.2 Hypoglycemia/Hyperglycemia

### GENERAL GUIDELINES

**General Guidelines**

This protocol is to be used for those patients whose blood glucose is less than 60 mg/dL or more than 300 mg/dL.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.

#### ALS Level 1

- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL:
  - If the patient is conscious and has an intact gag reflex, administer oral glucose 15g (1 tube), if possible.
  - If the patient is stuporous or unconscious, administer D50 50 mL via slow IV (a).
  - If unable to start an IV/IO access, provide Glucagon 1 mg IM. This can be repeated once in 20 minutes. (Medical Procedure, Medication Delivery 4.18)
  - Perform a second glucose test with a finger stick. If glucose remains less than 60 mg/dL, administer D50 50 mL IV (a).
- If blood glucose greater than 300 mg/dL:
  - Administer normal saline 500 mL IV, unless contraindicated.

#### ALS Level 2

- None

#### Note

(a) To avoid infiltration and resultant tissue necrosis, D50 should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.
## 2.8.3 Nausea/Vomiting

### GENERAL GUIDELINES

To enhance patient comfort and safety, the treatment of nausea and vomiting may be appropriately accomplished in the field. The symptoms of nausea and vomiting may occur as a result of acute illness or as a medication side effect.

### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>ALS Level 1</th>
<th>ALS Level 2</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>• Administer Zofran® (Ondansetron hydrochloride)</td>
<td>• Oral 4 mg PO oral disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose is 8 mg</td>
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<tr>
<td></td>
<td>• Injection 4 mg slow IV push over 2-3 minutes OR IM lateral thigh. May be repeated once if no improvement within 10-15 minutes. Do not exceed 8 mg total dosage.</td>
<td></td>
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</tr>
</tbody>
</table>
# 2.8.4 Non-Traumatic Abdomen Pain

## GENERAL GUIDELINES

This protocol should be used for patients who complain of abdominal pain without a history of trauma. Assessment should include specific questions pertaining to the GI/GU systems. Abdominal physical assessment:

- Ask the patient to point to the area of pain (palpate this area last).
- Gently palpate for tenderness, rebound tenderness, distention, rigidity, guarding, and pulsatile masses. Also palpate the flank for CVA tenderness.

Abdominal history:
- History of pain (OPQRRRST)
- History of nausea/vomiting (color, bloody, coffee grounds)
- History of bowel movement (last BM, diarrhea, bloody, tarry)
- History of urine output (painful, dark, bloody)
- History of abdominal surgery
- History of acute onset of back pain
- SAMPLE history (attention to last meal)

Additional questions should be asked of the female patient regarding OB/GYN history (Adult Protocol 2.7, Adult OB/GYN Emergencies). All female patients of childbearing age who complain of abdominal pain should be considered to have an ectopic pregnancy (even if vaginal bleeding is absent) until proven otherwise. An acute abdomen can be caused by appendicitis, cholecystitis, duodenal ulcer perforation, diverticulitis, abdominal aortic aneurysm, kidney infection, urinary tract infection (UTI), kidney stone, pelvic inflammatory disease (PID female), or pancreatitis (Appendix 6.1, Abdominal Pain Differential).

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.

### ALS Level 1

- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of normal saline 500 mL.
- See Pain Management Protocol

### ALS Level 2

- None

### Note
### Sickle Cell Crisis

#### GENERAL GUIDELINES

Sickle cell anemia is a chronic hemolytic anemia occurring almost exclusively in African Americans; it is characterized by the presence of sickle-shaped red blood cells. Sickle cell crisis results from the occlusion of a blood vessel by masses of these misshapen blood cells. Pain is the principal manifestation and represents the most common type of crisis. Typical pain occurs in the joints and back. Hepatic, pulmonary, or central nervous system involvement can occur, with each type being associated with its own group of symptoms. Keep in mind that patients with sickle cell disorder have a high incidence of life threatening disorders at a very young age.

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. Administer 100% oxygen via non-rebreather mask at 15 L/min.
- Provide emotional support.

**ALS Level 1**
- Fluid challenge of normal saline 500 mL may repeat once to a maximum of 1000 mL IV.
- If pain persists and systolic BP is greater than 100 mm Hg, Administer
  - Morphine Sulfate may be given via slow IV in 5 mg may repeat once in 5-10 minutes, titrated to pain and BP above 90 mm Hg, up to a maximum of 10 mg (a)
  - OR
  - Fentanyl
    - May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration). Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.
- Consider Diphenhydramine in conjunction with opioid – 25 mg SLOW IV over 2 minutes or IM

**ALS Level 2**
- None

**Note**
- Extreme caution should be used with administering narcotic analgesics to a patient with a SpO2 less than 94%.
# Sepsis

## General Guidelines

Sepsis is a rapidly progressing, life threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and death. Appendix 6.19 Sepsis Alert form.

### Definitions

**SEPSIS ALERT** = Patient Meets the Definition of Sepsis (#2) Below

1. **Systemic Inflammatory Response Syndrome (SIRS)**
   - Temperature greater than 38°C (100.4°F) OR less than 36°C (96.8°F)
   - Respiratory Rate greater than 20 breaths/min
   - Heart Rate greater than 90 beats/min

2. **Sepsis**
   - SIRS + Documented OR Suspected Infection
     - Documented infections include but are not limited to pneumonia, UTI, wounds, skin and decubitus ulcers.
     - Suspected infection may be determined via the presence of high risk criteria such as a) nursing home resident b) recent surgery c) immunosuppression or d) indwelling device.
     - Symptoms such as cough, increased work of breathing, stiff neck, ALOC, urinary pain or frequency, abdominal pain-distension-firmness, or inflamed joint may determine suspicion of infection.

3. **Severe Sepsis**
   - Sepsis + Sepsis-induced organ dysfunction or tissue hypoperfusion
     - Organ dysfunction or tissue hypoperfusion defined as either
       - Cardiovascular: Hypotension (Mean Arterial Pressure (MAP) less than 65 mmHg)(a)
       - Metabolic: Lactate greater than or equal to≥ 4 mg/dL (if available)
       - ETCO2 less than 25 mmHg

## Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Apply cardiac monitor: Document rhythm
- Administer oxygen according to following criteria:
  - SpO2 94% or above do not administer O2.
  - SpO2 less than 94% administer O2 by nasal cannula at 2 L/min.

**ALS Level 1**

- Utilize the Broward Sepsis Alert Form Section 6.19 or on-line forms.
- Notify hospital of incoming Sepsis Alert (Meets definition of Sepsis).
- Place one large bore IV (18g or larger).

**FOR SEVERE SEPSIS ONLY**

- Administer Normal Saline 30 mL/kg, may repeat to a maximum of 2 Liters (a)
  - Titrate fluid volume to MAP of at least 70 mmHg.

**ALS Level 2**

- None

**Note**

(a) Mean Arterial Pressure is located on your monitor can be determined using the grid below.
   - Alternatively it can be calculated using the following formula
     - \( MAP = \frac{[(2 \times \text{diastolic})+\text{systolic}]}{3} \)
(b) Monitor for pulmonary edema by clinical status and physical exam (auscultation) especially in the elderly.
## 2.8.7 Acute Adrenal Insufficiency

### GENERAL GUIDELINES

**NOTE:** Use this protocol for patients confirmed to have Acute Adrenal Insufficiency by either the presence of a medical alert bracelet, designation of medical records or other patient, family or medical confirmation.

- Adrenal insufficiency or Addison’s disease is an endocrine disorder that occurs when the adrenal glands do not produce sufficient amounts of cortisol and other glucocorticoid hormones needed to respond to stress and inflammatory reactions.
- Early signs and symptoms of patients in crisis include pallor, dizziness, headache, weakness/lethargy, abdominal pain, nausea/vomiting and hypoglycemia.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Determine hemodynamic stability and symptoms.

#### ALS Level 1

- Administer Oxygen to maintain a saturation of 94% or above.
- Provide advanced airway management, if necessary (a).
- Initiate cardiac monitoring
- Establish IV access
- Administer a fluid challenge of normal saline 500 cc IV or IO to maintain SBP of >90 mmHg, repeat as needed.
- Check blood glucose level (BGL)
- Administer steroids
  - Assist with administration of patient’s Hydrocortisone Sodium Succinate (Solu-cortef) if present (b) (c).
  - If Solu-cortef not available, administer Methylprednisolone (Solu-medrol) 125 mg slow IVP (if available)
- If the patient has persistent hypotension start Dopamine 5 – 10 mcg/kg/min (1600 mcg/mL infusion concentration = 15 – 60 gtts/min).
  - Titrate to maintain a minimum systolic BP of 90 mm Hg and maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min).

#### ALS Level 2

- None

### Note

(a) Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at hospital.
(b) The patient or family shall provide the medication, dosage and route information.
(c) Typical stress dose of Hydrocortisone Sodium Succinate is 100 mg IV/IM yet may vary per patient.
2.9 Adult Environmental Emergencies

GENERAL GUIDELINES

The following protocols cover a range of problems attributable to the environment, including trauma due to changes in atmospheric pressure, exposure to heat and cold extremes, water submersion, and exposure to electricity. Initial efforts should focus on removing the patient from the harmful environment.
2.9.1 Barotrauma/Decompression Illness: Dive Illness

**GENERAL GUIDELINES**

**General Guidelines**

Barotrauma and decompression illness are caused by changes in the surrounding atmospheric pressure beyond the body’s capacity to compensate for excess gas load. These injuries are most commonly associated with the use of SCUBA (Self-Contained Underwater Breathing Apparatus). SCUBA diving emergencies can occur at any depth, with the most serious injuries manifesting symptoms after a dive. If a patient took a breath underwater, from any source of compressed gas (e.g., submerged vehicle, SCUBA) while greater than three (3) feet in depth, the patient may be a victim of barotrauma. Barotrauma may cause several injuries to occur, including arterial gas embolism (AGE), pneumothorax, pneumomediastinum, subcutaneous emphysema, and the “squeeze.” Decompression illnesses may also include decompression sickness (“bends”).

**TREATMENT GUIDELINES**

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Administer 100% oxygen via non-rebreather mask at 15 L/min.
- Place the patient in a supine position.
- Complete the Dive Accident Signs and Symptoms checklist (Appendix 6.7).
- Obtain a Dive History Profile, if possible (the patient’s dive buddy may be helpful in answering many of these questions).
- Whenever possible, have the legal authority in charge (e.g., police, Florida Marine Patrol, U.S. Coast Guard) secure all of the victim’s dive gear and maintain the proper chain of custody for testing, analysis, and other measures.
- Manage the patient according to the appropriate protocol(s).
- Transport the patient to the closest emergency department or trauma center with a helipad (air transport of diving accident victims must remain at an altitude of less than 1000 feet).
- Contact the Diver’s Alert Network (DAN) at Duke University Medical Center, by calling 919-684-4326, for further assistance (a).
- Bring the dive computer to the hospital if available.

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**

(a) DAN may be contacted while on scene or after arrival at the hospital. If the contact is made at the hospital, provide DAN with the name of the ED physician and the ED phone number.
### 2.9.2 Cold – Related Emergencies

#### GENERAL GUIDELINES

**Factors that predispose and/or cause a patient to develop hypothermia include geriatric and pediatric age, poor nutrition, diabetes, hypothyroidism, brain tumors or head trauma, sepsis, use of alcohol and certain drugs, and prolonged exposure to water or low atmospheric temperature. Patients can be classified into three categories based on their degree of hypothermia: mild (temperature = 94-97°F), moderate (temperature = 86-94°F), and severe (temperature below 86°F). Most oral thermometers will not register below 96°F. However, some tympanic thermometers (Braun Thermoscan™ Pro-1 and Pro 3000) will register in the range of 68-108°F.**

Severe hypothermia patients may be disoriented and confused to the point of stupor and coma. Shivering will usually stop and physical activity will be uncoordinated. In addition, severe hypothermia will frequently produce an Osborn wave or J wave on the ECG, as well as dysrhythmias (bradycardia, ventricular fibrillation).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Airway Management 2.1.2
- Trauma Supportive Care Protocol 2.1.4 (a).
- Remove all wet clothes and dry the patient.
- Protect the patient from heat loss and wind chill.
- Maintain the patient in a horizontal position.
- Avoid rough movement and excess activity.
- Monitor the patient’s temperature.
- Add heat to the patient’s head, neck, chest, and groin.
- For severe hypothermia, warm IV fluids.
- For severe hypothermic cardiac arrest: Start CPR.

**For VF or pulseless VT, (Adult Protocol 2.3.6)**

- Utilize warm humidified oxygen, if available
- Establish an IV with warm normal saline.

If temperature is above 86°F: Follow the appropriate dysrhythmia treatment (Adult Protocol 2.3).

If temperature is below 86°F: Continue CPR and transport immediately. Do not treat dysrhythmias in patients with severe hypothermia (warm the patient prior to treatment)

**ALS Level 2**

- None

**Note**

(a) Cases of frostbite should be bandaged with dry sterile dressings and transported without attempting rewarming in the prehospital setting.
### 2.9.3 Heat – Related Emergencies

#### General Guidelines

Hyperthermia occurs when the patient is exposed to increased environmental temperature and can manifest as heat cramps, heat exhaustion, or heat stroke. Certain drugs may cause an increase in temperature (e.g., cocaine, Ecstasy).

- **Heat cramps**: Signs and symptoms include muscle cramps of the fingers, arms, legs, or abdomen; hot, sweaty skin; weakness; dizziness; tachycardia; normal BP; and normal temperature.
- **Heat exhaustion**: Signs and symptoms include cold and clammy skin, profuse sweating, nausea/vomiting, diarrhea, tachycardia, weakness, dizziness, transient syncope, muscle cramps, headache, positive orthostatic vital signs, and normal or slightly elevated temperature.
- **Heat stroke**: Signs and symptoms include hot dry skin (sweating may be present), confusion and disorientation, rapid bounding pulse followed by slow weak pulse, hypotension with low or absent diastolic reading, rapid and shallow respirations (which may later slow), seizures, coma, and elevated temperature greater than 105°F.

#### Treatment Guidelines

**Supportive Care**

- **Heat cramps and heat exhaustion**
  - Initial Assessment Protocol 2.1.1.
  - Trauma Supportive Care Protocol 2.1.4.
  - Remove the patient from the warm environment; cool the patient.
  - Monitor the patient’s temperature.
  - For mild to moderate heat cramps and heat exhaustion, if the patient is conscious and alert, encourage the patient to drink salt-containing fluids (e.g., half-strength Gatorade®).

- **Heat stroke**
  - Initial Assessment Protocol 2.1.1.
  - Trauma Supportive Care Protocol 2.1.4.
  - Remove the patient from the warm environment; aggressively cool the patient. Remove the patient’s clothing, and wet the patient directly with ice water. Also, turn air-conditioning units and fans on high, and apply ice packs to the patient’s head, neck, chest, and groin.
  - Monitor the patient’s temperature. Cool the patient to 102°F, then dry the patient, remove any ice packs, and turn off fans (avoid lowering the patient’s temperature too much).

**ALS Level 1**

- **Heat cramps and heat exhaustion**
  - If heat cramps are severe or if the patient’s level of consciousness is diminished, administer a fluid challenge of normal saline 500 mL IV.

- **Heat stroke**
  - Treat hypotension (systolic BP less than 90 mm Hg) with IV fluids. Avoid using vasopressors and anticholinergic drugs; they may potentiate heat stroke by inhibiting sweating. Administer a fluid challenge of normal saline 500 mL IV.

**ALS Level 2**

- None

### Note
2.9.4 Drowning

GENERAL GUIDELINES

Drowning is a process resulting in primary respiratory impairment from submersion in a liquid medium. Implicit to this definition, is that a liquid-air interface is present at the entrance to the victim's airway, which prevents the individual from breathing oxygen. Outcome may include delayed morbidity or death, death, or life without morbidity. The terms wet drowning, dry drowning, active or passive drowning, near-drowning, secondary drowning, and silent drowning should be discarded. The proper terms should be drowning, fatal or drowning, non-fatal.

Persons who have been submerged in fresh or salt water may or may not be conscious. If the patient is still in the water upon arrival of EMS, a Dive Rescue Team should be used to remove the patient from the water whenever possible. Additional protocols may be needed for treatment decisions (e.g., Adult Protocol 2.9.1, Barotrauma/Decompression Illness: Dive Injuries). Drownings are NOT Trauma Alerts, unless there is a specific traumatic component associated with the event.

TREATMENT GUIDELINES

Supportive Care
- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (protect the c-spine).
- Determine any pertinent history (e.g., duration of submersion, depth, water temperature, possible seizure, drug and/or alcohol use).
- Maintain the patient's body temperature; dry and warm the patient.
- All non-fatal drowning patients should be transported to the hospital, regardless of how well they may seem to have recovered. Delayed death or complications due to pulmonary edema or aspiration pneumonia are not uncommon.
- Consider contacting the police department for investigation.

ALS Level 1
- Treat dysrhythmias per specific protocol (Adult Protocol 2.3).

ALS Level 2
- None

Note
### 2.9.5 Electrical Emergencies

#### GENERAL GUIDELINES

| General Guidelines | A wide range of injuries can be caused by a lightning strike or contact with electricity. Electrical injury can occur from direct contact, an arc, or a flash of the electricity, and from a direct hit or a splash from lightning. The movement of electrical current through the body can cause violent muscle contractions that can lead to fractures; as a consequence, the patient’s c-spine should be protected. The thermal energy can cause external burns, but in many cases the majority of thermal damage is internal, with few external signs of injury. Dysrhythmias are also common (e.g., ventricular fibrillation). The rescuer should be sure that the patient is no longer in contact with the electrical current before initiating treatment. |

#### TREATMENT GUIDELINES

| Supportive Care | - Initial Assessment Protocol 2.1.1.  
- Trauma Supportive Care Protocol 2.1.4 (protect the c-spine) (a).  
- Treat burns per Adult Protocol 2.10.8.  
- Try to determine the amps, volts, and duration of contact with the electricity, if possible. (500 volts or more should be categorized as high voltage).  
- Consider the need to transport the patient to a trauma center (General Protocol 1.10). |

| ALS Level 1 | - Treat dysrhythmias per specific protocol (Adult Protocol 2.3). |

| ALS Level 2 | - None |

| Note | (a) Asystole is a common presentation with lightning strikes. These patients should be aggressively resuscitated unless their injuries are incompatible with life. |
### 2.9.6 Electronic Control Device TASER

**GENERAL GUIDELINES**

**All EMS personnel will treat and transport any patient who has been Tasered. At minimum, all electronic control device-event patients will receive the supportive and ALS Level 1 care outlined below.** In the event that a patient resists the delivery of care, these actions will be carried out with the safety of the crew in mind. If a patient is violent, a police officer will be required to accompany the patient in the rescue unit during transport and appropriate chemical restraints will be utilized according to Adult Protocol 2.5.2, Violent and/or Combative Patient and Excited Delirium.

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
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<tbody>
<tr>
<td>• Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>• Establish that the scene has been secured and determine which events led up to the individual being subdued with an electronic control device.</td>
</tr>
<tr>
<td>• Determine whether the patient wants to be treated. If the patient refuses treatment, (General Protocol 1.8) (a).</td>
</tr>
<tr>
<td>• Provide general supportive care, including:</td>
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<tr>
<td>o C-spine precautions, unless a cervical spine injury can be definitively ruled out.</td>
</tr>
<tr>
<td>o Oxygen as needed.</td>
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</tbody>
</table>

Determine how many 5-second cycles of energy the individual was exposed to, and document this information in the Patient Care Report.

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>• Initiate cardiac monitoring including 12 Lead EKG if possible. Treat dysrhythmias per specific protocol (Adult Protocol 2.3).</td>
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<tr>
<td>• Monitor the patient’s glucose.</td>
</tr>
<tr>
<td>• Establish an IV; give normal saline KVO. If patient is exhibiting signs of excited delirium and is hyperthermic, use “cool” normal saline and/or apply ice packs to groin and axilla. (Adult Protocol 2.5.2)</td>
</tr>
<tr>
<td>• If the patients is under police custody then the patient will be automatically transported to a hospital for medical evaluation by EMS.</td>
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</tbody>
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<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>➢ None</td>
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<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
### General Guidelines

These protocols cover specific types of injuries and their treatment. The initial assessment of the trauma patient should include determination of trauma alert criteria (see General Protocol 1.10, Trauma Transport). When the situation demands it (e.g., when Trauma Alert criteria are met), scene time should be limited as much as possible (e.g., 10 minutes) and the patient should be expeditiously transported to a trauma center. Do not delay transport to establish vascular access or bandage and splint every injury. Priority should be given to airway management and rapid preparation for transport (e.g., full immobilization on a backboard) and control of gross hemorrhage.

If a vascular access is obtained and hypovolemia is suspected (e.g., the patient shows signs and symptoms of shock, such as systolic BP less than 90 mm Hg), a fluid challenge of 1-2 L (20 mL/kg) may be administered until a systolic BP of 90 mm Hg is maintained. If the patient is still in shock after receiving 2 L of fluid, an additional 1 L of fluid may be administered (maximum total fluid administration = 3 L). However, administration of large volumes of IV fluids has been found to be deleterious to the survival of patients with uncontrolled hemorrhage, internally or externally. Studies (NEJM, 1994) have shown that maximal fluid resuscitation may increase the bleeding, thereby preventing the formation of a protective thrombus or dislodging it once the intraluminal pressure exceeds the tamponading pressure of the thrombus. For this reason, consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g., less than 20 minutes).

A female in her second or third trimester (greater than 20 weeks) of pregnancy should be placed on her left side for transport. If the injuries require the use of a backboard, following full immobilization to the backboard, the backboard should be tilted to the left. Failure to follow this practice may cause hypotension due to decreased venous return.

If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the patient’s head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization. Cases involving hangings that do not meet Trauma Alert criteria are not considered Trauma Alert patients (e.g., a “suffocation type” patient without c-spine deformity).
### 2.10.1 Head and Spine Injuries

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Assessment Protocol 2.1.1.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Trauma Supportive Care Protocol 2.1.4 (Procedure Spinal Immobilization 4.24).</strong></td>
<td></td>
</tr>
<tr>
<td><strong>If the patient is not hypotensive (systolic BP greater than 90 mm Hg), elevate the head of the backboard to 30 degrees (12-18 inches).</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If signs of brain stem herniation exist (e.g., pupillary dilation, asymmetric pupillary reactivity, or motor posturing), consider placement of an advanced airway and hyperventilate the patient to achieve an optimal EtCO2 of 30-40 mm Hg (Medical Procedure 4.4 and Medical Procedure 4.10).</strong></td>
<td></td>
</tr>
<tr>
<td><strong>If the patient is seizing, refer to Adult Protocol 2.5.3; avoid administration of glucose-containing solutions and medications.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Apply a hemostatic gauze on severe wounds to the head, neck, face, or axilla that cannot be controlled by other means (direct pressure) Medical Procedure Hemostatic Gauze 4.27.1</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
<td></td>
</tr>
</tbody>
</table>

**Note**
# 2.10.2 Eye Injuries

## GENERAL GUIDELINES

This protocol covers a variety of injuries to the eye. If other injuries to the body exist, priority of care should be given as appropriate.

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (establish an IV as needed).
- Remove, or ask the patient to remove, contact lenses, if still in the affected eye(s).
- For a penetrating object, stabilize the object and cover the affected eye with an ocular shield or similar rigid device. Cover both eyes to minimize eye movement. Avoid direct pressure on either the eye or the penetrating object.
- If the eyeball has been forced out of the socket, cover the entire eye area with a rigid container, such as a disposable drinking cup. Avoid contact with the exposed globe. If bleeding is present, control it by administering direct pressure with a sterile dry dressing.
- If there are signs and symptoms or suspicion of ocular exposure to chemicals or foreign body, without obvious or suspected penetrating injury or laceration of the cornea or globe, irrigate the eye with a normal saline IV solution (Medical Procedure 4.19, Morgan Lens).

### ALS Level 1

- If the patient is experiencing eye pain, administer Tetracaine, 1 drop in each affected eye. Tetracaine may NOT be given in penetrating eye injuries or in patients with allergies to Lidocaine.

### ALS Level 2

- None

### Note
### 2.10.3 Chest Injuries

#### GENERAL GUIDELINES

**General Guidelines**

This protocol covers both blunt and penetrating chest trauma and should be part of initial resuscitation if the patient’s breathing is compromised.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Penetrating injuries to the chest or upper back should be covered immediately with a vented chest seal. If needed, “burp” the dressing to prevent/relieve a tension pneumothorax.
- Do not attempt to remove an impaled object; instead, stabilize it with a bulky dressing or other means. If the impaled object is very large or unwieldy, attempt to cut object to no less than 6 inches from the chest.

**ALS Level 1**

- For tension pneumothorax, decompress the chest on the affected side (Medical Procedure 4.9).
- For massive flail chest with severe respiratory compromise, insert an advanced airway and assist ventilations (Medical Procedures 4.1.5 and 4.4). If flail chest does not cause severe respiratory compromise, stabilize the chest externally by placing the patient’s ipsilateral arm in a sling and swathe.
- For traumatic asphyxia refer to Crush Protocol 2.10.9

**ALS Level 2**

- None

**Note**
### 2.10.4 Traumatic Chest Pain

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain due to blunt trauma may be an indication of underlying injury. Blunt injuries such as pulmonary contusion and cardiac contusion may cause respiratory insufficiency and/or myocardial infarction.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 2.1.4.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Treat dysrhythmias per specific protocol (Adult Protocol 2.3).</td>
</tr>
<tr>
<td>- Consider the need for other protocols (Adult Protocol 2.4.2).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
</tr>
</tbody>
</table>

**Note**
### 2.10.5 Abdomino-Pelvic Injuries

#### GENERAL GUIDELINES

**General Guidelines**

This protocol covers blunt and penetrating abdomino-pelvic trauma. Penetrating injuries may also include the chest (Adult Protocol 2.10.3, Chest Injuries).

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td></td>
<td>• Trauma Supportive Care Protocol 2.1.4.</td>
</tr>
<tr>
<td></td>
<td>• For penetrating injuries, apply an occlusive dressing (e.g., Vaseline gauze).</td>
</tr>
<tr>
<td></td>
<td>• For evisceration, cover the organs with a saline-soaked sterile dressing and then cover it with an occlusive dressing (e.g., foil). Do not attempt to put the organs back into the abdomen.</td>
</tr>
<tr>
<td></td>
<td>• Do not log-roll any patient with a suspected pelvic fracture (may use scoop stretcher).</td>
</tr>
<tr>
<td></td>
<td>• If a pelvic fracture is suspected, stabilize the patient with a “sheet sling” or a commercial available pelvic splint.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALS Level 2</td>
<td>None</td>
</tr>
</tbody>
</table>

**Note**

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*5th Edition Version 1, February 2017   Florida Regional Common EMS Protocols 84*
## 2.10.6 Extremity Injuries

### GENERAL GUIDELINES

This protocol covers open and closed injuries to the extremities, including amputation.

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (establish an IV as needed).
- Any fracture or suspected fracture should be splinted appropriately, with ice being applied to the affected area. Remove and secure all jewelry. Check pulse sensation and movement before and after splinting.
- Closed angulated fractures should be aligned using proximal and distal traction during splinting, except in fractures that involve joints, which should be splinted in the position in which they are found.
- Traction splints should be used in cases of closed femur fractures, unless a pelvic fracture is suspected.
- Amputations should be dressed with bulky dressings. The amputated part should be placed in a plastic bag and then the bag placed on ice for transportation to the hospital.
- Apply direct pressure for hemorrhage control. If direct pressure does not stop the hemorrhage apply a trauma tourniquet (Procedure Wound Care Trauma Tourniquet 4.27.2).
- Apply a hemostatic gauze on severe wounds to the head, neck, face, axilla, buttocks that cannot be controlled by other means (direct pressure/tourniquet) Medical Procedure Hemostatic Gauze Procedure 4.27.1.

**ALS Level 1**

- See Adult Protocol 2.1.5 for pain management guidelines

**ALS Level 2**

- None

**Note**
## 2.10.7 Traumatic Arrest

### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>The decision to attempt resuscitation of a traumatic arrest should be based on the paramedic’s judgment as to the possibility of survival and/or the possibility of organ harvest. There are instances where resuscitation of a traumatic arrest is not warranted (General Protocol 1.4, Death in the Field).</td>
</tr>
</tbody>
</table>

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.

#### ALS Level 1

- If IV(s) can be established, infuse to a maximum of 3 L of fluid.
- Avoid use of vasopressors in cases of suspected hypovolemia.

#### ALS Level 2

- None

### Note
# 2.10.8 Burn Injuries

## General Guidelines

Burns can be caused by thermal, chemical, and electrical sources. If an electrical burn is suspected, also see Adult Protocol 2.9.5, Electrical Emergencies. Remember that burn patients are volume depleted. However, burns do not bleed, so you should look for other sources of bleeding. Many burn injuries are associated with inhalation injury. The signs and symptoms of inhalation injury include nasal and oropharyngeal burns, charring of the tongue or teeth, sooty (blackened) sputum, singed nasal and facial hair, abnormal breath sounds (e.g., stridor, rhonchi, wheezing), and respiratory distress.

In cases of inhalation injury, attention should be given to the patency of the airway. Acute swelling can cause an airway obstruction. The paramedic should consider the need for early intubation to avoid a complete airway obstruction that requires a cricothyroidotomy.

## Treatment Guidelines

- **Initial Assessment Protocol 2.1.1.**
- **Trauma Supportive Care Protocol 2.1.4.**
- **Stop the burning process:**
  - Thermal burns: Lavage the burned area with tepid water (sterile, if possible) to cool the skin. Do not attempt to wipe off semisolids (e.g., grease, tar, wax).
  - Dry chemical burns: Brush off dry powder, then lavage with copious amounts of tepid water (sterile, if possible) for 15 minutes.
  - Liquid chemical burns: Lavage the burned area with copious amounts of tepid water (sterile, if possible) for 15 minutes. (When phenol has caused the burn, also see Hazardous Material Exposure Section Phenol 7.1.20.)
- **Remove clothing from around the burned area, but do not remove/peel off skin or tissue.**
- **Remove and secure all jewelry and tight-fitting clothing.**
- **Assess the extent of the burn using the Rule of Nines and the degree of burn severity (Appendix 6.4, Burn Severity Categorization, and Rule of Nines).**
- **Apply a dressing to the burned area as follows:**
  - If there is greater than or equal to 20% second-degree burns or 5% third-degree burns, cover the burned area with dry sterile dressings or Water Gel™ wraps.
  - If there is less than 20% second-degree burns or 5% third-degree burns, apply wet sterile dressings to the burned areas for 15 minutes to aid in pain control. Alternatively, Burn Free™ gel pads or Water Gel™ wraps may be applied continuously to aid in pain control.
- **Prevent hypothermia by keeping the patient warm and ensuring that all outer layers of dressings are dry.**

## ALS Level 1

- Pain Management Protocol (Adult Protocol 2.1.5).

## ALS Level 2

- None
Crush injuries are rarely seen in pre-hospital medicine but are common in times of disaster, both natural and manmade. Early and aggressive treatment of victims suspected of having a crush injury is paramount. Without aggressive pre-hospital treatment, the victim may die during extrication or weeks later from complications of the injury.

In the crush injury syndrome, the initial injury is at the site of the muscle crushed by the mechanical force of an object. The muscle cells die as the result of the following. First, the force of the crushing object ruptures muscle cells. Second, the direct pressure of the object on the limb causes muscle cells to become ischemic. The combination of mechanical force and ischemia can cause muscle death within an hour. Third, the force of the crush injury compresses large vessels, resulting in the loss of blood supply to muscle tissue. Muscles can normally survive circulatory ischemia for up to four hours before the cell death. After four hours, the cells begin to die as a result of the circulatory compromise.

The damaged muscle tissue produces and releases many toxins that can have detrimental effects on the body. The longer the victim is trapped, the longer the toxins are given to build up distal to the crush site. The crushing force acts as a dam that prevents these toxins from being released into the rest of the body. Once the force is removed, the toxins are allowed to run freely throughout the body, causing a myriad of problems. Along with the release of toxins after extrication, the victim can become severely hypovolemic from the third spacing of fluid, and the rapid swelling of the injured area can cause acute compartment syndrome.

### ToxinsReleasedbyDamagedMuscleTissue

<table>
<thead>
<tr>
<th>Toxin</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histamine</td>
<td>Vasodilitation and Bronchoconstriction</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>Acidosis and dysrhythmias</td>
</tr>
<tr>
<td>Nitric Oxide</td>
<td>Vasodilitation</td>
</tr>
<tr>
<td>Potassium</td>
<td>Hyperkalemia</td>
</tr>
<tr>
<td>Thromboplastin</td>
<td>DIC</td>
</tr>
</tbody>
</table>

### TREATMENT GUIDELINES

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Spinal immobilization follow 2.10.1
- Apply cardiac monitor
- Administer oxygen according to following criteria:
  - SpO2 94% or above do not administer O2.
  - SpO2 less than 94% administer O2 by nasal cannula at 2 L/min.
- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.
2.10.9 Crush/Compartment Syndrome (continued)

TREATMENT GUIDELINES

ALS Level 1

**CRUSH INJURY** or **COMPARTMENT SYNDROME**

- Establish IV access; give Normal Saline 1 Liter.
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate 5 mg via slow IV may be repeated once in 5-10 minutes, titrated to pain and BP greater than or equal to 90 mm Hg, up to a maximum of 10 mg.

  **OR**
  - Fentanyl
  May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration).
  Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.
- For crush injury release compression and extricate patient

**CRUSH SYNDROME**

If unable to release compression and situation progresses to **CRUSH SYNDROME**

- Entrapment with compression lasting longer than 4 hours OR on the thorax for 20 minutes.
- Suspicion of hyperkalemia (Peaked T-waves, absent P waves or widened QRS).
- Establish IV access, 2 large bore IVs recommended in order to separate CaCL and Bicarb;
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate 5 mg via SLOW IV may be repeated once in 5-10 minutes, titrated to pain and BP greater than or equal to 90 mm Hg, up to a maximum of 10 mg.

  **OR**
  - Fentanyl
  May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration).
  Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.
- Calcium Chloride 1 g into 50 mL or 100 mL bag of normal saline and administer SLOW IV over 10 minutes (follow with minimum of 20 mL flush).
- Sodium Bicarbonate Bolus at 1 meq/kg
- Continue IV fluids at 500 mL/hr
- Administer Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6).

ALS Level 2

None

Note

Ideally Calcium and Sodium Bicarb should not be administered through the same IV line due to crystallization within the tubing therefore 2 large bore IVs are recommended. If 2 IVs are not possible administer 20 mL flush in between Calcium and Sodium Bicarb.
2.11 Adults with Special Healthcare Needs

GENERAL GUIDELINES

These protocols cover specific types of special healthcare needs in adult patients. Adults with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typical adults.

The general approach to adults with special healthcare needs includes the following:
1. Priority is given to the CABs.
2. Do not be overwhelmed by the machines.
3. Listen to the caregiver.
4. If a nurse is present, rely on his/her judgment.
5. Remember that the patient’s cognitive level of function may be altered.
6. Assume that the patient can understand exactly what you say.
7. Bring all medications and equipment to the hospital.

Obtaining a history includes asking the parent/caregiver about the following issues:
1. The patient’s normal vital signs.
2. The patient’s actual weight.
3. Developmental level of the patient.
4. The patient’s allergies, including to latex.
5. Pertinent medications/therapies.
### 2.11.1 Home Mechanical Ventilator

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>Home mechanical ventilators may be indicated for chronically ill adults with abnormal respiratory drive, severe chronic lung disease, or severe neuromuscular weakness. Some patients require continuous mechanical ventilations, whereas others require only intermittent support during sleep or acute illness. Home ventilators may either be volume limited or pressure limited. All are equipped with alarms.</th>
</tr>
</thead>
</table>

#### TYPES OF VENTILATOR ALARMS

- **Low pressure or apnea** - may be caused by a loose or disconnected circuit or an air leak in the circuit or at the tracheostomy, resulting in inadequate ventilation.
- **Low power** - caused by a depleted battery.
- **High pressure** - can be caused by a plugged or obstructed airway or circuit tubing, by coughing, or by bronchospasm.
- **Setting error** - caused by ventilator settings outside the capacity of the equipment.
- **Power switchover** - occurs when the unit switches from alternating-current power to the battery.

#### TREATMENT GUIDELINES

| Supportive Care | Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- If a ventilator-dependent patient is in respiratory distress and the cause is not easily ascertained and corrected, remove the ventilator and provide assisted manual ventilations with a BVM. Suction as needed.
- Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies). |
|---|---|

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>None</th>
</tr>
</thead>
</table>

| ALS Level 2 | None |

### Note
### 2.11.2 Tracheostomy

#### GENERAL GUIDELINES

**General Guidelines**

Tracheostomies are indicated for long-term ventilatory support to bypass an upper airway obstruction and to aid in the removal of secretions. Tracheostomies come in a variety of sizes and can either be single lumen or double lumen. Special attachments include a tracheostomy nose (filtration device), tracheostomy collar (for oxygen or humidification), and Passy-Muir valve (speaker valve).

**SIGNS OF TRACHEOSTOMY OBSTRUCTION**

- Excess secretions
- No chest wall movement
- Cyanosis
- Accessory muscle use
- No chest wall rise with bag-valve ventilations

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- If an obstruction is present, inject 1-3 mL of normal saline into the tracheostomy tube and suction as needed.
- If unable to clear the obstruction by suctioning, remove the tracheostomy tube and insert a new tube (either of the same size or one size smaller). Do not force the tube.
- If unable to insert a new tracheostomy tube, or if one is unavailable, insert an endotracheal tube of similar size into the stoma and ventilate with a BVM as needed.
- If unable to insert an endotracheal tube, ventilate with a bag-valve mask over the stoma or over the patient’s mouth while covering the stoma as needed.
- Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies).

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**
## 2.11.3 Central Venous Lines

### GENERAL GUIDELINES

**Central Guidelines**

Central venous lines are indicated for administration of medications, delivery of chemotherapy, nutritional support, infusion of blood products, and blood draws. Types of central venous lines include Broviac/Hickman, Port-a-Cath/ Med-a-Port, and percutaneous intravenous catheters (PIC). Central venous line emergencies include the catheter coming completely out, bleeding at the site, the catheter broken in half, blood embolus, thrombus, air embolus, and internal bleeding. Use of SQ ports requires special training; these ports should not be used for IV access.

Signs of blood embolus, thrombus, air embolus, and internal bleeding are as follows:

- Chest pain
- Cyanosis
- Dyspnea
- Shock

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. CVP and PIC lines may be used for emergency IV access under sterile conditions.
- If the catheter has come completely out, apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.
- If the catheter is broken in half, clamp the end of the remaining tube.
- If blood embolus, thrombus, or internal bleeding is suspected, clamp the line.
- If air embolus is suspected, clamp the line and place the patient on his/her left side.
- Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies).

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**
## 2.11.4 Feeding Tubes

### GENERAL GUIDELINES

Feeding tubes are indicated for administration of nutritional supplements and in patients who have an inability to swallow. Types of feeding tubes include nasogastric tubes (temporary) and gastrostomy tubes (G tube). Types of G tubes include those that are surgically placed, percutaneous endoscopic gastrostomy tubes (PEG tubes), and jejunal tubes (J tube). Potential complications include leaks, bleeding around the site, and displacement of the tube.

### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- If the catheter has come completely out, cover the site with Vasoline gauze and apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.

**ALS Level 1**
- None

**ALS Level 2**
- None

**Note**
# 2.11.5 Ventricular-Assist Devices

## General Guidelines

Ventricular-Assist devices (VADs) also known as heart pumps are surgically implanted circulatory support devices designed to assist the pumping action of the heart. Caring for these patients is complicated, and every effort should be made to contact the patient’s primary caretaker (spouse, guardian etc.) and the VAD coordinator during your evaluation. **Patients with properly functioning VADs may NOT have a detectable pulse, normal blood pressure or oxygen saturation.**

## Treatment Guidelines

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- Treat non-VAD associated conditions in accordance with the appropriate protocol.
- Determine the type of device, access alarms, auscultate for pump sounds, if needed assist patient (caretaker) in replacing the device’s batteries or cables.
- Contact the VAD coordinator phone number will be on the device and the equipment carrying bag.
- If there is bleeding at the site, apply direct pressure.

### ALS Level 1

- Monitor capnography to assess ventilation and perfusion
- Perform a blood glucose level if any weakness, altered mental status or history of diabetes (Medical Procedure 4.17). If blood glucose is less than 60 mg/dl, refer to Hypoglycemia/Hyperglycemia protocol 2.8.2.
- If signs of hypoperfusion administer 500 mL bolus of normal saline
- Evaluate unresponsive patients carefully for reversible causes
- CPR risks rupturing of the ventricular wall leading to fatal hemorrhage. Only perform CPR when the patient’s VAD has no hand pump and no other option exists.
- Transport to the closest appropriate facility based on the patient’s chief complaint. If a cardiac issue or VAD mechanical issue is identified (alarm sounds) then transport to the most appropriate Broward County VAD receiving center, if possible (see hospital capabilities).

### ALS Level 2

- None

### Note

- Take all equipment associated with the VAD system to the ED
Florida Regional Common

EMS Protocols

Section 3

Pediatric Protocols

Pediatric Section Table of Contents

3.1 Pediatric Initial Assessment and Management
   3.1.1 Pediatric Assessment
   3.1.2 Airway Management
   3.1.3 Medical Supportive Care
   3.1.4 Trauma Supportive Care
   3.1.5 Pain Management

3.2 Pediatric Respiratory Emergencies
   3.2.1 Airway Obstruction
   3.2.2 Upper Airway (Stridor-Croup/Epiglottitis)
   3.2.3 Lower Airway (Wheezing-Asthma/Bronchiolitis)

3.3 Pediatric Cardiac Dysrhythmias
   3.3.1 Asystole/Pulseless Electrical Activity (PEA)
   3.3.2 Bradycardia
   3.3.3 Narrow Complex Tachycardia
   3.3.4 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia)
   3.3.5 Wide Complex Tachycardia without a Pulse and Ventricular Fibrillation

3.4 Newborn/Infant Cardiopulmonary Arrest
   3.4.1 Newborn Resuscitation
   3.4.2 Sudden Unexpected Infant Death (SUID)

3.5 Pediatric Neurologic Emergencies
   3.5.1 Altered Level of Consciousness (Altered Mental Status)
   3.5.2 Seizure Disorders
   3.5.3 Violent, Impaired Patient and/or Excited Delirium (ExDS) Patient

3.6 Pediatric Toxicologic Emergencies
   3.6.1 Pediatric Ingestion (Overdose)
   3.6.2 Bites and Stings

3.7 Other Pediatric Medical Emergencies
   3.7.1 Allergic Reactions/Anaphylaxis
   3.7.2 Hypoglycemia/Hyperglycemia
   3.7.3 Nausea/Vomiting
   3.7.4 Nontraumatic Abdominal Pain
   3.7.5 Nontraumatic Chest Pain - Undifferentiated
   3.7.6 Suspected Child Abuse
   3.7.7 Sickle Cell Anemia
   3.7.8 Acute Adrenal Insufficiency
3.8 Pediatric Environmental Emergencies
   3.8.1 Drowning
   3.8.2 Heat-Related Emergencies
   3.8.3 Cold-Related Emergencies
   3.8.4 Barotrauma/Decompression Illness: Dive Injuries
   3.8.5 Electrical Emergencies

3.9 Pediatric Trauma Emergencies
   3.9.1 Head and Spine Injuries
   3.9.2 Eye Injuries
   3.9.3 Chest Injuries
   3.9.4 Abdomino-Pelvic Injuries
   3.9.5 Extremity Injuries
   3.9.6 Traumatic Arrest
   3.9.7 Burn Injuries

3.10 Children with Special Healthcare Needs
   3.10.1 Home Mechanical Ventilator
   3.10.2 Tracheostomy
   3.10.3 Central Venous Lines
   3.10.4 Feeding Tubes
   3.10.5 Brief Resolved Unexplained Event (BRUE)
3.1 Pediatric Initial Assessment Management

**GENERAL GUIDELINES**

The protocols in Section 3.1 are designed to guide the EMT or paramedic in his or her initial approach to assessment and management of pediatric patients. The Level 1 care is specified as either EMT and Paramedic (BLS) or Paramedic Only (ALS).

Protocol 3.1.1 should be used on all pediatric patients for initial assessment. During this assessment, if the paramedic determines that there is a need for airway management, Protocol 3.1.2 should be used for the management of the pediatric airway. These protocols are frequently referred to by other protocols, which may or may not override them in recommending more specific therapy.

Protocol 3.1.3 presents the basic components of preparation for transport of medical patients. Due to the significant differences in priorities and packaging in the prehospital care of trauma and hypovolemia cases, a separate Trauma Supportive Care protocol has been developed. After following Protocol 3.1.1, this Medical Supportive Care protocol may be the only protocol used in medical emergency situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. Protocol 3.1.3 is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 3.1.4 presents the basic components of preparation for transport of trauma patients. Due to the significant differences in priorities and packaging in the prehospital care of medical cases, a separate Medical Supportive Care protocol has been developed. After following Protocol 3.1.1, this Trauma Supportive Care protocol may be the only protocol used in trauma or hypovolemia situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Paramedics only should use Protocol 3.1.5 for pain management.

When transporting a pediatric patient consider all pediatric restraints necessary for a safe transport to the medical/trauma facility. In general a parent should not hold a pediatric patient on the stretcher. If available, utilize the infant’s/child’s car seat, or the on board child restraint system built into the seat, or a pediatric immobilization device (Procedure 4.24) or Pedi-Mate™ (Procedure 4.23.1) or similar restraining device. The goal is to provide the pediatric patient with a safe transport to the medical/trauma facility.

**References:**
3.1.1 Pediatric Assessment

**GENERAL GUIDELINES**

The initial assessment of the pediatric patient will vary with the age of the patient. Nevertheless, some initial components of assessment remain consistent for all patients, regardless of their age. The paramedic or EMT should follow the appropriate approach to patient assessment with respect to the patient’s age. In addition to addressing the patient, the responder may need to interview the parents or caregiver to gain information needed for a complete assessment of the patient.

A five-step, systematic approach should be used when assessing the child:

1. Scene size-up
2. General assessment (pediatric assessment triangle [PAT]).
   a. Appearance
   b. Work of breathing
   c. Circulation
3. Primary assessment
   a. ABCDE
   b. Cardiopulmonary function
   c. Neurological function
   d. Vital signs
4. Secondary assessment
   a. SAMPLE
   b. Head-to-toe survey
5. Ongoing assessment

**EMT AND PARAMEDIC**

I. Scene Size-up.
   A. Review the dispatch information.
   B. Assess the need for body substance isolation.
   C. Assess scene safety.
   D. Determine the mechanism of injury.
   E. Determine the number and location of patients.
   F. Determine the need for additional resources.
   G. Observe the environment of the pediatric patient.

II. Pediatric Assessment Triangle: Rapid Cardiopulmonary Assessment.

The PAT has three major components: appearance, work of breathing, and circulation to the skin.

A. Appearance. The appearance is assessed by considering the following clinical signs: tone, interaction, consolable, look or gaze, speech or cry (Table 3-1). This particular component is influenced by developmental issues and must be applied with knowledge of normal childhood development.
3.1.1 Pediatric Assessment (continued)

### General Guidelines

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Features to Look For</th>
</tr>
</thead>
</table>
| **Tone**       | Is the infant/child moving or resisting examination vigorously? (Normal)  
|                | Does the infant/child have good muscle tone? (Normal)  
|                | Or is the infant/child limp, listless, or flaccid? (Abnormal) |
| **Interactiveness:** | How alert is the infant/child? (Alert is normal)  
|                | How readily does a person, object, or sound distract/draw the infant/child’s attention? (Distract or draw attention is normal)  
|                | Will the infant/child reach for, grasp, and play with a toy or exam instrument, such as a penlight or tongue blade? (Reaching is normal)  
|                | Or is the infant/child uninterested in playing or interacting with the caregiver or prehospital professional? (Abnormal) |
| **Consolability:** | Can the infant/child be consoled or comforted by the caregiver or by the prehospital professional? (Normal)  
|                | Or is the infant/child’s crying or agitation unrelieved by gentle reassurance? (Abnormal) |
| **Look/gaze**  | Does the infant/child make eye contact with you? (Normal)  
|                | Or is there a “nobody home,” glassy-eyed stare? (Abnormal) |
| **Speech/cry** | Is the infant/child’s cry strong and spontaneous? (Normal)  
|                | Or is the cry weak or high-pitched? (Abnormal)  
|                | Is the content of speech age appropriate? (Normal)  
|                | Or is the content confused or garbled? (Abnormal) |

B. Work of Breathing. The work of breathing reflects a child’s respiratory status - specifically, the degree of respiratory effort needed to oxygenate and ventilate the child’s body. As work of breathing increases, physical signs appear to alert the prehospital provider to an underlying illness or injury. Table 3-2 outlines the clinical signs associated with increased work of breathing. The presence of any of these features indicates abnormal work of breathing; the presence of specific signs may further delineate the category of disease process as upper or lower airway obstruction, disease of the lungs, or disorders of breathing.
### General Guidelines

#### Table 3-2 Characteristics of Work of Breathing

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Abnormal Features to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal airway sounds</td>
<td>Snoring, muffled or hoarse speech, stridor, grunting, wheezing</td>
</tr>
<tr>
<td>Abnormal positioning</td>
<td>Sniffing position, tripoding, refusing to lie down</td>
</tr>
<tr>
<td>Retractions</td>
<td>Supraclavicular, intercostal, or substernal retractions of the chest wall; head bobbing in infants</td>
</tr>
<tr>
<td>Flaring</td>
<td>Flaring of the nares on inspiration</td>
</tr>
</tbody>
</table>

C. Circulation to Skin. Circulation to the skin is assessed by looking at the overall skin color and color pattern. A child’s appearance will reflect inadequacies in brain perfusion, but altered appearance may be caused by a number of other conditions, including overdose/intoxication, metabolic disease, primary injury, and hypoxia. As a consequence, the addition of skin and mucous membrane color/perfusion changes to the PAT adds to the evaluation of core perfusion (Table 3-3). When faced with fluid or blood loss or changes in venous capacitance, the body will preserve perfusion to vital organs (heart and brain) through increased systemic vascular resistance (decreasing skin perfusion) and increases in heart rate; thus changes in skin color and skin perfusion are important early signs of shock in children.

#### Table 3-3 Characteristics of Circulation to Skin

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Abnormal Features to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pallor</td>
<td>White or pale skin or mucous membrane coloration from inadequate blood flow</td>
</tr>
<tr>
<td>Mottling</td>
<td>Patchy skin discoloration due to vasoconstriction/vasodilation</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>Bluish discoloration of skin and mucous membranes</td>
</tr>
</tbody>
</table>

D. Each component of the PAT is evaluated separately, utilizing specific predefined physical findings as outlined in Tables 3-1, 3-2, and 3-3. If an abnormal physical finding is noted, the corresponding component is, by definition, abnormal. Abnormalities in the three components can then be combined to form a general impression (Table 3-4).

#### Table 3-4 Components of the PAT and the General Impression

<table>
<thead>
<tr>
<th>Component</th>
<th>Stable</th>
<th>Respiratory Distress</th>
<th>Respiratory Failure</th>
<th>Shock</th>
<th>CNS/ Metabolic Failure</th>
<th>Cardiopulmonary Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Normal</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Normal/ Abnormal</td>
<td>Abnormal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Work of Breathing</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Circulation to the skin</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal/ Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
</tbody>
</table>
III. Primary Assessment.
   A. Assess airway, c-spine, and initial level of consciousness (AVPU: Alert, responds to Verbal stimuli, responds to Pain, Unresponsive).
   B. Assess breathing.
   C. Assess circulation and presence of hemorrhage.
   D. Assess disability - movement of extremities.
   E. Expose and examine the patient’s head, neck, chest, abdomen, and pelvis (check the back when the patient is rolled on his/her side).
   F. Identify priority patients.
   G. Assess the vital signs:
      1. Blood pressure (Capillary refill)
      2. ECG
      3. \( \text{SpO}_2 \)

IV. Initial Management. (Pediatric Protocol 3.1.3, Medical Supportive Care, or Pediatric Protocol 3.1.4, Trauma Supportive Care.)
   A. Life-threatening (urgent)
   B. Non-life-threatening (not urgent)

V. Secondary Assessment.
   A. Conduct a toe-to-head survey.
   B. Neurological assessment.
      1. Pupillary response.
      2. Pediatric Glasgow Coma Scale (GCS) score. (Appendix 6.9.2)
   C. Repeat-PAT and rapid cardiopulmonary assessment.
   D. Obtain a medical history.
      1. S - Symptoms; assessment of chief complaint.
      4. P - Past medical history.
      5. L - Last oral intake.
      6. E - Events leading to illness or injury.

VI. Ongoing Assessment. Reassess the patient every fifteen (15) minutes, or for critical patients every five (5) minutes.
   A. Continually monitor:
      1. Respiratory effort
      2. Skin color
      3. Mental status
      4. Temperature
      5. Pulse oximetry (Medical Procedure 4.22)
   B. Reevaluate vital signs and compare with baseline vital signs.

VII. Other Assessment Techniques.
   A. Glucose determination (Medical Procedure 4.17).
   B. Capnography (Medical 4.10).
   Dealing with the autistic patient (Medical Procedure 4.6).
3.1.2 Airway Management

**GENERAL GUIDELINES**

**EMT AND PARAMEDIC**

- Initial Assessment Protocol 3.1.1.

---

**TREATMENT GUIDELINES**

**Supportive Care**

If spontaneous breathing is present without compromise:
- Monitor breathing during transport.
- Administer oxygen as needed to maintain O2 saturation of 94-99% (a). Avoid over oxygenation; Wean oxygen concentration as tolerated.
  - Infants via infant mask at 2-4 L/min.
  - Small child (1-8 years) via pediatric mask at 6-8 L/min.
  - Older child (9-15 years) via non-rebreather mask at 10-15 L/min.
  - If the mask is not tolerated, administer oxygen via blow-by method.

If spontaneous breathing is present with compromise:
- Maintain the patient’s airway (e.g., modified jaw-thrust procedure) (Medical Procedure 4.1.4).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
- Administer oxygen as needed to maintain O2 saturation of 94-99% (a). Avoid over oxygenation; Wean oxygen concentration as tolerated.
  - Infants via infant mask at 2-4 L/min.
  - Small child (1-8 years) via pediatric mask at 6-8 L/min.
  - Older child (9-15 years) via non-rebreather mask at 10-15 L/min.
  - If the mask is not tolerated, administer oxygen via blow-by method.
- If unable to maintain the patient’s airway, insert an oropharyngeal, nasopharyngeal, or supraglottic airway (e.g., King tube, i-gel or LMA) as needed (Medical Procedure 4.4 Advanced Airways).
  - Attach an end-tidal CO2 monitoring device.
  - Confirm placement via auscultation and capnography.
  - Secure the tube with tape or a tube stabilizing device.
  - Monitor SpO2 with the pulse oximeter.
- Assist ventilations with bag valve mask (BVM) as needed (see Medical Procedure 4.1.5, Rescue Breathing).
- Apply and monitor a pulse oximeter and capnography monitoring device, as soon as possible (Medical Procedures 4.10 and 4.22).

If spontaneous breathing is absent or markedly compromised:
- Maintain the patient’s airway (e.g., modified jaw-thrust procedure) (Medical Procedure 4.1.3, 4.1.4).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
### 3.1.2 Airway Management (continued)

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th></th>
</tr>
</thead>
</table>
| | • If unable to maintain the patient’s airway, insert an oropharyngeal, nasopharyngeal, or supraglottic airway (e.g., i-gel, King tube or LMA) as needed (Medical Procedure 4.4, Advanced Airways).  
  o Attach an end-tidal CO2 monitoring device.  
  o Secure the tube with tape or a tube stabilizing device.  
  o Monitor SpO2 with the pulse oximeter.  
  o Confirm placement via auscultation and capnography  
• Ventilate with a BVM (Medical Procedure 4.1.5, Rescue Breathing)  
• Perform endotracheal intubation as a procedure of last resort if previous advanced airway/BVM support is ineffective (a) (b) (c) (see Medical Procedure 4.4, Advanced Airways).  
  o Attach an end-tidal CO2 monitoring device.  
  o Confirm ETT placement via auscultation and capnography.  
  o Secure the ETT with tape or an ETT-stabilizing device.  
  o Monitor SpO2 with the pulse oximeter.  
• If unable to intubate and the patient cannot be adequately ventilated by other means, perform a needle cricothyroidotomy (Medical Procedure 4.5.1, Needle Cricothyroidotomy for Pediatrics) and transport the patient rapidly to the Nearest hospital. |

| ALS Level 2 | ➢ None |

| Note | (a) Ineffective ventilations may be evident by poor chest rise, poor lung sounds, and capnography readings failing to improve with ventilations.  
(b) The BVM should be initially used for ventilatory support. Endotracheal intubation should be used only when the BVM is ineffective or prolonged ventilatory support is necessary.  
(c) Follow the Universal Airway Algorithm on all advanced airways |
### 3.1.3 Medical Supportive Care

#### Supportive Care

- EMT AND PARAMEDIC
  - Initial Assessment Protocol 3.1.1.
  - Attempt to maintain or restore normal body temperature.
  - Establish hospital contact for notification of an incoming patient and advise of the patient’s length/weight-based color category.
  - The EMT should apply the AED (Medical Procedure 4.1.1, AED).

#### ALS Level 1

- PARAMEDIC
  - Establish an IV/IO; give normal saline with a regular infusion set as needed (a), unless overridden by other specific protocols. Medical Procedure, Medication Delivery 4.18
  - OR
    - Medication may be administered via intranasal (IN) via the MAD device. (Medical Procedure, Medication Delivery 4.18)
    - Monitor the ECG as needed.
    - If the patient is hypotensive administer 20mL/kg normal saline bolus, may be repeated to a total of 3 times (60ml/kg) over a minimum of 30 minutes.
    - If the patient remains hypotensive consider Dopamine infusion 5-15mcg/kg/min

#### ALS Level 2

- The paramedic should obtain consultation for ALS Level 2 orders.

#### Note

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. A large-bore intracath should be used for unstable patients; avoid establishing access sites below the diaphragm.
### 3.1.4 Trauma Supportive Care

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMT AND PARAMEDIC</strong></td>
</tr>
</tbody>
</table>
| ● Initial Assessment Protocol 3.1.1.  
● Initiate a Trauma Alert, if applicable (General Protocol 1.10, Trauma Transport).  
● Correct any open wound/sucking chest wound (occlusive dressing).  
● Control any hemorrhage.  
● Immobilize the c-spine and secure the patient to a backboard or pediatric immobilizer as needed (Protocol 2.10.1. and Medical Procedure 4.24, Spinal Immobilization) (a).  
● Keep the patient warm. |
| **PARAMEDIC ONLY** |
| ● Correct any massive flail segment that causes respiratory compromise with positive pressure ventilation (advanced airway as needed).  
● Correct any tension pneumothorax (Medical Procedure 4.9, Chest Decompression).  
● Expedite transport. |

**The following steps should not delay transport:**

- Complete bandaging, splinting, and packaging as needed.
- Contact online medical control for notification of an incoming patient and obtain consultation for ALS Level 2 orders.

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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</thead>
</table>
| ● Establish an IV/IO; give normal saline with a regular infusion set as needed (b), unless overridden by other specific protocol. Rapid transport should not be delayed to establish an IV. (Medical Procedure, Medication Delivery 4.18)  
● In a critical trauma patient, an intraosseous (IO) line may be considered (Medical Procedure, Medication Delivery 4.18)  
● Monitor the ECG as needed. |

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
</tr>
</tbody>
</table>

### Note

(a) Infants and small children in car seats may be immobilized without removing them from the car seat, as long as it will not interfere with patient assessment and other needed procedures and the car seat is intact. If the patient is not in a car seat on your arrival, do not put the patient back into the car seat to immobilize him/her; use a backboard or pediatric immobilizer instead.

(b) Authorized IV routes include all peripheral venous sites. The external jugular vein may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. Two IVs, using large-bore intracaths, should be used for unstable patients; avoid establishing access sites below the diaphragm. Rapid transport should not be delayed to establish an IV.
## 3.1.5 Pain Management

### GENERAL GUIDELINES

**PARAMEDIC ONLY**  
This entire protocol is ALS/Paramedic Only.

### ISOLATED EXTREMITY FRACTURE

The purpose of this procedure is to manage pain associated with isolated extremity fractures that are not associated with multisystem trauma or hemodynamic instability.

### ACUTE BACK STRAIN

This procedure should be used in the isolated back strain where an acute abdominal process is not suspected (see Appendix 6.1, Abdominal Pain Differential).

### SOFT-TISSUE INJURIES, BURNS, BITES, AND STINGS

This procedure is used for pain associated with soft-tissue injuries, burns, bites, and stings that are not associated with multisystem trauma or hemodynamic instability.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 3.1.  
- For Isolated Extremity Fractures  
  - Any extremity fracture should be immobilized as described in Adult Protocol 2.10.6, Extremity Injuries.  
  - Extremity fractures should be elevated, if possible, and cold applied.  
  - Distal circulation, sensation, and movement in the injured extremity should be noted and recorded.

#### ALS Level 1

- Patients should be asked to quantify their pain on an analog pain scale (from 0 = least severe to 10 = most severe) or Wong-Baker Faces Scale; for infants, an infant behavior score may be used. This score should be documented used to measure the effectiveness of analgesia.  
- The extremity should be immobilized as described in Pediatric Protocol 3.9.5, Extremity Injuries. Self-administered analgesia with Nitrous Oxide should be given special consideration for pain management during this procedure (Medical Procedure 4.20, Nitrous Oxide-Nitronox), if available. (c)  
- If pain persists and systolic BP is adequate (Appendix 6.16, Pediatric Vital Signs), Administer (Medical Procedure, Medication Delivery 4.18)  
  - Morphine Sulfate - may be given IV titrated to pain, pediatric dose: 0.1 mg/kg; infant dose: 0.05 mg/kg. Maximum single dose of 4 mg. If pain persists and systolic BP is adequate, may repeat dose x 1 in 3-5 minutes, (repeat single dose maximum of 4 mg). Administer at a rate not to exceed 1 mg/min(a). (Appendix 6.16, Pediatric Vital Signs).  
  - OR  
    - Fentanyl 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg).
3.1.5 Pain Management (continued)

TREATMENT GUIDELINES

Note

(a) Extreme caution should be used with administering narcotic analgesics to a patient with a SpO₂ less than 94%.
(b) When administering Morphine Sulfate/Fentanyl, closely monitor the patient’s respiratory status. In the event that the patient’s respirations/oxygenation is suppressed (SpO₂ less than 94%), utilize basic airway maneuvers (open airway), administer oxygen and if no improvement consider Narcan.
(c) May have to assist administration with younger children

<table>
<thead>
<tr>
<th>Pain Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

ASSESSMENT OF SCORE
0  Relaxed: infant comfortable, not distressed.
1-2 Some transitory distress caused: returns immediately to “relaxed.”
3-4 Transitory distress; likely to respond to consolation.
5  Infant experiences pain; if no response to consolation, may require analgesia.
6  “Anguished” and “exaggerated”: infant experiencing acute pain; is unlikely to respond to consolation, will probably benefit from analgesia.
7-8 “Inert”: no response to traumatic procedure; infant is habituated to pain; will not respond to consolation; systematic pain control by analgesia should be considered.

FACIAL EXPRESSION
0  Relaxed - Smooth muscled; relaxed expression; either in deep sleep or quietly alert.
1  Anxious - Anxious expression; frown; REM behind closed lids; wandering gaze; eyes narrowed; lips parted; pursed lips as if “oo” is pronounced.
2  Anguished - Anguished expression/crumples face; brow bulge; eye squeeze; nasolabial furrow pronounced; square-stretched mouth; cupped tongue; “silent cry.”
3  Inert - No response to trauma; no crying; rigidity; gaze avoidance; fixed/staring gaze; apathy; diminished alertness (only during or immediately after traumatic procedure).

BODY MOVEMENT
0  Relaxed - Relaxed trunk and limbs; body in tucked position; hands in cupped position or willing to grasp a finger.
1 Restless - Moro reflex; startles; jerky or uncoordinated movement of limbs; flexion/extension of limbs; attempt to withdraw limb from site of injury.

2 Exaggerated - Abnormal position of limbs; limb/neck extension; splaying of fingers and/or toes; flailing or thrashing of limbs; arching of back; side swiping/guarding site of injury.

3 Inert - No response to trauma; inertia; limpness/ rigidity; immobility (only during or immediately after traumatic procedure).

COLOR
0 Normal skin color.
1 Redness; congestion.
2 Pallor; mottling; gray.
### 3.2.1 Airway Obstruction

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes of upper airway obstruction include the tongue, foreign bodies, swelling of the upper airway due to angio-neurotic edema (Pediatric Protocol 3.7.1, Allergic Reactions/Anaphylaxis), trauma to the airway, and infections (Pediatric Protocol 3.2.2, Upper Airway [Stridor-Croup/Epiglottitis]). Differentiation of the cause of upper airway obstruction is essential to determine the proper treatment.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
</table>
| ● Initial Assessment Protocol 3.1.1  
● Medical Supportive Care Protocol 3.1.3.  
● If air exchange is inadequate and there is a reasonable suspicion of foreign body airway obstruction (FBAO), apply abdominal thrusts until the patient becomes unresponsive then administer chest compressions (a). For an infant apply chest compressions and back blows (Medical Procedure 4.1.6, Suspected Foreign Body Airway Obstruction) (a). |

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
</table>
| ● If unable to relieve the FBAO, visualize it with a laryngoscope and extract the foreign body with magill forceps.  
● If the obstruction is due to trauma and/or edema, or if uncontrollable bleeding into the airway causes life-threatening ventilatory impairment, proceed directly to an advanced airway (Medical Procedure 4.4, Advanced Airways).  
● If unable to intubate and the patient cannot be adequately ventilated by other means, perform a needle cricothyroidotomy (Medical Procedure 4.5.1, Needle Cricothyroidotomy for Pediatrics). |

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) If air exchange is adequate with a partial airway obstruction, do not interfere, but rather encourage the patient to cough up the obstruction. Continue to monitor for adequacy of air exchange. If air exchange becomes inadequate, continue with the protocol.</td>
</tr>
</tbody>
</table>
### 3.2.2 Upper Airway (Stridor - Croup/Epiglottitis)

#### General Guidelines

**Stridor** is a high-pitched “crowing” sound caused by restriction of the upper airway (usually heard on inspiration). In addition to FBAO (see Pediatric Protocol 3.2.1), stridor can be caused by croup and epiglottitis.

**Croup** (laryngotracheobronchitis) is a viral infection of the upper airway, which causes edema/inflammation below the larynx and glottis with a resultant narrowing of the lumen of the airway. Croup most often occurs in children 6 months to 4 years of age. The child with croup will have stridor, a distinctive barking cough, and cold symptoms (low-grade fever [100-101°F]), with a gradual onset of respiratory distress.

**Epiglottitis** is an acute infection and inflammation of the epiglottis that potentially is life-threatening. Since the Haemophilus influenza, type B (Hib) vaccine became available, the incidence of epiglottitis has markedly decreased, yet it may still occur from other bacterial pathogens. Epiglottitis usually occurs in children 4 years of age and older. The child with epiglottitis will present with stridor, acute respiratory distress, sore throat, pain upon swallowing that causes the distinctive drooling, and high-grade fever (102-104°F). The patient may assume the classic tripod position.

#### Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3, including use of a pulse oximeter (Medical Procedure 4.22, Pulse Oximeter). Avoid IVs in these patients (a).
- Avoid agitating the child with suspected epiglottitis. Keep the patient in a position of comfort (he/she may be held by a parent to avoid agitation). Never examine the epiglottis (a).
- Administer humidified oxygen. If humidified oxygen is unavailable, use nebulized saline. Do not force an oxygen mask on a pediatric patient; use the blow-by technique if necessary (a).

**ALS Level 1**

- 3-5ml of aerosolized Epinephrine, 1:1000 (no dilution) for Croup patients only.

*Aerosolized Epinephrine is contraindicated for epiglottitis.*

**ALS Level 2**

None

**Note**

(a) Avoid any procedure that will agitate the pediatric patient.
### Lower Airway (Wheezing-Asthma/Bronchiolitis)

#### General Guidelines

Wheezing is a whistling-type breath sound associated with narrowing or spasm of the smaller airways (usually heard on expiration, but may also be heard on inspiration). Wheezing in the child younger than 1 year of age is usually the result of bronchiolitis, a viral infection of the bronchioles that causes prominent expiratory wheezing, clinically resembling asthma.

Asthma is a chronic inflammatory disease that is triggered by many different factors (e.g., environmental allergens, cold air, exercise, foods, irritants, certain medications). Asthma is characterized by a two-phase response. The first phase is associated with a histamine release, which causes bronchoconstriction and bronchial edema. Early treatment with bronchodilators may reverse the bronchospasm. The second phase consists of inflammation of the bronchioles and additional edema. The second phase will usually not respond to bronchodilators; instead, an anti-inflammatory medication (e.g., a corticosteroid) is typically required.

Assessment of the asthma patient usually includes a history of asthma with associated medications. The patient will be tachypneic and may have an unproductive cough. Use of accessory muscles is evident and wheezing may be heard, most commonly on expiration. In a severe asthma attack, the patient may not wheeze at all due to a lack of air flow.

#### Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3, including use of a pulse oximeter (Medical Procedure 4.22, Pulse Oximeter).

**ALS Level 1**

Administer the following bronchodilator:

- Albuterol (Ventolin®): one nebulizer treatment. (Medical Procedure 4.18.6, Nebulizer). May repeat twice as needed.
  - If patient less than 1 year or less than 10 kg, 1.25 mg/1.5 mL (0.083%);
  - If patient greater than 1 year or greater than 10 kg, 2.5 mg/3 mL (0.083%)
- If a bronchodilator is administered, add Ipratropium Bromide (Atrovent®) to Albuterol nebulizer treatment. (See Medical Procedure 4.18.6, Nebulizer).
  - If patient less than 8 year, 0.25mg/1.25mL
  - If patient greater than 8 year, 0.5mg/2.5mL
- Consider the need for assisted ventilation and advanced airway (Medical Procedure 4.4, Advanced Airways).

If respiratory distress is severe:

- Administer Epinephrine (1:1000) 0.01 mg/kg IM (up to a maximum dose of 0.3 mg) may be repeated every 3-5 minutes to a maximum of 3 doses (Medical Procedure 4.18, Medication Administration)
- Methylprednisolone sodium succinate (Solu-Medrol) 2mg/kg not to exceed 60 mg IV or IM if an IV cannot be established; if available. (Medical Procedure, Medication Delivery 4.18)
- For severe dyspnea, administer Magnesium Sulfate 40 mg/kg (maximum dose of 2 g) IV (mixed in 50 mL of D5W given over 30 minutes), as needed

**ALS Level 2**

- None

**Note**

- None
### 3.3 Pediatric Cardiac Dysrhythmias

**General Guidelines**

Cardiac dysrhythmias in pediatric patients are uncommon and are usually due to noncardiac problems, unless the patient is known to have congenital or acquired cardiac disease. Cardiac arrest is usually the end result of hypoxemia and acidosis resulting from respiratory insufficiency or shock. Therefore, attention should be given initially to support of the respiratory system. Pediatric dysrhythmias can be classified into three categories: slow rhythms, fast rhythms, or no rhythm. The most common dysrhythmia is bradycardia, which is the result of hypoxia or acidosis. Tachycardia can be a compensatory mechanism or a result of a reentry mechanism. Ventricular fibrillation, although rare in pediatric patients, is usually the result of hypoxia. Asystole is a terminal event, following prolonged, untreated bradycardia.

Automated external defibrillators (AEDs) may be used for children 1 to 8 years of age who have no signs of circulation. Ideally the device should deliver a pediatric dose. The arrhythmia detection algorithm used in the device should demonstrate high specificity for pediatric shockable rhythms; i.e., it will not recommend delivery of a shock for non-shockable rhythms (Class IIb).

The protocols in Section 3.3 follow the AHA/PALS guidelines. The paramedic should use these protocols to guide him/her through the treatment of cardiac patients with specific dysrhythmias and accompanying signs and symptoms. After stabilization of the patient, the paramedic may need to refer to additional protocols for continued treatment (e.g., other cardiac protocols).

In cardiac arrest, a major component of the primary and secondary survey is to consider the secondary differential diagnosis and to think carefully about what could be causing the arrest. The “H’s and T’s” chart will assist in the recognition of a possible underlying cause.

<table>
<thead>
<tr>
<th>H’s</th>
<th>Treatment</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Fluid challenge with normal saline 20ml/kg or 10ml/kg for neonates (infants less than 1 month) IV/IO</td>
<td>Shock Protocol</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Airway management</td>
<td>Protocol 3.1.2</td>
</tr>
<tr>
<td>Hydrogen ion-acidosis</td>
<td>Airway management, ventilate consider Sodium Bicarbonate</td>
<td>Protocol 3.1.2 Drug Summary 5.31</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Consider Calcium Chloride, Consider Sodium Bicarbonate 1 mEq/kg</td>
<td>Drug Summary 5.7 Drug Summary 5.31</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Cold-related emergencies</td>
<td>Protocol 3.8.3</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>If glucose is less than 60 mg/dl, consider Dextrose or Glucagon</td>
<td>Protocol 3.7.2 Drug Summary 5.11 and 5.18</td>
</tr>
<tr>
<td>Hypocalcemia</td>
<td>Consider Calcium Chloride</td>
<td>Drug Summary 5.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T’s</th>
<th>Treatment</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablets</td>
<td></td>
<td>Protocol 3.6</td>
</tr>
<tr>
<td>Tamponade, cardiac</td>
<td>Consider fluid challenge, Dopamine drip</td>
<td>Protocol 3.4.1</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Consider chest decompression</td>
<td>Procedure 4.9</td>
</tr>
<tr>
<td>Thrombosis, coronary</td>
<td>Consider AMI, cardiogenic shock</td>
<td>Protocol 3.4</td>
</tr>
<tr>
<td>Thrombosis, pulmonary</td>
<td></td>
<td>Protocol 3.4</td>
</tr>
<tr>
<td>Trauma</td>
<td></td>
<td>Protocol 3.9</td>
</tr>
</tbody>
</table>
### 3.3.1 Asystole/Pulseless Electrical Activity (PEA)

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>This protocol is used for asystole, electromechanical dissociation (EMD), pseudo-EMD, idioventricular rhythms, bradyasystolic rhythms, and post-defibrillation idioventricular rhythms.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Consider criteria for death/no resuscitation (General Protocol 1.4).</td>
</tr>
<tr>
<td>- Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>- Medical Supportive Care Protocol 3.1.3.</td>
</tr>
<tr>
<td>- Determine the patient’s (un)responsiveness and check the CABs.</td>
</tr>
<tr>
<td>- Begin immediate CPR at a compression rate of 100-120 /min for 2 minutes while the monitor is being attached.</td>
</tr>
<tr>
<td>- Complete full 2 minutes of CPR before checking the heart rhythm. Continuous uninterrupted compressions are paramount to patient survival.</td>
</tr>
<tr>
<td>- Consider the H’s and T’s.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Confirm patent airway, ensure visible chest rise with each breath, monitoring 02 saturation.</td>
</tr>
<tr>
<td>- Establish IV or IO access; give normal saline wide open for fluid challenge at 20ml/kg or 10ml/kg for neonates (infants less than 1 month).</td>
</tr>
<tr>
<td>- When IV or IO line is established,</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>- Give 2 minutes of chest compressions; check the heart rhythm.</td>
</tr>
<tr>
<td>- Search for and treat possible contributing factors; see the H’s and T’s charts.</td>
</tr>
<tr>
<td>- If the patient is taking calcium channel blockers or if there is a high suspicion for hyperkalemia, administer Calcium Chloride 20 mg/kg IV/IO slowly.</td>
</tr>
<tr>
<td>- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia Protocol 3.7.2</td>
</tr>
<tr>
<td>- Perform ten (10) cycles of CPR and then reevaluate the heart rhythm.</td>
</tr>
<tr>
<td>- If a pulse is present, begin post-resuscitative care.</td>
</tr>
<tr>
<td>- Administer Narcan 0.1 mg/kg, IVP may repeat once.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Provide a 15:2 compression to ventilation ratio, once an advanced airway is in place, then provide 1 breath every 6 seconds, monitor electronic EtCO2, and waveform.</td>
</tr>
<tr>
<td>(b) If EtCO2 is less than 10mmHg: Improve CPR (compressions vs. ventilation). If EtCO2=12 - 25mm Hg: Goal during resuscitation.</td>
</tr>
<tr>
<td>If EtCO2=35 - 45mm Hg: Check for ROSC</td>
</tr>
<tr>
<td>(c) If ROSC achieved, wean down oxygen to maintain a SpO2 of 94-99%.</td>
</tr>
</tbody>
</table>
### 3.3.2 Bradycardia

**GENERAL GUIDELINES**

Causes of symptomatic bradycardia include hypoxemia, hypothermia, head injury, heart block, heart transplant (special situation), and toxin/poison/drug overdose.

**TREATMENT GUIDELINES**

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Assure adequate ventilation and oxygenation.
- If heart rate is less than 60/min in an infant or child associated with poor systemic perfusion, start chest compressions (Medical Procedure 4.1.2, Cardiopulmonary Resuscitation).
- Consider the H’s and T’s.

**ALS Level 1**

- Start IV/IO administer a fluid challenge of normal saline 20 ml/kg IV or 10 ml/kg for neonates (infants less than 1 month).
- Administer Epinephrine (1:10,000) 0.01 mg/kg IV or IO (maximum dose 1 mg IV/IO) repeat every 3-5 minutes as needed.
- Administer Atropine 0.02 mg/kg IV or IO (minimum single dose 0.1 mg)(a)(b). May repeat Atropine once, maximum single dose for a child is 0.5 mg, maximum single dose for an adolescent is 1 mg(a).
- If the patient remains hypotensive and bradycardic and is conscious and aware of the situation, consider sedation with one of the following benzodiazepines, Midazolam (Versed®) is the preferred benzodiazepine: (Medical Procedure, Medication Delivery 4.18)
  - Midazolam (Versed®) 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg.
  - Diazepam (Valium) 0.2mg/kg (maximum single dose 5 mg) IV, IO or IN; may repeat once, to a maximum dose of 10 mg.
  - Lorazepam (Ativan) 0.05 mg/kg IV, IO, or IN; may repeat once, to a maximum dose of 4 mg.

**ALS Level 2**

- None

**Note**

- (a) Administer Atropine before Epinephrine for bradycardia due to suspected increased vagal tone or primary AV block.
- (b) Small doses of Atropine less than 0.1 mg may produce paradoxical bradycardia.
Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don’t delay therapy

2. Cardiopulmonary compromise?
   - Hypotension
   - Acutely altered mental status
   - Signs of shock

2a. No

3. CPR if HR <60/min with poor perfusion despite oxygenation and ventilation

3a. Yes

4. Bradycardia persists?
   - Support ABCs
   - Give oxygen
   - Observe
   - Consider expert consultation

4a. No

4b. Yes

5. Doses/Details
   - Epinephrine IO/IV dose: 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If IO/IV access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of 1:1000).
   - Atropine IO/IV dose: 0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.

6. If pulseless arrest develops, go to Cardiac Arrest Algorithm

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### 3.3.3 Narrow Complex Tachycardia

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric patients suffering from tachycardia may or may not exhibit symptoms. Narrow complex tachycardia (QRS less than or equal to 0.08 second) may be either sinus tachycardia or supraventricular tachycardia. The following rates should be considered:</td>
<td></td>
</tr>
<tr>
<td>● Sinus tachycardia is a greater than normal rate (see Appendix 6.16, Pediatric Vital Signs), usually greater than 180/min for a child and greater than 220/min for an infant (less than one year old). The rate may vary with sinus tachycardia.</td>
<td></td>
</tr>
<tr>
<td>● Supraventricular tachycardia is usually a rate above 220/min for infants. If the patient is greater than 2 years of age, SVT may be slower (e.g., 180-220/min). The rate will not vary with SVT.</td>
<td></td>
</tr>
</tbody>
</table>

Wide complex SVTs are rare in children and, therefore, should initially be considered as ventricular in origin, unless proven otherwise (e.g., documented QRS morphology consistent with preexisting BBB or Wolff-Parkinson-White (WPW) syndrome).

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNSTABLE SINUS TACHYCARDIA (DIMINISHED PERFUSION)</strong></td>
<td></td>
</tr>
<tr>
<td>● Initial Assessment Protocol 3.1.1</td>
<td></td>
</tr>
<tr>
<td>● Medical Supportive Care Protocol 3.1.3.</td>
<td></td>
</tr>
<tr>
<td>● Determine the patient’s hemodynamic stability and symptoms.</td>
<td></td>
</tr>
<tr>
<td>● Apply SpO2 monitor and administer oxygen to maintain SpO2 of 94-99 %.</td>
<td></td>
</tr>
<tr>
<td>● Consider the H’s and T’s.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>● Apply an ECG; record a rhythm strip and obtain a 12-lead ECG.</td>
<td></td>
</tr>
<tr>
<td>● If suspected hypovolemia, administer a fluid challenge of normal saline 20 ml/kg IV or 10 ml/kg for neonates (infants less than 1 month).</td>
<td></td>
</tr>
<tr>
<td>● If the patient is asymptomatic, provide Medical Supportive Care Protocol 3.1.3 and transport.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Note</th>
<th>None</th>
</tr>
</thead>
</table>
### 3.3.3 Narrow Complex Tachycardia (continued)

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>STABLE SVT (NORMAL PERFUSION)</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>● Medical Supportive Care Protocol 3.1.3.</td>
</tr>
<tr>
<td>● Determine the patient’s hemodynamic stability and symptoms.</td>
</tr>
<tr>
<td>● Apply SpO2 monitor and administer oxygen to maintain SpO2 of 94-99 %.</td>
</tr>
<tr>
<td>● Consider the H’s and T’s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Apply an ECG; record a rhythm strip and obtain a 12-lead ECG.</td>
</tr>
<tr>
<td>● Establish IV access; give normal saline wide open for fluid challenge at 20ml/kg or 10ml/kg for neonates (infants less than 1 month).</td>
</tr>
<tr>
<td>● If the patient is asymptomatic, provide Medical Supportive Care Protocol 3.1.3 and transport.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Attempt vagal maneuvers; begin with ice water (Medical Procedure 4.26, Vagal Maneuvers) (a).</td>
</tr>
<tr>
<td>● Administer Adenosine Triphosphate (Adenocard ®) 0.1 mg/kg (6 mg is the maximum first dose) via rapid IVP/IO, followed by 10 mL normal saline flush (a).</td>
</tr>
<tr>
<td>● If not resolved after 2 minutes repeat Adenosine 0.2 mg/kg (12 mg is the maximum second dose) via rapid IVP/IO, followed by 10 mL normal saline flush (a).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
</table>
### 3.3.3 Narrow Complex Tachycardia (continued)

#### GENERAL GUIDELINES

**UNSTABLE SVT (DIMINISHED PERFUSION)**

#### SUPPORTIVE CARE

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Determine the patient’s hemodynamic stability and symptoms.
- Apply SpO2 monitor and administer oxygen to maintain SpO2 of 94-99 %.
- Consider the H’s and T’s.

#### ALS Level 1

- Consider sinus tachycardia as the underlying rhythm, not SVT.
- Apply an ECG; record a rhythm strip and obtain a 12-lead ECG.
- Establish IV/IO access; give normal saline wide open.
- If the patient is responsive, administer Adenosine Triphosphate (Adenocard ®) 0.1 mg/kg (maximum dose 6 mg) via rapid IVP/IO, followed by 10 mL normal saline flush (a).
- If unresolved after 2 minutes, repeat Adenosine 0.2 mg/kg (maximum dose 12 mg) via rapid IVP/IO, followed by 6 mL normal saline flush. (a).
- If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines with Midazolam (Versed®) being the preferred benzodiazepine: (Medical Procedure, Medication Delivery 4.18)
  - Midazolam (Versed®) 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (c).
  - OR
    - Diazepam (Valium) 0.2mg/kg (maximum single dose 5 mg) IV, IO or IN; may repeat once, to a maximum dose of 10 mg (c).
  - OR
    - Lorazepam (Ativan) 0.05 mg/kg IV, IO, or IN; may repeat once, to a max dose of 4 mg (c).
- If the patient is poorly responsive, apply synchronized cardioversion at 0.5 joule/kg. (b).
- If the patient remains poorly responsive, apply synchronized cardioversion at 1 joule/kg (b).
- If the patient is still poorly responsive, apply synchronized cardioversion at 2 joule/kg (b).

#### ALS Level 2

- None

#### Note

(a) Record the patient’s heart rhythm while attempting to convert the rhythm so as to capture conversion data.
(b) Do not delay synchronized cardioversion to establish an IV for sedation purposes.
(c) Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
### 3.3.4 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia)

#### GENERAL GUIDELINES

This protocol is used in wide complex tachycardia (QRS greater than 0.12 second).

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>STABLE (NORMAL PERFUSION) and UNSTABLE (DIMINISHED PERFUSION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td></td>
<td>• Medical Supportive Care Protocol 3.1.3.</td>
</tr>
<tr>
<td></td>
<td>• Determine the patient’s (un)responsiveness and check the CABs.</td>
</tr>
<tr>
<td></td>
<td>• Consider the H’s and T’s</td>
</tr>
</tbody>
</table>

#### ALS Level 1

<table>
<thead>
<tr>
<th>STABLE (NORMAL PERFUSION)</th>
<th>UNSTABLE (DIMINISHED PERFUSION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Administer Amiodarone 5 mg/kg IV 50ml or 100ml over 20-60 minutes.</td>
<td>• If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines with Midazolam (Versed®) being the preferred benzodiazepine: (a) (Medical Procedure 4.18, Medication Administration)</td>
</tr>
<tr>
<td></td>
<td>o Midazolam (Versed®) 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (b).</td>
</tr>
<tr>
<td></td>
<td>OR o Diazepam (Valium) 0.2mg/kg (maximum dose 5 mg) IV, IO or IN; may repeat once, to a maximum dose of 10 mg (b).</td>
</tr>
<tr>
<td></td>
<td>OR o Lorazepam (Ativan) 0.05 mg/kg IV, IO, or IN; may repeat once, to a maximum dose of 4 mg (b).</td>
</tr>
<tr>
<td></td>
<td>• If the patient is poorly responsive, apply synchronized cardioversion at 0.5 joule/kg. (a).</td>
</tr>
<tr>
<td></td>
<td>• If the patient remains poorly responsive, apply synchronized cardioversion at 1 joule/kg (a).</td>
</tr>
<tr>
<td></td>
<td>• If the patient is still poorly responsive, apply synchronized cardioversion at 2 joule/kg (a).</td>
</tr>
</tbody>
</table>

#### ALS Level 2

- If the patient converts to a sinus rhythm after cardioversion and the patient is normotensive, consult medical control for Amiodarone 5mg/kg 50ml or 100ml over 20-60 minutes.

#### Note

(a) Do not delay synchronized cardioversion to establish an IV for sedation purposes.

(b) Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
### 3.3.5 Wide Complex Tachycardia Without a Pulse and Ventricular Fibrillation

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>This protocol is intended for the pulseless patient.</th>
</tr>
</thead>
</table>

#### TREATMENT GUIDELINES

| Supportive Care | Initial Assessment Protocol 3.1.1  
|-----------------|----------------------------------|
|                 | Medical Supportive Care Protocol 3.1.3.  
|                 | Determine the patient’s (un)responsiveness and check the CABs.  
|                 | Begin CPR at a compression rate of 100-120/min for 2 minutes while the monitor is being attached.  
|                 | Complete full 2 minutes of CPR before checking the heart rhythm. Perform chest compressions at 15:2 ratio unless an advanced airway has been established (supraglottic or ETT).  
|                 | Do not interrupt CPR to check the heart rhythm. Continuous uninterrupted compressions are paramount to patient survival.  
|                 | Consider the H’s and T’s. |

| ALS Level 1 | Defibrillate at an initial dose of 2 J/kg.  
|-------------|----------------------------------|
|             | Resume CPR immediately. Administer ten cycles of CPR.  
|             | Check the heart rhythm. Treat according to the applicable protocol.  
|             | For refractory VF, increase the dose to 4 J/kg; continue CPR while the defibrillator is charging.  
|             | Resume CPR immediately.  
|             | Administer Epinephrine (1:10,000) 0.01 mg/kg IV or IO (maximum dose 1 mg). Repeat every 3-5 minutes for the duration of pulselessness.  
|             | Reevaluate the heart rhythm after ten cycles of CPR.  
|             | Subsequent energy levels should be at least 4 J/kg, and higher energy levels may be considered, not to exceed 10 J/kg or the adult maximum dose (AHA Class IIb, LOE C). CPR while the defibrillator is charging.  
|             | Resume CPR immediately.  
|             | Administer one of the following antiarrhythmics: Amiodarone 5 mg/kg IV or IO.  
|             | OR  
|             | If the patient has torsades de pointes, Magnesium Sulfate 25-50 mg/kg IV/IO, up to a maximum dose of 2 g over 2 minutes. |

| ALS Level 2 | >  
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<td>None</td>
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### Note
### General Guidelines

Infant and newborn cardiopulmonary arrest is usually a result of prolonged poor oxygenation and/or severe circulatory collapse. Newborn/neonates (infants less than 1 month) should be resuscitated using Pediatric Protocol 3.4.1. Unless there are obvious signs of death (General Protocol 1.4, Death in the Field), the infant in cardiopulmonary arrest should be resuscitated using the protocols in Pediatric Protocol 3.3. While some infants may not be salvageable, the paramedic may determine a resuscitation attempt is warranted for psychological reasons (e.g., the parent’s peace of mind). Consideration should also be given to Sudden Unexpected Infant Death (SUIDs) (Pediatric Protocol 3.4.2).
3.4.1 Newborn Resuscitation

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>This protocol is to be used for newborns that are in need of resuscitation immediately following delivery.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREATMENT GUIDELINES</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Supportive Care</strong></td>
<td>• Initial Assessment Protocol 3.1.1&lt;br&gt;• Dry and keep the newborn warm (cover with a thermal blanket or dry towel, and cover the scalp with a stocking cap).&lt;br&gt;• Position the patient so as to open the airway (a).&lt;br&gt;• Clear the airway; suction the mouth and nose with a bulb syringe as needed.&lt;br&gt;<strong>Paramedic Only</strong>: If the newborn has signs of thick meconium after suctioning with a bulb syringe and if the newborn is not vigorous and crying, intubate and suction the trachea using the meconium aspirator (see Medical Procedure 4.3.1, Flexible Suctioning, Medical Procedure 4.3.2, Rigid Suctioning) (b). <em>(From PALS 2010: In the absence of randomized, controlled trials, there is insufficient evidence to recommend a change in the current practice of performing endotracheal suctioning of nonvigorous babies with meconium-stained amniotic fluid (Class IIb, LOE C). However, if attempted intubation is prolonged and unsuccessful, BVM should be considered, particularly if there is persistent bradycardia.)</em>&lt;br&gt;• Stimulate the newborn (rub the newborn’s back).&lt;br&gt;  o Never “milk” the cord, after infant delivery wait at least 30 seconds up to 3 minutes or until the cord stops pulsating to clamp/cut the cord. Apply two umbilical cord clamps (2 inches apart and at least 8 inches from the navel), and then cut the cord between the clamps.&lt;br&gt;• Assess skin color, respirations, and heart rate.&lt;br&gt;• Administer 100% oxygen via blow-by method to newborns that are breathing but have central cyanosis or have no improvement in respiratory, circulatory, or neurological status within 90 seconds of initial assessment.&lt;br&gt;• Ventilate at 40-60 breath/min with 100% oxygen under the following conditions:&lt;br&gt;  o Apnea.&lt;br&gt;  o Heart rate less than 100 beat/min.&lt;br&gt;  o Persistent central cyanosis after high-flow oxygen.&lt;br&gt;<strong>Paramedic Only</strong>: Place an advanced airway only under the following conditions (Medical Procedure 4.4):&lt;br&gt;  o Bag valve mask (BVM) ventilation is ineffective after 2 minutes.&lt;br&gt;  o Tracheal suctioning is required, especially for thick meconium, and the newborn is not vigorous and crying (b).&lt;br&gt;  o Prolonged positive-pressure ventilation is needed.&lt;br&gt;• Newborns who require CPR in the prehospital setting, should receive CPR according to infant guidelines: 2 rescuers provide continuous chest compressions with asynchronous ventilations if an advanced airway is in place and a 15:2 ventilation-to-compression ratio if no advanced airway is in place (Class IIb, LOE C). Perform chest compressions at 120/min using two thumbs placed side by side (or superimposed one on top of the other) over the mid-sternum, just below the nipple line, with the fingers encircling the chest and supporting the back, under the following conditions:&lt;br&gt;  o Heart rate is less than 100 beat/min and not rapidly increasing despite adequate ventilation with 100% oxygen for approximately 30 seconds.</td>
</tr>
</tbody>
</table>
3.4.1 Newborn Resuscitation (continued)

**TREATMENT GUIDELINES**

**ALS Level 1**

- Administer Epinephrine (1:10,000) 0.01mg/kg IV/IO under the following conditions:
  - Asystole.
  - Heart rate is less than 60 beat/min despite adequate ventilation with 100% oxygen and 30 seconds of chest compressions.
- Repeat every 3-5 minutes as needed.
- Administer a fluid challenge of normal saline 10mL/kg IV/IO under the following conditions:
  - Pallor that persists after adequate oxygenation.
  - Faint pulses with a good heart rate.
  - Poor response to resuscitation with adequate ventilations.
- Check the blood glucose level for all resuscitated newborns who do not respond to initial therapy. Use a heel stick (see Medical Procedure 4.17, Glucometer).
  - If blood glucose less than 40 mg/dL, administer D 10 5 mL/kg IV/IO (dilute D 50 1:4 with normal saline to make D10).
- Perform Pediatric Assessment Triangle: Rapid Cardiopulmonary Assessment (Pediatric Protocol 3.1.1, Initial Assessment) frequently.

**ALS Level 2**

- If the newborn is unresponsive with depressed respirations, consider Naloxone (Narcan®) 0.1 mg/kg (1 mg/mL concentration) IV/IO/IN/IM (c) (Medical Procedure, Medication Delivery 4.18)

**Note**

(a) The newborn should be placed on his/her back or side with the neck in a neutral position. To help maintain correct position, a rolled blanket or towel may be placed under the back and shoulders of the supine newborn to elevate the torso 0.75 or 1 inch off the mattress to extend the neck slightly. If copious secretions are present, the newborn should be placed on his/her side with the neck slightly extended to allow secretions to collect in the mouth rather than in the posterior pharynx.

(b) Tracheal suctioning for thick meconium should be done via an endotracheal tube using a meconium aspirator attached to the 15-mm adaptor of the ETT. The suction unit is then attached and placed on low pressure (no more than 100 mm Hg). Suctioning should be performed until the ETT is clear (maximum 5 seconds). It may be necessary to repeat the intubation and continue suctioning until clear (maximum three times).

(c) Avoid the use of Naloxone if the mother has a history of drug use/abuse, as Naloxone may precipitate seizures in the newborn due to acute withdrawal.
### General Guidelines

Sudden unexpected infant deaths (SUID) are defined as deaths in infants less than 1 year of age that occur suddenly and unexpectedly, and whose cause of death are not immediately obvious prior to investigation. Each year in the United States, about 4,000 infants die suddenly of no immediately obvious cause. About half of these SUIDs are due to Sudden Infant Death Syndrome (SIDS), the leading cause of SUID and of all deaths among infants aged 1–12 months. The three most frequently reported causes are SIDS, cause unknown, and accidental suffocation and strangulation in bed. Additional information and training material is available at [www.cdc.gov/SIDS/](http://www.cdc.gov/SIDS/)

Expanding Safe Infant Sleep Outreach - The U.S. national campaign to reduce the risk of SIDS has entered a new phase and will now include all sleep-related SUIDs. The campaign, which has been known as the Back to Sleep Campaign, has been renamed the Safe to Sleep Campaign.

Sudden Infant Death Syndrome (SIDS) is defined as the sudden death of an infant less than 1 year of age that cannot be explained after a thorough investigation is conducted, including a complete autopsy, examination of the death scene, and review of the clinical history.

SIDS almost always occurs when the infant is asleep or is thought to be asleep. Although there may be obvious signs of death the paramedic may attempt resuscitation of the infant for psychological reasons (e.g., the parent’s peace of mind). There may also be some infants in whom the Paramedic determines that a resuscitation attempt is not warranted (General Protocol 1.4, Death in the Field). In either event, the Paramedic should be prepared for a myriad of grief reactions from the parents and/or caregiver. The Paramedic should document the location the infant was found and the appearance of the infant.

Some SIDS deaths are mistaken for child abuse. If there are possible signs of abuse (Appendix 6.2.2, Signs of Child Abuse), the paramedic should continue as if it were a SIDS death, to avoid any unnecessary grief on the part of the parents and/or caregiver. The paramedic should not attempt to determine whether child abuse has taken place. The scene should be treated as any other death scene, with attention to preservation of potential evidence.

### Treatment Guidelines

#### Supportive Care

- Initial Assessment Protocol 3.1.1
- In most instances, resuscitation should be attempted (see the appropriate Pediatric Protocols).
- Assign a crew member to assist the parents and/or caregiver and to explain the procedures.
- If time permits, elicit a brief history and perform an environmental check. Document all findings on the EMS Run Report.
- Once resuscitation is started, do not stop until directed to do so in the hospital by a physician.

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>ALS Level 2</th>
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<td>None</td>
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#### Note

- None
3.5 Pediatric Neurologic Emergencies

GENERAL GUIDELINES

This section covers the most common pediatric neurologic emergencies, altered mental status, and seizures. It is important for the paramedic to understand appropriate behavior for the child/infant’s age to properly assess level of consciousness (Appendix 6.9.2, Glasgow Coma Scale Score, for pediatric patients). Attention should be given to how the child interacts with parents and the environment and whether the patient can make good eye contact. Parents may be invaluable for a baseline comparison of level of consciousness. The parents may simply state that the patient is not acting right. Causes of pediatric altered mental status may include hypoxia, head trauma, ingestion/poisoning, infection, and hypoglycemia.

Approximately 4-6% of all children will have at least one seizure. Seizures may be due to an underlying disease (e.g., epilepsy) or may simply be a result of fever. Other potential causes of pediatric seizures include trauma, hypoxia, infection of brain and spinal cord (e.g., meningitis), hypoglycemia, and ingestion/poisoning.
### 3.5.1 Altered Level of Consciousness (Altered Mental Status)

#### GENERAL GUIDELINES

**General Guidelines**

Common signs of altered mental status in pediatric patients include combative behavior, decreased responsiveness, lethargy, weak cry, moaning, hypotonia, ataxia, and changes in personality. The initial management approach should be based on the assumption that the patient is suffering from infection, hypoxia, ischemia, hypoglycemia, or dehydration. Secondary considerations should include medications, illicit drugs/alcohol, plants, trauma, and other factors.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3; consider the need for spinal immobilization (Medical Procedure 4.24, Spinal Immobilization).
- Consider the need for ventilatory assistance.

**ALS Level 1**

- If the child remains unresponsive and prolonged ventilatory assistance is needed, consider use of an appropriate airway adjunct device (a).
- Perform a glucose test with a finger stick. If glucose less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia protocol 3.7.2
- If the patient’s mental status is depressed and signs of dehydration exist, administer a fluid challenge of normal saline 20 mL/kg IV or 10 ml/kg for neonates (infants less than 1 month).
- If the patient’s mental status and respiratory effort are depressed, administer naloxone (Narcan®) 0.1 mg/kg (maximum dose 2 mg) IV/IO/IM/IN. May repeat every 5 minutes as needed. (Medical Procedure 4.18, Medication Administration)
- If toxicology (poisoning) is suspected, contact:

  **Poison Information Center (1-800-222-1222)**

**ALS Level 2**

- None

**Note**

(a) Use appropriate discretion regarding the immediate use of airway adjuncts in pediatric patients, as they may quickly regain consciousness.
### 3.5.2 Seizure Disorders

#### GENERAL GUIDELINES

**General Guidelines**

This protocol should be used when the patient has shown continuous convulsions or repeating episodes without regaining consciousness or sufficient respiratory compensation. Consider an underlying etiology such as fever, hypoxia, head trauma, infection (e.g., meningitis), hypoglycemia, electrolyte imbalance, and ingestion/poisoning.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3. Apply gentle support to the patient’s head to avoid trauma, and loosen tight-fitting clothing. (a)

**ALS Level 1**

- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia Protocol 3.7.2
- If the seizure continues, administer: (Medical Procedure, Medication Delivery 4.18).
  - Diazepam (Valium) 0.2mg/kg (maximum dose 5 mg) IV, IO or IN; may repeat once, to a maximum dose of 10 mg(b)
  - Midazolam (Versed®) 0.1 mg/kg, maximum single dose of 4 mg IV/IO. For IN or IM administration use 0.2mg/kg/dose (use 10mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose 10mg (b)
  - Lorazepam (Ativan ®) 0.1mg/kg IV or IN, max 2 mg per dose, if no effect after 5 minutes may be repeated once to a maximum total dose of 4 mg (b)

**ALS Level 2**

- Call for orders for additional benzodiazepine

**Note**

- Providers should not withhold obtaining IV access for fear of not wanting to agitate the patient.
- Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
### General Guidelines

This treatment protocol is used in conjunction with General Protocol 1.2, Behavioral Emergencies. There are many reasons for a patient to be impaired or violent such as, psychiatric, drug overdose, CVA, ETOH, hypoxia and hypoglycemia.

- If the patient is violent and an immediate threat to the patient, EMS crew or bystander safety exists, chemical and/or physical restraint should be used to prevent patient from harming him/herself or others.
- If patient is not violent, be observant for possibility of violence and avoid provoking the patient.
- Particular caution should be exercised when evaluating and treating any patient that was subdued by a “non-lethal” law enforcement device such as pepper spray or taser.
- Typical findings for any violent and/or impaired patient:
  - P – Psychological issues
  - R – Recent drug / alcohol use
  - I – Incoherent thought process
  - O – Off (clothes) and sweating
  - R – Resistant to presence / dialogue
  - I – Inanimate objects / shiny / glass – violent
  - T – Tough, unstoppable, superhuman strength
  - Y – Yelling
- Excited delirium syndrome is a state in which a person is in a psychotic and extremely agitated state. Mentally the patient is unable to focus and process any rational thought. The condition is brought on by overdose on stimulant or hallucinogenic drugs, drug withdrawal, or psychiatric patient not taking medication for significant amount of time.
- Typical signs and symptoms to suspect excited delirium are elevated temperature, nudity, profuse sweating, and change from aggressive behavior to “instant tranquility.” These patients should be closely observed for cardiac and respiratory changes.

### Supportive Care

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care 3.1.3.
- Consult with Law Enforcement about placing the patient under the Baker Act provisions when appropriate and refer to the Impaired/Incapacitated Persons Act (General Protocol 1.2, Behavioral Emergencies).
- Rule out causes other than psychiatric (e.g., drug overdose, ETOH, head trauma, hypoxia, hypoglycemia).
- If appropriate, consider physically restraining patient (Medical Procedure 4.23, Restraints).
- Apply SpO2 and administer oxygen to maintain SpO2 greater than or equal to 94%.
- Perform glucose test with finger stick (Medical Procedure 4.17, Glucometer).
- Obtain body temperature.
## 3.5.3 Violent, Impaired Patient and/or Excited Delirium (ExDS) Patient (continued)

### GENERAL GUIDELINES

#### ALS Level 1
- If patient has elevated temperature above 100 degrees, consider cooling patient using cold packs to patient’s head, axilla and groin (goal temperature less than 100 degrees).
- Administer benzodiazepines as rapidly and as safely as possible (a) (b). (Medical Procedure 4.18, Medication Administration)
  - Diazepam (Valium) 0.2mg/kg (maximum single dose 5 mg) IV, IO or IN; may repeat once, to a maximum dose of 10 mg (a) (b).

**OR**
  - Midazolam (Versed®) 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (a)(b).

**OR**
  - Lorazepam (Ativan ®) 0.1mg/kg IV or IN, max 2 mg per dose if not effect after 5 minutes may be repeated once to a maximum total dose of 4 mg (a)(b).

- Diphenhydramine HCl (Benadryl®) 1 mg/kg (maximum dose 50 mg) IM or SLOW IV. If administering Benadryl IV dilute in 9mL of normal saline (Medical Procedure 4.18, Medication Administration).
- Consider Ketamine 4 mg/kg IM, 2mg/kg IN if available if the patient does not respond to benzodiazepine (Medical Procedure 4.18, Medication Administration).

**OR**
- Administer Haloperidol (Haldol®) 0.1mg/kg IM maximum of 5 mg, if available (a) (c).
- Initiate cardiac monitoring.
- Treat dysrhythmias per specific protocol (Pediatric Protocol 3.3).
- Expedite transport – Transport Code 3 to closest appropriate facility.

#### ALS Level 2
- None

### Note
(a) In some instances, IV administration may present a safety concern; in this case, IM or IN administration of sedatives may be the more desirable route.
(b) Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
(c) Haloperidol (Haldol®) may result in a dystonic reaction if it is administered alone. This effect can be avoided or reversed with Benadryl. Haloperidol should be used with caution in cases of suspected overdose, especially cocaine, and its use should be preceded by benzodiazepine administration.
3.6 Pediatric Toxicologic Emergencies

**GENERAL GUIDELINES**

This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure (e.g., drug overdose, snake bite). Each of the subprotocols gives specific considerations for each type of exposure as well as general treatment guidelines. Additional assistance may be necessary in certain cases (e.g., hazardous materials team for toxic exposure; police for scene control, including the presence of violent and/or impaired patient - see Pediatric Protocol 3.7.5). Also refer to the Chemical Treatment Guidelines (found in Chapter 7) as needed.

A history of the events leading to the illness or injury should be obtained from the patient and bystanders, to include the following information:

1. To which drugs, poisons, or other substances was the patient exposed? Consider multiple substances, especially on overdoses. Also consider plants and herbal remedies.
2. When did the exposure occur, and how much exposure was there?
3. What is the duration of symptoms?
4. Is the patient depressed or suicidal? Does he/she have a history of previous over-dose? (if applicable)
5. Was the exposure accidental? What was the nature of the accident?
6. What was the duration of exposure? (if applicable)

Collect all pill bottles - empty or full - and check for a “suicide note” (if applicable). Transport any/all information or items that may assist in the treatment of the patient to the emergency department.

Contact the **Poison Information Center (1-800-222-1222)** for consultation regarding specific therapy.
### 3.6.1 Pediatric Ingestion (Overdose)

#### GENERAL GUIDELINES

**General Guidelines**

This protocol should be used on most types of ingestion /poisoning (e.g., acetaminophen, benzodiazepines, narcotics, tricyclic antidepressants, vitamins with iron). See Adult Protocol 2.6 for lists of different types of medications. Symptoms vary with the substance involved. Also refer to the Pediatric Chemical Treatment Guidelines (found in Chapter 7) as needed.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Consider the need for ventilatory support (Medical Procedure 4.1).
- **Contact the Poison Information Center (1-800-222-1222).**

**ALS Level 1**

- Consider the need for use of an airway adjunct device. If an endotracheal tube is used, attempt to utilize a “cuffed tube” to prevent aspiration.
- Perform a glucose test with a finger stick. If glucose less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia Protocol 3.7.2
- If narcotic overdose is suspected in a non-neonate, administer naloxone (Narcan®) 0.1 mg/kg (maximum dose of 2 mg) IV/IO/IM/IN. May repeat every 5 minutes as needed. (Medical Procedure, Medication Delivery 4.18)
- If tricyclic antidepressant overdose is suspected, administer Sodium Bicarbonate 1 mEq/kg IV/IO

**ALS Level 2**

> None

**Note**

If the patient is seizing, also see Pediatric Protocol 3.5.2.
### 3.6.2 Bites and Stings

#### GENERAL GUIDELINES

**General Guidelines**

This protocol includes the treatment for snake and spider bites, dog and cat bites, insect stings, and marine animal envenomations and stings. All bite patients should be transported to the hospital.

- Contact the **Poison Information Center (1-800-222-1222)**.
- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4.

#### TREATMENT GUIDELINES

**Supportive Care**

**Snake Bites**

- Consider the need for Pediatric Protocol 3.7.1, Allergic Reactions/Anaphylaxis.
- Splint the affected area. Place the patient in a supine position with the extremities at a neutral level. Keep the patient quiet. Remove and secure all jewelry.
- Wash the area of the bite with copious amounts of water.
- Attempt to identify the snake, if it is safe to do so.
- Check the temperature and pulse distal to a bite on an extremity, and mark level of swelling and time with pen every 15 minutes.

**Dog, Cat, and Wild Animal Bites**

- Wound care: BLS. Do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat.
- Advise dispatch to contact animal control and the police department for identification and quarantine of the animal.

**Insect Stings (Including Centipedes, Scorpions, and Spiders)**

- Consider the need for Pediatric Protocol 3.7.1, Allergic Reactions/Anaphylaxis.
- Remove the stinger by scraping the skin with the edge of a flat surface (e.g., a credit card). Do not attempt to pull the stinger out, as this may release more venom.
- Clean the wound area with soap and water.

**Human Bites**

- General Protocol 1.12, Personal Exposure to Infectious Diseases.
- Wound care: BLS. Do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat. Clean the wound area with soap and water.
- Advise dispatch to contact the police department for possible domestic disturbance.

**Marine Animal Envenomations: Stingray, Scorpionfish (Lionfish, Zebrafish, Stonefish), Catfish, Weeverfish, Starfish, and Sea Urchin**

- Consider the need for Pediatric Protocol 3.7.1, Allergic Reactions/Anaphylaxis.
- Immerse the punctures in nonscalding hot water to tolerance (110-113°F) to achieve pain relief (30-90 minutes). Transport should not be delayed for this purpose; immersion in nonscalding hot water may be continued during transport.
- Remove any visible pieces of the spine(s) or sheath. Gently wash the wound with soap and water, and then irrigate it vigorously with fresh water (avoid scrubbing).
### 3.6.2 Bites and Stings (continued)

#### SUPPORTIVE CARE

**MARINE ANIMAL STINGS: JELLYFISH, MAN-OF-WAR, SEA NETTLE, IRUKANDJI, ANEMONE, HYDROID, AND FIRE CORAL**

- Consider the need for Pediatric Protocol 3.7.1, Allergic Reactions/Anaphylaxis.
- Rinse the skin with sea water. Do not use fresh water, do not apply ice, and do not rub the skin.
- Remove any large tentacle fragments using forceps. Use gloves to avoid contact with your bare hands.
- Zerym Spray

#### ALS LEVEL 1

- Refer to Pediatric Protocol 3.1.5 for pain management guidelines.

#### ALS LEVEL 2

- None

#### NOTE

- None
### 3.7 Other Pediatric Medical Emergencies

<table>
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<tr>
<th>General Guidelines</th>
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<tbody>
<tr>
<td>The paramedic should use these protocols to guide him/her through the treatment of patients with other medical emergencies who are exhibiting signs and symptoms. In addition to these protocols, the paramedic may need to refer to other protocols for continued treatment.</td>
</tr>
</tbody>
</table>
### General Guidelines

This protocol should be used for patients who are exhibiting signs and symptoms consistent with allergic reaction:

- **Skin**: flushing, itching, hives, swelling, cyanosis.
- **Respiratory**: dyspnea, sneezing, coughing, wheezing, stridor, laryngeal edema, laryngospasm, bronchospasm.
- **Cardiovascular**: vasodilatation, increased heart rate, decreased blood pressure.
- **Gastrointestinal**: nausea/vomiting, abdominal cramping, diarrhea.
- **CNS**: dizziness, headache, convulsions, tearing.

Treatment is outlined according to the severity of the allergic reaction (mild, moderate, and severe or anaphylaxis).

### Treatment Guidelines

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>MILD REACTIONS</th>
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<tbody>
<tr>
<td>Initial Assessment Protocol 3.1.1</td>
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<tr>
<td>Trauma Supportive Care Protocol 3.1.4</td>
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#### ALS Level 1

#### MILD REACTIONS

Mild reactions consist of redness and/or itching, but normal perfusion without dyspnea.

- For severe itching, administer Diphenhydramine (Benadryl®) 1 mg/kg IM or SLOW IV (maximum dose 50 mg). If administering Benadryl IV dilute amount in 9mL of normal saline (Medical Procedure 4.18, Medication Administration).

#### MODERATE REACTIONS

Moderate reactions are characterized by edema, hives, dyspnea, wheezing, and normal perfusion (Medical Procedure 4.18, Medication Administration).

- Epinephrine (1:1000) 0.01 mg/kg IM lateral thigh (maximum dose of 0.3 mg) (a).
- Diphenhydramine (Benadryl®) 1 mg/kg IM lateral thigh or SLOW IV (maximum dose of 50 mg). If administering Benadryl IV dilute amount in 9 mL of normal saline.
- Albuterol (Ventolin®): If the patient remains in respiratory distress, administer one nebulizer treatment.
  - If less than 1 year or less than 10 kg: 1.25 mg/1.5 mL (0.083%).
  - If greater than 1 year or greater than 10 kg: 2.5 mg/3 mL (0.083%).

#### SEVERE REACTIONS

Severe reactions are characterized by edema, hives, severe dyspnea and wheezing, poor perfusion, and possible cyanosis and laryngeal edema. Consider the need for immediate intubation. (Medical Procedure 4.18, Medication Administration).

- Epinephrine (1:1000) 0.01 mg/kg IM lateral thigh (maximum dose of 0.3 mg) (a).
- Diphenhydramine (Benadryl®) 1 mg/kg IM lateral thigh or SLOW IV (maximum dose of 50 mg). If administering Benadryl IV dilute amount in 9 mL of normal saline.
- Albuterol (Ventolin®): If patient remains in respiratory distress, administer 1 nebulizer treatment.
If less than 1 year or less than 10 kg: 1.25 mg/1.5 mL (0.083%).
If greater than 1 year or greater than 10 kg: 2.5 mg/3 mL (0.083%).

- If bronchodilators are administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (2.5 mL) to either Albuterol nebulizer treatment for the first nebulizer treatment only. May repeat Epinephrine (1:1000) 0.01 mg/kg IM lateral thigh.
  o If less than 8 years old 0.25/1.25 ml
  o If greater than 8 years old 0.5mg/2.50ml

**MILD REACTIONS:** Epinephrine (1:1000) 0.01 mg/kg IM lateral thigh (max dose 0.3 mg).

**MODERATE REACTIONS:** None

**SEVERE REACTIONS:** Consult Medical Direction for further orders.

(a) The EpiPen® (greater than 8 yrs) or EpiPen Jr® (1-8 yrs) may be used if other means of Epinephrine administration are not available.
3.7.2 Hypoglycemia/Hyperglycemia

**GENERAL GUIDELINES**

This protocol is to be used for those patients whose blood glucose is less than 60 mg/dL (see Pediatric Protocol 3.4.1 for newborn guidelines). Consider medication errors, overdoses, accidental ingestions, and other factors related to etiology. Look for pill bottles.

**TREATMENT GUIDELINES**

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.

**ALS Level 1**

- Perform a glucose test with a finger stick.
- If the child is above 3 years of age and the patient is conscious with an intact gag reflex, administer oral glucose 15 g (1 tube), if possible.
- For neonates (infants less than 1 month) with blood glucose of less than 40 mg/dL administer D10 5 mL/kg IV/IO (b).
- If glucose less than 60 mg/dL, administer:
  - If 1 month-1 year: D10 5 mL/kg IV/IO (b).
  - If 1-8 years: D25 2 mL/kg IV/IO (a).
  - If greater than 8 years: D50 1 mL/kg IV/IO (Medical Procedure 4.17, Glucometer) (a).
  - If unable to obtain IV/IO access provide Glucagon IM as follows: (Medical Procedure 4.18, Medication Administration)
    - Patient less than or equal to 20 kg: 0.5 mg IM
    - Patients greater than 20 kg: 1 mg IM
- Repeat a glucose test with a finger stick. If glucose less than 60 mg/dL, administer dextrose dosing above.

**ALS Level 2**

➢ None

**Note**

(a) To avoid infiltration and resultant tissue necrosis, dextrose 25% and 50% should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.

(b) Dilute D50 1:4 with normal saline to make D10.
### 3.7.3 Nausea and Vomiting

#### GENERAL GUIDELINES

To enhance patient comfort and safety, the treatment of nausea and vomiting may be appropriately accomplished in the field. The symptoms of nausea and vomiting may occur as a result of acute illness or as a medication side effect.

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Administer Zofran® (Ondansetron hydrochloride) (Drug Summary 5.37)</td>
</tr>
<tr>
<td></td>
<td><strong>Oral</strong></td>
</tr>
<tr>
<td></td>
<td>Less than 20 kg: Do NOT administer</td>
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<tr>
<td></td>
<td>20 kg - 39 kg (5-11 year): 4 mg oral disintegrating tablet (ODT) placed under the tongue. Dose may not be repeated</td>
</tr>
<tr>
<td></td>
<td>40 kg or more (12 year or older): 4 mg oral disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose of 8 mg</td>
</tr>
<tr>
<td></td>
<td><strong>Injection</strong></td>
</tr>
<tr>
<td></td>
<td>Less than 40 kg: 0.1 mg/kg SLOW IV push over 2-3 minutes or IM (Medical Procedure 4.18, Medication Administration). Do not repeat.</td>
</tr>
<tr>
<td></td>
<td>40 kg or more: 4 mg SLOW IV push over 2-3 minutes or IM (Medical Procedure 4.18, Medication Administration). May be repeated once if no improvement within 30 minutes. Do not exceed 8 mg total dosage.</td>
</tr>
</tbody>
</table>

| ALS Level 2 | None |

### Note
### General Guidelines

This protocol should be used for patients who complain of abdominal pain without a history of trauma (refer to Appendix 6.2.2 Signs of Child Abuse). Assessment should include specific questions pertaining to the GI/GU systems.

Abdominal physical assessment:
- Ask patient to point to the area of pain (palpate this area last).
- Gently palpate for tenderness, rebound tenderness, distention, rigidity, guarding, and pulsatile masses. Also palpate the flank for CVAT (costovertebral angle tenderness).
- Abdominal history:
  - History of pain (OPQRRRST).
  - History of nausea/vomiting (color, bloody, coffee grounds, dark bilious).
  - History of bowel movement (last BM, diarrhea, bloody, tarry).
  - History of urine output (painful, dark, bloody).
  - History of abdominal surgery.
  - History of medication ingestions.
  - SAMPLE history (pay attention to last meal).

Additional questions should be asked of the female adolescent patient regarding OB/GYN history (Adult Protocol 2.7, Adult OB/GYN Emergencies).

An acute abdomen can be caused by appendicitis, diabetic ketoacidosis, incarcerated hernia, intussusception, cholecystitis, cystitis-UTI (bladder inflammation), duodenal ulcer, diverticulitis, abdominal aortic aneurysm, kidney infection, urinary tract infection (UTI), kidney stone, pelvic inflammatory disease (PID; female), or pancreatitis (Appendix 6.1, Abdominal Pain Differential).

### Treatment Guidelines

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>Initial Assessment Protocol 3.1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medical Supportive Care Protocol 3.1.3.</td>
</tr>
<tr>
<td></td>
<td>Check Glucose</td>
</tr>
</tbody>
</table>

| ALS Level 1       | In case of decreased perfusion (Appendix 6.16, Pediatric Vital Signs), administer a fluid challenge of normal saline 20 mL/kg IV and 10 ml/kg for neonates (infants less than 1 month). |

| ALS Level 2       | Consider pain control management (Pediatric Protocol 3.1.5 for pain scale and medication dosage - same as isolated extremity fracture pain protocol). |

**Note**

### 3.7.5 Nontraumatic Chest Pain—Undifferentiated

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most chest pains in children are non-cardiac related. Causes of nontraumatic chest pain in the pediatric patient include wheezing-associated illness, spontaneous pneumothorax, pleurisy, costochondritis, pulmonary embolism, pneumonia, peptic ulcer, drug usage (e.g., stimulants—cocaine), dissecting aortic aneurysm, pericarditis, hiatal hernia, esophageal spasm, cholecystitis, pancreatitis, cervical disk problem, and, rarely, cardiac problems (see Appendix 6.5, Chest Pain Differential). Also refer to Appendix 6.2.2, Signs of Child Abuse.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
</table>
| • Initial Assessment Protocol 3.1.1  
• Medical Supportive Care Protocol 3.1.3.  
• Consider the need for other protocols (e.g., Pediatric Protocol 3.2, Pediatric Respiratory Emergencies). |

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>➢ None</td>
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<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consider pain control management (Pediatric Protocol 3.1.5 for pain scale and medication dosage—same as isolated extremity fracture pain control).</td>
</tr>
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</table>

#### Note
3.7.6  Suspected Child Abuse

<table>
<thead>
<tr>
<th>GENERAL GUIDELINES</th>
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<tbody>
<tr>
<td><strong>General Guidelines</strong></td>
</tr>
<tr>
<td>This protocol should be used when the paramedic suspects that child abuse may have occurred. See Appendix 6.2.2, Signs of Child Abuse, and Appendix 6.2.1, Report of Abuse. Child abuse is when a person intentionally inflicts, or allows to be inflicted, physical or psychological injury to a child, which causes or results in risk of death, disfigurement, or distress. Child neglect is when a child’s physical, mental, or emotional condition is impaired or endangered because of failure of the legal guardian to supply basic necessities, including adequate food, clothing, shelter, education, or medical care.</td>
</tr>
</tbody>
</table>

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<tr>
<th>TREATMENT GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supportive Care</strong></td>
</tr>
<tr>
<td>- Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 3.1.4.</td>
</tr>
<tr>
<td>- Advise police that child abuse is suspected.</td>
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<tr>
<td>- Protect the child from further abuse.</td>
</tr>
<tr>
<td>- Obtain information in a nonjudgmental manner.</td>
</tr>
<tr>
<td>- Do not confront the caregiver and/or parent.</td>
</tr>
<tr>
<td>- Transport the patient to the hospital for evaluation and possible treatment (a).</td>
</tr>
<tr>
<td>- Report suspected child abuse—Florida Child Abuse Hotline: 1-800-96 ABUSE (1-800-962-2873)(b) (Appendix 6.2.1 Report of Abuse and Appendix 6.2.2 Signs of Abuse)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>- None</td>
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<table>
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<tr>
<th>ALS Level 2</th>
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<tr>
<td>➢ None</td>
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</table>

<table>
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<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) If the parent refuses to have the pediatric patient transported to a hospital, request police assistance.</td>
</tr>
<tr>
<td>(b) Reporting of suspected child abuse is required by law.</td>
</tr>
</tbody>
</table>

Multiple bruises or injuries that are in different stages of healing are concerns for abuse.
3.7.7  Sickle Cell Anemia

### GENERAL GUIDELINES

**General Guidelines**

Sickle cell anemia is a chronic hemolytic anemia occurring frequently in African Americans and Hispanics; it is characterized by sickle-shaped red blood cells. Sickle cell crisis results from the occlusion of a blood vessel by masses of sickle-shaped red blood cells. Pain is the principal manifestation—it represents the most common type of crisis. This pain typically occurs in the patient’s joints and back. Hepatic pulmonary or central nervous system involvement can occur, with each manifestation having its own group of symptoms. Patients with sickle cell disorder have a high incidence of life threatening disorders at a very young age.

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Provide emotional support.

**ALS Level 1**

- Administer a fluid challenge of normal saline 20mL/kg or 10 mL/kg for neonates (infants less than 1 month) IV.
  
  If pain persists and systolic BP is adequate (Appendix 6.16, Pediatric Vital Signs): (Medical Procedure, Medication Delivery 4.18)
  
  - Morphine Sulfate - may be given IV titrated to pain, pediatric dose: 0.1 mg/kg; infant dose: 0.05 mg/kg. Maximum single dose of 4 mg. If pain persists and systolic BP is adequate, may repeat dose x 1 in 3-5 minutes, (repeat single dose maximum of 4 mg). Administer at a rate not to exceed 1 mg/min (a). (Appendix 6.16, Pediatric Vital Signs).

  **OR**
  
  - Fentanyl 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg)

**ALS Level 2**

> None

**Note**

(a) Extreme caution should be used with administering narcotic analgesics to a patient with a SpO₂ less than 94%.
### General Guidelines

NOTE: Use this protocol for patients confirmed to have Acute Adrenal Insufficiency by either the presence of a medical alert bracelet, designation of medical records or other patient, family or medical confirmation.

- Adrenal insufficiency or Addison’s disease is an endocrine disorder that occurs when the adrenal glands do not produce sufficient amounts of cortisol and other glucocorticoid hormones needed to respond to stress and inflammatory reactions.
- Early signs and symptoms of patients in crisis include pallor, dizziness, headache, weakness/lethargy, abdominal pain, nausea/vomiting and hypoglycemia.

### Supportive Care

- Initial Assessment Protocol 3.1.1.
- Determine hemodynamic stability and symptoms.

### ALS Level 1

- Administer Oxygen to maintain a saturation of 94% or above.
- Provide advanced airway management, if necessary (a).
- Initiate cardiac monitoring
- Establish IV access
- Administer a fluid challenge of normal saline 500 cc IV or IO to maintain SBP of ≥90 mmHg, repeat as needed.
- Check blood glucose level (BGL)
- Administer steroids
  - Assist with administration of patient’s Hydrocortisone Sodium Succinate (Solu-cortef) if present (b) (c).
  - If Solu-cortef not available, administer Methylprednisolone (Solu-medrol) 1 mg/kg slow IVP (max dose 125 mg) (if available)
- If the patient has persistent hypotension start Dopamine (1600 mcg/mL) - Mix 400 mg in 250 mL of D5W. Dosage: 5-15 mcg/kg/min. Use a microdrip (60 gtt/mL) and refer to the Handtevy Medication Guide for drip rate based on patient weight or age.
  - Titrate to maintain a minimum systolic BP of 90 mm Hg and maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min).

### ALS Level 2

- None

### Note

(a) Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at hospital.
(b) The patient or family shall provide the medication, dosage and route information.
(c) Typical stress dose of Hydrocortisone Sodium Succinate is dependent on the child’s weight yet should not exceed 100 mg IV/IM.
### General Guidelines

The following protocols cover a range of problems related to the environment, including trauma due to changes in atmospheric pressure, exposure to heat and cold extremes, water submersion, and exposure to electricity. Initial management efforts should focus on removing the patient from the harmful environment.
### 3.8.1 Drowning

#### GENERAL GUIDELINES

**General Guidelines**

Drowning is a process resulting in primary respiratory impairment from submersion in a liquid medium. Implicit to this definition, is that a liquid-air interface is present at the entrance to the victim's airway, which prevents the individual from breathing oxygen. Outcome may include delayed morbidity or death, or life without morbidity. The terms wet drowning, dry drowning, active or passive drowning, near-drowning, secondary drowning and silent drowning should be discarded. The proper terms should be fatal drowning, or non-fatal drowning.

If the patient is still in open water upon arrival of EMS crew members, a Dive Rescue Team should be used to remove the patient from the water whenever possible. Additional protocols may be needed for treatment decisions (e.g., Pediatric Protocol 3.8.4, Barotrauma/Decompression Illness: Dive Injuries). Drownings are **not** Trauma Alerts, unless there is specific traumatic component associated with the event.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4: protect the c-spine (a).
- Determine any pertinent history (duration of submersion, depth, water temperature, possible seizure, drug and/or alcohol use, possible trauma).
- Maintain the patient’s body temperature; dry and warm the patient.
- All non-fatal drowning patients should be transported to the hospital, regardless of how well they may seem to have recovered. Delayed death or complications due to pulmonary edema or aspiration pneumonia are not uncommon. The most devastating injury is the result of asphyxia.

**ALS Level 1**

- Treat dysrhythmias per specific protocol (Pediatric Protocol 3.3).

**ALS Level 2**

- None

**Note**

(a) The routine use of chest thrusts for a drowning, non-fatal patient is not recommended. This maneuver should be used only in cases of FBAO.
3.8.2 Heat-Related Emergencies

General Guidelines

Hyperthermia occurs when the patient is exposed to increased environmental temperature. It can manifest as heat cramps, heat exhaustion, or heat stroke. Certain drugs may also cause an increase in body temperature (e.g., cocaine, ecstasy).

Some tympanic thermometers (e.g., Braun Thermoscan™ Pro-1 and Pro 3000) will register temperatures in the range of 68-108°F. Tympanic thermometers should not be used in infants less than 1 year.

- Heat cramps: Signs and symptoms include muscle cramps of the fingers, arms, legs, or abdomen; hot, sweaty skin; weakness; dizziness; tachycardia; normal BP; and normal temperature.
- Heat exhaustion: Signs and symptoms include cold and clammy skin, profuse sweating, nausea/vomiting, diarrhea, tachycardia, weakness, dizziness, transient syncope, muscle cramps, headache, positive orthostatic vital signs, and normal or slightly elevated temperature.
- Heat stroke: Signs and symptoms include hot dry skin (sweating may be present), confusion and disorientation, rapid bounding pulse followed by slow weak pulse, hypotension with low or absent diastolic reading, rapid and shallow respirations (which may later slow), seizures, coma, and elevated temperature (greater than 105°F).

Treatment Guidelines

HEAT CRAMPS AND HEAT EXHAUSTION

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Remove the patient from the warm environment; cool the patient.
- Monitor the patient’s temperature.

For mild to moderate heat cramps and heat exhaustion, if the patient is conscious, encourage the patient to drink salt-containing fluids.

HEAT STROKE

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- Remove the patient from the warm environment; aggressively cool the patient. Remove the patient’s clothing, and cover the patient with sheets soaked in ice water. Also, turn air-conditioning units and fans on high, and apply ice packs to the patient’s head, neck, chest, and groin.
- Monitor the patient’s temperature. Cool the patient to 102 °F, then remove wet sheets and ice packs, and turn off fans (avoid lowering the patient’s temperature too much).
### 3.8.2 Heat-Related Emergencies (continued)

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>▶ ▶ ▶</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT CRAMPS AND HEAT EXHAUSTION</td>
<td>If heat cramps are severe or if the patient’s level of consciousness is diminished, administer a fluid challenge of normal saline 20 mL/kg IV or 10 ml/kg for neonates (infants less than 1 month) IV or IO. (Medical Procedure 4.18, Medication Administration).</td>
<td></td>
</tr>
<tr>
<td>HEAT STROKE</td>
<td>• Treat hypotension with IV fluids. Avoid using vasopressors and anticholinergic drugs, as they may potentiate heat stroke by inhibiting sweating. Administer a fluid challenge of normal saline 20 mL/kg IV or 10 ml/kg for neonates (infants less than 1 month) IV or IO. (Medical Procedure 4.18, Medication Administration).</td>
<td></td>
</tr>
</tbody>
</table>

#### Note

• None
### General Guidelines

Factors that predispose and/or cause a patient to develop hypothermia include geriatric and pediatric age, poor nutrition, diabetes, hypothyroidism, brain tumors or head trauma, sepsis, use of alcohol and certain drugs, and prolonged exposure to water or low atmospheric temperature.

Hypothermia patients can be classified into three categories:

- **Mild hypothermia**: temperature 94-97°F.
- **Moderate hypothermia**: temperature 86-94°F.
- **Severe hypothermia**: temperature less than 86°F.

Most oral thermometers will not register temperatures of less than 96°F. However, some tympanic thermometers (e.g., Braun Thermoscan™ Pro-1 and Pro 3000) will register temperatures in the range of 68-108°F. Tympanic thermometers should not be used in infants less than 1 year.

Patients with mild to moderate hypothermia will generally present with shivering, lethargy, and stiff, uncoordinated muscles. Patients with severe hypothermia may have altered mental status, ranging from confusion to lethargy or coma. Shivering will usually stop and physical activity will be uncoordinated. In addition, severe hypothermia will frequently produce an Osborn wave or J wave on the ECG, as well as dysrhythmias (bradycardia, ventricular fibrillation).

### Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3 (a).
- Remove all wet clothes; dry the patient.
- Protect the patient from heat loss and wind chill.
- Maintain the patient in a horizontal position.
- Avoid rough movement and excess activity.
- Monitor the patient’s temperature.
- Add heat to the patient’s head, neck, chest, and groin.
- In cases of severe hypothermia, warm IV fluids, if possible.
- For severe hypothermic cardiac arrest: - Start CPR.

**ALS Level 1**

- For VF or pulseless VT, see Pediatric Cardiac Dysrhythmia Protocol 3.3.6.
- Insert an advanced airway and ventilate the patient with warm humidified oxygen, if possible. (Procedure Section 4.4)
- Establish IV access; give warm normal saline.
- If temperature is greater than 86°F: follow the appropriate dysrhythmia treatment (Pediatric Protocol 3.3).
- If temperature is less than 86°F: continue CPR and transport the patient immediately. Do not treat dysrhythmias in patients with severe hypothermia; warm the patient prior to treatment.

**ALS Level 2**

- None

**Note**

(a) Areas of frostbite should be bandaged with dry sterile dressings. Patients with frostbite should be transported without attempting rewarming in the prehospital setting.
### 3.8.4 Trauma/Decompression Illness: Dive Injuries

#### GENERAL GUIDELINES

**General Guidelines**

Barotrauma and decompression illness are caused by changes in the surrounding atmospheric pressure beyond the body’s capacity to compensate for the excess gas load. These injuries are most commonly associated with the use of SCUBA (Self-Contained Underwater Breathing Apparatus). SCUBA diving emergencies can occur at any depth, with the most serious injuries manifesting symptoms after a dive. If a patient took a breath underwater from any source of compressed gas (e.g., submerged vehicle, SCUBA), while at a depth greater than 3 feet, the patient may be a victim of barotrauma. Barotrauma may cause several injuries to occur, including arterial gas embolism (AGE), pneumothorax, pneumomediastinum, subcutaneous emphysema, and the “squeeze.” Decompression illnesses may also include decompression sickness (“bends”).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4: Give high-flow O2.
- Place the patient in a supine position.
- Complete the Dive Accident Signs and Symptoms checklist (Appendix 6.7).
- Start a Dive History Profile, if possible (the patient’s dive buddy may be helpful in answering many of these questions).
- Whenever possible, have the legal authority in charge (e.g., police, Florida Marine Patrol, U.S. Coast Guard) secure all of the victim’s dive gear, following the proper chain of custody for testing, analysis, and other purposes.
- Manage the patient according to the appropriate protocol(s).
- Transport the patient to the closest emergency department or trauma center with a helipad. Air transport of a diving accident victim must remain below an altitude of 1000 feet.
- Contact the Diver’s Alert Network (DAN) at Duke University Medical Center for further assistance; call DAN collect at 919-684-4326 (a).

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**

(a) DAN may be contacted while on scene or after arrival at the hospital. If contact is made at the hospital, provide the name of the ED physician and ED phone number.
### 3.8.5 Electrical Emergencies

#### GENERAL GUIDELINES

**General Guidelines**

A wide range of injuries can be caused by a lightning strike or contact with electricity. Electrical injury can occur from direct contact, an arc, or a flash of electricity, and by a direct hit or a splash from lightning. The movement of electrical current through the body can cause violent muscle contractions that can lead to fractures; for this reason, the c-spine of a patient who has experienced an electrical emergency should be protected. The thermal energy can cause external burns, but in many cases the majority of thermal damage is internal, with few external signs of injury. Dysrhythmias are also common (e.g., ventricular fibrillation). The rescuer should be sure that the patient is no longer in contact with the electrical current before initiating treatment.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4: Protect the c-spine.
- Treat burns per Pediatric Protocol 3.9.7.
- Consider the need to transport the patient to a trauma center (General Protocol 1.10).
- Try to determine the amps, volts, and duration of contact with the electricity, if possible. (500 volts or more should be categorized as high voltage).

**ALS Level 1**

- Treat dysrhythmias per specific protocol (Pediatric Protocol 3.3).

**ALS Level 2**

- None

**Note**

- None
### General Guidelines

These protocols cover specific types of injuries and their treatment. The initial assessment of the trauma patient should include determination of Trauma Alert criteria (General Protocol 1.10, Trauma Transport). When the situation demands it (e.g., when Trauma Alert criteria are met), scene time should be limited as much as possible (e.g., 10 minutes), and the patient should be expeditiously transported to a trauma center. Do not delay transport to establish vascular access or to bandage and splint every injury. Priority should be given to airway management, rapid preparation for transport (e.g., full immobilization on a backboard), and control of gross hemorrhage.

If a vascular access is obtained and hypovolemia is suspected (e.g., the patient shows signs and symptoms of shock), a fluid challenge of 20 mL/kg or 10 ml/kg for neonates (infants less than 1 month) should be administered. If the patient is still in shock, repeat the fluid challenge at 20 mL/kg until a maximum of 60 mL/kg of fluid is administered.

Be aware that administration of large volumes of IV fluids has been found to be deleterious to the survival of patients with uncontrolled hemorrhage, internally or externally. Studies (NEJM, 1994) have shown that maximal fluid resuscitation may increase bleeding, thereby preventing the formation of a protective thrombus or dislodging it once the intraluminal pressure exceeds the tamponading pressure of the thrombus. Therefore, consultation with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g., less than 20 minutes).

Avoid the use of vasopressor agents (e.g., dopamine) in trauma patients who are hypotensive (Appendix 6.16, Pediatric Vital Signs). The adolescent female in her second or third trimester of pregnancy should be placed on her left side for transport. If the injuries require the use of a backboard, following full immobilization to the backboard, the backboard should be tilted to the left. Failure to follow this practice may cause hypotension due to decreased venous return.
### 3.9.1 Head and Spine Injuries

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
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<tbody>
<tr>
<td>If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the patient’s head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization.</td>
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</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
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</thead>
<tbody>
<tr>
<td>● Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>● Trauma Supportive Care Protocol 3.1.4.</td>
</tr>
<tr>
<td>● If the patient is not hypotensive (Appendix 6.16, Pediatric Vital Signs), elevate the head of the backboard 30 degrees (12-18 inches).</td>
</tr>
<tr>
<td>● Apply a hemostatic gauze on severe wounds to the head, neck, face, axilla, or buttocks that cannot be controlled by other means (direct pressure) Medical Procedure Hemostatic Gauze 4.27.1</td>
</tr>
</tbody>
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<th>ALS Level 1</th>
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<tr>
<td>● If signs of brain stem herniation exist (e.g., pupillary dilation, asymmetric pupillary reactivity, or motor posturing), consider advanced airway and ventilate at 20 breaths/min for a child and 30 breaths/min for an infant (Medical Procedure 4.4, Advanced Airways, and Medical Procedure 4.1.5, Rescue Breathing).</td>
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<tr>
<th>ALS Level 2</th>
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</thead>
<tbody>
<tr>
<td>● If the patient is seizing, see Pediatric Protocol 3.5.2. Avoid administration of glucose-containing solutions and medications.</td>
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<th>Note</th>
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<tr>
<td>● None</td>
</tr>
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</table>
### 3.9.2 Eye Injuries

#### GENERAL GUIDELINES

**General Guidelines**

This protocol covers a variety of injuries to the eye. If other injuries to the body exist, priority of care should be determined as appropriate.

#### TREATMENT GUIDELINES

##### Supportive Care

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4:
  - Establish IV access as needed.
  - Remove, or ask the patient to remove, contact lenses, if still in the affected eye(s).
  - For a penetrating object, stabilize the object and cover the affected eye with an ocular shield or similar rigid device. Cover both eyes to minimize eye movement. Avoid placing direct pressure on the eye or penetrating object.
  - If the eyeball has been forced out of the socket, cover the entire eye area with a rigid container, such as a disposable drinking cup. Avoid contact with the exposed globe. If bleeding is present, control it by applying direct pressure with a sterile dry dressing.
  - If there are signs and symptoms or suspicion of ocular exposure to chemicals or foreign body, without obvious or suspected penetrating injury or laceration of the cornea or globe, irrigate with a normal saline IV solution (Medical Procedure 4.19, Morgan Lens).

##### ALS Level 1

- If the patient is experiencing eye pain, administer tetracaine 1 drop in each affected eye. Tetracaine is contraindicated in penetrating eye injuries or patients with allergies to lidocaine.

##### ALS Level 2

- None

##### Note

- None
### 3.9.3 Chest Injuries

#### GENERAL GUIDELINES

**General Guidelines**

This protocol covers both blunt and penetrating chest trauma and should be part of the initial resuscitation effort if the patient’s breathing is compromised.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4.
- Penetrating injuries to the chest or upper back should be covered immediately with an occlusive dressing (e.g., Vaseline gauze).

Do not attempt to remove an impaled object; instead, stabilize it with bulky dressing or other means. If the impaled object is very large or unwieldy, attempt to cut the object to no less than 6 inches from chest.

**ALS Level 1**

- For tension pneumothorax, with evidence of respiratory and circulatory compromise, decompress the chest on the affected side (Medical Procedure 4.8, Chest Decompression).
- For massive flail chest with severe respiratory compromise, ventilate at 20 breaths/min for a child and 30 breaths/min for an infant consider advanced airway. If the flail chest does not cause severe respiratory compromise, stabilize the chest externally by placing the ipsilateral arm in a sling and swathe.
- For crush/compartment injury, refer to Protocol 3.9.8, Crush/Compartment Syndrome.

**ALS Level 2**

- None

**Note**

- None
# 3.9.4 Abdomino-Pelvic Injuries

## GENERAL GUIDELINES

**General Guidelines**

This protocol covers blunt and penetrating abdomino-pelvic trauma. Penetrating injuries may also affect the chest (Pediatric Protocol 3.9.3, Chest Injuries, also refer to Appendix 6.2.2, Signs of Child Abuse).

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 3.1.1
- Trauma Supportive Care Protocol 3.1.4.
- For penetrating injuries, cover the wound with an occlusive dressing (e.g., Vaseline gauze).
- For evisceration, cover the organs with a saline-soaked sterile dressing, and then cover it with an occlusive dressing (e.g., foil). Do not attempt to put the organs back into the abdomen.
- Do not log-roll any patient with suspected pelvic fracture; you may use a scoop stretcher if it is appropriate given the patient’s size.

### ALS Level 1

- None

### ALS Level 2

- None

### Note

- None
### 3.9.5 Extremity Injuries

#### GENERAL GUIDELINES

This protocol covers open and closed injuries to the extremities, including amputation.

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
</table>
| ● Initial Assessment Protocol 3.1.1  
● Trauma Supportive Care Protocol 3.1.4.  
● Any fracture or suspected fracture should be splinted appropriately, with ice being applied to the affected area. Remove and secure all jewelry. Check the pulse, motor and sensation, in the extremity before and after splinting.  
● Angulated fractures should be aligned using proximal and distal traction during splinting, except in fractures that involve a joint, which should be splinted in the position in which they are found.  
● Traction splints should be used in cases of femur fractures, unless a pelvic fracture is suspected.  
● Amputations should be dressed with bulky dressings. The amputated part should be wrapped in moistened sterile gauze and placed in a plastic bag; this bag should then be placed on ice for transportation to the hospital.  
● Apply direct pressure for hemorrhage control. If direct pressure does not stop the hemorrhage apply a trauma tourniquet (Medical Procedure Wound Care Trauma Tourniquet 4.27.2).  
● Apply a hemostatic gauze on severe wounds (head, neck, face, axilla or buttocks) that cannot be controlled by other means (direct pressure/tourniquet) Medical Procedure Hemostatic Gauze 4.27.1 |

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
</table>
| ● If pain persists and systolic BP is adequate (Appendix 6.16, Pediatric Vital Signs): (Medical procedure 4.18.3, 4.18.5)  
  ○ Morphine Sulfate - may be given IV titrated to pain, pediatric dose: 0.1 mg/kg; infant dose: 0.05 mg/kg. Maximum single dose of 4 mg. If pain persists and systolic BP is adequate, may repeat dose x 1 in 3-5 minutes, (repeat single dose maximum of 4 mg). Administer at a rate not to exceed 1 mg/min (a). (Appendix 6.16, Pediatric Vital Signs).  
  OR  
  ○ Fentanyl 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg). |

<table>
<thead>
<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>● None</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Extreme caution should be used with administering narcotic analgesics to a patient with a SpO₂ less than 94%.</td>
</tr>
</tbody>
</table>
### 3.9.6 Traumatic Arrest

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>The decision to attempt resuscitation of a patient in traumatic arrest should be based on the paramedic’s judgment as to the possibility of survival and/or the possibility of organ harvest. In some instances, attempted resuscitation of a traumatic arrest is not warranted (General Protocol 1.4, Death in the Field).</td>
</tr>
</tbody>
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#### TREATMENT GUIDELINES

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<th>Supportive Care</th>
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<tbody>
<tr>
<td>- Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 3.1.4.</td>
</tr>
<tr>
<td>- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>- If IV access can be established, infuse normal saline 20 mL/kg, (newborn 10mL/kg) up to a maximum of 60 mL/kg IV.</td>
</tr>
<tr>
<td>- Avoid use of vasopressors in cases of suspected hypovolemia</td>
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</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
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</thead>
<tbody>
<tr>
<td>- None</td>
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</tbody>
</table>

Note
### 3.9.7 Burn Injuries

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burns can be caused by thermal, chemical, and electrical sources. If an electrical burn is suspected, also see Pediatric Protocol 3.8.5, Electrical Emergencies. Remember that burn patients are volume depleted. Burns do not bleed, however, so look for other sources if bleeding is present. Assume that any patient with compromised perfusion has other injuries and treat him/her accordingly. Many burn injuries are associated with inhalation injury. Signs and symptoms of inhalation injury include nasal and oropharyngeal burns, charring of the tongue or teeth, sooty (blackened) sputum, singed nasal and facial hair, abnormal breath sounds (e.g., stridor, ronchi, wheezing), and respiratory distress. In cases of inhalation injury, attention should be given to the patency of the airway. Acute swelling can cause an airway obstruction. The paramedic should consider the need for early intubation to avoid a complete airway obstruction that requires a cricothyroidotomy.</td>
</tr>
</tbody>
</table>

### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
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</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 3.1.1</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 3.1.4.</td>
</tr>
<tr>
<td>- Stop the burning process, if necessary, but do not cause hypothermia.</td>
</tr>
<tr>
<td>- Thermal burns: Lavage the burned area with tepid water (sterile, if possible) to cool skin. Do not attempt to wipe off semisolids (e.g., grease, tar, wax).</td>
</tr>
<tr>
<td>- Dry chemical burns: Brush off dry powder, then lavage with copious amounts of tepid water (sterile, if possible) for 15 minutes.</td>
</tr>
<tr>
<td>- Liquid chemical burns: Lavage the burned area with copious amounts of tepid water (sterile, if possible) for 15 minutes. (When phenol has caused the burn, flush with copious amounts of tepid water and then apply vegetable oil to the burned area, if available. Isopropyl alcohol may be used for very small areas.)</td>
</tr>
<tr>
<td>- Remove clothing from around the burned area, but do not remove or peel off any skin or tissue.</td>
</tr>
<tr>
<td>- Remove and secure all jewelry and tight-fitting clothing.</td>
</tr>
<tr>
<td>- Assess the extent of the burn using the modified Rule of Nines and the degree of burn severity (Appendix 6.4.1, Burn Severity Categorization, and Appendix 6.4.2, Rule of Nines). An alternative method is to use the palmar surface of the patient as an estimate of 1% BSA.</td>
</tr>
<tr>
<td>- Apply a dressing to the burned area:</td>
</tr>
<tr>
<td>- If there is greater than or equal to 20% second-degree or 5% third-degree burns, cover the burned areas with dry sterile dressings or Water Gel™ wraps.</td>
</tr>
<tr>
<td>- If there is less than 20% second-degree or 5% third-degree burns, apply wet sterile dressings to the burned areas for 15 minutes to aid in pain control. Alternatively, Burn Free™ gel pads or Water Gel™ wraps may be applied continuously to aid in pain control.</td>
</tr>
<tr>
<td>- Prevent hypothermia, keep the patient warm, and ensure that all outer layers of dressings are dry.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>- Pain Management Protocol 3.1.5</td>
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<table>
<thead>
<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>=&gt; None</td>
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</tbody>
</table>

### Note
| None |

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Florida Regional Common EMS Protocols
3.9.8 Crush/Compartment Syndrome

**GENERAL GUIDELINES**

**General Guidelines**

Crush injuries are rarely seen in pre-hospital medicine but are common in times of disaster, both natural and manmade. Early and aggressive treatment of victims suspected of having a crush injury is paramount. Without aggressive pre-hospital treatment, the victim may die during extrication or weeks later from complications of the injury.

In the crush injury syndrome, the initial injury is at the site of the muscle crushed by the mechanical force of an object. The muscle cells die as the result of the following. First, the force of the crushing object ruptures muscle cells. Second, the direct pressure of the object on the limb causes muscle cells to become ischemic. The combination of mechanical force and ischemia can cause muscle death within an hour. Third, the force of the crush injury compresses large vessels, resulting in the loss of blood supply to muscle tissue. Muscles can normally survive circulatory ischemia for up to four hours before the cell death. After four hours, the cells begin to die as a result of the circulatory compromise.

The damaged muscle tissue produces and releases many toxins that can have detrimental effects on the body. The longer the victim is trapped, the longer the toxins are given to build up distal to the crush site. The crushing force acts as a dam that prevents these toxins from being released into the rest of the body. Once the force is removed, the toxins are allowed to run freely throughout the body, causing a myriad of problems. Along with the release of toxins after extrication, the victim can become severely hypovolemic from the third spacing of fluid, and the rapid swelling of the injured area can cause acute compartment syndrome.

<table>
<thead>
<tr>
<th>Toxins Released by Damaged Muscle Tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toxin</strong></td>
</tr>
<tr>
<td>Histamine</td>
</tr>
<tr>
<td>Lactic Acid</td>
</tr>
<tr>
<td>Nitric Oxide</td>
</tr>
<tr>
<td>Potassium</td>
</tr>
<tr>
<td>Thromboplastin</td>
</tr>
</tbody>
</table>

**TREATMENT GUIDELINES**

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Spinal immobilization
- Apply cardiac monitor: Document rhythm
- Administer oxygen according to following criteria:
  - SpO₂ 94% or above do not administer O₂.
  - SpO₂ less than 94% administer O₂ by nasal cannula at 2 L/min.
- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.
3.9.8 Crush/Compartment Syndrome (continued)

**TREATMENT GUIDELINES**

**ALS Level 1**

**CRUSH INJURY or COMPARTMENT SYNDROME**

- Establish IV access; give Normal Saline 1 Liter.
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate - may be given intravenously in increments every 3-5 minutes, titrated to pain, to a maximum dose of 4 mg. Administer at a rate not to exceed 1 mg/min. Pediatric dose: 0.1 mg/kg IV. Infant dose: 0.05 mg/kg IV (a).

**OR**

- Fentanyl 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg)

- For crush injury release compression and extricate patient

**CRUSH SYNDROME**

If unable to release compression and situation progresses to CRUSH SYNDROME

- Entrapment with compression lasting longer than 4 hours OR on the thorax for 20 minutes.
- Suspicion of hyperkalemia (Peaked T-waves, absent P waves or widened QRS).
- Establish IV access, 2 large bore IVs recommended in order to separate CaCL and Bicarb;
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate - may be given IV titrated to pain, pediatric dose: 0.1 mg/kg; infant dose: 0.05 mg/kg. Maximum single dose of 4 mg. If pain persists and systolic BP is adequate, may repeat dose x 1 in 3-5 minutes, (repeat single dose maximum of 4 mg). Administer at a rate not to exceed 1 mg/min.

**OR**

- Fentanyl 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg)

- Calcium Chloride 20mg/kginto 50 mL bag of normal saline and administer SLOW IV over 10 minutes (follow with minimum of 20 mL flush).
- Sodium Bicarbonate and Normal Saline –Add Sodium Bicarbonate 50 mEq to 1 L of Normal Saline (or alternatively sodium bicarbonate 25 mEq added into 500 ML of normal saline). Infuse via IV wide-open just prior to extrication. May repeat x 1 for prolonged extrication. Recommended in second line.
- Continue IV fluids at 500 mL/hr
- Administer Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6).

**ALS Level 2**

- None

**Note**

- None
These protocols cover specific types of special healthcare needs in pediatric patients. Children with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typically developing young children.

The general approach to children with special healthcare needs includes the following measures:

1. Priority is given to the CABs.
2. Do not be overwhelmed by the machines.
3. Listen to the caregiver.
4. If a nurse is present, rely on his/her judgment.
5. Remember that the child’s cognitive level of function may be altered.
6. Assume that the child can understand exactly what you say.
7. Bring all medications and equipment to the hospital.

Obtaining a history includes asking the patient/caregiver about the following issues:

1. The child’s normal vital signs.
2. The child’s actual weight.
3. The child’s developmental level.
4. The child’s allergies, including to latex.
5. Pertinent medications/therapies.
### 3.10.1 Home Mechanical Ventilator

#### GENERAL GUIDELINES

**Home mechanical ventilators** may be indicated for chronically ill children with abnormal respiratory drive, severe chronic lung disease, or severe neuromuscular weakness. Some children require continuous mechanical ventilation, whereas others require only intermittent support during sleep or acute illness. Home ventilators may either be limited or pressure limited. All are equipped with alarms.

**TYPES OF VENTILATOR ALARMS**
- Low pressure or apnea: may be caused by a loose or disconnected circuit or an air leak in the circuit or at the tracheostomy, resulting in inadequate ventilation.
- Low power: caused by a depleted battery.
- High pressure: may be caused by a plugged or obstructed airway or circuit tubing, by coughing, or by bronchospasm.
- Setting error: caused by ventilator settings that exceeds the capacity of the equipment.
- Power switchover: occurs when the unit switches from alternating-current power to the internal battery.

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- If a ventilator-dependent child is in respiratory distress and the cause is not easily ascertained and corrected, remove the ventilator and provide assisted manual ventilations with a bag-valve device. Suction as needed.
- Consider the need for other protocols (e.g., Pediatric Respiratory Emergencies Protocol 3.2).

**ALS Level 1**
- None

**ALS Level 2**
- None

**Note**
- None
3.10.2 Tracheostomy

GENERAL GUIDELINES

General Guidelines

Tracheostomies are indicated for long-term ventilatory support, to bypass an upper airway obstruction, and to aid in the removal of secretions. Tracheostomies come in neonatal, pediatric, and adult sizes and can include either a single lumen or a double lumen. Special attachments include a tracheostomy nose (filtration device), tracheostomy collar (for oxygen or humidification), and Passy-Muir valve (speaker valve).

SIGNS OF TRACHEOSTOMY TUBE OBSTRUCTION
● Excess secretions.
● No chest wall movement.
● Cyanosis.
● Accessory muscle use.
● No chest wall rise with bag-valve ventilations.

TREATMENT GUIDELINES

Supportive Care
● Initial Assessment Protocol 3.1.1
● Medical Supportive Care Protocol 3.1.3.
● If an obstruction is present, inject 1-3 mL of normal saline into the tracheostomy tube and suction as needed (set the suction pressure at 100 mm Hg or less).
● If unable to clear the obstruction by suctioning, remove the tracheostomy tube and insert a new tube (the same size or one size smaller). Do not force the tube.
● If unable to insert a new tracheostomy tube or if one is unavailable, insert an endotracheal tube of similar size into the stoma and ventilate with a bag-valve mask as needed.
● If unable to insert an endotracheal tube, ventilate with a bag-valve mask over the stoma or over the patient’s mouth while covering the stoma as needed.
● Consider the need for other protocols (e.g Pediatric Respiratory Emergencies Protocol 3.2).

ALS Level 1
● None

ALS Level 2
➢ None

Note
● None
### 3.10.3 Central Venous Lines

#### GENERAL GUIDELINES

**General Guidelines**

Central venous lines are indicated for administration of medications, delivery of chemotherapy, nutritional support, infusion of blood products, and blood draws. Types of central venous lines (CVL) include Broviac/Hickman, Port-a-Cath/ Med-a-Port, and percutaneous intravenous catheters (PIC). Central venous line emergencies include the catheter coming completely out, bleeding at the site, the catheter broken in half, blood embolus, thrombus, air embolus, and internal bleeding. Use of SQ ports requires special training; these ports should not be used for IV access.

**Signs of Blood Embolus, Thrombus, Air Embolus, and Internal Bleeding**

- Chest pain.
- Cyanosis.
- Dyspnea.
- Shock.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3. CVL and PIC lines may be used for emergency IV access under sterile conditions.
- If the catheter has come completely out, apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.
- If the catheter is broken in half, clamp the end of the remaining tube.
- If a blood embolus, thrombus, or internal bleeding is suspected, clamp the line.
- If an air embolism is suspected, clamp the line and place the patient on his/her left side.
- Consider the need for other protocols (e.g., Pediatric Protocol 3.2, Pediatric Respiratory Emergencies).

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**

- None
# 3.10.4 Feeding Tubes

## General Guidelines

Feeding tubes are indicated for administration of nutritional supplements and in patients who have an inability to swallow. Types of feeding tubes include nasogastric tubes (temporary) and gastrostomy tubes (G tube). Types of G tubes include those that are surgically placed, percutaneous endoscopic gastrostomy tubes (PEG tubes), and jejunal tubes (J tubes). Potential complications include leaks, bleeding around the site, and the displacement of the tube.

## Treatment Guidelines

### Supportive Care

- Initial Assessment Protocol 3.1.1
- Medical Supportive Care Protocol 3.1.3.
- If the catheter has come completely out, cover the site with Vaseline gauze and apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.

### ALS Level 1

- None

### ALS Level 2

- None

### Note

- None
### 3.10.5 Brief Resolved Unexplained Event (BRUE)

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
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</thead>
<tbody>
<tr>
<td>• A Brief Resolved Unexplained Event (BRUE), formerly known as an Apparent Life-Threatening Event (ALTE) is defined as an episode that is frightening to the observer and is characterized by some combination of apnea, color change (cyanotic, pallid, erythematous or plethoric) change in muscle tone (usually diminished), and choking or gagging. In some cases, the observer fears that the infant has died.</td>
</tr>
<tr>
<td>• Approximately 10-25% of BRUEs may remain unexplained following a thorough evaluation.</td>
</tr>
<tr>
<td>• BRUEs have been associated with gastroesophageal reflux disease, viral lower respiratory tract infection, pertussis, sepsis and/or meningitis, seizures, metabolic disorders, toxic ingestion, cardiac dysrhythmia (e.g., long QT syndrome, supraventricular tachycardia), anemia, nonaccidental trauma, or structural CNS, cardiac (ductal-dependent lesion), or airway anomaly.</td>
</tr>
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#### TREATMENT GUIDELINES

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<th>Supportive Care</th>
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<tbody>
<tr>
<td>• Initial Assessment Protocol 3.1.1</td>
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<tr>
<td>• Medical Supportive Care Protocol 3.1.3.</td>
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<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>• Place the infant on a cardiac monitor</td>
</tr>
<tr>
<td>• Pulse oximetry should be routinely used as an adjunct to other monitoring</td>
</tr>
<tr>
<td>• Give supplemental oxygen for signs of respiratory distress or hypoxemia. Escalate from a nasal cannula to a simple face mask to a non-rebreather mask as needed, in order to maintain normal oxygenation (above 94%).</td>
</tr>
<tr>
<td>• Suction the nose and/or mouth (via bulb, suction catheter) if excessive secretions are present.</td>
</tr>
<tr>
<td>• IVs should only be placed in children for clinical concerns of shock, or when administering IV medications.</td>
</tr>
<tr>
<td>• If apnea persists, initiate bag-valve-mask (BVM) ventilation.</td>
</tr>
<tr>
<td>o Supraglottic devices and intubation should be utilized only if BVM ventilation fails in setting of respiratory failure or apnea. The airway should be managed in the least invasive way possible.</td>
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</tbody>
</table>

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<tr>
<th>ALS Level 2</th>
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<tr>
<td>➢ None</td>
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<table>
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<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Routine use of lights and sirens (Code 3 transport) is not recommended during transport</td>
</tr>
<tr>
<td>• Consider transport to a facility with pediatric critical care capability for patients with history of cyanosis, past medical history, resuscitation attempt by caregiver, or more than one BRUE in 24 hours.</td>
</tr>
</tbody>
</table>
Florida Regional Common
EMS Protocols

Section 4

Procedure Section

Procedure Section Table of Contents

4.1 Basic Life Support
   4.1.1 Automated External Defibrillator (AED)
   4.1.2 Cardiopulmonary Resuscitation (CPR)
   4.1.3 Head Tilt-Chin Lift
   4.1.4 Jaw Thrust
   4.1.5 Rescue Breathing
   4.1.6 Suspected Foreign Body Airway Obstruction (FBAO)

4.2 Airway Adjuncts
   4.2.1 Nasopharyngeal Insertion (NPA)
   4.2.2 Oropharyngeal Insertion (OPA)

4.3 Airway Suctioning
   4.3.1 Flexible Suctioning
   4.3.2 Rigid Suctioning

4.4 Advanced Airways
   4.4.1 Laryngeal Mask Airway (LMA)
   4.4.2 KingLT Supraglottic Airway
   4.4.3 i-gel Airway
   4.4.4 Orotracheal Intubation by Direct Laryngoscopic Visualization

4.5 Surgical and Nonsurgical Airways
   4.5.1 Needle Cricothyroidotomy for Pediatrics
   4.5.2 Surgical Airway (Cricothyroidotomy)

4.6 The Autistic Patient

4.7 Blood Alcohol Sampling

4.8 Chest Compression Devices
   4.8.1 Auto-Pulse
   4.8.2 Lucas Chest Compression System

4.9 Chest Decompression

4.10 CO2 Monitoring Devices
   4.10.1 Electronic Waveform CO₂ Detection
   4.10.2 Color Metric End-Tidal CO₂ Detector

4.11 CO Monitoring (Rad-57) Carboxyhemoglobin

4.12 CPAP
   4.12.1 Whisper Flow Fixed-Flow O₂ Generator
   4.12.2 FlowSafe

4.13 Cyanokit (Hydroxocobalamin for Injection)

4.14 ECG Monitoring/Treatment
   4.14.12-Lead Application
   4.14.2 External Pacemaker

4.15 Eye Washing for Chemical and Small Foreign Body

4.16 Helmet/Face Mask Removal
   4.16.1 Football Helmet Face Mask Removal
   4.16.2 Full Face Mask Helmet Removal
   4.16.3 Football Helmet Removal
   4.16.4 Other Helmets

4.17 Glucometer

4.18 Medication Administration
  4.18.1 Auto-Injector
    4.18.1.1 AtroPen®
    4.18.1.2 Auto-Injector EpiPen®
    4.18.1.3 Auto-Injector DuoDote®
  4.18.2 Intramuscular Injection (IM)
  4.18.3 Intranasal (IN) Mucosal Atomization Device (MAD)
  4.18.4 Intraosseous
    4.18.4.1 Intraosseous - Bone Injection Gun (BIG)
    4.18.4.2 Intraosseous - Cook IO
    4.18.4.3 Intraosseous - EZ-IO (Adult and Pediatric)
  4.18.5 Intravenous Cannulation (IV)
  4.18.6 Nebulizer

4.19 Morgan Lens
4.20 Nitrous Oxide - Nitronox
4.21 Pediatric Weight-Based Emergency Tape: Broselow and Handtevy
4.22 Pulse Oximeter
4.23 Restraints
  4.23.1 Pediatric Restraint Device – Pedi-Mate™
  4.23.2 Physical Restraints

4.24 Spinal Immobilization
  4.24.1 Spinal Immobilization - Blunt
  4.24.2 Spinal Immobilization - Penetrating
  4.24.3 Horizontal Spinal Immobilization
  4.24.4 Pediatric Spinal Immobilization
  4.24.5 Standing Spinal Immobilization
  4.24.6 Vest-Type Extrication Device (KED)

4.25 Splinting
  4.25.1 Air Splint
  4.25.2 Rigid Splint
  4.25.3 Hare Traction Splint
  4.25.4 Sager Traction Splint
  4.25.5 Vacuum Splint

4.26 Vagal Maneuvers
  4.26.1 Ice Water Immersion of the Face (Vagal Maneuvers)
  4.26.2 Valsalva Maneuver (Vagal Maneuvers)

4.27 Wound Care
  4.27.1 Hemostatic Gauze
  4.27.2 Trauma Tourniquet
4.1.1 Automated External Defibrillator (AED)

Automated external defibrillators are to be used by the first responder and EMT, when Advanced Life Support providers (e.g., paramedics with monitors/defibrillators) are not available, for treatment of the patient in nontraumatic cardiac arrest. Two types of AEDs are distinguished: fully automatic and semiautomatic.

1. Perform continuous CPR until the AED is applied.
2. Apply the AED pads to the patient according to the manufacturer’s recommendation.
3. Activate the unit and follow the AED prompts.
4. If the AED advises to “shock,” clear everyone from touching the patient.
5. Push the “shock” button to defibrillate the patient.
6. Immediately resume chest compressions.
7. Analyze per AED prompt after 2 minutes of uninterrupted compressions.
4.1.2 Cardiopulmonary Resuscitation (CPR)

**Adult**
1. Establish unresponsiveness (call for backup as needed).
2. **C**: Administer compressions at rates of 100-120 per minute (Place the heel of hand on the sternum between the nipples and compress to a depth of 2 inches but no greater than 2.4 inches). The goal is to achieve a (CCF) Chest Compression Fraction of 60-80%.
3. **A**: Open the airway using an appropriate method.
4. **B**: Assess breathing (5-10 seconds). If breathing is absent, give two breaths.
5. Administer 30 compressions and then 2 ventilations
6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.
7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.

**Child**
1. Establish unresponsiveness (call for backup as needed).
2. **C**: Administer compressions at rates of 100-120 per minute (Place the heel of hand on the sternum between the nipples and compress to a depth of 2 inches but no greater than 2.4 inches). The goal is to achieve a (CCF) Chest Compression Fraction of 60-80%.
3. **A**: Open the airway using an appropriate method.
4. **B**: Assess breathing (5-10 seconds). If breathing is absent, give two breaths to make the chest rise.
5. For one rescuer, administer 30 compressions and then 2 ventilations; for two rescuers, administer 15 compressions and then 2 ventilations.
6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.
7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.
4.1.2 Cardiopulmonary Resuscitation (CPR) (continued)

Infant
1. Establish unresponsiveness (call for backup as needed).
2. C: Assess circulation via brachial pulse (5-10 seconds).
   • For one rescuer, use two fingers on the sternum, one finger width below the nipple line; administer 100-120 compression per minute, at one-third the depth of the chest.
   • For two rescuers, use two thumbs side by side at the center of breast bone just below the nipple line. Squeeze the infant’s posterior chest with the encircled fingers, and administer at least 100 compressions per minute at a depth of 1½ inches of the chest.
3. A: Open the airway using an appropriate method.
4. B: Assess breathing (5-10 seconds). If breathing is absent, give two breaths to make the chest rise.
5. For one rescuer, administer 30 compressions and then 2 ventilations, for two rescuers; administer 15 compressions and then 2 ventilations.
6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.
7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.
4.1.3 & 4.1.4  Basic Life Support – Head-Tilt & Jaw Thrust

4.1.3 Head Tilt – Chin Lift

1. Place one hand on the patient’s forehead and push with your palm to tilt the head back.
2. Place the fingers of the other hand under the bony part of the patient’s lower jaw near the chin. Do not press deeply into the soft tissue under the chin because it might obstruct the airway.
3. Lift the jaw to bring the chin forward.

4.1.4 Jaw Thrust

1. Place a hand on each side of the patient’s face.
2. Grasp the angles of the patient’s mandible and lift upward.
3. If there are not enough responders to maintain the jaw thrust or if the jaw thrust is not successful in opening the airway, proceed to the head tilt-chin lift maneuver (Medical Procedure 4.1.3).
4.1.5 Rescue Breathing

One Person
1. Position yourself directly above the patient’s head.
2. Place the mask on the patient’s face, using the bridge of the nose as a guide for correct positioning.
3. Use the E-C clamp technique to hold the mask in place while you lift the patient’s jaw to hold the airway open.
   - Perform a head tilt.
   - Use the thumb and index finger of one hand to make a “C,” pressing the edges of the mask to the face.
   - Use the remaining fingers to lift the angles of the jaw (three fingers form an “E”) and open the airway.
4. Squeeze the bag to achieve chest rise. The delivery of breaths is the same whether you do or do not use supplementary oxygen.
   For perfusing rhythm:
   - Adult: 10-12 breaths/min.
   - Pediatric: 12-20 breaths/min.
   When CPR is being performed or if an Advanced Airway is in place:
     - Adult and pediatric: 8-10 breaths/min (1 breath every 6 seconds).
5. Insert an oral or nasal airway.

Two Persons
1. Rescuer one:
   - Take a position directly above the patient’s head.
   - Place the mask on the patient’s face, using the bridge of the nose as a guide for correct positioning.
   - Use the E-C clamp technique to hold the mask in place with both hands.
   - Use the thumb and index finger of one hand to make a “C,” pressing the edges of the mask to the face.
   - Use the remaining three fingers to form an “E” to lift the angles of the jaw.
2. Rescuer two:
   - Squeeze the bag for 1 second, while watching for chest rise.
   - Apply continuous cricoid pressure.
3. Squeeze the bag to achieve chest rise. The delivery of breaths is the same whether you do or do not use supplementary oxygen.
   For perfusing rhythm:
   - Adult: 10-12 breaths/min.
   - Pediatric: 12-20 breaths/min.
   When CPR is being performed or if an advanced airway is in place:
     - Adult and pediatric: 8-10 breaths/min (1 breath every 6 seconds).
4. Insert an oral or nasal airway.
**4.1.6 Suspected Foreign Body Airway Obstruction (FBAO)**

**Adult**
1. If the patient is conscious, ask, “Are you choking?”
2. If the patient is unable to speak and/or nods his/her head “yes,” give abdominal thrusts, or chest thrusts if the patient is pregnant or obese.
3. Repeat the abdominal thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:
4. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
5. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
7. Repeat Steps 4 through 6 until the FBAO is relieved.

**Child**
1. If the patient is conscious, ask, “Are you choking?”
2. If the patient is unable to speak and/or nods his/her head “yes,” give abdominal thrusts.
3. Repeat the abdominal thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:
1. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
2. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
3. Give 30 chest compressions.
4. Repeat Steps 4 through 6 until the FBAO is relieved.

**Infant**
1. If the patient is conscious, determine airway patency.
2. If the patient is unable to move air or has poor air exchange, give 5 back slaps between the shoulder blades and then 5 chest thrusts with the patient in a head-dependent position.
3. Repeat the back slaps and chest thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:
1. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
2. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
3. Give 30 chest compressions.
4. Repeat Steps 4 through 6 until the FBAO is relieved.
4.2 Airway Adjuncts – OPA & NPA

4.2.1 Nasopharyngeal Airway Insertion (NPA)

This procedure should not be performed in the presence of frontal head or midfacial trauma where
the cribriform plate may be fractured.
1. Determine the proper size of tube (measure from the nostril to the earlobe).
2. Lubricate with a water-soluble lubricant (optional: lidocaine gel).
3. Position the patient’s head in a neutral position, inspect the nose, and select the larger nostril.
   (Optional: Spray Neo-Synephrine into nasopharynx.)
4. Insert the nasopharyngeal tube with the bevel facing the nasal septum.
5. Gently insert the tube until the flange rests against the nostril.
   ● If resistance is met, insert with a twisting motion.
   ● If there continues to be resistance, attempt insertion in the other nostril.
6. Ventilation with a bag-valve device.

4.2.2 Oropharyngeal Airway Insertion (OPA)

1. Determine the proper size of tube (measure from the corner of the mouth to the earlobe).
2. Open the patient’s mouth by tongue/jaw-lift maneuver.
3. Insert the oropharyngeal tube with the tip toward the side of the mouth.
   ● Prior to complete insertion; start to rotate the tube 90 degrees so that the flange rests on
     the lips.
   ● If the patient has an intact gag reflex, perform a nasopharyngeal insertion.
4. Ventilate with a bag-valve device.
4.3 Airway Suctioning – Flexible & Rigid

4.3.1 Flexible Suctioning
1. Wear protective eyewear, gloves, and face mask.
2. Preoxygenate the patient.
3. Turn on the suction unit.
4. Insert the catheter to an appropriate depth, place your thumb over the suction control orifice, and rotate the catheter between your fingertips while withdrawing catheter. (Caution: Do not suction for more than 10 seconds.)
5. Monitor the patient’s heart rate, pulse, oxygen saturation, and clinical appearance during suctioning. If bradycardia occurs or the clinical appearance deteriorates, administer high-flow oxygen until the rate and clinical appearance return to normal.
6. Maintain ventilatory support with 100% oxygen.

4.3.2 Rigid Suctioning
1. Wear protective eyewear, gloves, and face mask.
2. Preoxygenate the patient.
3. Turn on the suction unit.
4. Measure the depth of catheter insertion from the patient’s earlobe to the corner of the mouth.
5. Insert the catheter to an appropriate depth, place your thumb over the suction control orifice, and suction the oropharynx. (Caution: Do not suction for more than 10 seconds.)
6. Monitor the patient’s heart rate, pulse, oxygen saturation, and clinical appearance during suctioning. If bradycardia occurs or the clinical appearance deteriorates, administer high-flow oxygen until the rate and clinical appearance return to normal.
7. Maintain ventilatory support with 100% oxygen.
4.4 Advanced Airways – LMA, KingLT and i-gel

For all advanced airways/supraglottics airway devices (SGA)
- Assure a patent airway and ventilate with 100% O₂ before attempting placement of the any advanced airway. Do not hyperventilate the patient
- Monitor SpO₂ with a pulse oximeter and provide 100% O₂ via a BVM
- Select the proper size tube
- Assemble and check the necessary equipment
- Confirm the SGA placement with an end-tidal CO₂ monitoring device and additional confirmation methods such as negative epigastric sounds and positive bilateral breath sounds.
- Secure the SGA with tape or a commercially available device.
- Continually monitor the pulse oximeter and the end-tidal CO₂ levels. Provide ventilations at a rate to keep the ETCO₂ between 35-45.

4.4.1 Laryngeal Mask Airway (LMA)
1. Tightly deflate the cuff so that it forms a smooth “spoon shape.” Lubricate the posterior surface of the mask with a water-soluble lubricant.
2. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
3. Carefully flatten the laryngeal mask tip against the hard palate.
4. Advance the mask until definite resistance is felt at the base of the hypopharynx.
5. Without holding the tube, inflate the cuff to the recommended volume of air for the tube size.

4.4.2 KingLT Airway
1. Lubricate the tip of the tube with a water-soluble gel.
2. Place the patient’s head in a neutral position.
3. Apply the tongue/jaw-lift maneuver with one hand while passing the tube with the other hand. Insert the device at a 45- to 90-degree angle, and rotate it to midline as it passes the tongue.
4. Without exerting excessive force, advance the tube until the base of the connector gastric access lumen is aligned with the patient’s teeth or gums.
5. Inflate the pharyngeal cuff with the recommended volume of air for the tube size.
6. Ventilate the tube with a BVM while slowly withdrawing the tube in the airway.
   - Initially, little or no air movement will occur
   - Once the tube is withdrawn into the proper space, air will readily pass, and good compliance will be felt. Stop withdrawing at this point.
   - Assess for chest rise, breath sounds and negative epigastric sounds

4.4.3 i-gel Airway
1. Lubricate the back, sides and front of the cuff with a thin layer of water-soluble lubricant (do not use silicone based lubricants).
2. Grasp the i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient.
3. The patient should be in the sniffing position with head extended and neck flexed. The chin should be gently pressed down before proceeding to insert the i-gel.
4. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
5. Glide the tube downwards and backwards along the hard palate with a continuous but gentle push.
until a definitive resistance is felt.

6. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework.

7. The incisors should be resting on the integral bite-block.
4.4 Advanced Airway - Orotracheal Intubation

4.4.4 Orotracheal Intubation by Direct Laryngoscopic Visualization

**Adult**

1. Assure a patent airway and ventilate with 100% O\textsubscript{2} before attempting placement of the airway device. Do not hyperventilate the patient.
2. Assemble and check the necessary equipment.
3. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
4. Perform laryngoscopy in less than 30 seconds:
   - Hold the handle in your left hand.
   - Insert the blade from the right side of the patient’s mouth.
   - Displace the tongue to the left.
   - Lift the laryngoscope forward to view the glottic opening.
   - Do not use the patient’s teeth or lips as a fulcrum.
5. Advance the tube through the glottic opening until the proximal end of the cuff disappears past the vocal cords.
6. If the patient is having difficulty tolerating the intubation attempt, sedate with Versed 0.02 mg/kg IV.
7. Remove the stylet, inflate the cuff with 10 cc of air, and remove the syringe.
8. Hold the tube firmly in place, attach a BVM, and confirm its placement.
9. Auscultate:
   - Negative epigastric sounds.
   - Positive bilateral breath sounds.
10. Attach an end-tidal CO\textsubscript{2} monitoring device.
11. Monitor SpO\textsubscript{2} with a pulse oximeter.
12. After positive confirmation of tube placement, secure it with a commercial device or tape applied to the maxillary region of the face.

**Child**

1. Assure a patent airway and ventilate with 100% O\textsubscript{2} before attempting placement of the airway device. Do not hyperventilate the patient.
2. Assemble and check the necessary equipment.
   - The endotracheal tube can be sized by several methods, including a weight-based tape or size of the nares or pinky finger.
3. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
4. Perform laryngoscopy in less than 30 seconds:
   - Hold the handle in your left hand.
   - Insert the blade from the right side of the patient’s mouth.
   - Displace the tongue to the left.
   - Lift the laryngoscope forward to view the glottic opening.
   - Do not use the patient’s teeth or lips as a fulcrum.
5. Advance the tube through the glottic opening until the proximal end of the tube disappears past the vocal cords.
6. If the patient is having difficulty tolerating the intubation attempt, sedate with Versed 0.02 mg/kg IV.
7. Remove the stylet.
4.4.4 Orotracheal Intubation by Direct Laryngoscopic Visualization (continued)

8. Hold the tube firmly in place, attach a bag-valve device, and confirm its placement.
9. Auscultate:
   - Negative epigastric sounds.
   - Positive bilateral breath sounds.
10. Attach an end-tidal CO₂ monitoring device.
11. Monitor SpO₂ with a pulse oximeter.
12. After positive confirmation of tube placement, secure it with a commercial device or tape applied to the maxillary region of the face.
4.5.1 Needle Cricothyroidotomy for Pediatrics

1. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
2. Locate the cricothyroid membrane between the cricoid and thyroid cartilages by palpating the depression caudal (toward the feet) to the midline Adam’s apple.
3. Clean the area well with a Betadine solution or povidone-iodine swabstick.
4. Prepare the necessary equipment:
   - 14-gauge, over-the-catheter needle
   - 10-cc syringe
   - 15-mm adaptor from 3.0 or 3.5 intubation tube
5. Insert the IV catheter through the skin and cricothyroid membrane into the trachea. Direct the needle at a 45-degree angle caudally (toward the feet). When the needle penetrates the trachea, a “pop” will be felt.
6. Aspirate with the syringe. If air is returned easily, the needle is in the trachea.
7. Withdraw the stylet while gently advancing the catheter downward into the position.
8. Attach the 15-mm adaptor to the needle hub.
9. Ventilate the patient with a bag-valve device using the 15-mm adaptor; provide high-flow oxygen.
10. Confirm placement:
    - Negative epigastric sounds.
    - Positive bilateral breath sounds.
11. Attach an end-tidal CO₂ monitoring device.
12. Monitor SpO₂ with a pulse oximeter.
13. Provide 100% O₂ with positive-pressure oxygen or a bag-valve device.
14. Monitor for changes in breathing or airway status.
4.5.2 Surgical and Nonsurgical Airways – Surgical Airway

4.5.2 Surgical Airway (Cricothyroidotomy)
1. If the patient less than 12 years of age, refer to the needle cricothyroidotomy protocol (Medical Procedure 4.5.1).
2. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
3. Locate the cricothyroid membrane between the cricoid and thyroid cartilages by palpating the depression caudal (toward the feet) to the midline Adam’s apple.
4. Clean the area well with a Betadine solution or povidone-iodine swabstick.
5. Using a scalpel, make a vertical incision through the skin and then a horizontal incision through the cricothyroid membrane.
6. Once the scalpel has passed into the membrane, insert the handle into the opening and twist the handle to open a space between the cricoid and thyroid cartilages. Do not aim the knife cephalad (toward the head), because injury to the vocal cords may occur.
   ● It is recommended to use a safety scalpel.
   or
   ● A trach hook may also be used.
7. Insert a size 6.0 endotracheal tube or tracheostomy tube through the incision.
8. Inflate the cuff with the recommended amount of air.
9. Ventilate the patient with a bag-valve device using the 15-mm adaptor; provide high-flow oxygen.
10. Confirm placement:
    ● Negative epigastric sounds.
    ● Positive bilateral breath sounds.
11. Attach an end-tidal CO₂ monitoring device.
12. Monitor SpO₂ with a pulse oximeter.
13. Provide 100% O₂ with positive-pressure oxygen or a bag-valve device.
14. Monitor for changes in breathing or airway status.
15. If necessary, cut several 4 × 4 gauze pads down the middle to the center of the pads. Wrap the pads at the base of the tube and secure them to assist in bleeding control and/or to reduce air escape.
### 4.5.3 Rapid Sequence Intubation (RSI)

- Evaluate the patient for the need to use paralytics.
- **Contraindications:**
  - Penetrating eye injuries.
  - Renal failure (dialysis patients).
  - Patients with distorted midface/neck anatomy
  - History of malignant hyperthermia
  - Inability to ventilate with a bag-valve-mask (BVM)

1. Prepare the necessary equipment:
   - BVM connected to a functioning O2 delivery system.
   - Working suction with yankauer suction tip attached.
   - Endotracheal tube(s) with stylet in place; tube shaped and lubricated, and cuff intact.
   - Laryngoscope handle with straight and curved blades.
   - Cricothyroidotomy kit.

2. Verify the patient has a functioning, secure IV line in place.
3. Ensure ECG monitoring and observe for dysrhythmia during induction.
4. Palpate the cricothyroid space and mark it with an ink pen.
5. Premedicate the patient as appropriate:
   - **Versed** 0.02mg/kg via IV push, for sedation
   - **Amidate** (Etomidate) 20mg (0.2mg/kg) or 0.2-0.6mg/kg via IV push for sedation
   - **Atropine** 0.02mg/kg (minimum dose 0.1mg; maximum dose 0.5mg) via IV push, for pediatric patients.

6. Administer succinylcholine chloride (Anectine) 1 mg/kg via IV push.
7. Apply cricoid pressure to occlude the esophagus until intubation is successfully completed and the endotracheal tube cuff is inflated. Elevate the patient’s head 15 degrees when possible.
   - After fasciculations stop (if they occur), demonstrate adequate relaxation by ventilating the patient four to five times with the BVM (hyperventilate to blow off CO2).
   - Jaw relaxation and decreased resistance to BVM ventilation indicate that the cords are paralyzed and that it is time to proceed with intubation (approximately 45 seconds to 1 minute).

8. Perform endotracheal intubation.
   - If unable to intubate during the first 20-second attempt, stop and ventilate with the BVM for 30-60 seconds.
   - If inadequate relaxation is present, give a second dose of succinylcholine chloride (1.0-1.5 times the initial dose). Observe for severe bronchospasm in pediatric patients.
   - If repeated intubation attempts fail, ventilate the patient via BVM until spontaneous ventilations return (usually 3-5 minutes).

9. If unable to intubate after the administration of succinylcholine chloride, ventilate the patient with a BVM. If unable to appropriately ventilate the patient with a BVM, consider performing surgical cricothyroidotomy.

10. Treat bradycardia occurring during intubation by temporarily halting intubation attempts and continue ventilation of the patient via BVM with 100% O2. If bradycardia does not resolve with oxygenation and ventilation, administer atropine 0.5-1.0 mg via IV push.
4.6 The Autistic Patient

This protocol is intended to assist emergency personnel in dealing with the special challenges that they face when encountering an autistic patient.

Signs of Autism

Many parents are in denial or do not realize the possibility that their child is autistic. It is for this reason that careful consideration should be made before inquiring whether a child is autistic. Doing so may prompt the parent to “shut down” or become defensive, which could hamper the process of acquiring patient information. Signs of autism that the emergency care provider may recognize include these:

- Has not “babbled” or “cooed” by the age of 1 year.
- Has not gestured, pointed, or waved by 1 year.
- Has not spoken a single word by 16 months.
- Has not spoken a two-word phrase by 2 years.

Special Considerations

When dealing with an autistic patient, special accommodations must be made during the encounter to achieve a positive outcome. Conditions that may affect the encounter include these:

- Autistic patients may respond aggressively to an unwanted touch.
- Autistic patients may appear to have a hearing impairment.
  - This may affect your assessment of the patient’s level of consciousness and the Glasgow Coma Scale score.
  - It may also prevent the patient from coming to you if called, such as in motor vehicle accidents, fires, and evacuations (a).
- During stressful times, autistic persons may “bolt” or run away from the situation even if they are hurt. These patients will not respond to someone calling their name to stop! This behavior may result in the person running into traffic or other hazardous areas (b).
- Autistic patients cannot tell or describe what is hurt or what they want (c).
- Autistic patients will likely not follow any directions. This will present a great challenge during the patient assessment (c).
- Autistic children do not play with toys appropriately.
- Autistic patients have poor eye contact, which may affect the evaluation of pupils.
  - The autistic patient usually directs his/her eyes up, down, or away. This factor should be considered when head injuries are suspected.
- Autistic patients appear to be in their own world. This could pose a concern if a patient is in danger and is not aware of it (d).
- Autistic patients have odd movement patterns.
  - These movements may include hand flapping, hand washing motions, spinning motions, head slapping, and covering of the ears or eyes
  - Autistic patients exhibit an unusual attachment to toys or other objects.
  - To gain the trust of an autistic patient, provide him/her with a favorite object, which may not necessarily be a toy. Ask the parent/caregiver to assist you.
4.6 The Autistic Patient (continued)

- Autistic patients often demonstrate repetitive behaviors.
  - Autistic persons feel compelled to complete certain tasks, such as lining up their toys.
  - Before allowing an intrusion, such as emergency workers examining them, autistic patients may feel compelled to complete a certain task such as lining up toys, opening a door, or going through a certain routine.
- Autistic patients do not adjust well to a change in their surroundings or routines.
  - These patients are usually set in a certain routine and are extremely comfortable in their known surroundings. Any changes could result in an aggressive response.
- Autistic patients may walk on “tippy toes.”
- Autistic patients may have an increased level of pain tolerance.
  - This may be a major consideration during the physical exam. A thorough physical exam is required, especially with suspected abdominal pain, fractures/sprains, and head/neck injuries.
- Autistic patients have an extreme sensitivity to touches and textures (i.e., smooth, rough, sticky, hot/cold, wet/dry).
  - Consideration should be given to this factor when applying dressings and bandages. The simplest of procedures, such as applying a Band-Aid or irrigating a wound, could result in a “meltdown.”
- Autistic patients are extremely sensitive to having things on their heads or around their necks.
  - This factor should be considered when applying dressings to head injuries, as well as when utilizing a sling to secure an extremity.

“Meltdowns and Refocus Periods”

Children with autism can have frequent “meltdowns” (tantrums) due to any one of the factors mentioned in the “Special Considerations” section of this protocol. These meltdowns may also occur for no apparent reason and may result in aggressive behavior. After a meltdown, autistic children will likely go through what is known as a “refocus” period. They will suddenly become quiet; they may crouch down and cover their ears or eyes. Typically they will look for a quiet, darkened, “sheltered” area. During this period, patients are trying to “refocus” their world; this is their time. The refocus period can last a few minutes to possibly 30 minutes or longer. If there is an attempt to rush this period, another meltdown may occur, to be followed by another refocus period; this process could become a vicious cycle.

If you encounter a parent/caregiver who is aware of the autism, ask him/her for advice on how to handle the patient. Parents of autistic children are usually very actively involved with their children and understand their “quirks.” Their help should enhance your treatment and be a major factor in lessening the stress level in an already stressful situation.

Note: Clues that may indicate that you are dealing with an autistic patient may include car magnet “puzzle piece” ribbons on vehicles involved in motor vehicle accidents as well as window stickers on homes indicating the presence of a special needs person.

(a) Autistic patients are not aware of any present dangers. To safely secure the patient, reduce the risk of danger before encountering the patient. Ask the parent/caregiver to assist you during your interview. (b) If possible, ask the parent/caregiver to assist with “refocusing” the patient. If such a person is not available, try clapping your hands to get the patient’s attention if the situation is urgent. (c) Be aware of a possibly aggressive response to an unwanted touch.
4.7 Blood Alcohol Sampling

Drawing a blood alcohol sample should not delay treatment or transport of the critical patient.

1. The EMS Run Report should contain the following information:
   a. A blood alcohol kit was used.
   b. A Betadine (povidone-iodine) solution (or hydrogen peroxide/acetone if the patient is allergic to iodine) was used for the skin preparation.
   c. Name of the law enforcement officer requesting blood sample.
   d. Time of draw.
   e. If the paramedic drawing sample is different from the one signing the report, that paramedic will sign under the above information.

2. All blood samples taken must be surrendered to the requesting law enforcement officer.

3. The paramedic:
   ● May be required to obtain multiple samples.
   ● Must follow all blood sampling kit guidelines.
   ● Must obtain blood alcohol samples only at the request of a law enforcement officer, either in the field or upon arrival in the emergency department.
4.8.1 Auto-Pulse Chest Compression System

A load-distributing band device is designed to deliver consistent uninterrupted chest compressions during cardiac arrest.

1. Initiate CPR.

2. Maintain high-quality compressions.

3. Power up the Auto-Pulse by pressing the ON/OFF button at the top of the device.

4. Remove the clothing on the patient’s torso:
   - Sit the patient up and perform a single cut down the back of the patient’s clothing. Then slide the Auto-Pulse platform into position behind the sitting patient, and have the patient lie down on the platform.
   - Log-roll the patient to one side and perform a single cut down the back of the patient’s clothing. Then log-roll the patient onto the Auto-Pulse platform.

5. Align the patient on the platform. The patient’s armpit should be positioned on the “yellow” indicator line on the Auto-Pulse platform.

6. Close the LifeBand over the patient’s chest.
   - Therapy electrodes or defibrillation pads should be in place before applying the LifeBand.
   - Make sure the LifeBand is not twisted.
   - The LifeBand is secure when the mating slot is placed over the alignment tab and the bands are pressed together to engage the Velcro.
   - Center the LifeBand on the patient’s chest.

7. Begin compressions by pressing the green Start/Continue button once. The Auto-Pulse device will automatically adjust the bands on the chest.

8. The Auto-Pulse unit will pause for 3 seconds to allow for a check of proper alignment.
   - If patient is not aligned correctly, push the orange Stop/Cancel button.
   - Realign the LifeBand and press the green Start/Continue button.

9. Select the desired mode of compressions by pushing the gray Menu/Mode button.
   - 30:2 mode: 30 compressions and a pause for 2 ventilations.
   - Continuous mode: uninterrupted compressions.

10. Complete the process of securing the patient for transport.
    - Clip the straps for the shoulder restraint to the Auto-Pulse platform and tighten them.
    - Secure the patient’s head to the Auto-Pulse platform with the manufacturer’s head immobilizer or tape applied across the patient’s forehead.

11. After successful resuscitation or termination of activities, press the orange Stop/Cancel button.
4.8.2     LUCAS Chest Compression System

1. Initiate CPR, Maintain high-quality compressions.
2. Open the LUCAS carrying bag to expose the unit.
3. Make certain the On/Off knob is in the “adjust” position.
4. Connect the high-pressure air line to the regulator on the air source.
5. Take the back plate out of the bag. With one rescuer on each side of patient, grab the patient’s arm to lift the upper body. One person should lift the patient and support the head, and the other person should lift the patient and slide the back plate below the armpits.
7. Take the upper part of the LUCAS unit out of the bag. Hold the LUCAS device by the handles on the support legs and make sure the support legs have reached their outer position.
8. Pull up once on the release rings to check that the claw locks are open.
9. Interrupt manual chest compressions and place the upper part of the LUCAS unit over the patient’s chest. The claw locks at the end of each support leg should be aligned with the back plate to lock the components together.
10. Check by pulling upward that both support legs are locked into the back plate.
11. Lower the suction cup with the height adjustment handles until the pressure pad inside the suction cup touches the patient’s chest without compressing the chest.
12. Turn the ON/OFF knob to activate the chest compressions.
13. Attach the neck pad by raising the patient’s head slightly. Clip the pad into each buckle attached to the support arms. Pull the excess slack out of each strap by pulling gently and simultaneously until the pad positions itself into place.
14. Attach the wrist straps to each of the patient’s wrists to assist with securing the arms during movement/transportation. Use caution to determine that the intravenous site is not compromised due to a slight bend that will occur in the patient’s arm. If this does occur, release the arm and secure the unit by other means.
15. After successful resuscitation or termination of activities, turn the ON/OFF knob to the “Off” position.

**LUCAS 2 Chest Compression System**

1. Initiate CPR, Maintain high-quality compressions.
2. Pull red handle on bag to open
3. To activate, push ON/OFF button for one second to start self-test and power up
4. The green LED adjacent to ADJUST illuminates
5. Take the back plate out of the bag. Pause manual CPR. With one rescuer on each side of patient, grab the patient’s arm to lift the upper body. One person should lift the patient and support the head, and the other person should lift the patient and slide the back plate below the armpits.
7. Take the upper part of the LUCAS 2 unit out of the bag. Hold the LUCAS 2 device by the handles on the support legs and make sure the support legs have reached their outer position.
8. Check that the release rings on claw locks are open.
9. Interrupt manual chest compressions and place the upper part of the LUCAS 2 unit over the
patient’s chest. The claw locks at the end of each support leg should be aligned with the back plate to lock the components together. Listen for the CLICK when attached.
4.8.3 LUCAS Chest Compression System

10. Check by pulling upward that both support legs are locked into the back plate.
11. Center the suction cup over the chest with the lower edge of the suction cup placed immediately above the end of the sternum
12. Push the suction cup down using two fingers, making sure you are in the ADJUST MODE and the green led is lit
13. The pressure pad should touch the patient’s chest. If pad does not touch or Lucas 2 does not fit properly, remove and continue manual compressions
14. Press PAUSE to lock the start position then remove your fingers from the suction cup
15. Check for proper position and press ACTIVE (continuous) or ACTIVE (30:2)
16. Attach stabilization strap by fully extending the buckles and placing cushion under patient’s neck
17. Fasten cushion to Lucas 2 device and tighten the straps
18. Delay the application of the stabilization strap when it might prevent or delay treatment
19. Attach the wrist straps to each of the patient’s wrists to assist with securing the arms during movement/transportation. Use caution to determine that the intravenous site is not compromised due to a slight bend that will occur in the patient’s arm. If this does occur, release the arm and secure the unit by other means.
20. Press PAUSE to stop compressions during ECG analysis
21. Keep interruptions to a minimum
22. After successful resuscitation or termination of activities, Press and hold the ON/OFF button for one second.
4.9 Chest Decompression

1. Assess the patient to make sure that his/her condition is due to a tension pneumothorax:
   - Mechanism of injury
   - Absent or decreased breath sounds on the affected side.
   - Poor ventilation despite an open airway.
   - Tracheal deviation away from the side of the injury (may not always be present).
   - Neck vein distention (may not be present if there is associated severe hemorrhage).
   - Tympany (hyperresonance) to percussion on the affected side.
   - Shock.
   - Decreased SpO2/end-tidal CO2.
2. Provide the patient with high-flow oxygen and ventilatory assistance.
3. Identify the second or third intercostal space (i.e., the space between the second and third ribs or between the third and fourth ribs) in the midclavicular line on the same side as the tension pneumothorax. If the mid-clavicular site cannot be accessed due to any reason (ballistic vest or patient trapped) utilize the mid-axillary site (the space between the 5th and 6th ribs) in the mid-axillary line.
4. Quickly prepare the area with povidone-iodine.
5a. Utilize a 14-gauge, 3- to 3 ½-inch needle IV catheter.
   OR
5b. Use a commercial decompression device.
6. If there is an extended transport time consider making a one way valve by inserting the IV catheter through the finger of a sterile glove that has been moistened with sterile water or (optional) attach the IV catheter to a syringe half-filled with saline to aid in visualizing air release
7. Insert the catheter into the intercostal space.
8. Insert the catheter through the parietal pleura until air escapes. It should exit under pressure.
9. Remove the needle and/or syringe. Leave the plastic catheter in place until it is replaced by a chest tube at the hospital.
10. Monitor the patient, as the initial catheter may clog or kink, requiring reinsertion of another needle.
4.10.1 Electronic Waveform CO₂ Detection

**Intubated/Supraglottic Device**
1. Follow the manufacturer’s recommendation for inserting the airway device.
2. Verify placement of the airway device.
3. Attach the CO₂ detection tubing to the airway device.
4. Monitor the electronic readings.

**Non-intubated Device**
1. Select the appropriate size of detection tubing.
2. Place the detection tubing on the patient.
3. Attach the detection tubing to the CO₂ detection device.
4. Monitor the electronic readings.
4.10.2 Color Metric End-Tidal CO₂ Detector

1. Remove the detector from the package and match the initial color of the indicator to the purple color labeled “CHECK” on the product dome.
   - The color should be the same or darker.
   - If the color is lighter, do not use the unit.
   - Use an appropriate CO₂ indicator based on the patient’s weight.
2. After the tube is inserted, firmly attach the EASY CAP detector between the tube and the breathing device.
3. Ventilate the patient with 6 breaths of moderate tidal volume. Interpreting results with fewer than 6 breaths can yield false results.
4. Compare the color of the indicator on full end-expiration to the color chart on the product dome. (The chemical indicator may become irreversibly yellow after contact with any liquid.)
   - If the color indicator is “yellow,” the ETT is in the trachea.
   - If the color indicator is “tan,” ventilate six more times and recheck.
   - If the color indicator is “purple,” recheck ETT placement with direct laryngoscopy to confirm placement.
5. If the results are not conclusive, the tube should be immediately removed unless correct anatomic placement can be confirmed with certainty by other means.
4.10 CO Monitoring (Rad-57) Carboxyhemoglobin

1. Press the green power button to activate the unit.
2. Place the sensor on the patient’s finger (observe the top and bottom of the sensor). Do not place the sensor on the thumb or fifth digit (pinky). If available, utilized the pediatric sensor as instructed by the manufacturer.
3. Four green LED lights below the power button indicate the battery level.
4. The sensor is calibrated to penetrate the mid-nail area, not the cuticle area. Do not force the patient’s finger in too far.
5. RAD-57 will calibrate on the patient in 5-8 seconds.
6. Displays will come up in pulse oximeter (SpO₂) mode.
7. The PI graph will display perfusion strength.
8. The display will show “SEN OFF” until the sensor is on the finger.
9. Press the orange “SpCO” button.
10. The display will show the SpCO level from 1% to 99%.
11. Record the level(s) on the patient report.
12. Press and hold the green power button to turn the unit off.

**CO Level: Signs and Symptoms**

<table>
<thead>
<tr>
<th>Level</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Minor headache</td>
</tr>
<tr>
<td>5-9</td>
<td>Headache</td>
</tr>
<tr>
<td>10-19</td>
<td>Dyspnea, headache</td>
</tr>
<tr>
<td>20-29</td>
<td>Headache, nausea, dizziness</td>
</tr>
<tr>
<td>30-39</td>
<td>Severe headache, vomiting, altered LOC</td>
</tr>
<tr>
<td>40-49</td>
<td>Confusion, syncope, tachycardia</td>
</tr>
<tr>
<td>50-59</td>
<td>Seizures, shock, apnea, coma</td>
</tr>
<tr>
<td>60-Up</td>
<td>Coma, death</td>
</tr>
</tbody>
</table>
CPAP Overview
Continuous Positive Airway Pressure (CPAP) is a non-invasive mechanically assisted delivery system designed to administer oxygenation of several respirational pathologies. CPAP is not a replacement for any medication or procedure, but a tool which can provide a high level of ventilatory support without the need for RSI or intubation. CPAP is approved for patients 18 years of age and older, with moderate to severe respiratory distress.

Indications
Respiratory distress secondary to suspected congestive heart failure, acute cardiogenic pulmonary edema, and chronic obstructive pulmonary disease (asthma, bronchitis, emphysema).

Contraindications
- Severely Impaired Consciousness.
- Uncooperative Patient or Inability to Follow Instructions (GCS<14)
- Respiratory or Cardiac Arrest
- Suspected Pneumothorax
- Inadequate Respiratory Drive
- Shock/Hypotension (BP <90)
- Facial, Head or Chest Trauma
- Chest Wall Trauma
- Persistent Nausea/Vomiting and or High Risk of Aspiration
- Has Active Upper GI Bleeding or History of Recent Gastric/Eosophageal Surgery.
- Upper Airway Obstructions

4.12.1 CPAP (Whisper Flow Fixed-Flow O2 Generator)
1. Place the patient in an upright or high Fowler’s position.
2. Assess vital signs.
3. Attach a cardiac monitor, pulse oximeter, and capnography.
4. Select a sealing face mask and ensure that the mask fits comfortably. The mask should form a seal with the bridge of the patient’s nose and fully cover the nose and mouth.
5. Connect the generator to a 50-psi oxygen outlet.
6. Hold the mask or have the patient hold the mask to his/her face. If the patient seems anxious, it is acceptable to turn the generator “on” and have the gas flowing before placing the mask on the patient’s face. When the patient is comfortable, use the head strap to hold the mask in place. Ensure it is not too tight. Some air leakage is acceptable, unless it is in the eye area.
7. Choose the appropriate PEEP valve 5-10 cm H2O.
8. Treatment should be given continuously throughout transport.
9. Evaluate vital signs every 5 minutes.
10. In case of a life-threatening complication, stop treatment and consider the need for intubation.
4.12.2 CPAP (FlowSafe II)

Procedure
1. Position patient in fowlers or semi-fowlers.
2. Connect CPAP unit to suitable O2 supply.
3. Place delivery device over mouth and nose. (leave ETCO2 nasal cannula in place)
4. Patient may require substantial coaching in order to receive compliance with mask seal, but a leak-less mask seal is essential.
5. Titrate CPAP pressure to patient’s tolerance until improvement in patient’s SpO2 and symptoms.
6. Max 5 cm/H2O for Bronchospasm
7. Max 10 cm/H2O for CHF, Pulmonary Edema, and Pneumonia.
8. Max 5 cm/H2O for pediatrics
9. If respiratory drive or level of consciousness deteriorates, discontinue use and prepare to support airway and ventilations.
10. Monitor patient every 5 minutes and advise receiving hospital as soon as possible of CPAP use, so they can prepare to continue treatment.
11. In case of a life-threatening complication, stop treatment and consider the need for intubation.

Considerations
- Continue CPAP at receiving hospital until facility is ready to take over treatment.
- Monitor for gastric distension
- CPAP is not a replacement for current parenteral medication treatments, but is to be used in conjunction with these treatments.
4.13 Cyanokit (Hydroxocobalamin for Injection)

This kit is for intravenous use. The hydroxocobalamin is to be reconstituted with 100 mL per vial of 0.9% sodium chloride injection. The starting dose is 5 g. (may be packaged in one or two vials).

1. Start a dedicated IV line
2. Reconstitution: Add 100 mL of 0.9% sodium chloride injection to the vial using a transfer spike. Fill to the line (with the vial in an upright position).
3. Mix: Rock or rotate the vial for 30 seconds to mix the solution. Do not shake.
4. If one vial infuse the 5 g vial: Use vented IV tubing to hang the bag and infuse over 15 minutes.
5. If two vials infuse the first vial: Use vented IV tubing to hang the bag and infuse over 7.5 minutes and then infuse the second vial: Repeat Steps 2 and 3 before the second infusion. Use vented IV tubing to hang the bag and infuse over 7.5 minutes.

See Drug Summary 5.18, Hydroxocobalamin.
4.14.1 12-Lead ECG Application

12-Lead ECG Electrode Placement.

1. RA: right arm, upper arm, or upper chest near the shoulder.
2. LA: left arm, upper arm, or upper chest near the shoulder.
3. RL: right leg or lower abdominal quadrant near the hip.
4. LL: upper leg or lower abdominal quadrant near the hip.
5. V1: fourth intercostal space, immediately to the right of the sternum.
6. V2: fourth intercostal space, immediately to the left of the sternum.
7. V4: fifth intercostal space in the midclavicular line. (Note: V4 must be placed prior to V3.)
10. V6: fifth intercostal space in the midaxillary line.
4.14.2 External Pacemaker

Several different external pacers are available. While their control panels may look different, all of them have several features in common.

1. Turn on the device.
2. Attach an ECG monitor and therapy electrodes and cables.
   - Place electrodes over the heart on the anterior and posterior locations.
   or
   - Place one electrode in the upper right torso (lateral to the sternum and below the clavicle). Place the other electrode in the left upper midaxillary area (lateral to patient’s left nipple).
3. Evaluate the patient:
   - Medication patches: Remove the patches.
   - Patient located on wet surface: Relocate the patient to a dry area.
   - Patient with fluid on chest or back area: Dry with a towel.
4. Record a strip of the patient’s rhythm prior to initiating pacing.
5. Consider sedation for conscious patients.
6. Set the unit to pacer mode.
7. Set the heart rate at 70 or 80 beats per minute. (Pediatrics 100-120 beats per minute)
8. Increase the energy setting until electrical capture is achieved (evidenced by a pacer spike followed by a wide QRS complex).
9. Evaluate pacing effectiveness and perform one of the following options:
   - Electrical capture is achieved: Check pulse and blood pressure (right carotid, right femoral, or either brachial pulse due to muscle twitching).
   or
   - Electrical capture is achieved but no pulse: Treat with the Asystole/PEA protocol.
   or
   - No electrical capture: Increase pacer to maximum energy setting and recheck all settings, cables, battery charge, electrode placement, and patient’s own rhythm.
10. ECG rhythm strips should be recorded and retained for documentation.
11. Continue all other supportive measures. (There is no risk of electrical shock from touching the patient or from performing other procedures during pacing.)

**Pediatric Pacing Indications**

- bradycardias from surgically acquired AV blocks
- congenital AV block
- viral myocarditis
- newborn complete heart block due to maternal lupus
- heart block secondary to toxin or drug overdose
- Permanent pacemaker generator failure in the pediatric patient with an implanted pacemaker.
4.15 Eye Washing for Chemical and Small Foreign body

1. Remove the patient from the contaminated area.
2. Attempt to identify the chemical and notify the receiving facility.
3. Remove the patient’s clothing (if necessary) and decontaminate with copious amounts of water.
4. Remove contact lenses (if present) to ensure that chemicals are not trapped under the lenses.
5. To ensure adequate rinsing behind the eyelid, hold the lid with your thumb and index finger, as it is normal for the eye to close when splashed.
6. Flush the eye away from the nose to avoid contamination of the other eye for a minimum of 20 minutes. Do not delay transport to complete the irrigation process.
7. Use any of these methods:
   - Flush using a faucet spray from a sink or shower.
   - Flush using a bottle of normal saline or sterile water.
   - Flush using a basin filled with water.
   - Flush using nasal cannula tubing.
4.16 Helmet/Face Mask Removal

4.16.1 Football Helmet Face Mask Removal
1. Apply manual in-line stabilization.
2. Employ any of these face mask removal methods:
   - Use a cordless screwdriver to remove the screws attaching the face mask to the helmet.
   or
   - Use a face mask extractor or other cutting device to cut the face mask straps.
3. Secure the patient to a long spine board.
4. Perform cervical immobilization.
   - Apply towel rolls on each side of the helmet and tape the helmet to the long spine board.
   or
   - Use a commercial cervical immobilization device.

4.16.2 Full Face Mask Helmet Removal
1. Apply manual in-line stabilization by placing your hands on each side of the helmet, with your fingers on the patient’s mandible.
2. Cut or disconnect the chin straps.
3. Transfer manual in-line stabilization to the second rescuer by placing one hand on the patient’s mandible (thumb on one side and fingers on the other side) and the other hand under the patient’s head at the occipital area.
4. Inspect the patient for glasses; remove them, if present.
5. Laterally move the helmet to clear the patient’s ears.
6. Tilt the helmet backward to raise over the patient’s nose and remove it.
7. Apply a cervical collar.
8. Secure the patient to a long spine board.

4.16.3 Football Helmet Removal
1. Apply manual in-line stabilization.
2. Consider completely removing the helmet in the following circumstances:
   - The face mask cannot be removed after a reasonable period of time to access the patient’s airway.
   - The helmet chin strap does not hold the patient’s head securely.
   - The helmet prevents immobilization during transport.
3. Cut or disconnect the chin straps.
4. Transfer manual in-line stabilization to the second rescuer by placing one hand on the patient’s mandible (thumb on one side and fingers on the other side) and the other hand under the patient’s head at the occipital area.
5. Laterally move the helmet to clear the patient’s ears.
6. Tilt the helmet backward to raise it over the patient’s nose and remove it.
7. Apply a cervical collar.
8. If the patient has a chest pad on, it is important to apply padding under the head so the cervical spine is maintained in a neutral position on the spinal board.
9. Secure the patient to a long spine board.
4.16 Helmet/Face Mask Removal

4.16.4 Other Helmets
In the absence of off-setting padding such as football shoulder pads, all other helmets should be removed. Failure to do so will result in compromising the neutral alignment of the spine. Helmets that should be removed include:

1. Motorcycle helmets
2. Bicycle helmets
3. Skateboard/Ski helmets
4. Roller blading helmets

Steps for Helmet Removal
1. Stabilize the helmet in the neutral in-line position and have a second individual remove the chin strap.
2. The individual that removed the chin strap will then support the occiput and mandible while the helmet is gently slipped up and forward.
3. Once the helmet is removed, standard c-spine control will take place and an appropriate sized cervical collar applied.

Note: If the helmet is too snug or you encounter significant resistance during the removal attempt, then leave the helmet in place and pad the body. Make sure you can access the airway.

Always check the helmet for damage to help assess mechanism of injury. Transport the helmet with the patient if possible.
4.17 Glucometer

The glucometer is designed to be used to test capillary blood for the level of glucose. Several types of glucometers are available. The paramedic should refer to the user’s manual for his/her specific type for further information.

1. Select a sample site on the patient’s finger and clean the area with an alcohol swab. Allow the alcohol to dry before sticking the finger for a sample.
2. Tear off a single test strip packet. Note the expiration date on the packet. Open the packet and fold back the foil ends to expose the meter end of the test strip.
3. Hold the test end of the test strip between the foil. Insert the test strip fully into the test slot located on the side of the meter; continue the insertion until a confirmation tone is heard.
4. Stick the patient’s finger with a lancing device and press the finger to form a small drop of blood. If blood does not readily form on the surface of the patient’s skin, have the patient lower his/her hand below the level of the heart to aid in this process.
5. Apply the drop of blood to the test strip.
6. Dispose of the sharp in a biohazard puncture-resistant container.
7. Following a brief delay, the blood glucose result appears in the display.
8. Remove and dispose of the test strip in biohazard garbage bag.
4.18 (4.18.1) Medication Administration - Auto-injectors

4.18.1 Auto-injectors

4.18.1.1 Auto-Injector AtroPen®
Mild symptoms of nerve agent (nerve gas) or insecticide exposure appear in situations where exposure is known or suspected: blurred vision, miosis, excessive unexplained teary eyes, excessive unexplained runny nose, increased salivation such as sudden unexplained excessive drooling, chest tightness or difficulty breathing, tremors throughout the body or muscular twitching, nausea and/or vomiting, unexplained wheezing or coughing, acute onset of stomach cramps, tachycardia, or bradycardia. One AtroPen® is recommended if 2 or more of the above are identified.

Severe symptoms include: strange or confused behavior, severe difficulty breathing or severe secretions from the lungs/airway, severe muscular twitching and general weakness, involuntary urination and defecation (feces), convulsions, or unconsciousness. If a victim is encountered who is unconscious or has any of the severe symptoms, immediately administer 3 AtroPen® injections into the victim's midlateral thigh in rapid succession using the appropriate weight-based AtroPen dose.

1. Check the expiration date.
2. Remove the auto-injector’s safety cap.
3. Grasp the unit like a pen and position the tip of the AtroPen® on the outer thigh mid-way between waist and knee.
4. Push the auto-injector firmly against the site until the injector is activated.
5. Hold the auto-injector in place until the medication is fully injected (minimum of 10 seconds).
6. Record the time.
7. Dispose of the auto-injector in a biohazard puncture-resistant container.
8. Reassess the patient.

4.18.1.2 Auto-Injector EpiPen®
The EMT (or Paramedic) may administer prescribed epinephrine via an auto-injector for patients who are exhibiting signs of respiratory distress associated with allergic reaction. These signs may include dyspnea, hives, flushing of the skin, wheezing, edema, and possibly unstable vital signs.

1. Assure the auto-injector is prescribed for the patient: EpiPen® for adult patient and EpiPen Jr.® for pediatric patient.
2. Check the expiration date.
3. Remove the auto-injector’s safety cap.
4. Grasp the unit like a pen and position the tip of the EpiPen® on the outer thigh mid-way between waist and knee.
5. Push the auto-injector firmly against the site until the injector is activated.
6. Hold the auto-injector in place until the medication is fully injected (minimum of 10 seconds).
7. Record the time.
8. Dispose of the auto-injector in a biohazard puncture-resistant container.
9. Reassess the patient.
4.18.1.3 Auto-Injector DuoDote® (source DuoDote.com)
The DuoDote® contains 2.1mg of atropine and 600 mg of Pralidoxime Chloride for use in nerve agent & insecticide poisoning.

Before injecting
1. Tear open the plastic pouch at any of the notches. Remove the DuoDote® auto-injector from its protective pouch.
2. Place the DuoDote® in your dominant hand. Firmly grasp the center of the DuoDote® with the green tip (needle end) pointing down.
3. With your other hand, remove the gray safety release. The DuoDote® auto-injector is now ready to be administered.

Select Site & Inject
4. The injection site is the mid-outer thigh area. The DuoDote® can inject through clothing. However, make sure pockets at the injection site are empty.
5. Swing and firmly push the green tip against the mid-outer thigh; it should be at a 90 degree angle to the thigh. Continue to firmly push until you feel the DuoDote® trigger and begin injecting the antidote. IMPORTANT: After the auto-injector triggers, hold the DuoDote® in place against the injection site for approximately 10 seconds.

After Injecting
6. Remove the DuoDote® from the thigh and look at the green tip. If the needle is visible, the drug has been administered. If the needle is not visible, check to be sure the grey safety release has been removed and repeat the previous steps beginning with Step 4, but push harder in Step 5.
7. After the drug has been administered, dispose of the unit in a biohazard puncture-resistant container. If biohazard container is not available push the needle against a hard surface to bend the needle back against the auto-injector.
8. Reassess the patient, immediately move yourself and the patient away from the contaminated area and seek definitive care for the patient.
4.18.2 Intramuscular Injection (IM)
1. Prepare the equipment. The needle size should be 21-23 gauge and 1-1.5 inches long.
2. Check for proper medication, expiration date, vial integrity, and color and clarity. Draw the medication into the syringe.
3. Preferred site is mid-lateral thigh, if the patient is obese use the distal portion of the thigh. The deltoid can also be used but has a longer absorption rate.
4. Cleanse the injection site with alcohol or Betadine in an expanding circular pattern using a firm pressure.
5. With one hand, pull the skin taut and insert the needle at a 90-degree angle into the muscle.
6. Aspirate to ensure that a blood vessel has not been entered. If blood is aspirated, remove the needle and repeat the procedure at a different site.
7. Administer the appropriate dose.
8. Remove the needle from the injection site and dispose of it in a secure sharps container.
9. Monitor the patient.

4.18.3 Intranasal Medication Administration (IN) Mucosal Atomization Device (MAD)
Damaged nasal mucosa may inhibit absorption of the medication. For this reason, contraindications for a MAD include the following conditions:
- Facial trauma.
- Epistaxis (nose bleed).
- Nasal congestion or discharge.
- Any recognized nasal mucosal abnormality.

1. Prepare the equipment.
2. Check the medication for proper name, expiration date, vial integrity, and color and clarity.
3. Draw the medication into the syringe.
   - Maximum adult and pediatric administration is 1 mL per nostril. The medication should be split with ½ of the dose given in one nostril and the other ½ given in the other nostril.
4. Expel all of the air from the syringe.
5. Securely attach the mucosal atomizer to the syringe.
6. The patient should be in a recumbent or supine position. If the patient is sitting, compress the nares after administration.
7. Briskly compress the syringe plunger to properly atomize the medication.
8. Monitor the patient.
4.18.4 Intraosseous (IO)

4.18.4.1 BIG (Bone Injection Gun)

**Adult**
1. Find and mark a penetration site located 2 cm medially and 1 cm proximally to the tibial tuberosity.
2. Clean the area with a povidone-iodine swab.
3. Position the BIG device with one hand to the site and pull out the safety latch with the other hand.
4. Trigger the BIG at a 90-degree angle to the surface.
5. Remove the BIG handle.
6. Pull out the stylet trocar.
7. Fix the cannula with the safety latch.
8. Attach a 10-cc syringe filled with \( \frac{1}{2} \) normal saline.
   - Aspirate for bone marrow, and then flush with fluid.
   - Observe for any signs of infiltration.
9. If the route is patent, connect it to the drip set tubing.
10. Attach a pressure infuser.
11. Secure the site.

**Child**
1. Find and mark a penetration site located 1 cm medially and 1 cm proximally to the tibial tuberosity.
2. Clean the area with a povidone-iodine swab.
3. Position the BIG device with one hand to the site and pull out the safety latch with the other hand.
4. Trigger the BIG at a 90-degree angle to the surface.
5. Remove the BIG handle.
6. Pull out the stylet trocar.
7. Fix the cannula with the safety latch.
8. Attach a 10-cc syringe filled with \( \frac{1}{2} \) normal saline.
   - Aspirate for bone marrow, and then flush with fluid.
   - Observe for any signs of infiltration.
9. If the route is patent, connect it to the drip set tubing.
10. Attach a pressure infuser.
11. Secure the site.
4.18.4 Medication Administration – IO

Intraosseous (IO)

4.18.4.2 Cook Pediatric IO

1. Locate the site of cannulation. Palpate the tibial tuberosity, and move 1-3 cm below the tuberosity on the medial surface of the tibia, approximately one finger’s width below the tuberosity.
2. Prep the area with antiseptic solution (e.g., povidone-iodine).
3. Grasp the patient’s thigh and knee above and lateral to the insertion site with the palm of your nondominant hand. Wrap your fingers and thumb around the knee to stabilize the proximal tibia. Do not let any portion of your hand rest behind the insertion site.
4. Palpate the landmarks again to confirm the insertion site.
5. Insert the needle through the skin, over the flat anteromedial surface of the tibia.
6. Advance the needle through the bony cortex of the proximal tibia, directing the needle perpendicular (90 degrees) to the long axis of the bone or slightly caudad (toward the toes) to avoid the epiphysial plate, using a gentle back-and-forth twisting or drilling motion.
7. Stop advancing the needle when a sudden decrease in resistance to forward motion of the needle is felt.
8. Unscrew the cap and remove the stylet from the needle.
9. Stabilize the needle and attach a 10-mL syringe filled with normal saline.
10. Aspirate for bone marrow, and then flush the needle with normal saline. Check for any signs of increased resistance to injection or swelling of the surrounding tissue.
11. If the test injection is successful, remove syringe and connect the IV tubing.
12. Attach a pressure infuser.
13. Secure the site.
Intraosseous (IO) 4.18.4.3 EZ IO

1. Locate an insertion site:
   - **Proximal Tibia**
     The proximal tibia insertion site is approximately 2 cm below the patella and approximately 2 cm medial to the tibial tuberosity (depending on patient anatomy).
   - **Proximal Humerus – permitted in pediatrics when landmarks are clearly identified**
     The proximal humerus insertion site is located directly on the most prominent aspect of the greater tubercle. Ensure that the patient’s hand is resting on the abdomen and that the elbow is adducted (close to the body). Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site. This is the preferred site for patients who are responsive to pain. Once the insertion is completed secure the arm in place to prevent movement and accidental dislodgement of the IO catheter.
   - **Distal Tibia** - The distal tibia insertion site is located approximately 3 cm proximal to the most prominent aspect of the medial malleolus (depending on patient anatomy). Place one finger directly over the medial malleolus; move approximately 3 cm proximal and palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.

2. Clean the area with a povidone-iodine swab.
3. Select the appropriate needle.
   - Small (pink) 15mm needle: weight = 3-39 kg
   - Medium (blue) 25mm needle: weight ≥ 40 kg
   - Large (yellow) 45mm needle: weight > 40 kg and patients with excessive tissue over insertion sites
4. Remove the needle from the case. Push the needle onto the power driver, and make sure that it is securely seated.
5. Remove and discard the needle set safety cap from the needle.
6. Insert the EZ-IO needle into the tibial site at a 90-degree angle to the bone surface.
7. Gently power the needle set until it touches bone, and then apply steady downward pressure.
8. Release the driver’s trigger until:
   - There is a sudden “give” or “pop.”
   - OR
   - The needle reaches the desired depth at 5 mm, which is indicated on the needle by the black line.
9. Remove the power driver and needle stylet.
10. Confirm that the catheter is stable.
11. Take the syringe containing 10 mL of normal saline and attach the EZ-IO catheter luer lock.
12. Use 5 mL normal saline to flush EZ-IO catheter luer lock; attach the luer lock to the needle
13. Pull back on the syringe to aspirate blood, and then flush with 5 mL of normal saline.
14. If the route is patent, connect it to the drip set tubing.
15. Attach a pressure infuser.
16. Secure the site and attach the wrist label to the patient’s hand.
4.18.5 Intravenous Cannulation

1. Locate a suitable venipuncture site. The back of the hand, forearm, and antecubital fossa are preferred sites. The external jugular vein is acceptable if no other suitable site can be found.

2. Place a constricting band to halt venous return without obstructing arterial flow. Leave one end of the slip knot exposed to assure rapid release when the procedure is complete.

3. Inspect the catheter to be sure that the catheter hub and primary push-off tab are fully seated to the needle housing assembly.

4. Locate a suitable vein. Palpate one that is well fixed (not rolling) and that does not have valves (firm nubs of tissue) proximal to the intended site of entry.

5. Cleanse the venipuncture site. Employ alcohol or Betadine in an expanding circular pattern, using a firm pressure.

6. Anchor the vein with gentle skin traction.

7. Hold the needle bevel up and insert catheter at a 30- to 45-degree angle until you feel the needle pop into the vein. Flashback of blood should be observed in the catheter/chamber.

8. At this point, the metal stylet is in the vein, but the catheter is not. Advance the cannula approximately 0.5 cm farther. Holding the metal stylet stationary, slide the catheter over the needle into the vein. Place a finger over the vein at the catheter tip and tamponade the vein to prevent blood from flowing out of the catheter.

9. Remove the tourniquet. Do not reinsert the needle into the catheter at any time.

10. Secure a luer device to the catheter by following the manufacturer’s instructions for that device.

11. Secure the catheter with tape or a commercial device.

12. Dispose of the needle in a secure sharps container.

Troubleshooting a Nonflowing IV

- Has the constricting band been removed? This is the most common cause.
- Is there swelling at the cannulation site? This indicates infiltration into the tissues.
- Are the tubing control valves open?
- Does the cannula need to be repositioned because it is up against a valve or wall of the vein? You may have to remove the securing device to check for this condition.
- Is the IV bag hung high enough?
- Is the drip bag completely filled with solution? If it is, turn bag upside down and squeeze the drip chamber to return some of the fluid to the bag.
- Lower the bag below the level of the insertion site. If blood return is seen in the IV site, the site is patent.
- If problems persist, remove the IV and reestablish it at another site.
4.18.6 Medication Administration - Nebulizer

4.18.6 Nebulizer

1. Prepare the equipment for appropriate application:
   - Mask application: mask, mist chamber, oxygen supply tubing, and cylinder.
   - Self-administration application: mouthpiece, mist chamber, oxygen supply tubing, and cylinder.
2. Add medication to the nebulizer mist chamber. Make sure the nebulizer mist chamber cap is tightly secured.
3. Gently swirl the nebulizer to mix the contents.
4. Attach the mouthpiece or mask.
5. Connect the nebulizer to the oxygen tubing and oxygen cylinder.
6. Set the flow:
   - Adult: 6-8 L/min
   - Pediatric: 6 L/min
7. The patient should breathe as calmly, deeply, and evenly as possible until no more mist is formed in the nebulizer chamber (5-15 minutes).
4.19 Morgan Lens

Morgan Lens Insertion
1. Remove the patient’s contact lenses, if present.
2. Instill topical local anesthetic (tetracaine HCl 0.5% eye drops) to the affected eye(s).
3. Attach the Morgan lens to IV tubing or Morgan lens delivery set.
4. Prime the tubing and lens with irrigation solution.
5. Have the patient look down; insert the Morgan lens under the upper lid.
6. Have the patient look up; retract the lower lid to drop the lens in place.
7. Release the lower lid over the lens.
8. Adjust the flow to the desired rate.
9. Tape the tubing to the patient’s forehead to prevent accidental lens removal.
10. Absorb any outflow with towels.

Removal of Morgan Lens
1. Have the patient look up; retract the lower lid behind the interior border of the lens.
2. Hold this position.
3. Have the patient look down; retract the upper lid and slide the lens out.
4.20 Nitrous Oxide - Nitronox

1. Prepare the equipment. Nitronox units consist of a nitrous oxide cylinder, a blending regulator, an oxygen cylinder, and a mask.
2. Contraindications: altered state of consciousness, COPD, acute pulmonary edema, pneumothorax, decompression sickness, air embolus, pregnancy (except during delivery), abdominal pain with distention or suspicion of obstruction, and inability to self-administer the medication.
3. Turn the oxygen and nitrous oxide cylinder valves to the “on” position. Make sure the device shows appropriate blending of the gases.
4. Attach a mask to the Nitronox unit regulator and provide it to the patient for self-administration. The patient must be able to self-administer the medication; if he/she cannot, Nitronox cannot be used.
5. Monitor the patient’s vital signs and pulse oximeter. If the patient’s vital signs become unstable or the patient becomes symptomatic from the side effects, discontinue Nitronox.
4.21 Pediatric Length-Based Emergency Tape: Broselow or Handtevy

The pediatric length-based emergency tape is designed to be used as a quick reference for drug dosages and equipment sizing for pediatric patients. The tape is calibrated in different zones according to different lengths. The zone that corresponds to the patient’s length is used. If the pediatric length-based emergency bag/box is also used, the zone on the tape can be matched with the zone on the pouch that contains the appropriately sized equipment.

1. Place the patient in a supine position.
2. Remove the tape and unfold it.
3. Place the tape next to the patient, ensuring that the multicolored side faces up.
4. Place the red end of the tape even with the top of the patient’s head.
5. Place the edge of one hand on the red end of the tape.
6. Starting from the patient’s head, run the edge of your free hand down the tape.
7. Stop your hand even with the heel of the patient’s foot. If the patient is larger than the tape, stop here and use the appropriate adult technique.
8. Verbalize the zone on the tape (color and/or age) where your free hand has stopped. If the patient falls on the line, go to the next higher section.
9. Use the medication doses which correspond to the zone selected.
10. Use the corresponding zone (color and/or age) to determine appropriate equipment sizes.
4.22 Pulse Oximeter

Pulse oximeters are used for the detection of hypoxemia in arterial oxyhemoglobin. Peripheral oxygen is obtained by placing a sensor probe on the peripheral capillary bed.

1. Attach the appropriate sensor to the patient’s finger or toe. Remove any nail polish.
2. Turn on the pulse oximeter unit.
3. Evaluate the results:
   - Normal range: oxygen saturation of 92-100%
   - Mild distress: oxygen saturation of 90-92%
   - Moderate distress: oxygen saturation of 80-89%
   - Severe distress: oxygen saturation of less than 80%
4. Oxygenate the patient with the appropriate delivery device based on the reading and the patient’s condition.
5. Evaluate the patient for possibly false high readings:
   - Carbon monoxide poisoning: Elevated carboxyhemoglobin can falsely elevate saturation readings because carboxyhemoglobin modulates light similar to oxyhemoglobin as it passes through the tissue.
   - Trauma: Despite a normal saturation level, severe hemorrhage can cause the patient to not have enough blood to perfuse the organs, so that the patient is hypoxic.
6. Evaluate the patient for possibly false low readings:
   - Deeply pigmented patients: may diminish light transmission.
   - Nail polish or fake nails: may diminish light transmission.
   - Patient movement: may cause the pulse oximeter to not register.
   - Low blood flow states: may cause the pulse oximeter to not register.
7. Continuously monitor and document readings.
4.23.1 Pediatric Restraint System— Pedi-Mate®

**Description** - The Pedi-Mate® is designed to secure infants and toddlers from 10 to 40 lbs (4.5 to 18.1 kg) on a stretcher. The Pedi-Mate® is designed for use only in an emergency setting and only by suitably trained personnel. Where child restraint is needed outside of this setting, the transport applicable local standards and regulations, including but not limited to, the United States Federal Motor Vehicle Safety Standards and Regulations. The Pedi-Mate® is not designed as an immobilization device and should not be used to immobilize the patient, or as part of an immobilization system.

**Positioning the Pedi-Mate®**
1. Remove any restraints attached to the cot.
2. Raise the cot backrest and lock in place at an angle between 15 and 45 degrees. This will keep the patient’s shoulders higher than the pelvis and maintain the proper center of gravity.
3. Unroll the Pedi-Mate® mattress with all straps extended.
4. Center the blanket left to right on the mattress.
5. Position the blanket with the black backrest strap at the point where you expect the patient’s shoulders to rest.
6. Using the Pedi-Mate®
7. Run the ends of the backrest strap around the cot backrest until they meet in the back, then fasten the buckle. Leave some slack in the strap for

**Securing the Pedi-Mate® to the stretcher**
1. Place the patient on the Pedi-Mate®. If the black backrest strap is not at the patient’s shoulder level, adjust the blanket position.
2. With the blanket properly positioned, tighten the strap until the mattress is compressed.
3. Fasten a main frame strap by threading the free end downward between the cot main frame and the mattress next to the head--end sidearm casting.
4. Wrap the strap up around the cot main frame and fasten the buckle. Leave a little slack in the strap for final adjustment.
5. Repeat with the other main--frame strap.
6. Tighten each main frame strap by holding onto the buckle with one hand and pulling firmly on the free end of the strap.

**Note:** To loosen a main--frame strap, unfasten it, then grasp the buckle tang, and pull outward. Refasten the buckle.

**Securing the Pedi-Mate® to the stretcher**
1. Place the patient on the Pedi-Mate®. If the black backrest strap is not at the patient’s shoulder level, adjust the blanket position.
2. With the blanket properly positioned, tighten the strap until the mattress is compressed.
3. Fasten a main frame strap by threading the free end downward between the cot main frame and the mattress next to the head--end sidearm casting.
4. Wrap the strap up around the cot main frame and fasten the buckle. Leave a little slack in the strap for final adjustment.
5. Repeat with the other main--frame strap.
6. Tighten each main frame strap by holding onto the buckle with one hand and pulling firmly on the free end of the strap.
4.23.1 Pediatric Restraint System– Pedi-Mate®

Securing the Patient
1. Pull the crotch strap buckle up between the patient's legs and lay the strap on the patient's abdomen.
2. Lift a shoulder strap over one shoulder of the patient. Place patient's arm through the strap, then lock the buckle half into the central buckle.
3. Repeat with the other shoulder strap.
4. Thread the shoulder strap on the patient's left side through the chest clip and slide the chest clip to armpit level.
5. To snug the shoulder/torso straps, refer to Figure 6 and use the following procedure:
   - Snug the shoulder strap against the shoulder and chest by pulling the end of the strap of the strap with one hand while steadying the central buckle with the other hand.
   - Repeat with the other shoulder strap.
   - Snug the torso strap by pulling on the end of the strap with one hand while steadying the central buckle with the other hand.
   - Repeat with the other torso strap.
6. Snug the crotch strap by pulling on the free end.

Disinfecting the Pedi-Mate®
Wipe or spray disinfectant on all Pedi-Mate® and surfaces and straps. Follow the disinfectant manufacturer's directions for application and contact time.

Cleaning the Pedi-Mate®
Hand wash the Pedi-Mate® blanket and straps with warm, soapy water and a clean cloth or soft brush. Rinse with clear water. Dry the blanket with a towel and allow the straps to air dry. Do not immerse the buckles in water.
4.23.2 Physical Restraints

A restraint is defined as any mechanism that physically restricts a person’s freedom of movement, physical activity, or normal access to his/her body. Restraints should be used only as a last resort because they have the potential to produce serious consequences, such as physical and psychological harm, loss of dignity, violation of the individual’s rights, and even death. Justification for the restraints must be noted in the EMS Run Report.

Restraints should be used only when attempts at pharmacological, verbal, and family intervention have been deemed ineffective and when the patient is:

- Attempting to inflict intentional harm on self or others.
- Attempting to inflict bodily harm on EMS personnel.

Only a commercial soft restraint system should be used.

1. The patient should be placed supine on a long spine board (or backboard). Never place a patient in the prone position.
   - Use of a long spine board provides the flexibility to easily move the patient should he/she vomit.
   - It also provides a safe means of transfer from the stretcher to the bed.
2. Wrap the cuff pad around each limb.
   - Do not cinch the strap tight. You should be able to insert one finger between the limb and the device.
   - Ensure that the device is properly applied per the manufacturer’s instructions, as some products can constrict circulation when improperly installed.
3. Secure one of the patient’s arms on the upper part of the long spine board and the other arm on the lower part of the long spine board.
4. Secure the patient’s ankles to the lower portion of the long spine board.
5. Secure the strap to the long spine board with a quick-release tie.
6. Check for and correct any circulatory, respiratory, or neurological compromise caused by the restraint.
7. Document the time when the restraint is applied.
8. Utilize the strapping mechanisms of the long spine board to provide additional security and support for the patient with moving.
9. Continuously monitor the patient for the following issues:
   - Tightening of the strap around the limb.
   - Changes in mental status.
   - Changes in vital signs.
   - Changes in pulse oximetry.
   - ECG changes.
   - Changes in respiratory effort (positional asphyxia).
   - Vomiting.
   - Signs of circulatory and/or neurological compromise at the site of the restraint.
10. Immediately address any changes in patient status.
11. Document the duration of the restraint.
4.24.1 Spinal Immobilization Restriction – Blunt Trauma

Determining the need for spinal immobilization requires a careful assessment of the patient's:

- **Mechanism of Injury**
- Mental status and ability to recognize the presence of spinal injury symptoms
- Physical complaints and overall condition

The following algorithm (Blunt Trauma) can be used to assist paramedics in making the most appropriate decision about the need for spinal immobilization.

**Blunt Trauma with Concerning Mechanism of Injury**

Concerning Mechanism of Injury is defined as:

- Any mechanism that produces a violent impact on the head, neck, torso or pelvis
- Incidents that produce sudden acceleration or deceleration, including lateral bending forces
- Any fall, especially in the elderly
- Ejection or fall from a moving mode of transportation

Immobilize if any of the following exist:

- **Altered level of consciousness or inability to communicate:**
  - Abnormal GCS
  - Evidence of significant intoxication
  - Dementia
  - Speech or hearing impairment
  - Age (young children)
  - Language barrier

- **Complaints suggestive of spinal injury:**
  - Spinal pain or tenderness, including paraspinal musculature
  - Neurologic deficit or complaint, including paraesthesia, paralysis or weakness
  - Anatomical deformity of the spine

- **Distracting Injuries:**
  - Long bone fractures
  - Joint dislocations
  - Abdominal or thoracic pain, or obvious visceral injury
  - Large lacerations, degloving injuries or crush injuries
  - Serious burns
  - Any injury producing acute functional impairment

**IF IN DOUBT, IMMOBILIZE**
4.24.2 Spinal Immobilization Restriction – Penetrating Trauma

Determining the need for spinal immobilization requires a careful assessment of the patient's:
- **Mechanism of Injury**
- **Mental status and ability to recognize the presence of spinal injury symptoms**
- **Physical complaints and overall condition**

The following algorithm (Penetrating Trauma) can be used to assist paramedics in making the most appropriate decision about the need for spinal Immobilization.

**Penetrating Trauma**

**Immobilize if any of the following exist:**
- Altered level of consciousness
- *Any neurological deficits* or complaints
  - Test motor function in both upper and lower extremities (entire extremity)
  - Test sensation in both upper and lower extremities (start proximal and work towards hands and feet)
  - Ask about numbness or tingling in extremities

*Examples are numbness, focal weakness, focal sensory deficit, paraesthesias. Identifying the presence of neurological signs and symptoms requires careful assessment and history taking.*

**IF IN DOUBT, IMMobilize**

Spinal precautions can be maintained by application of a cervical collar and securing patient firmly to the stretcher *without* a long backboard if all 4 of these criteria are met:
1. Patient is ambulatory at the scene
2. Patient does not demonstrate an altered level of consciousness or inability to communicate
3. Patient does not have complaints suggestive of spinal injury
4. Patient does not have distracting injuries

**Spinal Motion Restriction all patients with the following conditions:**
- High voltage electrical injuries (does not include Taser use)
- Shallow water drowning or diving injuries

If spinal immobilization is indicated but refused by the patient:
- Advise the patient of the indication for immobilization, and the risks of refusing the intervention
- If the patient allows, apply the cervical collar even if backboard is refused
- Maintain spinal alignment as best as can be achieved during transport
- Clearly document refusal of immobilization

If spinal immobilization is indicated but the patient cannot tolerate supine position:
- Apply all elements of spinal immobilization that the patient will tolerate
- Maintain spinal alignment as best as can be achieved during transport
- Clearly document the clinical condition that interfered with full immobilization
4.24.3 Horizontal Spinal Immobilization

1. Manually immobilize the head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.

2. Contraindications to placement in an in-line position:
   - Neck muscle spasm that prohibits neutral alignment.
   - Increased pain.
   - Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
   - Compromise of the airway or ventilation.
   - If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.

3. Size and apply a cervical collar according to the manufacturer’s recommendations.

4. While maintaining manual stabilization with a cervical collar in place:
   - Log-roll the patient.
   - Position the backboard next to the patient so that the head of the backboard is approximately 1-2 feet above the patient’s head.
   - Roll the patient onto the backboard in a supine position.
   - Reposition the patient to center him/her on the backboard, by sliding patient in an upward motion (axial) on the board. Do not slide the patient in a direct lateral position, as this may manipulate the spine.

5. Secure the patient’s body to the board with straps:
   - Immobilize the upper torso to prevent upward sliding of patient’s body during movement and transportation. This is accomplished by bringing the straps over the shoulders and across the chest to make an X.
   - Additional straps must be placed to prevent side-to-side movement of the body on the board. This can be accomplished by placing the straps across the iliac crests and mid-to-distal thigh or at the pelvis with groin loops.
   - Arms should be placed at the patient’s side to prevent movement of the shoulder girdle.

6. Secure the patient’s head with a cervical immobilization device:
   - Commercially available cervical immobilization device: Follow the manufacturer’s recommendation.
   - Towel rolls applied to each side of the head: Secure the towels by placing 1- or 2-inch tape directly across the patient’s forehead to the underpart of the backboard. Also secure the towels with tape across the surface of the semi-rigid cervical collar to the underpart of the backboard. Do not apply tape directly under the patient’s chin, as this may create an airway obstruction.

7. Pad the space, as needed, between the back of the patient’s head and the backboard to prevent hyperextension of the cervical vertebrae.
4.24.4 Pediatric Spinal Immobilization

1. Manually immobilize the patient’s head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.

2. Contraindications to placement in an in-line position:
   - Neck muscle spasm that prohibits neutral alignment.
   - Increased pain.
   - Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
   - Compromise of the airway or ventilation.
   - If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.

3. Size and apply a cervical collar according to the manufacturer’s recommendations.

4. While maintaining manual stabilization with a cervical collar in place:
   - Log-roll the patient.
   - Position the pediatric immobilizer next to the patient so that the head of the immobilizer is approximately 6-12 inches above the patient’s head.
   - Roll the patient onto the backboard in a supine position.
   - Reposition the patient to center him/her on the immobilizer, by sliding the patient in an upward motion (axial) on the immobilizer.
   - Do not slide the patient in a direct lateral position, as this may manipulate the spine.

5. Secure the patient’s body to the board with straps.
   - Pediatric immobilizers with integrated strapping design: Secure them according to the manufacturer’s recommendation.
   - or
   - Immobilize the upper torso to prevent upward sliding of the patient’s body during movement and transportation. This is accomplished by bringing the straps over the shoulders and across the chest to make an X.
   - Additional straps must be placed to prevent side-to-side movement of the body on the board. This can be accomplished by placing the straps across the iliac crests and mid-to-distal thigh or at the pelvis with groin loops.

6. If the patient is so small that there is a space left between straps and sides of patient, take up space with pads (e.g., blanket, towel).

7. The patient’s arms should be placed at his/her side to prevent movement of the shoulder girdle.

8. Secure the patient’s head with a cervical immobilization device.
   - Commercially available cervical immobilization device: Follow manufacturer’s recommendation
   - or
   - Towel rolls applied to each side of the head: Secure the towels by placing 1- or 2-inch tape directly across the patient’s forehead to the underpart of the backboard. Also secure the towels with tape across the surface of the semi-rigid cervical collar to the underpart of the backboard. Do not apply tape directly under the patient’s chin, as this may create an airway obstruction.

9. Pad the space, as needed, between the back of the patient’s head and the backboard to prevent hyperextension of the cervical vertebrae.
4.24.6 Vest-Type Extrication Device (KED)

1. Manually immobilize the patient’s head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.

2. Contraindications to placement in an in-line position:
   - Neck muscle spasm that prohibits neutral alignment.
   - Increased pain.
   - Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
   - Compromise of the airway or ventilation.
   - If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.

3. Size and apply a cervical collar according to the manufacturer’s recommendations.

4. Insert the device behind the patient. Try to limit the patient’s movement while you are positioning the device.

5. Position the device so that it fits securely under the axilla of the patient. Open the side flaps and place them around the patient’s torso. Make sure the device is centered on the patient.

6. Position, connect, and adjust the torso straps. Leave the uppermost strap loose until the patient’s head is immobilized.

7. Position and fasten each groin loop. Adjust one side at a time to prevent excess movement of the patient.

8. Place the pad behind the patient’s head, filling the void to prevent hyperextension.

9. Position the head flaps. Fasten the forehead strap and apply the chin strap over the cervical collar.
4.25.1 Air Splint
1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity.
   ● Do not align a joint injury if resistance is met. Use another device instead.
4. Place your arm through the splint and grasp the patient’s hand or foot.
5. Apply gentle traction while sliding the splint into position.
6. Inflate the splint to a point that a slight dent can be made into the plastic when pressed with a finger.
7. Reevaluate the patient’s distal pulse, motor function, and sensory function.

4.25.2 Hare Traction Splint
1. Expose the injured area.
2. Apply manual traction of the affected leg.
3. Check the patient’s distal pulse, motor function, and sensory function.
4. Place the splint next to the uninjured leg. Adjust it to the proper length, from the top of the patient's pelvis to a few inches past the ankle.
5. Attach the ankle hitch about the foot and ankle.
6. Manually apply gentle in-line traction to the ankle hitch.
7. Slide the splint into position under the injured leg.
8. Place the ischial pad against the iliac crest.
9. Fasten the ischial strap.
10. Connect the loops of the ankle hitch to the end of the splint.
11. Tighten the ratchet and release the manual traction. Continue to pull until the patient has relief of pain and muscle spasms.
12. Secure the splint with straps.
13. Reevaluate the patient’s distal pulse, motor function, and sensory function.

4.25.3 Rigid Splinting
1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity. Do not align a joint injury if resistance is met.
4. Acquire the appropriate-length wood planks. Provide padding to ensure even contact with the splint.
5. Place the wood on each side of the injury.
6. Secure the extremity to the rigid splint with tape, cling, or Ace wraps.
   ● Long bone injury: Immobilize the joint above and joint below the injury.
   ● Joint injury: Immobilize the bone above and bone below the injury.
7. Reevaluate the patient’s distal pulse, motor function, and sensory function.
4.25.4 Sager Traction Splint
1. Expose the injured area.
2. Apply manual traction to the affected leg.
3. Check the patient’s distal pulse, motor function, and sensory function.
4. Position the Sager traction splint between the patient’s legs.
5. Adjust the splint to a distance slightly past the patient’s ankle.
6. Apply the abductor bridle (thigh strap) around the upper thigh of the fractured limb.
7. Push the ischial perineal cushion gently down while pulling the thigh strap snugly.
8. Apply the Malleolar Harness (ankle harness) and attach it to the traction handle.
9. Place one hand on the padded shaft and the other hand on the traction handle while gently extending splint.
10. Pull the traction handle and release the manual traction. Continue to pull until one of the following conditions is met:
    - Maximum of 7 kg (15 lb) for one femur fracture.
    - Maximum of 14 kg for bilateral femur fractures.
    - Patient has relief of pain and muscle spasms.
11. Secure the splint with large elastic leg cravats.
12. Reevaluate the patient’s distal pulse, motor function, and sensory function.

4.25.5 Vacuum Splint
1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity. Do not align a joint injury if resistance is met.
4. Wrap and secure the vacuum splint around the extremity.
5. Draw the air out of the splint.
6. Reevaluate the patient’s distal pulse, motor function, and sensory function.
The degree of stimulation of the vagus nerve affects the heart rate. The greater the degree of vagal stimulation, the more the vagus nerve will slow the heart rate, thereby inhibiting the SA node.

### 4.26.1 Ice Water Immersion of the Face (Vagal Maneuvers)
1. Attach the patient to an ECG for continuous monitoring.
2. Establish intravenous access.
3. Determine that patient is conscious and cooperative.
4. Note that this procedure is contraindicated for patients with history of acute coronary syndrome, hypertension, and heart transplant.
5. Document the ECG and any dysrhythmia.
6. Describe the procedure to the patient.
   - Fill a large basin or sink with ice water. It must be very cold.
   - Ask the patient to hold his/her breath and put the entire face into the water for several seconds.
   - OR
     - Fill a large latex exam glove with ice water.
     - Place the glove on the patient’s face for several seconds.
6. Continue to monitor the heart rhythm during the procedure. Stop the procedure if:
   - The patient becomes confused.
   - The heart rate drops below 100 BPM.
   - Asystole occurs.

### 4.26.2 Valsalva Maneuver (Vagal Maneuvers)
1. Attach the patient to an ECG for continuous monitoring.
2. Establish intravenous access.
3. Determine that the patient is conscious and cooperative.
4. Document the ECG and any dysrhythmia.
5. Describe the procedure to the patient.
   - Have the patient inhale and hold his/her breath.
   - Bear down as if to have a bowel movement.
   - Hold for 20-30 seconds.
   - Try to turn the face red.
   - OR
     - Have the patient blow forcefully through a straw or IV catheter for as long as possible.
6. Continue to monitor the heart rhythm during the procedure. Stop the procedure if:
   - The patient becomes confused.
   - The heart rate drops below 100 BPM.
   - Asystole occurs.
4.27.1 Wound Care – Hemostatic Dressing

Indications
- Wounds involving the scalp, face, neck, axilla, groin or buttocks.
- Severe wounds that cannot be controlled by other means (direct pressure/tourniquet).
- Junctional hemorrhage

Contraindications
- Avoid contact with eye injuries
- Vaginal bleeding
- Internal bleeding
- Open abdominal or chest wounds

Procedure
1. Provide supportive care.
2. Apply direct pressure to wound or proximal pressure point (axillary junction or medical groin).
3. If extremity wound and a trauma tourniquet is indicated, apply tourniquet.
4. If direct pressure is insufficient, apply hemostatic dressing; maintain direct pressure when using hemostatic dressing.
5. Open the hemostatic dressing package and remove dressing.
6. Remove clothing around wound. Remove excess pooled blood from wound with gauze.
   a. Preserve any clots already in the wound to aid in the clotting process.
   b. When the source of the bleeding is located, pack the wound tightly and directly onto the wound with the hemostatic dressing.
   c. Use as much of the dressing as needed to stop the blood flow. The remainder of the dressing can be used to cover the top of the wound.
7. Quickly apply pressure until the bleeding stops. Estimated time 3-5 minutes of continuous pressure.
8. Leave the hemostatic dressing in place and wrap the area with kling or ace bandage to secure wound and dressing.
9. Do NOT remove the bandage or hemostatic dressing, elevate the injury if needed.
10. Reassess the wound and patient for any changes and document.
11. Transport the patient to the appropriate trauma center.

Note
Hemostatic dressings are NOT appropriate for minor bleeding, bleeding that can be controlled by direct pressure, or bleeding that can be controlled by the application of a trauma tourniquet.
4.27.2 Wound Care

4.27.2 Wound Care – Trauma Tourniquet (Combat-Application Tourniquet® C-A-T)

Indications for tourniquet use: to stop bleeding when;
- Life-threatening extremity hemorrhage that is not controlled by direct pressure or immediately obvious that direct pressure alone will not provide control.
- Traumatic amputation has occurred
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

Contraindications
- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical.

Procedure – Upper extremities/arms
1. Provide supportive care.
2. Apply direct pressure (with hand or knee) to wound or proximal pressure point (axillary junction)
3. Expose the extremity by removing clothing in proximity to the wound
4. Place tourniquet over the extremity proximal to the wound over exposed skin.
5. Route the self-adhering band around the extremity.
6. Pass the band through the outside slit of the buckle
7. Pull the self-adhering band tight and secure the band back on itself with the velcro adhesive strap.
8. Twist the windless rod until the bleeding has stopped.
9. Lock the rod in place with the windlass clip.
10. Secure the rod with the strap by pulling it tight and adhering it to the opposite hook on the windlass hook
11. Record the date/time of application on the tourniquet.
12. Reassess the wound and patient for any changes and document.
13. When time and the tactical situation permit, a distal pulse check should be accomplished. If a distal pulse is still present, consider additional tightening of the tourniquet or the use of a second tourniquet, side by side and proximal to the first, to eliminate the distal pulse.
14. Transport the patient to the appropriate trauma center.

Procedure – Lower Extremities – Legs
1. Provide supportive care.
2. Apply direct pressure (with hand or knee) to wound or proximal pressure point (medial groin)
3. Expose the extremity by removing clothing in proximity to the wound
4. Place tourniquet over the extremity proximal to the wound high in the groin/thigh over exposed skin.
5. Route the self-adhering band around the extremity. Pass the band through the inside/double friction bracket slit of the buckle. Double friction bracket use must be used for lower extremities.
6. Pull the self-adhering band tight and secure the band back on itself with the velcro adhesive strap.
7. Twist the windless rod until the bleeding has stopped.
8. Lock the rod in place with the windlass clip.
9. Secure the rod with the strap by pulling it tight and adhering it to the opposite hook on the windlass hook.
10. Record the date/time of application on the tourniquet.
11. Reassess the wound and patient for any changes and document.
12. When time and the tactical situation permit, a distal pulse check should be accomplished. If a distal pulse is still present, consider additional tightening of the tourniquet or the use of a second tourniquet, side by side and proximal to the first, to eliminate the distal pulse.
13. Transport the patient to the appropriate trauma center.

**Note**
If one tourniquet correctly applied does not completely control hemorrhage, in addition to direct pressure, an additional tourniquet may be applied just proximal to the first tourniquet. Once bleeding has been controlled by a tourniquet, leave the tourniquet in place throughout the remainder of scene care and transport.
4.27.2     Wound Care – Trauma Tourniquet (Combat-Application Tourniquet® C-A-T)

**Combat Application Tourniquet™**

**Instructions For Use**

Easy One-Handed Operation Occludes Blood Flow In 5 Quick Steps

1. **Insert the Wounded Extremity**
   Through the loop of the Self-Adhering Band

2. **Pull the Self-Adhering Band Tight**
   And securely fasten the band back on itself

3. **Adhere the Band Around the Arm**
   Do not adhere the band past the Windlass Clip™

4. **Twist the Windlass Rod™ Until bright red bleeding has stopped**

5. **Lock the Rod With the Windlass Clip™**
   **Bleeding is controlled**

6. **Adhere the Band Over the Rod**
   For small extremities, continue adhering the band around the extremity and over the Windlass Rod™

7. **Secure the Rod and Band With the Strap**

   Adhering it to the opposite hook on the Windlass Clip™

   **The C-A-T™ is ready for transport**

For added security and **always before moving a patient**, secure the Windlass Rod™ with the Windlass Strap™. For small extremities, also secure the Self-Adhering Band under the Windlass Strap™.
**4.27.2 Wound Care – Hemorrhage Control IT Clamp**

**Hemorrhage Control IT Clamp**

**Indications:** Provides temporary control of severe bleeding in the scalp, extremities, axilla, and inguinal areas

**Contraindications:** Not for use where skin approximation cannot be obtained (i.e. Large skin defects under high tension)

**Warnings and Precautions:**

- This device is intended for temporary use only; not to exceed three hours.
- Patients must be seen by medical personnel for device removal and surgical wound repair
- Use device as directed to avoid needle stick injury.
- Do not use where delicate structures are within 10 mm of the skin surface (ex. Orbits of the eye).
- This device will not control hemorrhage in non-compressible sites, such as the abdominal and/or chest cavities.
- Ensure proper PPE is utilized to protect against possible splashing of blood during application.
- The device is designed for single use. Do not use if sterility seal on package has been broken or otherwise damaged.
- Dispose of the device as you would sharps.
- For extreme extremity injuries not amenable to clamp application consider tourniquet application per protocol.

**Procedure:** (if patient is conscious, explain procedure)

- Apply appropriate PPE
- Open sterile package by pulling forward on outer tabs
- Remove device from package by lifting up. Take care not to close device until it has been applied to the wound.
  - If the device has been accidentally closed, push the side buttons inward with one hand and pull the device open using the device arms.
- Locate wound edges
- Align the device parallel to the length of the wound edge. Position the needles approx. 1-2 cm from the wound edge on either side.

(For very large wounds the device can be applied to one side, then pulled to the other side, or the tissue can be approximated by hand and the device applied.)
4.27.2 Wound Care – Hemorrhage Control IT Clamp (continued)

- Press the arms of the device together to close the device. The device’s safety seal will break with pressure.
- Ensure the entire wound is sealed and bleeding stops, using a gauze pad to wipe the area to verify no leaking of blood from the wound.

More than one device may be required for large wounds.

- If bleeding continues:
  - Ensure the device is in the correct position, close the device more firmly by applying further pressure to the arms of the device
  - If wound is too large apply additional devices to the open section
  - If device is applied incorrectly or not positioned properly remove the device according to the instructions and reapply.

Removal:

Unless you need to reposition the device all removal should be done in a medical facility prepared to manage the wound.

- Hold the device by the gripping bars, press the device further closed to release the lock
- While maintaining pressure on the arms, press both release buttons with your other hand.
- While pressing the release buttons, pull one of the gripping bars open and rotate the needles from the wound, one side at a time.
- Pick up the device ONLY by the buttons to prevent accidental contact with the needles
- Dispose of the device in accordance with local guidelines for sharps.

Notes: If desired wound packing and/or the use of a hemostatic agent may be applied. The hemostatic agent does not need to be removed prior to application of the clamp.
Florida Regional Common
EMS Protocols

Section 5

Drug Section

May 31st, 2017
# Drug Summary Section Table of Contents

1. **Adenosine Triphosphate (Adenocard®)**
2. **Albuterol (Proventil®, Ventolin®)**
3. **Amiodarone Hydrochloride (Cordarone®)**
4. **Aspirin**
5. **Atropine**
   - 5.6.1 Atropine Sulfate as Cardiac Agent
   - 5.6.2 Atropine Sulfate as Antidote for Poisonings
6. **Atropine Sulfate as Cardiac Agent**
7. **Atropine Sulfate as Antidote for Poisonings**
8. **Calcium Chloride 10%**
9. **Calcium Gluconate**
10. **Dextrose (Glucose)**
11. **Diazepam Hydrochloride (Valium®)**
12. **Diltiazem Hydrochloride (Cardizem®)**
13. **Diphenhydramine Hydrochloride (Benadryl®)**
14. **Dopamine Hydrochloride (Intropin®)**
15. **Epinephrine**
   - 5.14.1 Epinephrine 1:1000
   - 5.14.2 Epinephrine 1:10,000
16. **Fentanyl**
17. **Glucagon**
18. **Haloperidol (Haldol®)**
19. **Hydroxocobalamin (Cyanokit®)**
20. **Ipratropium Bromide (Atrovent®)**
21. **Ketamine hydrochloride**
22. **Lorazepam (Ativan®)**
23. **Magnesium Sulfate**
24. **Methylene Blue**
25. **Methylprednisolone Sodium Succinate (Solu-Medrol ®)**
26. **Midazolam (Versed®)**
27. **Morphine Sulfate (MS)**
28. **Naloxone Hydrochloride (Narcan®)**
29. **Nitroglycerin (Nitrostat®, Nitrolingual® Spray)**
30. **Nitrous Oxide 50% Blended in Oxygen (Nitronox®)**
31. **Pralidoxime (2-PAM®, Protopam Chloride®)**
32. **Sodium Bicarbonate 8.4% and 4.2%**
33. **Sodium Bicarbonate 8.4% and 4.2%**
34. **Sodium Thiosulfate**
35. **Succinylcholine Chloride (Anectine®)**
36. **Tetracaine Hydrochloride 0.5% Eye Drops**
37. **Vecuronium Bromide (Norcuron®)**
38. **Zofran (Ondansetron Hydrochloride)**
5.1 Adenosine Triphosphate (Adenocard®)

**ACTIONS**
Adenosine exerts its effects by decreasing conduction through the AV mode. The half-life of Adenocard (adenosine) is less than 10 seconds. Thus its effects - both desired and undesired - are self-limited.

**INDICATIONS**
Adenocard is indicated for supraventricular tachycardia (SVT), including that associated with accessory bypass tracts (Wolff-Parkinson-White syndrome). When clinically advisable, appropriate vagal maneuvers should be attempted prior to Adenocard administration.

**CONTRAINDICATIONS**
Adenocard is contraindicated in second- or third-degree AV block and sick sinus syndrome (except in patients with a functioning artificial pacemaker), and known hypersensitivity to adenosine.

**PRECAUTIONS**
The effects of adenosine are antagonized by methylxanthines such as caffeine and theophylline. Thus larger doses may be required for adenosine to be effective in patients who have taken methylxanthines.

Adenosine effects are potentiated by dipyridamole (Persantine™). Thus smaller doses of adenosine may be effective in those who have taken this drug. Adenosine may produce bronchoconstriction in patients with asthma.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Cardiovascular: Facial flushing, headache, and rarely: sweating, palpitations, chest pain, and hypotension.
- Respiratory: Shortness of breath, chest pressure, and rarely: hyperventilating metallic taste, tightness in throat, and head pressure.
- CNS: Light headedness and rarely: dizziness, blurred vision, tingling and numbness in extremities, apprehension.

**WARNINGS**
Adenocard may produce a short-lasting first-, second-, or third-degree heart block. In extreme cases, transient asystole may result. At the time of conversion to normal sinus rhythm, a variety of new rhythms may appear (PVCs, PACs sinus bradycardia, sinus tachycardia, skipped beats, and varying degrees of AV block), though they generally last only a few seconds without intervention.

**DOSAGE**
**Adult:** 12 mg rapid IVP immediately followed by 20 mL NS flush. If not resolved repeat in 2 minutes at 12 mg IVP, followed by 20 mL NS flush PRN.

**Pediatric:** 0.1 mg/kg (maximum first dose 6 mg) rapid IVP/IO, immediately followed by 6 mL NS flush. If not resolved repeat in 2 minutes at 0.2 mg/kg (maximum dose 12 mg) rapid IVP, IO followed by 10 mL NS flush PRN.

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Florida Regional Common EMS Protocols
5.2 Albuterol Sulfate (Proventil®, Ventolin®)

ACTIONS
Beat agonist relaxes bronchial smooth muscle, resulting in bronchodilation and also relaxes vascular and uterine smooth muscle, decreases airway resistance. Onset of actions between 5-15 minutes with a peak effect of 3-4 hours.

INDICATIONS
Indicated for relief of bronchospasm in patients with reversible obstructive airway disease, including asthma.

CONTRAINDICATIONS
Albuterol is contraindicated in patients with a history of hypersensitivity.

ADVERSE REACTIONS AND SIDE EFFECTS
• Cardiovascular: Tachycardia, hypertension, and angina.
• CNS: Nervousness, tremor, headache, dizziness, and insomnia.
• GI: Drying of oropharynx, nausea, and vomiting, unusual taste.

WARNINGS
Use cautiously in patients with coronary artery disease, hypertension, hyperthyroidism, and diabetes. Administer cautiously to patients on MAO inhibitors or tricyclic antidepressants. Beta blockers and albuterol will inhibit each other.

DOSAGE
If greater than 1 year or greater than 10 kg: Add 2.5 mg of albuterol already mixed in 3 mL of NS (0.083%) to the nebulizer and flow oxygen at 6-8 L/min

If less than 1 year or less than 10 kg: Add 1.25 mg of albuterol already mixed in 1.5 mL of NS (0.083%) to the nebulizer and flow oxygen at 3 L/min.
5.3 Amiodarone Hydrochloride (Cordarone®)

**ACTIONS**
Amiodarone blocks potassium channels, which contributes to slowing of conduction and prolongs cardiac cellular action potential and refractory period. Its vasodilatory action can decrease cardiac workload and consequently myocardial oxygen consumption.

**INDICATIONS**
Amiodarone is indicated for initiation of treatment and prophylaxis of frequently recurring ventricular fibrillation and hemodynamically unstable ventricular tachycardia in patients refractory to other therapy. It may also be used to treat supraventricular tachycardia.

**CONTRAINDICATIONS**
- Known hypersensitivity to amiodarone
- Cardiogenic shock,
- Sinus bradycardia,
- Second or Third Degree AV Block
- Atrial fibrillation with Wolf Parkinson White (WPW)

**PRECAUTIONS**
- Beta blockers, calcium channel blockers, and other antiarrhythmics are additive and can be proarrhythmic when given in combination with Amiodarone due to similar mechanisms of action.
- Amiodarone precipitates at certain concentrations when mixed at a Y-site with sodium bicarbonate, furosemide, and heparin.
- Use with caution in pregnant patients and nursing mothers. Also use with caution with patients allergic to iodine.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Adverse reactions include fever, bradycardia, CHF, cardiac arrest, hypotension, ventricular tachycardia, nausea, and abnormal liver function.

**DOSAGE**
**Adult:** VT with pulse and SVT: 150 mg IV in 50 mL D₅W over 10 minutes. May repeat every 10 minutes PRN.
VF and pulseless VT: 300 mg IV push, if unresolved consider repeat 150 mg IVP

**Pediatric:** VT with a pulse and SVT: 5 mg/kg in 50 mL D₅W IV/IO over 20 minutes. VF and pulseless VT: 5 mg/kg IV/IO push.
5.4 Aspirin

**ACTIONS**
Aspirin is an analgesic, anti-inflammatory, and antipyretic agent, which also appears to inhibit the synthesis and release of prostaglandins. In small doses Aspirin blocks formation of thromboxane A₂ (thromboxane A₂ causes platelets to aggregate and arteries to constrict). Use of aspirin can reduce the overall mortality from acute myocardial infarction.

**INDICATIONS**
Aspirin is indicated in the acute myocardial infarction (AMI) setting to prevent further clotting.

**CONTRAINDICATIONS**
Known allergy to aspirin (e.g., asthma), active GI ulceration or bleeding, hemophilia or other bleeding disorders, during pregnancy, children younger than 2 years of age.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- **GI:** Nausea, vomiting, heartburn, and stomach pain.
- **Otic:** Tinnitus.
- **Hypersensitivity:** Bronchospasm, tightness in chest, angioedema, urticaria, and anaphylaxis.

**DOSAGE**
**Adult:** 162 mg chewable (2 tablets), up to 324 PO for AMI. (High doses may interfere with the benefits of aspirin.)

**Special Notes:** Baby ASA is heat and light sensitive. The odor of acetic acid (vinegar-like smell) indicates degradation of product.
## 5.6.1 Atropine Sulfate as a Cardiac Agent

### ACTIONS
Atropine is an anticholinergic (parasympathetic blocker, parasympatholytic) agent that reduces vagal tone, thereby increasing SA node automaticity and AV conduction.

### INDICATIONS
- Symptomatic bradycardia (sinus, junctional, and AV blocks causing significant hypotension, ventricular ectopy, chest pain, altered level of consciousness, etc.), monitored patient only.
- In infants (< 6 months), bradycardia of less than 80 beats/min should be treated even if BP is normal.

### CONTRAINDICATIONS
- Tachycardia
- Obstructive GI disease, paralytic ileus, intestinal atony of the elderly or debilitated patient, severe ulcerative colitis, or toxic megacolon complicating ulcerative colitis
- Hepatic disease
- Renal disease, obstructive uropathy
- Myasthenia gravis (unless used to treat side effects of acetylcholinesterase inhibitor
- Asthma
- Thyrotoxicosis
- Mobitz type II block and 3rd degree heart block

### ADVERSE REACTIONS AND SIDE EFFECTS
- CNS: Restlessness, agitation, confusion, psychotic reaction, pupil dilation, blurred vision, and headache.
- Cardiovascular: Increased heart rate, may worsen ischemia or increase area of infarction, ventricular fibrillation, ventricular tachycardia, angina, flushing of skin.
- GI: Dry mouth, difficulty swallowing.
- Other: Urinary retention; may worsen preexisting glaucoma.

### WARNINGS
If a too-small dose (< 0.5 mg) is given or if atropine is pushed too slowly, it may initially cause the heart rate to decrease. Antihistamines and antidepressants potentiate the effects of atropine. A maximum dose of 0.04 mg/kg should not be exceeded. For second-degree AV block type II and third-degree AV block, omit atropine and use an external pacer instead.

### DOSAGE
**Adult:** Bradycardia: Atropine 0.5 mg IV/IO; repeat every 3 - 5 minutes, up to a maximum total dose of 3 mg.

**Pediatric:** 0.02 mg/kg IV/IO (minimum dose = 0.1 mg; maximum single dose = 0.5 mg for a child and 1 mg for an adolescent).
### 5.6.2 Atropine for Antidote Poisonings

**ACTIONS** - Atropine is a potent parasympatholytic agent that binds to acetyl choline receptors, thereby diminishing the actions of acetylcholine. Atropine reverses the muscarinic effects of cholinergic poisoning by primarily reversing bronchorrhea and bronchoconstriction.

**INDICATIONS** - Anticholinesterase syndrome poisoning, such as with organophosphates (e.g., Parathion, Malathion, Rid-a-Bug) and carbamate (Baygon, Sevin, and many common roach and ant sprays). Signs of organophosphate poisoning are Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis, Miosis – SLUDGEM - plus pinpoint pupils, bradycardia, and excessive sweating.

**CONTRAINDICATIONS** - None when used in the management of severe organophosphate poisoning.

**ADVERSE REACTIONS AND SIDE EFFECTS** - Victims of organophosphate poisoning require larger doses of atropine in comparison to doses given with cardiac patients. Signs of atropinization are the endpoint of treatment: flushing, pupil dilation, dry mouth, and tachycardia.

**WARNINGS** - It is important that the patient be adequately oxygenated and ventilated prior to using atropine, as atropine may precipitate ventricular fibrillation in a poorly oxygenated patient. Even after atropine is administered, the patient may require intubation and aggressive ventilatory support.

**DOSAGE**

- **Adult**: 0.03 mg/kg IV/IO, repeat q 5-10 minutes until atropinization occurs.
- **Pediatric**: 0.05 mg/kg (max dose 3 mg) IV/IO, repeat q 5-10 minutes until atropinization occurs.

**AtroPen**:

- Atropine is rapidly and well absorbed after intramuscular administration. Atropine disappears rapidly from the blood and is distributed throughout the various body tissues and fluids. Each prefilled auto-injector provides a dose of the antidote atropine in a self-contained unit, specially designed for self or caregiver administration. FOUR STRENGTHS of ATROPEN® are available; they are ATROPEN® 0.25 mg, ATROPEN® 0.5 mg, ATROPEN® 1 mg, and ATROPEN® 2 mg.

- **Adults**: At least 2 to 3 mg parenterally; repeat until signs of atropine intoxication appear.
- **Peds**: AtroPen 2 mg is typically used for adults and patients weighing more than 90 lbs.

The AtroPen auto-injector should be administered as soon as symptoms of organophosphorus or carbamate poisoning appear (e.g., usually tearing, excessive oral secretions, wheezing, muscle fasciculations). More than 1 AtroPen may be required until atropinization is achieved (flushing, mydriasis, tachycardia, dryness of the mouth and nose).
5.7 Calcium Chloride 10%

**ACTIONS**
Calcium chloride increases the force of myocardial contraction; it may either increase or decrease systemic vascular resistance. In normal hearts, calcium’s positive inotropic and vasoconstricting effects produce a predictable rise in systemic arterial pressure.

**INDICATIONS**
Calcium chloride is indicated during resuscitation for the treatment of hypocalcemia and calcium-channel blocker toxicity (e.g., Verapamil or Cardizem overdose) and magnesium sulfate overdose. It also protects the heart from hyperkalemia, which may occur in patients with end-stage renal disease.

**CONTRAINDICATIONS**
Cardiopulmonary arrest not associated with calcium-channel blocker toxicity, hypocalcemia, or hyperkalemia.

**ADVERSE REACTIONS AND SIDE EFFECTS**
If the heart is beating, rapid administration of calcium can produce slowing of the cardiac rate.

**WARNINGS**
Calcium chloride should not be administered in the same infusion with sodium bicarbonate, because calcium will combine with sodium bicarbonate to form an insoluble precipitate (calcium carbonate). Calcium chloride should be given with extreme caution, and in reduced dosage, to persons taking digitalis because it increases ventricular irritability and may precipitate digitalis toxicity.

**DOSAGE**

**Adult:** For hypotension following administration of calcium-channel blockers (e.g., Cardizem, Verapamil): 4 mg/kg IV, slowly. If the patient is taking digitalis, 2 mg/kg IV, slowly. Repeat every 10 minutes PRN.
For calcium-channel blocker overdose and hyperkalemia: 8-16 mg/kg IV, slowly.

**Pediatric:** 5 mg/kg or 0.2 mL/kg IV, slowly, every 10 minutes PRN.
For calcium-channel blocker overdose and hyperkalemia: 20 mg/kg IV, slowly.
**ACTIONS**
Calcium is a basic element that is essential for growth and maintenance of nerve, muscle, and bone tissue. It is necessary for transmission of nerve impulses; contraction of cardiac, smooth, and skeletal muscles; renal function; respirations; and blood clotting. Calcium also plays an important role in the regulation of neurotransmitters, hormones, and amino acid metabolism. Its IV administration improves vascular tone and myocardial contractility in patients in hypocalcemic states. Cardiac output and blood pressure usually increase.

**INDICATIONS**
Used in the treatment of hydrofluoric acid burns and magnesium sulfate overdose. Also indicated in the management of black widow spider bites to relieve muscle spasms.

**CONTRAINDICATIONS**
- Absence of hydrofluoric acid burns or magnesium sulfate overdose
- Digitalis toxicity
- Do not mix with Sodium Bicarbonate

**ADVERSE REACTIONS AND SIDE EFFECTS**
IM administration can cause severe tissue necrosis and tissue sloughing. Calcium gluconate can also induce serious cardiac dysrhythmias.

**DOSAGE**
**Adult:** Burns to eyes: Mix Calcium Gluconate (10%) 50 mL in normal saline 500 mL and wash the eyes with the solution using a Morgan lens.

Burns to skin: Mix Calcium Gluconate (10%) 10 mL into a 2-oz tube of sterile water-based gel lubricant (KY Jelly). Apply the gel to the burned skin area.

Inhalation: Administer Calcium Gluconate (10%) 1 mL mixed with normal saline 3 mL via nebulizer. For severe exposure, administer calcium gluconate (10%) 1-2 g via slow IV over 5 minutes.
**5.9 Dextrose (Glucose)**

**ACTIONS**
Glucose is a monosaccharide that provides calories for metabolic needs, thereby sparing body proteins and preventing loss of electrolytes. It is readily excreted by the kidneys, producing diuresis. Dextrose is a hypertonic solution.

**INDICATIONS**
Hypoglycemia; coma of unknown origin.

**CONTRAINDICATIONS**
- Intracranial or intraspinal hemorrhage
- DTs with dehydration
- Blood glucose level > 60 mg/dL

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Cardiovascular: Thrombosis, sclerosing—if given in a peripheral vein.
- Local: Tissue irritation—if infiltration occurs.
- Other: Acidosis, alkalosis, hyperglycemia, and hypokalemia.

**WARNINGS**
May cause Wernicke-Korsakoff syndrome in acute alcohol intoxication; usually this outcome is prevented by prior administration of thiamine 100 mg IM or IV, Thiamine can be given within 24 hours to treat Wernicke-Korsakoff. Perform a glucose test prior to administering dextrose.

**DOSAGE**

**Adult:** (above 8 years of age) 50 cc of a 50% solution; (25 g) IV.
If conscious, glucose paste/gel may be given orally (15g tube)

**Pediatric:**
If conscious, and above 3 years of age glucose paste/gel may be given orally (15g tube).
If glucose less than 60 mg/dL, administer:
- If 1 month-1 year: D10 5 mL/kg IV/IO (b).
- If 1-8 years: D25 2 mL/kg IV/IO (a).
- If greater than 8 years: D50 1 mL/kg IV/IO (Medical Procedure 4.17, Glucometer) (a).
- If unable to obtain IV/IO access provide Glucagon IM as follows: (Medical Procedure 4.18, Medication Administration)
  - Patient less than or equal to 20 kg: 0.5 mg IM
  - Patients greater than 20 kg: 1 mg IM
- Repeat a glucose test with a finger stick. If glucose less than 60 mg/dL, administer dextrose dosing above.

**Newborn:** 5 mL/kg IV of a 10% solution (dilute D50 4:1 with NS).
5.10  Diazepam Hydrochloride (Valium®)

**ACTIONS**
A member of the benzodiazepine family, diazepam depresses the limbic system, thalamus, and hypothalamus, resulting in calming effects. Diazepam produces an amnesic effect and is also a muscle relaxant.

**INDICATIONS**
- Status epilepticus
- Premedication prior to cardioversion
- Agitation due to acute alcohol withdrawal
- Short-term relief of acute anxiety
- Cocaine intoxication
- Severe muscle spasm due to acute back strain

**CONTRAINDICATIONS**
- Acute alcohol intoxication
- Pregnancy (except for control of seizures associated with status epilepticus or eclampsia)
- Neonates

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Confusion, muscular weakness, blurred vision, drowsiness, respiratory depression, respiratory arrest, slurred speech.
- Cardiovascular: Bradycardia, hypotension, and cardiovascular collapse.
- GI: Nausea, vomiting, abdominal discomfort, hiccups.
- Other: Potentiates MAOs, barbiturates, tricyclic antidepressants, and phenothiazines; potentiated by cimetidine, ETOH, and other CNS depressants.

**WARNINGS**
Do not mix diazepam with any other drug, as it precipitates with almost all medications. When injecting the drug via IV, administer it slowly through the IV tubing, as close as possible to the vein insertion. Do not administer diazepam into small veins such as those on dorsum of the hand, as this causes local irritation and possibly venous thrombosis in small veins.

**DOSAGE**
- **Adult**: 5-10 mg IV/IO/IM/IN. The IV route should be administered slowly. May repeat initial dose after 2 minutes if patient still seizing. Maximum total dose 10 mg.
- **Pediatric**: For status epilepticus, 0.1-0.2 mg/kg (maximum dose 10 mg) IV slowly or 0.5 mg/kg (maximum dose 10 mg) PR.
5.11 Diltiazem Hydrochloride (Cardizem®)

**ACTIONS**
Diltiazem inhibits the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle. The therapeutic benefits of diltiazem in supraventricular tachycardias are related to its ability to slow AV nodal conduction time and prolong AV nodal refractoriness. Diltiazem slows ventricular rates and interrupts the reentry circuit in AV nodal reentrant tachycardias and reciprocating tachycardias (e.g., Wolff-Parkinson-White syndrome). It also prolongs the sinus cycle length and decreases peripheral vascular resistance.

**INDICATIONS**
- Atrial fibrillation or atrial flutter with rapid ventricular response.
- Paroxysmal supraventricular tachycardia. Unless contraindicated, vagal maneuvers should be attempted prior to administration of diltiazem.

**CONTRAINDICATIONS**
- Sick sinus syndrome, except in the presence of a functioning ventricular pacemaker.
- Second- or third-degree AV block, except in the presence of a functioning ventricular pacemaker.
- Severe hypotension or cardiogenic shock.
- Demonstrated hypersensitivity to diltiazem.
- Intravenous diltiazem and intravenous beta blockers should not be administered together or in close proximity (within a few hours).
- Wolff-Parkinson-White syndrome or short PR syndrome.
- Ventricular tachycardia.

**PRECAUTIONS**
Diltiazem should be used with caution in patients with impaired liver or renal function. Intravenous diltiazem administered to a patient who is taking oral beta blockers may cause bradycardia, AV block, and/or depression of contractility. Caution should be used when administering diltiazem and anesthetics. Caution should also be used in pregnant females and mothers who are nursing. Use with caution if administered in the presence of CHF.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Hypotension, itching or burning at the injection site, flushing of skin, or junctional rhythm. Other side effects are less frequently encountered (e.g., AV blocks, atrial flutter, chest pain).

**DOSAGE**
*Adult:* 0.25 mg/kg IV/IO every 5 minutes to a maximum does of 0.25mg/kg. If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV or IO (over 2 minutes)
5.12 Diphenhydramine Hydrochloride (Benadryl®)

**ACTIONS**
Diphenhydramine is an antihistamine with anticholinergic (drying) and sedative side effects. Antihistamines appear to compete with histamine for cell receptor sites on effector cells. Diphenhydramine prevents, but does not reverse, histamine-mediated responses—particularly histamine effects on the smooth muscle of the bronchial airways, gastrointestinal tract, uterus, and blood vessels.

**INDICATIONS**
- Allergy symptoms, anaphylaxis (as an adjunct to epinephrine)
- Sedation of a violent patient
- Dystonic reactions from phenothiazine overdose (e.g., Haldol, Compazine, Thorazine, and Stelazine)
- Rhinitis
- Anti-Parkinsonism syndrome
- Nighttime sedation
- Motion sickness

**CONTRAINDICATIONS**
Diphenhydramine is not to be used in newborn or premature infants or in nursing mothers. It is also not to be used in patients with lower respiratory tract symptoms, including asthma.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Drowsiness, confusion, insomnia, headache, vertigo (all especially in the elderly).
- Cardiovascular: Palpitations, tachycardia, PVCs and hypotension.
- Respiratory: Thickening of bronchial secretions, tightness of the chest, wheezing, nasal stuffiness.
- GI: Nausea, vomiting, diarrhea, dry mouth, and constipation.
- GU: Dysuria, urinary retention.

**WARNINGS**
- In infants and children especially, antihistamines in overdose may cause hallucinations, convulsions, or death.
- As in adults, antihistamines may diminish mental alertness in children. In young children, they may produce excitation.
- Diphenhydramine has additive effects with alcohol and other CNS depressants (e.g., hypnotics, sedatives, tranquilizers).
- Antihistamines are more likely to cause dizziness, sedation, and hypotension in elderly patients (60 years or older).

**DOSAGE**
**Adult:** 50 mg IV/IO, or 50 mg deep IM lateral thigh. The patient may require as much as 100 mg.

**Pediatric:** 1 mg/kg IM lateral thigh or SLOW IV (maximum dose of 50 mg). If administering Benadryl IV dilute amount in 9 mL of normal saline.
**5.13 Dopamine Hydrochloride (Intropin®)**

**ACTIONS**
Dopamine stimulates dopaminergic beta-adrenergic and alpha-adrenergic receptors of the sympathetic nervous system. It exerts an inotropic effect on the myocardium, resulting in an increased cardiac output. Dopamine produces less increase in myocardial oxygen consumption than does isoproterenol, and its use is rarely associated with tachyarrhythmia. Dopamine dilates renal and mesenteric blood vessels at low doses that may not increase heart rate or blood pressure. Therapeutic doses have predominant beta-adrenergic receptor-stimulating actions that result in increases in cardiac output without marked increases in pulmonary occlusive pressure. At high doses, dopamine has alpha-receptor stimulating actions that result in peripheral vasoconstriction and marked increases in pulmonary occlusive pressure.

**INDICATIONS**
To treat shock and correct hemodynamic imbalances, improve perfusion to vital organs, and increase cardiac output.

**CONTRAINDICATIONS**
Dopamine should not be used in patients with pheochromocytoma or hypovolemic shock.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Headache.
- Cardiovascular: Ectopic beats, tachycardia, anginal pain, palpitations, hypotension.
- GI: Nausea, vomiting.
- Local: Necrosis and tissue sloughing with extravasation.
- Other: Piloerection, dyspnea.

**WARNINGS**
Do not administer dopamine in the presence of uncorrected tachydysrhythmias or ventricular fibrillation. Do not add dopamine to any alkaline diluent solution, because the drug is inactivated in alkaline solution.

Patients who have been treated with monoamine oxidase (MAO) inhibitors will require substantially reduced dosage. MAO inhibitors include the following agents:
- Furazolidone (Furoxone)
- Isocarboxazid (Marplan)
- Pargyline hydrochloride (Eutonyl)
- Pargyline hydrochloride with methyclothiazide (Eutron)
- Phenelzine sulfate (Nardil)
- Procarbazine hydrochloride (Matulane)
- Tranylcypromine sulfate (Parnate)

**DOSAGE**
**Adult:** Mix dopamine in D5W or Normal Saline to yield a concentration of 800 or 1600 mcg/mL. Begin the infusion at 5 mcg/kg/min and titrate to effect (maximum dose 20 mcg/kg/min).

**Pediatric:** Dopamine (1600 mcg/mL) Mix 400 mg in 250 mL of D5W, Concentration = 1600 mcg/mL, Dosage: 5-15 mcg/kg/min. Use a microdrip (60 gtt/mL) and refer to the Handtevy Medication Guide for drip rate based on patient weight or age.
5.14.1 Epinephrine 1:1,000

ACTIONS
Epinephrine is a sympathomimetic agent that stimulates both alpha- and beta-adrenergic receptors, causing immediate bronchodilation, increase in heart rate, and increase in the force of cardiac contraction.

INDICATIONS
- Asthma
- Anaphylaxis
- Angioneurotic edema

CONTRAINDICATIONS
Hyperthyroidism, hypertension, cerebral arteriosclerosis in asthma. Epinephrine should not be administered in elderly or debilitated patients with underlying cardiovascular disease. In the setting of anaphylaxis, however, there are no contraindications.

ADVERSE REACTIONS AND SIDE EFFECTS
Same as for epinephrine 1:10,000 (Drug Summary 5.14.2).

WARNINGS
Same as for epinephrine 1:10,000 (Drug Summary 5.14.2). Epinephrine 1:1000 also causes hyperglycemia. With the exception of cardiac arrest cases, Epinephrine 1:1000 should not be given intravenously; it should be diluted first (1 mg in 9 mL of NS = 1:10,000 or 1 mg/10 mL).

DOSAGE
Adult: 0.3 mg (0.3-0.5 cc) IM preferred site lateral thigh; may be repeated every 15 minutes maximum of 3 doses.

Pediatric: 0.01 mg/kg, up to 0.3 mg IM preferred site lateral thigh for asthma and anaphylaxis may be repeated every 15 minutes maximum of 3 doses.
5.14.2 Epinephrine 1:10,000

**ACTIONS**
Epinephrine is a sympathomimetic agent that stimulates both alpha- and beta-adrenergic receptors. As a result of its effects, myocardial and cerebral blood flows are increased during ventilation and chest compression. Epinephrine increases systemic vascular resistance and, therefore, may enhance defibrillation.

**INDICATIONS**
Asystole, ventricular fibrillation unresponsive to defibrillation, PEA. Other pediatric indications: hypotension in patients with circulatory instability, symptomatic bradycardia (before use of Atropine).

**CONTRAINDICATIONS**
None in the cardiac arrest situation.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Anxiety, headache, cerebral hemorrhage.
- Cardiovascular: Tachycardia, ventricular dysrhythmias, hypertension, angina, palpitations.
- GI: Nausea and vomiting.

**WARNINGS**
Epinephrine is inactivated by alkaline solutions - never mix it with sodium bicarbonate. Do not mix isoproterenol and epinephrine, as this combination results in exaggerated response. The action of catecholamines is depressed by acidosis; attention to ventilation and circulation is essential. Antidepressants potentiate the effects of epinephrine.

**DOSAGE**

**Adult:**
- IV push (1:10,000): 1 mg (10 mL) IV; repeat every 3-5 minutes.
- Pressor infusion: 1 mg/250 mL D5W; start at 1 mcg/min and titrate to effect.
- Severe anaphylaxis (ALS level 2)
  - Epinephrine (1:100,000) 0.1 mg via slow IV over 5-10 minutes,
  - Administration instructions
    - Remove 9 mL of Epi 1:10,000 from the 10 mL prefilled syringe
    - Fill the syringe back up with 9 mLs of normal saline, **You now have Epi 1:100,000 (0.01 mg/mL)**
    - Administer this solution IV (Epi 1:100,000) slowly over 10 minutes (1 mL/min), titrate to clinical effect and systolic BP greater than 90.
    - Close hemodynamic monitoring is required when providing Epinephrine 1:100,000 IV

**Pediatric:**
- IV push (1:10,000): 0.01 mg/kg (0.1 mL/kg) IV or IO; repeat every 3-5 minutes.
5.15  Fentanyl (Sublimaze)

**ACTIONS**
Fentanyl is similar to morphine and meperidine in its respiratory effects, except that respiration of healthy individuals returns to normal more quickly after fentanyl. This agent exhibits little hypnotic activity and histamine release rarely occurs. Preferentially use intranasal delivery (IN) via MAD for those where IV access may be difficult to obtain in a timely fashion (extremity burns/injuries) or not indicated for chief complaint (stable dental or back pain). After each drug dosage administration, (divide dose equally between nostrils).
- Reassess the patient’s pain
- Note adequacy of ventilation and perfusion
- Assess vital signs

**INDICATIONS**
- For relief of moderate to severe pain.
- Pain from acute myocardial infarction
- Pain associated with isolated extremity fracture, renal colic, or burns

**CONTRAINDICATIONS**
- Contraindicated if systolic blood pressure less than 90 mmHg
- Volume depletion or hypotension
- Head trauma
- Acute alcoholism
- Depressed ventilatory function (e.g., COPD, cor pulmonale, emphysema and acute asthma
- Patients with known hypersensitivity to hydromorphone.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Sedation, drowsiness, mental clouding, lethargy, impairment of mental and physical performance, anxiety, fear, dysphoria, dizziness, psychic dependence, and mood changes.
- Cardiovascular: Circulatory depression, peripheral circulatory collapse, and cardiac arrest have occurred following rapid administration.
- Orthostatic hypotension and fainting may occur if the patient stands up following injection.
- GI: Nausea and vomiting, constipation, urinary retention
- Respiratory: Respiratory depression, bronchoconstriction, decreased cough reflex

**WARNINGS**
The concomitant use of other CNS depressants—including other opioids, sedatives or hypnotics, general anesthetics, phenothiazines, tranquilizers, skeletal muscle relaxants, sedating antihistamines, potent inhibitors of P450 (e.g., erythromycin, ketoconazole, and certain protease inhibitors), and alcoholic beverages may produce increased depressant effects. Hypoventilation, hypotension, and profound sedation may occur.

**DOSAGE** - Monitor oxygen saturation & end-tidal C02
- **Adult** - 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM, IO. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg). Second dose, if needed not to exceed a maximum total dose of 200 mcg IV, IN, IM, IO. If Fentanyl was initially given IN and an IV is then established, then one IV dose of 50 mcg. can be given if needed.
- **Pediatric** - 0.5 mcg/kg (maximum 25 mcg) SLOW IV; repeat once after 5 minutes as needed (max 50 mcg total dose) OR IN 1.5 mcg/kg (max 100 mcg).
5.16 Glucagon

**ACTIONS**
Glucagon, which is produced naturally in the pancreas by the alpha cells of the islets of Langerhans, causes an increase in blood glucose concentrations. It is effective in small doses, and no evidence of toxicity has been reported with its use. Glucagon acts only on liver glycogen, converting it to glucose if the patient has adequate glycogen reserves. Glucagon possesses positive inotropic and chronotropic properties.

**ONSET OF ACTION:**
- 1 mg IM: 8-10 minutes
  - IV: 1 minute

**Peak Effects:**
- 1 mg IM: 12-14 minutes
  - IV: 3-6 minutes

**Duration of Action:**
- 1 mg IM: 12-27 minutes
  - IV: 20 minutes

**INDICATIONS**
Documented hypoglycemia is a true medical emergency, IM glucagon should be administered rapidly if IV access is delayed. Glucagon is indicated for the treatment of hypoglycemia when an IV cannot be established and oral glucose is contraindicated. It may also be effective in symptomatic beta-blocker overdose.

**CONTRAINDICATIONS**
- Pheochromocytoma
- Insulinoma
- Known hypersensitivity
- Should not be routinely used to replace dextrose when IV access has been obtained

**ADVERSE REACTIONS AND SIDE EFFECTS**
Occasional nausea and vomiting.

**WARNINGS**
Glucagon should be administered with caution in patients with a history of insulinoma and/or pheochromocytoma.

**DOSAGE**
**Adult:** 1.0 unit (1.0 mg) of Glucagon IM. This can be repeated once in 20 minutes.

**Pediatric:**
- Patient less than or equal to 20 kg: 0.5 mg IM.
- Patient greater than 20 kg: 1 mg IM
- Not as effective in children as in adults
5.17 Haloperidol (Haldol®)

**ACTIONS**
Haloperidol is a potent, long-acting butyrophenone derivative. It has pharmacologic actions similar to those of piperazine phenothiazines, but is associated with higher incidence of extrapyramidal effects, less hypotension, and relatively low sedative activity. It exerts a strong antiemetic effect; it also impairs central thermoregulation. Haloperidol produces weak central anticholinergic effects and transient orthostatic hypotension. Its actions are thought to be due to blockade of dopamine activity.

**INDICATIONS**
Used for management of manifestations of psychotic disorders and for the treatment of agitated states in acute and chronic psychoses.

**CONTRAINDICATIONS**
Hypersensitivity to haloperidol, Parkinson’s disease, seizure disorders, coma, alcoholism, severe mental depression, CNS depression, thyrotoxicosis, and cocaine overdose.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Parkinson-like symptoms, restlessness, lethargy, headache, exacerbation of psychotic symptoms.
- Cardiovascular: Tachycardia, hypotension, hypertension (with overdose).
- GI: Nausea, vomiting.
- Other: Bronchospasm, laryngospasm, respiratory depression, dry mouth, hypersalivation (“drooling”).

**WARNINGS**
Use with caution in patients with severe cardiovascular disorders (may cause transient hypotension and/or precipitation of anginal pain), receiving anticonvulsant medication (may lower the convulsive threshold), or with a history of allergic reactions to drugs.

**DOSAGE**
- **Adult:** 5-10 mg IM
- **Pediatric:** 0.1mg/kg IM (maximum 5 mg).
5.18 Hydroxocobalamin (Cyanokit ®)

**ACTIONS**
The action of hydroxocobalamin in the treatment of cyanide poisoning is based on its ability to bind to cyanide ions. Each hydroxocobalamin molecule can bind one cyanide ion by substituting it for the hydroxo ligand linked to the trivalent cobalt ion, thereby forming cyanocobalamin, which is then excreted in urine.

**INDICATIONS**
Hydroxocobalamin is indicated for known or suspected cyanide poisoning. Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide-containing compounds, including smoke from closed-space fires. Sources of cyanide poisoning include hydrogen cyanide and its salts, cyanogenic plants, aliphatic nitriles, and prolonged exposure to sodium nitro-prusside.

The presence and extent of cyanide poisonings are often initially unknown. There is no widely available, rapid confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of cyanide poisoning is high, hydroxocobalamin should be administered without delay.

**Common Signs and Symptoms of Cyanide Poisoning**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
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<tbody>
<tr>
<td>Headache</td>
<td>Altered mental status (e.g., confusion, disorientation)</td>
</tr>
<tr>
<td>Confusion</td>
<td>Seizures or coma</td>
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<tr>
<td>Dyspnea</td>
<td>Mydriasis</td>
</tr>
<tr>
<td>Chest tightness</td>
<td>Tachypnea/hyperpnea (early)</td>
</tr>
<tr>
<td>Nausea</td>
<td>Bradypnea/apnea (late)</td>
</tr>
<tr>
<td></td>
<td>Hypertension (early) / hypotension (late)</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular collapse</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td>Plasma lactate concentration</td>
<td>³ 8 mmol/L</td>
</tr>
</tbody>
</table>

**CONTRAINDICATIONS** None.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Serious adverse reactions include allergic reactions and increased blood pressure. Other side effects include:
- Red-colored urine
- Red-colored skin and mucous membranes, acne-like rash
- Nausea, vomiting, diarrhea, bloody stools, trouble swallowing, stomach pain
- Throat tightness, dry throat
- Headache, dizziness, memory problems, restlessness
- Infusion site reaction
- Eye swelling, irritation, or redness
- Swelling of feet and ankles
- Irregular heartbeat, increased heart rate
- Fluid in lungs
**WARNINGS**

In addition to hydroxocobalamin, treatment of cyanide poisoning must include immediate attention to airway patency, adequacy of oxygenation and hydration, cardiovascular support, and management of any seizure activity. Consideration should be given to decontamination measures based on the route of exposure.

Many patients with cyanide poisoning will be hypotensive; however, elevations in blood pressure have also been observed in known or suspected cyanide poisoning victims.

**DOSAGE**

**Adult**: 5 g packaged as a single 5 g vial or in two 2.5 g vials administered as an IV infusion over 15 minutes (approximately 15 mL/min)—if using the two vials 7.5 minutes per vial. Depending on the severity of the poisoning and the clinical response, a second dose of 5 g may be administered by IV infusion for a total dose of 10 g. The rate of infusion for the second dose may range from 15 minutes (for patients in extremis) to 2 hours, as clinically indicated.

**Pediatric**: 70 mg/kg 10 gtt/min over 15 minutes has been used to treat pediatric patients.
5.19 Ipratropium Bromide (Atrovent®)

**ACTIONS**
Ipratropium bromide is an anticholinergic (parasympatholytic) agent, which causes localized bronchodilation.

**INDICATIONS**
Ipratropium bromide is indicated for relief of bronchospasms associated with asthma and chronic obstructive pulmonary disease, including chronic bronchitis and emphysema that is unresponsive to treatment with albuterol alone.

**CONTRAINDICATIONS**
Hypersensitivity to atropine or its derivatives.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Respiratory: Cough, exacerbation of symptoms.
- CNS: Nervousness, dizziness, headache.
- Cardiovascular: Palpitations.
- GI: Nausea, vomiting, GI distress.
- Other: Tremor, dry mouth, blurred vision.

**WARNINGS**
Ipratropium bromide is not indicated for the initial treatment of acute episodes of bronchospasms where rapid response is required.

**DOSAGE**
- **Adult**: Add 0.5 mg (0.5 mL) of Atrovent to the nebulizer (in addition to the standard dose of albuterol) and flow oxygen at 6-8 L/min.
- **Pediatric**: Add Ipratropium Bromide (Atrovent ®) to Albuterol nebulizer treatment and flow oxygen at 6-8 L/min
  - If patient less than 8 year, 0.25mg/1.25mL
  - If patient greater than 8 year, 0.5mg/2.5mL
5.20 Ketamine Hydrochloride

**ACTIONS** Nonbarbiturate anesthetic

**INDICATIONS**
- Violent Agitated Patient
- Failure to “talk patient down”
- Suspected “Excited Delirium” (confusion, agitation, drug abuse)
- Resisting restraints putting self or crew in danger

**CONTRAINDICATIONS**
- Significant Head Trauma
- Increased intracranial pressure

**WARNINGS/PRECAUTIONS**
Respiratory depression/apnea may occur with overdosage or too rapid rate of use; employ supportive ventilation and respiration. Caution with chronic alcoholics and acutely alcohol-intoxicated and in elderly patients. Use in pregnancy is not recommended.

**ADVERSE REACTIONS**
- Hypertension and tachycardia, generally self-limited
- Laryngospasm: may produce mild stridor, oxygen and BVM prn
- Hypersalivation – can cause an increase in oral secretions, elevating the head 30 degrees may help.
- Nausea and vomiting
- Tonic and clonic muscle movements
- Transient respiratory depression occasionally occurs
- Roving eye movements and nystagmus

**PSYCHOLOGICAL ADVERSE REACTIONS**
- Visual Hallucinations
- Emergence Delirium
- Sensation of detachment from the body

**ADULT DOSAGE**

**Excited Delirium**
- 4 mg/kg IM to the lateral thigh or deltoid or 2 mg/kg IN (max dose 400 mg)
- Use 100 mg/mL concentration

**Pain**
- 20 mg IV SLOW over 1 minute.
  - May be repeated once within 5-10 minutes if desired effect is not met.
- **Note**: Must dilute if using 100 mg/mL concentration. May repeat x 1 in 5 minutes.
  - Dilution instructions - Add 20 mg (0.2 mL of 100 mg/mL concentration) to 0.8 mL Normal Saline. Then administer slowly over 1 minute.
5.21 Lorazepam (Ativan®)

**ACTIONS**
Lorazepam is a benzodiazepine, so it depresses the central nervous system. It produces sedation, relieves anxiety, causes lack of recall, and provides for relief of skeletal muscle spasms.

**INDICATIONS**
- Adjunct to seizure control
- Control of violent patients

**CONTRAINDICATIONS**
Known sensitivity to benzodiazepines; narrow-angle glaucoma.

**PRECAUTIONS**
May cause respiratory depression.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Excessive CNS depression.
- Cardiovascular: Rarely hypotension/hypertension.
- Respiratory: Hypoventilation, partial airway obstruction.
- Local: Pain, burning, and redness at injection site.
- General: Nausea/vomiting and skin rash.

**DOSAGE**
**Adult:** 1-2 mg IV, IO, IM or IN may be repeated once as needed, up to maximum of 4 mg.

**Pediatric:** 0.1mg/kg IV, IO, IM or IN, maximum single dose 2 mg, if no effect after 5 minutes may be repeated once to maximum of 4 mg.
**5.22 Magnesium Sulfate**

**ACTIONS**
Magnesium is an important cofactor for enzymatic reactions and plays an important role in neurochemical transmission and muscular excitability. Magnesium prevents or controls convulsions by blocking neuromuscular transmission and decreasing the amount of acetylcholine liberated at the end-plate by the motor nerve impulse. It is said to have a depressant effect on the central nervous system, but it does not affect the mother, fetus, or neonate when used as directed in eclampsia and pre-eclampsia. Magnesium acts peripherally to produce vasodilatation.

**INDICATIONS**
- Parenteral anticonvulsant for the prevention and control of seizures in severe toxemia of pregnancy, pre-eclampsia, and eclampsia.
- Torsades de pointes.
- Severe asthma.
- Suspected hypomagnesemic state (e.g., chronic alcoholism and chronic use of diuretics).
- Refractory ventricular fibrillation.

**PRECAUTIONS** - Because magnesium is removed from the body solely by the kidneys, this drug should be used with caution in patients with renal impairment. Monitoring magnesium serum levels and the patient’s clinical status is essential to avoid the consequences of overdose and toxemia. Clinical indications that it is safe to give magnesium to the patient include the presence of a patellar reflex (knee jerk) and the absence of respiratory depression (approximately 16 breaths or more per minute). Calcium chloride should be immediately available to counteract the potential hazards of magnesium intoxication in eclampsia.

**ADVERSE REACTIONS AND SIDE EFFECTS** - Adverse effects of magnesium sulfate IV are usually the result of magnesium intoxication. Signs of hypermagnesemia include flushing, sweating, hypotension, depression of reflexes, flaccid paralysis, hypothermia, circulatory collapse, depression of cardiac function, and central nervous system depression. These symptoms can precede fatal paralysis.

**WARNINGS** - Magnesium sulfate should not be given intravenously to mothers with toxemia of pregnancy during the 2 hours immediately preceding delivery. Magnesium sulfate injection USP, 50%, must be diluted to a concentration of 20% or less prior to IV infusion.

**ADULT:**
- **Severe asthma** – 2 g IV (mixed in 50 mL or 100 mL of D5W) given over 5-10 minutes. Monitor the blood pressure and if it decreases slow down or stop the infusion.
- **Eclamptic seizures** – 4 gm IV (mixed in 50 mL of D5W and administered over 5-10 minutes). May repeat once at 2 g IV (mixed in 50 mL of D5W and administered over 5-10 minutes). **Torsades de pointes and refractory VF**: 1-2 g IV (mixed in 50 mL or 100 mL of D5W and administered over 1-2 minutes), followed by a maintenance infusion (1 g in 250 mL of D5W administered at 30-60 gtts/min).

**PEDIATRIC:**
- **Severe asthma** – 40 mg/kg (max 2 g) IV mixed in 50 mL D5W given over 30 minutes. Monitor the blood pressure and if it decreases slow down or stop the infusion
- **Torsades de pointes (without a pulse) and refractory VF**: 25-50 mg/kg IV/IO, up to a maximum dose of 2 g over 2 minutes, followed by a maintenance infusion (1g in 250 mL of D5W at 30-60 gtts/min).
5.23 Methylene Blue

**ACTIONS**
Low concentrations of methylene blue will convert methemoglobin to hemoglobin (methemoglobin is toxic and gives the blood a chocolate-brown color; it does not carry oxygen). High concentrations convert ferrous iron of hemoglobin to ferric iron, thereby forming methemoglobin.

**INDICATIONS**
Initial treatment of methemoglobinemia.

**CONTRAINDICATIONS**
Renal insufficiency (excreted in urine and bile).

**ADVERSE REACTIONS AND SIDE EFFECTS**
Cyanosis, profuse sweating, dizziness, headache, nausea, vomiting, diarrhea (turns urine and stool blue-green). May induce hemolysis in patients deficient in glucose-6-phosphate dehydrogenase.

**DOSAGE**
Methylene blue (10 mg/mL)
- **Adult:** 1 mg/kg of a 1% solution. Very slow IV push of 1 mL (10 mg) every 5 minutes.
- **Pediatric:** 1 mg/kg IV over 5 minutes, See Handtevy Medication Guide (WMD page) for dosing.
5.24 Methylprednisolone Sodium Succinate (Solu-Medrol®)

**ACTIONS**
Methylprednisolone sodium succinate is a potent anti-inflammatory synthetic steroid.

**INDICATIONS**
Control of severe allergic reactions, asthmatic attacks, and bronchospasm associated with COPD that do not respond to other treatments.

**CONTRAINDICATIONS**
Known hypersensitivity, neonates, and patients with systemic fungal infections.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Cardiovascular: Fluid retention, hypertension/hypotension, dysrhythmias, CHF, electrolyte imbalance.
- CNS: Seizures, vertigo, headache.
- GI: Nausea/vomiting, GI bleeding, abdominal distention.
- General: Urticaria, anaphylactic reaction.

**DOSAGE**
- **Adult**: Bronchospasm associated with asthma, COPD, severe allergic reactions, or adrenal crisis: 125 mg IV. If IV cannot be established then administer IM 125 mg.
- **Pediatric**: Bronchospasm associated with asthma, severe allergic reaction, or adrenal crisis: 2 mg/kg IV (maximum dose 60 mg). If IV cannot be established then administer 2 mg/kg IM (maximum dose 60 mg).
5.25 Midazolam (Versed®)

**ACTIONS**
Midazolam is a short-acting benzodiazepine (a central nervous system depressant) that produces sedation and lack of recall.

**INDICATIONS**
- Status epilepticus
- Premedication prior to cardioversion
- Agitation due to acute alcohol withdrawal
- Short-term relief of acute anxiety
- Cocaine intoxication
- Severe muscle spasm due to acute back strain

**CONTRAINDICATIONS**
- Acute alcohol intoxication
- Pregnancy (except for control of seizures associated with status epilepticus or eclampsia)
- Neonates

**PRECAUTIONS**
Midazolam does not protect against the increase in intracranial pressure and bradycardia associated with multiple intubation attempts.

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Respiratory: Respiratory depression, laryngospasm, bronchospasm, dyspnea.
- Cardiovascular: PVCs, bradycardia, tachycardia, nodal rhythms, hypotension.
- CNS: Retrograde amnesia, altered mental status, dizziness, prolonged emergence from anesthesia.
- GI: Nausea/vomiting, hiccoughs, coughing.
- Local: Pain, redness, swelling, burning at injection site.

**DOSAGE**
**Adult:** Sedation and seizures:
Sedation and seizures: 5 mg IV, IO, IM, or IN. Maximum total dose of 10 mg.

**Pediatric:** 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg.

For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
5.26 Morphine Sulfate (MS)

**ACTIONS**
Morphine is a narcotic analgesic. It depresses the central nervous system and decreases sensitivity to pain. It increases venous capacitance, decreases venous return, and produces mild peripheral vasodilatation. Morphine also decreases myocardial oxygen demand.

**INDICATIONS**
- Pain from acute myocardial infarction
- Pain associated with isolated extremity fracture, isolated acute back strain, renal colic, or burns
- Abdominal pain or with flank pain that is associated with kidney stones.
- SOFT-TISSUE INJURIES, BURNS, BITES, AND STINGS
- Pain associated with multisystem trauma, soft-tissue injuries, burns, bites, and stings

**CONTRAINDICATIONS**
- Volume depletion or hypotension
- Head trauma (relative)
- Acute alcoholism
- Acute asthma
- Known hypersensitivity to MS

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Euphoria, drowsiness, pupillary constriction, respiratory arrest.
- Cardiovascular: Bradycardia, hypotension.
- GI: Decreased gastric motility, nausea and vomiting.
- GU: Urinary retention.
- Respiratory: Bronchoconstriction, decreased cough reflex
- Watch for histamine effects (wheals, urticaria) proximal to IV site; contact medical control

**WARNINGS**
Morphine is detoxified by the liver. It is potentiated by alcohol, antihistamines, barbiturates, sedatives, and beta blockers.

**DOSAGE**
**Adult:** 5 mg-SLOW IV may repeat once in 5 - 10 minutes until desired response is achieved (maximum dose 10 mg). Can also be given IM. **Peak effects occur within 20 minutes.**

**Pediatric:** 0.1-0.2 mg/kg IV slowly Administer at a rate not to exceed 1 mg/min. If pain persists and systolic BP is adequate, may repeat dose x 1 in 3-5 minutes, (repeat single dose maximum of 4 mg).

**Infant:** 0.05 mg/kg IV slowly
5.27 Naloxone Hydrochloride (Narcan®)

ACTIONS
The mechanism of action for naloxone hydrochloride is not fully understood. It does appear that this agent antagonizes the effects of opiates by competing at the same receptor sites. When given IV, the action is apparent within 2 minutes. Effects appear slightly more slowly with IM.

INDICATIONS
Naloxone is indicated for the complete or partial reversal of opiate narcotic depression and respiratory depression secondary to opiate narcotics or related drugs: Naloxone can also be used for suspected acute opiate OD.

<table>
<thead>
<tr>
<th>Codeine</th>
<th>Methadone</th>
</tr>
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<tbody>
<tr>
<td>Fentanyl</td>
<td>Morphine</td>
</tr>
<tr>
<td>Heroin</td>
<td>Pentazocine (Talwin)</td>
</tr>
<tr>
<td>Hydromorphone (Dilaudid)</td>
<td>Percodan</td>
</tr>
<tr>
<td>Lomotil</td>
<td>Propoxyphene (Darvon)</td>
</tr>
<tr>
<td>Meperidine (Demerol)</td>
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</tbody>
</table>

CONTRAINDICATIONS
Naloxone is contraindicated in patients known to be hypersensitive to it. Nebulized Narcan with EtCO2 greater than 45 and SpO2 less than 94% or inadequate ventilatory effort.

ADVERSE REACTIONS AND SIDE EFFECTS
- CNS: Tremor, agitation, belligerence, pupillary dilation, seizures, increased tear production, sweating, seizures secondary to withdrawal.
- Cardiovascular: Hypertension, hypotension, ventricular tachycardia, pulmonary edema, ventricular fibrillation.
- GI: Nausea, vomiting

WARNINGS
Naloxone should be administered cautiously to persons (including newborns of mothers) who are known or suspected to be physically dependent on opiates; it may precipitate an acute abstinence syndrome in these individuals. Naloxone administration may need to be repeated in this scenario because the duration of action of some narcotics may exceed that of naloxone. Naloxone is not effective against a respiratory depression caused by non-opiate drugs. Use caution during its administration because patients may become violent as their level of consciousness increases.

DOSAGE
Adult:
- Administer Naloxone (Narcan) 0.4 mg – 2 mg IV/IO/IM or IN to restore adequate ventilatory effort and/or improve mental status and-titrate to effect. Usual doses should not exceed 10 mg, Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects.
- If administering Naloxone (Narcan) via IN, must use concentration 2 mg/2 mL (For IN administration refer to 4.18.5)
- If administering Naloxone (Narcan) via nebulization must use concentration 2 mg/2 mL (add 2 mg of Narcan to 3 mL of saline) and titrate to effect. If administering Naloxone (Narcan) via prepackaged product Nasal Spray then the dose is 4 mg/0.1 mL spray IN

Pediatric: 0.1 mg/kg IV, IM, IO, IN may repeat with 0.1 mg/kg if no improvement is noted.
**5.28 Nitroglycerin (Nitrostat®, Nitrolingual® Spray)**

**ACTIONS**
Nitroglycerin is a direct vasodilator that acts principally on the venous system, although it also produces direct coronary artery vasodilation. Its use decreases venous return, which in turn decreases the workload on the heart, and thereby decreases myocardial oxygen demand. Sublingual nitroglycerin is readily absorbed. Pain relief occurs within 1-2 minutes and therapeutic effects can last as long as 30 minutes.

**INDICATIONS**
- Chest pain or discomfort associated with suspected AMI or angina pectoris
- Pulmonary edema with hypertension

**CONTRAINDICATIONS**
Patients with increased intracranial pressure, systolic blood pressure less than 90 mm Hg, children younger than 12 years.

**PRECAUTIONS**
Tolerance to nitrates easily develops, which necessitates increasing the dosage. Nitroglycerin tablets are inactivated by light, heat, air, and moisture, so they must be kept in amber glass containers with tight-fitting lids. Do not leave cotton in the container. Do not shake Nitrolingual spray. Alcohol will accentuate the vasodilating and hypotensive effects of nitroglycerin. The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
  a. Stendra (Avanafil) – in the past 12 hours
  b. Viagra (Sildenafil) – in the past 24 hours
  c. Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours

**ADVERSE REACTIONS AND SIDE EFFECTS**
- CNS: Headache, dizziness, flushing, nausea and vomiting.
- Cardiovascular: Hypotension, reflex tachycardia.

**DOSAGE**
**Adult:** 0.4 mg (1 tablet or 1 spray sublingual); may repeat in 3-5 minutes (maximum dose of 1.2 mg or 3 doses).
5.29 Nitrous Oxide 50% Blended in Oxygen (Nitronox®)

**ACTIONS**
Nitrous oxide is a colorless gas that acts on the central nervous system. When mixed with 50% oxygen and inhaled, it produces an effect similar to a mild intoxicant. The patient laughs and talks but does not go to sleep. When inhaled, nitrous oxide has potent analgesic effects, which dissipate within 2-5 minutes after stopping its administration.

**INDICATIONS**
Moderate to severe pain, as in trauma, burns, renal colic, and labor.

**CONTRAINDICATIONS**
Nitrous oxide is contraindicated in any altered state of consciousness (e.g., head injury, alcohol ingestion, drug overdose). It is also contraindicated in patients with COPD, acute pulmonary edema, pneumothorax, decompression sickness, air embolus, abdominal pain with distention or suspicion of obstruction, and pregnancy (except during delivery), and in patients who are unable to self-administer Nitronox.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Light-headedness, confusion, drowsiness, nausea and vomiting.

**WARNINGS**
Because nitrous oxide is heavier than air, it may accumulate on floor of ambulance. During transits lasting more than 15 minutes, nitrous oxide may affect ambulance personnel.

**DOSAGE**
Blended mixture of 50% nitrous oxide and 50% oxygen, which is self administered through inhalation. Also apply O₂ cannula at 4-6 L to maintain O₂ therapy when nitrous oxide is not being administered.

Note: Also see Medical Procedure 4.21, Nitrous Oxide-Nitronox
### ACTIONS
Pralidoxime reactivates cholinesterase that has been deactivated by organophosphorous pesticides and related products. It inactivates acetylcholine at both muscarinic and nicotinic sites in the periphery.

### INDICATIONS
Organophosphorous toxicity; used as an adjunct to systemic atropine administration.

### CONTRAINDICATIONS
- Poisoning with Sevin (a carbamate insecticide); Sevin increases the drug’s toxicity.
- Use with extreme caution in patients with a history of asthma, renal insufficiency, and peptic ulcers.

### ADVERSE REACTIONS AND SIDE EFFECTS
- **CNS:** Dizziness, headache, drowsiness, excitement.
- **Cardiovascular:** Tachycardia.
- **EENT:** Blurred vision, diplopia, impaired accommodation, laryngospasm.
- **GI:** Nausea.
- **Other:** Muscular weakness or rigidity, hyperventilation.
- Rapid injection of 2-PAM can cause tachycardia, laryngeal spasm, muscle rigidity, and transient neuromuscular blockage.

### DOSAGE
**Pralidoxime (2-PAM)** (1 g dry powder: Mix with 20 cc sterile water (50 mg/mL).
- **Adult:** IV infusion 1-2 g in 100 mL of saline over 30 minutes.
  If pulmonary edema is present, give IVP over 5 minutes.
- **Pediatric:** 25 mg/kg IV See Handtevy Medication Guide (WMD page) for dosing. Dilute recommended dose with NS and infuse over 10 minutes, then can provided continuous infusion at 5-10 mg/kg/hr.
5.31 Sodium Bicarbonate 8.4% and 4.2%

**ACTIONS**
This alkalizing agent is used to buffer acids present in the body during and after severe hypoxia. Bicarbonate combines with excess acids (usually lactic acid) present in the body to form a weak, volatile acid. This acid is broken down into CO₂ and H₂O. Sodium bicarbonate is effective only when administered in patients who have adequate ventilation and oxygenation.

**INDICATIONS**
Metabolic acidosis due to the following causes:
- Salicylate (aspirin) overdose
- Barbiturate overdose
- Tricyclic antidepressant overdose
- Hyperkalemia
- Severe ketoacidosis
- Cardiac arrest
- Shock
- Physostigmine toxicity
- Methanol toxicity
- Ethylene glycol toxicity

**CONTRAINdications**
Congestive heart failure; alkalotic states.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Metabolic alkalosis; hypernatremia; cerebral acidosis; sodium and H₂O retention, which can cause CHF.

**WARNINGS**
Excessive bicarbonate therapy inhibits the release of oxygen. Bicarbonate does not improve the ability to defibrillate. Administration of sodium bicarbonate may inactivate simultaneously administered catecholamines; it will create an insoluble precipitate if mixed with calcium chloride. Administration should be guided by arterial blood gases and pH data, when available.

**DOSAGE**
**Adult:** 1 mEq/kg IV (8.4%). Repeat with 0.5 mEq/kg q 10 minutes.

**Pediatric:** 1 mEq/kg IV (8.4%). Repeat with 0.5 mEq/kg q 10 minutes.

**Infant:** 1 mEq/kg IV (4.2%) slowly; may repeat in 10 minutes.
5.32 Sodium Thiosulfate

**ACTIONS**
Sodium thiosulfate converts cyanide to the less toxic thiocyanate. The thiocyanate is then excreted in the urine.

**INDICATIONS**
Used in acute cyanide toxicity; not useful in hydrogen sulfide toxicity.

**CONTRAINDICATIONS**
None in acute cyanide toxicity.

**DOSAGE** Sodium Thiosulfate (25%)
- **Adult:** 12.5 g (50 mL of 25% solution) given by slow IV over 10 minutes.
- **Pediatric:** 1.2 mL/kg IV over 10-20 minutes, See Handtevy Medication Guide (WMD page) for dosing
5.33 Succinylcholine Chloride (Anectine®)

**ACTIONS**
Succinylcholine chloride is a short-acting skeletal muscle paralytic. Onset of action occurs in 1-2 minutes, with recovery happening in 5-10 minutes. This agent works by depolarizing the receptors on skeletal muscle. It then blocks the action of acetylcholine, which causes enhanced cholinergic activity, with the face and neck muscles being affected first. These effects are followed by paralysis of the chest, diaphragm, and other skeletal muscles. Use of succinylcholine may trigger histamine release.

**INDICATIONS**
Facilitation of endotracheal intubation.

**CONTRAINDICATIONS**
- Known sensitivity to succinylcholine or other anesthetics
- Preexisting neuromuscular disease (myasthenia gravis)
- Organophosphate or anticholinesterase toxicity
- Severe burns or eye injuries
- Tetanus

**ADVERSE REACTIONS AND SIDE EFFECTS**
- Prolonged respiratory depression
- Bradycardia (rare tachycardia or hypertension)
- Hypersalivation and bronchospasm

**DOSAGE**
**Succinylcholine (20mg/mL)**
**Adult:** 1 mg/kg IV over 30-60 seconds

**Pediatric:**
- 1 year and below: 2 mg/kg IV/IM
- 2 years and above: 1 mg/kg IV/IM
### 5.34 Tetracaine Hydrochloride 0.5% Eye Drops

**ACTIONS**
Tetracaine is an ophthalmic solution that anesthetizes the eyes. The onset of anesthesia usually begins within 20 seconds and lasts as long as 15 minutes.

**INDICATIONS**
Tetracaine is intended for use in the patient who is unable to cooperate with the provider in adequately flushing the eye(s) due to discomfort or pain. If flushing can be accomplished easily, tetracaine may not be needed.

**CONTRAINDICATIONS**
Allergy to any topical anesthetic.

**PRECAUTIONS**
Do not use the solution if it contains crystals, or if it is cloudy or discolored. Tetracaine eye drops are for topical ophthalmic use only - not for injection. The patient should be advised not to touch or rub the eye(s) until the effect of the anesthesia has worn off.

**DOSAGE Adult and Pediatric**
1 drop in each affected eye.
**5.35 Vecuronium Bromide (Norcuron®)**

**ACTIONS**
Vecuronium bromide is a short-acting, nondepolarizing skeletal muscle relaxant. Its binding with cholinergic receptor sites inhibits transmission of nerve impulses, antagonizing the action of acetylcholine. Vecuronium bromide has no analgesic properties, and the patient may be conscious but unable to communicate by any means. The first muscles affected are those of the eyes, face, and neck, followed by the limbs, abdomen, and chest; the diaphragm is affected last. Recovery usually occurs in the reverse order and may take longer than 60 minutes. With IV administration, the onset of action is in 30-60 seconds; peak action occurs in 3-5 minutes and the effects last for 30-60 minutes.

**INDICATIONS**
An authorized paramedic may induce general anesthesia to facilitate intubation.

**PRECAUTIONS**
Vecuronium bromide causes respiratory paralysis—supportive airway control must be continuous and under direct observation at all times. Myasthenia gravis and other neuromuscular diseases increase sensitivity to the drug.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Hypersensitivity reactions are possible.

**DOSAGE**
- **Adult and Pediatric** (over 10 years): 0.08 - 0.1 mg/kg; slow administration over 30-60 seconds IV. Dose is usually 5-7 mg for an average-size adult.
- **Pediatric** (1-9 years of age): May require a higher dose.
5.36 Ondansetron hydrochloride (Zofran®)

**ACTIONS**
Ondansetron hydrochloride (Zofran) blocks serotonin receptors (5HT3) found in the neurons of the gastrointestinal system and in the area of the brain that controls nausea and vomiting.

**INDICATIONS**
Nausea and vomiting

**PRECAUTIONS**
Ondansetron can be associated with a prolongation of the QT interval. Therefore, do not use Ondansetron in patients with a known long QT interval or who are taking medications that are known to prolong the QT interval. Arrhythmias believed to be caused by prolongation of the QT interval should be treated immediately with IV Magnesium Sulfate (Protocol 2.3.6). Zofran ODT contains Phenylalanine which is aspartame artificial sweetener found in Equal. May cause an allergic reaction to patients allergic to aspartame.

**ADVERSE REACTIONS AND SIDE EFFECTS**
Hypersensitivity reactions are possible. Common side effects of Ondansetron include abdominal pain, anxiety, diarrhea, fever, dizziness, drowsiness, constipation and headache. Uncommon side effects of Ondansetron include chest pain, decrease in blood pressure, itch, rash, tremor and uncontrolled muscle movements.

**DOSAGE**

**Adult**
- **Oral** 4 mg PO disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose of 8 mg
- **Injection** 4 mg slow IV push over 2-3 minutes OR IM lateral thigh. May be repeated once if no improvement within 10-15 minutes. Do not exceed 8 mg total dosage

**Pediatric**
- **Oral**
  - Less than 20 kg: Do NOT administer
  - 20 kg - 39 kg (5-11 year): 4 mg oral disintegrating tablet (ODT) placed under the tongue. Dose may not be repeated
  - 40 kg or more (12 year or older): 4 mg oral disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose of 8 mg
- **Injection**
  - Less than 40 kg: 0.1 mg/kg SLOW IV over 2-3 minutes or IM (preferably in the lateral thigh). Do not repeat.
  - 40 kg or more: 4 mg. SLOW IV push over 2-3 minutes or IM (preferably in the lateral thigh) May be repeated once if no improvement within 30 minutes. Do not exceed 8 mg total dosage.
Florida Regional Common

EMS Protocols

Section 6

Appendix

5th Edition, Version 1, March 1, 2017
## Appendix Section Table of Contents

6.1 Abdominal Pain Differential  
6.2 Abuse  
   6.2.1 Report of Abuse  
   6.2.2 Signs of Child Abuse  
   6.2.3 Signs of Elderly Abuse  
6.3 APGAR Score  
6.4 Burns  
   6.4.1 Burns Severity Categorization  
   6.4.2 Burns Rule of Nines  
6.5 Chest Pain Differential  
6.6 Consent for the Care of a Minor  
6.7 Dive Accident Checklists  
   6.7.1 Dive History Profile  
   6.7.2 Dive Accident Signs and Symptoms  
   6.7.3 Dive Accident Rapid Field Neurological Exam Record  
6.8 Emergency Worker Rehabilitation Form  
6.9 Glasgow Coma Scale Score  
   6.9.1 Adult Glasgow Coma Scale Score  
   6.9.2 Pediatric Glasgow Coma Scale  
6.10 Types of EMS Information  
   6.10.1 Types of Care  
   6.10.2 Types of EMS Providers  
   6.10.3 Types of EMS Units  
   6.10.4 Types of Patients  
6.11 Hospital Information  
   6.11.1 Hospital Capabilities  
   6.11.2 Hospital Capabilities Worksheet *see on-line form*  
   6.11.3 Hospital List  
6.12 Infectious Disease Exposure  
   6.12.1 Exposure Form  
6.13 IV Drip Calculations  
6.14 Medical Abbreviations  
6.15 Medical Terminology  
6.16 Pediatric Vital Signs  
6.17 Phone Numbers  
6.18 Safe Haven for Newborns  
   6.18.1 Birth Mother Questionnaire  
6.19 Sepsis Alert Form  
6.20 Stroke Forms  
6.21 Trauma Transport Protocol  
   6.21.1 County Unified Trauma Telemetry – CUTT form
### 6.1 Abdominal Pain Differential

<table>
<thead>
<tr>
<th>Upper GI Bleed</th>
<th>Lower GI Bleed</th>
<th>Gynecological</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of peptic ulcer disease; can cause massive hemorrhage</td>
<td>May be occult or bright red; a common cause of orthostatic hypotension and undetected anemia</td>
<td>Think ectopic! if the patient is still having menses; diagnosis includes: 1. Lower abdominal pain 2. Hypotension 3. Shoulder pain 4. Vaginal bleeding +/- 5. Syncope</td>
</tr>
</tbody>
</table>

#### Common Causes Associated with the Different Types of Presenting Pain

<table>
<thead>
<tr>
<th>Upper GI Bleed</th>
<th>Lower GI Bleed</th>
<th>Gynecological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal varices (history of cirrhosis, hepatitis)</td>
<td>Diverticulitis</td>
<td>Ectopic pregnancy</td>
</tr>
<tr>
<td>Peptic ulcer disease</td>
<td>Hemorrhoids</td>
<td>Pelvic inflammatory disease/STDs</td>
</tr>
<tr>
<td>Aspirin, NSAIDS</td>
<td>Cancer</td>
<td>Ovarian cyst</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Inflammatory bowel disease</td>
<td>Kidney/urinary infection</td>
</tr>
<tr>
<td>Ingestion of caustic substances</td>
<td>Chronic diarrhea, overuse of laxatives</td>
<td>Endometriosis</td>
</tr>
</tbody>
</table>

#### Back Pain

<table>
<thead>
<tr>
<th>Upper GI Bleed</th>
<th>Lower GI Bleed</th>
<th>Gynecological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal aortic aneurysm</td>
<td>Bowel obstruction</td>
<td>Ruptured appendix</td>
</tr>
<tr>
<td>Cholelithiasis</td>
<td>Renal obstruction/“kidney stones”</td>
<td>Ruptured ovarian cyst</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>Gallbladder obstruction</td>
<td>Pelvic inflammatory disease (PID)</td>
</tr>
<tr>
<td>Perforated ulcer</td>
<td>Ulcerative colitis</td>
<td>Perforated ulcer</td>
</tr>
<tr>
<td>Perforated ulcer</td>
<td>Crohn’s disease</td>
<td>Peritonitis, advanced</td>
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</tbody>
</table>

#### Common Causes Associated with the Different Types of Presenting Pain

<table>
<thead>
<tr>
<th>Back Pain</th>
<th>Colicky Pain</th>
<th>Peritoneal Pain</th>
<th>Vomiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal aortic aneurysm</td>
<td>Bowel obstruction</td>
<td>Ruptured appendix</td>
<td>Infection of GI tract</td>
</tr>
<tr>
<td>Cholelithiasis</td>
<td>Renal obstruction/“kidney stones”</td>
<td>Ruptured ovarian cyst</td>
<td>Ulcers</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>Gallbladder obstruction</td>
<td>Pelvic inflammatory disease (PID)</td>
<td>Toxic ingestions</td>
</tr>
<tr>
<td>Perforated ulcer</td>
<td>Ulcerative colitis</td>
<td>Perforated ulcer</td>
<td>Bowel obstruction</td>
</tr>
<tr>
<td>Perforated ulcer</td>
<td>Crohn’s disease</td>
<td>Peritonitis, advanced</td>
<td>Stones of the gallbladder or kidney</td>
</tr>
</tbody>
</table>

Reference: Bosker G, MD; Sequeira M, MD, FACED; Weins D, MD, FACEP: The 60-Second EMT: Rapid BLS/ALS Assessment, Diagnosis, and Triage, 2nd edition, Mosby, St. Louis, MO, 1996
6.2.1 Report of Abuse
415.504 Mandatory reports of child abuse or neglect; mandatory reports of death; central abuse hotline.  
(1) Any person, who knows, or has reasonable cause to suspect, that a child is an abused, abandoned, or neglected child shall report such knowledge or suspicion to the department.

415.511 Immunity from liability in cases of child abuse or neglect.  
(1) (a) Any person, official, or institution participating in good faith in any act authorized or required by FS 415.502-415.514, or reporting in good faith any instance of child abuse to any law enforcement officer shall be immune from any civil or criminal liability which might otherwise result by reason of such action.

415.513 Penalties relating to abuse reporting.  
(1) A person who is required by FS 415.504 to report known or suspected child abuse or neglect; and who knowingly and willfully fails to do so, or who knowingly or willfully prevents another person from doing so, is guilty of a misdemeanor of the second degree.

Report Elder Abuse or Neglect

The Florida Department of Elder Affairs is committed to ensuring the safety and well-being of the elders in Florida. The Department works in conjunction with the Department of Children and Families (DCF) Adult Protective Services (APS) and the Aging Network to protect disabled adults or elderly persons from further occurrences of abuse, neglect or exploitation. Services provided may include protective supervision, placement and in-home and community-based services.

How To Report Child, Elder Abuse, Neglect and Exploitation

By Phone: Call Florida Abuse Hotline at 1-800-96-ABUSE (1-800-962-2873). Press 1 to report suspected abuse, neglect or exploitation of the elderly or a vulnerable adult, press 2 to report abuse, neglect or abandonment of a child. This toll free number is available 24/7. TDD (Telephone Device for the Deaf): 1-800-453-5145

By Fax: To make a report via fax, please send a detailed written report with your name and contact telephone to 1-800-914-0004.
6.2.2 Signs of Child Abuse

PHYSICAL ASSESSMENT SUGGESTIVE OF CHILD ABUSE
1. Fractures in children younger than 2 years of age.
2. Injuries in various stages of healing.
3. Frequent injuries.
4. Bruises or burns in patterns (e.g., iron or cigarette burns, cord marks, bite or pinch marks, and bruises to head, neck, back, or buttocks).
5. Widespread injuries over the body.
6. Obvious physical neglect (malnutrition, lack of cleanliness).
7. Inappropriate dress (e.g., very little clothes in winter).

HISTORY SUGGESTIVE OF CHILD ABUSE
1. The history does not match with the nature or severity of the injury.
2. The parents’ and/or caregivers’ account is vague or changes.
3. The “accident” is beyond the capabilities of the child (e.g., a 12-month-old who burns himself/herself by turning on the hot water in the bathtub).
4. There is a delay in seeking help.
5. The parent and/or caregiver may be inappropriately unconcerned about the child’s injury.

CHARACTERISTICS OF THE ABUSED CHILD
1. If younger than 5 years old, is likely to be passive.
2. If older than 5 years of age, is likely to be aggressive.
3. Does not look to the parent (the abuser) for support, comfort, or reassurance.
4. May cry without any expectation of receiving help.
5. May be quiet and withdrawn.
6. May be fearful of the parent (the abuser).

CHARACTERISTICS OF THE ABUSER
1. Crosses all religious, ethnic, occupational, educational, and socioeconomic boundaries.
2. May resent or reject the child.
3. May have feelings of worthlessness about self or about the child.
4. May have unrealistic expectations of what the child is capable of doing.
5. May be very critical of the child.
6. Often times is repeating what the abuser learned as a child (the abuser was more than likely abused as a child).
7. May be overly defensive rather than concerned.
### 6.2.3 Abuse - Signs of Elderly Abuse
6.2.3 Signs of Elderly Abuse (information from the Florida Department of Elder Affairs)

The Power to Prevent Elder Abuse
Physical signs may include cuts, puncture wounds, burns, bruises, welts, dehydration or malnutrition, poor coloration, sunken eyes or cheeks, soiled clothing or bed, or lack of necessities such as food, water or utilities.

Behavioral Signs of Abuse:
Behavioral signs may include fear, anxiety, agitation, anger, isolation, withdrawal, depression, non-responsiveness, resignation, ambivalence, contradictory statements, implausible stories, hesitation to talk openly, confusion or disorientation.

What Is Abuse?
Physical Abuse Pushing, striking, slapping, kicking, pinching, restraining, shaking, beating, burning, hitting, shoving or other acts that can cause harm to an elder.

Emotional or Psychological Abuse: verbal berating, harassment, intimidation, threats of punishment or deprivation, criticism, demeaning comments, coercive behavior or isolation from family and friends.

Financial or Material Exploitation: Improper use of an elder's funds, property, or assets; cashing checks without permission; forging signatures; forcing or deceiving an older person into signing a document; using an ATM/debit card without permission.

Sexual Abuse: Nonconsensual sexual contact of any kind including assault or battery, rape, sodomy, coerced nudity or sexually explicit photographing.

Self-neglect: When individuals fail to provide themselves with whatever is necessary to prevent physical or emotional harm or pain.
6.3 APGAR Score

The APGAR score should be used in newborns at 1 and 5 minutes after birth. If the patient is not immediately improving after birth, see Pediatric Protocol 3.4.1, Newborn Resuscitation.

The APGAR score occurs right after the baby's birth. The test is designed to quickly evaluate a newborn's physical condition after delivery and to determine any immediate need for extra medical or emergency care.

The acronym stands for: Activity, Pulse, Grimace, Appearance, and Respiration.

The APGAR test is performed at 1 minute after birth, and again at 5 minutes after birth.

Five factors are used to evaluate the baby's condition and each factor is scored on a scale of 0 to 2:
- appearance (skin coloration)
- pulse rate (heart)
- grimace response (medically known as "reflex irritability")
- activity and muscle tone
- breathing (rate and effort)

These five factors together to calculate the APGAR score. Scores obtainable are between 10 and 0, with 10 being the highest possible score.

<table>
<thead>
<tr>
<th>APGAR Scoring</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (skin color)</td>
<td>Normal color all over (hands and feet are pink)</td>
<td>Body pink, hands and feet bluish</td>
<td>Bluish-gray or pale all over</td>
</tr>
<tr>
<td>Pulse Rate (heart rate)</td>
<td>Normal (above 100 beats per minute)</td>
<td>Less than 100 beats per minute</td>
<td>Absent (no pulse)</td>
</tr>
<tr>
<td>Grimace (irritability response to flick on sole&quot;)</td>
<td>Vigorous cry Pulls away, sneezes, or coughs with stimulation</td>
<td>Some motion, Weak cry</td>
<td>Absent (no response to stimulation)</td>
</tr>
<tr>
<td>Activity (muscle tone)</td>
<td>Active, spontaneous movement</td>
<td>Some flexion of extremities</td>
<td>Flaccid, limp</td>
</tr>
<tr>
<td>Respiratory (rate and effort)</td>
<td>Normal rate and effort</td>
<td>Slow or irregular breathing</td>
<td>Absent (no breathing)</td>
</tr>
</tbody>
</table>

A baby who scores a 7 or above on the test at 1 minute after birth is generally considered in good health.
6.4 Burns
### 6.4.1 Burn Classification

<table>
<thead>
<tr>
<th>Burn Classification</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor burn injury</td>
<td>First-degree (1°) burn Second-degree (2°) burn &lt; 15% BSA in adults Second-degree (2°) burn &lt; 5% BSA in children/elderly Third-degree (3°) burn &lt; 2% BSA</td>
</tr>
<tr>
<td>Moderate burn injury</td>
<td>Second-degree (2°) burn 16-25% BSA in adults Second-degree (2°) burn 5-20% BSA in children/elderly Third-degree (3°) burn 2-10% BSA</td>
</tr>
<tr>
<td>Major burn injury</td>
<td>Second-degree (2°) burn &gt; 25% BSA in adults Second-degree (2°) burn &gt; 20% BSA in children/elderly Third-degree (3°) burn &gt; 10% BSA Burns involving the hands, face, eyes, ears, feet, or perineum Most patients with inhalation injury, electrical injury, concomitant major trauma, or significant preexisting diseases</td>
</tr>
</tbody>
</table>

### 6.4.2 Rules of Nine

![Rules of Nine Diagram]

- Upper arm: 9%
- Lower arm: 9%
- Upper leg: 18%
- Lower leg: 18%
- Abdomen: 18%
- Back: 18%
- Total body surface area: 100%
# 6.5 Chest Pain Differential

<table>
<thead>
<tr>
<th></th>
<th>Myocardial Infarction</th>
<th>Angina Pectoris</th>
<th>Dissecting Aneurysm</th>
<th>Pericarditis</th>
<th>Peptic Ulcer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>Usually sudden</td>
<td>Exertional/</td>
<td>Acute</td>
<td>Subacute</td>
<td>Acute/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>emotional</td>
<td></td>
<td></td>
<td>subacute</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Crushing heaviness, dull pressure, band like, constricting squeezing, burning, bursting</td>
<td>Discomfort, choking, pressing squeezing, strangling constricting, bursting, burning</td>
<td>Deep tearing, shearing, “knife-like”</td>
<td>Sharp</td>
<td>Burning</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Substernal, may vary</td>
<td>Substernal</td>
<td>Substernal</td>
<td>Substernal, more left-substernal sided</td>
<td>Epigastric</td>
</tr>
<tr>
<td><strong>Radiation</strong></td>
<td>Across mid-Occasionally thorax, anterior arms, shoulder, neck, jaw, teeth, fingers</td>
<td>Same as MI</td>
<td>Back lumbar region</td>
<td>Usually none occasionally tip of shoulder, neck, flank</td>
<td>back</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>Usually &gt; 30 minutes</td>
<td>5-15 minutes</td>
<td>Hours</td>
<td>Hours</td>
<td>Hours</td>
</tr>
<tr>
<td><strong>Provocation</strong></td>
<td>Usually none, see comments</td>
<td>Exercise, excitement, stress, cold, meals</td>
<td>None</td>
<td>Worsened: lying down, breathing, swallowing, coughing, twisting</td>
<td>Alcohol, lack of food, acidic foods</td>
</tr>
<tr>
<td><strong>Alleviation</strong></td>
<td>None</td>
<td>Rest, NTG</td>
<td>None</td>
<td>Tripod position, Shallow respirations</td>
<td>Antacids food</td>
</tr>
<tr>
<td><strong>Comments</strong></td>
<td>After heavy meals, severe emotional stress S/S: SOB, N&amp;V, pallor, diaphoresis, impending doom, elderly-atypical</td>
<td>May be nocturnal</td>
<td>Sudden onset, may subside spontaneously or be associated with paralysis</td>
<td>May be with URI, flu, Prone- styl, hydralazine, lupus; may be febrile</td>
<td>ASA, NSAIDs (e.g., Voltaren Feldene, Naprosyn Motrin, Advil) may trigger</td>
</tr>
</tbody>
</table>
6.5 Chest Pain Differential (continued)
<table>
<thead>
<tr>
<th>Onset</th>
<th>Pancreatitis</th>
<th>Esophageal Rupture Costochondritis</th>
<th>Pulmonary Embolism</th>
<th>Esophageal Spasm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute/subacute</td>
<td>Acute</td>
<td>Sudden or gradual</td>
<td>Subacute</td>
<td>Sudden or gradual</td>
</tr>
<tr>
<td>Quality</td>
<td>Severe or dull</td>
<td>Severe</td>
<td>Sharp or dull</td>
<td>Sharp superficial,</td>
</tr>
<tr>
<td>Location</td>
<td>Epigastric</td>
<td>Retrosternal</td>
<td>Multiple</td>
<td>Anterior/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lateral costochondral junction</td>
</tr>
<tr>
<td>Radiation</td>
<td>Back</td>
<td>Lateral</td>
<td>None</td>
<td>Jaw, either arm</td>
</tr>
<tr>
<td>Duration</td>
<td>Hours</td>
<td>Hours</td>
<td>Variable</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5-60 minutes</td>
<td>Variable</td>
</tr>
<tr>
<td>Provocation</td>
<td>Alcohol, trauma, gallbladder disease</td>
<td>Swallowing</td>
<td>Respiration s, cough</td>
<td>Spontaneous, cold liquids, recumbency</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Movement, palpation, cough respirations</td>
</tr>
<tr>
<td>Alleviation</td>
<td>Time</td>
<td>None</td>
<td>None</td>
<td>Antacids occasionally NTG</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Time, heat, analgesia</td>
</tr>
<tr>
<td>Comments</td>
<td>May be viral (e.g., mumps)</td>
<td>Alcoholics with forceful vomiting; associated with pleural effusion, shock, and hydro-pneumothorax</td>
<td>May have hemoptysis, signs of peripheral phlebitis, cough, and fever</td>
<td>Mimics angina, may occur after meals, at night with an acid taste, sensation—linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Signs and symptoms: fever, cough, URI</td>
</tr>
</tbody>
</table>
6.6 Consent for the Care of a Minor

EMANCIPATION: FLORIDA STATUTE 326
Freedom of a child from legal subjection to parents/guardians and having the right to labor for himself/herself and collect and control the person’s own wages is called “emancipation.”

- Emancipation of a child may be in writing.
- Emancipation of a child may be by parol (word of mouth).
- Emancipation of a child may be expressed or implied from the parents’ conduct, which makes further obedience of the child difficult.
- Emancipation cannot result merely from a minor child giving birth and becoming a parent.

Emancipation becomes a matter of law when a minor leaves home permanently, secures his/her own living quarters, and becomes completely self supporting, with the parents paying none of his/her bills. Once emancipation is established, the parent is no longer liable for the child’s debts, including those for “necessities” such as medical treatment.

REMOVAL OF DISABILITIES OF NON-AGE (COURT-ORDERED EMANCIPATION): FLORIDA STATUTE 743.075
The court may determine that the removal of disability of non-age (minor) at least 16 years of age, is in the child’s best interest and shall enter an order to that effect. This order shall give a minor the status of an adult for purposes of all criminal and civil laws of the state. The judgment is recorded in the county where the minor resides, and a certified copy shall be issued as proof.

MARRIED MINORS
Any minor who is married, even if divorced or widowed, may give consent.

UNWED PREGNANT MINOR OR MINOR MOTHER - CONSENT TO MEDICAL CARE: FLORIDA STATUTE 743.065
- An unwed pregnant minor may consent to care relating to her pregnancy.
- An unwed minor mother may consent to care for her child.
6.7.1 Dive History Profile
**DIVE HISTORY/PROFILE** Complete as much as possible.

1. Type of Dive: Rescue ____ Commercial ____ Recreational ____

2. Type of Gas Used: Compressed Air ____ Nitrox ____ Heliox ____ Other _____________

3. Water Type: Contaminated ____ Fresh ____ Salt ____

4. Water Temperature: ___________

5. Number of Dives in the Past Several Days: _______

List Each Dive with:
- Maximum Depth
- Bottom Time
- Surface Interval

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>_________</td>
<td>_________</td>
<td>_________</td>
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<tr>
<td>_________</td>
<td>_________</td>
<td>_________</td>
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<tr>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
</tbody>
</table>

6. Time of Last Ascent: _____________


8. Problems During Dive (e.g., Buoyancy, Clearing Ears, Equipment):

9. Possible Contact with Dangerous Marine Life: _______

10. Fly After Diving: ______ How Long After: _____________

11. Alcohol Ingestion: _____ When: _____ Quantity: ____________________________

12. Dive Workload (e.g., Currents, Hard Work, Over-weighted):

13. Any Post-dive Physical Activity: ____________________________________________

14. Dive Buddy: _____ Is He/She Present? _____ Name and Phone Number:

15. Other Witnesses (Names and Phone Numbers):

16. Statements and Other Information:
6.7.2 Dive Accident Signs and Symptoms

Dive Accident: Signs and Symptoms Enter “Y” (yes) or “N” (no). Explain where needed.

1a. Joint Pain _____ 1b. Location ________________________________
2a. Head Pain ____ 2b. Location ________________________________
3a. Chest Pain ____ 3b. Location ________________________________
3c. Increase with Inspiration or Cough _____ 3d. Radiates _____
3e. Location ________________________________
4a. Abdominal Pain _____ 4b. Encircling Pain _____
5a. Unconsciousness _____ 5b. When ________________________________
6a. Difficulty Breathing _____ 6b. Rapid Respirations _____
7. Convulsions _____
8. Confused/Disoriented _____
9. Extremity Edema _____
10a. Rash ____ 10b. Blotching _____ 10c. Itching _____
11. Shock _____
12. Weakness/Fatigue _____
13a. Numbness _____ 13b. Tingling _____ 13c. Decreased Sensation _____
13d. Location ________________________________
14a. Faintness _____ 14b. Dizziness _____
15a. Difficulty Urinating _____
15b. Difficulty Moving Bowels _____
16a. Difficulty Hearing _____ 16b. Which Ear? __________
18a. Staggering _____ 18b. Paralysis _____ 18c. Location ________________________________
19. Visual Disturbances _____
20a. Apnea _____ 20b. Bloody Froth from Mouth _____ 20c. Cough _____
21a. Cyanosis _____ 21b. Location ________________________________
22a. Feeling of Blow to Chest During Dive _____ 22b. When? ________________________________
6.7.3 Dive Accident Rapid Field Neurological Exam Record
**Dive Accident Rapid Field Neurological Exam Record** Answer yes or no.

**Mental Status: Does He/She Know**
1a. His/her name?_______ 1b. Where he/she is?_______ 1c. Time of day?_______ 1d. Most recent activity?_______ 1e. Speech is clear, correct?_______

**Sight**
2a. Correctly counts fingers?_______ 2b. Vision clear?_______

**Eye Movement**
3a. Move all four directions?_______ 3b. Nystagmus absent?_______

**Facial Movements**
4a. Teeth clench okay?_______ 4b. Able to wrinkle forehead?_______ 4c. Tongue moves all directions?_______ 4d. Smile symmetrical?_______

**Head/Shoulder Movements**
5a. Adam’s apple moves?_______ 5b. Shoulder shrug normal, equal?_______ 5c. Head movements normal, equal?_______

**Hearing**
6a. Normal for that diver?_______ 6b. Equal in both ears?_______

**Sensations:** Present, Normal, and Symmetrical Across
7a. Face?_______ 7b. Chest?_______ 7c. Abdomen?_______ 7d. Arms (front)?_______ 7e. Hands?_______ 7f. Legs (front)?_______ 7g. Feet?_______ 7h. Back?_______ 7i. Arms (back)?_______ 7j. Buttocks?_______ 7k. Legs (back)?_______

**Muscle Tone:** Present, Normal, and Symmetrical for
8a. Arms?_______ 8b. Legs?_______ 8c. Hand grips?_______ 8d. Feet?_______

**Balance and Coordination**
9a. Romberg okay?_______ 9b. If supine, heel-shin slide okay?_______ 9c. Alternating hand movements okay?_______
### 6.8 Emergency Worker Rehabilitation Form

<table>
<thead>
<tr>
<th>Florida Regional Common EMS Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strenuous Activity – Medical Evaluation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident #</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Unit #</td>
</tr>
<tr>
<td>Date</td>
<td>Last Assign</td>
</tr>
</tbody>
</table>

#### Time of Evaluation:
- **Pulse Rate**
  - SpO2
  - SpCO
- **BP**
- **Injuries/Illness?**
  - Y N Y N Y N Y N
- **Oral Temperature**
  - Other

#### Pre-Training or Initial Evaluation

#### All Workers Hydrated With 16oz. Water or Electrolyte Solution

<table>
<thead>
<tr>
<th>Time of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Rate</strong></td>
</tr>
<tr>
<td>SpO2</td>
</tr>
<tr>
<td>SpCO</td>
</tr>
<tr>
<td><strong>BP</strong></td>
</tr>
<tr>
<td><strong>Injuries/Illness?</strong></td>
</tr>
<tr>
<td>Y N Y N Y N Y N</td>
</tr>
<tr>
<td><strong>Oral Temperature</strong></td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

#### Second [10 minutes] Evaluation

- Vomiting, Diarrhea, Heat Exhaustion in the last 72 hours
- Large open skin wounds / rash
- Insulin-using diabetic has not eaten in the past 4 hours
- Wheezing or congested lungs
- Respirations < 8 or > 40
- Pulse over 120 or irregular
- SpO2 < 94%
- SpCO > 8% after oxygen
- Oral Temp. > 100.6F or < 90F
- Systolic BP > 180 or < 100 mmHg
- Dizziness
- Need for Transport (see below)

#### Deny Return to Duty if

<table>
<thead>
<tr>
<th>Time of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Rate</strong></td>
</tr>
<tr>
<td>SpO2</td>
</tr>
<tr>
<td>SpCO</td>
</tr>
<tr>
<td><strong>BP</strong></td>
</tr>
<tr>
<td><strong>Injuries/Illness?</strong></td>
</tr>
<tr>
<td>Y N Y N Y N Y N</td>
</tr>
<tr>
<td><strong>Oral Temperature</strong></td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

#### Third [20 minutes] Evaluation

### Consider Transport of Emergency Worker to Hospital if symptoms are present for longer than 20 minutes:
- Respirations < 8 or > 40
- Pulse rate over 120 BPM
- SpO2 ≤ 92%
- SpCO > 8% after oxygen
- Oral Temperature > 101F or < 90F
- Systolic BP > 180 or < 100 mmHg

### Transport Emergency Worker to hospital immediately if any of the signs below are present:
- Irregular Pulse (acute onset)
- Altered Mental Status
- Symptoms of Heat Stroke
- Significant Injury
- Shortness of Breath
- Chest Pain
- Severe Headache
- SpCO > 25%

<table>
<thead>
<tr>
<th>Heat Index</th>
<th>Comments</th>
</tr>
</thead>
</table>

RE022514

Return completed form to EMS Division
6.9 Glasgow Coma Scale
6.9.1 Adult Glasgow Coma Scale Score (GCS)

**EYE OPENING**

4. Spontaneous: At this point, with no further stimulation, the patient has eyes open.
3. To Voice: If the patient’s eyes are unopened, a request to “open your eyes” should be spoken, and if necessary, should be shouted.
2. To Pain: If verbal stimulation is unsuccessful in eliciting eye opening, the standard painful stimulus is applied. NOTE: Document if eyes are closed due to swelling, facial injuries, or other causes.
1. None: No eye opening.

**BEST VERBAL RESPONSE**

5. Oriented: After the patient is aroused, he/she is asked who he/she is, where he/she is, and what the year and month are. If accurate answers are obtained, this is recorded as oriented.
4. Confused: Although the patient is unable to give correct answers to previous questions, he/she is capable of producing complete phrases, sentences, and even conversational exchange.
3. Inappropriate Words: The patient speaks or exclaims only a word or two. Such a response is usually obtained only by physical stimulation rather than a verbal stimulus, although occasionally a patient will shout obscenities or call relatives names for no apparent reasons.
2. Incomprehensible Words: The patient’s response consists of groans, moans, or indistinct mumbling and does not contain any intelligible words.
1. No Verbal Response: Prolonged and, if necessary, repeated stimulation does not produce any phonation.

**BEST MOTOR RESPONSE**

6. Obey Commands: This requires an ability to comprehend instructions, usually given in some form of verbal commands but sometimes by gestures and writing. The patient is required to perform the specific movements requested. The command is given to hold up two fingers (if physically feasible); the patient should respond appropriately.
5. Localizes Pain: If the patient does not obey commands, a painful stimulus may be applied as firm pressure to the sternum or nail bed for 5 seconds. The patient should reach to and/or try to remove source of pain.
4. Withdrawals: After painful stimulus:
   - Elbow flexes, Rapid movement, No muscle stiffness, Arm is drawn away from the torso
3. Flexion Response: After painful stimulation:
   - Slow movement, Accompanied by stiffness, Forearm and head held against the body, Limbs assume hemiplegic position
2. Extension Response: After painful stimulation:
   - Legs and arms extend, Accompanied by stiffness, Internal rotation of shoulder and forearm
1. None: No motor response.

Note: The Glasgow Coma Scale measures cognitive ability. Therefore, if injury (chronic or acute) has caused paraplegia or quadriplegia, alternate methods of assessing motor response must be used (e.g., ability to blink eyes = obeys commands).
### 6.9 Glasgow Coma Scale

#### 6.9.1 Adult Glasgow Coma Scale Score (GCS)

<table>
<thead>
<tr>
<th>Eye Opening (E)</th>
<th>Glasgow Coma Score</th>
<th>Motor Response (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4=Spontaneous</td>
<td>5=Normal conversation</td>
<td>6=Normal</td>
</tr>
<tr>
<td>3=To voice</td>
<td>4=Disoriented conversation</td>
<td>5=Localizes to pain</td>
</tr>
<tr>
<td>2=To pain</td>
<td>3=Words, but not coherent</td>
<td>4=Withdraws to pain</td>
</tr>
<tr>
<td>1=None</td>
<td>2=No words......only sounds</td>
<td>3=Decorticate posture</td>
</tr>
</tbody>
</table>

Total = E+V+M

#### 6.8.2 Pediatric Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>&gt; 1 Year</th>
<th>&lt; 1 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Spontaneously</td>
<td>Spontaneously</td>
</tr>
<tr>
<td>3</td>
<td>To verbal command</td>
<td>To verbal command</td>
</tr>
<tr>
<td>2</td>
<td>To pain</td>
<td>To pain</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Best Motor Response</th>
<th>&gt; 1 Year</th>
<th>&lt; 1 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Obey</td>
<td>Localizes pain</td>
</tr>
<tr>
<td>5</td>
<td>Localizes pain</td>
<td>Flexion—normal</td>
</tr>
<tr>
<td>4</td>
<td>Flexion—withdrawal</td>
<td>Flexion—abnormal (decorticate rigidity)</td>
</tr>
<tr>
<td>3</td>
<td>Flexion—abnormal (decorticate rigidity)</td>
<td>Extension (decerebrate rigidity)</td>
</tr>
<tr>
<td>2</td>
<td>Extension (decerebrate rigidity)</td>
<td>No response</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Best Verbal Response</th>
<th>&gt; 5 Years</th>
<th>&lt; 2-5 Years</th>
<th>0-23 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Oriented and converses</td>
<td>Appropriate words and phrases</td>
<td>Smiles, coos, cries appropriately</td>
</tr>
<tr>
<td>4</td>
<td>Disoriented and converses</td>
<td>Inappropriate words</td>
<td>Cries</td>
</tr>
<tr>
<td>3</td>
<td>Inappropriate words</td>
<td>Cries and/or screams</td>
<td>Inappropriate crying and/or screaming</td>
</tr>
<tr>
<td>2</td>
<td>Incomprehensible</td>
<td>Grunts</td>
<td>Grunts</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>
6.10 Types of EMS Information
6.10.1 Types of Care
Basic Life Support: All medical care that is classified as BLS by the State of Florida and outlined in these protocols.
Advanced Life Support: All medical care, in addition to BLS care, that is classified as ALS by the State of Florida and outlined in these protocols.

6.10.2 Types of EMS Providers
Paramedic: Being certified by the State of Florida as a Paramedic enables the provider to administer Basic and Advanced Life Support as outlined in these protocols.
EMT: Being certified by the State of Florida as an EMT enables the provider to administer Basic Life Support as outlined in these protocols.
Emergency First Responder: A provider (e.g., firefighter, lifeguard, police officer) who is not certified as a Paramedic or EMT.

6.10.3 Types of EMS Units
Advanced Life Support Transport - An ambulance (e.g., freightliner rescue) that is licensed by the State of Florida to carry ALS equipment and transport patients in an ALS capacity.
Advanced Life Support Non-transport - An emergency vehicle (e.g., fire engine) that is licensed by the State of Florida to carry ALS equipment, but does not transport patients.
Advanced Life Support Helicopter - An air ambulance (rescue helicopter) that is licensed by the State of Florida to carry ALS equipment and transport patients in an ALS capacity.

6.10.4 Types of Patients
Adult: For trauma a patient who is 16 years of age or older, medical patients 18 years of age or older.
The definition of pediatric patients will be described below. It is imperative to understand that the medical decision making for a pediatric patient should be based on the definitions provided below.
Transport (destination) decisions should be made using the Hospital Capability Form.

Pediatric Medical Decision Definitions:
Newborn: A patient who has just been delivered.
Neonate: A patient who is younger than 6 weeks of age.
Infant: A patient who is under 1 year of age.
Child: A patient ranging from 1 year of age to puberty (pubic hair, facial hair, breast development)
Adolescent: A patient who has reached puberty. Treat these patients using adult protocols.

Transport Decision Definitions:
Pediatric: Trauma patient -15 years of age or younger
Medical patients - 17 years of age or younger.
6.11.1 Hospital Information

6.11.1 Hospital Capabilities

All hospitals licensed under Chapter 395, Florida Statutes, are required to accept patients via their emergency departments in accordance with Chapter 395.1041, Florida Statutes, and other state and federal laws. However, some patients may require specialized treatment not available at every hospital. It is these specialized care capabilities that should be considered when determining a transport destination. In most cases, patients with medical needs that do not require specialized care would be transported to the closest hospital emergency room. For those patients who require specialized care, the following hospital capabilities should be considered.

TRAUMA CENTER
These hospitals are able to provide specialized trauma care and have been designated as a Trauma Center as defined in Chapter 395.4001, Florida Statutes. Adult trauma patients who meet Adult Trauma Alert Criteria must be transported to a Level 1 or Level 2 Trauma Center, if available (General Protocol 1.10). Pediatric patients who meet Pediatric Trauma Alert Criteria must be transported to a Pediatric Trauma Referral Center, if available (General Protocol 1.10).

MATERNITY (OB) HOSPITAL
These hospitals are able to provide specialized obstetric care, including labor and delivery services in accordance with the guidelines established by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and Agency for Health Care Administration (AHCA).

PRIMARY STROKE CENTER
These hospitals are able to provide specialized care to stroke patients in accordance with the standards outlined by the American Stroke Association (ASA) or JCAHO and AHCA, and have been designated by the State of Florida as Stroke Centers.

COMPREHENSIVE STROKE CENTER (CSC)
Hospitals shall ensure that stroke centers establish specific procedures for screening patients that recognize that numerous conditions, including cardiac disorders, often mimic stroke in children. Stroke centers should ensure that transfer to an appropriate facility for specialized care is provided to children and young adults with known childhood diagnoses. A hospital’s program may be designated as a Comprehensive Stroke Center on the basis of that hospital providing to the Agency for Health Care Administration an affidavit signed by the Chief Executive Officer of the hospital that the program has received initial Primary Stroke Center designation as provided in paragraph 59A-3.2085(15)(a), F.A.C:

PSYCHIATRIC TREATMENT CENTER
These hospitals are able to provide specialized care to psychiatric patients in accordance with Chapter 394, Florida Statute. All patients who have been “Baker Acted” (General Protocol 1.2) should be transported to the closest hospital, as defined in Chapter 395, Florida Statutes, for medical clearance prior to transport to a mental health facility that does not meet the requirement for a hospital in Chapter 395, Florida Statutes.
6.11.1 Hospital Capabilities (continued)

INTERVENTIONAL CARDIOVASCULAR CENTER
These hospitals are able to provide specialized cardiac care and have been designated as Interventional Cardiac Centers by JCAHO or AHCA. These hospitals will be able to provide the following services:

1. An Emergency Department with dedicated chest pain triage, treatment, interventional beds, and staffing. Must have immediate 12-lead ECG capabilities available in the ED.
2. 24 hour/day, 7 day/week committed receiving station (fax machine and/or electronic receiving station) in the ED for transmission of prehospital ECGs.
3. 24 hour/day, 7 day/week interventional cardiology catheterization lab availability within 30 minutes of prehospital field notification and ED confirmation via 12-lead ECG transmission.
   a. Documented track record of at least 20 acute coronary non-elective (from ED to cath lab) interventions per year.
   b. 24 hour/day emergency cardiac surgery availability, which does not have to be “in-house.”
   c. 24 hour/day left ventricular (LV) assist capabilities, including intra-aortic balloon pump (IABP) insertion and maintenance.
   d. One on-call interventional team per participating interventional facility that will respond upon ED notification.
4. An interventional cardiologist on call, 24 hour/day, 7 day/week. Must have a track record that meets all ACC guidelines, with optimal outcomes and acceptable complication rates, and must be signed off by the Cath Medical Director.
5. Documented volume of at least 200 acute MI patients admitted to the hospital per year.
6. Dedicated coronary care unit with sufficient beds and staff to accommodate acute MI and sudden death patients with ROSC.
7. Identification of a research coordinator/administrator to track and release treatment and patient outcomes of patients transported to the facility by Fire Rescue personnel.
### 6.11.2 & 6.11.3 Hospital Information

**6.11.2 Hospital Categorization** available on - [www.gbemda.org](http://www.gbemda.org) under forms

**6.11.3 Broward County Hospital List** also available on - [www.gbemda.org](http://www.gbemda.org) under forms

#### Broward County Hospital List
Revised March 2014

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Address</th>
<th>ER Phone</th>
<th>Fax</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Broward Health Coral Springs</strong></td>
<td>3000 Coral Hills Dr., Coral Springs</td>
<td>#954-344-3018</td>
<td>#954-344-3389</td>
<td>Northwest side</td>
</tr>
<tr>
<td><strong>Broward Health Imperial Point</strong></td>
<td>6401 N. Federal Hwy., Ft. Lauderdale</td>
<td>#954-776-8610</td>
<td>#954-776-8521</td>
<td>Northwest side</td>
</tr>
<tr>
<td><strong>Broward Health Medical Center #10601 Trauma Center Adult &amp; Pediatric</strong></td>
<td>1600 S. Andrews Ave., Ft. Lauderdale</td>
<td>#954-235-5760</td>
<td>#954-235-5113</td>
<td>Northeast side</td>
</tr>
<tr>
<td><strong>Broward Health North Trauma Center Adult Only</strong></td>
<td>201 E. Sample Rd., Pompano Beach</td>
<td>#954-786-2179</td>
<td>#954-786-7340</td>
<td>North side</td>
</tr>
<tr>
<td><strong>Cleveland Clinic #10618</strong></td>
<td>1823 N Corporate Lakes Blvd., Weston</td>
<td>#954-689-5132</td>
<td>#954-689-5687</td>
<td>North side</td>
</tr>
<tr>
<td><strong>Florida Medical Center</strong></td>
<td>5000 W. Oakland Park Blvd., Lauderdale</td>
<td>#954-730-2893</td>
<td>#954-730-2839</td>
<td>South side</td>
</tr>
<tr>
<td><strong>Holy Cross Hospital</strong></td>
<td>4725 N. Federal Hwy., Ft. Lauderdale</td>
<td>#954-492-1842</td>
<td>#954-351-5930</td>
<td>West side</td>
</tr>
<tr>
<td><strong>Memorial Hospital South</strong></td>
<td>3600 W. Washington St., Hollywood</td>
<td>#954-985-6300</td>
<td>#954-985-6382</td>
<td>North side</td>
</tr>
<tr>
<td><strong>Memorial Hospital Miramar</strong></td>
<td>1901 SW 172 Ave., Miramar</td>
<td>#954-538-5101</td>
<td>#954-538-5107</td>
<td>Northwest side</td>
</tr>
<tr>
<td><strong>Memorial Hospital Pembroke #10612</strong></td>
<td>7500 Sheridan St., Pembroke Pines</td>
<td>#954-966-0231</td>
<td>#954-966-0231</td>
<td>West side</td>
</tr>
<tr>
<td><strong>Memorial Regional - Trauma Center Adult &amp; Pediatric #10617</strong></td>
<td>3501 Johnson St., Hollywood</td>
<td>#954-263-3401</td>
<td>#954-985-1493</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>Memorial Hospital West #10616</strong></td>
<td>703 N. Flamingo Road, Pembroke Pines</td>
<td>#954-438-1103</td>
<td>#954-430-4619</td>
<td>(secure)</td>
</tr>
<tr>
<td><strong>Northwest Medical Center</strong></td>
<td>2801 N. State Rd 7, Margate</td>
<td>#954-978-4100</td>
<td>#954-978-4146</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>Plantation General Hospital #10621</strong></td>
<td>401 NW 42 Ave., Plantation</td>
<td>#954-513-6470</td>
<td>#954-513-6677</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>University Hospital</strong></td>
<td>7201 N. University Dr., Tamarac</td>
<td>#954-724-6225</td>
<td>#954-724-6433</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>Westside Regional Medical Center #10631</strong></td>
<td>8201 W. Broward Blvd., Plantation</td>
<td>#954-476-3900</td>
<td>#954-236-0247</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>Aventura Medical Center – (Cade County)</strong></td>
<td>20900 Biscayne Blvd., Miami</td>
<td>#305-682-7290</td>
<td>#305-937-3909</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>Boca Raton Regional Hospital – (Palm Beach County)</strong></td>
<td>800 Meadow Rd., Boca Raton</td>
<td>#561-488-236</td>
<td>#561-488-2397</td>
<td>(nurse’s station)</td>
</tr>
<tr>
<td><strong>West Boca Medical Center – (Palm Beach County)</strong></td>
<td>21644 Florida 7, Boca Raton</td>
<td>#561-488-2397</td>
<td>#561-488-2397</td>
<td>(nurse’s station)</td>
</tr>
</tbody>
</table>
6.12 Personal Exposure to Infectious Diseases
PREVENTION AND IMMUNIZATION PRACTICES

Purpose Each employer shall identify “at risk” workers based on job descriptions. (OSHA CFR 1910.1030)

Risk Levels:

At-risk Workers. Emergency medical and public safety workers are at risk for exposure to blood, body fluids, feces and/or respiratory secretions.

Low-risk Workers. These workers are identified through job descriptions as having job tasks that are low or not “At-risk” to exposure to blood, body fluids, feces and/or respiratory secretions. For these workers timely postexposure prophylaxis rather than preexposure vaccination may be considered.

Special Risk Workers. Periodic evaluation of job description may be done as indicated to evaluate certain tasks that may be considered at a higher level.

History of Immunity. Workers who are “at risk” for exposure to and possible transmission of vaccine preventable diseases should have on record of employment all immunizations currently recommended by the US Public Health Service. A medical evaluation that includes childhood immunity or immunization history for Measles, Mumps, Rubella, Tetanus, Diphtheria, Polio, Pertussis (Whooping cough) and Varicella zoster (Chicken pox) should be obtained and recorded for these workers. This program should be completed at the time of hire or as part of a catch-up program. (CDC MMWR November 25, 2011/60(RR07); 1-45). (NFPA 1581; 2010ed., 4.5.2.1).

INFECTION CONTROL PROGRAMS.

Infection Control Officer. Employers shall identify a Designated Infection Control Officer.

Education. Workers shall have Bloodborne/Airborne Pathogen Training.

Immunization Programs. Employers with vaccination programs shall offer vaccine product information and declination statements as determined by CDC and OSHA regulation. Employers shall make vaccines available to workers who initially decline and later decides to accept the vaccines within 10 days.

Medical Records and Test Maintenance. All workers’ medical records, immunization records and baseline testing shall be maintained according to applicable laws governing medical confidentiality. (29 CFR 1910.1030(h)).

Needle-Stick Prevention Programs. Employers shall provide needleless systems (where applicable). Needleless systems means a device that does not use needles for: (1) The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established; (2) The administration of medication or fluids; or (3) Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps. (OSHA 29 CFR 1910.1030(e) (2)).
6.12 Personal Exposure to Infectious Diseases (continued)

**Hepatitis Vaccination Programs.** All “At-Risk” workers shall have made available to them at employment (within 10 days) of initial assignment the Hepatitis vaccine and education, unless the worker has documentation of the following: completed vaccination series, record of immunity (positive titer), or medical contraindications. (29 CFR 1910.1030(f) (2)). Hepatitis A vaccination is strongly recommended and may be offered if specific local conditions dictate. (NFPA 1581; 2010 ed., 4.5.2.1).

**Influenza Vaccination Programs.** “At-Risk” Workers are considered to be at significant risk for acquiring or transmitting influenza (the common Flu). Influenza vaccine should be made available to workers from October through February annually. (CDC MMWR November 25, 2011/60(RR07);1-45) (NFPA 1581).

**Tdap Vaccination Programs.** “At-Risk” Workers are considered to be at significant risk for acquiring or transmitting tetanus toxoid, diphtheria toxoid and acellular pertussis. Tdap vaccines should be made available to workers from October through February annually. (CDC MMWR November 25, 2011/60(RR07);1-45).

**Periodic Titer Screening for Immunizations.** Routine periodic post vaccination screening is not recommended after initial titer level has been determined. Booster doses are not currently recommended. If the US Public Health Service recommends a routine booster dose(s) at a future date, such booster dose(s) shall be made available. (29 CFR 1910.1030(f) (1) (ii).

**BASELINE AND ANNUAL SCREENING**

**Baseline Screening.** Baseline screening for TB, Hepatitis A, B and C is indicated for presumptive laws requirements. Meningitis is also covered in the presumptive law but does not require a baseline screening. (FS 112.181 6(a) (b)). (Florida Pension Statue for police and firefighters only)

**TB Screening.** A tuberculin skin test (PPD) or Quantiferon-TB (CPT 84480) Test shall be performed for all “at-risk” annually. Workers who have previously tested negative and now test positive shall have a baseline chest x-ray and one follow-up a year later. All new positive TB test results shall have prophylactic treatment offered. (CDC MMWR 1994:43(RR13) or for Quantiferon MMWR 2003: January 31 (RR02; 15-18).
POSTEXPOSURE MANAGEMENT

- Provide personal first aid.
- Remove contaminated clothing
- Secure area to prevent further contamination.
- Wash the area well with soap and water or personal protective solution.
- Notify Supervisor
- Assess the level of exposure (Significant or non-significant)

**Notification and Relief of Duty.** The worker’s supervisor should be notified if a worker experiences an occupational exposure involving potentially infectious material. The supervisor should determine if the worker needs to be relieved of duty.

**Assess the level of Exposure.** An Occupational exposure is the “exposure to another person’s body fluids or airborne fluids. There are two types of occupational exposures, non significant and significant.

**Non-Significant Exposure.** Non-Significant exposures are occupational exposures that have little to no risk of transmission of diseases known at this time. All Non-Significant exposures need to be documented on the “Infectious Disease Exposure Report Form”, so at a later date said occupation exposure be reported by the CDC as having an increased risk, the exposure was documented.

**Significant Exposure.** Significant Exposures have increased risk of transmission and acquiring of disease(s). All Significant exposures need documentation and medical follow-up.

**Assessing Exposures to Blood or Body Fluids.** A significant bloodborne or body fluid exposure

**Body Fluids:**
- Blood, Serum, and all fluids visibly contaminated with blood
- Pleural, amniotic, peritoneal, synovial, and cerebrospinal fluids
- Uterine/vaginal secretions, semen, feces and urine
- Saliva

**Action or Injury:**
- Percutaneous (through the skin injuries such as, needlestick, laceration, abrasion, bites, ect.)
- Mucous membranes (e.g. eyes, nose, mouth)
- Nonintact skin (e.g. cut, chapped or abraded skin). Consider the larger the area and/or the longer the material is in contact, the more difficult it is to verify that all relevant skin area is intact. Also, an increased risk if within 2 hours of shaving skin and scabs <24 hours, if skin is still open.

**Assess the Exposure to droplets or airborne exposure.** A significant airborne exposure is considered a combination of a source exhibiting signs/symptoms of suspected airborne illness and an incident that would place the worker at risk of droplet or airborne exposure.

Source: Any aerosolized exhalations containing droplets, sputum, lung secretions or saliva either by the source coughing, spitting, breathing or by any airway management action by the worker such as suctioning or intubating AND the worker was not wearing appropriate respiratory protection (HEPA mask, eye protection).

Actions by worker that have increased risk of airborne disease spread include; unprotected mouth-to-mouth CPR, and airway management.
REPORTING, MEDICAL ATTENTION, CONSENT AND TESTING

Report the Exposure. The worker or supervisor should begin filling out an Infectious Disease Exposure Form” and submit it to the Designated Infection Control Officer.

Transport. A significantly exposed worker should be transported to a designated facility within 2 hours for evaluation, testing and treatment options (preferably a facility that offers rapid HIV testing if the material was blood or body fluids). The worker and the source patient should be transported to the same medical facility.

Triage. The worker should be rapidly triaged as soon as possible. The worker should present to the medical facility an Infectious Disease Exposure reporting Form and an Employer Information Sheet that contains specific information about the employer, the employee’s Designated Infection Control Officer, the employee’s worker compensation policy, and employers medical providers information for follow-up care.

Consent and Counseling. Counseling shall be provided to and consent obtained from both source of the exposure and the exposed worker (29 CFR 1910.1030(f) (3)). The Worker’s Compensation carrier will incur cost of testing for source and worker.

Informed Consent. Source and exposed worker consent to physician authorizing testing. The source will not incur any cost of said testing.

No Consent. (e.g. source is unconscious or denies consent) If consent cannot be obtained from the source of the exposure and blood sample is available, the facility can conduct testing without consent and the attending physician documents the need in the medical record of the worker.

Note: Florida’s Omnibus AIDS Act provides for a court order for the source to comply and have testing completed. In this case, prophylaxis treatment may not be completed in a timely manner, medical protocol provides for an “unknown source” category.

Postexposure Testing for Blood and Body Fluids. The facility should perform an Acute Hepatitis Panel (CPT 80074), Rapid HIV and RPR (Syphilis) tests. Testing maybe added as per attending physician request.

Postexposure Testing for droplets or airborne exposure. Focus on airborne droplet exposure is focused on alerting the medical facility that a significant exposure has occurred. Testing is administered by the facility targeting a myriad of airborne diseases. If TB exposure is suspected a tuberculin skin test (PPD) or Quantiferon (CPT 84480) following the exposure should be performed on source and exposed worker. Do not perform tuberculin skin test (PPD) on an exposed worker who has been tested within the previous 12 weeks, or has a history of positive skin test reaction.

Hospital Notification. If no exposure was reported to the medical facility, and the medical facility determined through testing that an increased risk of disease transmission may have occurred, shall notify the agency of such event within 48 hours after determination. (F.S. Ryan White Act)

Discharge. The Infectious Disease Exposure Reporting form should be complete with a discharge summary that includes a description of all diagnostic tests performed on the worker. A copy of the form is routed to the Designated Infection Control Officer and a copy is provided to the worker.

Postexposure Medical Follow-Up. The employer is responsible to provide or make available postexposure monitoring as directed by the medical provider. Follow-up testing from blood and body fluid exposures will be performed after the initial, at week six, week twelve and week twenty-six after the exposure. Testing after one year maybe indicated for high-risk significant exposures.
6.12 Personal Exposure to Infectious Diseases (continued)
<table>
<thead>
<tr>
<th>AIRBORNE DROPLET</th>
<th>Transmission</th>
<th>Prevention</th>
<th>Post Exposure</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis (TB)</td>
<td>Droplets: coughing, sneezing, intubation, suctioning, mouth to mouth resuscitation.</td>
<td>Annual PPD or Quantiferon. Wear HEPA / N-95 masks.</td>
<td>Source=PPD, or Quantiferon. Employee= PPD unless PPD tested within prior 12 weeks or previously PPD reactive or Quantiferon.</td>
<td>PPD at week 12 post exposure. If new positive: CRX and Rx with Isoniazid (INH) for 9 months.</td>
</tr>
<tr>
<td>Varicella Zoster (Chicken Pox)</td>
<td>Close contact, droplets: coughing, sneezing, intubation, suctioning. Also direct contact with vesicle fluid.</td>
<td>Vaccine=1 shot (Varivax). HEPA mask. BSI</td>
<td>Treatment: Varicella Zoster Immune Globulin (VZIG) within 96 hours of exposure.</td>
<td>As determined by medical professional.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BLOODBORNE</th>
<th>Transmission</th>
<th>Prevention</th>
<th>Post Exposure</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>Percutaneous, Mucous Membranes, and Non Intact Skin,</td>
<td>OSHA BBP, BSI. No Vaccine.</td>
<td>See PEP Flow Chart.</td>
<td>Periodic screening: 6, 12, 26 weeks after exposure.</td>
</tr>
<tr>
<td>Syphilis</td>
<td>Percutaneous, Mucous Membranes, and Non Intact Skin,</td>
<td>OSHA BBP, BSI No Vaccine.</td>
<td>Source=RPR, Employee=RPR. RX Penicillin.</td>
<td>Repeat test at 3 and 6 months, if positive refer for FTA</td>
</tr>
<tr>
<td>HBV</td>
<td>Percutaneous, Mucous Membranes, and Non Intact Skin,</td>
<td>Vaccine=3 shot series. Titer and reimmunize if necessary. OSHA BBP, BSI</td>
<td>Source=Acute Hep panel. Employee=Acute Hep panel. If source positive, employee not immune: administer immune globulin and consider vaccine series at this time.</td>
<td>If unvaccinated, periodic screening: 6, 12, 26 weeks after exposure. If positive titer no further TX is needed.</td>
</tr>
<tr>
<td>HCV</td>
<td>Percutaneous, Mucous Membranes, and Non Intact Skin,</td>
<td>No Vaccine. OSHA BBP, BSI</td>
<td>Source=Acute Hep Panel. Employee=Acute Hep Panel.</td>
<td>Periodic screening: 6, 12 and 26 weeks after exposure. If source positive, consider employee qualitative HCV RNA &amp; ALT testing 6 weeks post exposure. If employee becomes HCV RNA positive, treat as determined by medical professional.</td>
</tr>
</tbody>
</table>
### Personal Exposure to Infectious Diseases (continued)

#### INFECTIOUS EXPOSURE REFERENCE SHEET 2014

<table>
<thead>
<tr>
<th>OTHER</th>
<th>Transmission</th>
<th>Prevention</th>
<th>Post Exposure</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAV</td>
<td>Fecal/Oral. Also, has blood to blood precautions.</td>
<td>Vaccine = 2 shot series.</td>
<td>Source=Acute Hep Panel.</td>
<td>Periodic screening: 12 weeks after exposure or if symptoms occur. If positive titer no further TX is needed.</td>
</tr>
<tr>
<td>Tetanus</td>
<td>Soiled object causing open wound.</td>
<td>Vaccine good for 10 years.</td>
<td>If no vaccine, administer at this time.</td>
<td>Seek medical care if symptoms of tetanus develop: lockjaw, rigid muscles.</td>
</tr>
<tr>
<td>Lyme Disease</td>
<td>Tick-borne: tick attached 24 hours.</td>
<td>Avoid tick infested areas.</td>
<td>Antibiotics: Amoxicillin, Doxycycline</td>
<td>As determined by medical professional.</td>
</tr>
<tr>
<td>Methicillin-Resistant Staphylococcus Aureaus (MRSA)</td>
<td>Direct contact: Skin, open sores, vesicles, mucous membranes, bedding/clothing, nursing homes</td>
<td>BSI</td>
<td>Clean, disinfect. Alcohol based antibacterial hand cleaners. If illness presents seek medical attention.</td>
<td>As determined by medical professional.</td>
</tr>
<tr>
<td>Scabies</td>
<td>Direct contact: mite infested areas, bedding/clothing, nursing homes</td>
<td>Avoid infested areas.</td>
<td>Lindane or Kwell applied to the whole body overnight.</td>
<td>Close supervision of treatment including bathing.</td>
</tr>
</tbody>
</table>
HEPA masks  A personal protective device worn on the face to remove particles equal to and greater than 0.3 microns (which essentially includes all bacteria, spores and viruses).

PPD  A method of assessing whether someone has become infected with M. tuberculosis complex. The test involves measurement of a subject's immune response to an injection of tuberculin purified protein derivative (PPD) manufactured from killed Mycobacterium tuberculosis bacilli. Also referred to as tuberculin skin tests or PPD tests.

Vesicle fluid  The serum from the blister formed during a varicella zoster infection.

VZIG  Varicella Zoster Immune Globulin.

Qualitative HCV-RNA.  Blood test to detect the presence of Hepatitis C virus.

ALT  Blood test to measure a liver-specific enzyme which indicates liver cell death or inflammation.


BSI  Body Substance Isolation

Standard Precautions  Precautions that should be utilized on all patient contact

QuantiFERON-TB Gold In-Tube test (QFT)  Is a highly-specific controlled blood test for use as an aid to the diagnosis of infection with bacteria responsible for TB and provides results showing an individual's T-cell response to highly specific antigens from the TB bacterium.
### 6.12.1 Personal Exposure Form

Also available on-line www.gbemda.com under forms

<table>
<thead>
<tr>
<th>INFECTIOUS DISEASE EXPOSURE FORM</th>
<th>(check one) Significant</th>
<th>Non-Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency Name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case/Alarm, Report #:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure Date:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure Time:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EXPOSED EMPLOYEE INFORMATION

<table>
<thead>
<tr>
<th>Last Name:</th>
<th>First Name:</th>
<th>Middle Initial:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td>City, State, Zip:</td>
<td></td>
</tr>
<tr>
<td>Contact Phone #:</td>
<td>Work Phone #:</td>
<td></td>
</tr>
<tr>
<td>Employer Name:</td>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Employment Category:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOURCE INFORMATION - (the person you came in contact with)

Source History (check all that apply): HIV/AIDS, Hepatitis A/B/C, Meningococcal Infection, TB

Source Last Name:  | First Name:          | Middle Initial: |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Address:</td>
<td>City, State, Zip:</td>
<td></td>
</tr>
<tr>
<td>Contact Phone #:</td>
<td>Work Phone #:</td>
<td></td>
</tr>
<tr>
<td>Occupation:</td>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Gender: Male [ ]</td>
<td>Female [ ]</td>
<td></td>
</tr>
</tbody>
</table>

### EXPOSURE DESCRIPTION

- What fluid were you in contact with? (check all that apply): Blood/Serum [ ], Any fluid visibly contaminated with blood [ ]
- Pleural [ ], Amniotic Fluid [ ], Peritoneal [ ], Vomit [ ], Synovial [ ], Cerebrospinal Fluids [ ], Urine/Vaginal Secretions [ ]
- Sperm [ ], Feces [ ], Urine [ ], Saliva[ ], Cough/Sputum [ ], Other Fluids [describe]:

- What was the method of contact? (check all that apply): Needlestick/Sharps [ ], Laceration [ ], Abnormal [ ], Bite [ ], Splash [ ]

### List all areas exposed:

Eyes [ ], Nose [ ], Mouth [ ], Other [specify]:

Nonintact Skin (cut, chapped or abraded skin): [ ] more than 24-hrs old, [ ] less than 24-hrs old

### List any personal protective equipment used at time of exposure:

- Gloves [ ], Tyvek Sleeves [ ], Eye Protection [ ], Mask [ ], Other [specify]:

### What immediate action was taken in response to the exposure to remove the contaminant? (check all that apply):

- Washed area [ ], Eye/nose/mouth with [ ], Other [specify]:

### Did you seek medical attention? No [ ] Yes [ ] (if yes, next section must be completed)

### TO BE COMPLETED BY THE MEDICAL FACILITY

Facility Name:  | Attending Physician: |
|----------------|----------------------|

Date of Arrival: | Time of Arrival: | Approximate time elapsed since exposure: |
|-----------------|-----------------|----------------------------------------|

Testing (check all that apply): PPD/Quantiferon [ ], Chest X-ray [ ], Acute HCV Panel [HCV/HBV/HIV] [ ], HIV [ ], PPD [ ]

Other [specify]:

- Was treatment provided? No [ ] Yes [ ] (specify):

- Was medication/prescription given? No [ ] Yes [ ] (specify):

Follow-up?

### SIGNATURES

Employee Signature:  | Date: |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection Control Office/Designee Signature:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
6.13 IV Drip Calculations
**Amiodarone**

SVT/VT with a Pulse OR if the patient converts out of VF or Pulseless VT using electricity:

Adult
Mix 150 mg in 50 mL of D₅W
Dosage: 150 mg over 8-10 min Using a macrodrip (10 gtt/mL): Run at 60-75 gtt/min

Pediatric:
Mix 5 mg/kg in 50 mL of D₅W
Dosage: 5 mg/kg over 8-10 minutes, using a macrodrip (10gtt/mL): Run at 60-75 gtt/min.

**Dopamine**

Mix 400 mg in 250 mL of D₅W, Concentration = 1600 mcg/mL, Dosage: 5-15 mcg/kg/min
Using a microdrip (60 gtt/mL):
15 gtt/min = 400 mcg/min
30 gtt/min = 800 mcg/min
45 gtt/min = 1200 mcg/min
60 gtt/min = 1600 mcg/min
Alternative: Mix 400 mg in 500 mL of D₅W Concentration = 800 mcg/mL

Using a microdrip (60 gtt/mL):
30 gtt/min = 400 mcg/min
60 gtt/min = 800 mcg/min
90 gtt/min = 1200 mcg/min
120 gtt/min = 1600 mcg/min

Quick Calculation:
Take the patient’s weight in pounds, drop the last number, and then subtract 2. This will give you the starting drip rate at 5 mcg/kg/min. For every change in micrograms, add or subtract 3 drops.

Example:
Patient weighs 175 lb; Drop last number (5) from 175 = 17, 17 - 2 = 15
5 mcg/kg/min = 15 gtt/min
6 mcg/kg/min = 15 + 3 = 18 gtt/min
(This quick calculation gives a very close approximate dose.)
6.13 IV Drip Calculations (continued)

**Epinephrine**
Mix 1 mg of 1:10,000 in 250 mL D5W Concentration = 4 mcg/mL Dosage: 2-10 mcg/min
Using a microdrip (60 gtt/mL): 15 gtt/min = 1 mcg/min
30 gtt/min = 2 mcg/min
45 gtt/min = 3 mcg/min
60 gtt/min = 4 mcg/min
75 gtt/min = 5 mcg/min
90 gtt/min = 6 mcg/min
105 gtt/min = 7 mcg/min
120 gtt/min = 8 mcg/min
135 gtt/min = 9 mcg/min
150 gtt/min = 10 mcg/min

**Magnesium Sulfate**
Eclamptic Seizures: Mix 4 g in 50 mL of D5W, Concentration = 80 mg/mL, Dosage: 4 g over 5-10 min, Using a macrodrip (10 gtt/min): Run at 58-116 gtt/min

Torsades de Pointes and VF: Mix 1-2 g in 50 mL of D5W, Concentration = 20-40 mg/mL, Dosage: 1-2 g over 1-2 min, Using a macrodrip (10 gtt/min): Run at 270 gtt/min

Maintenance:
Mix 1 g in 250 mL of D5W, Concentration = 4 mg/mL, Dosage: 2-4 mg/min
Using a microdrip (60 gtt/mL):
30 gtt/min = 2 mg/min
45 gtt/min = 3 mg/min
60 gtt/min = 4 mg/min
6.14 Medical Abbreviations
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abd</td>
<td>abdominal</td>
</tr>
<tr>
<td>ABG</td>
<td>arterial blood gas</td>
</tr>
<tr>
<td>A/C</td>
<td>Antecubital fossa</td>
</tr>
<tr>
<td>ACLS</td>
<td>Advanced Cardiac Life Support</td>
</tr>
<tr>
<td>ADL</td>
<td>Activities of daily living</td>
</tr>
<tr>
<td>AF</td>
<td>Arterial fibrillation</td>
</tr>
<tr>
<td>AICD</td>
<td>Automatic implantable cardiac defibrillator</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>ALS</td>
<td>Advanced Life Support</td>
</tr>
<tr>
<td>AK</td>
<td>Above the knee</td>
</tr>
<tr>
<td>a.m.</td>
<td>Morning</td>
</tr>
<tr>
<td>a.m.a</td>
<td>Against medical advise</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute myocardial infarction</td>
</tr>
<tr>
<td>amp</td>
<td>ampule; amputation</td>
</tr>
<tr>
<td>A.P.</td>
<td>Anteriorposterior</td>
</tr>
<tr>
<td>ARC</td>
<td>AIDS – related complex</td>
</tr>
<tr>
<td>ARDS</td>
<td>Acute respiratory distress syndrome</td>
</tr>
<tr>
<td>ATV</td>
<td>All-terrain vehicle</td>
</tr>
<tr>
<td>BLS</td>
<td>Basic Life Support</td>
</tr>
<tr>
<td>BK</td>
<td>Below the knee</td>
</tr>
<tr>
<td>BM</td>
<td>Bowel movement</td>
</tr>
<tr>
<td>BP</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>bpm</td>
<td>Beats per minute</td>
</tr>
<tr>
<td>BSA</td>
<td>Body surface area (burns)</td>
</tr>
<tr>
<td>BSI</td>
<td>Body substance isolation</td>
</tr>
<tr>
<td>BVM</td>
<td>Bag-valve mask</td>
</tr>
<tr>
<td>C</td>
<td>Calorie; Celsius</td>
</tr>
<tr>
<td>CAB</td>
<td>Circulation Airway, breathing</td>
</tr>
<tr>
<td>CABG</td>
<td>Coronary artery bypass graft</td>
</tr>
<tr>
<td>CBC</td>
<td>Complete blood count</td>
</tr>
<tr>
<td>CCU</td>
<td>Coronary care unit</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for disease control and prevention</td>
</tr>
</tbody>
</table>
### 6.14 Medical Abbreviations (continued)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF</td>
<td>Congestive heart failure</td>
</tr>
<tr>
<td>cm</td>
<td>Centimeter</td>
</tr>
<tr>
<td>CNS</td>
<td>Central nervous system</td>
</tr>
<tr>
<td>CO</td>
<td>Carbon monoxide; cardiac output</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>CP</td>
<td>Cerebral palsy</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous positive airway pressure</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiopulmonary resuscitation</td>
</tr>
<tr>
<td>CS</td>
<td>Cesarean section</td>
</tr>
<tr>
<td>CSF</td>
<td>Cerebrospinal fluid</td>
</tr>
<tr>
<td>C-spine</td>
<td>Cervical spine</td>
</tr>
<tr>
<td>CVA</td>
<td>Cerebrovascular accident</td>
</tr>
<tr>
<td>CVL</td>
<td>Central Venous Line</td>
</tr>
<tr>
<td>D₅W</td>
<td>5% dextrose in water</td>
</tr>
<tr>
<td>D₂₅</td>
<td>Dextrose 25%</td>
</tr>
<tr>
<td>D₅₀</td>
<td>Dextrose 50%</td>
</tr>
<tr>
<td>DCAP-BLS</td>
<td>Deformity, contusions, abrasions, penetrations, burns, lacerations, and swelling</td>
</tr>
<tr>
<td>DIC</td>
<td>Disseminated intravascular coagulation</td>
</tr>
<tr>
<td>DKA</td>
<td>Diabetic ketoacidosis</td>
</tr>
<tr>
<td>DM</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>DNA</td>
<td>Deoxyribonucleic acid</td>
</tr>
<tr>
<td>DNR</td>
<td>Do not resuscitate</td>
</tr>
<tr>
<td>DNRO</td>
<td>Do not resuscitate order</td>
</tr>
<tr>
<td>DOA</td>
<td>Dead on arrival</td>
</tr>
<tr>
<td>DOB</td>
<td>Date of birth</td>
</tr>
<tr>
<td>DT</td>
<td>Delirium tremens</td>
</tr>
<tr>
<td>Dx</td>
<td>Diagnosis</td>
</tr>
<tr>
<td>ECG or EKG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>EDD</td>
<td>Estimated date of delivery</td>
</tr>
<tr>
<td>EEG</td>
<td>Electroencephalogram</td>
</tr>
<tr>
<td>EENT</td>
<td>Eye, ear, nose, throat</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>e.g.</td>
<td>For example</td>
</tr>
<tr>
<td>EMS</td>
<td>Emergency medical services</td>
</tr>
<tr>
<td>EMT</td>
<td>Emergency medical technician</td>
</tr>
<tr>
<td>ENT</td>
<td>Ears, nose, and throat</td>
</tr>
<tr>
<td>ER</td>
<td>Emergency room</td>
</tr>
<tr>
<td>ETA</td>
<td>Estimated time of arrival</td>
</tr>
<tr>
<td>ET tube</td>
<td>Endotracheal tube</td>
</tr>
<tr>
<td>F</td>
<td>Fahrenheit</td>
</tr>
<tr>
<td>f</td>
<td>Female</td>
</tr>
<tr>
<td>FBAO</td>
<td>Foreign body airway obstruction</td>
</tr>
<tr>
<td>GCS</td>
<td>Glasgow Coma Scale</td>
</tr>
<tr>
<td>g, gm</td>
<td>Gram</td>
</tr>
<tr>
<td>GERD</td>
<td>Gastroesophageal reflux disease</td>
</tr>
<tr>
<td>GI</td>
<td>Gastrointestinal</td>
</tr>
<tr>
<td>GSW</td>
<td>Gunshot wound</td>
</tr>
<tr>
<td>Gtt, gtt</td>
<td>drops</td>
</tr>
<tr>
<td>GU</td>
<td>Genitourinary</td>
</tr>
<tr>
<td>GYN</td>
<td>Gynecology</td>
</tr>
<tr>
<td>HAV</td>
<td>Hepatitis A virus</td>
</tr>
<tr>
<td>HBV</td>
<td>Hepatitis B virus</td>
</tr>
<tr>
<td>HBP</td>
<td>High blood pressure</td>
</tr>
<tr>
<td>HCV</td>
<td>Hepatitis C virus</td>
</tr>
<tr>
<td>HEENT</td>
<td>Head, ears, eyes, nose, and throat</td>
</tr>
<tr>
<td>Hgb</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
</tr>
<tr>
<td>h/o</td>
<td>History of</td>
</tr>
<tr>
<td>H2O</td>
<td>Water</td>
</tr>
<tr>
<td>H2O2</td>
<td>Hydrogen peroxide</td>
</tr>
<tr>
<td>HR</td>
<td>Heart rate</td>
</tr>
<tr>
<td>HTN</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Hx, hx</td>
<td>History</td>
</tr>
<tr>
<td>HTN</td>
<td>Hypertension</td>
</tr>
<tr>
<td>ICP</td>
<td>Intracranial pressure</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive care unit</td>
</tr>
</tbody>
</table>
### 6.14 Medical Abbreviations (continued)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDDM</td>
<td>Insulin dependant diabetic mellitus</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive care unit</td>
</tr>
<tr>
<td>IM</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>IN</td>
<td>Intra Nasal</td>
</tr>
<tr>
<td>IUD</td>
<td>Intraterine device</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>IVP</td>
<td>Intravenous push</td>
</tr>
<tr>
<td>J</td>
<td>Joule</td>
</tr>
<tr>
<td>JVD</td>
<td>Jugular vein distention</td>
</tr>
<tr>
<td>kg</td>
<td>Kilogram</td>
</tr>
<tr>
<td>KVO</td>
<td>Keep vein open</td>
</tr>
<tr>
<td>L</td>
<td>Liter</td>
</tr>
<tr>
<td>lb</td>
<td>Pound</td>
</tr>
<tr>
<td>L&amp;D</td>
<td>Labor and delivery</td>
</tr>
<tr>
<td>LDL</td>
<td>Lethal dose</td>
</tr>
<tr>
<td>LLE</td>
<td>Left lower extremity</td>
</tr>
<tr>
<td>LLL</td>
<td>Lower left lobe</td>
</tr>
<tr>
<td>LLQ</td>
<td>Lower left quadrant</td>
</tr>
<tr>
<td>limp</td>
<td>Last menstrual period</td>
</tr>
<tr>
<td>LOC</td>
<td>Level/loss of consciousness</td>
</tr>
<tr>
<td>LUE</td>
<td>Left upper extremity</td>
</tr>
<tr>
<td>LUL</td>
<td>Left upper lobe</td>
</tr>
<tr>
<td>LUQ</td>
<td>Left upper quadrant</td>
</tr>
<tr>
<td>m</td>
<td>Male</td>
</tr>
<tr>
<td>MAP</td>
<td>Mean arterial pressure</td>
</tr>
<tr>
<td>mcg</td>
<td>Microgram</td>
</tr>
<tr>
<td>MCI</td>
<td>Mass-casualty incident</td>
</tr>
<tr>
<td>MD</td>
<td>Muscular dystrophy; Medical doctor</td>
</tr>
<tr>
<td>MDI</td>
<td>Meter dose inhaler</td>
</tr>
<tr>
<td>mEq</td>
<td>Milliequivalent</td>
</tr>
<tr>
<td>mg</td>
<td>Milligram</td>
</tr>
<tr>
<td>min</td>
<td>Minute</td>
</tr>
<tr>
<td>mL</td>
<td>Milliliter</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
</tbody>
</table>
MS  mitral stenosis; multiple sclerosis, morphine sulfate
### 6.14 Medical Abbreviations (continued)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVA</td>
<td>Motor vehicle accident</td>
</tr>
<tr>
<td>MVC</td>
<td>Motor vehicle collision</td>
</tr>
<tr>
<td>N/A</td>
<td>Not applicable</td>
</tr>
<tr>
<td>NAD</td>
<td>No acute distress</td>
</tr>
<tr>
<td>NG</td>
<td>Nasogastric</td>
</tr>
<tr>
<td>NKA</td>
<td>No known allergies</td>
</tr>
<tr>
<td>NIDDM</td>
<td>Noninsulin dependant diabetes mellitus</td>
</tr>
<tr>
<td>NPO</td>
<td>Nothing by mouth</td>
</tr>
<tr>
<td>NS</td>
<td>Normal saline</td>
</tr>
<tr>
<td>NSR</td>
<td>Normal sinus rhythm</td>
</tr>
<tr>
<td>N&amp;V, N/V</td>
<td>Nausea and vomiting</td>
</tr>
<tr>
<td>O</td>
<td>Oxygen</td>
</tr>
<tr>
<td>OB</td>
<td>Obstetrics</td>
</tr>
<tr>
<td>OR</td>
<td>Operating room</td>
</tr>
<tr>
<td>os</td>
<td>Mouth</td>
</tr>
<tr>
<td>OTC</td>
<td>Over the counter</td>
</tr>
<tr>
<td>oz</td>
<td>ounce</td>
</tr>
<tr>
<td>PaCO₂</td>
<td>Partial pressure of CO₂ in arterial blood</td>
</tr>
<tr>
<td>PaO₂</td>
<td>Partial pressure of O₂ in arterial blood</td>
</tr>
<tr>
<td>PALS</td>
<td>Pediatric advanced life support</td>
</tr>
<tr>
<td>PDR</td>
<td>Physician’s Desk Reference</td>
</tr>
<tr>
<td>per</td>
<td>By</td>
</tr>
<tr>
<td>PERRLA</td>
<td>Pupils equal, regular, react to light and accommodation</td>
</tr>
<tr>
<td>pH</td>
<td>Hydrogen ion concentration</td>
</tr>
<tr>
<td>PIC</td>
<td>Percutaneous Intravenous Catheter</td>
</tr>
<tr>
<td>p.m.</td>
<td>Evening</td>
</tr>
<tr>
<td>PMD</td>
<td>Private medical doctor</td>
</tr>
<tr>
<td>PVC</td>
<td>Premature ventricular contraction</td>
</tr>
<tr>
<td>RBC</td>
<td>Red blood cell</td>
</tr>
<tr>
<td>RDS</td>
<td>Respiratory distress syndrome</td>
</tr>
<tr>
<td>RLE</td>
<td>Right lower extremity</td>
</tr>
<tr>
<td>RLL</td>
<td>Right lower lobe</td>
</tr>
<tr>
<td>RLQ</td>
<td>Right lower quadrant</td>
</tr>
<tr>
<td>R/O</td>
<td>Rule out</td>
</tr>
</tbody>
</table>
6.14 Medical Abbreviations (continued)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM</td>
<td>Range of motion</td>
</tr>
<tr>
<td>RR</td>
<td>Respiratory rate</td>
</tr>
<tr>
<td>RUE</td>
<td>Right upper extremity</td>
</tr>
<tr>
<td>RUL</td>
<td>Right upper lobe</td>
</tr>
<tr>
<td>RUQ</td>
<td>Right upper quadrant</td>
</tr>
<tr>
<td>SIDS</td>
<td>Sudden infant death syndrome</td>
</tr>
<tr>
<td>SOB</td>
<td>Shortness of breath</td>
</tr>
<tr>
<td>SUIDS</td>
<td>Sudden unexpected infant death syndrome</td>
</tr>
<tr>
<td>sq</td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>SpO₂</td>
<td>Percentage of oxygen in the blood as measured via pulse oximeter (equal to SaO₂)</td>
</tr>
<tr>
<td>SV</td>
<td>Stroke volume</td>
</tr>
<tr>
<td>T</td>
<td>Temperature</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis, tuberculin</td>
</tr>
<tr>
<td>TIA</td>
<td>Transient ischemic attack</td>
</tr>
<tr>
<td>THREAT</td>
<td>Threat suppression, Hemorrhage control, Rapid Extrication to safety, Assessment by medical providers, Transport to definitive care</td>
</tr>
<tr>
<td>TMJ</td>
<td>Temporomandibular joint</td>
</tr>
<tr>
<td>Tx</td>
<td>Treatment</td>
</tr>
<tr>
<td>URI</td>
<td>Upper respiratory infection</td>
</tr>
<tr>
<td>UTI</td>
<td>Urinary tract infection</td>
</tr>
<tr>
<td>WBC</td>
<td>White blood cell</td>
</tr>
<tr>
<td>WF/BF</td>
<td>White female/black female</td>
</tr>
<tr>
<td>WM/BM</td>
<td>White male/black male</td>
</tr>
<tr>
<td>WNL</td>
<td>Within normal limits</td>
</tr>
<tr>
<td>yo</td>
<td>Year old</td>
</tr>
</tbody>
</table>

**MISCELLANEOUS**
- Negative
+ Plus/positive
# Number
% Percent
@ At
Active Assailant: The Department of Homeland Security’s (DHS) definition of an active assailant is an individual actively engaged in killing or attempting to kill people in a confined, populated area; in most cases, active shooters use firearms and there is no pattern or method to their selection of victims.

Active Assailant Incident: Active assailant situations are unpredictable and evolve quickly; most are over within 10 to 15 minutes.

Aerosolized: In the form of ultramicroscopic solid or liquid particles dispersed or suspended in air or gas

Adult Patient: For trauma a patient who is 16 years of age or older, medical patients 18 years of age or older.

Amniotic Fluid: The serous liquid in which the embryo is suspended in the uterus.

Antibody: A protein substance produced in the blood or tissues in response to a specific antigen, such as a virus. Antibodies destroy or weaken bacteria and neutralize organic poisons, thereby forming the basis of immunity.

Asthma: Chronic inflammatory disease that can be acutely triggered by many irritants.

Ataxia: Staggered/unsteady gait that may be indicative of neurological impairment.

Baker Act: Florida Statutes, Chapter 394, which relate to the authorization of police, physicians, and the courts to dictate certain medical care for persons who pose a threat to themselves or to others.

Blood: Human blood, human blood components, and products made from human blood.

Bloodborne Pathogens: Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B, hepatitis C, human immunodeficiency virus (HIV), and syphilis.

BSI: Body Substance Isolation

Casualty Collection Point (CCP): A safe location(s) where fire rescue personnel can receive victims. Victims may have to be carried or dragged to the CCP. This may be inside a structure or exterior. This may be the same as the treatment area if located in the cold zone.

Cerebrospinal Fluid: The serum-like liquid that circulates through the ventricles of the brain and the cavity of the spinal cord.

Child Abuse: When persons intentionally inflict, or allow to be inflicted, physical or psychological injury to a child, which causes or results in risk of death, disfigurement, or distress.

Child Neglect: When an endangered child’s physical, mental, or emotional condition is impaired or because of failure of the legal guardian to supply basic necessities, including adequate food, clothing, shelter, education, or medical care

CISM: Critical incident stress management. Support and professional intervention provided after a significant traumatic event where personal coping mechanisms may become overwhelmed.

Competent: When individuals are able to understand the nature and consequences of their actions by refusing medical care and/or transportation.

Concealment: Concealment is a law enforcement term that represents an object that only provides protection from observation.
6.15 Medical Terminology (continued)
Contact Team: Contact team is a law enforcement term used to designate the team of law enforcement officers that make entry with the specific intention of ONLY to go after and to neutralize the perpetrator.

Cover: Cover is a law enforcement term that represents an object or location that provides protection from direct gunfire.

Contraindication: A factor that renders the administration of a drug or the carrying out of a medical procedure advisable.

Croup: A viral infection of the upper airway that causes edema/inflammation below the larynx and glottis, with a resultant narrowing of the lumen of the airway.

Decompression Sickness: A disorder resulting from a reduction of (“Bends”): surrounding pressure, such as during an ascent from a dive, and attributed to the formation of bubbles from dissolved gas in the body tissues. It is usually characterized by symptoms of pain and neurological dysfunction, which may range from subtle to very acute in nature.

DNRO: Do not resuscitate order; Florida HRS form 1896, provider notification of a patient’s/legal guardian’s wishes not to be resuscitated.

Drowning: Submersion in either fresh or saltwater, such that the person may or may not be conscious – fatal or non-fatal.

Epiglottitis: An acute infection and inflammation of the epiglottis that is potentially life-threatening.

HEPA Mask: A high-efficiency particulate air filter that is used as a personal protective device. It is worn over the nose and mouth to filter/remove bacteria, spores, and viruses whose size is equal to and greater than 0.3 micron. OSHA’s standard for respiratory protection requires that employees be trained in the use of respirators and that the mask be fit tested.

Hemiplegia: Weakness on a unilateral side of the body.

Improvised Explosive Device (IED): The Department of Defense (DOD) definition of an IED is a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military components, but is normally devised from nonmilitary components.

Influenza: An acute contagious viral infection characterized by inflammation of the respiratory tract and by fever, chills, and muscular pain.

Intubation: To insert a tube into a hollow organ or body passage.

Level 1: Actions authorized prior to physician contact.

Level 2: Actions expected or to be requested with physician contact.

Litter Bearer: A team of personnel assigned to Triage to move victims from the incident site to the treatment area or Transport Units.

Mantoux Test (PPD): A method of assessing whether someone has become infected with Mycobacterium tuberculosis complex. The test involves measurement of a subject’s immune response to an injection of tuberculin purified protein derivative (PPD) manufactured from killed M. tuberculosis bacilli. Also referred to as a tuberculin skin test or PPD test.

Mass Casualty Incident (MCI): The number of injured exceeds the capabilities of the first-arriving unit as well as for large-scale MCIs.
Medical Direction: The action of a licensed physician granting authority and accepting responsibility for the care provided by EMS; it includes participation in all aspects of EMS to ensure maintenance of accepted standards of medical practice.

Medication Access Point (MAP): Intermittent vascular access site (i.e., saline or heparin lock)

Miosis: Constricted pupils

Morgan Lens: Ocular irrigation device that is placed on the global surface

Nasopharyngeal Airway: The part of the pharynx above the soft palate that is continuous with the nasal passages.

Newborn: A patient who has just been delivered.

Neonate: A patient who is younger than 6 weeks of age.

Online Medical Control: The moment-to-moment contemporaneous medical supervision of EMS personnel caring for patients in the field by a licensed physician. It occurs via radio, telephone, or on-scene physicians.

OSHA BBP: Occupational Safety and Health Adm. Blood Borne Pathogen Precautions

Percutaneous: Passed, done, or effected through the skin.

Pericardial Fluid: The liquid suspended in the sac surrounding the heart.

Peritoneal Fluid: The liquid suspended in the body cavity that contains most of the abdominal and pelvic organs.

Plasma: The clear yellowish fluid portion of blood, lymph, or intramuscular fluid in which cells are suspended.

Pleural Fluid: The liquid matter contained in and around the body cavity that contains the lungs.

PPD: A method of assessing whether someone has become infected with M. tuberculosis complex. The test involves measurement of a subject's immune response to an injection of tuberculin purified protein derivative (PPD) manufactured from killed Mycobacterium tuberculosis bacilli. Also referred to as tuberculosis skin tests or PPD tests.

Post-exposure Prophylaxis (PEP, chemoprophylaxis): Prophylaxis means disease prevention. Post-exposure prophylaxis (PEP) means taking antiviral medications as soon as possible after exposure to a pathogen so that the exposure will not result in an infection.

PRN: As needed

QuantiFERON-TB Gold In-Tube test (QFT) - Is a highly-specific controlled blood test for use an aid to the diagnosis of infection with bacteria responsible for TB and provides results showing an individual's T-cell response to highly specific antigens from the TB bacterium.

Qualitative HCV-RNA.: Blood test to detect the presence of Hepatitis C virus.

Rapid HIV Testing: A laboratory method called Single-Use Diagnostic System (SUDS® HIV-1 Test) that detects and reports HIV antibody test results in the same day.
6.15 Medical Terminology (continued)
Rescue Task Force: Rescue personnel and Law Enforcement personnel formed to make entry into a structure to triage victims and provide life saving immediate treatment as needed i.e stopping hemorrhage.

SUIDS: Sudden Unexpected infant Death which includes SIDS and sleep related deaths.

START: Simple Triage And Rapid Treatment; A protocol that allows for assessing a large number of victims rapidly and can be used effectively by personnel with limited medical training

Seroconversion: Development of antibodies in blood serum as a result of infection or immunization.

Serum: The clear yellowish fluid obtained by separating whole blood into its solid and liquid components.

Sputum: Matter that is coughed up and usually ejected from the mouth, including saliva, foreign material, and substances such as mucus or phlegm from the respiratory tract.

Strike Team: Five of the same type of units, including common communications and leader (i.e., an ALS Transport Unit Strike Team would consist of five ALS Transport Units with a leader).

Synovial Fluid: The liquid that lubricates joints and nourishes cartilage.

Task Force: Five different types of units, including common communications and leader. MCI Task Force: May be two ALS Transport Units, two BLS Transport Units, and one Suppression Unit, including common communications and leader

Titer: A level of concentration of antibodies in a blood sample that shows whether exposure and subsequent immunity to an infectious disease are present.

Triage: The process for sorting and prioritizing injured people into groups based on their need for or likely benefit from immediate medical treatment in a medical setting

Vesicle fluid: The serum from the blister formed during a varicella zoster infection
## 6.16 Pediatric Vital Signs

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (kg)</th>
<th>Minimum Systolic BP</th>
<th>Normal Heart Rate</th>
<th>Normal Respiratory Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature</td>
<td>&lt; 2.5</td>
<td>40</td>
<td>120-170</td>
<td>40-60</td>
</tr>
<tr>
<td>Term</td>
<td>3.5</td>
<td>60</td>
<td>100-170</td>
<td>40-60</td>
</tr>
<tr>
<td>3 months</td>
<td>6</td>
<td>60</td>
<td>100-170</td>
<td>30-50</td>
</tr>
<tr>
<td>6 months</td>
<td>8</td>
<td>60</td>
<td>100-170</td>
<td>30-50</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>72</td>
<td>100-170</td>
<td>30-40</td>
</tr>
<tr>
<td>2 years</td>
<td>13</td>
<td>74</td>
<td>100-160</td>
<td>20-30</td>
</tr>
<tr>
<td>4 years</td>
<td>15</td>
<td>78</td>
<td>80-130</td>
<td>20</td>
</tr>
<tr>
<td>6 years</td>
<td>20</td>
<td>82</td>
<td>70-115</td>
<td>16</td>
</tr>
<tr>
<td>8 years</td>
<td>25</td>
<td>86</td>
<td>70-110</td>
<td>16</td>
</tr>
<tr>
<td>10 years</td>
<td>30</td>
<td>90</td>
<td>60-105</td>
<td>16</td>
</tr>
<tr>
<td>12 years</td>
<td>40</td>
<td>94</td>
<td>60-100</td>
<td>16</td>
</tr>
</tbody>
</table>

Typical blood pressure in children 1 to 10 years of age: $80 \text{ mm Hg} + (\text{child’s age in years} \times 2)$

Lower limits of systolic blood pressure in children 1 to 10 years of age: $70 \text{ mm Hg} + (\text{child’s age in years} \times 2)$
### 6.17 Phone Numbers
## OTHER RESOURCE NUMBERS

<table>
<thead>
<tr>
<th>Agency for Toxic Substance and Disease Registry (ATSDR)</th>
<th>(800) 232-4636</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemtrec</td>
<td>(800) 424-9300</td>
</tr>
<tr>
<td>Diver’s Alert Network (DAN) (Duke University)</td>
<td>(800) 446-2671 or 1-919-684-9111</td>
</tr>
<tr>
<td>Domestic Abuse Hotline</td>
<td>(800) 500-1119</td>
</tr>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td>(404) 562-8700 or (800)424-8802</td>
</tr>
<tr>
<td>Florida Abuse Hotline (800) 96 ABUSE</td>
<td>(800) 962-2873</td>
</tr>
<tr>
<td>Florida Department of Health - Bureau of EMS</td>
<td>(850) 245-4440</td>
</tr>
<tr>
<td>Poison Information Center</td>
<td>(800) 222-1222</td>
</tr>
<tr>
<td>Runaway Hotline</td>
<td>(800) 786-2929</td>
</tr>
</tbody>
</table>
6.18 Safe Haven for Newborns

A Safe Haven for Newborns
Fire/EMS Quick Reference Guide

Gloria M. Silverio Foundation 501(c)3 - "A Safe Haven for Newborns"
www.asafehavenfornewborns.com - Education/Training program.

Step 1
Recognize that a “Safe Haven Newborn” event is occurring and assure parent(s) remain anonymous by not making personal information available to any organization public or private.

Step 2
Notification of Law Enforcement, Department of Children and Families or any other agency is not required by law unless child abuse is suspected.

Step 3
Provide emergency medical care to the newborn infant. Surrender period is approximately 7 days old or younger-Physician to make final determination.

Step 4
Offer the mother emergency medical care while allowing her to remain anonymous in person and list the mother on the medical report as “SAFE HAVEN MOTHER” under name category.

Step 5
Arrange for immediate transportation of the newborn infant to the appropriate hospital.

Step 6
Complete agency run report and list newborn infant as “Safe Haven Baby” under name category.

Step 7
Notify your agency public information officer to handle media inquiries.

Step 8
Important: Notify “A Safe Haven for Newborns” immediately by calling 1-877-767-2229.

Note:
For other questions/issues refer to the complete updated version of the “Safe Haven” procedures, which can be downloaded from: www.asafehavenfornewborns.com.

Pass code: 120799FE or call “Safe Haven” at 1-877-767-2229.

Order training/education materials, public awareness materials, signs, etc. at safehaven@asafehavenfornewborns.com
6.18 Safe Haven for Newborns
SAFE HAVEN MEDICAL QUESTIONNAIRE

Dear Birth Mother:

You have taken the first step in assuring that your child will be safe and well taken care of. We know this has been a very difficult decision for you, and we want to assure you that we will give your child the best possible care.

We are asking for your help by providing some health information that may be important for your child to know in his or her future. This information is important for your child’s care, and will be most helpful for the adoptive family. The information will be used only for this purpose. It will not be used to identify you or find you. You may not know all of the answers - Please provide as much information as you do know.

What is the baby’s birth date? __________ Was the baby premature? ______ if yes, when was the approximate date you became pregnant? ____________________________________________

Were there any problems with the pregnancy or delivery? if yes, please describe:

Did you smoke, use alcohol, drugs or any medication during the pregnancy? if yes, please list them:

<table>
<thead>
<tr>
<th>Do you have any medical conditions such as:</th>
<th>Does the baby’s Father have any medical conditions such as:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Diabetes</td>
<td>□ Diabetes</td>
</tr>
<tr>
<td>□ Asthma</td>
<td>□ Arthritis</td>
</tr>
<tr>
<td>□ Allergies</td>
<td>□ Asthma</td>
</tr>
<tr>
<td>□ Seizures</td>
<td>□ Eye problems</td>
</tr>
<tr>
<td>□ Cancer</td>
<td>□ Allergies</td>
</tr>
<tr>
<td>□ Heart Disease</td>
<td>□ Seizures</td>
</tr>
<tr>
<td>□ High Blood Pressure</td>
<td>□ Cancer</td>
</tr>
<tr>
<td>□ Mental Illness</td>
<td>□ Heart Disease</td>
</tr>
<tr>
<td></td>
<td>□ High Blood Pressure</td>
</tr>
<tr>
<td></td>
<td>□ Mental Illness</td>
</tr>
</tbody>
</table>

What is your:

- Age: ______  Race: ______
- Height: ______  Weight: ______

What is the baby’s father’s:

- Age: ______  Race: ______
- Height: ______  Weight: ______

To your knowledge are there any hereditary conditions that run in your family, or the father’s family?

Please feel free to include a note to your baby, or to the people who will adopt your child. You can use the back of this form.

You have given your baby a special gift by providing this medical information. You have taken good care of your baby; now please take care of yourself. It is now important that you personally get a medical check-up – you will remain anonymous, just as the law allows. We can assist you.

Gloria M. Silverio Foundation – “A Safe Haven for Newborns”
6801 NW 77th Ave. Suite 404
Miami FL, 33166
Website: www.asafehavenfornewborns.com  Email:safehaven@asafehavenfornewborns.com
Phone:305-882-1304 ext. 103  Fax:305-889-0017
6.19  Sepsis Alert Form

Also available on-line www.gbemda.com under forms

**BROWARD SEPSIS ALERT**

Date: ___________  Unit #: ___________  Age: ___________  Sex:  ☐ Male  ☐ Female

Patient's Name: ______________________________  Incident Number: ___________

### Documentation of SEPSIS (2 Criteria Required)

#### 1. SIRS

(Systemic Inflammatory Response Syndrome)

<table>
<thead>
<tr>
<th>☐ YES</th>
<th>☐ NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient have 2 or more of the following SIRS criteria?</td>
<td></td>
</tr>
<tr>
<td>: Temperature</td>
<td>&gt; 100.4 or ≤ 96.8 F</td>
</tr>
<tr>
<td>: Heart Rate</td>
<td>≥ 90</td>
</tr>
<tr>
<td>: Respiratory Rate</td>
<td>≥ 20</td>
</tr>
</tbody>
</table>

If "YES" proceed to next section

#### 2. INFECTION

<table>
<thead>
<tr>
<th>☐ YES</th>
<th>☐ NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient have any of the listed infections, high risk criteria or symptoms?</td>
<td></td>
</tr>
<tr>
<td>Documented Infections: Pneumonia/UTI/Sepsis/Wounds/Skin Infections/Decubitus ulcers</td>
<td></td>
</tr>
<tr>
<td>High Risk Criteria: Nursing home resident/Recent surgery/Immunosuppressed/Indwelling device</td>
<td></td>
</tr>
<tr>
<td>Symptoms: Cough/increased work of breathing/Stiff neck/ALOC/Urinary pain or frequency/Infamed joint/Abdominal pain, distension or firmness/Infected wound</td>
<td></td>
</tr>
</tbody>
</table>

**If both boxes are checked "YES" this patient is a SEPSIS ALERT**

### Pre-Hospital Treatment Determination (Severe Sepsis Only)

<table>
<thead>
<tr>
<th>☐ YES</th>
<th>☐ NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient meet one or more of the following criteria?</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular: MAP &lt; 65 (see display on monitor)</td>
<td></td>
</tr>
<tr>
<td>Neurological: Acute Change in Mental Status</td>
<td></td>
</tr>
<tr>
<td>Metabolic: Lactate ≥ 4 (If available)</td>
<td></td>
</tr>
<tr>
<td>ETCO2 &lt; 25 (correlates to lactate of &gt; 4)</td>
<td></td>
</tr>
</tbody>
</table>

**If the box above is "YES" administer Normal Saline 30 cc/kg bolus**

_Titrate Fluids to Goal MAP > 70. Consider pressors after 1L NS infused. Max of 2 L NS_

**EMS Script:** This is Rescue ___ coming in with a Sepsis Alert. The patient is a ___ year old (male/female) with suspected sepsis. The patient is positive for SIRS criteria and a suspected infection. Vital signs are as follows (state VS), with a MAP of ___. The patient does/does not qualify for a 30 cc/kg bolus based on criteria for severe sepsis. We are requesting further orders. ETA is ___ minutes.
6.20 Stroke Form
GBEMDA
Greater Broward EMS Medical Directors’ Association

BROWARD ADVANCED STROKE TRIAGE

Date ___________ Time: ___________ Unit #: _______ Age:_______ Sex: [ ] Male [ ] Female
Patient’s Name: __________________________ Incident Number: ________________
Event Witness Name: ______________________ Cell#: _______ Home #: __________
Closest Relative (If different from above): Cell #: Home #: 

Stroke / Stroke Alert Determination Page

Check if abnormal | Cincinnati Stroke Scale (FAST)

☐ F (Face) Facial Droop: Have patient smile or show teeth. (Look for asymmetry)
Normal: Both sides of the face move equally or not at all
Abnormal: One side of the patient’s face droops

☐ A (Arm) Motor Weakness: Arm drift (close eyes, extend arms, palms up)
Normal: Arms remain extended equally, drift equally, or do not move at all
Abnormal: One arm drifts down when compared with the other

☐ S (Speech) Speaking: “You can’t teach an old dog new tricks.” (Repeat phrase)
Normal: Phrase is repeated clearly and correctly
Abnormal: Words are slurred (dysarthria), abnormal (aphasia), or none

☐ T (Time) TIME LAST SEEN NORMAL: ________________________________

If any box is checked above, this is a possible STROKE ALERT. Move on to section 1

Section 1: Check all appropriate box(es)

☐ Time last seen normal greater than 12 hours
☐ Resolution of stroke symptoms prior to arrival in the ED (TIA)
☐ Glucose less than 50 and symptoms improve with administration of D50

Are any items in Section 1 checked?

YES: Patient IS NOT a Stroke Alert. TRANSPORT TO NEAREST STROKE CENTER
NO: PROCEED TO SECTION 2. THIS IS A STROKE ALERT

Broward Advanced Stroke Triage Form - Version 1 (2/2013)
6.20 Stroke Form (continued)

Also available on-line www.gbemda.com under forms

Destination Determination Page

Section 2:
Is the patient permanently bed or wheelchair confined, do they require constant care OR is assistance essential for activities of daily living prior to today's event?

YES: TRANSPORT TO NEAREST STROKE CENTER
NO: PROCEED TO SECTION 3

Section 3: Check the appropriate box(es)

<table>
<thead>
<tr>
<th>Los Angeles Motor Scale (LAMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
</tr>
<tr>
<td>Facial Droop</td>
</tr>
<tr>
<td>Absent</td>
</tr>
<tr>
<td>Present</td>
</tr>
<tr>
<td>Arm Drift</td>
</tr>
<tr>
<td>Absent</td>
</tr>
<tr>
<td>Drifts Down</td>
</tr>
<tr>
<td>Falls Rapidly</td>
</tr>
<tr>
<td>Grip Strength</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Weak Grip</td>
</tr>
<tr>
<td>No Grip</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

☐ Score 4 - 5 – TRANSPORT TO COMPREHENSIVE STROKE CENTER
☐ Score 3 – Proceed to Section 4
☐ Score 0 - 2 – TRANSPORT TO NEAREST STROKE CENTER

Section 4: Check the appropriate box(es)

☐ Estimated arrival at Emergency Department is greater than 3.5 hours since last seen normal
☐ Seizure (at onset)
☐ Patient is on any of the following blood thinners: Coumadin (warfarin), Pradaxa (dabigatran), Brilinta (ticagrelor), Xarelto (rivaroxaban), Lovenox (enoxaparin) or Fragmin (dalteparin)
☐ Recent (within 14 days) or current bleeding, trauma, surgery, or invasive procedure
☐ Bleeding / Clotting disorders (history of GI GU bleeding within last 21 days)
☐ Pregnancy or Completion / Termination of pregnancy less than 30 days
☐ Intracranial pathology (Tumor, Aneurysm, ArterioVenous Malformation (AVM), Intracranial hemorrhage)
☐ Sudden onset of worst headache ever

Are any items in Section 4 checked?

YES: TRANSPORT TO A COMPREHENSIVE STROKE CENTER (Call a Stroke Alert)
NO: TRANSPORT TO NEAREST STROKE CENTER (Call a Stroke Alert)

Broward Advanced Stroke Triage Form - Version 1 (2/2013)
6.21 Trauma Transport Protocol
BROWARD COUNTY UNIFORM TRAUMA TRANSPORT PROTOCOL  
(revised December 2011) 

I. COMMUNICATION (DISPATCH ) CENTER PROCEDURE 

A. All EMS systems utilize the 911-phone system in conjunction with either manual or Computer Aided Dispatch (CAD) programs. The call taker confirms all emergency information, including address and callback data prior to the end of the telephone conversation. Emergency information is immediately transmitted to the Fire-Rescue/EMS Dispatcher who selects the nearest available unit(s) for response; dispatches the call and provides all unit(s) with all available information concerning the incident. 

B. Call taker personnel/dispatchers shall make every attempt to obtain the following information from the 911 caller: 
   1. Nature of the emergency; 
   2. Location of the incident; 
   3. Call back number; 
   4. Number of patients; 
   5. Severity of the illness/injury; 
   6. Name of the caller. 

Should on scene personnel recognize a need for other emergency agencies (e.g. law enforcement, fire, EMS, Coast Guard) they shall notify Dispatch immediately. On scene personnel must identify the agencies needed and the specific amount of personnel, equipment, etc. required. The communications center shall make contact with the appropriate services (mutual aid/automatic aid). A contact list of all available emergency services is maintained and available through the Broward County Warning Point (Broward Sheriff’s Office Communications Center). 

II. ON SCENE PROCEDURE - Ground 

A. Upon arrival at the scene, EMS personnel shall conduct a size up of the scene, to include, but not limited to, Trauma Alert Criteria (Section IV), safe entry, severity, and number of patients, the need for extrication, and the need for additional help. Dispatch and the nearest appropriate trauma center will be notified, as soon as possible, of "Trauma Alert" patient(s). Dispatchers shall immediately transfer this information, using the words "Trauma Alert" to the supervisor on duty. 

B. EMS personnel shall transport patient(s) to the nearest appropriate trauma center (catchment area identified in the Broward County Trauma Plan). 

C. EMS personnel shall submit the treatment data for each trauma patient to the trauma center as required in 64J-1.014, F.A.C. and their respective agency.
### III. TRANSPORT PROCEDURE (Rescue Helicopter)

*Three steps to follow when Broward Sheriff’s Office, Dept. of Fire Rescue’s (BSODFR) Rescue Helicopter is used for rapid transport of the trauma patient. The first two are directed toward the safety of the helicopter pilot and crew, ground personnel, patient, and bystanders; and the third is to establish operational guidelines as to when and/or if the helicopter is used to transport these patients.*

**A.** Severe weather at scene, helicopter hanger, landing zone (LZ), or Trauma Center reduces the use of the Rescue Helicopter.

**B.** Safety considerations for landing zone (if any of 4 below, use ground transport or **move** the landing zone):
1. Power lines around landing zone;
2. Trees, signs, poles, or other obstacles in immediate landing area;
3. Pedestrians and large gatherings of civilians in the area;
4. An expectation that the area may not remain safe.

**C.** Rescue helicopter to be used if:
1. The Trauma Center that the patient would be transported to by ground, is farther away than twenty (20) minutes (**30 Minutes for Level II patients**) driving time;
2. Ground transportation is not available and is not expected to be available within a reasonable time;
3. The helicopter is needed to gain access to a patient for transport from an inaccessible area;
4. Extrication time greater than twenty (20) minutes.

**D.** Operational Guidelines by ground EMS crews for Rescue helicopter use:
1. Secure a TAC radio channel through the County’s dispatch center and keep open until Helicopter has left scene.
2. Ground Crew **PRE-ALERT** Trauma Center.
3. Start **CUTT REPORT** (County Unified Trauma Telemetry Report) or respective agency’s modified patient treatment form. (see 1.10.1)
4. Airway - advise Air Crew on airway status and if airway assistance or **RSI** (Rapid Sequence Intubation) is required.

**NOTE:** *(for pediatric patients only)* if using the landing pad at North Broward Medical Center and crew feels that the patient requires immediate attention, advise helicopter crew that the patient will be seen by the Trauma Services physicians prior to transport to pediatric trauma center *(BGH or Memorial)*

5. Begin Packaging Patient (remove shoes and clothes from vital areas). Advise Air Crew of the weight of the patient.
6. Have a minimum of three (3) unobstructed lanes of traffic for roadway landings whenever possible.
7. Pilot may require traffic stopped in both directions.
8. Landing Zone units must remain at their post until helicopter has left the scene.
9. Headlights should be turned off at night.

Only clear landing zone upon direction of Air Rescue crew and law enforcement on scene.
6.21 Trauma Transport Protocol (continued)
IV TRAUMA ALERT CRITERIA

The following guidelines are to be used to establish the criteria for a "Trauma Alert" patient and determine which patient(s) will be transported to a trauma center. Any patient that meets any one of the “RED” criteria will be a trauma alert, while any patient that meets any two of the “BLUE” criteria will be a trauma alert.

A. ADULT TRAUMA SCORECARD METHODOLOGY

1. Each EMS provider shall ensure that upon arrival at the location of an incident, EMS personnel shall:
   a. Assess the condition of each adult trauma patient using the adult trauma scorecard methodology, as provided in this section to determine whether the patient should be a trauma alert.
   b. In assessing the condition of each adult trauma patient, the EMS personnel shall evaluate the patient’s status for each of the following components: airway, circulation, best motor response (a component of the Glasgow Coma Scale), cutaneous, long bone fracture, patient’s age, and mechanism of injury. The patient’s age and mechanism of injury (ejection from a vehicle or deformed steering wheel) shall only be assessment factors when used in conjunction with assessment criteria included in # 3 (Level II) of this section. (NOTE: Glasgow Coma Scale included for quick reference.)

2. The EMS personnel shall assess all adult trauma patients using the following “RED” criteria in the order presented and if any one of the following conditions is identified, the patient shall be considered a trauma alert patient:
   a. AIRWAY: Active ventilation assistance required due to injury(ies) causing ineffective or labored breathing beyond the administration of oxygen.
   b. CIRCULATION: Patient lacks a radial pulse with a sustained heart rate greater than 120 beats per minute or has a blood pressure of less than 90mmHg.
   c. BEST MOTOR RESPONSE (BMR): Patient exhibits a score of four or less on the motor assessment component of the Glasgow Coma Scale; exhibits the presence of paralysis; suspicion of a spinal cord injury; or the loss of sensation.
   d. CUTANEOUS: 2\textsuperscript{nd} or 3\textsuperscript{rd} degree burns to 15 percent or more of the total body surface area; electrical burns (high voltage/direct lightning) regardless of surface area calculations; an amputation proximal to the wrist or ankle; any penetrating injury to the head, neck, or torso (excluding superficial wounds where the depth of the wound can be determined).
   e. LONGBONE FRACTURE: Patient reveals signs or symptoms of two or more long bone fractures sites (humerus, radius/ulna, femur, or tibia/fibula).
3. Should the patient not be identified as a trauma alert using the red criteria listed in #2 of this section, the trauma patient shall be further assessed using the “BLUE” criteria in this section and shall be considered a trauma alert patient when a condition is identified from any two of the seven components included in this section.
   a. **AIRWAY:** Respiratory rate of 30 or greater.
   b. **CIRCULATION:** Sustained heart rate of 120 beats per minute or greater.
   c. **BEST MOTOR RESPONSE (BMR):** BMR of 5 on the motor component of the Glasgow Coma Scale.
   d. **CUTANEOUS:** Soft tissue loss from either a major degloving injury, or a major flap avulsion greater than 5 inches, or has sustained a gunshot wound to the extremities of the body.
   e. **LONGBONE FRACTURE:** Patient reveals signs or symptoms of a single long bone fracture resulting from a motor vehicle collision or a fall from an elevation of 10 feet or greater.
   f. **AGE:** Patient is 55 years of age or older.
   g. **MECHANISM OF INJURY:** Patient has been ejected from a motor vehicle, (excluding any motorcycle, moped, all terrain vehicle, bicycle or the open body of a pick-up truck), or the driver of the motor vehicle has impacted with the steering wheel causing steering wheel deformity.

4. If the patient is not identified as a trauma alert after evaluation using the criteria in sections 2 or 3 above, the trauma patient will be evaluated using all elements of the Glasgow Coma Scale. If the score is 12 or less, the patient shall be considered a trauma alert (excluding patients whose normal Glasgow Coma Scale Score is 12 or less, as established by medical history or pre-existing medical condition when known).

5. Where additional trauma alert criteria has been approved by the medical director of the EMS service and approved for use in conjunction with Broward County trauma alert criteria as the basis for calling a trauma alert shall be documented as required in section 64J-1.014, F.A.C. of the patient care record. Such local trauma assessment criteria can only be applied after the patient has been assessed as provided in sections #2, #3, and #4 above of the Adult Trauma Alert Criteria.

6. In the event that none of the conditions are identified using the criteria in sections #2, #3, #4 or #5 above, during the assessment of the adult trauma patient, the paramedic can call a trauma alert if, in his or her judgment, the patient’s condition warrants such action. Where paramedic judgment is used as the basis for calling a trauma alert, it shall be documented on all patient data records as required in section 64J-1.014, F.A.C.

7. The results of the patient assessment shall be recorded and reported on all patient data records in accordance with the requirements of section 64J-1.014, F.A.C.

Patients found to meet Trauma Alert criteria upon arrival at or subsequent to arrival at a non-trauma center will be expeditiously transferred to the appropriate trauma center. (See Section V)
**Level 1 Adult Trauma Alert Criteria**

<table>
<thead>
<tr>
<th>Red Criteria (1 Required)</th>
<th>Blue Criteria (2 Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway</td>
<td>Sustained respiratory rate ≥30</td>
</tr>
<tr>
<td>Circulation</td>
<td>Sustained HR ≥120 w/radial pulse and BP &lt;90 systolic</td>
</tr>
<tr>
<td>Fractures</td>
<td>Single longbone FX sites due to MVA or single longbone FX site due to fall ≥10 ft</td>
</tr>
<tr>
<td>Cutaneous</td>
<td>Major degloving, flap avulsion &gt;5 inches, or GSW to extremities</td>
</tr>
<tr>
<td>Best Motor Response (BMR)</td>
<td>BMR ≥ 5</td>
</tr>
<tr>
<td>Mechanism of Injury</td>
<td>Ejection from vehicle (excluding open vehicles) or deformed steering wheel</td>
</tr>
<tr>
<td>Age</td>
<td>Age 55 or older</td>
</tr>
<tr>
<td>Misc</td>
<td>Paramedic Judgment</td>
</tr>
<tr>
<td></td>
<td>Glasgow Coma Score ≤12</td>
</tr>
</tbody>
</table>

**Pediatric Trauma Alert Criteria**

<table>
<thead>
<tr>
<th>Red Criteria (1 Required)</th>
<th>Blue Criteria (2 Required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway</td>
<td>Amnesia or reliable HX of LOC</td>
</tr>
<tr>
<td>Consciousness</td>
<td>Carotid or femoral pulses palpable or systolic BP 90-50</td>
</tr>
<tr>
<td>Circulation</td>
<td>Single closed longbone FX site</td>
</tr>
<tr>
<td>Fracture</td>
<td>Major soft tissue disruption, amputation proximal to wrist or ankle, 2º or 3º burns to 10% BSA, electrical burns (high voltage/direct lightning) regardless of surface area, penetrating injury to head, neck or torso</td>
</tr>
<tr>
<td>Misc</td>
<td>Red, Purple ≤11kg (&lt;24 lbs.)</td>
</tr>
</tbody>
</table>

**Level 2 Trauma Criteria with SIGNIFICANT INJURY (Adult and Pediatric)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls &gt;12 ft. Adult</td>
<td>Death of an occupant in the same passenger compartment</td>
<td>Pedestrian struck by vehicle</td>
</tr>
<tr>
<td>Falls &gt;6ft. Pediatric</td>
<td>Major Intrusion</td>
<td>Age 55 or greater</td>
</tr>
<tr>
<td>Extrication time &gt;15 min.</td>
<td>Ejection from Bicycle</td>
<td>Anti Coagulants</td>
</tr>
<tr>
<td>Rollover motor-vehicle crash</td>
<td></td>
<td>Anti Platelets</td>
</tr>
</tbody>
</table>

Paramedic Judgment: ________ Comments: ________

(Rev 11/11)
6.21 Trauma Transport Protocol – CUTT Report

County Unified Trauma Telemetry Report

Patient Evaluation

Age: _____  Sex: M or F  Glasgow Coma Score (Adult): ________
Mechanism of Injury:

Assessed Injuries:

Treatment Interventions: (Check all that apply)
- Oxygen
- C-Collar
- IV x ________
- BVM
- Backboard
- ETT
- CPR
- Drug Therapy: ________________________________
- Other: ______________________________________

Current Vital Signs:  BP ________  Pulse ________  Resp. Rate ________  Glasgow Coma Score ________

Additional Information: (If time permits)

Name: ______________________________________  Date of Birth: ____________
Address: ____________________________________
Past Medical History: ___________________________
Medications: __________________________________
Allergies: ____________________________________

Glasgow Coma Score

Best Eye Response (4)
1 - No eye opening
2 - Eye opening to pain
3 - Eye opening to verbal command
4 - Eyes open spontaneously

Eye = _________

Total: E(______) V(______) M(______) = GCS______

Note the Glasgow Coma Scale measures cognitive ability. Therefore, if injury (chronic or acute) has caused paraplegia or quadriplegia, alternate methods of assessing motor response must be used (e.g., ability to blink eyes = obeys commands).
Florida Regional Common

EMS Protocols

Section 7

Hazardous Materials Exposure

5th Edition, Version 1, March 1, 2017
### Hazardous Material Exposure Table of Contents

**Introduction**

1. **Adult Hazardous Material Exposure (Chemicals)**
   - 1.1 Acids and Acid Mists
   - 1.2 Alkaline Compounds
   - 1.3 Ammonia (Liquid and Gas)
   - 1.4 Aromatic Hydrocarbons (Benzene, Toluene, Xylene) and Ketones
   - 1.5 Arsenic Compounds (Heavy Metal Poisoning)
   - 1.6 Carbamate (Insecticide Poisoning)
   - 1.7 Carbon Monoxide Poisoning
   - 1.8 Chlorinated Hydrocarbons
   - 1.9 Chlorine Gas And Phosgene (CG)
   - 1.10 Cyanide: Hydrogen Cyanide, Hydrocyanic Acid (AC), Cyanogen Chloride (CK), Potassium Cyanide, Sodium Cyanide
   - 1.11 Dinitrobenzene (DNB)
   - 1.12 Ethylene Glycol
   - 1.13 Hydrofluoric Acid (HF)
   - 1.14 Hydrogen Sulfide, Sulfides, and Mercaptans
   - 1.15 Methanol
   - 1.16 Methylene Biphenyl Isocyanate, Ethyl Isocyanate, and Methylene Dilsocyanate (MDI)
   - 1.17 Mustard (Sulfur Mustard): Lewisite, Blister Agents (H, HD, HS)
   - 1.18 Nitrogen Products and Other Products Causing Methemoglobinemia
   - 1.19 Organophosphates: Insecticide Poisoning and Nerve Agents (GA, GB, GD, GF, VX)
   - 1.20 Phenol
   - 1.21 Phosphine

2. **Chemical Treatment Guide Index**
   - Chemical Treatment Guide 1A: Yellow
   - Chemical Treatment Guide 2A: Blue
   - Chemical Treatment Guide 3A: Gray
   - Chemical Treatment Guide 4A: Green
   - Chemical Treatment Guide 5A: Red
   - Chemical Treatment Guide 6A: Pink
   - Chemical Treatment Guide 7A: Orange
   - Chemical Treatment Guide 8A: Purple
   - Chemical Treatment Guide 9A: White

3. **Adult Hazardous Material Exposure (Biological Agents)**
   - 3.1 Anthrax
   - 3.2 Botulism
   - 3.3 Cholera
   - 3.4 Plague
   - 3.5 Q Fever
   - 3.6 Ricin
   - 3.7 Smallpox
   - 3.8 Staphylococcal Enterotoxin B
   - 3.9 Trichothecene Mycotoxins (T2)
   - 3.10 Tularemia
   - 3.11 Venezuelan Equine Encephalitis (VEE)
   - 3.12 Viral Hemorrhagic Fevers

4. **Adult Hazardous Material Exposure (Radiological Agents)**
   - 4.1 Radiation Exposure/Contamination
   - 4.2 Acute Radiation Syndrome
Introduction

These protocols have been developed to address the specialized treatment of patients exposed to hazardous materials. Some of the agents covered in these protocols may be used as a weapon of mass destruction (WMD) in a terrorist attack. In these instances, scene safety and a need to stage at a safe distance from the scene should be a primary concern for all personnel.

The protocols cover exposure to chemical (7.1), biological (7.2), and radiological (7.3) agents. A color code is assigned to each protocol in the Chemical section (7.1), which coincides with the chemical treatment guide. The Chemical Treatment Guides have the adult and pediatric dosages combined.

The protocols are intended to include a comprehensive overview of hazardous materials for use by hazmat teams and/or hazmat tox medics. The availability of these specialized teams and medics precludes the need for the participating Broward County Fire-Rescue departments to carry all of the medications listed in this protocol.
7.1 Adult Hazardous Material Exposure (Chemicals)

This protocol is to be used for those patients suspected of exposure to hazardous materials via any route of exposure (e.g., inhalation, absorption). The protocols give specific considerations for each type of exposure as well as general treatment guidelines. Scene safety should be of primary concern, with special attention being paid to the need for personal protective equipment. Additional assistance may be necessary in certain cases (e.g., hazardous materials team for toxic exposure, police for scene control, including a violent and/or impaired patient - see Adult Protocol 2.5.2 or Pediatric Protocol 3.7.5).

A history of the events leading to the illness or injury should be obtained from the patient and bystanders, to include the following information:
1. To which poison or other substances was the patient exposed?
2. When and how much?
3. Duration of symptoms?
4. Is there any pertinent medical history?
5. Accidental? Nature of accident?
6. Duration of exposure (if applicable)?

If risk of exposure from fumes is high, call the hazardous materials team. In this instance, refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high. All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy, and then contact the receiving emergency department for confirmation of Level 2 orders.

It is imperative that the emergency department be made aware early that a contaminated patient is being transported so that the proper preparations can be made to receive the patient.
7.1.1 Acids and Acid Mists

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
Acids are colorless to yellow liquids with strong irritating odors. Some acids may be flammable agents. Acids act as direct irritants and corrosive agents to moist membranes and to intact skin to a lesser extent.

SIGNS AND SYMPTOMS
Low concentrations of airborne acids can produce rapid onset of eye, nose, and throat irritation.

Higher concentrations can produce cough, stridor, wheezing, chemical pneumonia, and non-cardiogenic pulmonary edema. Ingestion of acids can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse, as well as partial- or full-thickness burns.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM.

Note:
This protocol does not include hydrofluoric acid (see Adult Protocol 7.1.13).

EXAMPLES
• Sulfuric acid (battery acid)
• Muriatic acid (pool cleaner)
• Hydrochloric acid (HCl)
• Some drain cleaners
7.1.2 Alkaline Compounds

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
Most alkaline compounds are solids. Alkalis will impart a soapy texture to aqueous solutions. Alkalis act as direct irritants and corrosive agents to moist membranes and to intact skin to a lesser extent. The extent of tissue penetration and severity of injury is usually greater with alkalis than with acids.

SIGNS AND SYMPTOMS
Low concentrations of airborne alkalis can produce rapid onset of eye, nose, and throat irritation. Higher concentrations can produce cough, stridor, wheezing, chemical pneumonia, and non-cardiogenic pulmonary edema. Ingestion of alkalis can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse, as well as partial- or full-thickness burns.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM.

EXAMPLES
- Lye (baseball field line chalk)
- Cement
- Some drain cleaners
- Sodium hydroxide
7.1.3 Ammonia (Liquid and Gas)

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
Ammonia is a colorless gas having an extremely pungent odor, which may be in an aqueous solution or gaseous state. Liquefied compressed gas may produce a cryogenic (freezing) hazard as it is released into the atmosphere. Common household ammonia contains 5-10% ammonia. It is a direct irritant and, in much higher concentrations, an alkaline corrosive agent to moist mucous membranes and, to a lesser extent, to intact skin. A chloramine gas can be liberated when household ammonia is mixed with a hypochlorite solution (bleach), which may injure the airway.

SIGNS AND SYMPTOMS
Low concentrations of airborne ammonia can produce cough, stridor, wheezing, and chemical pneumonia (non-cardiogenic pulmonary edema). Ingestion of concentrated ammonia (e.g., > 5%) may cause corrosive injury to the esophagus, stomach, and eye.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM.

EXAMPLES
• Component of household cleaners
• Refrigerant gases
• Used in manufacture of plastics, explosives, and pesticides
• Corrosion inhibitor
• Used in water purification process
• Component of fertilizers
7.1.4 Aromatic Hydrocarbons (Benzene, Toluene, Xylene) and Ketones

TREATMENT
Chemical Treatment Guide 2: BLUE

DESCRIPTION
Aromatic hydrocarbons may be found as colorless liquids or in a solid form with an ether-like or pleasant odor. These compounds may be highly flammable. Ketones are organic compounds derived from secondary alcohols by oxidation. They generally have low viscosity, low to moderate boiling points, moderate vapor pressures, and high evaporation rates. Most ketones are chemically stable liquids. Routes of exposure include absorption through the skin and eyes, inhalation, and ingestion.

SIGNS AND SYMPTOMS
Mild exposure: cough, hoarseness, headache, drowsiness, dizziness, weakness, tremors, transient euphoria, vision and hearing disturbances, nausea/ vomiting, salivation, and stomach pain.

Moderate to severe exposure: cardiovascular collapse, tachydysrhythmias (especially ventricular fibrillation), chest pain, pulmonary edema, dyspnea, tachypnea, respiratory failure, paralysis, altered mental status, seizures, excessive salivation, and delayed carcinogenic effects. Halogenated hydrocarbons (chloride, bromide, iodide, fluoride) may present with ventricular tachycardia, ventricular fibrillation, and supraventricular tachycardias. Aromated hydrocarbons may present with altered mental status.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM.

EXAMPLES
- Components of gasoline
- Methyl benzene
- Methyl benzol
- Phenyl methane
7.1.5 Arsenic Compounds (Heavy Metal Poisoning)

TREATMENT
Chemical Treatment Guide 2: BLUE

DESCRIPTION
Arsenic compounds may be found as white, transparent, or colorless crystals; colorless liquids; or colorless gas (e.g., ant poison). They are either odorless or have a garlic-like odor. Some are flammable. Exposure can be fatal or cause severe injury at concentrations too low to detect. Lewisite is a blistering agent made from arsenic that causes immediate pain, irritation, and blistering of skin and mucous membranes. It is very similar in action to mustard and may be treated as mustard (Protocol 7.1.17). Arsine gas is made from arsenic and causes renal failure and destruction of red blood cells. Most exposures commonly occur when arsine gas is used to extract precious metals from ore.

SIGNS AND SYMPTOMS
Severe gastrointestinal fluid loss, burning abdominal pain, watery or bloody diarrhea, muscle spasm, seizures, cardiovascular collapse, tachycardia, hypotension, ventricular dysrhythmias, shock, and coma. There may be respiratory or cardiac arrest and acute renal failure may occur with bronze urine within a few minutes.

EXAMPLES
• Component of wood preservatives, insecticides, and herbicides
• Arsine gas: used to extract precious metals from ore
7.1.6 Carbamate (Insecticide Poisoning)

TREATMENT
Chemical Treatment Guide 4: GREEN

DESCRIPTION
Carbamate may be found in a solid, powder, or liquid form; it has a white or gray color and a weak odor. This reversible acetyl cholinesterase inhibitor is found in insecticides, herbicides, and some medicinal products. Many carbamates are well absorbed through intact skin, so they pose a serious exposure risk to rescuers. Simple water washing may be sufficient to remove oily compounds. Carbamates affect both the parasympathetic nervous system (muscarinic effects) and the sympathetic nervous system (nicotinic effects). Although the muscarinic effects may be reversed with atropine, the nicotinic effects may cause respiratory paralysis and require intubation and aggressive ventilatory support. Carbamates may be incorporated in a flammable base.

SIGNS AND SYMPTOMS
Muscarinic effects are the same as seen with organophosphates, which are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effect include bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis) with inhalation or skin exposure. Ingestion may or may not cause miosis; however, stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasciculations, and seizures.

EXAMPLES
Insecticides used for house tenting: Temic, Metical, Isolan, Furadan, Lannae, Zectran, Mesurol Dimetialn, Bagon

Note:
PPE (usually Level A) with SCBA must be worn in the hazardous area when carbamates are present. PPE with a minimum of Level C protection must be worn for treatment outside the hazardous area.
7.1.7 Carbon Monoxide Poisoning

TREATMENT
Chemical Treatment Guide 2: BLUE

DESCRIPTION
Carbon monoxide (CO) poisoning should be suspected when the patient has been exposed to the products of combustion (e.g., smoke, automobile exhaust, exhaust fumes from fuel-powered machinery) and is experiencing symptoms. These symptoms may vary with the level of CO exposure.

SIGNS AND SYMPTOMS
Mild CO exposure: headache, nausea/vomiting, poor concentration, irritability, agitation, and anxiety. May resemble flu-type symptoms. Suspect CO exposure during a cold snap with use of charcoal heaters and other types of furnaces, and where there are multiple victims in the same house or building.

Moderate to severe CO exposure: altered mental status, chest pain, cardiac dysrhythmias, pale skin, cyanosis, seizures, and rarely cherry-red skin.

EXAMPLES
- Suspect CO poisoning when multiple victims in same building exhibit symptoms.
- Use of petroleum-fueled heaters, machinery, and other devices inside a building (especially with improper ventilation).
- Incomplete burning of natural gas, LP gas, gasoline, kerosene, oil, coal, wood, or any other material containing carbon.
- Fire fighters working at a fire scene, especially during overhaul operations.
7.1.8 Chlorinated Hydrocarbons

TREATMENT
Chemical Treatment Guide 2: BLUE

DESCRIPTION

Methylene chloride is a volatile liquid that yields heavy vapors. At room temperature, it is a clear, colorless liquid with a pleasant (ether-like) odor. Exposure can occur through skin absorption, eye contact, inhalation, and ingestion. Methylene chloride is converted inside the body to carbon monoxide.

SIGNS AND SYMPTOMS
Cardiovascular collapse, ventricular dysrhythmias, respiratory arrest, pulmonary edema, dyspnea and tachypnea, headache, drowsiness, dizziness, altered mental status, seizures, nausea/vomiting, diarrhea, abdominal cramps, and chemical burns.

EXAMPLES
- Component (solvent) in paint, varnish strippers, and degreasing agents
- Used in production of photographic films, synthetic fibers, pharmaceuticals, adhesives, inks, and printed circuit boards
- Employed as a blowing agent for polyurethane foams, as a propellant for insecticides, in air fresheners, and in paint
7.1.9 Chlorine Gas and Phosgene (CG)

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
Chlorine is either a colorless to amber-colored liquid (aqueous chlorine is usually in the form of hypochlorite [bleach] in variable concentrations) or a greenish-yellow gas (anhydrous) with a characteristic odor. The liquid hypochlorite solutions are very unstable and react with acids to release chlorine gas (e.g., bleach mixed with vinegar or a toilet bowl cleaner containing HCl). Liquefied compressed chlorine gas may produce a cryogenic (freezing) hazard as it is released into the atmosphere. Clothing that has been soaked in a hypochlorite solution can be a hazard to rescuers. A chloramine gas may be liberated when a hypochlorite solution (bleach) is mixed with household ammonia, which may cause injury to the airway.

Phosgene (CG) is a chemical warfare agent. Phosgene gas can be liberated when Freon or chlorinated compounds (e.g., bleach mixed with ammonia) are heated. Phosgene has similar effects on the body as chlorine; however, symptoms from phosgene may be delayed for several hours.

SIGNS AND SYMPTOMS
Both agents: dyspnea, tachypnea, cough, choking sensation, rhinorrhea, acute or delayed chemical pneumonia (non-cardiogenic pulmonary edema), ventricular dysrhythmias, cardiovascular collapse, severe irritation and burns of the mucous membranes and lungs, headache, dizziness, altered mental status, nausea/vomiting, and severe irritation and burns to the eyes and skin.

EXAMPLES
- Chlorine gas is used in water purification processes at water plants and sewage treatment plants, as well as in pesticides, refrigerants, and solvents.
- Hypochlorite solutions are used in cleaning solutions and as disinfectants for water (drinking, waste, and swimming pools).
- Phosgene is used in paint removers, dry cleaning fluid, dyes, and pesticides.
7.1.10 Cyanide: Hydrogen Cyanide, Hydrocyanic Acid (AC), Cyanogen Chloride (CK), Potassium Cyanide, Sodium Cyanide

**TREATMENT**
Chemical Treatment Guide 5: RED

**DESCRIPTION**
Cyanide can be found in a liquid (solutions of cyanide salts), solid (cyanide salts), or gaseous (hydrogen cyanide) form. In solid form, it is white and has a faint almond odor (20% of the population is genetically unable to detect the odor). Hydrogen cyanide gas may be formed when acid is added to cyanide salt or a nitrite or when plastics burn. If a large amount of liquid or solid cyanide material is present on the victim’s clothing or skin, it poses a significant risk of exposure to rescuers. Exposure can occur through skin absorption, eye contact, inhalation, and ingestion. If the patient is unconscious and is being rescued from a fire, there is a high probability of concurrent carbon monoxide and cyanide poisoning; both conditions must be treated (also see Chemical Treatment Guide 2: Blue for these patients).

**SIGNS AND SYMPTOMS**
Cardiovascular: initially, pulse decreases and BP rises; in later stages, dysrhythmias and cardiovascular collapse can occur. There may also be palpitations and/or chest tightness.
Respiratory: can cause immediate respiratory arrest. Initially, there is usually an increase in the rate and depth of respirations, which later become slow and gasping.
CNS: can cause immediate coma. Initially there is usually weakness, headache, and confusion; seizures are common.
GI: nausea/vomiting, salivation.
Skin: pale, cyanotic, or reddish color. Death is caused by an inhibitory action on the cytochrome oxidase system, preventing tissue usage of oxygen.

**EXAMPLES**
- Hydrogen cyanide is used in the production of organic chemicals (it may be called nitrile).
- Potassium and sodium cyanide are used primarily in electroplating and metal treatment.
- Cyanides may be present in smoldering fires (e.g., wool, foams).

**Note:**
- PPE (usually Level A) with SCBA must be worn in the hazardous area when cyanide compounds are present. PPE with a minimum of Level C protection must be worn for treatment outside the hazardous areas.
- Good medical supportive care, including airway management, is paramount and should precede the use of the cyanide antidote kit. However, the rapid administration of the cyanide antidote kit will be the only therapy that will reverse the life-threatening symptoms of cyanide poisoning.
7.1.10 Cyanide Poisoning (continued)

7.1.10 Cyanide: Hydrogen Cyanide, Hydrocyanic Acid (AC), Cyanogen Chloride (CK), Potassium Cyanide, Sodium Cyanide (continued)

Option 1

For cyanide exposures: administer Cyanokit (hydroxocobalamin).

Option 2

For cyanide exposures: administer sodium nitrite and sodium thiosulfate.

For cyanide exposure with smoke inhalation (structure fires) or carbon monoxide poisoning: only administer sodium thiosulfate and 100% oxygen.

For hydrogen sulfide exposures: only administer sodium nitrite.

TREATMENT:

Cyanokit (Hydroxocobalamin for Injection) for use with cyanide exposures

This kit is for intravenous use. The hydroxocobalamin is to be reconstituted with 100 mL per vial of 0.9% sodium chloride injection. The starting dose is 5 g. (may be packaged in one or two vials). See Procedure 4.13 and Drug Summary 5.18, Hydroxocobalamin.

1. Start a dedicated IV line
2. Reconstitution: Add 100 mL of 0.9% sodium chloride injection to the vial using a transfer spike. Fill to the line (with the vial in an upright position).
3. Mix: Rock or rotate the vial for 30 seconds to mix the solution. Do not shake.
4. Infuse the first vial: Use vented IV tubing to hang the bag and infuse over 7.5 minutes.
5. Infuse the second vial: Repeat Steps 2 and 3 before the second infusion. Use vented IV tubing to hang the bag and infuse over 7.5 minutes.

OR

For cyanide or hydrogen sulfide

1. If intubated provide PPV utilizing a BVM
2. As soon as possible start an IV of normal saline and immediately give:
   a) Sodium nitrite 10ml of a 3% solution IV over 2 minutes (300mg). Monitor BP, as hypotension may occur (sodium nitrite converts approximately 20% of the circulating hemoglobin to methemoglobin). Additional doses of sodium nitrite should only be done once methemoglobin blood analysis is completed.
   b) Children—Administer 0.33 ml / kg of a 3% solution over 10 minutes.
   c) Sodium thiosulfate 50 ml of a 25% solution over 10 minutes. Monitor BP
   d) Children—Administer 1.65 ml / kg up to 50 ml over 10 minutes.
3. Administer 100% (NRBM) oxygen after administering sodium nitrite.

Note: Do not administer sodium nitrite in cases involving smoke inhalation (structure fires) or carbon monoxide poisoning. Administer only sodium thiosulfate and 100% oxygen.
7.1.11 Dinitrobenzene (DNB)

TREATMENT
Chemical Treatment Guide 3: GRAY

DESCRIPTION
Dinitrobenzene (DNB) is a colorless, oily liquid with a characteristic and peculiar sweet odor. It can also be found as a solid. Dinitrobenzene (DNB) causes methemoglobinemia, resulting in a state of relative hypoxia due to the inability of RBCs to carry oxygen. Dinitrobenzene (DNB) is explosive; it is detonated by heat or shock.

SIGNS AND SYMPTOMS
Signs and symptoms of the methemoglobinemia caused by this exposure include chocolate-brown-colored blood, headache, ataxia, vertigo, tinnitus, dyspnea, CNS depression, hypotension, heart blocks, ventricular dysrhythmias, seizures (rare), cyanosis, and cardiovascular collapse.
7.1.12 Ethylene Glycol

TREATMENT
Chemical Treatment Guide 6: PINK

DESCRIPTION
Ethylene glycol is an odorless, colorless, syrupy liquid found in antifreeze, brake fluid, and other industrial products. Because it is readily available and relatively inexpensive, it is often used in suicide attempts. Ingestion is the primary route of exposure. The potential lethal dose is reported to be 100 mL (1.0-1.5 mL/kg) in adults. It is the toxic metabolites - not the parent compound - that are responsible for the associated toxic effects. These effects include metabolic acidosis, tetany, QT interval prolongation on the ECG, and irreversible kidney failure. Ethylene glycol poisoning can be fatal, and quick diagnosis and intervention are imperative to prevent the damaging effects of the metabolites. If the patient has concurrently ingested ethanol, symptoms of ethylene glycol toxicity may be delayed.

SIGNS AND SYMPTOMS
The clinical manifestations of ethylene glycol poisoning occur in three phases:
- Phase I (30 minutes to 12 hours): ethanol-like inebriation, metabolic acidosis, seizures, and coma.
- Phase 2 (12 to 36 hours): tachycardia, tachypnea, hypertension, pulmonary edema.
- Phase 3 (36 to 48 hours): crystalluria, acute tubular necrosis with oliguria - renal failure.

EXAMPLES
- Component of antifreeze (including new-generation-type antifreeze)
- Brake fluids
- Inks in stamp pads and ballpoint pens
- Paints and plastics
7.1.13 Hydrofluoric Acid (HF)

TREATMENT
Chemical Treatment Guide 7: ORANGE

DESCRIPTION
Hydrofluoric acid is a colorless to yellow liquid with a strong, irritating odor. Because the boiling point of HF is 67ºF, when exposed to air, HF will readily change to a gaseous state. When HF comes in contact with metals, it forms hydrogen gas, which is extremely flammable. Once HF is absorbed into the tissues, it binds to calcium and magnesium. This form of fluoride poisoning can be fatal, even if exposure is due to a dilute solution (< 3%). Contact with as little as 7 mL of 100% solution can cause death.

SIGNS AND SYMPTOMS
Hypovolemic shock and collapse, tachycardia with weak pulse, acute pulmonary edema, asphyxia, chemical pneumonitis, upper airway obstruction with stridor, pain and cough, decreased LOC, nausea/vomiting, diarrhea, possible GI bleeding, and possible blindness. HF also causes severe skin burns. The damage may be severe with no outward signs, except that the patient will complain of severe pain.

EXAMPLES
• Rust removers
• Metal plating
• Glass etching
• Computer manufacturing
7. 1.14 Hydrogen Sulfide, Sulfides, and Mercaptans

7.1.14 Hydrogen Sulfide, Sulfides, and Mercaptans

TREATMENT
Chemical Treatment Guide 5: RED

DESCRIPTION
Members of this class of gases are colorless but have a strong offensive odor, like rotten eggs or sewer gas. When they are present at high levels, however, the olfactory senses will be overwhelmed, making the gas odorless. These chemicals may be found in a liquid form at low temperatures or high pressures. Clothing that has become soaked in sulfide solutions or mercaptans may pose a risk to rescuers. These types of chemicals can cause severe respiratory irritation, including pulmonary edema and respiratory paralysis (especially likely with hydrogen sulfide).

SIGNS AND SYMPTOMS
Cardiovascular collapse, tachycardia, dysrhythmias, irritation of the respiratory tract, cough, dyspnea, tachypnea, respiratory arrest, pulmonary edema, headache, altered mental status, garlic taste in mouth, seizures, nausea/vomiting, diarrhea, profuse salivation, dermatitis, sweating, and possible cyanosis.

EXAMPLES
- Found in sewers, septic tanks, livestock waste pits, manholes, well pits, and similar settings
- Found in chemical wastes, petroleum, and natural gas (28%)
- Produced in industrial processes that work with sulfur compounds
### 7.1.15 Methanol

**TREATMENT**
Chemical Treatment Guide 6: PINK

**DESCRIPTION**

Methanol is found as a highly volatile clear liquid and in mixtures. It is used in solvents, additives, and emulsifiers. It is a frequent ingredient in windshield washer fluid. Routes of exposure include skin absorption, eye contact, inhalation, and ingestion. Methanol has CNS depressant properties that are highly toxic upon aspiration and can cause respiratory failure and cardiac dysrhythmias. The metabolites that are formed following the metabolism of methanol - formaldehyde and formic acid - can cause a severe delayed toxicity.

**SIGNS AND SYMPTOMS**

**Cardiovascular:** dysrhythmias and hypotension.

**Respiratory:** respiratory insufficiency or arrest, pulmonary edema, chemical pneumonitis, and bronchitis.

**CNS:** CNS depression and coma, seizures, headache, muscle weakness, and delirium.

**GI:** GI bleeding, nausea/vomiting, and diarrhea. Eye: chemical conjunctivitis.

**Skin:** problems ranging from irritation to full-thickness burns.
7.1.16 Methylene Biphenyl Isocyanate, Ethyl Isocyanate, and Methylene Diisocyanate (MDI)

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
MDI is found as a solid, whose color ranges from white to yellow flakes. Various liquid solutions are also used for industrial purposes. There is no odor to the solid or liquid solutions. The vapor is approximately eight times heavier than air.

This chemical is a strong irritant to the eyes, mucous membranes, skin, and respiratory tract. MDI is also a very potent respiratory sensitizer. Various industrial processes utilize MDI in production and usage of (poly)urethane foams, lacquers, and sealants; MDI is also used in the production of insecticides and laminating materials. These chemicals are not cyanide compounds.

SIGNS AND SYMPTOMS
Irritation to the eyes, mucous membranes, skin, and respiratory tract (cough, dyspnea, and pulmonary edema).

EXAMPLES
- Component of smoke in plastic fires
7.1.17 Mustard (Sulfur Mustard): Lewisite, Blister Agents (H, HD, HS)

TREATMENT
Chemical Treatment Guide 1: YELLOW

DESCRIPTION
Mustard is a “blister agent” that causes cell damage and destruction. It is a colorless to light yellow to dark brown oily liquid with the odor of garlic, onion, or mustard. It does not evaporate readily, but may pose a vapor hazard in warm weather. Mustard is a vapor and liquid hazard to skin and eyes, and a vapor hazard to airways. Its vapor is five times heavier than air. Sulfur mustard has been used as a research tool to study DNA damage and repair. A variety of military munitions are filled with mustard, including projectiles, mortars, and bombs. Mustard damages DNA in cells, which leads to cellular damage and death. It penetrates the skin and mucous membranes very quickly, and cellular damage begins within minutes.

Lewisite is a “blister agent” that has the same effect on the body as mustard; with the exception that onset of symptoms begins immediately.

SIGNS AND SYMPTOMS
Mustard: Clinical effects begin within 2 to 24 hours. The initial effects include the following issues:
- Eyes: itching or burning, redness, corneal damage.
- Skin: erythema with itching and burning, blisters.
- Respiratory tract: epistaxis, hoarseness, sinus pain, dyspnea, and cough.

Lewisite: same effect on the body as mustard, with the exception that onset of symptoms begins immediately.
7.1.18 Nitrogen Products and Other Products Causing Methemoglobinemia

TREATMENT
Chemical Treatment Guide 3: GRAY

DESCRIPTIONS
These products can be found in a gas, liquid, or solid form. They are released from the combustion or decomposition of substances that contain nitrogen. Depending on the individual compound, these agents may pose a significant health hazard for rescuers. Many are well absorbed through intact skin. Simple water washing may be sufficient to remove oil compounds. Other routes of exposure include eye contact, inhalation, and ingestion. These products are respiratory tract irritants that can cause a severe, delayed pulmonary edema or immediate upper airway irritation and edema. They also change Fe$^2+$ to Fe$^3+$ (methemoglobinemia), which does not bind to oxygen.

SIGNS AND SYMPTOMS
Cardiovascular: cardiovascular collapse with weak and rapid pulse.
Respiratory: a mild, transient cough and tachypnea (only symptoms at the time of exposure to most agents). A delayed onset of dyspnea, tachypnea, violent coughing, cyanosis, and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing, and possibly upper airway obstruction spasm or edema of the glottis.
CNS: headache, dizziness, vertigo, fatigue, restlessness, and decreased LOC (usually delayed signs).
GI: burning of the mucous membranes, nausea/vomiting, and abdominal pain.
Eye: chemical conjunctivitis.
Skin: irritation of moist skin areas, pallor, and cyanosis with normal SpO$_2$.

Note:
Symptoms may be immediate or may be delayed for 5 to 72 hours.

EXAMPLES
- Propellant fuels and agricultural fumigants
- Also used in laboratory research solvents, bleaching agents, and refrigerants
- Found in grain silos (silo filler’s disease)
- Product of combustion in most fires (e.g., structure fires)
7.1.19 Organophosphates

7.1.19 Organophosphates: Insecticide Poisoning and Nerve Agents (GA, GB, GD, GF, VX)

TREATMENT
Chemical Treatment Guide 4: GREEN

DESCRIPTION
Organophosphate compounds are used as insecticides in residential applications as well as commercial agriculture. They are found as liquids, dusts, wettable powders, concentrates, and aerosols. Chemical nerve agents include Tabun (GA), Sarin (GB), Soman (GD), GF, and VX. Many are well absorbed through intact skin, so they pose a serious hazard to rescuers. Simple water washing may be sufficient to remove oily compounds. Routes of exposure include skin absorption, eye contact, inhalation, and ingestion. Organophosphates affect both the parasympathetic nervous system (muscarinic effects) and the sympathetic nervous system (nicotinic effects). Although the muscarinic effects may be reversed with atropine, the nicotinic effects may cause respiratory paralysis and require intubation and aggressive ventilatory support. Organophosphates may be incorporated in a flammable base.

SIGNS AND SYMPTOMS
Exposure may produce the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effects include bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis, which may last as long as 2 months) with inhalation or skin exposure. Ingestion may or may not cause miosis. However, stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasiculations, and seizures.

EXAMPLES
- Pesticides (e.g., Chlorthion, Diazinon, Dipterex, Di-Syton, Malathion, Parathion, Phosdrin)
- Chemical warfare agents (e.g., VX, Sarin, Tabun, Soman)

Note:
PPE (usually Level A) with SCBA must be worn in the hazardous area when organophosphates are present. PPE with a minimum of Level C protection must be worn for treatment outside the hazardous areas.
7.1.20 Phenol

TREATMENT
Chemical Treatment Guide 9: WHITE

DESCRIPTION
Phenol (carbolic acid), at room temperature, is a translucent, colorless, crystalline mass; white powder; or thick, syrupy liquid. The crystals turn pink to red in air. Phenol has a sweet, tar-like odor that is readily detected at low concentrations. It is soluble in alcohol, glycerol, petrolatum, and, to a lesser extent, water. Phenol is absorbed rapidly by all routes; however, the inhalation hazard is limited. In dilute concentrations (1% to 2%), phenol may cause severe burns. Systemic toxicity can rapidly lead to death. Phenol is mainly used in the manufacture of phenolic resins and plastics. It is also used as a disinfectant and has some medicinal applications (e.g., Campho Phenique®).

SIGNS AND SYMPTOMS
Nausea/vomiting, diarrhea, excessive sweating, headache, dizziness, ringing in the ears, seizures, loss of consciousness, coma, respiratory depression, inflammation of the respiratory tract, shock, and death. Exposure to skin can result in severe burns, which will cause the skin to have a white, red, or brown appearance. Failure to decontaminate the skin may allow the phenol to be absorbed systemically, resulting in death.

EXAMPLES
• Used in the manufacture of phenolic resins and plastics
• Used as a disinfectant
• Campho Phenique®
7.1.21 Phosphine

TREATMENT
Chemical Treatment Guide 8: PURPLE

DESCRIPTION

Phosphine can be found in a gas, liquid, or solid form. Most gases are colorless to brown, and have a sharp odor. Phosphine is used as a chemical warfare and protection agent, as a propellant fuel, and as an agricultural fumigant. Some compounds are used in laboratory research, solvents, and pesticides. They are released from the combustion or decomposition of substances that contain nitrogen. A toxic exposure can result from working on or in grain silos. Very small amounts of phosphine can be trapped in a victim’s clothing after an overwhelming exposure, posing a risk to rescuers. Routes of exposure include skin absorption, eye contact, inhalation, and ingestion. Phosphine is a respiratory tract irritant that can cause a severe, delayed pulmonary edema or immediate upper airway irritation and edema.

SIGNS AND SYMPTOMS

Cardiovascular: cardiovascular collapse with weak and rapid pulse. Patients may present with a reflex bradycardia.

Respiratory: mild and transient cough (only symptom at the time of exposure to most agents). A delayed onset of dyspnea, tachypnea, violent coughing, and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing, and possibly upper airway obstruction spasm or edema of the glottis. 

CNS: fatigue, restlessness, and decreased LOC (usually delayed signs). GI: burning of the mucous membranes, nausea/vomiting, and abdominal pain.

Eye: chemical conjunctivitis.

Skin: irritation of moist skin areas, pallor, and cyanosis.

Symptoms may be immediate or may be delayed for 5 to 72 hours.

EXAMPLES
• Pesticides (especially rodenticides). Also see description.

Note
PPE (usually Level A) with SCBA must be worn in the hazardous area where phosphine is present. PPE with a minimum of Level C protection must be worn for treatment outside the hazardous areas.
# 7.1 G Chemical Treatment Guide Index

## 7.1. G Chemical Treatment Guide Index

<table>
<thead>
<tr>
<th>Chemical Name or Group Name</th>
<th>Treatment Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acids and acid mists</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Alkaline compounds</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Ammonia (liquid and gas)</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Aromatic hydrocarbons (benzene, toluene, xylene)</td>
<td>Guide 2 - BLUE</td>
</tr>
<tr>
<td>Arsenic compounds (heavy metal poisoning)</td>
<td>Guide 2 - BLUE</td>
</tr>
<tr>
<td>Blister agents (H, HD, HS)</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Carbamates: insecticide poisoning</td>
<td>Guide 4 - GREEN</td>
</tr>
<tr>
<td>Carbon monoxide poisoning</td>
<td>Guide 2 - BLUE</td>
</tr>
<tr>
<td>Chlorinated hydrocarbons (methylene chloride)</td>
<td>Guide 2 - BLUE</td>
</tr>
<tr>
<td>Chlorine gas</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Cyanide</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Cyanogen chloride (CK)</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Methylene biphenyl isocyanate</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Dinitrobenzene (DNB)</td>
<td>Guide 3 - GRAY</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>Guide 6 - PINK</td>
</tr>
<tr>
<td>Ethyl isocyanate</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Hydrocyanic acid (AC)</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Hydrogen cyanide</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Hydrofluoric acid (HF)</td>
<td>Guide 7 - ORANGE</td>
</tr>
<tr>
<td>Hydrogen sulfide, sulfides</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Ketones</td>
<td>Guide 8 - PURPLE</td>
</tr>
<tr>
<td>Lewisite</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Mercaptans</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Methanol</td>
<td>Guide 6 - PINK</td>
</tr>
<tr>
<td>Methylene biphenyl isocyanate</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Methylene dilsocyanate (MDI)</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Mustard (sulfur mustard)</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Nerve agents (GA, GB, GD, GF, VX)</td>
<td>Guide 4 - GREEN</td>
</tr>
<tr>
<td>Nitrogen products and other products causing methemoglobinemia</td>
<td>Guide 3 - GRAY</td>
</tr>
<tr>
<td>Organophosphate insecticide poisoning</td>
<td>Guide 4 - GREEN</td>
</tr>
<tr>
<td>Phenol (carbolic acid)</td>
<td>Guide 9 - WHITE</td>
</tr>
<tr>
<td>Phosgene (CG)</td>
<td>Guide 1 - YELLOW</td>
</tr>
<tr>
<td>Phosphine Guide</td>
<td>Guide 8 - PURPLE</td>
</tr>
<tr>
<td>Potassium cyanide</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Sodium cyanide</td>
<td>Guide 5 - RED</td>
</tr>
<tr>
<td>Sulfur mustard (mustard)</td>
<td>Guide 1 - YELLOW</td>
</tr>
</tbody>
</table>
Chemical Treatment Guide 1A: **YELLOW**

- Acids and acid mists
- Alkaline compounds
- Ammonia (liquid and gas)
- Chlorine gas and phosgene (CG)
- Methylene biphenyl isocyanate, ethyl isocyanate, and methylene diphenyl isocyanate (MDI)
- Mustard (sulfur mustard): Lewisite, blister agents (H, HD, HS)

**SIGNS AND SYMPTOMS**

Low concentrations of airborne acids and alkalis can produce rapid onset of eye, nose, and throat irritation. Higher concentrations (low concentrations of ammonia) can produce cough, stridor, wheezing, and chemical pneumonia (non-cardiogenic pulmonary edema). Ingestion of acids and alkalis can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse, as well as partial- or full-thickness burns. End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM.

**Supportive Care**

- Remove the patient from the hazardous area (a).
- If the patient was exposed externally, remove his/her clothing and jewelry and decontaminate with copious amounts of water. Provide ocular irrigation with normal saline (do not attempt to neutralize with another solution) (see Medical Procedure 4.19, Morgan Lens).
- If the patient has external burns, see Adult Protocol 2.10.8, Burn Injuries.
- Medical Supportive Care Protocol Adult 2.1.3 or Pediatric 3.1.3. (Ipecac, charcoal, and NG tube are contraindicated; avoid oral airways.)
- Contact the Poison Information Center (1-800-222-1222).
- If the patient has pulmonary edema, maintain adequate ventilation and oxygenation, and provide pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should not be treated with Lasix, but with positive end expiratory pressure (PEEP) or a CPAP mask (see Medical Procedure 4.12).

**ALS Level 1**

- If the patient has bronchospasm: Albuterol (Ventolin®): See Medical Procedure 4.18.6
  - **Adult**
    - 1 nebulizer treatment containing 2.5 mg of albuterol pre-mixed with 3 mL normal saline
  - **Pediatric**
    - If < 1 year old or < 10 kg: mix 1.25 mg in 1.5 mL of normal saline (0.083%).
    - If > 1 year or > 10 kg: pre-mixed 2.5 mg in 3 mL of normal saline (0.083%). May repeat twice PRN (a).
- Adult and pediatric - may give terbutaline (Brethine®) 0.25 mg SQ, if available.
- If bronchodilators are administered, may add ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to either albuterol or levalbuterol nebulizer treatment on first nebulizer treatment only (b) (c) (d).
- Adult and pediatric if the patient has inhaled chlorine or hydrochloric acid (HCl) and has significant respiratory distress, administer sodium bicarbonate via nebulizer (8.4% 3 mL mixed with normal saline 3 mL or 4.2% in 6 mL).
7.1.G  Chemical Treatment Guide: YELLOW (continued)

Chemical Treatment Guide 1A: **YELLOW** (continued)

- If seizures continue for 5 minutes, Administer one of the following benzodiazepines:
  (Medication Delivery Procedure 4.18.)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg.
    Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (a).
    OR
  - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose
    0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2
    mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once
    if necessary. Maximum total dose of 10 mg (e)
    OR
  - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a
    max dose of 4 mg (a). Pediatric dose 0.1mg/kg, maximum dose is 2 mg.

- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is
  60 mL/kg) Neonate 10mg/kg maximum total dose is 30mL/kg. (Adult Protocol 2.4.1).

ALS Level 2 - None

Note:
(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the
appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very
high.
(b) Adult do not give albuterol or ipratropium bromide if the patient’s heart rate 140.
(c) Pediatric do not give albuterol or ipratropium bromide if the patient’s heart rate is above 200.
(d) Caution should be used when the patient is older than 40 years of age or has a history of
hypertension or heart disease.
(e) For IN administration, administer 1ml per nare, give half the volume in one nostril and the
other half of the volume in the other nare.

ALS Level 2 - None
7.1.G  Chemical Treatment Guide 2A: BLUE

Chemical Treatment Guide 2A: BLUE

- Aromatic hydrocarbons (benzene, toluene, xylene)
- Arsenic compounds (heavy metal poisoning)
- Carbon monoxide poisoning
- Chlorinated hydrocarbons (methylene chloride)

SIGNS AND SYMPTOMS
Mild exposure signs and symptoms: Cough, hoarseness, headache, poor concentration, irritability, agitation, anxiety, drowsiness, dizziness, weakness, tremors, transient euphoria, vision and hearing disturbances, nausea/vomiting, salivation, diarrhea, stomach pain, and chemical burns with chlorinated hydrocarbons. (For arsenic signs and symptoms, see below.)
Moderate to severe exposure signs and symptoms: Cardiovascular collapse, tachydysrhythmias (especially ventricular fibrillation), chest pain, pulmonary edema, dyspnea, tachypnea, respiratory failure, paralysis, altered mental status, seizures, excessive salivation, pale skin, cyanosis, rarely cherry-red skin with carbon monoxide, and delayed carcinogenic effects. (For arsenic signs and symptoms, see below.)
Signs and symptoms of arsenic exposure: Severe gastrointestinal fluid loss, burning abdominal pain, watery or bloody diarrhea, muscle spasm, seizures, cardiovascular collapse, tachycardia, hypotension, ventricular dysrhythmias, shock, and coma. There may be respiratory or cardiac arrest, and acute renal failure may occur with bronze urine within a few minutes.
End-stage symptoms may resemble organophosphate poisoning. However, patients will have normal or dilated pupils (patients will not have pinpoint pupils). These patients should not be given atropine or 2-PAM. Products may be flammable.

Supportive Care
- Remove the patient from the hazardous area (a).
- Medical Supportive Care Protocol Adult 2.1.3 or Pediatric 3.1.3. (Ipecac and an NG tube are contraindicated. Avoid oral airways.)
- If the patient was exposed externally, remove his/her clothing and jewelry and decontaminate as appropriate. Provide ocular irrigation with normal saline (see Medical Procedure 4.19, Morgan Lens).
- Administer high-flow oxygen (100%) (b).
- Contact the Poison Information Center (1-800-222-1222).
- If the patient has pulmonary edema, maintain adequate ventilation and oxygenation, and provide pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should not be treated with Lasix, but with positive end-expiratory pressure (PEEP) or a CPAP mask (see Medical Procedure 4.12).
7.1.G Chemical Treatment Guide 2A: BLUE (continued)

Chemical Treatment Guide 2A: **BLUE** (continued)

ALS Level 1

- If the patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3) (c).
- If seizures continue for 5 minutes, administer one of the following benzodiazepines: (Medication Delivery Procedure 4.18)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (d).
  - OR
  - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (d).
  - OR
  - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg (d). Pediatric dose 0.1mg/kg, maximum dose is 2 mg.
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is 60 mL/kg) Neonate 10mg/kg maximum total dose is 30mL/kg. (Adult Protocol 2.4.1).

ALS Level 2 - None

Note:

(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
(b) Document the duration of exposure to CO and when oxygen therapy was started (this information is needed to assist in making HBO decisions).
(c) Administration of epinephrine to patients in a pre-code status may not be desirable for this group of patients. A physician or the Poison Information Center should guide the administration of epinephrine in these cases.
(d) For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
7.1.G Chemical Treatment Guide 3A: GRAY

Chemical Treatment Guide 3A: GRAY

- Dinitrobenzene (DNB)
- Nitrogen products and other products causing methemoglobinemia

**SIGNS AND SYMPTOMS**

Methemoglobinemia characterized by chocolate-brown-colored blood, CNS depression, headache, dizziness, ataxia, vertigo, tinnitus, dyspnea, tachypnea, violent coughing, choking, possibly upper airway obstruction spasm or edema of the glottis, abdominal pain, hypotension, heart blocks, ventricular dysrhythmias, seizures (rare), pallor, cyanosis, and cardiovascular collapse.

Symptoms may be immediate or may be delayed for 5 to 72 hours.

**Supportive Care**

- Remove the patient from the hazardous area (a).
- Medical Supportive Care Protocol Adult 2.1.3 or Pediatric 3.1.3.
- If the patient was exposed externally, remove his/her clothing and decontaminate as appropriate.
- Administer high-flow oxygen (100%).
- Contact the Poison Information Center (1-800-222-1222).
- If nitrogen product ingestion occurred, adult and pediatric dose administer activated charcoal 1g/kg maximum dose is 50 g PO.

**ALS Level 1**

- Adult and pediatric if the patient is dyspneic, is cyanotic, has normal SpO2 and has chocolate brown colored blood, administer methylene blue (1%) 1 - 2 mg/kg slow IV over 5 minutes, followed by a normal saline 30 mL flush to decrease pain at the IV site.
- If the patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3).
- If seizures continue for 5 minutes, Administer one of the following benzodiazepines:
  (Medication Delivery Procedure 4.18)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (b).
  - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (b)
  - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg Pediatric dose 0.1mg/kg, maximum dose is 2 mg (b).
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is 60 mL/kg) Neonate 10mg/kg maximum dose is 30mL/kg. (Adult Protocol 2.4.1).
- Do not induce vomiting.

**ALS Level 2**

- If cyanosis persists, adult and pediatric dose administer methylene blue (1%) 1-2 mg/kg slow IV over 5 minutes, followed by a 30 mL flush of normal saline to decrease pain at the IV site.

**Note:**

(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.

(b) For IN administration, administer, 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
Chemical Treatment Guide 4A: **GREEN**

- Carbamates: insecticide poisoning
- Organophosphates: insecticide poisoning and nerve agents (GA, GB, GD, GF, VX)

**SIGNS AND SYMPTOMS**
The muscarinic effects are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effects include bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis, which may last as long as 2 months despite appropriate treatment) with inhalation or skin exposure. Ingestion may or may not cause miosis. Stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasiculations, and seizures.

**Supportive Care**
- Remove the patient from the hazardous area (a).
- Avoid exposure to the patient’s sweat, vomit, stool, and vapors emitting from soaked clothes.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.3.
- Administer high-flow O2.
- If the patient was exposed externally, remove his/her clothing and decontaminate as appropriate (place the patient’s clothes in sealed bag).
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**
If treating 1-4 patients:
- If the patient is bradycardic (patient is usually tachycardic) or has excessive pulmonary secretions, adult dose administer atropine 0.03 mg/kg IV (2 mg/70 kg), pediatric dose 0.05mg/kg maximum dose is 3mg. Repeat every 5 minutes until secretions are inhibited (b) (c).
- In case of organophosphate poisoning, adult and pediatric dose consider pralidoxime (Protopam®, 2-PAM®) 1-2 g mixed in 100 mL NS IV drip over 30 minutes. In severe cases, 2-PAM® may be given via IV at a maximum rate of 200 mg/min or 1 g/5 min (used when nicotinic effects are present, as evidenced by fasciculation of large muscles). Observe patient for hypertension. (May be needed with high exposure to carbamates.)
- If seizures continue for 5 minutes, Administer one of the following benzodiazepines: (Medication Delivery Procedure 4.18)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (e).
  - OR
  - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (e)
  - OR
  - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg. Pediatric dose 0.1mg/kg, maximum dose is 2 mg (e).
### Chemical Treatment Guide 4A: GREEN (continued)

If treating 5 or more patients older than 5 years of age or treating self-exposure (with pinpoint pupils): Adult and pediatric.

- Administer DuoDote(s) (combined Atropine and Pralidoxime) or Mark I Kit(s) (two auto-injectors containing Atropine 2 mg in one and pralidoxime 600 mg in the other; see Medical Procedure 4.18.1) as follows:
  - For early symptoms (severe rhinorrhea or mild to moderate dyspnea): administer one DuoDote or Mark I auto-injector kit. If no improvement in patient’s status in 10 minutes, administer another DuoDote or Mark I auto-injector kit (c) (d).
  - For severe respiratory distress, coma, or seizures: administer three DuoDotes or Mark I auto-injectors and one CANA/Valium auto-injector (diazepam 10 mg IM) (c) (d).

For all patients meeting the preceding criteria:

- Alert the emergency department to prepare for a contaminated patient.
- Do not induce vomiting or give Furosemide (Lasix®) or Morphine.
- If the patient is experiencing eye pain and/or blepharospasm, administer Scopolamine 1 drop in each eye.

**ALS Level 2 - None**

**Note:**

(a) If risk of exposure from fumes is high, call for a hazardous materials team. PPE (usually Level A) with SCBA must be worn in the hazardous area. PPE with a minimum of Level C protection must be worn for treatment outside the hazardous area.

(b) If advised by the Poison Information Center, every other dose of Atropine can be increased to 0.06 mg/kg IV.

(c) The endpoint for treatment is manifested by patient improvement with clear lung sounds.

(d) When possible, establish an IV and administer Atropine, Diazepam, Lorazepam, and Midazolam IV and Pralidoxime IV drip.

(e) For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
7.1.G  Chemical Treatment Guide 5A: RED

Chemical Treatment Guide 5A: RED

- Cyanide: hydrogen cyanide, hydrocyanic acid (AC), cyanogen chloride (CK)
- Hydrogen sulfide, sulfides, and mercaptans
- Azides

SIGNS AND SYMPTOMS
Cardiovascular: initially, pulse decreases and BP rises. In later stages, tachycardia, dysrhythmias, and cardiovascular collapse can occur. There may also be palpitations and/or chest tightness.
Respiratory: can cause immediate respiratory arrest. Initially there is usually an increase in the rate and depth of respirations, which later become slow and gasping. Irritation of the respiratory tract, cough, dyspnea, tachypnea, and pulmonary edema may also occur.
CNS: can cause immediate coma. Initially there is usually weakness, headache, and confusion; seizures are common.
GI: nausea/vomiting, profuse salivation, possibly garlic taste in mouth. Skin: pale, cyanotic, or reddish color, dermatitis, sweating.

Note:
Good medical supportive care, including airway management, is paramount and should precede the use of the cyanide antidote kit. However, the rapid administration of the cyanide antidote kit is the only therapy that will reverse the life-threatening symptoms.

Supportive Care
- Remove the patient from the hazardous area (a).
- Avoid exposure to vapors emitting from soaked clothes.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric 3.1.3.
- Administer high-flow O₂.
- If the patient was exposed externally, remove his/her clothing quickly and decontaminate.
- Contact the Poison Information Center (1-800-222-1222).
- If the patient is conscious, administer activated charcoal 1g/kg maximum dose is 50 g PO for oral ingestion.
- Only a physician or the Poison Information Center can authorize treatment beyond supportive care for exposure to azides.
- Alert the emergency department to prepare for a contaminated patient.
- Do not induce vomiting.

ALS Level 1
- Adult and pediatric if the patient is unconscious, administer sodium bicarbonate 1 mEq/kg IV.
- If advanced airway in place provide PPV utilizing a BVM
- If the patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric 3.1).
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is 60 mL/kg). For neonate, 10mL/kg maximum total dose is 30mL/kg. (Adult Protocol 2.4.1).
Chemical Treatment Guide 5A: RED (continued)

- If the patient is exhibiting life-threatening symptoms (severe respiratory compromise or arrest, shock, seizures, coma), administer the Cyanokit or if unavailable the cyanide antidote kit (3 parts) in the following order (to induce methemoglobinemia). If symptoms are not severe, or if diagnosis is not certain, omit Steps 1 and 2 and only give sodium thiosulfate (Step 3). Paramedics who are not part of a hazardous materials team and non-rescue supervisors can only give sodium thiosulfate.

TREATMENT:

Option 1 Cyanokit (Hydroxocobalamin for Injection), for use with cyanide exposures
This kit is for intravenous use. The hydroxocobalamin is to be reconstituted with 100 mL per vial of 0.9% sodium chloride injection. The starting dose is 5 g. (may be packaged in one or two vials). See Procedure 4.13 and Drug Summary 5.18, Hydroxocobalamin.

1. Start a dedicated IV line
2. Reconstitution: Add 100 mL of 0.9% sodium chloride injection to the vial using a transfer spike. Fill to the line (with the vial in an upright position).
3. Mix: Rock or rotate the vial for 30 seconds to mix the solution. Do not shake.
4. Infuse the first vial: Use vented IV tubing to hang the bag and infuse over 7.5 minutes.
5. Infuse the second vial: Repeat Steps 2 and 3 before the second infusion. Use vented IV tubing to hang the bag and infuse over 7.5 minutes.

OR

Option 2: For severe hydrogen sulfide exposures
Rescue Supervisor and Hazardous Materials Team Paramedic

1. Sodium Nitrite 10ml of a 3% solution IV over 2 minutes (300mg). Monitor BP, as hypotension may occur. (Sodium Nitrite converts approximately 20% of the circulating hemoglobin to methemoglobin). Additional doses of Sodium Nitrite should only be done once methemoglobin blood analysis is completed. Administer 100% (NRBM) oxygen after administering Sodium Nitrite.

Note: Do not administer sodium nitrite in cases involving smoke inhalation (structure fires) or carbon monoxide poisoning. Administer only sodium thiosulfate and 100% oxygen.
Chemical Treatment Guide 5A: RED (continued)

- If seizures continue for 5 minutes, Administer one of the following benzodiazepines: (Medication Delivery Procedure 4.18)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (c).
  OR
  - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN. Pediatric dose 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (c).
  OR
  - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg. Pediatric dose 0.1mg/kg, maximum dose is 2 mg (c).

ALS Level 2
- If symptoms persist after 20 minutes, repeat the cyanide antidote kit at 50% of the initial dose.
- If the patient becomes cyanotic after administration of the cyanide antidote kit, contact the Poison Information Center (1-800-222-1222) for further instructions.

Note:
(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
(b) If the patient has IV access and received supportive care, Step 1 may be bypassed for Step 2.
(c) For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
### Chemical Treatment Guide 6A: PINK

- Ethylene glycol
- Methanol

**CLINICAL MANIFESTATIONS OF ETHYLENE GLYCOL POISONING**

- **Phase I (30 minutes to 12 hours):** ethanol-like inebriation, metabolic acidosis, seizures, and coma.
- **Phase 2 (12 to 36 hours):** tachycardia, tachypnea, hypertension, pulmonary edema.
- **Phase 3 (36 to 48 hours):** crystalluria, acute tubular necrosis with oliguria - renal failure.

**SIGNS AND SYMPTOMS OF METHANOL EXPOSURE**

- **Cardiovascular:** dysrhythmias and hypotension.
- **Respiratory:** respiratory insufficiency or arrest, pulmonary edema, chemical pneumonitis, and bronchitis.
- **CNS:** CNS depression and coma, seizures, headache, muscle weakness, and delirium.
- **GI:** GI bleeding, nausea/vomiting, and diarrhea. **Eye:** chemical conjunctivitis.
- **Skin:** problems ranging from irritation to full-thickness burns.

**Supportive Care**

- Remove the patient from the hazardous area.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3.
- Contact the Poison Information Center (1-800-222-1222).

### ALS Level 1

- If seizures continue for 5 minutes, Administer one of the following benzodiazepines: (Medication Delivery Procedure 4.18)
  - **Diazepam (Valium®)** Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg IV, IM, IN or IO, may repeat to a max of 10 mg (a).
  - **OR**
    - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose 0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (a)
  - **OR**
    - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg (a). Pediatric dose 0.1mg/kg, maximum dose is 2 mg.

- If the patient’s lungs are clear, administer normal saline at a rate of 100 mL/h IV.
- If the patient’s respiratory rate is twice the normal rate, administer sodium bicarbonate 8.4% 1-2 mEq/kg IV.
- If the patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3).
- Administer thiamine 100 mg IV if available

### ALS Level 2 - None

Note: (a) for IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
Chemical Treatment Guide 7A: **ORANGE**

- Hydrofluoric acid (HF)
- Vicane

**SIGNS AND SYMPTOMS**
Hypovolemic shock and collapse, tachycardia with weak pulse, acute pulmonary edema, asphyxia, chemical pneumonitis, upper airway obstruction with stridor, pain and cough, decreased LOC, nausea/vomiting, diarrhea, possible GI bleeding, and possible blindness. HF also causes severe skin burns. The damage may be severe with no outward signs, except that the patient will complain of severe pain.

**Supportive Care**
- Remove the patient from the hazardous area (a).
- Medical Supportive Care Protocol 2.1.3 or pediatric 3.1.3. (Ipecac is contraindicated.)
- If the patient was exposed externally, remove his/her clothing and jewelry and decontaminate with copious amounts of water.
- Contact the Poison Information Center (1-800-222-1222).
- If the patient has pulmonary edema, maintain adequate ventilation and oxygenation, and provide pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should not be treated with Lasix, but with positive end-expiratory pressure (PEEP) or a CPAP mask (see Medical Procedure 4.12).

**ALS Level 1 for Adult and Pediatric**
- If the patient has burns to the eye(s): Immediately flush with copious amounts of water or normal saline. Prepare an eye wash solution by mixing calcium gluconate (10%) 50 mL in normal saline 500 mL (b).
- Apply calcium gluconate eye wash using the Morgan lens (see Medical Procedure 4.45) and continue until arrival at the receiving facility (b).

**If the patient has burns to the skin for Adult and Pediatric**
- Immediately flush with copious amounts of water.
- Prepare a skin gel by mixing calcium gluconate (10%) 10 mL into a 2-oz tube of KY Jelly (making a 2.5% gel) (b).
- Apply a 2.5% calcium gluconate gel on the burned area. For burns to the hand(s), place the hand in a glove filled with this gel (b).
7.1.G Chemical Treatment Guide 7A: ORANGE (continued)

Chemical Treatment Guide 7A: ORANGE (continued)

For inhalation injury: For Adult and Pediatric
- Immediately support ventilations.
- Administer calcium gluconate Treat inhalation injuries with oxygen and 2.5% calcium gluconate nebulizer, administer 1mL mixed 3mL normal saline via a nebulizer.
- For severe respiratory depression/arrest and/or cardiac toxicity (dysrhythmia, prolonged QT interval, hypotension), administer calcium gluconate (10%) 1-2 g slow IV over 5 minutes (b).
- If the patient has dysrhythmias, treat PRN (Adult Protocol 2.3 or Pediatric Protocol 3.3).
- If hypotension persists, treat PRN (Adult Protocol 2.4.1).
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is 60 mL/kg) Neonate 10mg/kg maximum total dose is 30mL/kg. (Adult Protocol 2.4.1).

ALS Level 2
If systemic symptoms persist, repeat calcium gluconate (10%) adult dose 1-2 g slow IV over 5 minutes pediatric dose 100mg/kg maximum dose is 1 g IV slow over 5 minutes (b).

Note:
(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
(b) Do not use calcium carbonate, as the outcome can be disastrous.
7.1.G Chemical Treatment Guide 8A: PURPLE

Chemical Treatment Guide 8A: **PURPLE**

- Ketones
- Phosphine

**SIGNS AND SYMPTOMS OF KETONE EXPOSURE**

**Cardiovascular:** cardiac dysrhythmias and tachycardia.

Respiratory: upper respiratory tract irritation, dyspnea, tachypnea, a burning sensation in the chest and pulmonary edema.

**CNS:** CNS depression to coma, confusion, tinnitus, disorientation, headache, drowsiness, weakness, and seizures.

**GI:** pain and irritation of the mucous membranes, nausea/vomiting, and diarrhea.

**Eye:** chemical conjunctivitis.

**Skin:** irritation and dermatitis, cyanosis of extremities.

**SIGNS AND SYMPTOMS OF PHOSPHINE EXPOSURE**

**Cardiovascular:** cardiovascular collapse with weak and rapid pulse. Patients may present with a reflex bradycardia.

**Respiratory:** mild and transient cough (only symptom at the time of exposure to most agents). A delayed onset of dyspnea, tachypnea, violent coughing, and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing, and possibly upper airway obstruction spasm or edema of the glottis.

**CNS:** fatigue, restlessness, and decreased LOC (usually delayed signs). GI: burning of the mucous membranes, nausea/vomiting, and abdominal pain.

**Eye:** chemical conjunctivitis.

**Skin:** irritation of moist skin areas, pallor, and cyanosis.

Note: Symptoms may be immediate or may be delayed for 5 to 72 hours.

Supportive Care Adult and Pediatric

- Remove the patient from the hazardous area (a).
- Avoid exposure to vapors emitting from soaked clothes.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric 3.1.3.
- Administer 100% high-flow oxygen.
- Ipecac is contraindicated.
- If the patient was exposed externally, remove his/her clothing and decontaminate as appropriate (do not use water as an initial irrigating solution for phosphine exposure due to possible reactivity). Provide ocular irrigation with normal saline (see Medical Procedure 4.45, Morgan Lens).
- Contact the Poison Information Center (1-800-222-1222).
- For phosphine ingestions. Administer activated charcoal 1g/kg maximum dose of 50g PO.
- If the patient has pulmonary edema, maintain adequate ventilation and oxygenation, and provide pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should not be treated with Lasix, but with positive end-expiratory pressure (PEEP) or CPAP mask (see Procedure 4.12).
7.1.G Chemical Treatment Guide 8A - PURPLE (continued)

Chemical Treatment Guide 8A: PURPLE (continued)

ALS Level 1

- If seizures continue for 5 minutes, administer one of the following benzodiazepines:
  (Medication Delivery Procedure 4.18)
  - Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg.
    Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (a).
  - OR
    - Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose
      0.1mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2
      mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once
      if necessary. Maximum total dose of 10 mg (b).
  - OR
    - Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a
      max dose of 4 mg (a). Pediatric dose 0.1mg/kg, maximum dose is 2 mg.

- If the patient has dysrhythmias, treat PRN (see Adult Protocol 2.3).
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is
  60 mL/kg) Neonate 10mg/kg maximum total dose is 30mL/kg. (Adult Protocol 2.4.1).

ALS Level 2 - None

Note:
(a) If risk of exposure from fumes is high, call for a hazardous materials team. PPE (usually
Level A) with SCBA must be worn in the hazardous area. PPE with a minimum of Level C
protection must be worn for treatment outside the hazardous areas.
(b) For IN administration, administer 1ml per nare, give half the volume in one nostril and the
other half of the volume in the other nare.
Chemical Treatment Guide 9A: WHITE

Phenol (carbolic acid)

SIGNS AND SYMPTOMS
Nausea/vomiting, diarrhea, excessive sweating, headache, dizziness, ringing in the ears, seizures, loss of consciousness, coma, respiratory depression, inflammation of the respiratory tract, shock, and death. Exposure to skin can result in severe burns, which will cause the skin to have a white, red, or brown appearance. Failure to decontaminate the skin may allow the phenol to be absorbed systemically, resulting in death.

Supportive Care
- Remove the patient from the hazardous area (a).
- Avoid exposure to vapors emitting from soaked clothes.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric protocol 3.1.3.
- Ipecac is contraindicated.
- If the patient was exposed externally, remove his/her clothing and decontaminate with copious amounts of water. After thoroughly rinsing skin, apply vegetable oil to exposed areas. (Isopropyl alcohol may be used for very small skin burns only.)
- Provide ocular irrigation with normal saline (see Medical Procedure 4.19, Morgan Lens).
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
- Assess the need for an advanced airway (Medical Procedure 4.4).
- If seizures continue for 5 minutes, Administer one of the following benzodiazepines:
  (Medication Delivery Procedure 4.18)
  o Diazepam (Valium®) Adult dose 5 mg IV, IM or IN; may repeat to a max of 20 mg. Pediatric dose 0.2 mg/kg, may repeat to a max of 10 mg (a).
  OR
  o Midazolam (Versed) Adult dose 2 mg increments IV, IO, IM, or IN, Pediatric dose 0.1 mg/kg, maximum single dose 4 mg IV, IO, IM. For IN administration use 0.2 mg/kg/dose (use 10 mg/2mL concentration), maximum single dose 5 mg; may repeat once if necessary. Maximum total dose of 10 mg (b)
  OR
  o Lorazepam (Ativan®) Adult dose 2 mg IV, IM, or IN; may repeat once as needed, up to a max dose of 4 mg (a). Pediatric dose 0.1 mg/kg, maximum dose is 2 mg.
- If hypotension persists, administer 20 mL/kg normal saline IV PRN (maximum total dose is 60 mL/kg) Neonate 10 mg/kg maximum total dose is 30 mL/kg. (Adult Protocol 2.4.1).

ALS Level 2 - None

Note:
(a) If risk of exposure from fumes is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
(b) For IN administration, administer 1 ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
7.2 Adult Hazardous Material Exposure (Biological Agents)

This protocol is to be used for those patients suspected of exposure to biological agents via any route of exposure (e.g., inhalation, absorption). It gives specific considerations for each type of exposure as well as general treatment guidelines. Scene safety should be of primary concern, with special attention being paid to the need for personal protective equipment. Additional assistance may be necessary (e.g., hazardous materials team, police).

Because many biological agents are spread through an airborne route, scene safety must include use of protective masks by all personnel, and must include containment of the unknown substance to prevent its airborne spread. Any victim who has a cough, respiratory symptoms, or a flu-like syndrome should be considered as potentially infectious to others by the respiratory route, until proven otherwise. Both patients and healthcare workers should wear protective masks. If a patient needs low-flow oxygen therapy, it may be given by nasal cannula under a protective mask. If a patient needs high-flow oxygen therapy, it may be given by non-rebreather mask, which should not be covered by a protective mask; instead, the healthcare workers must wear protective masks.

Symptoms that would develop after a biological weapon (BW) attack would be delayed and nonspecific, making the initial diagnosis difficult. A BW attack should be considered if any of the following factors are present:
- Large epidemic with unprecedented number of ill or dying
- HIV-positive individuals who demonstrate first susceptibility (“canary in a coal mine”)
- High volumes of patients complaining primarily of respiratory symptoms that are severe and are associated with an unprecedented mortality rate
- A cause of infection that is unusual or impossible for the particular region (such as the Ebola virus, which is rarely seen outside Africa)
- Multiple, yet simultaneous outbreaks
- An epidemic caused by a multidrug-resistant pathogen, previously unknown
- Sick or dead animals of multiple types
- Identification of the delivery vehicle for the agent
- Prior intelligence reports or claims by aggressors of a BW attack

SIGNS AND SYMPTOMS
After a characteristic incubation period following aerosol exposure, most BW agents present as an initial influenza syndrome characterized by the following signs and symptoms:
- Fever
- Chills
- Malaise
- Headache
- Myalgia
7.2 Adult Hazardous Material Exposure (Biological Agents) (continued)

Some BW agents rapidly develop into a pulmonary syndrome characterized by the following signs and symptoms:
- Dyspnea
- Cyanosis
- Chest pain
- Radiological abnormalities
- Liver involvement, indicated by rising liver enzymes, with or without jaundice
- Encephalitis (may occur with some viral agents), typified by photophobia, confusion, and nuchal rigidity
- Maculopapular, vesicular pustular, or ulcerative skin lesions, with or without bleeding abnormalities

Unexplained death or flaccid paralysis (may indicate a biological toxin) A history should be obtained from the patient and bystanders, to include the following information:
- Duration of symptoms
- Pertinent medical history
- Patient’s recent history of travel
- Infectious contacts
- Employment
- Activities over the preceding 3-5 days

If a biological agent exposure is suspected, call for a hazardous materials team. In this instance, refer to the appropriate hazardous materials PPE protocol, to protect against secondary contamination. All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy, and then contact the receiving emergency department for confirmation of ALS Level 2 orders.

It is imperative that the emergency department be made aware early that a contaminated patient is being transported so that proper preparations can be made to receive the patient.
7.2.1 Anthrax

Bacillus anthracis is a gram-positive, rod-shaped organism that becomes infectious when it converts into a spore and enters the host. The spore germinates inside a macrophage, which is then transported to regional lymph nodes. There, local production of toxins causes edema and necrosis of the tissue, leading to bacteremia, toxemia, and death. Symptoms vary with the method of exposure:

- **Cutaneous Anthrax**: Skin lesions appear in 1-5 days, consisting of 1- to 2-cm vesicles with regional edema and lymphadenitis. Most patients with small lesions will be afebrile. Lesions develop into a painless necrotic ulcer with a black eschar base.
- **Gastrointestinal Anthrax**: Signs and symptoms include fever, nausea/vomiting, abdominal pain, bloody diarrhea, sometimes rapidly developing ascites, and possibly acute abdomen. Oropharyngeal cases show primary involvement of the tonsils.
- **Inhalation Anthrax**: A 6-day incubation period is followed by fever, myalgias, cough, and fatigue. Initial improvement is followed by abrupt onset of respiratory distress, shock, and death in 24-36 hours. Physical findings are nonspecific, pneumonia is rare, and 50% of cases have associated hemorrhagic meningitis.

**Supportive Care**
- Remove the patient from the hazardous area (a).
- If the patient was exposed externally, remove his/her clothing and decontaminate as appropriate.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**
None

**ALS Level 2**
If there is a high suspicion of significant exposure to anthrax, then Medical Control or the Poison Information Center may order preventive treatment with oral ciprofloxacin (Cipro®) 500 mg PO bid or doxycycline 100 mg PO bid.

**Note:**
(a) If risk of exposure is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
7.2.2 Botulism

The botulinum toxins are a group of seven related neurotoxins produced by the bacillus Clostridium botulinum. When inhaled, these toxins produce a clinical picture very similar to that associated with foodborne intoxication, although the time to onset of paralytic symptoms may actually be longer than for foodborne cases, and may vary by type and dose of toxin. The clinical syndrome produced by one or more of these toxins is known as “botulism.” Botulism toxin is also a licensed medicine that is used for the treatment of dystonias and can be found in some hospital pharmacies.

SIGNS AND SYMPTOMS
The onset of symptoms of inhalation botulism may vary from 24-36 hours to several days following exposure. Symptoms include the following:
Bulbar palsies produce loss of function in nerves originating in the brain stem, causing the following symptoms:
• Blurred vision
• Mydriasis
• Diplopia
• Ptosis
• Photophobia
• Dysphagia
• Dysphonia

Following bulbar palsies, skeletal muscles become weak, leading to a symmetrical descending paralysis (head-to-toe). These symptoms may progress acutely to respiratory failure and death within 24 hours. Patients usually remain awake and alert.

Supportive Care
• Medical Supportive Care Protocol 2.1.3 or Pediatric Protocol 3.1.3.
• Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
None
7.2.3 Cholera

Vibrio cholerae is a short, curved, motile, gram-negative, non-sporulating rod. Cholera is the prototype toxigenic diarrhea, which is secretory in nature. Transmission of the pathogen occurs through direct and indirect fecal contamination of water or foods, and by heavily soiled hands or utensils. V. cholerae can survive for as long as 24 hours in sewage, and as long as 6 weeks in certain types of relatively impure water containing organic material. Because cholera does not easily spread from human to human, for this pathogen to be an effective biological weapon, major drinking water supplies would have to be heavily contaminated.

Cholera is an acute infectious disease, characterized by sudden onset with nausea, vomiting, profuse diarrhea with “rice water” appearance, rapid loss of body fluids, toxemia, and frequent collapse. If untreated, mortality may by 50%.

SIGNS AND SYMPTOMS
The following signs and symptoms occur within 12 to 72 hours of exposure:
- Intestinal cramping
- Painless diarrhea
- Vomiting
- Malaise
- Headache
- Low-grade fever

Supportive Care
- Remove the patient from the hazardous area.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Consider fluid replacement.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
In-hospital treatment may include the use of tetracycline 500 mg qid for 3 days or doxycycline 300 mg once or 100 mg bid for 3 days. If the organism is tetracycline resistant, use ciprofloxacin 500 mg bid for 3 days or erythromycin 500 mg qid for 3 days.
7.2.4 Plague

The plague is spread to humans from either the bite of an infected flea or inhalation of the organism. Infection occurs in three forms:

- **Bubonic**: involves lymph nodes closest to the bite of infected flea.
- **Pneumonic**: an infection of the lungs.
- **Septicemia**: a generalized infection in the blood, caused by the bacteria escaping through the lymph nodes or lungs.

**SIGNS AND SYMPTOMS**

Two to three days after inhaling the plague organism, the patient will develop the following signs and symptoms:

- High fever
- Myalgia
- Chills
- Headache
- Cough with bloody sputum
- Signs of overwhelming infection (including pneumonia)

Chest X-ray may show patchy infiltrates or consolidation, with a rapidly progressing pneumonia causing dyspnea, stridor, and cyanosis. The patient will experience eventual respiratory failure and circulatory collapse; laboratory evidence will show disseminated intravascular coagulation (DIC).

**Supportive Care**

- Remove the patient from the hazardous area (a).
- Respiratory isolation is mandatory for the first 48 hours of treatment.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**

None

**ALS Level 2**

- Antibiotic treatment must be started within 24 hours of the onset of symptoms. In-hospital treatment may include the use of streptomycin 15 mg/kg IM bid for 10 days or doxycycline 200 mg IV initially, followed by 100 mg bid for 10 days. For plague meningitis, administer chloramphenicol 12.5-18.75 mg/kg qid.
- If there is a high suspicion of significant exposure to plague, then Medical Control or the Poison Information Center may order preventive treatment with oral ciprofloxacin (Cipro®) 500 mg PO bid or doxycycline 100 mg PO bid.

**Note:**

(a) If risk of exposure is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
7.2.5 Q Fever

Q fever is caused by a rickettsia organism, Coxiella burnetii, that is highly infectious and resistant to heat and drying. Its natural reservoir is sheep, cattle, and goats. Humans acquire the disease by inhalation of aerosols contaminated with the organism. Following a 10- to 20-day incubation, Q fever generally occurs as a self-limiting febrile illness lasting 2 days to 2 weeks, and is characterized by headaches, fatigue, and myalgias. Pneumonia occurs in 50% of all patients, with half of these patients (25% total) presenting with a cough (usually non-productive) or rales.

SIGNS AND SYMPTOMS
- High-grade fever
- Rigors
- Severe headache
- Photophobia
- Myalgias
- Nausea/vomiting
- Diarrhea

Supportive Care
- Remove the patient from the hazardous area.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None.

ALS Level 2
Most cases will resolve even without antibiotic therapy. To shorten the duration of the illness, in-hospital treatment may include the use of tetracycline 500 mg qid or doxycycline 100 mg bid for 5 to 7 days.
7.2.6 Ricin

Ricin is a potent cytotoxin that is derived from the beans of the castor plant and is a by-product in castor oil production. When inhaled as a small-particle aerosol, this toxin may produce pathologic changes within 8 hours and severe respiratory symptoms followed by acute hypoxic respiratory failure in 36-72 hours. When ingested, ricin causes severe gastrointestinal symptoms, followed by vascular collapse and death. This toxin may also cause disseminated intravascular coagulation, microcirculatory failure, and multiple-organ failure if given intravenously.

SIGNS AND SYMPTOMS
After inhalation:
- Fever
- Chest tightness
- Cough
- Shortness of breath
- Nausea
- Joint pain within 4 to 8 hours of exposure
- Necrosis of the lower airway epithelium and severe pulmonary edema
- Death within 36-72 hours

After ingestion:
- Nausea
- Vomiting
- Severe diarrhea
- Gastrointestinal hemorrhage with necrosis of the liver, spleen, and kidneys
- Shock leading to death within 3 days

After injection:
- Marked death of muscles and lymph nodes near the site of injection
- Multiple-organ failure, leading to death

Supportive Care
- Remove the patient from the hazardous area (a).
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1 None

ALS Level 2
If ingested, aggressive gastric lavage and activated charcoal should be administered in the hospital.

Note:
(a) Risk of exposure via the airborne route is high. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
7.2.7 Smallpox

Smallpox is caused by the Variola virus. Although the fully developed cutaneous eruption of smallpox is unique, earlier stages of the rash could be mistaken for varicella. Secondary spread of infection constitutes a nosocomial hazard from the time of onset of a smallpox patient’s exanthem until scabs have separated. Quarantine with respiratory isolation should be applied to secondary contacts for 17 days post-exposure.

SIGNS AND SYMPTOMS

- Fever
- Rigors
- Headache
- Malaise
- Nausea/vomiting
- Back ache
- Approximately 15% of patients develop delirium.
- Approximately 10% of light-skinned patients exhibit an erythematous rash.
- Two to three days later, an enanthem appears concomitantly with a discrete rash about the face, hands, and forearms.
- Following eruptions on the lower extremities, the rash spreads to the trunk over the next week.
- Lesions quickly progress from macules to papules, and eventually to pustular vesicles.
- With smallpox, lesions are more abundant on the extremities and face, as opposed to varicella (chickenpox), in which lesions on various segments of the body remain generally synchronous in their stage of development and primarily start on the trunk and spread to the extremities.

Supportive Care

- Remove the patient from the hazardous area (a).
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1

None

ALS Level 2

Immune globulin for variola and the vaccines (vaccinia and VIG) may be obtained through the CDC.

Note:

(a) Risk of exposure via the airborne route is high. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
7.2.8 Staphylococcal Enterotoxin B

Staphylococcal enterotoxin B (SEB) is a fever-producing exotoxin produced by the bacteria Staphylococcus aureus. This toxin commonly causes food poisoning in improperly handled foods that have an overgrowth of the staph organism and then are ingested. SEB symptoms will vary with the route of exposure (inhaled versus ingested).

SIGNS AND SYMPTOMS
- From 3-12 hours after aerosol exposure, there will be a sudden onset of the following signs and symptoms:
  - Fever (103-106°F), lasting 2 to 5 days
  - Chills
  - Headache
  - Myalgia
  - Nonproductive cough, which may persist for up to 4 weeks
  - In some patients, shortness of breath and retrosternal chest pain

If ingested, symptoms include the following:
- Nausea
- Vomiting
- Diarrhea

High exposure can lead to septic shock and death.

Supportive Care
- Remove the patient from the hazardous area.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
None
7.2.9 Trichothecene Mycotoxins (T2)

The trichothecene mycotoxins are nonvolatile compounds produced by filamentous fungi (molds). They are relatively insoluble in water, but are highly soluble in ethanol, methanol, and propylene glycol. Exposure usually occurs through inhalation, ingestion, and/or absorption. Aerosol attack in the form of “yellow rain” will present as droplets of yellow fluid contaminating clothes and the environment.

**SIGNS AND SYMPTOMS**

<table>
<thead>
<tr>
<th>Exposure to skin</th>
<th>Severe poisoning by any route:</th>
<th>Exposure to airway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin pain</td>
<td>Prostration</td>
<td>Nose and throat pain</td>
</tr>
<tr>
<td>Pruritus</td>
<td>Weakness</td>
<td>Nasal discharge</td>
</tr>
<tr>
<td>Redness</td>
<td>Ataxia</td>
<td>Itching and sneezing</td>
</tr>
<tr>
<td>Vesicles</td>
<td>Collapse</td>
<td>Cough</td>
</tr>
<tr>
<td>Necrosis</td>
<td>Shock</td>
<td>Dyspnea</td>
</tr>
<tr>
<td>Sloughing of epidermis</td>
<td>Death</td>
<td>Wheezing</td>
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<tr>
<td></td>
<td></td>
<td>Chest pain</td>
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<td></td>
<td></td>
<td>Hemoptysis</td>
</tr>
</tbody>
</table>

Supportive Care
- Remove the patient from the hazardous area.
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
If ingested, aggressive gastric lavage and activated charcoal should be administered in the hospital.
7.2.10 Tularemia

Francisella tularensis is a nonmotile, gram-negative coccobacillus that typically causes disease in animals. Humans can become infected by either handling diseased animal fluids or by being bitten by infected deerflies, mosquitoes, or ticks. The organism can also remain viable for weeks in a number of media and is easily spread by aerosol. After infection, bacteremia results, with a secondary spread to the lungs and other organs.

SIGNS AND SYMPTOMS
The following signs and symptoms will appear within 2-10 days of inhalational exposure:
- Fever
- Chills
- Headache
- Generalized muscle pain
- Nonproductive cough
- Pneumonia

If the organism was ingested or inoculated, symptoms will also include regional lymphadenopathy, with or without cutaneous ulcers. Clinical diagnosis is both difficult and problematic. Physical findings are usually nonspecific, although chest X-ray may reveal pneumonic process, mediastinal lymphadenopathy, or pleural effusion. Routine culture is possible but hazardous to lab personnel. Diagnosis can be established retrospectively by serology.

Supportive Care
- Remove the patient from the hazardous area (a).
- Medical Supportive Care Adult Protocol 2.1.3 or Pediatric Protocol 3.1.3
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
- Antibiotic therapy for 10 days includes streptomycin 1 g q 12 hours IM or 15 mg/kg IM bid. If not available, administer gentamicin 3 mg/kg/day.
- Prophylaxis with tetracycline or doxycycline is effective if warning of BW attack is provided or if there is a high suspicion of significant exposure, as ordered by Medical Control or the Poison Information Center.

Note:
(a) If risk of exposure is high, call for a hazardous materials team. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.
Venezuelan Equine Encephalitis (VEE)

VEE virus is a mosquito-borne alphavirus that is endemic in certain parts of the world (Central and South America, Mexico, and Florida), where it infects horses, mules, and donkeys. If this agent was intentionally released as an aerosol, disease might occur simultaneously in both horses and humans, but this pattern would not be commonly recognized.

**SIGNS AND SYMPTOMS**

After exposure, a sudden onset of symptoms begins in 1-5 days:
- Generalized malaise
- Spiking fever (up to 104°F)
- Rigors
- Severe headache
- Photophobia
- Myalgias in the legs and lumbosacral area
- Nausea and vomiting
- Cough
- Sore throat
- Diarrhea

These symptoms last up to 3 days, and then are followed by a period of weakness and lethargy. Most patients recover in 1-2 weeks. Some patients, especially children, may develop signs of CNS infection, with meningismus, convulsions, coma, and paralysis. There is a 20% mortality rate in children who develop encephalitis.

**Supportive Care**
- Remove the patient from the hazardous area (a).
- Medical Supportive Care Protocol 2.1.3 or Pediatric Protocol 3.1.3.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**
None

**ALS Level 2**
None

Note:
(a) Risk of exposure via the airborne route is low. However, patients should be isolated from mosquitoes for 72 hours to prevent spread by vectors.
7.2.12 Viral Hemorrhagic Fevers

The VHF are a diverse group of illnesses caused by a variety of RNA viruses; they demonstrate a wide range of morbidity and mortality. These viruses include: Ebola, Marburg, Dengue, Yellow fever, Crimean-Congo fever, Hantaan viruses, Lassa fever.

Each of these viruses has a unique history and is capable of being spread in most cases by an aerosol or formite (except dengue virus). VHF agents, especially Marburg and Ebola, have allegedly been considered for weaponization. The clinical syndrome that these viruses cause in humans is called VHF.

SIGNS AND SYMPTOMS

- Fever
- Easy bleeding
- Petechiae
- Hypotension and shock
- Flushing of the face and chest
- Edema
- Malaise
- Myalgias
- Headache
- Vomiting
- Diarrhea

Supportive Care

- Remove the patient from the hazardous area (a)(b).
- Medical Supportive Care Protocol 2.1.3 or Pediatric Protocol 3.1.3.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1 - None

ALS Level 2 - None

Note:

(a) Risk of exposure via the airborne route is high. Refer to the appropriate hazardous materials PPE protocol, as the risk of secondary contamination is very high.

(b) Risk of exposure from a symptomatic patient via blood or body secretions is high. Full PPE with masks, goggles, sleeves, and gowns is appropriate. If the patient is not severely ill, IV access should be delayed until hospital arrival. If IV access is needed for immediate patient resuscitation, extra care is appropriate to protect the healthcare worker, and IV attempts should not be made on combative patients or in a moving vehicle.
7.3 Adult Hazardous Material Exposure (Radiological Agents)

This protocol is to be used for those patients suspected of exposure to radiological agents via any route of exposure (e.g., ingestion, absorption). It gives specific considerations for each type of exposure as well as general treatment guidelines. Scene safety should be of primary concern, with special attention being paid to the need for personal protective equipment. If a radiological agent exposure is suspected, call for a hazardous materials team. In this instance, refer to the appropriate hazardous materials PPE protocol to protect against secondary contamination. All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy, and then contact the receiving emergency department for confirmation of ALS Level 2 orders.

It is imperative that the emergency department be made aware early that a contaminated patient is being transported so that the proper preparations can be made to receive the patient.

TYPES OF RADIATION INJURY

- External irradiation occurs when all or part of the body is exposed to penetrating radiation from an external source. Following external exposure, an individual is not radioactive and can be treated like any other patient.
- Contamination means that radioactive materials in the form of gases, liquids, or solids are released into the environment and contaminate people externally, internally, or both. An external surface of the body, such as the skin, can become contaminated quite easily. If radioactive materials get inside the body through the lungs, gut, or wounds, the contaminant can become deposited internally.
- Incorporation refers to the uptake of radioactive materials by body cells, tissues, and target organs such as bone, liver, thyroid, or kidney. Incorporation cannot occur unless contamination has occurred.

These three types of accidents can happen in combination and can be complicated by physical injury or illness.

Irradiation of the whole body or some specific body part does not constitute a medical emergency, even if the amount of radiation received is high. The effects of irradiation usually are not evident for days or weeks; thus, while medical treatment is needed, it is not needed on an emergency basis. In contrast, contamination accidents must be considered medical emergencies, because they might lead to internal contamination and subsequent incorporation. Incorporation can result in adverse health effects several years later if the amount of incorporated radioactive material is high.

Treatment priorities are established as follows:
- Treat life-threatening problems first.
- Limit the radiation dose to both victims and healthcare personnel (time, distance, shielding).
- Control the spread of radioactive contaminants.

Serious medical problems should have priority over concerns about radiation, such as radiation monitoring, contamination control, and decontamination. However, attention should be given to PPE for medical personnel.
7.3.1 Radiation Exposure / Contamination

Radiation exposure/contamination may be a health risk to both the patient and the rescuer, depending on the type of radiation, time of exposure, distance from the radioactive source, and level of shielding from the radioactive source. Not all exposures will require medical treatment, however. In exposures where traumatic injuries are not present, the following steps should be taken.

Supportive Care
- Remove the patient from the hazardous area (a)(b).
- Decontaminate as appropriate (b).
- Medical Supportive Care Protocol 2.1.3 or Pediatric Protocol 3.1.3.
- Contact the Poison Information Center (1-800-222-1222).

ALS Level 1
None

ALS Level 2
Additional treatment should be administered in the hospital.

Note:
(a) Use of radiological monitoring devices is essential, as risk of exposure may be high. Call for a hazardous materials team.
(b) In mild to moderate exposures without traumatic injuries, self-decontamination may be recommended for the patient at his/her home. Self-decontamination should include removing one’s clothing, placing the clothes into a plastic bag, and showering with soap and water.
7.3.2 Acute Radiation Syndrome

Acute radiation syndrome (ARS) is an acute illness that follows a roughly predictable course over a period of time ranging from a few hours to several weeks after exposure to ionizing radiation. It occurs if enough radiation reaches enough sensitive tissue. The following factors are important in determining whether ARS will develop:

- High dose
- High dose rate
- Whole-body exposure
- Penetrating irradiation

Other factors to be considered include age (young and old), sex, genetics, and medical history. Regardless of the source of radiation, if the dose is high enough, it will produce the same effect.

SIGNS AND SYMPTOMS

Signs and symptoms that develop in the ARS occur in four distinct phases:

**Prodromal phase.** Depending on the total amount of radiation absorbed, patients may experience a variety of symptoms, including:
- Loss of appetite
- Nausea
- Vomiting
- Fatigue
- Diarrhea

After high radiation doses, the following additional symptoms may develop:
- Prostration
- Fever
- Respiratory difficulties
- Increases in excitability

This is the stage at which most victims seek medical care.

**Latent phase.** During this transitional period, many of the initial symptoms resolve. This phase may last for as long as 3 weeks, depending on the original dose. This time interval decreases as the initial dose increases.

**Illness phase.** In this phase, overt illness develops, often characterized by the following signs and symptoms:
- Infection
- Bleeding
- Electrolyte imbalance
- Diarrhea
- Changes in mental status
- Shock

**Recovery or death phase.** This phase follows the period of overt illness, which may take weeks or months to resolve.

- Remove the patient from the hazardous area.
- Medical Supportive Care Protocol 2.1.3 or Pediatric Protocol 3.1.3.
- Decontaminate as appropriate.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1:** None.

**ALS Level 2:** Additional treatment should be administered in the hospital.