# Emergency Medical Services Standing Written Orders of Ada County

***WORKING TOGETHER TO SERVE ADA COUNTY***

***UPDATED AUG-2013***

- **ADA COUNTY PARAMEDICS**
- **BOISE FIRE DEPARTMENT**
- **EAGLE FIRE DEPARTMENT**
- **KUNA FIRE DEPARTMENT**
- **MERIDIAN FIRE DEPARTMENT**
- **STAR FIRE DEPARTMENT**

# V I S I O N

To be a premier emergency medical response and mitigation system that meets the current and future needs of Ada County.

*These Standing Written Orders are the result of adherence to nationally recognized guidelines, with the input from local EMS services and oversight by the medical directors of Ada County Emergency Medical System. The following agencies and their medical directors have endorsed the protocols.*

***Working together to serve Ada County.***

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| **DRUG NAME** | ***TRADE NAME*** | **Transport** | **Non-Transport** | **NOTES** |
| Acetylsalicylic Acid | *Aspirin, ASA* | ***YES*** | ***YES*** | |
| Adenosine | *Adenocard* | ***YES*** | ***YES*** | |
| Albuterol Sulfate | *Albuterol, Proventil, Ventolin Salbutamol* | ***YES*** | ***YES*** | |
| Amiodarone | *Cordarone, Pacerone* | ***YES*** | ***YES*** | |
| Atropine Sulfate | *Atropine* | ***YES*** | ***YES*** | All units 1 mg preload; transport mulit dose vial |
| Calcium Chloride | *Calcium, CaC12* | ***YES*** | ***YES*** | |
| Dextrose 50% in Water | *Dextrose, D50, D50W, Glucose* | ***YES*** | ***YES*** | |
| Diazepam | *Valium, Diastat* | ***YES*** | ***YES*** | |
| Diltiazem | *Cardizem, Dilacor XR, Tiazac, Cartia XT, Tiamate* | ***YES*** | | |
| Diphenhydramine Hydrochloride | *Benadryl* | ***YES*** | ***YES*** | |
| Dopamine Hydrochloride | *Dopamine, Intropin* | ***YES*** | | |
| Epinephrine | *Adrenalin, Epi* | ***YES*** | ***YES*** | All units 1 mg preload; transport mulit dose vial; all cc ampule (1:1000) |
| Etomidate | *Amidate* | ***YES*** | ***YES*** | |
| Fentanyl Citrate | *Sublimaze, Atiq (lollypop for PEDs)* | ***YES*** | ***YES*** | |
| Furosemide | *Lasix* | ***YES*** | | |
| Glucagon | *Glucagon* | ***YES*** | ***YES*** | |
| Haloperidol | *Haldol* | ***YES*** | ***YES*** | |
| Hydromorphone | *Dilaudid* | ***YES*** | ***YES*** | Added March 5, 2012 |
| Ipratropium Bromide | *Atrovent* | ***YES*** | ***YES*** | |
| Ketamine Hydrochloride | *Ketamin, Ketanest, Ketaset, Ketalar* | ***YES*** | ***YES*** | Add April 4, 2012 |
| Lidocaine Hydrochloride | *Lidocaine, Xylocaine* | ***YES*** | ***YES*** | All units 100 mg preload; transport drip setup; all lidocaine jelly |
| Magnesium Sulfate | *Mag, Mag Sulfate, MgS04++* | ***YES*** | ***YES*** | |
| Methylprednisolone | *Solu-Medrol* | ***YES*** | | |
| Midazolam | *Versed* | ***YES*** | ***YES*** | |
| Morphine Sulfate | *Duramorph, Morphine, MS MS04* | ***YES*** | ***YES*** | |
| Naloxone | *Narcan* | ***YES*** | ***YES*** | |
| Nitroglycerin | *Nitro, NTG, Nitrostat, Nitrol, Tridil, Nitrolingual, Nitro-Bid Ointment* | ***YES*** | ***YES*** | All units NTG Spray, transport only NTG Paste |
| Ondansetron | *Zofran* | ***YES*** | ***YES*** | |
| Oral Glucose | *Glutose, Insta-Glucose* | ***YES*** | ***YES*** | |
| Oxytocin | *Pitocin, Syntocinon* | ***YES*** | | |
| Phenylephrine | *Neosyephrine* | ***YES*** | ***YES*** | |
| Procainamide | *Pronestyl, Procan* | ***YES*** | | |
| Ranitidine | *Zantac* | ***YES*** | | |
| Sodium Bicarbonate | *Bicarb, NaHC03* | ***YES*** | ***YES*** | |
| Succinylcholine Chloride | *Anectine* | ***YES*** | ***YES*** | |
| Tetracaine Hydrochloride | *Pontocaine Eye, Pontocaine HCI* | ***YES*** | ***YES*** | |
| Vecuronium | *Norcuron* | ***YES*** | | |

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Protocol
G-1

**SECTION: G-1**

**TITLE: Foundations of Patient Care**

**REVISED: May 1, 2012**

Foundations of Patient Care

**Ada County Emergency Services System Standing Written Orders (SWOs)**

A. **Foundation**: These SWOs are the result of the combination of nationally recognized guidelines, local medical practice, and input from the medical directors and the Standards of Care Committee (SOCC). Sources include but are not limited to:
   - Basic Life Support (CPR), Advanced Cardiac Life Support (ACLS and ACLS-EP) and associated branch courses
   - Pediatric Advanced Life Support (PALS)
   - Emergency Pediatric Care (EPC)
   - Neonatal Resuscitation Program (NRP, NALS)
   - Advanced Medical Life Support (AMLS)
   - Basic Trauma Life Support (BTLS), Pre-Hospital Trauma Life Support (PHTLS) and associated branch courses, and
   - Advanced Burn Life Support (ABLS)

   EMS personnel are encouraged to use the guidance and algorithms of these courses to supplement SWOs. If contradiction occurs, these SWOs will supersede any other algorithm. Alternative courses of action may be utilized, when appropriate, following standard medical control, deviation, and documentation guidelines.

   Special Emergency Response Team (SERT) providers face unusual situations often outside the depth of these guidelines, having roles that border on law enforcement functions, or require procedures beyond the scope of normal EMS providers. These special situations may be covered in separate protocols and policies which will supplement this document.

B. While this document cannot cover every possible variation of disease or injury encountered in the field, it should provide a foundation for the acute care of the majority of patients seen.

C. Each and every protocol should be considered to have, as its first directive, a mandate to maintain universal blood and body fluid precautions/isolation.

D. Newer defibrillators using biphasic technology require lower energy doses and self-regulate the appropriate electrical energy. When not specified, or when a different device (than normally used), or if device deployment changes after publication of the SWOs, all protocols assume energy levels as set by the manufacturer recommendations for the device.

E. Unless specifically addressed in these protocols, a provider's scope of practice is assumed to include lower levels. For example, a paramedic level guideline is assumed to include the EMT scope as well.

F. **Trauma, Cardiac and Stroke patients**: All patients shall be stabilized and transported as rapidly and efficiently as possible. When treating patients who may benefit from specific interventional therapy (surgery, thrombolytic, catheterization lab) a goal of less than ten minutes on-scene time is desirable (within the bounds of providing quality patient care).

G. **EARLY NOTIFICATION OF RECEIVING FACILITY IS ESSENTIAL IN SIGNIFICANT CASES**

H. **General treatment**: All patients shall receive the following general supportive care as appropriate within the scope of practice and sound clinical judgment of the provider:

**Airway control**

- Positioning/suctioning
- Oral or nasopharyngeal airways
- Combi-tube, King LTS (or other adopted advanced airway)
- Endotracheal intubation (oral, nasal, RSI, digital)
- Cricothyrotomy (needle, surgical, and similar devices)
- Use of pharmacological agents to facilitate airway control
- Use of difficult airway devices, such as the Endotracheal Tube Introducer (a.k.a. the Gum Bougie) to facilitate airway control

**Ventilatory support**

- Supplemental oxygen by appropriate means
- Bag-valve mask using a traditional face mask, intra-oral mask (IOM) , or similar device.
- Bag-valve ETT
- Flow-restricted, oxygen-powered ventilation device (FROPVD), AKA Demand Valve, or an Elder valve
- Monitoring of pulse oximetry and end tidal $CO_2$
- CPAP and BiPAP devices when available
- Deep tracheal suctioning
- Use of a mechanical ventilator

**Circulatory support**

- CPR and components of CPR
- Use of devices to support circulation, including mechanical CPR devices (such as the LUCAS™2, or other devices) and CPR adjuncts (such as the ResQPod, ITD, and similar devices) as training and availability allow.
- Basic bleeding control, up to and including use of tourniquets.

**Naso- and oro-gastric tube placement**

**Spinal immobilization:** Selective immobilization using cervical collars, KEDs (or similar devices), spine boards (or similar devices), and improvised devices. This includes screening for appropriate immobilization.

**Splinting**: Using pillows, cardboard splints, vacuum splints, traction devices and other improvised devices as appropriate and available.

**Vascular access**

- Single or multiple lumens
- Peripheral, central or intraosseous access, including pre-established lines
- Normal saline and saline lock as appropriate
- Use and maintenance of other crystalloid solutions and pre-established vascular access, including PICC lines, Hickman catheters, hemodialysis lines, and other routes of vascular access (as provider training and comfort level allows)
- While ILS providers are often limited in the number of IV attempts and fluid administration by this document, ILS providers may exceed those guidelines when functioning under the general direction of the Paramedic in charge of the patient. Likewise, Paramedics are limited by sound clinical judgment rather than an arbitrary number of "attempts" at vascular access

**EKG/Electrical therapy**: Defibrillation /cardioversion/pacing, including AEDs and manual devices. EKG and 12-lead monitoring.

- Patients requiring ***continuous*** EKG monitoring shall be attended by a Paramedic at all times
- All charts for patients requiring the use of an EKG, continuous or otherwise, shall be signed by at least one Paramedic. If the chart is written by an EMT, the Paramedic will co-sign the chart

**Needle thoracotomy (chest decompression)**

**Blood glucose monitoring**

**Monitoring and titration of medication drips,** including medications on pumps when appropriate and training allows.

**Monitoring of blood product infusions**

**Physical restraints as required for patient and provider safety. This does not imply that EMS providers assume law enforcement functions.**

**ALS providers may decrease the dosage or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.**

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**SECTION: G-2**

**TITLE: Medical Direction**

**REVISED: October 27, 2010**

These standing written orders are written physician orders giving field personnel the authority to implement procedures and administer designated medications.

A. These standing written orders are to be used only by field personnel operating under a medical control recognized by the Idaho State Board of Medicine.

B. These standing written orders may be implemented prior to the establishment of direct communication with medical control. Direct communication with medical control shall be established as soon as feasible in life-threatening situations.

C. Direct communication with medical control shall be established prior to the release of any patient in the following categories:
   - Those who have received ALS care in the field prior to release and do not fall under specific treat-and-release protocols
   - Where questions over disposition exist
   - As mandated for specific situations and protocols

D. The type of medical control shall be documented when ALS care is provided.

E. No procedure or medication shall be used without the proper equipment or beyond the training, capabilities, or certification level of the EMS provider.

   Procedures and medications that are **bold and underlined** normally require a direct order from an acceptable medical control physician (see permissible exceptions below). An acceptable medical control physician includes either the Emergency Department physician at the receiving hospital or if communication with the receiving medical control physician is delayed (within two to three minutes), personnel may contact the Emergency Department physician at any one of the other acceptable hospitals.

F. **When a receiving hospital has not been established, on-line medical control shall be the nearest receiving facility.**

   **EXCEPTION:** If attempts to establish communication with medical control fail, and a patient is at high risk for mortality or increased morbidity, or if the delay anticipated in establishing communication with medical control may result in mortality or increased morbidity, procedures and/or medications normally restricted to direct medical order may be performed or administered without the direct order of a medical control physician. Communications with medical control shall be established as soon as possible. The reasons for the decision to institute treatment shall be clearly documented both in the chart and on the SWO deviation form.

**EXCEPTION:** As an alternative, **Alternative medical direction/Physician on scene**: Occasionally, a physician other than an approved medical control physician may provide or direct patient care. In those situations the following shall apply:

- When a licensed Idaho physician is on location and requests a deviation from the SWOs, **the physician must accept responsibility for patient care including attending the patient during transport**. While the provider may assist the physician in procedures, the provider shall not exceed his or her scope of practice in performing procedures.
- If a licensed Idaho physician is directing patient care on location but will not accept responsibility for patient care, **or** a licensed Idaho physician is directing patient care by telephone and requests a deviation from the SWOs, the following shall apply:
    - The physician must be an Idaho-licensed M.D. or D.O. with proper identification or personally known to the provider
    - Personnel will request that the physician call the on-line medical control physician for consultation
    - Personnel will establish contact with the medical control physician to confirm orders
    - Document name of physician/provider on scene and who provided care

G. In all cases of patient transport, including those where direct medical control is not required, routine contact with the receiving hospital will be made as soon as feasible.

**SECTION: G-3**

**TITLE: Hospital Destination Protocol**

**REVISED: July 21, 2011-**

**Patient destination shall be based on the following:**

A. **Acute Care Facilities.** Generally, emergency ambulance transport shall only be provided to acute care facilities accredited by the Joint Commission (formerly JCAHO). In rare instances, transport may be provided to a private physician's office or clinic at the request of a private physician **WITH THE PERMISSION OF THE ON-DUTY SUPERVISOR, AND THE ON-LINE MEDICAL CONTROL PHYSICIAN***.*

- This does not include **prearranged non-emergency** transports at the order of a physician

B. **Informed Patient Preference** shall take precedence over all other sections of the destination protocol. If the attending EMS provider makes contact with the patient's private physician, an expressed hospital preference should be honored in absence of a specific patient request.

C. **Closest Appropriate Facility.** If no patient or physician preference is expressed, the medical problem is not emergent, and not specifically otherwise covered in these protocols, patients should be transported to the closest appropriate facility.

D. **Facilities Outside Ada County.** Request for transportation to a facility outside of Ada County must be approved by the on-duty supervisor. Mercy Medical Center and West Valley Medical Center will be the only out-of-county hospitals authorized for patient transport.

E. **Trauma Patients.** Level one and two trauma patients shall be transported to Saint Alphonsus Regional Medical Center unless instructed otherwise by the on-line Medical Control physician. Saint Alphonsus Regional Medical Center shall be notified as soon as possible in these situations to ensure rapid notification of appropriate resources. Level three trauma patients do not mandate transfer to the trauma center; however, the clinical judgment of the medic is essential to ensure proper triage of patients to an appropriate receiving center.

*See Appendix "O" for Trauma Leveling Criteria for Field Providers*

F. **Suspected Acute Coronary Syndrome** (cardiac chest pain, etc): A patient with chest discomfort relieved by NTG, without other symptoms, and without EKG changes shall follow the standard destination protocol. Patients with acute chest discomfort and the following signs and symptoms should be transported to St. Luke's Regional Medical Center-Boise, or St. Luke's Regional Medical Center-Meridian, or Saint Alphonsus Regional Medical Center where interventional cath-lab capabilities exist**.**

- Acute 12-lead EKG consistent with STEMI
- Diaphoresis, nausea, SOB, or the patient is not responding effectively to nitrates

G. **Brain Attack**: Destination at less than 3 hours from onset can be any of the following location; SARMC-Boise; St. Lukes-Meridian; St. Lukes-Boise. At greater than 3 hours and less than 8 hours from onset patient must be transported to SARMC-Boise or St. Lukes-Boise as they are the only two with 24/7 in house interventional radiology.

H. **Inter-facility Transport:** Physician-ordered inter-facility transport shall be to the hospital directed by the transferring physician. In all cases, to comply with EMTALA/COBRA regulations, the physician or designee must write the order, and the receiving physician must be specifically documented. If, during transport, the patient deteriorates beyond the provider's ability to effectively manage, the provider may divert to the closest appropriate hospital.

I. **Pregnant Patients:**

- A pregnant woman who **has received pre-natal care** and has an established physician may be transported to the hospital of choice
- A pregnant woman who has a history of **high-risk pregnancies should be transported to St. Luke's Regional Medical Center, St. Luke's Meridian Medical Center or Saint Alphonsus Regional Medical Center.** These hospitals have Neonatal Intensive Care Units
- Complicated imminent deliveries from home, medical facility or birthing center will be transported to the closest appropriate facility

J. In the event of a Mass Casualty Incident (MCI), the Incident Commander or his designee shall dictate patient hospital destination.

If the patient or attending physician requests transport to a facility not consistent with the above guidelines, the request will be honored only after informing the patient, responsible person, or physician of the unavailability of certain services at that facility. If the patient demonstrates impairment of judgment related to injury, shock, drug effects, or emotional instability, the Paramedic will act in the patient's best interest and transport to the most appropriate facility.

This protocol shall not relieve Ada County Emergency Medical Services System (*ACEMSS*) personnel of the responsibility to determine the patient's destination preference. Where question exists concerning the appropriate patient destination, Medical Control shall be consulted. **ACEMSS personnel have the option to transport patients with immediate life-threatening conditions to the closest appropriate facility**.

Protocol

G-3

# Hospital Destination

**SECTION: G-4**

**TITLE: Special Resuscitation Situations**

**REVISED: January 26, 2010**



A. **Withholding resuscitation**
In situations requiring CPR (e.g., cardiac arrest), resuscitative efforts may be withheld under the following circumstances:

- Obvious signs of death defined by:
  - Rigor mortis
  - Dependent lividity, or
  - Injury not compatible with life

- In all other situations, full resuscitation efforts shall be initiated **unless** there is:

  A DNR order meeting the following criteria:
  - Idaho Physician Order for Scope of Treatment (POST) form
  - The physical presence of a physician-signed DNR order in the setting of a hospital (e.g., Idaho Elks Rehabilitation Hospital, Treasure Valley Hospital), **or**
  - The physical presence of a physician-signed, out-of-state DNR order, **or**
  - The physical presence of a valid State of Idaho Comfort One order or photocopy, **or**
  - State of Idaho Comfort One identification being worn by the patient, **or**
  - A DNR order written prior to July 1, 1994, regardless of format.

*See Appendix T: In-Field Death/POST/Comfort One/DNR Guidelines for further guidance.*

**If there is a question concerning the appropriateness of CPR initiation, begin CPR and contact Medical Control.**

B. **Discontinuation of resuscitation**
In all cases where CPR efforts have been appropriately initiated, Paramedic consultation with the on-line Medical Control physician is required prior to discontinuation. If CPR has been initiated inappropriately as outlined above, personnel may discontinue CPR without on-line Medical Control.

Protocol

G-4

# Special Resuscitation Situations

Protocol
G-5

**SECTION: G-5**

**TITLE: Air Medical Response**

**REVISED: January 27, 2010**

Any licensed EMS provider or law enforcement agency within the Ada County EMS system may request an air ambulance. All air medical requests shall go through Ada County Dispatch Center. While a valuable tool in reducing morbidity and mortality in both medical and trauma patients, air medical transport is both expensive and also carries with it inherent safety risks that are often underestimated.

The use of air medical resources should be carefully considered and done on a case-by-case basis. Many situations that may call for an air ambulance in one case may be better handled by ground transport in another. This protocol is a supplement to, not a replacement for, good judgment.

**Indications**
Use of an air medical transport is based on many considerations including but not limited to:

**Physiologic Criteria**
- GCS <13 (does not follow commands)
- S/S of shock (e.g., rapid HR; altered mental status; cool, clammy, pale skin)—remember that hypotension is a late sign of shock
- Pediatric trauma (may not see s/s of shock until late)
- Geriatric trauma (may not see s/s of shock until late)
- Hypothermia
- Airway compromise, actual or potential
- Prolonged transport or delayed ALS response/transport that will have a reasonable likelihood of affecting patient mortality/morbidity
- Patients with signs of Acute Coronary Syndrome in which ground ALS response is significantly delayed
- Current or post-cardiac or respiratory arrest situations in which ground ALS response is significantly delayed

**Anatomic Criteria**
- Penetrating injuries to the head, neck, chest, abdomen, or thighs
- Two or more long bone fractures
- Limb paralysis
- Limb amputation proximal to the wrist or ankle in which bleeding cannot be controlled
- Trauma combined with burns of >20%, particularly those involving the face or airway
- Signs of a rupturing aortic aneurism

**Mechanism of Injury**
Mechanism of injury criteria should accompany physiologic and/or anatomic criteria.

- High-speed MVC
- Prolonged extrication
- Fatality within the same vehicle
- Ejection from vehicle
- Passenger compartment intrusion of >12 inches
- Fall greater than 2x patient's height

**Other Criteria**

- Areas where access by EMS vehicles or crews is difficult or impossible

**"Stand-By" vs. "Launch"**
At times, air medical response may seem unnecessary based on initial dispatch information, location of call, or capabilities of the responding EMS units. While not prohibited, it is generally not prudent to cancel an air ambulance prior to arriving on scene. When the need for air medical transport is suspected but unclear, the air ambulance agency may be placed on "stand-by" (the exact meaning of "stand-by" is usually defined by the air ambulance agency and may or may not include aircraft lift-off).

- In most cases, an air ambulance should only be cancelled by EMS personnel who have completed an on-scene patient assessment
- All cancellations of air transport will be brought to the Medical Directorate by the provider for review of the decision

**Landing Zones and Safety**
In Ada County, landing zones are often handled by law enforcement or the fire service. In some cases, field personnel may be required to establish their own landing zones. In an effort to standardize safe scene operations, Idaho's air ambulance agencies have developed the following basic landing zone (LZ) and safety guidelines.

**Types of Landing Zones**
Landing zones fall into three basic categories, listed here in order of safety preference.

- Established helipads. Usually located at airports or hospitals, heliports are generally constructed with consideration to size, slope, and surface, as well as approach and departure paths
- Pre-established (or designated) landing areas (PELA). These are essentially pre-arranged rendezvous locations. By pre-planning specific LZ sites with the air medical provider, the pilots are given the opportunity to survey the area ahead of time to identify potential hazards

- On-scene landing zones. Having the aircraft land at the scene typically offers the most expedient evacuation of the patient. Care must be taken to ensure a suitable and safe LZ

**Landing Zone Officer**
The most important component of safe scene operations is the LZ Officer. S/he is responsible for the safety of the responding aircraft(s), the LZ set up, and basic communication between flight and ground crews. The LZ Officer should be someone not directly involved in patient care. This position may have a different title in the National Incident Management System (NIMS).

**Landing Zone Preparation**
The following criteria are generally considered "ideal." If local conditions necessitate deviation, consult the pilot as soon as possible.

- Size – The preferred size of landing zone is 100 ft. x 100 ft. (60 ft. absolute minimum)
- Slope – The slope of the ground should be no more than 5 degrees (gentle slope)
- Surface – The ground must be a firm surface preferably, with no loose dirt or snow. If necessary and available, consider wetting down dirt surfaces. Loose snow can be compacted with snowmobiles
- Hazards/Obstructions – Poles, wires, fences, towers, trees, and unstable ground are all hazards to report to the pilot.
    - Hazardous Materials – The presence of hazardous materials MUST be relayed prior to their approach to the scene
    - Clear Area – The area is clear of loose debris, large rocks, posts, stumps, vehicles, people, animals, and other hazards. Caps and hats should be secured
    - Overhead – Free of overhead obstructions such as wires, antennas, and poles
- Marking/Lighting
    - The four corners of the landing zone should be marked. During the daytime, this can be done with traffic cones. At night, flashlights, "LZ lights" or low-beam headlights can be used. Flares, if used at all, must be used with extreme caution as they present a fire hazard and should be secured to the ground
    - Identified hazards should be illuminated if possible.
    - NEVER direct any lights up at the aircraft or use high-beam headlights

**The pilot always has the final say** regarding landing zones. He/she may request an alternate site.

**Landing Zone Communications**
The Landing Zone Officer is responsible for radio communications with the responding air ambulance. Responsibilities include:

- Assisting the pilot in locating the LZ with simple directions and easily identifiable landmarks. Avoid using directions such as right and left unless the aircraft is directly in sight
- Advising the pilot of LZ conditions, wind speed and direction, and hazards.
- Primary communications between ground and aircraft should be on “State F2,” 155.280 MHz, although local “F3” (Saint Alphonsus channel) is available to most services and is a good back-up channel. Other channels or methods may be used as the situation demands
- Hand signals and gestures are discouraged

**Landing Zone Safety**

- Ensure no one approaches the aircraft **until specifically directed by the pilot or crew**
- **Unless otherwise directed**, always approach from the front half of the aircraft (9 o’clock to 3 o’clock), in view of the pilot, and while maintaining eye contact. Approach from the downhill side if landed on a slope. When in doubt, wait for a member of the crew to escort you
- The tail rotor is an especially dangerous area because, due to its speed, the blades may be nearly impossible to see. **NEVER** go near the tail of the aircraft while it is running
- Rotor wash is the air forced down by the main blades, creating “winds” near 100 mph. All loose objects such as hats, sheets, and blankets must be secured
- Consider dirt and small rocks as potential airborne hazards and wear appropriate personal protective equipment
- If you drop something, do not chase it

**Patient Care**
Appropriate patient care should continue until the flight crew arrives **at the patient’s side**. Patient care should not be delayed “because the air ambulance is coming.” After the flight crew arrives, EMS personnel should assist as needed within their respective scope of practice.

Protocol
G-6

**SECTION: G-6**

**PROTOCOL TITLE: Pre-hospital Integration of Care Protocol**

**REVISED: May 14, 2010**

Pre-hospital Integration of Care Protocol

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**General**: Responding to a patient's 911 call for help typically generates a response from multiple agencies. This protocol is intended to provide a BASELINE understanding of the interactions that shall take place between transport and non-transport agencies. It is the intent and understanding that all agencies involved in the care of a patient strive to work as a team to maximize quality patient care, seamless interactions, and maximum efficiency. It is also understood that developing those relationships before and after an incident will help achieve the intent of this protocol. It is the responsibility of all responders to recognize the importance of cooperation and understanding in order to provide the patient with the best medical care and treatment possible. It is highly encouraged that responding personnel from transport and non-transport agencies go beyond this protocol, through non-incident interactions and communications, to develop a higher rapport and understanding of each other's expectations, thoughts, and ideas on how to better the patient care experience.

It is the responsibility of all EMS responders to insure the proper and timely utilization of resources to meet the goals of scene safety, quality patient care, and rapid movement to medical facilities. The role of the first arriving EMS personnel on scene will be to provide any and all necessary care within their scope of practice to the patient. The goal of the EMS system is to provide effective and contiguous patient care on scene and expedite, when appropriate, patient transport to definitive care.

**Definition:** "Integration of Care" is defined as multiple agency responders working together as a unified team during the treatment and/or transport phase of a patient encounter.

**Process:**

1. Patient care requires an integration of care with other EMS providers to accomplish the goals and mission of providing quality patient care. The following guidelines will be observed when multiple agencies are on scene.

   A. The EMS responder with the highest licensure level is ultimately responsible for the care of the patient.

   B. A licensed Basic or Advanced EMT will transfer care to a licensed Paramedic upon their arrival. This transfer of care should include a face-to-face report to the Paramedic describing what they have learned to that point and any interventions done. Once this report is completed, the paramedic will assume patient care and the other on-scene providers will integrate into the patient care process and assist in any way possible using a teamwork approach.

C. Multiple Paramedic providers exist within Ada County staffed on transport and non-transport apparatus. When this occurs, a primary Paramedic needs to be identified. With this, it is also understood that input on patient care should be the responsibility of all providers. To determine the primary paramedic, the following will be observed:

1. The first ALS Paramedic arriving on scene **and** has begun a detailed assessment, established a patient rapport, and/or has begun treatment shall assume the primary Paramedic role. The identification of the primary Paramedic role may change if or when mutually agreed upon (for example, a non-transport Paramedic not intending to accompany patient during transport.).

   In the event of simultaneous or near simultaneous arrival of the ALS transport and the ALS non-transport agencies, the transport Paramedic shall assume the primary Paramedic role. All providers shall assist in any way possible using a teamwork approach.

2. Upon the arrival of another ALS agency, the primary Paramedic will give a verbal report to the incoming Paramedic as soon as feasible. (See Appendix "Z"; "Integration of Care Reporting Guidelines" template, section III). The incoming Paramedic will then integrate into the patient care process and assist in any way possible using a teamwork approach.

3. **All** responders shall strive to work in a team-like fashion to allow for maximum utilization of knowledge and resources.

D. **Integration of Care during the transport of a patient:**

If the transporting Paramedic sees a need for additional EMS resources during transport, the transport Paramedic can REQUEST assistance from the non-transport EMS providers (BLS or ALS). This may occur when a patient's condition may require multiple procedures or other situation when the transport Paramedic sees a need for the continued involvement of the non-transport Paramedic or EMTs.

Likewise, the non-transport Paramedic may also REQUEST to maintain an Integration of Care during transport if he/she believes their further involvement would benefit the patient, or the non-transport Paramedic would like to continue involvement in patient care for the development or maintenance of their clinical skills. While the non-transport medic may remain "primary" during transport if mutually agreed upon, the transport paramedic shall remain engaged.

All requests shall be determined by the party that is asked to assist. The approval or denial of a request should consider the positive or negative impact on patient care, current system deployment status, and any other pertinent factors. Denial of a request will be documented along with the chart(s) and forwarded to the respective Administrations and Medical Directors for review as appropriate. This will be documented on the appropriate form.

Teamwork is a vital component to the successful treatment of a seriously ill or injured patient. This concept shall be maintained throughout the call.

E. **Conflict Resolution:** In the event two on-scene paramedics disagree on treatment options and are unable to resolve the differences, the following guidance is provided:

1. *Life threatening decision with discretionary time:* Medical Control **will** be contacted and the issue resolved. **ANY** decision made by Medical Control **will** be honored.
2. *Life threatening with no discretionary time:* If the time delay to contact medical control is likely to increase the morbidity or mortality of the patient, the "primary paramedic" as described above will make the decision and maintain the lead on scene and during transport, assume medical liability, and be responsible for patient care decisions.
3. *Non life threatening with discretionary time:* If a non life threatening disagreement regarding patient care exists on scene, the primary paramedic at the time shall make the final decision and, if applicable, will maintain the lead on scene and during transport if requested by the transport paramedic, assume medical liability, and be responsible for patient care decisions throughout transport to the hospital. Medical control is also an option.

After delivery of the patient to the hospital, the responders involved will attempt to resolve the disagreement using the conflict resolution process approved by all EMS agencies. At any time a non-transport paramedic assumes the lead during transport due to a disagreement with the transport medic, or a disagreement occurs on scene and was not resolved, the issue shall be forwarded to the respective Administrations and Medical Directorate for review. The two parties involved will meet with the Medical Directorate at the earliest convenience, who will provide guidance on the issue after hearing from all parties involved.

# Protocol G-6

# Pre-hospital Integration of Care Protocol

1. Every paramedic in the EMS system has an obligation to provide quality patient care. Each paramedic has a duty to act and bring any concerns to the attention of the primary paramedic. Nothing in this protocol shall indicate poor patient care is acceptable in an attempt to minimize conflict between paramedics.

2. Accurate documentation of the patient encounter is considered integral to these protocols and will be provided to the transporting crew as time permits or be sent to the hospital in a timely fashion. Documentation should include a description of the chief complaint, history of the present illness and of pertinent past problems, vital signs, mental status, and pre-hospital assessment and care. All Advanced Life Support care provided by the non-transport Paramedic will be documented on the form prior to transport as time permits. This document will accompany the patient to the hospital and will be included in both the transport and non-transport agency's patient care reporting system.

3. "The Primary Paramedic for all calls will complete a patient care report in the ESO ePCR system for all transports and must be a paramedic in good standing within their respective department. Any non-ACP paramedic must successfully complete ESO training prior to acting as the Primary during the transport phase of a medical call".

4. If information was not exchanged on scene that may be necessary for the continued care of the patient or patient documentation purposes, providers who were on the scene may exchange pertinent information necessary to fulfill their duties. Information may also be exchanged between the crews caring for the patients, their administrators, or their medical directors for quality assurance purposes and on-going performance improvement.

5. Orders communicated directly from the on-line medical control physician from the patient's destination hospital or an acceptable alternate physician may supersede established protocol if such orders fall within the responder scope of practice.

Protocol

G-7

**SECTION: G7**

**TITLE: Medical Monitory for Incident Rehab**

**REVISED: Pending November 2, 2010**

**PENDING (See details of protocol on-line at www.adaparamedics.org under SWO pending section**

Medical Monitory for Incident Rehab

Protocol

G-7

# Medical Monitory for Incident Rehab

**SECTION: G-8**

**TITLE: Extremity Tourniquet**

**REVISED: May 02, 2012**

**Introduction:** A tourniquet is to be used for **any severe hemorrhage that cannot be controlled with direct pressure, elevation or pressure point application or if the situation precludes the application of standard hemorrhage control.** It is possible that a law enforcement officer may place a tourniquet prior to EMS assessment. It is expected that the EMS provider will examine the continued need for the tourniquet upon their arrival or when the situation allows.

**Indication:**

- **Severe hemorrhage of upper extremities**
- **Severe hemorrhage of lower extremities**

**Contraindications:** A tourniquet should not be used for simple hemorrhage that can be controlled by the traditional means. Additionally, a tourniquet should not be used if the wound is higher than the tourniquet can be placed.

**Contraindicated application:**

- **Head**
- **Neck**
- **Genitalia**

**Procedure:** A tourniquet should be placed at least 2-3 inches above the hemorrhage site and may be placed higher up the extremity if necessary to control bleeding. See appendix section for specific tourniquet applications.

**General Comments:** It is important that the EMS provider **REASSESS** the need for tourniquet if there is going to be a prolonged field time, usually greater than an hour. Always record the time when the tourniquet is placed. This is best accomplished by writing on the tourniquet itself. When handing off care to another provider or at the hospital, always inform and show the receiving party the location of the tourniquet and the time it was placed.

**Physician PEARLS:**

- Most tourniquets should be placed 2-3” above the injury site.
- Tourniquets should not be placed over a joint.
- Record the time the tourniquet was placed.
- Always report the location and timing of a tourniquet when handing off care.

Protocol

G-8

# Tourniquet Use/C-A-T

**SECTION: C-1**

**TITLE: Adult Cardiac and Respiratory Arrest**

**REVISED: March 30, 2012**



Attention to "the basics" during cardiac arrest is equally important as ALS drug therapies.

## BLS-Specific Care

- For **unwitnessed arrest**: Consider 2 minutes of good, sustained, and effective CPR prior to defibrillation or AED attachment.
- For **witnessed arrest**, or after 2 minutes of good, effective and sustained CPR: AED use per 2010 AHA guidelines and manufacturer recommendations.
    - Single shocks are recommended to reduce interruption of CPR.
- When possible, reduce interruptions of chest compressions.
- When VF/pulseless ventricular tachycardia (VT) is present, deliver 1 shock and **immediately** resume CPR, beginning with chest compressions. **Do not delay resumption of chest compressions to recheck the rhythm or pulse.**
- After 5 cycles (about 2 minutes) of CPR, analyze the cardiac rhythm and deliver another shock if indicated. If a non-shockable rhythm is detected, resume CPR immediately.
- Careful use of BVM, airway adjuncts. Ventilations should occur over 1-2 seconds.
- Avoid hyperventilation/hyperinflation.
- Notify responding ALS unit ASAP.
- Apply LUCAS Chest Compression system when available

## ILS-Specific Care

- Combitube as appropriate.
- Obtain peripheral vascular access.
    - IV: 200-500 cc crystalloid solution. Repeat PRN.

## ALS-Specific Care

- Advanced airway management as appropriate.
- Rhythm-specific therapy *(see appropriate protocols).*
- The precordial thump may be considered for patients with witnessed, monitored, unstable VT (including pulseless VT) if a defibrillator is not immediately ready for use, but it should not delay CPR and shock delivery.
- Epinephrine
    - IV: 1 mg IVP every 3-5 minutes, or
    - ETT: 2-2.5 mg of 1:1,000 diluted to 8-10 cc every 3-5 minutes. Consider underlying causes of cardiac arrest and treat accordingly.

Consider as appropriate:

- Sodium bicarbonate for known hyperkalemia, bicarb acidosis (DKA, TCA), prolonged resuscitation after ROSC.

- IV: 1 mEq/kg repeated in 10 minutes (if still in arrest) at 0.5 mEq/kg. Minimum initial dose is 50 mEq. Follow TCA recommendations if TCA overdose is suspected.

**ALS-Specific Care** *Continued*

- Calcium chloride for suspected hyperkalemia, calcium channel blocker OD, or suspected hypocalcemia.
  - IV: 500-1000 mg IVP.
  - Also administer sodium bicarbonate at 1 mEq/kg afterward. **Flush line thoroughly between medications.**
- Albuterol sulfate (high dose) for suspected hyperkalemia.
  - ETT: 10 mg (4 unit-doses) directly instilled into the ETT, followed by brief hyperventilation.
- Narcan (naloxone) for suspected narcotic overdose.
  - IV or ETT: 2 mg repeated PRN.
- Dextrose 50% for hypoglycemia.
  - IV: 12.5-50 g

**Physician Pearls:** Outside of the Comfort One/DNR situations *(see Appendix T),* once ALS intervention is initiated, Medical Control should be called prior to ceasing efforts. In addition, BLS interventions, an advanced airway, and at least 10 minutes of rhythm-appropriate therapy should have been performed prior to considering termination of efforts.

The American Heart Association (AHA) *2010 Guidelines for CPR and Emergency Cardiac Care* recommends:

- Good, sustained, and effective CPR. "**Push hard and fast**."
- **Sustained coronary perfusion is believed essential for the heart to respond to defibrillation; any interruption in compressions should be minimized or avoided.** Even brief interruptions of compressions, such as those seen in the pause for ventilations or defibrillation, result in a rapid decrease of coronary perfusion.
- Change to a one-shock protocol. Frequent or long interruptions in precordial chest compressions for rhythm analysis or rescue breathing were associated with post resuscitation myocardial dysfunction and **reduced survival rates**. According to the AHA, "… if one shock fails to eliminate VF, the incremental benefit of another shock is low, and **the resumption of CPR is likely to confer a greater value than another shock.**" Therefore, when a shockable rhythm is found, **only one shock instead of three stacked shocks is recommended.**

Protocol
C-2a

**SECTION: C-2a**

**TITLE: Adult Cardiopulmonary Arrest – BLS Algorithms**

**REVISED: September 28, 2010**

# Adult Cardiopulmonary Arrest – BLS

### Box #1:

**If adequate CPR is being performed upon arrival:**

a) Confirm cardiopulmonary arrest.
b) Continue CPR only long enough to apply AED pads.
c) Move on to, **"Box 4."**

### Box #2:

**Sudden, witnessed arrest in the presence of EMS:**

**a)** Perform CPR only long enough to apply AED pads.
**b)** Move on to, **"Box 4."**

### Box #3:

**If inadequate CPR, or no CPR at all, is being performed upon arrival:**

a) Initiate CPR
b) 5 cycles 30 compressions to 2 ventilations (approximately 2 minutes)
c) During CPR:
   1) Apply AED pads
   2) Move on to, **"Box 4,"** after 2 minutes CPR completed.

### Box #4:

**Place patient on long back board as soon as possible/feasible-**
**AED Analysis of Rhythm**

### Shock Advised:

**a) Clear patient.**
**b)** Deliver shock.
**c)** Immediately resume CPR.
**d)** Perform 5 cycles 30:2
   **1)** Approximately 2 minutes.
**e)** Insert supraglottic airway i.e. OPA, NPA. (if necessary) with cessation of compressions.

### No Shock Advised:

**a) Check for pulse.**
   a. If pulse present, support respirations as necessary.
   b. If no pulse, immediately resume CPR.
**b)** Perform 5 cycles 30:2
   **a.** Approximately 2 minutes
**c)** Insert supraglottic airway i.e. OPA, NPA. (if necessary) with cessation of compressions.

# Protocol C-2a

# Adult Cardiopulmonary Arrest – BLS

**Box #5:**
**AED Analysis of Rhythm**

**Shock Advised:**

- **a) Clear patient**
- **b)** Deliver shock.
- **c)** Immediately resume CPR.
- **d)** Perform 5 cycles 30:2
  - **1)** Approximately 2 minutes.

**No Shock Advised:**

- **a) Check for pulse.**
  - **1)** If pulse present, support respirations as necessary.
  - **2)** If no pulse, immediately resume CPR.
- **b)** Immediately resume CPR.
- **c)** Perform 5 cycles 30:2
  - **1)** Approximately 2 minutes.

Continue the:

*2 minutes CPR → AED Analysis of Rhythm → Shock if Advised/Pulse Check if No Shock Advised → 2 minutes CPR (if necessary)*

Sequence until:

1) Transfer to a higher level of care occurs.
2) Patient regains a pulse
   a. Initiate supportive care (i.e. oxygen via non-rebreather or BVM assisted breaths if necessary.)
3) Resuscitative efforts are terminated (following OLMC consult.)

Protocol
C-2b

SECTION: C-2b

TITLE: Adult Cardiopulmonary Arrest – ILS Algorithms

REVISED: November 16, 2010

Adult Cardiopulmonary Arrest – ILS

**Box #1:**

**If adequate CPR is being performed upon arrival:**

a) Confirm cardiopulmonary arrest.
b) Continue CPR only long enough to apply AED pads.
c) Move on to, **"Box 4."**

**Box #2:**

**Sudden, witnessed arrest in the presence of EMS:**

**a)** Perform CPR only long enough to apply AED pads.
**b)** Move on to, **"Box 4."**

**Box #3:**

**If inadequate CPR, or no CPR at all, is being performed upon arrival:**

a) Initiate CPR
b) 5 cycles 30 compressions to 2 ventilations (approximately 2 minutes)
c) During CPR:
   1) Apply AED pads
   2) Move on to, **"Box 4,"** after 2 minutes CPR completed.

**Box #4:**

**Place patient on long back board as soon as possible/feasible-**
**AED Analysis of Rhythm**

**Shock Advised:**

**a)** **Clear patient.**
**b)** Deliver shock.
**c)** Immediately resume CPR.
**d)** Perform 5 cycles 30:2
   **1)** Approximately 2 minutes.
**e)** Insert supraglottic airway, i.e. OPA, NPA, King Airway. (if necessary) without cessation of compressions.

**No Shock Advised:**

**a)** **Check for pulse.**
   a. If pulse present, support respirations as necessary.
   b. If no pulse, immediately resume CPR.
**b)** Perform 5 cycles 30:2
   **a.** Approximately 2 minutes
**c)** Insert supraglottic airway, i.e. OPA, NPA, King Airway. (if necessary) without cessation of compressions.

# Protocol C-2b

Adult Cardiopulmonary Arrest – ILS

**Box #5:**
**AED Analysis of Rhythm**

**Shock Advised:**

- **a) Clear patient**
- **b)** Deliver shock.
- **c)** Immediately resume CPR.
- **d)** Perform 5 cycles 30:2
  - **1)** Approximately 2 minutes.
- **e)** Obtain IV/IO access if permitted by protocols

**No Shock Advised:**

- **a) Check for pulse.**
  - **1)** If pulse present, support respirations as necessary.
  - **2)** If no pulse, immediately resume CPR.
- **b)** Perform 5 cycles 30:2
  - **1)** Approximately 2 minutes.
- **c)** Obtain IV/IO access if permitted by protocols

Continue the:

*2 minutes CPR → AED Analysis of Rhythm → Shock if Advised/Pulse Check if No Shock Advised → 2 minutes CPR (if necessary)*

Sequence until:

**1)** Transfer to a higher level of care occurs.
**2)** Patient regains a pulse
   a. Initiate supportive care (i.e. oxygen via non-rebreather or BVM assisted breaths if necessary.)
**3)** Resuscitative efforts are terminated (following OLMC consult.)

Protocol
C-2c

**SECTION: C-2c**

**TITLE: Adult Cardiopulmonary Arrest – ALS Algorithms**

**REVISED: August 1, 2013**

Adult Cardiopulmonary Arrest – ALS

### Box #1:

**If adequate CPR is being performed upon arrival:**

a) Confirm cardiopulmonary arrest and, if necessary, continue CPR.
b) Apply defibrillation pads and cardiac monitor without cessation of CPR.
c) Move on to, **"Box 4."**

### Box #2:

**Sudden, witnessed arrest in the presence of EMS:**

**a)** Perform CPR only long enough to apply defibrillation pads and cardiac monitor.
**b)** Move patient to Long Backboard as soon as possible/feasible
**c)** Move on to, **"Box 4."**

### Box #3:

**If inadequate CPR, or no CPR at all, is being performed upon arrival:**

a) Initiate CPR
b) 5 cycles 30 compressions to 2 ventilations (approximately 2 minutes)
c) During CPR:
   1) Apply defibrillation pads and cardiac monitor.
   2) Prepare for endotracheal intubation.
   3) Prepare IV/IO equipment.
   4) Move on to, **"Box 4."**

### Box #4:
### Rhythm Check

### VF/Pulseless VT:

**a)** Continue CPR while defibrillator charges.
**b)** **Shock @ manufacturer's recommendation.**
**c)** Immediately resume CPR without pause for rhythm check.
**d)** Perform 5 cycles 30:2 (approx. 2 min)
**e)** Intubate without cessation of compressions.

### Asystole/PEA:

**a)** No shock indicated.
**b)** Immediately resume CPR.
**c)** 5 cycles 30:2 (approx. 2 min)
**d)** Intubate without cessation of compressions.

# Protocol C-2c

# Adult Cardiopulmonary Arrest – ALS

## Box #5: Rhythm Check

### VF/Pulseless VT:

**a) Shock @ manufacturer's recommendation.**

- Continue CPR while defibrillator charges.

**b)** Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

**c)** Obtain IV/IO access without cessation of compression

**d)** Assess BG

***MEDICATION ADMINISTRATION DURING CPR:***

**e) IV/IO 1:10,000 epinephrine:**

**1)** 1 mg with saline flush.

**2)** Repeat every 3-5 minutes as needed

**OR:**

**f) ETT 1:1,000 epinephrine:**

**1)** If unable to obtain IV/IO access.

**2)** 2-2.5 mg diluted to 10 ml with NS.

**3)** Repeat every 3-5 minutes as needed.

### Asystole/PEA:

**a) No shock indicated.**

**b)** Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

**c)** Obtain IV/IO access.

**d)** Assess BG or BGL.

***MEDICATION ADMINISTRATION DURING CPR:***

**e) IV/IO 1:10,000 epinephrine:**

**1)** 1 mg with saline flush

**2)** Repeat every 3-5 minutes as needed.

**OR:**

- **ETT 1:1,000 epinephrine:**

**3)** If unable to obtain IV/IO access.

**4)** 2-2.5 mg diluted to 10 ml with NS.

**5)** Repeat every 3-5 minutes as needed.

# Adult Cardiopulmonary Arrest – ALS

**Box #6:**
**Rhythm Check**

## VF/Pulseless VT:

a) **Shock @ manufacturer's recommendation**.
   - Continue CPR while defibrillator charges.

b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

c) ***MEDICATION ADMINISTRATION DURING CPR:***

d) **IV/IO Amiodarone:**
   ***1)*** 300 mg initial dose. Consider repeat 150 mg 3-5 min after.

e) **IV/IO 2% lidocaine:**
   **1)** 1-1.5 mg/kg with 20 ml NS flush.
   **2)** Repeat every 3-5 minutes as needed. Max dose 3 mg/kg

**OR:**

- **ETT 2% lidocaine:**
   **3)** If unable to obtain IV/IO access.
   **4)** 2-3 mg/kg.
   **5)** Repeat every 3-5 minutes as needed. Max dose 3 mg/kg

f) **Lidocaine maintenance infusion:*****
   **1)** If, following lidocaine therapy, dysrhythmia is terminated.
   **2)** 2-4 mg/min.
   **3)** Using 4 mg/ml solution:
      **i.** 1 mg/kg bolus total=2 mg/min.
      **ii.** 2 mg/kg bolus total=3 mg/min.
      **iii.** 3 mg/kg bolus total=4 mg/min.

g) **IV/IO magnesium sulfate:**
   **1)** 1-2 g bolus (may repeat every 5 min. prn.)
   **2)** First-line in torsades.
   **3)** Administer in conjunction with lidocaine if hypomagnesemia suspected.
   **4)** Consider for refractory VF/pulseless VT.

## During CPR

- **Push hard & fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- One cycle of CPR: 30 compressions to 2 breaths; 5 cycles ≈ 2 min
- Avoid hyperventilation
- Secure airway & confirm placement
- Rotate compressions every 2 minutes with rhythm checks
- Search for & treat possible contribution factors:
   - **H**ypovolemia
   - **H**ypoxia
   - **H**ydrogen ion (acidosis)
   - **H**ypo-/hyperkalemia
   - **H**ypothermia
   - **T**oxins
   - **T**amponade, cardiac
   - **T**ension Pneumothorax
   - **T**hrombosis (coronary or pulmonary)

* After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/minutes. Check rhythm every 2 minutes.

Continue the following:

***CPR → RHYTHM CHECK → CPR (if necessary while defibrillator charges) → SHOCK (if indicated) → CPR AND MEDICATION ADMINISTRATION***

Continue this sequence until:

a) Transport/transfer of care is complete.
b) Resuscitative efforts are terminated.
c) A rhythm change occurs.

If a rhythm change occurs, treat according to its respective algorithm, starting at the top of that algorithm.

**Additional pharmacologic therapies:**

**a) IV/IO Sodium bicarbonate:** 1 mEq/kg for known hyperkalemia, acidosis (DKA, TCA), prolonged resuscitation after ROSC. Flush line thoroughly before and after administration. Repeat @ ½ the dose in 10 minutes.

**1)** If cyclic antidepressant OD suspected, rebolus in 5-10 minutes at 0.5 mEq/kg.

**b) IV/IO Calcium chloride:** 500-1000 mg for suspected hyperkalemia or calcium channel blocker overdose. Flush line thoroughly before and after administration.

**c) Albuterol:** For suspected hyperkalemia. ETT: 10 mg (4 unit doses) directly instilled into the ETT followed by brief hyperventilation.

**d) IV/IM/IO/IN Narcan (naloxone):** 2 mg for suspected opiate overdose.

**e) IV/IO Dextrose:** 12.5- 25 g if coexisting hypoglycemia present.

**Physician Pearls:**

AHA guidelines recommend Amiodarone as “first line” in pulseless VT/VF.

**SECTION: C-3**

**PROTOCOL TITLE: GENERAL CARDIAC CARE/ACS**

**REVISED: October 27, 2010**



**GENERAL COMMENTS:** The community standard of care for AMI is rapid catheterization. A key component of this would be the rapid assessment of the patient, 12 lead EKG acquisition, and transmission of all pertinent data to the appropriate hospital to allow for decreased door to cath lab time. In the case of likely MI (manifested by 12 lead changes, unstable angina patterns, or failure to respond to treatment) care should be focused with this goal in mind.

**BLS SPECIFIC CARE:**

- Basic BLS care and assessments including oxygen administration and v/s every 5 minutes
- AED at patient side. Pads may be placed (but do not turn AED on unless pulses are lost) if patient appears in extreme distress
- Consider assisted ventilations with signs of severe respiratory distress
- ***Assistance*** *with administration of patient's prescribed sublingual nitroglycerin (NTG.):*
    - Determine how many doses the patient has already self-administered
    - If the patient has not already administered/received a total of 3 doses, EMT-B may assist patient with sublingual administration of up to a total of 3 doses
    - **DO NOT** administer if:
      Patient's systolic BP < 90 mmHg
      - The patient's medication has expired
      - The patient has taken a total of 3 doses prior to EMS arrival
      - The patient presents with altered mental status
      - The patient has taken medications for erectile dysfunction in the preceding 24 hours

*Pharmacologic therapy:*

- ***Aspirin:***
    - *Four (4) 81 mg chewable tabs (324 mg total.)*
    - *Administer even if patient has received normal daily dose within the past 24 hours*
    - *Do not administer if patient is taking other anticoagulants/platelet aggregation inhibitors*
    - *Do not administer if:*
      - *Patient history of aspirin allergy*
      - *Recent history of GI or other internal bleeding/disorders*

## ILS SPECIFIC CARE:

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers
- *Limit fluid administration unless symptomatic, hypotensive, and with clear lung sounds*
- An end goal of 3 IV lines (2 single lumen and 1 single multi-lumen. Always have at lease 2 single lumen established) is a desirable goal to facilitate cath lab/thrombolytic care

## ALS SPECIFIC CARE:

Nitrates:

- NTG Spray: For discomfort suspicious of cardiac origin.
    - SL: 0.4 mg SL spray/tab every 3-5 minutes PRN.
    - Hold for B/P <90, or Viagra use (or similar drug) within previous 24 hours. Use with caution in suspected right-sided MI
- NTG Paste: Initiate if NTG is successful in reducing discomfort.
    - TD: 0.5-1.5 inches applied topically (TD) to non-hairy area of trunk. Hold for B/P <90, or Viagra use (or similar drug) within previous 24 hours. Use with caution in suspected right-sided MI
    - Wipe off if hypotension develops

- Aspirin:
    - PO: 324 mg ASA PO, chewed and swallowed. Hold if sensitivity/allergy to ASA, or in setting of recent bleeding or at risk for bleeding issues
    - Administer ASA even if pt has received a normal daily dose within 24 hours

Analgesics and/or sedatives:

- Discontinue or do not administer if:
    - Signs and symptoms of hypoperfusion are present or develop
    - Respiratory rate, $SpO_2$ and/or mental status diminishes
    - Contact OLMC to exceed maximum doses
    - The paramedic MAY reduce the dose of any analgesic/sedative to achieve needed results

- Morphine Sulfate: For discomfort suspicious of cardiac origin. Use with caution in patients with unstable angina.
    - IV/IM: 2-5 mg IV, repeated every 5-10 minutes PRN for discomfort to a max of 20 mg. Hold for B/P <90

- Fentanyl: To be used if allergic to morphine
    - IV/IM: 25-50 mcg IV, repeated every 5-10 minutes PRN for discomfort to a max of 100 mcg

Anti-emetics:

- IV/IM/IO Zofran (ondansetron):
    - 4 mg
    - Repeat one time in 15 minutes, if needed
- IV/IM/IO Benadryl (diphenhydramine):

- The 12-lead ECG will include patient name, DOB, and cardiologist if available. 12 lead is interpreted as an ST segment elevation MI, the receiving facility shall be informed of an incoming STEMI patient as soon as possible.

**PHYSICIAN PEARLS:**

- Remember that many patients will have atypical presentations, including female patients, diabetics, the elderly, and those with a history of hyper-dynamic drug use. Many recent studies also suggest that women and younger patients are under-triaged, and under-treated for cardiac events. The provider should keep a high index of suspicion for potential cardiac events and assess/treat accordingly.
- 12 lead ECG transmission is a crucial component of decreasing “E to B” (Emergency 911 to Balloon) time. All 12 lead ECGs shall be transmitted to the receiving hospital whenever there is a suspected STEMI or Physician consult on EKG.
- The goal of NTG administration is not only to reduce pain through increased coronary artery perfusion, but also to improve cardiac hemodynamics secondary to increased venous capacitance. Patients with ACS should receive SL NTG spray (Followed by transdermal NTG paste**)** as long as systolic BP remains above 90 mm/Hg. (Even if pain is resolved with less than 3 SL NTG spray, follow with transdermal NTG paste as long as hemodynamic status is maintained) Use nitrates with caution in patients with a suspected right ventricular infarction.

Protocol

C-3

General Cardiac Care/A.C.S.

Protocol
C-4

**SECTION: C-4**

**PROTOCOL TITLE: STEMI PROTOCOLS/FlowChart**

**REVISED: October 27, 2010**

**GENERAL COMMENTS:**

The 911 response to STEMI is to reduce time from the door at the Emergency Department (ED) and the Coronary Cath Lab.

## BLS SPECIFIC CARE:

- General Cardiac/ACS protocols C-3
- Obtain the following information for data input to ACP's Life Pac 12-Lead monitor
    - Pt Last Name
    - Pt First Name
    - Pt DOB (mm/dd/yyyy)
    - Pt Cardiologist's (if known)
    - Pt Age
    - Pt. Sex
- Patients PMH including but not limited to:
    - Meds
    - POST/DNR/DNI status
    - 

For preparation to "Heads up radio/LL Report"

## ILS SPECIFIC CARE:

- General Cardiac/ACS protocols C-3
- IV Access:
- An end goal of 3 IV lines (2 single lumen and 1 single multi-lumen. Always have at lease 2 single lumen established) is a desirable goal to facilitate cath lab/thrombolytic care

Stemi Protocols

# Protocol C-4

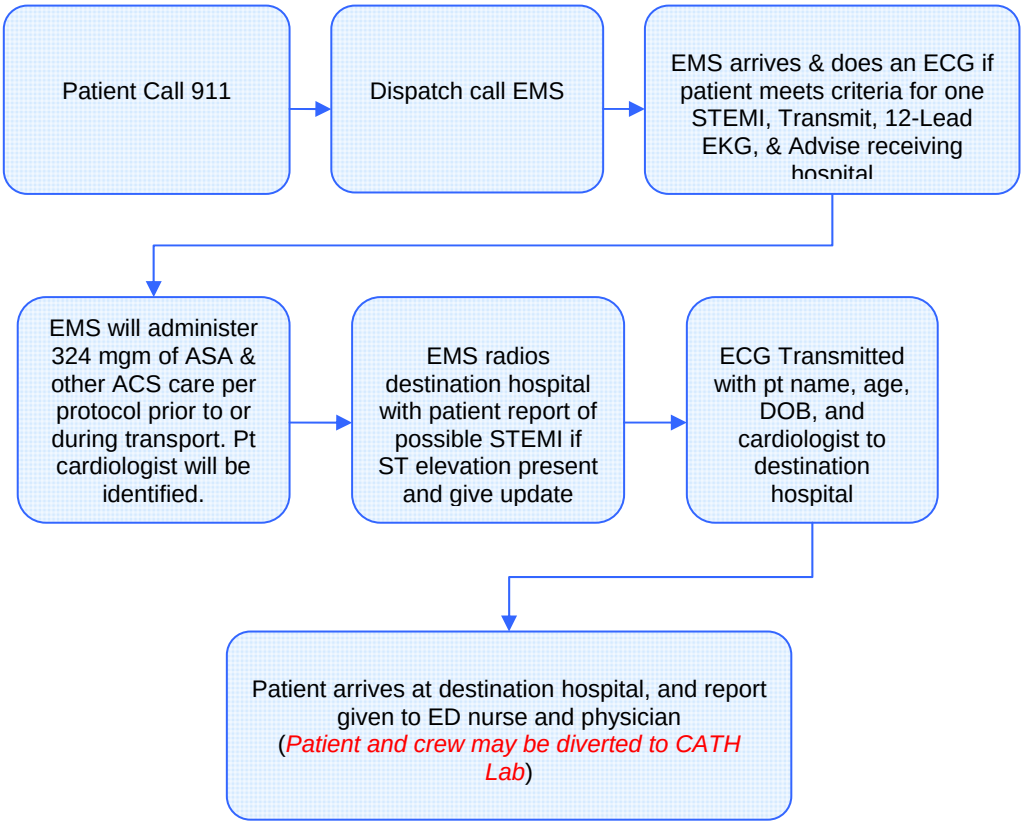
# Stemi Protocol.

## ALS SPECIFIC CARE:

- General Cardiac/ACS protocols C-3

- Establish a 12-lead and transmit to receiving facility
  - Initial "Heads Up" patient information
  - Use hand held radio or LL while on scene
  - Unit ID
  - LOC
  - Stable vs Unstable (hemodynamic)
  - Age
  - Gender
  - POST/DNR/DNI
  - Name of Cardiologist (if available)
  - STEMI confirmed in leads:_____ (Confirm 12-lead transmissions)
  - ETA
  - Stay on Hospital frequency
  - 

- GOAL is 10 minute scene time




BLOCKS REPRESENT EACH PROCESS IN SEQUENCE

Protocol
C-5

**SECTION: C-5**

**TITLE: Adult Wide-Complex Tachycardia**

**REVISED: August 1, 2013**

Adult Wide-Complex Tachycardia

This protocol includes ventricular tachycardia with a pulse, Torsades with a pulse, and wide-complex tachycardias of unclear origin. When possible, a 12-lead may be helpful in determining rhythm origin.

**BLS-Specific Care** *See Adult General Cardiac Care and ACS Protocol C-3*

**ILS-Specific Care** *See Adult General Cardiac Care and ACS Protocol C-3*

**ALS-Specific Care** *See Adult General Cardiac Care and ACS Protocol C-3*

*Cardioversion for hemodynamicaly UNSTABLE patients*

- Settings for manual, synchronized cardioversion.
    - 200j ⇒ 300 j ⇒ 360j LP15
    - 100j => 150j => 200j MRx
    - Ensure "**SYNC**" button is pressed between each desired synchronized shock.
- If synchronization is not obtained, proceed with unsynchronized cardioversion at the same settings.
- Sedation/Analgesia prior to cardioversion is highly desirable, but not mandatory. If IV access cannot be obtained for prompt sedation, then cardioversion may be performed without sedation.
    - *See the Adult Pain Control and Sedation Protocol M-11 for medications and doses.*
    - Midazolam (Versed) is to only be used for sedation in cardioversion.

*Antiarrhythmics*

- Amiodarone
    - 150 mg IV infusion over 10 minutes. May repeat every 10 minutes as needed. Mix 150 mg in 20cc NS in a buretrol and drip at a rate of 120 gtts/min.
- Lidocaine (Xylocaine)
    - IV: 1-1.5 mg/kg, repeated at 0.5-0.75 mg/kg every 5 minutes for continued ectopy. Max. bolus of 3 mg/kg or 300 mg in 30 min.
    - Maintenance Infusion 2-4 mg/minute titrated for effect. Must bolus again with Lidocaine in 5-10 minutes after initiation of the drip to reach therapeutic levels unless max. bolus dose has been reached.

- Adenosine (Adenocard): Consider Adenocard for **suspected SVT with aberrancy**. Use Lidocaine or Procainamide instead of Adenosine in cases of **known VT**.
    - IV: 6 mg **rapid IVP**,
    - Repeat at 12 mg in 3-5 minutes two times PRN (total 30 mg)
    - Follow each dose with a flush of at least 20-60 cc.

- For hemodynamically STABLE patients presenting with wide complex tachycardia, antidysrhythmic therapy is indicated. (continued)

- IV/IO Magnesium sulfate:
    - First line agent in treatment of hemodynamically stable polymorphic wide complex tachycardia (torsades de pointes.)
    - Also indicated in treatment of refractory VF, wide complex tachycardia in the presence of suspected hypomagnesmia and life threatening ventricular dysrhythmias due to suspected digitalis toxicity.
        - 1-2 g over 5 minutes.
        - Rapid administration of magnesium sulfate (i.e. rates>1 g/min) can cause hypotension and respiratory depression. Carefully monitor both during infusion.
    - To prepare:
        - 1-2 g diluted to 50 ml with NS in burette of Metriset administered IV over approximately 5 minutes.
        - Start infusion with roller-clamp half open and titrate to rate of approximately 10 ml/minute.

Consider sedation prior to cardioversion if it will not cause unnecessary delays.

- **DO NOT** administer if:
    - Systolic BP < 90 mmHg.
    - Low respiratory rate, SpO2 and/or diminished mental status.
- Versed (midazolzam) IV/IM/IO:
    - 0.5-2.5 mg.
    - Maximum 5 mg.

For hemodynamically UNSTABLE patients presenting with wide complex tachycardias, perform immediate synchronized DC cardioversion.

**Physician Pearls**

Protocol
C-6

**SECTION: C-6**

**PROTOCOL TITLE: Adult Narrow Complex Tachycardia**

**REVISED: September 28, 2010**

**GENERAL COMMENTS:** This protocol includes Supraventricular Tachycardia (SVT), Atrial Tachycardia, Atrial Fibrillation with a rapid ventricular response, and Atrial Flutter with a rapid ventricular response. When possible, a 12 lead may be helpful in determining origin of the rhythm.

**BLS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ILS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ALS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

*Vagal Manuevers*

- Valsalva Manuever
- Carotid Sinus Massage (CSM) or Carotid Sinus Pressure (CSP)

*Cardioversion for Unstable patients*

- Settings for manual synchronized cardioversion by the Medtronic LP12:
    - Start at 50j for SVT and Atrial flutter only; otherwise begin at 100j as noted below.
    - ⇒ 100j ⇒ 200j ⇒ 300j ⇒ 360j
    - Insure "**SYNC**" button is pressed between each desired synchronized shock.
- If synchronization is not obtained, proceed with unsynchronized cardioversion at the same settings
- Sedation/Analgesia prior to cardioversion is highly desirable, but not mandatory. In event IV access cannot be obtained for prompt sedation, then cardioversion may be performed.
    - See the Adult Pain Control and Sedation protocol M-11 for medications and doses.
    - Midazolam (Versed) is to only be used for sedation with cardioversion.

***Antiarrhythmics:***

- Adenosine (Adenocard) Use Lidocaine or Procainamide instead if KNOWN VT. **DO NOT** administer to irregular tachycardia's.
    - IV: 6 mg RAPID IVP,
    - Repeat at 12 mg in 3-5 minutes two times PRN (total 30 mg)
    - Follow each dose with a flush of at least 20-60 cc.

Adult Narrow Complex Tachycardia

- Procainamide (Pronestyl)
    - Initial infusion IV: Mix 1g in 50 cc (20mg/cc) buretrol. Run 20-50 mg/min (60-150 gtts/min) until:
        - Max of 17 mg/kg
        - QRS widens by 50%
        - Rhythm resolves
        - Hypotension develops
    - Maintenance infusion: Mix 1 g /250 cc of NS. Run at 1-4 mg/minute (15-60 gtts/min).
    - Hold Procainamide for:
        - Torsades
        - Uncorrected hypotension
        - Recent (24 hours) administration of IV Amiodarone or chronic oral Amiodarone administration.
        - Tricyclic Antidepressant Overdose
        - Myasthenia gravis (relative)

- Pronestyl (procainamide) infusion**:**
    - If, following procainamide therapy, dysrhythmia is terminated.
        - 1-4 mg/min.
        - Administer using 60 gtt/mL administration set.
    - To prepare: dilute 1 g procainamide to 250 ml to yield a solution of 4 mg/ml.
        - 1 mg/min = 15 gtts/min
        - 2 mg/min = 30 gtts/min
        - 3 mg/min = 45 gtts/min
        - 4 mg/min = 60 gtts/min
- Cardizem (Diltiazem):
    - IV: 10 mg slow over 2 minutes
    - Repeat every 10-15 minutes PRN rate control.
    - Hold for WPW
    - Max dose 40 mg
    - ACEMSS uses a smaller dose to avoid hypotension and other adverse effects. Higher doses may be used on medical control order.

**For hemodynamically <u>STABLE</u> patients presenting with symptomatic narrow complex tachycardias, vagal maneuvers and antidysrhythmic therapy are indicated.**

**PHYSICIAN PEARLS:**
**In addition to being therapeutic, vagal maneuvers can also have limited diagnostic value.**

| Tachycardia | Expected Response to Vagal Maneuvers |
|---|---|
| Sinus Tachycardia | No response or gradual slowing |
| Paroxysmal Atrial Tachycardia | No response or conversion to sinus rhythm |
| Atrial Flutter increasing block | Ventricular slowing revealing flutter waves |
| Atrial Fibrillation | Variable slowing |
| Ventricular Tachycardia | No response |

- **Procainamide is contraindicated if the patient is on Amiodarone or TCA toxicity is a suspected. As are other drugs that widen the QRS.**

Protocol

C-6

# Adult Narrow Complex Tachycardia

**SECTION: C-7**

**TITLE: Adult Bradycardia**

**REVISED: April 29, 2011**

When possible, a 12-lead may be helpful in determining origin of the rhythm.

**BLS-SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ILS-SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ALS-SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

For hemo dynamically **UNSTABLE** patients presenting with bradycardia, perform immediate transcutaneous pacing (TCP)**.**

- Consider sedation/analgesia with transcutaneous pacing if it will not cause unnecessary delays.

*Sedation:*

- **DO NOT** administer if:
  - Systolic BP < 90 mmHg
  - Low respiratory rate, $SpO_2$ and/or diminished mental status.

- Versed (midazolam) IV/IM/IO:
  - 0.5-2.5 mg every 5-10 minutes as needed.
  - Maximum dose of 5 mg.

*Analgesia:*

- **DO NOT** administer/discontinue administration if:
  - Systolic BP < 90 mmHg
  - Respiratory rate, $SpO_2$ and/or mental status diminishes.

- Fentanyl IV/IM/IO:
  - 25-50 mcg IV/IM every 5-10 minutes as needed.
  - Maximum dose 200 mcg.

- *Morphine IV/IM/IO:*
  - 2-5 mg IV/IM every 5-10 minutes as needed.
  - Maximum dose 20 mg.

- Transcutaneous pacing:
  - Start at 80 ppm and 80 mA.

# Protocol C-7

## Adult Bradycardia

For hemodynamically **STABLE** patients presenting with symptomatic bradycardias, pharmacologic therapy is indicated.

- Atropine sulfate:
  - Not indicated for complete and high degree heart blocks.
    - IV/IO: 0.5 mg as needed every 3-5 minutes.
    - Maximum total dose 3 mg.
    - Maximum total dose of 0.04 mg/kg for morbidly obese patients.

For the treatment of the adult with symptomatic and unstable bradycardia, chronotropic drug infusions are recommended as an alternative to pacing.

*Vasopressors:*

- For bradycardia or hypotension unresponsive to other therapies.
  - Dopamine infusion:
    - 2-20 mcg/kg/min.
    - See, “Adult Dopamine Infusion Chart.”
    - Titrated to adequate heart rate and/or blood pressure response.
  - **Epinephrine infusion:**
    - 2-10 mcg/min.
    - See, “Adult Epinephrine Infusion Chart.”
    - Titrated to adequate heart rate and/or blood pressure response.

**PHYSICIAN PEARLS:**

**Dopamine Infusion Matrix**

| Recommended Infusion Rates for Dopamine<br>Mix 400 mg / 250 cc for a 1600mcg / 1 cc concentration. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dos** | **Patient Weight (kg)** | | | | | | | | | | | | | |
| | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 |
| 5 | 8 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 24 | 26 | 28 | 30 | 32 |
| 7 | 11 | 13 | 16 | 18 | 21 | 24 | 26 | 29 | 32 | 34 | 37 | 39 | 42 | 45 |
| 10 | 15 | 19 | 23 | 26 | 30 | 34 | 38 | 41 | 45 | 49 | 53 | 56 | 60 | 64 |
| 15 | 23 | 28 | 34 | 39 | 45 | 51 | 56 | 62 | 68 | 73 | 79 | 84 | 90 | 96 |
| 20 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 98 | 105 | 113 | 120 | 128 |

**Epinephrine Infusion Matrix**

| Recommended Infusion Rate for Epinephrine | | |
|---|---|---|
| DOSE mcg/min | **1 mg/250 cc with microdrip 4 mcg/ml concentration** | **1 mg/100 cc Buritrol 10 mcg/ml concentration** |
| **2** | 30 gtt/min (ml/hr) | 12 gtt/min (ml/hr) |
| **3** | 45 gtt/min (ml/hr) | 18 gtt/min (ml/hr) |
| **4** | 60 gtt/min (ml/hr) | 24 gtt/min (ml/hr) |
| **5** | 75 gtt/min (ml/hr) | 30 gtt/min (ml/hr) |
| **6** | 90 gtt/min (ml/hr) | 36 gtt/min (ml/hr) |
| **7** | 105 gtt/min (ml/hr) | 42 gtt/min (ml/hr) |
| **8** | 120 gtt/min (ml/hr) | 48 gtt/min (ml/hr) |
| **9** | 135 gtt/min (ml/hr) | 54 gtt/min (ml/hr) |
| **10** | 150 gtt/min (ml/hr) | 60 gtt/min (ml/hr) |

Protocol

C-7

# Adult Bradycardia

**SECTION: C-8**

**PROTOCOL TITLE: Congestive Heart Failure/Pulmonary Edema**

**REVISED: January 26, 2010**

**GENERAL COMMENTS:** For CHF with Hypotension, see Protocol M-3, "Adult Hypotension and Shock"

**BLS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ILS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ALS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

- NTG Spray:
  - SL: 0.4 mg SL spray/tab every 3-5 minutes PRN. Hold for B/P <90, Viagra use (or similar drug) within previous 24 hours, or suspected right-sided MI.
- NTG Paste:
  - TD: 0.5-1.5 inches applied topically (TD) to non-hairy area of trunk. Hold for B/P <90, Viagra use (or similar drug) within previous 24 hours, or right-sided MI. Wipe off if hypotension develops.
- CPAP: See also *Appendix E*
  - **Medical Control Required if BP less than 90 systolic.**
  - Initial setting at 0-2 cmH2O,
  - Titrate upward for effect. **MAX: 10 cmH2O**
  - Coaching will be required to reduce anxiety.

- **If coaching is unsuccessful, then consider low dose sedation. See the Adult Pain Control and Sedation protocol M-11 for medications and doses.**
- Furosemide (Lasix)
  - IV/IM/IO: 20-80 mg,
  - Administer by IV slowly.
  - May increase up to TWICE the patient's daily dose.
  - Use only if Dx of CHF is supported by Hx and exam findings.
  - **Use of Lasix in Pneumonia and/or Sepsis can be detrimental.**
  - **Do not give in patient with fever or new productive cough.**

*Analgesics:*

- Do not administer/discontinue administration if:
- Systolic BP < 90 mmHg.
- Suspected right ventricular infarction.
- The patient presents with altered mental status.

- Morphine sulfate IV/IM/IO:
  - 2-5 mg every 5-10 minutes as needed.
  - Maximum dose 10 mg.

Protocol
C-9

**APPENDIX: C-9**

**TITLE: INDUCED HYPOTHERMIA**

**REVISED: April 29, 2011**

**GENERAL COMMENTS:**

**BLS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ILS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**ALS SPECIFIC CARE:** *See Adult General Cardiac Care/ACS Protocol C-3*

**INCLUSION CRITERIA:**

| | |
|---|---|
| ROSC | Neuro exam **5 minutes after ROSC** shows NO purposeful pain response |
| Age >16 (Adult) | |
| Temp > 34 C/ F | Intubated (Intubate if indicated) |
| SBP > 90mmHg | |

**EXCLUSION CRITERIA:**

| | |
|---|---|
| DNR/POST, or other Advanced | Obvious Pregnancy |
| Directive | Obvious Traumatic Arrest |
| Obvious Terminal Illness | |

**PROCEDURE:**

| | |
|---|---|
| *Assess and Documents*: | *Airway Control:* |
| Pupil Response | Intubate as indicated |
| Neuro assessment | Ventilate to a ETCO2 of 35. Do not hyperventilate. |
| | |

*Sedation and Paralytics:*

- Midazolam (Versed) – may be used to prevent shivering
  - IV, IO, IM: 0.5-5 mg, Max of 10mg
- Vecuronium (Norcuron): Use only when patient shivering is witnessed (to prevent heat production**)** **ADMINISTER ONLY AFTER ENDOTRACHEAL TUBE** type airway is **SECURED** and placement confirmed with **$SPO_2$** and **CONTINUOUS $ETCO_2$**
  - IV/IO: 0.1mg/kg, repeated PRN.

*Induced Hypothermia*

- Establish a second IV if possible.
- Expose the patient while protecting modesty.
- Cold Packs to Groin, Axilla, and Neck (if accessible).
- Saline/Water soaked Sheet applied to trunk
- Chilled Crystalloid
  - IV: 30 cc/kg fluid bolus to max of 2 liters

INDUCED HYPOTHERMIA

# Protocol C-9

INDUCED HYPOTHERMIA

*Target Systolic Blood Pressure : 90*

Vasopressors: titrate to a blood pressure of 90 systolic if chilled saline does not maintain

Cold saline is a strong vasoconstrictor. Watch blood pressures closely!

- Dopamine infusion
  - IV: 2-20 mcg/kg/min.
- Epinephrine infusion
  - IV: 2-10 mcg/min

**Ensure early notification to receiving facility for expeditious coordination of care.**

**PHYSICIAN PEARLS:**

If vecuronium is administered, ensure versed is provided for patient sedation.

To clarify: SBP >90 needed before initiation of cooling. Patients may require vasopressors to meet this inclusion criteria.

**Dopamine Infusion Matrix**

Recommended Infusion Rates for Dopamine
Mix 400 mg / 250 cc for a 1600mcg/1 cc concentration.

| Dose | Patient Weight (KG) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 |
| 5 | 8 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 24 | 26 | 28 | 30 | 32 |
| 7 | 11 | 13 | 16 | 18 | 21 | 24 | 26 | 29 | 32 | 34 | 37 | 39 | 42 | 45 |
| 10 | 15 | 19 | 23 | 26 | 30 | 34 | 38 | 41 | 45 | 49 | 53 | 56 | 60 | 64 |
| 15 | 23 | 28 | 34 | 39 | 45 | 51 | 56 | 62 | 68 | 73 | 79 | 84 | 90 | 96 |
| 20 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 98 | 105 | 113 | 120 | 128 |

**Epinephrine Infusion Matrix**

Recommended Infusion Rate for Epinephrine

| Dose Mcg/min | **1 mg/250 cc with microdrip 4 mcg/ml concentration** | **1 mg/100 cc buritrol 10 mcg/ml concentration** |
|---|---|---|
| **2** | 15 gtt/min (ml/hr) | 12 gtt/min (ml/hr) |
| **3** | 30 gtt/min (ml/hr) | 18 gtt/min (ml/hr) |
| **4** | 45 gtt/min (ml/hr) | 24 gtt/min (ml/hr) |
| **5** | 60 gtt/min (ml/hr) | 30 gtt/min (ml/hr) |
| **6** | 75 gtt/min (ml/hr) | 36 gtt/min (ml/hr) |
| **7** | 90 gtt/min (ml/hr) | 42 gtt/min (ml/hr) |
| **8** | 105 gtt/min (ml/hr) | 48 gtt/min (ml/hr) |
| **9** | 120 gtt/min (ml/hr) | 54 gtt/min (ml/hr) |
| **10** | 135 gtt/min (ml/hr) | 60 gtt/min (ml/hr) |

**Saline Infusion & Maintenance of Mean Arterial Pressure**

- ❑ Initiate cold saline bolus through up to (2) IV or I/O access points.
- ❑ Infuse cold saline at 30ML/kg to max 2 liters

| 0.9 Normal Saline at near freezing | WEIGHT (kg) | Volume Max (mL) |
|---|---|---|
| | **30** | **900** |
| | **35** | **1050** |
| | **40** | **1200** |
| | **45** | **1350** |
| | **50** | **1500** |
| | **55** | **1650** |
| | **60** | **1800** |
| | **> or = 65** | **2000** |

- ❑ Target Mean Arterial Pressure (MAP: 90-100
- ❑ Check MAP on the LP-12 but manually monitor

| Systolic | Diastolic | Map |
|---|---|---|
| **110** | **80** | **90** |
| **120** | **75-90** | **90-100** |
| **130** | **70-85** | **90-100** |
| **140** | **65-80** | **90-100** |

| Glasgow Coma Scale | |
|---|---|
| ***Eye Opening*** | |
| Spontaneous | 4 |
| To verbal command | 3 |
| To pain | 2 |
| No response | 1 |
| ***Verbal response*** | |
| Oriented and converses | 5 |
| Disoriented and converses | 4 |
| Inappropriate words | 3 |
| Incomprehensible sounds | 2 |
| No response | 1 |
| ***Motor Response*** | |
| Obeys verbal commands | 6 |
| Localizes pain | 5 |
| Withdraws from pain (flexion) | 4 |
| Abnormal flexion in response to pain (decerebrate rigidity) | 3 |
| Extension in response to pain | 2 |
| No response | 1 |

Protocol

C-9

INDUCED HYPOTHERMIA

| Pediatric Glasgow Coma Scale | | | | |
|---|---|---|---|---|
| | | **> 1 Year** | **< 1 Year** | |
| ***Eye Opening*** | 4 | Spontaneous | Spontaneous | |
| | 3 | To verbal command | To Shout | |
| | 2 | To pain | To pain | |
| | 1 | No response | No response | |
| | | **> 1 Year** | **< 1 Year** | |
| ***Best Motor Response*** | 6 | Obeys | | |
| | 5 | Localizes pain | Localizes pain | |
| | 4 | Flexion-withdrawal | Flexion-withdrawal | |
| | 3 | Flexion-abnormal (decorticate rigidity) | Flexion-abnormal (decorticate rigidity) | |
| | 2 | Extension (decerebrate rigidity) | Extension (decerebrate rigidity) | |
| | 1 | No response | No response | |
| | | **> 5 Year** | **2-5 Year** | **0-23 months** |
| ***Best Verbal Response*** | 5 | Oriented & converses | Appropriate words & phrases | Smile, coos, cries appropriately |
| | 4 | Disoriented & converses | Inappropriate words | Cries |
| | 3 | Inappropriate words | Cries and/or screams | Inappropriate crying and/or screaming |

Protocol
M-1

**SECTION: M-1**

**PROTOCOL TITLE: GENERAL MEDICAL CARE**

**REVISED: October 27, 2010**

**GENERAL COMMENTS:** This is a general protocol for non-specific medical complaints, including SOB of non-specific etiology. When possible this protocol should supplement other, more specific protocols based on clinical assessments and judgment.

## BLS SPECIFIC CARE:

- Basic BLS care and assessments and V/S every 15 minutes, unless unstable, then reassess and V/S every 5 minutes
- Oxygen administration titrated for SAO2 < 95%. Use NRB and high flow O2 for signs of significant distress. Assist ventilations as needed
- Patients with a respiratory complaint should receive supplemental oxygen, regardless of oxygen saturation. Respiratory complaints should receive ALS evaluation when available
- Assess blood glucose level as appropriate
- Position patient as appropriate

## ILS SPECIFIC CARE:

- IV access (to a max of three attempts) or IO access if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers.
    - IV: Crystalloid solution at a TKO rate. May administer 200-500 cc if S/S of dehydration are present, repeat as needed
    - Multiple IV lines if necessary. An end goal of 3 IV lines (2 single lumen and 1 single multi-lumen lines. Always have at lease 2 single lumen established) is a desirable goal.
    - Withhold fluids and maintain IV at TKO rate if patient is hemo dynamically stable or signs and symptoms of fluid overload are present

GENERAL MEDICAL CARE

# Protocol M-1

GENERAL MEDICAL CARE

## ALS SPECIFIC CARE:

- Assess and identify causes of complaints, treat as needed
- Maintain patent airway as necessary to include CPAP and endotracheal intubation when appropriate
- Apply cardiac monitor and/or multi-function electode (MFE) pads if necessary
    - Treat unstable dysrhythmias and vital signs as necessary and as per specific protocols
- 12 lead ECGs: Also See Protocol C4 - General Cardiac Care.
  The following patients should have a 12 lead ECG obtained by paramedic.
    - Any non-trauma patient with primary complaint of chest pain
    - Any patient with concern for cardiac etiology for their complaint (not limited to AMI)
    - Any patient with syncope
    - Patients with primary complaint of Shortness of Breath with changes to any of the following factors:
        - Diabetic
        - Over the age of 65
        - Altered Mental Status or Dementia
        - History of Heart Disease
- 12-lead ECG's will only be transmitted for the following:
    - STEMI
    - On-line medical direction consult, regarding 12-lead ECG

Protocol
M-2

**SECTION: M-2**

**PROTOCOL TITLE: Adult Reactive Airway Emergencies**

**REVISED: September 28, 2010**

ADULT REACTIVE AIRWAY

**GENERAL COMMENTS:** This protocol includes asthma, COPD, pneumonia and bronchitis, as well as the myriad of similar conditions. As such it is imperative that the provider attempt to differentiate between a true reactive airway disorder and other respiratory emergencies such as pneumonia and CHF and treat appropriately.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Assist the patient with their prescribed "rescue inhaler." Use a spacer if the patient is prescribed one and has it available.
    - Assisted Inhaler: 2 puffs or a specific number of puffs as prescribed
    - Repeat every 5-10 minutes to a maximum of 6 puffs or as prescribed
    - Hold for HR >150/min.
- As an alternative, the patient may be allowed to use their own nebulized medication. The QRU will offer to hook up oxygen in lieu of a room air "condenser" and run at 6-8 lpm with the patient's hand held nebulizer (HHN). The patient must prepare it himself

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

*Bronchodilators*

- Nebulizer
    - Albuterol 2.5 mg (0.83% in 3 cc)/ Atrovent 0.5 mg (0.02% in 2.5 cc) nebulized
        - May use DuoNeb™ preparation for initial nebulizer.
    - Repeat as needed with Albuterol Only
    - Do not dilute
- Magnesium Sulfate for refractory patients in extremis
    - Magnesium sulfate: IV/IO (for severe episodes)
        - 2 g over 5 minutes
        - IV: 2 g given SLOWLY. Take 2g (4cc), dilute to 20 to make 10% solution.
        - Rapid administration of magnesium sulfate (i.e. rates>1 g/min) can cause hypotension and respiratory depression. Carefully monitor both during infusion
        - Do don't give faster than faster than 1 g/minute

- Brethine (terbutaline): IM *** (for the severe episodes)
    - 0.25 mg (0.25 ml) to repeat one time in 30 minutes if needed
    - Consider IM Brethine over IM epinephrine in patients of advanced age and/or with cardiac history
- Epinephrine: IM: 1:1,000 (for severe episodes)
    - 0.3-0.5 mg IM for severe refractory bronchospasm
    - Use Epinephrine with caution on patients over 65 or with cardiac history

*Steroidal Therapy*

- Solu-medrol (methylprednisolone): IV/IO *** (for severe episodes.)
    - IV/IO/IM: 125 mg
    - Hold for fever, new onset productive cough, suspicion of CHF etiology.

*CPAP*

- CPAP: See also *Appendix E*
    - **Medical Control Required if BP less than 90 systolic.**
    - Initial setting at 0-2 cmH2O, **MAX: 5 cmH2O (10 cmH20 for CHF)**
    - Coaching will be required to reduce anxiety
    - If coaching is unsuccessful, then consider low dose sedation. See the Adult Pain Control and Sedation protocol M-12 for medications and doses

**PHYSICIAN PEARLS:**

- It is important to note, “not all asthma wheezes” and “not all that wheezes is asthma.”
- Magnesium Sulfate and Epinephrine (IM/SQ) should be used only on severe patients who are refractory to initial treatments

**Regarding CPAP**:

- If CPAP is not otherwise available, and the patient has a C-PAP or a Bi-PAP device, and if the ambulance is equipped with an inverter or other means to power device is available, use of the patient’s own C-PAP /Bi-PAP is a viable option in addition to other therapies
- Advise receiving hospital as soon as possible so they can prepare for the patient’s arrival
- Do not remove CPAP until hospital therapy is ready to be placed on the patient
- Monitor patient for gastric distension which may lead to vomiting
- Once CPAP headset is in place, consider early administration of nitro-paste, as nitro spray may be impractical to use
- Success is highly dependent upon patient tolerance, and EMT-P ability to coach the patient. Instruct patient to breath in through nose and exhale through mouth as long as possible
- Monitor closely for development of pneumothorax and or hypotension
- Monitor patients closely for vomiting and or gastric distention
- Most patients will improve in 5-10 minutes. If no improvement within this time, assess for other causes and problems. Re-evaluate for intermittent positive pressure ventilation or intubation
- CPAP may be the treatment of choice in a patient with a DNR order in respiratory failure
- CPAP therapy needs to be continuous and should not be removed unless the patient can not tolerate the mask or experiences continued or worsening respiratory failure. Intermittent positive pressure ventilation and/or intubation should be considered if patient is removed from CPAP therapy

Protocol

# M-2

# ADULT REACTIVE AIRWAY

Protocol
M-3

**SECTION: M-3**

**PROTOCOL TITLE: Adult Hypotension and Shock**

**REVISED: April 29, 2011**

**GENERAL COMMENTS:** *Hypotension is defined as a symptomatic blood pressure less than 90 mm/Hg.* Use of good clinical judgment is essential to determine cause and how aggressively to treat the hypotension.
This protocol includes shock and hypotension from a myriad of causes. Follow a more specific protocol if appropriate (i.e. Dehydration or Allergic Reaction). Fluid administration use should be used with caution in CHF patents.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Administer high flow oxygen.
- Place patient in Trendelenburg position if tolerated.
- Maintain body temperature.

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Assess and treat underlying cause of shock, if known.

*Vasopressors*

- Dopamine infusion IV/IO: ***
  - IV: 2-20 mcg/kg/min.
  - See, "Adult Epinephrine/Dopamine Infusion Chart." See C-7
  - To maintain systolic BP of > 90 mmHg

- **Epinephrine infusion IV/IO: ***
  - IV: 2-10 mcg/min
  - First line agent for treatment of anaphylactic shock.
  - See, "Adult Epinephrine Infusion Chart." See C-7
  - 2-10 mcg/min
  - Titrated to adequate heart rate and/or blood pressure response.
  - Second line agent if patient unresponsive to dopamine.

ADULT HYPOTENSION/SHOCK

# Protocol M-3

ADULT HYPOTENSION/SHOCK

**PHYSICIAN PEARLS:**

**Dopamine Infusion Matrix**

| Recommended Infusion Rates for Dopamine<br>Mix 400 mg / 250 cc for a 1600mcg/1 cc concentration. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dose** | **Patient Weight** | | | | | | | | | | | | | |
| | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 |
| 5 | 8 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 24 | 26 | 28 | 30 | 32 |
| 7 | 11 | 13 | 16 | 18 | 21 | 24 | 26 | 29 | 32 | 34 | 37 | 39 | 42 | 45 |
| 10 | 15 | 19 | 23 | 26 | 30 | 34 | 38 | 41 | 45 | 49 | 53 | 56 | 60 | 64 |
| 15 | 23 | 28 | 34 | 39 | 45 | 51 | 56 | 62 | 68 | 73 | 79 | 84 | 90 | 96 |
| 20 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 98 | 105 | 113 | 120 | 128 |

**Epinephrine Infusion Matrix**

| Recommended Infusion Rate for Epinephrine | | |
|---|---|---|
| DOSE Mcg/min | **1 mg/250 cc with microdrip 4 mcg/ml concentration** | **1 mg/100 cc buritrol 10 mcg/ml concentration** |
| **2** | 15 gtt/min (ml/hr) | 12 gtt/min (ml/hr) |
| **3** | 30 gtt/min (ml/hr) | 18 gtt/min (ml/hr) |
| **4** | 45 gtt/min (ml/hr) | 24 gtt/min (ml/hr) |
| **5** | 60 gtt/min (ml/hr) | 30 gtt/min (ml/hr) |
| **6** | 75 gtt/min (ml/hr) | 36 gtt/min (ml/hr) |
| **7** | 90 gtt/min (ml/hr) | 42 gtt/min (ml/hr) |
| **8** | 105 gtt/min (ml/hr) | 48 gtt/min (ml/hr) |
| **9** | 120 gtt/min (ml/hr) | 54 gtt/min (ml/hr) |
| **10** | 135 gtt/min (ml/hr) | 60 gtt/min (ml/hr) |

Protocol
M-4

**SECTION: M-4**

**PROTOCOL TITLE: Adult CVA**

**REVISED: July 21, 2011**

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Administer Oxygen (high flow if neurological deficits or altered mental status).
- Reduce any noxious stimuli, dim lights, and minimize stimulation.
- Assess patient ability to swallow and cough, maintain airway through suction.
- Assess for neurologic deficit using The Cincinnati Prehospital Stroke Scale. (*appendix* AA)
- Determine time of onset of symptoms.
- Minimize on-scene time. Perform only essential procedures on-scene and defer others until transport has been initiated.
- Perform the Cincinnati Prehospital Stroke Scale (*appendix* AA) and document the findings on the "Patient Information Sheet".
- Facilitate rapid notification of "Brain Attack" and transport to an appropriate medical facility.

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- In acute onset (**less than 3 hours**), an end goal of 2 IV lines, (2 single lumen or 1 single lumen and 1 multi-lumen), is a desirable goal to facilitate cath-lab/thromolytic care. Always have at the minimum 1 single lumen IV established using an 18g or bigger in the right AC.
-

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Monitor airway status and treat accordingly.
- Correct hypoglycemia if necessary.
- Perform the Cincinnati Prehospital Stroke Scale (*appendix* AA) and document the findings on the "Patient Information Sheet".
- Lowering BP in the face of a hemorrhagic CVA can be catastrophic
- Be prepared to treat seizures

*Anticonvulsants:*

- Valium (diazepam) IV/IO/PR:
  - IV/IO: 2-10 mg every 5-10 minutes as needed.
    - Maximum 20 mg.
  - PR: 5-10 mg every 5-10 minutes as needed.
    - Maximum of 20 mg.
- Midazolam (Versed) IV/IO/IN/IM:
  - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed
    - Maximum of 5 mg.
  - IN: 5mg with 2.5 mg in each nare
    - Maximum total dose 5 mg.
  - IM**:** 5mg
    - Maximum dose 5 mg

ADULT CVA

# Protocol M-4

ADULT CVA

Protocol
M-5

**SECTION: M-5**

**PROTOCOL TITLE: Adult Seizure Activity**

**REVISED January 11, 2010**

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Administer oxygen (high flow if neurological deficits or altered mental status)
- Place the patient in recovery position, and prevent accidental harm.
- Anticipate brief combativeness or agitation in post ictal phase.
- Screen for probable causes.
- If first time (or undiagnosed/unevaluated) seizure, *perform Cincinnati stroke scale* assessment as feasible.
- Ensure safe environment for patient
- If patient is female, determine if she is pregnant or has recently delivered.

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

*Anticonvulsant Therapies*

- Diazepam (Valium):
  - IV/IO: 2-10 mg, every 5-10 minutes PRN
  - PR/IM: 5-10 mg, every 5-10 minutes PRN
  - Max of 20 mg
- Midazolam (Versed):
  - IV: 0.5-2.5 mg, repeat PRN to a max of 5 mg
  - IN (intranasal) 5mg (2.5 mg each nare) to maximum total dose 5 mg
  - IM/IN: 5 mg (If no vascular access)
- Dextrose IV/IO: (If hypoglycemia present)
  - 12.5-25 g administered slowly through the distal port of a free flowing IV line
- Glucagon IM: (If hypoglycemia present and unable to obtain IV access)
  - 1 U (mg)

ADULT SEIZURE ACTIVITY

**PHYSICIAN PEARLS:**
If the maximum dose of a benzodiazepine is reached without seizure control, call medical control to switch to a different benzodiazepine.

IM Versed is absorbed quicker than IM Valium. Consider using Versed when there is no vascular access.

Complete a detailed neurological assessment as patient condition allows.

**Modified Cincinnati Stroke Assessment**

| Assessment | Findings |
|---|---|
| **Facial Droop** | **Normal**<br>- Both sides of face move equally<br>- Grimace and grin are equal<br>**Abnormal**<br>- One side of face does not move with grin or grimace<br>- Droop noted to forehead, corner of eyes, or corner of mouth |
| **Arm Drift** | **Normal**<br>- (With Patient's eyes closed) Both arms are kept equal and extended<br>**Abnormal**<br>- (With patient's eyes closed) One arm drifts compared to the other |
| **Speech** | **Normal**<br>- Patient uses correct words with no slurring<br>- Patient says "You can't teach an old dog new tricks"<br>**Abnormal:**<br>- Slurred or inappropriate words<br>- Repetitive Words<br>- Acute inability to speak |

**SECTION: M-6**

**PROTOCOL TITLE: ADULT HYPOGLYCEMIA**

**REVISED: September 29, 2010**

**GENERAL COMMENTS:** Symptomatic hypoglycemia is defined as BG < 60 mg/dl with an altered LOC.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Protect the patient from harm and keep the patient calm
- Aggressively monitor and protect the airway. Administer supplemental oxygen as tolerated by the patient
- BLS providers may check blood glucose levels if they have completed the Idaho State EMS approved optional module. Document as appropriate

Simple carbohydrates/sugars**:**

- If the patient can hold a cup or plate without assistance, and can swallow on command, encourage the patient to consume simple and complex carbohydrates. Attempt to document volume of food/liquid ingested. If grams of sugar are known, document this as well
- If hypoglycemia is confirmed by glucometry: (BGL < 60 mg/dl **with** symptoms)
    - Assess patient's ability to orally consume carbohydrates
    - If patient is able to eat or drink effectively without any assistance, have the patient administer oral glucose
- Oral Glucose dosing and follow-up:
    - If simple and complex carbohydrates are not readily available or not feasible
    - Only if patient retains an intact, self-maintained airway, and can swallow on command
    - 15-45 g of glucose paste administered orally. The EMT may mix this in a liquid to make it more palatable for the patient
    - One (1) tube (24 g) p.o. self administered by patient
    - Repeat if BGL remains < 60 mg/dl with symptoms
    - Re-assess BGL following administration
- Treat and released only after ALS (Paramedic) evaluation

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

# Protocol M-6

# ADULT HYPOGLYCEMIA

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Dextrose 50% (D50W)
    - 12.5-25 g administered slowly through the distal port of a free flowing IV line. 25 g if patient is unconscious. May start with 12.5 g if patient is conscious and responsive or suspected CVA
- Glucagon IM: (If unable to obtain IV access)
    - IM: 1 mg administered if IV access is not available.
    - Vomiting may occur following administration
- Treat and Release:
    1. Complete Diabetic Treat and Release checklist
    2. Complete Refusal of Treatment and/or Transport form
    3. Attach both of the above forms to patient care report

Protocol
M-7

**SECTION: M-7**

**PROTOCOL TITLE: ADULT HYPERGLYCEMIA**

**REVISED: January 11, 2010**

**GENERAL COMMENTS:** Symptomatic hyperglycemia is defined as BG >250mg/dl with signs of severe dehydration, altered LOC, or shock.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Protect the patient from harm and keep the patient calm
- Aggressively monitor and protect the airway. Administer supplemental oxygen as tolerated by the patient

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Treat symptomatic patients aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF Hx

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Treat unstable dysrhythmias and vital signs as necessary and as per specific protocols
  - In the presence of DKA, continuous EKG monitoring is essential to detect rhythm disturbances and changes associated with accompanying electrolyte imbalances and acidosis
    - Primary electrolyte disturbance is due to hypokalemia
      - T-wave flattening, ST-segment depression, appearance of U-waves and QT prolongation
      - Can precede malignant dysrhythmias
  - Obtain 12-lead EKG
    - Due to possibility of precipitating/accompanying AMI.
  - Re-administer 250-500 ml crystalloid fluid boluses as needed
    - Reassess patient and BGL following each bolus

ADULT HYPERGLYCEMIA

# Protocol M-7

ADULT HYPERGLYCEMIA

**PHYSICIAN PEARLS:**

Hyperglycemic emergencies in patients with diabetes can generally be broken into two categories: Diabetic Ketoacidosis (DKA) and Hyperosmolar Hyperglycemic State (HHS), also known as Hyperosmolar Hyperglycemic Non-ketotic Coma (HHNC). It is estimated that 2-8% of all hospital admissions are for the treatment of DKA.

Mortality for DKA is between 2-10%. Published mortality rates for HHS vary, but the trend is that the older the patient and the higher the osmolarity, the greater the risk for death.

Regardless, most pre-hospital care is focused around the treatment of severe dehydration, and support of vital functions.

Protocol
M-8

**SECTION: M-8**

**PROTOCOL TITLE: Adult Vomiting/Severe Nausea/Vertigo**

**REVISED: January 11, 2010**

**GENERAL COMMENTS:** Nausea and vomiting are general complaints that can have any number of underlying causes. Care should be taken to screen for significant pathology and treat accordingly.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Treat hypotension aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF History.

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Assess and treat underlying disorder.

*Antiemetics:*

- Zofran (Ondansetron)
  - 4 mg IV/IM/IO
  - Repeat one time in 15 minutes, if needed
- Benadryl (diphenhydramine) IV/IM/IO:
  - 25-50 mg

*Benzodiazepines:* To be used for inner ear pathology (vertigo, labrynthitis, etc)

- Diazepam (Valium)
  - IV, IM 2-5 mg, Max of 10 mg
- Midazolam (Versed)
  - IV, IM: 0.5 mg, Max of 2.5 mg

ADULT VOMITING/SEVERE NAUSEA/VERTIGO

- **PHYSICIAN PEARLS:**

*ALS Providers may decrease the dosage, or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.*

Protocol
M-9

**SECTION: M-9**

**PROTOCOL TITLE: Dehydration and Rehab**

**REVISED: June 23, 2010**

**GENERAL COMMENTS:** The treat and release portion of this protocol is intended for recreational events, fire line support, sport/athletic calls and similar scenarios. In general the EMT/Paramedic should not apply it to other patients without careful consideration.
If a patient has an altered mental status, marked hyperthermia, or other priority symptoms, then follow other more appropriate protocols.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

Oral Re-hydration:

- Obtain orthostatic V/S and assessments
- Obtain a temperature, if possible. Cool as needed
- Initiate oral re-hydration if feasible (water, ½ strength Gatorade or similar drink, no caffeine) until minimum 1000 cc (1 liter, approx 32 ounces) and signs and symptoms resolve for a minimum of 15-20 minutes
- Encourage rest, and cooling of body temperature to a normothermic level

*Criteria for release without medical control contact (need all 3)*

- BP and HR
  - Systolic: < 160 and > 90
  - Diastolic: < 100
  - HR: <100 per minute
- Subjective and Objective findings:
  - All initial complaints are resolved for 15-20 minutes
  - All complaints on initial contact have been completely assessed
  - No priority S/S (chest discomfort, SOB, altered mental status)
  - No ALS care required
- Documentation
  - Further transport offered and declined, refusal is signed

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Consider feasibility of oral hydration (if patient is stable) instead of IV access
- Treat hypotension aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF History

Adult Dehydration and Rehab

# Protocol M-9

# Adult Dehydration and Rehab

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Assess and treat any underlying disorders

*ANALGESICS:*

*DO NOT* administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Fentanyl IV/IO/IM:
  - 25-50 mcg every 5-10 minutes as needed
  - Maximum dose 200 mcg
- Morphine sulfate IV/IM/IO:
  - 2-5 mg every 5-10 minutes as needed
  - Maximum dose 20 mg

*SEDATIVES:*

- Valium (diazepam) IV/IO:
  - 2-5 mg every 5-10 minutes as needed
  - Maximum dose 10 mg
- Versed (midazolam) IV/IM/IO:
  - 0.5-2.5 mg every 5-10 minutes as needed
  - Maximum dose 5 mg

Anti-emetics:

Consider with administration of analgesics

- Zofran (ondansetron) IV/IM/IO:
  - 4 mg
  - Repeat one time in 15 minutes, if needed
- Benadryl (diphenhydramine) IV/IM/IO:
  - 25-50 mg IV or IM

**PHYSICIAN PEARLS:**
If the patient presents in a rehab/support scenario (meth lab breakdown, wild land fire support, HAZMAT Operations support, etc) inform the patient's immediate superior, as well as Incident Commander (IC), of patient status and ability to return from rehab sector.

Protocol

M-9

# Adult Dehydration and Rehab

**SECTION: M-10**

**PROTOCOL TITLE: ADULT ALLERGIC/ANAPHYLAXIS**

**REVISED: May 1, 2012**

**GENERAL COMMENTS:** This protocol covers allergic, anaphylactic, and anaphylactoid reactions of all severities.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Epi-Pen protocol (if, "Epinephrine Auto-Injector," Optional Module completed.)
- If optional module not completed follow assisted Epi-Pen protocol:
    - Confirm prior to administration
        - Is Epi-Pen prescribed to the patient (Right Patient?)
        - Is it an Epi-Pen of the correct dose (Right Dose?)
            - Epi-Pen Adult: 0.3 mg
            - Epi-Pen Junior: 0.15 mg
        - Is the Epi-Pen an intramuscular (IM) auto injector (Right Route?)
        - Is the Epi-Pen expired?
        - What is the medication's appearance?
            - It should be clear and colorless
- Re-evaluate patient's sign and symptoms every 5 minutes following administration
    - Evaluate for presence adverse effects of epinephrine.
        - Chest pain
        - Headache
        - Palpitations
        - Anxiety/tremors
- Repeat in 10 minutes if no improvement
- EMS transport is indicated if Epi-Pen administered either by patient or by EMS
- If signs of bronchospasm are present:
- Assist the patient with his prescribed "rescue inhaler." Use a spacer if the patient is prescribed one and has it available
    - Assisted Inhaler: 2 puffs or a specific number of puffs as prescribed by patient's MD
    - Repeat every 5-10 minutes or as prescribed by patient's MD
    - Hold for HR >150/min
- As an alternative, the patient may be allowed to use his/her own nebulized medication. The QRU will offer to hook up oxygen in lieu of a room air "condenser" and run at 6-8 lpm with the patient's hand held nebulizer (HHN). The patient must prepare it him/herself

# Protocol M-10

# ADULT ALLERGY/ANAPHYLAXIS

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Treat hypotension aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF History

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

*Sympathomemetics*

- Epinephrine 1:1000
  - IM: 0.3-0.5 mg
  - Repeat x 1 in 10 minutes if s/s do not significantly improve
- Epinephrine Infusion for persistent hypotension (<80 mm Hg systolic) and severe refractory s/s
  - Mix 1 mg in either 100 cc buritrol or 250 cc NS,
  - IV: 2-10 mcg/min, titrate for effect
- Epinephrine Neb *(for laryngeal edema only)*
  - 5 mg (5 cc) epinephrine 1:1,000 nebulized undiluted.

*Bronchodilators*

- Nebulizer Treatment
  - Albuterol 2.5 mg (0.83% in 3 cc)
  - Ipratropium Bromide (Atrovent) 0.5 mg (0.02% in 2.5 cc)
  - May repeat as needed using Albuterol only. May use equivalent solutions of above medications such as *DuoNeb* as available

*Antihistamines*

- Benadryl (Diphenhydramine)
  - IV, IM,IO: 25-50 mg
  - PO: (If available) 25-50 mg (for mild cases)
- Zantac (Ranitidine) To be used in conjunction with Benadryl
  - IV, IM, IO: 50 mg
  - PO: (If available) 150-300 mg (for mild cases)

*Antiemetic*:

- Zofran (ondansetron) IV/IM/IO
  - 4 mg
  - Repeat one time in 15 minutes, if needed
- Benadryl (diphenhydramine) IV/IM/IO
  - 25-50 mg

*Benzodiazepines:*

- For concomitant vertigo-type symptoms.
- Valium (diazepam) IV/IO
  - IV 2.5mg every 10 minutes as needed.
  - Maximum: 10 mg
- Versed (midazolam) IV/IM/IO
  - 0.5 mg every 10 minutes as needed
  - Maximum: 2.5 mg

## PHYSICIAN PEARLS:

For cases of Vertigo, both anti-emetics listed above should not be used congruently. The preferred treatment is Valium in combination with Zofran

**CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one-hour following treatment for return of symptoms.**

**Epinephrine Auto injector:** EMTs can administer the epinephrine Auto-Injector if it has been prescribed to the patient. In addition, EMTs may administer an auto injector that HAS NOT been prescribed to the patient IF they have successfully completed additional training as required by the Department of Health and Welfare, Bureau of EMS and their agencies medical director.

**Ranitidine:** Ranitidine is an adjunctive therapy to Benadryl (with or without epinephrine) in anaphylaxis & severe allergic reactions. It is not a stand-alone intervention.

**Common Presentations:** The most common symptoms are urticaria and angioedema, occurring in approximately 88% of patients. The next most common manifestations are respiratory symptoms, such as upper airway edema, dyspnea, and wheezing. Gastrointestinal symptoms occur most commonly in food-induced anaphylaxis, but can occur with other causes as well. Oral pruritus is often the first symptom observed in patients experiencing food-induced anaphylaxis. Abdominal cramping is also common, but nausea, vomiting, and diarrhea are frequently observed as well. Remember that a reaction may be monophasic, biphasic, or even protracted in duration. Laryngeal edema is more common in the protracted (57%) or biphasic (40%) cases
Cardiovascular symptoms of dizziness, syncope, and hypotension are less common, *but it is important to remember that cardiovascular collapse may occur abruptly, without the prior development of skin or respiratory symptoms.*

**PITFALLS:** It is commonly believed that all cases of anaphylaxis present with cutaneous manifestations, such as hives or mucocutaneous swelling. But in fact, as previously mentioned, up to 20% of anaphylactic episodes may not involve these signs and symptoms on presentation for emergency care. Moreover, a survey of children with food-induced anaphylaxis showed that 80% of fatal reactions were not associated with cutaneous manifestations. *Therefore, a thorough assessment and a high index of suspicion are required for all potential allergic reaction patients.*

In one study (Sampson et al) many cases of fatal food-induced anaphylaxis occurred in a biphasic clinical pattern. In these, mild oral and gastrointestinal symptoms occurred within 30 minutes of food ingestion. These symptoms resolved, only to be followed 1–2 hours later by severe respiratory symptoms and hypotension. *Due to the potential for this presentation, it is critical that patients with food-induced anaphylaxis presenting for emergency care be closely observed a minimum of 4 hours following their recovery from the initial event.*

Individuals at greater risk for a fatal reaction include those with asthma, atopic dermatitis (eczema), prior anaphylactic history, and those who delay treatment.

Protocol

M-10

ADULT ALLERGY/ANAPHYLAXIS

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Protocol
M-11

**SECTION: M-11**

**PROTOCOL TITLE: Adult Pain Control and Sedation**

**REVISED: January 11, 2010**

ADULT PAIN CONTROL AND SEDATION

**GENERAL COMMENTS:** Ada County EMS is committed to the relief of suffering in its patient population. Accurate and standardized evaluation of the pain is an essential component of pain management. Assessment should be on the 0 → 10 scale whenever possible, using OPQRST as an assessment tool, to provide a quantitative level of discomfort and allow accurate documentation. Providers at all levels should take a multi-faceted approach to pain control and sedation.

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Treat underlying injury or illness as appropriate
- Consider that proper splinting may either exacerbate or relieve pain, use good clinical judgment in deciding course of action
- Assist patient in maintaining position of comfort
- Use distraction (through conversation, etc) and breathing techniques to help patient alleviate pain
- Ice packs or similar cold therapy for swelling
- Splint fractures as necessary
- Ice packs as necessary for swelling

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

*Analgesics*

**DO NOT** administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Fentanyl IV/IO/IM
  - 25-50 mcg every 5-10 minutes as needed
  - Maximum dose 200 mcg
- Morphine sulfate IV/IM/IO
  - 2-5 mg every 5-10 minutes as needed
  - Maximum dose 20 mg

*Sedatives*

**DO NOT** administer/discontinue administration if

- Systolic BP < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Versed (midazolam) IV/IM/IO
  - 0.5-2.5 mg every 5-10 minutes as needed
  - Maximum dose 5 mg

*Anti-emetics:*

Consider with administration of analgesics

- Zofran (ondansetron) IV/IM/IO
  - 4 mg
  - Repeat one time in 15 minutes, if needed
- Benadryl (diphenhydramine) IV/IM/IO
  - 25-50 mg

**PHYSICIAN PEARLS:**
*ALS Providers may decrease the dosage, or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.*

*Regarding Abdominal Pain*: Narcotic analgesia was historically considered contraindicated in the pre-hospital setting for abdominal pain of unknown etiology. It was thought that analgesia would hinder the ER physician or surgeon's evaluation of abdominal pain. It is now becoming widely recognized that severe pain actually confounds physical assessment of the abdomen and that narcotic analgesia rarely diminishes all of the pain related to the abdominal pathology. It would seem to be both prudent and humane to "take the edge off of the pain" in this situation with the goal of reducing, not necessarily eliminating the discomfort. Additionally, in the practice of modern medicine the exact diagnosis of the etiology of abdominal pain is rarely made on physical examination. Advancement in technology and availability has made laboratory, x-ray, ultrasound, CT scan, & occasionally MRI essential in the diagnosis of abdominal pain. *Therefore medication of abdominal pain is both humane and appropriate medical care.*

Protocol

# M-11

# ADULT PAIN CONTROL AND SEDATION

Protocol
M-12

**SECTION: M-12**

**PROTOCOL TITLE: Adult Heat Emergencies**

**REVISED: January 11, 2010**

ADULT HEAT EMERGENCIES

**BLS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Remove from cause of heat injury to a cool place
- Obtain a full set of vital signs
    - V/S's should include temperature
    - Evaluate for presence of orthostatic hypotension
- Promote cooling; initiate active cooling for significant hyperthermia.
- Position patient as appropriate
    - Move patient to a cool area if possible
- Initiate passive cooling
- Obtain temperature, core temp if unresponsive
- Consider orthostatic vital signs
- Encourage rest, and cooling of body temperature to a normothermic level
- Initiate oral re-hydration if feasible (water, ½ strength Gatorade or similar drink, no caffeine) until minimum 1000 cc (1 liter, approx 32 ounces) and signs and symptoms resolve for a minimum of 15-20 minutes. *Criteria for release without medical control contact (need all 3)*
- BP and HR
    - Systolic :< 160 and > 90
    - Diastolic: < 100
    - HR: <100 per minute
- Subjective and objective findings:
    - All initial complaints are resolved for 15-20 minutes. If patient is presenting without complaint in a rehab situation, minimal monitoring time for cooling is 15-20 minutes
    - All complaints on initial contact have been completely assessed
    - No priority S/S (chest discomfort, SOB, altered mental status)
    - *No ALS care is required*
- Documentation
    - Further transport is offered and declined, a refusal is signed

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Consider feasibility of oral hydration (if patient is stable) instead of IV access
- Treat hypotension aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF History

# Protocol M-12

ADULT HEAT EMERGENCIES

**ALS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- Assess and treat underlying disorder
- Follow Seizure protocol as appropriate (M-6)
- Treat underlying disorders/complaints
    - Be prepared to treat seizures

*Anticonvulsant therapy:*

- Valium (diazepam) IV/IO/PR
    - IV/IO: 2-10 mg every 5-10 minutes as needed to maximum 20 mg
    - PR: 5-10 mg every 5-10 minutes as needed to maximum of 20 mg
- Versed (midazolam) IV/IO/IN/IM
    - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to maximum of 5 mg
    - IN (intranasal): 5mg (2.5 mg each nare) to maximum total dose 5 mg
    - IM: 5mg dose

**PHYSICIAN PEARLS:**

Protocol
M-13

**SECTION: M-13**

**PROTOCOL TITLE: Adult Cold Emergencies**

**REVISED: November 16, 2010**

**GENERAL COMMENTS:** True Hypothermia is defined as a body temperature less than 95 degrees. Mild hypothermia is 34-35C / 93-95F. Moderate Hypothermia is 30-34 C/86-93F. Severe hypothermia is <30C/86F.

**BLS SPECIFIC CARE:** ***See adult General Medical Care Protocol M-1***

- Handle gently
- Do not re-warm cold injured extremities if there is a chance of refreezing prior to arrival at definitive care
- Obtain a temperature, core temp if unresponsive
- For mild hypothermia, increase heat production through exercise and calorie/fluid replacement
- For moderate and severe hypothermia, treat gently and keep horizontal.

*Begin passive re-warming*

- Heat packs to critical areas.
- Rewarm trunk prior to extremities.

*Cardiac Arrest treatment for moderate to severe hypothermia:*

- CPR as normal, and increase duration of pulse check to 30 seconds.
- One (1) SHOCK then hold until temperature is >30 C/86 F
- Keep horizontal, avoid rough treatment but do not delay critical interventions
- Active re-warming

*Fight Heat loss:*

- radiation (55-65%): Cover with warm blankets. Cover the head (not the face).
- conduction (15%): Separate the patient from cold surfaces
- convection (15%): REMOVE WET CLOTHING
- evaporation (15%): Cover with warm blankets. Cover the head (not the face)
- Obtain core body (i.e. rectal) temperature as necessary
- Handle patient gently, at core body temperatures less than 30°C (86°F) rough handling can precipitate lethal cardiac dysryhthmias
- Remove patient from cold environment if possible, remove wet clothing and insulate against further heat loss
- Do not attempt to re-warm cold injured extremities if there is a chance of the extremity refreezing prior to arrival at definitive care

ADULT COLD EMERGENCIES

*BLS Continued*

- For patients in cardiopulmonary arrest
  - If an automated external defibrillator (AED) is being used:
    - Shock as indicated
    - Continue CPR and obtain core body (rectal) temperature.
    - If core body temperature <30C/86F °, administer further shocks as indicated
    - If core body temperature <30C/86F withhold further shocks.
      - Focus on CPR and re-warming

**ILS SPECIFIC CARE:** *See adult General Medical Care Protocol M-1*

- If available, a microwave oven may be used to warm IV fluids.
  - Two (2) minutes per liter on, "high"
  - Shake bag prior to initiating infusion

**ALS SPECIFIC CARE:** ***See adult General Medical Care Protocol M-1***

- Assess and treat underlying disorder
- Obtain blood glucose

*Severe Pain: See Adult Pain Control and Sedation Protocol M-13*
*Cardiac Arrest treatment for moderate to severe hypothermia:*

- (1) One total shock, then hold until temperature is >30 C/86 F
- Keep horizontal, avoid rough treatment but do not delay critical interventions
- Active re-warming
- Temp <30 C/86 F: withhold medications
- Temp >30 C /86 F: Increased intervals between meds.
- Sinus bradycardia may be physiologic in severe hypothermia and cardiac pacing and medications are usually not indicated
- Focus treatment on re-warming and rapid transport of patient
- For cardiopulmonary arrest associated with hypothermia see the algorithms

# Hypothermia: Stages

**Normal Cold response 98.6-95.1ºF**

■Feel cold
■Shivering
■Vasoconstriction

**Mild hypothermia (34-35C / 93-95F)**

■Maximum **SHIVERING** at 35C (95F)
■Cold, pale skin (vasoconstriction)
■Pulse and BP are normal or elevated
■Faster breathing
■Mild confusion, slurred speech, unsteady gait
■Amnesia

**Moderate (30-34 C/86-93F) to severe hypothermia (</30C/86F)**

■SHIVERING STOPS
■Pulse slows (bradycardia)
■Breathing slows
■Risk of cardiac arrhythmia
–Atrial fib
■Intense vasoconstriction - surface pooling (promotes afterdrop)
■Decreased LOC
■**Increased mortality in major trauma by 40-50%**

**Severe hypothermia (</30C/86F)**

■Intense vasoconstriction - surface pooling (promotes afterdrop)
■As core temp drops the risk of cardiac arrest increases dramatically
■Lethal cardiac dysrhythmias
■Non-cardiac pulmonary edema

Protocol

M-13

# Adult Cold Emergencies: Hypothermic Cardiopulmonary Arrest:

ADULT COLD EMERGENCIES

## Box #1:

**If adequate CPR is being performed upon arrival:**

a. Confirm cardiopulmonary arrest.
   i. When the patient is hypothermic, pulse and respiratory rates may be slow or difficult to detect. For these reasons assess breathing and later assess the pulse for a period of 30 to 45 seconds to confirm respiratory arrest, pulseless cardiac arrest, or bradycardia that is profound enough to require CPR.

b. Apply defibrillation pads and cardiac monitor without cessation
   i. of CPR.

c. Move on to, **"Box 4."**

## Box #2:

**Sudden, witnessed arrest in the presence of EMS:**

**a)** Perform CPR only long enough to apply defibrillation pads and charge monitor.

**b)** Move on to, **"Box 4."**

## Box #3:

**If inadequate CPR, or no CPR at all, is being performed upon arrival:**

**a.)** Confirm cardiopulmonary arrest.
   **1.** When the patient is hypothermic, pulse and respiratory rates may be slow or difficult to detect. For these reasons assess breathing and later assess the pulse for a period of 30 to 45 seconds to confirm respiratory arrest, pulse-less cardiac arrest, or bradycardia that is profound enough to require CPR.

**b.)** Initiate CPR.

**c.)** 5 cycles 30 compressions: 2 ventilations (approximately 2 minutes.)
   **1.** Apply defibrillation pads and cardiac monitor.
   **2.** Prepare equipment for endotracheal intubation.
   **3.** Prepare IV equipment.
   **4.** Move on to, **"Box 4."**

Protocol
M-13

# Adult Cold Emergencies: Hypothermic Cardiopulmonary Arrest:

**Box #4:**
**Rhythm Check**

### VF/Pulseless VT:

a) **Shock @ 200J or per manufacturer's recommendations.**
   1) Continue CPR while defibrillator charges.
b) Immediately resume CPR without pause for rhythm check.
c) Perform 5 cycles 30:2 (approx. 2 min)
d) Intubate without cessation of compressions.
e) Establish IV access without cessation of compressions.
f) **Obtain core body (rectal) temperature.**

### Asystole/PEA:

a) **No shock indicated.**
b) Immediately resume CPR.
c) Perform 5 cycles 30:2 (approx. 2 min)
d) Intubate without cessation of compressions.
e) Establish IV access without cessation of compressions.
f) **Obtain core body (rectal) temperature.**

**Box #5:**
**Core Body Temperature**

### Core Body Temperature < 30° C (86°F):

a) **Continue CPR 30:2, check rhythm every 5 cycles (approx. 2 min)**
b) **Withhold further shocks if VF/VT present.**
c) **Withhold IV/IO/ETT medications.**
d) Transport and focus efforts upon raising core body temperature > 30°C.
   1) Infuse warm NS fluid boluses. ( 43° C/109° F)

### Core Body Temperature > 30° C (86°F):

a.) **Continue CPR30:2, check rhythm every 5 cycles (approx. 2 min)**
b.) Shock as necessary if VF/VT present.
c.) Administer appropriate IV/IO/ETT medications for presenting rhythm (i.e. VF/VT, PEA, asystole) as indicated but at longer than standard intervals.
d.) Transport, monitor core body temperature and continue re-warming.
   1) Infuse warm NS fluid boluses. ( 43° C/109° F)

Protocol

# M-13

ADULT COLD EMERGENCIES

**PHYSICIAN PEARLS:**
If the core temperature falls below 32 C a characteristic J-wave (AKA Osborn wave) can occur. The J wave occurs at the junction of the QRS complex and the ST segment Also noticeable are T wave inversion and prolongation of the PR, QRS, and QT intervals.

EKG IN HYPOTHERMIA

Hypothermic patients also exhibit "cold diuresis." Peripheral vasoconstriction initially causes central hypervolemia to which the kidneys respond by putting out large amounts of dilute urine. Alcohol and cold water immersion worsen this process. Therefore hypothermic patients may be dehydrated as well.
Ringers Lactate is NOT used because it is not metabolized by a hypothermic liver. When available, a microwave can be used to warm the IV fluid. Two minutes on high per liter is usually sufficient, but be sure to shake the bag well to avoid "hot spots."

Protocol
M-14

**SECTION: M-14**

**PROTOCOL TITLE: Behavioral Emergencies & Combative Patients**

**REVISED: January 11, 2010**

ADULT BEHAVORIAL EMERGENCIES

**GENERAL COMMENTS:** Behavioral emergencies and combative patients are some of the most pitfall filled patients EMS personnel will encounter. Many of these patients will have multiple underlying pathologies, including illicit drug use, which will pose many challenges to overcome. Patient care should be focused with preventing/mitigating hyperthermia, agitated delirium, positional asphyxia, hypoxia, and physical self-harm.

**BLS SPECIFIC CARE:** ***See adult General Medical Care Protocol M-1***

- Assess for medical causes for altered LOC/violent behavior.
- Involve law enforcement as early as possible.
- Restraints may be used for patient and/or rescuer safety.
    - Do not restrain prone if possible. 4 point restraints are recommended
    - Observe and prevent positional asphyxia. Monitor airway and respirations closely. If restrained, do not release restraints until at the hospital unless required for essential patient care
- Do not leave patient unattended
- Allow for adequate heat dissipation
- Attempt to isolate and correct possible causes
    - Loosen all restrictive clothing
    - Ensure Foley catheter is not kinked or occluded and that the drainage/collection bag is not overfilled
        - Remove kinks if present
        - Slowly empty drainage/collection bag if overfilled
    - Attempt to relieve pressure on any bed sores/ wounds, etc.
    - Attempt to correct any other noxious causes
    - Provide a low stimulus environment

**ILS SPECIFIC CARE:** ***See adult General Medical Care Protocol M-1***

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers
- Assess BG to rule out hypoglycemic episode

**ALS SPECIFIC CARE:** ***See adult General Medical Care Protocol M-1***

*Sedation*

- Diazepam (Valium)
  - IV: 2-5 mg every 5-10 min PRN.
  - IM: 5-10 mg repeated once in 20 minutes PRN.
  - Max of 20 mg
- Midazolam (Versed)
  - IV/IM: 0.5-2.5 mg every 5-10 min repeated PRN to a max of 5 mg
- Haloperidol (Haldol)
  - IV/IM: 2.0-5.0 mg IVP PRN to a max of 10 mg
  - Strongly consider co-administration of Benadryl
  - Caution with Hyperthermia, seizure risks, and Hyperdynamic drug use

If removal of noxious stimulus fails to resolve episode, pharmacologic therapy is indicated.

*Adjunctive medications:* These medications are given for their potentiation of other drugs effects or for the prevention/treatment of certain side effects (nausea, EPS, etc) of drugs used in sedation.

- Benadryl (Diphenhydramine)
  - IV/IM: 25-50 mg

**PHYSICIAN PEARLS:**

*ALS Providers may decrease the dosage, or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.*

Cautions with using medications to restrain a patient:

- Respiratory depression
- Loss of gag reflex
- Occasional paradoxical reaction results in increased agitation
- Increase effect of other CNS depressants
- Limit mental status assessment and neurologic examination during sedation

Among the most difficult tasks is determining the etiologies of combative patients and treating accordingly

- Psychiatric (functional)
- Non-psychiatric (organic)
  - Medical (CVA, Hypoglycemia, Increased ICP, Meningitis etc )
  - Toxicologic
- Approximately two thirds have non-psychiatric (organic) etiology.

Protocol

# M-14

# ADULT BEHAVORIAL EMERGENCIES

Protocol
OB-1

**SECTION: OB-1**

**PROTOCOL TITLE: GENERAL OB Care**

**REVISED: October 27, 2010**

**GENERAL COMMENTS:** This is a general protocol for non-specific OB emergencies, including contractions of non-specific etiology and vaginal bleeding (other than post partum). When possible this protocol should supplement other, more specific protocols based on clinical assessments and judgment.

## BLS SPECIFIC CARE:

- Basic BLS care and assessments and V/S every 15 minutes unless unstable, then reassess and V/S every 5 minutes
- Coordinate resources to insure prompt arrival of ALS care to the patient. Update responding ALS as needed
- O2 administration titrated for SAO2 < 95%. Use NRB and high flow O2 for signs of significant distress, significant bleeding, or significant MOI, regardless of SAO2. Assist ventilations as needed
- Patients with a respiratory complaint should receive supplemental oxygen, regardless of oxygen saturation
- Any pregnant patient with direct blunt trauma to the abdomen should be encouraged to seek medical evaluation
- In case of vaginal bleeding (second or third trimester) assess for imminent delivery of fetus or other tissue
- Rapid transport to an *appropriate* facility
- All patients in second and third trimester who are transported in the supine position should be placed in the left lateral recumbent position at approximately 30°
- If amniotic sac has ruptured, determine time of rupture and try to ascertain if meconium was present in the fluid (determine color, odor and consistency)
- **Delivery:**
    - Throughout the delivery, continually assess and provide care for the mother
    - Assess and examine for fetal movement
    - Time regular uterine contractions
        - Time from the beginning of one contraction to the beginning of the next
    - During contractions examine the perineum for evidence of: bleeding, prolapsed cord, crowning and/or any other obvious conditions
    - Remember to determine APGAR scores at 1 and 5 mins. (see Page 4 of OB-1)
    - Don gloves, mask, gown and eye protection
    - Create a clean field around the vaginal opening with clean towels or paper barriers. Have extra sheets or towels

GENERAL O.B. CARE

available to cover feces if the mother defecates prior to, or during, delivery

- Prepare for delivery
    - Have the mother lie in a modified semi-Fowler's or Trendelenburg position (knees drawn up and spread apart)
    - Elevate buttocks – with blankets or pillows.
    - The floor is actually recommended over bed for delivery
    - If an alternate position is preferred, then attempt to accommodate the mother
- When the infant's head appears during crowning, exert gentle palmer pressure to prevent explosive delivery.
- If amniotic sac does not break, or has not broken, puncture the sac and push it away from the infant's head and mouth as they appear
    - Evaluate for the presence of meconium in the amniotic fluid
- After the infant's head is delivered, support the head and *suction the mouth and then the nostrils.* Use caution to avoid contact with the back of the mouth
- If the umbilical cord is wrapped around the neonate's head or neck, (nuchal cord) gently slip it back over the head.
- If the cord cannot be removed from the neonate's head, tie/clamp the cord in places approximately 2 inches apart, if possible, and cut in between them
- Gently guide the neonate's head downward to allow delivery of the upper (anterior) shoulder
- Following delivery of the upper (anterior) shoulder, gently guide the neonate's body upward and deliver the lower (posterior) shoulder
- Following delivery of the head and shoulders, gently support the neonate's body as the rest of it delivers
    - Keep the neonate's body at the level of the vagina to prevent over/under transfusion of blood from the placenta
- Immediately following delivery, tie/clamp the umbilical cord approximately 6 inches from the newborn. Apply a second tie/clamp approximately 2 inches distally from the first and cut in between the two
- Vigorously dry the neonate with clean, dry towels immediately
- Simultaneously perform neonatal assessment

- Wrap neonate in dry and warm (if possible) blankets.
- It is extremely important to provide for and maintain the warmth of the neonate
- Allow baby to suckle at mother's breast if possible
- Record the time of delivery

- **Maternal post-partum care:**
  - Allow baby to suckle at mother's breast if possible.
  - Expect blood loss of up to 500 ml with normal deliveries
  - If the uterus has not contracted following delivery, provide firm but gentle uterine massage
    - Place one hand directly above pubis symphysis and the other at the fundus (top) of the uterus
    - Cup the uterus between the two hands and massage until complete contraction occurs.
    - Complete contraction has occurred when the uterus has assumed a woody hardness and has compressed to the size of a grapefruit
  - Do not pull on the umbilical cord to facilitate delivery of the placenta
  - Do not delay transport awaiting the delivery of the placenta.
  - Following its delivery, place in a plastic bag and transport with mother
  - Apply direct pressure via pressure dressings to tears of the perineum

## ILS SPECIFIC CARE:

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers
  - IV: Crystalloid solution at a TKO rate. May administer 200-500 cc boluses and repeat as needed for suspected hypovolemia
  - Consider large bore IV and 2 IV lines as appropriate

## ALS SPECIFIC CARE:

- Assess and identify causes of complaints, treat as needed
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Apply cardiac monitor and multi-function electrode (MFE) pads if necessary
- Treat unstable dysrhythmias and vital signs as necessary and as per specific protocols
  - To include repeating fluid boluses as needed

Key Considerations:

**APGAR Scoring:**

| Sign | 0 | 1 | 2 |
|---|---|---|---|
| **Activity** | Limp | Some Flexion | Active Motion |
| **Pulse** | Absent | <100 | >100 |
| **Grimace** | None | Grimace | Cough or sneeze<br>Pulls away |
| **Appearance** | Central Cyanosis<br>Blue/Pale | Central Pink<br>Peripheral Blue | Completely Pink |
| **Respiration** | Absent | Slow, ineffective, irregular | Good and Crying |

Assess APGAR scores at 1 minute following delivery and at 5 minutes following delivery

**PHYSICIAN PEARLS:**
Manual exams of the vagina are not done in the field. Do not delay transport with high risk deliveries. Remember that maternal blood volume increases up to 45% with a relative anemia developing by the increase in circulating plasma. Therefore a pregnant patient may lose up to 35% circulating volume prior to showing severe S/S shock. If the pregnant patient is showing s/s of shock, in severe respiratory distress, altered in her mental status, or otherwise in extremis, transport to a facility with immediate emergency surgical capability.

**General considerations:**

- Blood pressure usually decreases by 10-15 mm Hg by end of first trimester
- Heart rate increases 10-15 beats per minute
- Signs and symptoms of shock are delayed in these patients
- Transport all second or third trimester patients on left side or with backboard tilted 20-30 degrees to the left
- Manually displace the uterus of third trimester patients to left side during CPR
- Angioedema and swelling may reduce the size of the airway, be prepared to use a smaller size ET Tube. (AHA 2010 recommendations)
- If CPR is required, do so while another responder manually pulls (externally) the uterus to the left. **Remove any fetal monitors prior to defibrillation**

Key history:

- Possible spontaneous abortion
- Post abortion bleeding
- Ruptured ectopic pregnancy
- Expected due date
- How many pregnancies (gravida)
- How many live births (para)
- How many abortions or miscarriages
- Pre-natal care
- Number of fetuses
- Pre-natal/para-partum drug/alcohol use
- Recent trauma
- Last fetal movement felt
- Other identified problems
- OB/primary physician & hospital choice
- Gestational age
- Amount and type of bleeding/discharge (if applicable)

High risk findings:

- No pre-natal care
- Age <16, >35
- Diabetes
- Heart disease
- Hypertension
- Sz disorders
- Drug use/abuse/withdraw (especially hyperdynamics)
- Trauma
- Psychological emergencies
- Pre-existing renal or cardiac disease

* Do not delay transport in active labor situations to obtain history.

Protocol

# OB-1

# GENERAL O.B. CARE

Protocol
OB-2

**SECTION: OB-2**

**PROTOCOL TITLE: Imminent Delivery**

**REVISED: December 9, 2010**

IMMINENT DELIVERY

BLS SPECIFIC CARE: *See adult General OB Care Protocol OB-1*

- Assess and examine for fetal movement
- Monitor contractions (time/frequency/duration/strength)
- Examine perineum for bleeding, evidence of prolapsed cord, crowning during contractions, or any other obvious conditions
- Remember to determine APGAR scores at 1 and 5 min
- Establish Universal Precautions. Apply gloves, mask, gown, eye protection for infection control precautions. Create a sterile field around the vaginal opening with sterile towels or paper barriers. Keep extra sheets to cover feces if the mother defecates prior to delivery
- Prepare for delivery
    - Have the mother lie in a modified semi-fowlers or Trendelenburg position (knees drawn up and spread apart).
    - Elevate buttocks – with blankets or pillows.
    - The floor is actually recommended over bed for delivery.
    - If an alternate position is preferred, then attempt to accommodate the mother
- When the infant's head appears during crowning, exert gentle pressure to prevent explosive delivery
- If amniotic sac does not break, or has not broken, puncture the sac and push it away from the infant's head and mouth as they appear
- After the infant's head is delivered, support the head; *suction the mouth then the nostrils.* Use caution to avoid contact with the back of the mouth.
- Tie and cut the cord at least 6 inches from the newborn. See *GENERAL NEWBORN CARE PROTOCOL (P-11)* for further newborn care
- After Delivery:
    - Allow baby to suckle if possible.
    - Massage uterus firmly after delivery.
- Record the time of delivery

**ILS SPECIFIC CARE:** *See adult General OB Care Protocol OB-1*

- Treat hypotension and severe post-partum hemorrhage (a loss of up to 500 cc is normal) aggressively with IV crystalloid up to 1000 cc. Hold for s/s of CHF/pulmonary edema or CHF History

**ALS SPECIFIC CARE:** *See adult General OB Care Protocol OB-1*

*Severe post-partum hemorrhage: (A loss of up to 500 cc is normal)*

- Observe and assess for significant blood loss, treat for shock.
- **Oxytocin (Pitocin) Infusion**
    - IV—10 U in 250 ml of NS administered at a rate to control uterine contractions.
    - Infused 10u/250 ml over 5 to 10 minutes; repeat if needed and continue fundal massage

# Protocol OB-2

IMMINENT DELIVERY

**PHYSICIAN PEARLS:**

Careful screening for high risk pregnancies will help anticipate problems and improve outcomes.

*Meconium Staining:*

- Amniotic fluid that is greenish or brownish-yellow rather than clear. It may be very foul in odor. It is a sign of possible fetal distress during labor
- DO NOT STIMULATE the infant prior to SUCTIONING the oropharynx

**APGAR SCORING**

| Sign | 0 | 1 | 2 |
|---|---|---|---|
| **Activity** | Limp | Some Flexion | Active Motion |
| **Pulse** | Absent | <100 | >100 |
| **Grimace** | None | Grimace | Cough or sneeze Pulls away |
| **Appearance** | Central Cyanosis Blue/Pale | Central Pink Peripheral Blue | Completely Pink |
| **Respiration** | Absent | Slow, ineffective, irregular | Good and Crying |

- Score assigned to newborns at 1 and 5 minutes following delivery
- APGAR should NOT be used as guide for initiating resuscitation
- If 5 min score <7, repeat every 5 min for 20 min.

**SECTION: OB-3**

**PROTOCOL TITLE: Complicated Deliveries**

**REVISED: January 27, 2010**

**BLS SPECIFIC CARE:** *See OB Care Protocols OB-1 and OB-2*

*Prolapsed cord:* Condition where the cord presents through the birth canal before delivery of the head; presents a serious medical emergency which endangers the life of the unborn fetus.

- Place mother in knee-chest position with head down
- Check cord for pulsation and rate
- Apply gentle pressure to presenting part and relieve pressure on the cord.
- Recheck cord for pulsation and rate. Keep cord moist and warm
- Assess fetal status
- Administer high flow oxygen
- Rapid transport in this position with rapid notification of receiving facility

*Breech/Limb Presentation:* Breech presentation occurs when the buttocks or lower extremity are low in the uterus and will be the first part of the fetus delivered.

- Place mother in delivery position, elevate pelvis with pillows (Modified Trendelenburg)
- Assist breech delivery as indicated
- Administer high flow oxygen
- *Initiate rapid transport*

*Cephalopelvic Disproportion (CPD)/Failure to progress:* A condition where the babies head/body will not progress through the pelvis during delivery. Causes include large fetus, small or abnormally shaped pelvis, overdue deliveries and abnormal fetal positions.

- Immediate treatment is caesarian section. Code 3 transport to a facility capable of emergent caesarian is indicated
- Reposition the patient. Sometimes this will resolve the problem
- Press firmly on the Pubic Symphasis. This may open the birth canal further to allow passage of the head
- All patients in second and third trimester who are transported in the supine position should be placed in the left lateral recumbent position.
- If amniotic sac has ruptured, determine time of rupture and try to ascertain if meconium was present in the fluid (determine color, odor and consistency)

**ILS SPECIFIC CARE:** *See OB Care Protocols OB-1 and OB-2*

# Protocol OB-3

# COMPLICATED DELIVARIES

**ALS SPECIFIC CARE:** *See OB Care Protocols OB-1 and OB-2*

- Assess and identify causes of additional complaints, treat as needed.
  - **Potential complications of delivery**
    - Included, but not limited to
  - **Nuchal cord**
    - Following delivery of the neonate's head, determine if the umbilical cord is wrapped around it or around the head
    - If the umbilical cord is wrapped around the neonate's head or neck, gently slip it back over the head
    - If the cord cannot be gently removed from around the neonate's head or neck, tie/clamp the cord in places approximately 2 inches apart, if possible, and cut in between them
    - Proceed with delivery

  - **Prolapsed umbilical cord:**
    - Definitive treatment is often caesarian section
      - Place mother in knee-chest position
      - Insert two fingers of a gloved hand into the vagina and raise the presenting part of the fetus (usually the head) off of the umbilical cord
      - Simultaneously, check the cord for pulsations
      - Do not touch or manipulate the cord any more than necessary
      - Transport in this position

  - **Cephalopelvic disproportion:**
    - Fetus's head is too large to fit through maternal pelvis.
      - Emergent caesarian section is needed
      - Reposition the patient. Sometimes this will resolve the problem
      - Press firmly on the pubis symphysis. This may open the birth canal further to allow passage of the head.
      - Initiate rapid transport

**Breech presentation:**

- Place mother on the edge of a firm bed with legs flexed
- Support the spontaneously delivering buttocks and extremities until the back appears
- Wrap a dry towel around the hips to provide gentle traction to the delivering fetus
- If possible, extract a 4-6 inch loop of umbilical cord for slack
- Continue light downward traction until shoulder blades or arm pits appear
- If head delivery is delayed, insert two fingers on each side of the neonate's nose in a, "V," shape to help maintain baby's airway
- Guide neonate up to deliver posterior shoulder first
- Splint humerus to side of neonate's body and try to sweep arm out of birth canal
- Next guide neonate down to deliver anterior shoulder
- Have assistant provide gentle downward pressure on the uterus to help facilitate flexion of the head
- Putting fingers around the mouth during delivery may prevent chin from hanging up
- Gently swing the body upward to help facilitate delivery
- Never try to pull the neonate's head out during breech delivery
- If the head fails to deliver within 3 minutes, create a "V" with the fingers on either side of the nose to create an airway
- Initiate rapid transport

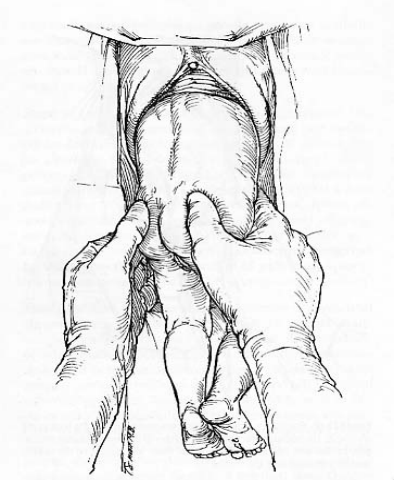
# Protocol OB-3

COMPLICATED DELIVARIES

**PHYSICIAN PEARLS:**

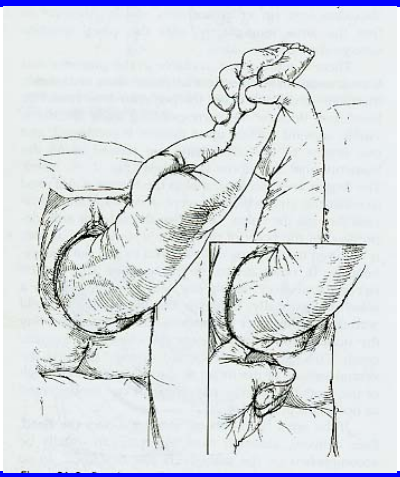
## Breech Delivery (Buttocks)

- Support the spontaneously delivering buttocks and extremities until the back appears
- When providing traction, grasp the iliac wings, don't pull on the legs, or apply pressure to the soft lower back
- If possible, extract a 4-6 inch loop of umbilical cord for slack
- Continue light downward traction until shoulder blades or arm pits appear
- If head delivery is delayed, insert two fingers on each side of the infants nose to help maintain baby's airway



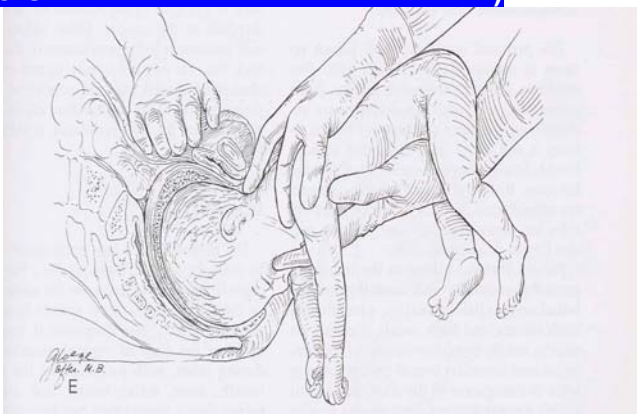
## Breech Delivery (Shoulder)

- Exact opposite of regular delivery.
- Guide neonate up to deliver posterior shoulder first
- Splint humerus to side of neonate's body and try to sweep arm out of birth canal
- Now guide neonate down to deliver anterior shoulder.



## Breech Delivery (head after body or shoulders )

- Have assistant provide gentle downward pressure on the uterus to help facilitate flexion of the head.
- Putting fingers around the mouth during delivery may prevent chin from hanging up.
- Gently swing the body upward to help permit delivery.
- **Never** try to pull the baby's head out during breech delivery
- If the head fails to deliver within 3 minutes, create a "V" with the fingers on either side of the nose to create an airway→Oxygen, IV, Monitor, Trendelenburg, Rapid transport.



Protocol
OB-4

**SECTION: OB-4**

**PROTOCOL TITLE: Pregnancy Induced Hypertension/Eclampsia**

**REVISED: December 9, 2010**

**BLS SPECIFIC CARE:** *See General OB Care Protocol OB-1*

- Create a low stimulus environment unless altered LOC, then transport code 3.
- Position patient as appropriate.
- In cases of suspected pre-eclampsia (patient not actively seizing) reduce/eliminate noxious environmental stimuli (light, noise, etc.)

**ILS SPECIFIC CARE:** *See General OB Care Protocol OB-1*

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers.

**ALS SPECIFIC CARE:** *See General OB Care Protocol OB-1*

- Assess and identify causes of complaints, treat as needed.

*Pre-eclampsia:*

- **Magnesium sulfate (for severe signs and symptoms) contact medical control :**
  - IV: 4 g over 20 minutes, repeat as needed
  - Take 4 g, Dilute to 100 cc Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr

*Eclampsia: (active seizures)*

- Magnesium sulfate
  - IV: 4 g over 5 minutes, repeat as needed.
  - Take 4 g, Dilute to 100 cc Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr

P.I.H./ECLAMPSIA

*Benzodiazepines (Use only with seizure history)::*

- Valium (diazepam)
  - IV/IO: 2-10 mg every 5-10 minutes as needed to maximum 20 mg
  - PR: 5-10 mg every 5-10 minutes as needed to maximum of 20 mg
- Versed (midazolam)
  - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to maximum of 5 mg
  - IN (intranasal): 5mg (2.5 mg each nare) to maximum total dose 5 mg
  - IM: 5mg to maximum dose 5 mg

**PHYSICIAN PEARLS:**

***Signs and Symptoms***

- Hypertension BP 140/90 or baseline increase of:
  - Systolic ↑30 mm/Hg and/or
  - Diastolic ↑15 mm/Hg
- SYSTEMIC edema: Starts at feet and moves up till it becomes systemic.
  - Severe frontal headache with photophobia.
- SEIZURES/ALTERED LOC
- Visual disturbances
- Hyperreflexia
- Epigastric pain (late sign), jaundice
- Pulmonary edema, JVD. (Think CHF)
- Tachycardia, dysrhythmias
- Chest pain

S/S MAY OCCUR AS MUCH AS 2-3 WEEKS POST PARTUM

Remember, magnesium sulfate can cause respiratory depression with cardiovascular collapse, especially with rapid IV push.

Protocol
R-1

**SECTION: R-1**

**PROTOCOL TITLE: Toxicological Emergencies**

**REVISED: January 27, 2010**

TOXICOLOGICAL EMERGENCIES

**GENERAL COMMENTS:** This is a general protocol for non-specific toxicological emergencies, including altered LOC of unclear origin. When possible this protocol should supplement other, more specific protocols. Care should be used to rule out more specific causes, such as closed head injury, CVA, sepsis, and diabetic emergencies.

## BLS SPECIFIC CARE:

- Scene safety:
  - Insure law enforcement is on scene for traditional overdoses.
  - Wear appropriate PPE including respiratory and topical skin protection
  - Request HAZMAT/HAZMED for suspected toxic exposure, such as meth labs, chemical mishaps, and topical poisons
- Basic BLS assessments and V/S every 15 minutes unless unstable, then reassess and V/S every 5 minutes
- All toxicological emergencies should receive ALS evaluation, if available.
- Patients with respiratory complaint or abnormality should receive supplemental oxygen, regardless of oxygen saturation. Assist ventilations as needed
- Restraints may be used for patient and/or rescuer safety. See the *Behavioral Emergencies and Combative Patients Protocol (M-14).*
- Monitor temperature

## ILS SPECIFIC CARE:

- IV access (to a max of three attempts) if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers
  - IV: Crystalloid solution at a TKO rate. May administer 200-500 cc if S/S of dehydration or hypotension are present. Repeat as needed
  - Monitor for S/S of fluid overload

## ALS SPECIFIC CARE:

- Assess and identify causes of complaints, treat as needed
- All potential overdose patients should have basic ECG assessment done
- Obtain blood glucose levels. Treat as appropriate
- Follow appropriate SZ protocol for seizure activity (M-6).

*Sedation/Combative Patients*

- Diazepam (Valium)
  - IV: 2-5 mg every 5-10 min PRN
  - IM: 5-10 mg repeated x 1 in 20 minutes PRN
  - Max of 20 mg
- Midazolam (Versed)
  - IV/IM: 0.5-2.5 mg every 5-10 min repeated PRN to a max of 5 mg

*Adjunctive medications*: These medications are given for potentiation of other drugs, or for the prevention/treatment of certain side effects (nausea, EPS, etc) of drugs used in sedation.

- Benadryl (Diphenhydramine)
    - IV/IM: 25-50 mg

**PHYSICIAN PEARLS:**

Many of these patients will have multiple underlying pathologies, which will pose many challenges to overcome. Patient care should be focused on recognition of risks, preventing/mitigating hyperthermia, agitated delirium, positional asphyxia, hypoxia, and physical self-harm. Provider safety is of primary importance, injuries are decreased with prudent planning and police involvement.

*Comment on agents used in sedation:*

- Consider using lower initial doses of sedatives when alcohol is involved

*ALS Providers may decrease the dosage, or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.*

Protocol
R-2

**SECTION: R-2**

**PROTOCOL TITLE: Opiate Overdose**

**REVISED: January 27, 2010**

**GENERAL COMMENTS:** The goal in treating an opioid overdose patient is generally not to wake the patient, but to maintain breathing and the airway. While difficult, this is especially important as opiates are often mixed with hyperdynamic substances and other drugs at the street level, and the opioid may be masking or suppressing other toxic effects.

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Oxygenation: some opiate overdose patients will respond well to simple assisted ventilations. See physician pearls
- Physical restraints as necessary
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- In addition to obtaining standard medical history attempt to obtain:
    - Name of ingested substance(s)
    - Quantity ingested
    - Time of ingestion
    - Has vomiting occurred?

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Attempt to identify co-morbid factors and other medical issues, including poly-pharmacy involvement.
- If patient has obviously aspirated, consider bypassing Narcan administration and intubate as required

*Opiate Antagonist:*

- Rapid reversal of a narcotic induced coma may lead to vomiting and, possibly, seizures. Administer Narcan slowly and be prepared to address both
- Narcan (naloxone)
    - Adult
        - IV/IO/SL: 0.1-2 mg slowly. Repeat as needed every 1-2 minutes to a maximum of 10 mg.
        - IM/IN**:** 2 mg (1 mg in each nare if given **IN**.) Repeat as needed to a maximum of 10 mg. If IV access is unavailable. Use nasal atomizer

OPIATE OVERDOSE

# Protocol R-2

## OPIATE OVERDOSE

**PHYSICIAN PEARLS:**
The Opiate Toxidrome consists of:

- Altered mental status
- Miosis
- Unresponsiveness
- Shallow respirations
- Slow respiratory rate
- Decreased bowel sounds
- Hypothermia
- Hypotension

**Osterwalder**, et al notes that "*In 1000 clinically diagnosed intoxications with heroin or heroin mixtures, from 4 to 30 serious complications can be expected. Such a high incidence of complications is unacceptable and could theoretically be reduced by artificial respiration with a bag valve device (hyperventilation) as well as by administering naloxone in minimal divided doses, injected slowly.*"
**This is supported by other studies and case reports as well. It is recommended that a couple of minutes of careful ventilation with a BVM (with Sellick's maneuver) be performed prior to Narcan administration to decrease the incidence of (uncommon but serious) complications.**

Many Opiates have a longer bioavailability than Narcan, therefore assess for re-sedation. Re-administer Narcan as needed.

Protocol
R-3

**SECTION: R-3**

**PROTOCOL TITLE: Hyperdynamic Crisis/Overdose**

**REVISED: January 27, 2010**

HYPERDYNAMIC CRISIS/OVERDOSE

**GENERAL COMMENTS: Also known as sympathomimetics,** this protocol includes cocaine, methamphetamine, amphetamine, and MDMA (ecstasy). It may include other stimulants as well. Patient care should be focused on preventing/mitigating hyperthermia, agitated delirium, positional asphyxia, hypoxia, and physical self-harm. With true hyperdynamic crisis (tachycardia, agitation, hyperthermia, and/or hypertension) treatment with benzodiazepines is indicated in addition to rhythm specific therapy or anti-hypertensive meds (with the exception of beta-blockers).

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Calm low stimulus environment
- Monitor temperature by whatever means feasible. Cool as appropriate.
- Allow for adequate heat dissipation.
- Attempt to identify co-morbid factors and other medical issues, including poly-pharm involvement.
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape.)
- Physical restraints as necessary.
- Obtain patient's temperature and cool/warm as necessary.
- Position patient as appropriate.

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Use Metriset administration set on medical patients less than 8 years of age

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

*Benzodiazepines for Hyperdynamic crisis, Acute Coronary Syndromes, as well as sedation.*

Do not administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Valium (diazepam) :
  - Adult: 2-5 mg IV/IO/IM every 5-10 minutes as needed to maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1mg/kg IV every 5-10 minutes as needed to maximum of 10 mg
    - IM: 0.5 mg/kg every 5-10 minutes as needed to maximum of 10 mg

- Versed (midazolam) IV/IO/IM
    - Adult: 0.5-2.5 mg every 5-10 minutes as needed to maximum of 5 mg
    - Pediatric: 0.05 mg/kg every 5-10 minutes as needed to maximum of 2.5 mg
- Haldol (haloperidol) IV/IM/IO
    - 2.0-5.0 mg every 5 minutes to a maximum of 10 mg
    - May possibly lower seizure threshold
    - Consider co-administration of Benadryl to mitigate possible EPS

*Anti-emetics:*

- Zofran (ondansetron) IV /IM/IO
    - Adult: 4 mg
    - Pediatric: 0.1 mg/kg to a maximum of 4 mg
- Benadryl (diphenhydramine) IV/IM/IO
    - Adult: 25-50 mg
    - Pediatric: 1-2 mg/kg to a maximum of 25 mg

*Drug induced acute coronary syndrome (ACS)*

- Aspirin

  Four (4) 81 mg chewable tabs (324 mg total)

  DO NOT administer if:
    - Patient history of aspirin allergy
    - Recent history of GI or other internal bleeding/disorders
    - *Do not administer if patient is taking other anticoagulants/platelet aggregation inhibitors*
- Nitrates:

  DO NOT administer/discontinue administration if:
    - Systolic B/P < 90 mmHg
    - Suspected right ventricular infarction
    - The patient presents with altered mental status
    - The patient has taken medications for erectile dysfunction in the preceding 24 hours
    - Sublingual (SL) nitroglycerin spray
        - One pump (0.4 mg) every 3-5 minutes as needed
    - Transdermal (TD) nitroglycerin paste
        - Use if SL NTG effective in reducing pain/discomfort
        - Apply ½-1 ½” to a hair-free portion of upper anterior chest

*Analgesics:*

DO NOT administer/discontinue administration if:

- Systolic B/P < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Morphine sulfate IV/IM/IO:
  - 2-5 mg IV/IM every 5-10 minutes as needed.
  - Maximum dose 20 mg
- Fentanyl IV/IM/IO:
  - For patients with history of opioid allergies
  - 25-50 mcg IV/IM every 5-10 minutes as needed
  - Maximum dose 100 mcg

*Cardiac Arrhythmias:* Follow with rhythm specific therapy for symptomatic refractory cases. Do not use procainamide.

- Lidocaine (Xylocaine) *for Ventricular Tachycardia REFRACTORY to Benzodiazepines*
  - IV: 1-1.5 mg/kg every 3-5 minutes to a max of 3 mg/kg
  - ETT: 2-3 mg/kg (2 times IV dose) every 3-5 minutes to a max of 3 mg/kg
  - Maintenance Infusion 2-4 mg/minute titrated for effect, to be initiated if ectopy resolves. Must rebolus with lidocaine in 5-10 minutes after initiation of drip to reach therapeutic levels (unless max bolus dose has been reached)
  - Always give full initial dose, but reduce all subsequent doses by ½ for elderly (>70) or with impaired hepatic function
- Magnesium Sulfate *(for Torsades REFRACTORY to Benzodiazepines)*
  - IV: 2 g given SLOWLY. Take 2 g (4cc), dilute to 20 cc to make 10% solution. Do not give faster than 1 g/minute

# Protocol R-3

# HYPERDYNAMIC CRISIS/OVERDOSE

**PHYSICIAN PEARLS:**
The Hyperdynamic (stimulant) Toxidrome generally consists of:

- Restlessness
- Excessive speech and
- Excessive motor activity
- Tremor
- Insomnia
- Tachycardia
- Hypertension
- Hyperthermia
- Hallucinations
- Seizures

**Management of agitated or combative patients:** Use of sedatives (Benzodiazepines) is highly recommended for even moderate agitation from hyperdynamic use, and may decrease heat production, decrease cardiac toxicity, and improve outcomes, as well as improve provider safety.
**Use of Haldol** with patients under the active influence of hyperdynamics is relatively contraindicated due to these drugs effects on seizure threshold, heat production and general side effects that may complicate care.

**MDMA**, and the more toxic drug PMA, have both amphetamine and hallucinatory like effects. The stimulant effects of MDMA/PMA, which enable users to perform physical exertion (like dancing) for extended periods, may also lead to dehydration, tachycardia, and hypertension. MAOI's may potentiate toxic effects. While any of the hyperdynamics can be dangerous, MDMA and PMA especially have been known to cause a marked increase in body temperature (malignant hyperthermia) leading to rapid onset of muscle breakdown, DIC, renal failure, and cardiovascular system failure, as well as seizures.

**Symptomatic tachycardias refractory to Benzodiazepines:**
Lidocaine is the anti-arrhythmic of choice for refractory monomorphic ventricular tachycardia (VT). Magnesium Sulfate remains the anti-arrythmic of choice for polymorphic VT (Torsades), although should be used with caution when hypotension is present.
**Cocaine is known to widen the QRS, therefore procainamide is contraindicated in this situation.**

**Pacing VT:** While large broad spectrum studies have not been performed, overdrive pacing at a rate of 100-120 PPM has been reported to terminate drug induced polymorphic VT (Torsades) refractory to other therapies. The AHA lists this intervention as *class indeterminate*; therefore it is not yet a standard intervention. Contact medical control for guidance.

**Drug induced Acute Coronary Syndromes (ACS):** The AHA notes that: *"…Cardiac Catheterization studies have shown that nitroglycerine and phentolamine reverse cocaine induced vasoconstriction"* and *"Therefore, nitroglycerine and benzodiazepines are first line agents".* **Beta-blockers in this setting remain controversial at best, and in many cases out right contraindicated.**

Protocol
R-4

**SECTION: R-4**

**PROTOCOL TITLE: TCA Overdose**

**REVISED: September 28, 2010**

**GENERAL COMMENTS:** Tricyclic Antidepressants (TCA's) are a leading cause of death in intentional overdoses. Aggressive care at onset of S/S is essential, as the patient can decompensate quickly. Early s/s includes widening of the QRS, tachycardia, hypotension and altered LOC.

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Trendelenburg for hypotension.
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- In addition to obtaining standard medical history attempt to obtain
  - Name of ingested substance(s)
  - Quantity ingested
  - Time of ingestion
  - Has vomiting occurred?

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Aggressively treat hypotension with IV crystalloid solution
- Use Metriset administration set on medical patients less than 8 years of age

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Continuous EKG monitoring is mandatory, 12 lead is recommended as stability permits.

*Specific Pharmacological Therapy*

- Sodium Bicarbonate for s/s of TCA toxicity
  - IV Adult and Pediatric: 1 meq/kg IV (minimum 50 meq for adults)
  - REBOLUS in 5-10 min at 0.5 meq/kq if s/s persist
  - OPTIONAL INFUSION: 50-100 meq/1000 cc, minimum infusion rate of 150 cc/hr

*Anti-Arrhythmics*

- Magnesium Sulfate *(for Torsades in conjunction with Sodium Bicarbonate)*
  - IV: 2 g given SLOWLY. Take 2 g (4cc), dilute to 20 cc to make 10% solution. Do not give faster than 1 g/minute.
- Lidocaine (Xylocaine) *for Ventricular Tachycardia REFRACTORY to Sodium Bicarbonate*
  - IV: 1-1.5 mg/kg every 3-5 minutes to a max of 3 mg/kg.
  - ETT: 2-3 mg/kg (2 times IV dose) every 3-5 minutes to a max of 3 mg/kg

TCA OVERDOSE

- Maintenance Infusion 2-4 mg/minute titrated for effect, to be initiated if ectopy resolves. Must rebolus with lidocaine in 5-10 minutes after initiation of drip to reach therapeutic levels (unless max bolus dose has been reached)
- Always give full initial dose, but reduce all subsequent doses by ½ for elderly (>70) or with impaired hepatic function

Vasopressors for refractory hypotension.

- Epinephrine infusion:
  - Adult**:** 2-10 mcg/min
    - See, "Adult Epinephrine Infusion Chart"
    - Titrated to adequate heart rate and/or blood pressure response
  - Pediatric**:** 0.1-0.2 mcg/kg/min
    - See, "Pediatric Epinephrine," preparation/infusion chart
    - Titrated to adequate heart rate and/or blood pressure response
- Dopamine infusion:
  - Adult and Pediatric: 2-20 mcg/kg/min.
    - Titrated to adequate heart rate and/or blood pressure response
    - See, "Adult Dopamine Infusion Chart," for adult infusion
    - See, "Pediatric Dopamine Infusion Chart," for infusion

*Anticonvulsants:*

- Valium (diazepam):
  - Adult:
    - IV/IO: 2-10 mg every 5-10 minutes as needed to a maximum of 20 mg
    - IM: 5-10 mg every 5-10 minutes as needed to a maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1-0.2 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg
    - PR/IM: 0.5 mg every 5 minutes as needed to a maximum total dose of 10 mg

- Versed (midazolam):
    - Adult:
        - IV/IO: 2.5 mg to a maximum of 5 mg
        - IN (Intranasal): 5mg (2.5 mg each nare)
        - IM: 5mg to a maximum dose 5 mg
    - Pediatric:
        - IV/IO/IM: 0.05-0.2 mg/kg every 5-10 minutes as needed to a maximum total dose of 10 mg
        - IN/PR: 0.2-0.4 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg

- <u>For hemodynamically UNSTABLE patients presenting with wide complex tachycardias</u>, perform immediate synchronized DC cardioversion.
- Consider sedation prior to cardioversion if it will not cause unnecessary delays.
    - DO NOT administer if:
        - Systolic BP < 90 mmHg
        - Low respiratory rate, SpO2 and/or diminished mental status
- Versed (midazolam) IV/IM/IO
        - 0.5-2.5 mg
        - Maximum 5 mg

*Synchronized DC cardioversion:*

- For unstable monomorphic ventricular tachycardia:
    - Initial energy setting of 100J (or as per manufacturer's recommendation)
    - If no response, escalate energy settings as follows:
    - 200J→300J→360J (or as per manufacturer's recommendation)
- If unable to obtain synchronization with QRS complexes, (as with torsades de pointes) proceed with unsynchronized cardioversion as detailed below

*Unsynchronized DC cardioversion:*

- For unstable torsades de pointes (polymorphic wide complex tachycardia)
    - Use unsynchronized defibrillation energy settings
    - 200J → 300J → 360J (or as per manufacturer's recommendation)

*Antidysrhythmics:*

- For dysrhythmias unresponsive to sodium bicarbonate therapy
  - 2% lidocaine
- Adult:
  - IV/IO bolus dose: 1-1.5 mg/kg initial bolus as needed every 5-10 minutes at ½ bolus to a maximum of 3 mg/kg
  - ETT: 2.0 mg/kg

- Lidocaine infusion:
  - If, following lidocaine therapy, dysrhythmia is terminated
    - 2-4 mg/min.
    - Administer using 60 gtt/ml administration set
  - To prepare: dilute 1 g lidocaine to 250 ml to yield a solution of 4 mg/ml
    - 1.0 mg/kg bolus total = 2mg/min (30 gtts/min)
    - 2.0 mg/kg bolus total = 3 mg/min (45 gtts/min)
    - 3.0 mg/kg bolus total = 4 mg/min (60 gtts/min)
  - Pediatric:
    - IV/IO bolus dose: 1 mg/kg initial bolus
    - Repeat as needed every 5-10 minutes to a maximum of 3 mg/kg
    - ETT: 2.0 mg/kg

**PHYSICIAN PEARLS:**

- **Procainamide and Amiodarone are contraindicated,** as are other drugs that widen the QRS.

Due to dopamine blockade, as well as catecholamine depletion, Epinephrine is considered a more effective vasopressor than dopamine, although fluids should be aggressively administered first.

In adults,

- 10-20 mg/kg is considered a moderate to serious exposure where coma and cardiovascular symptoms are expected
- Approximately 35 mg/kg is thought to be a lethal dose without medical intervention

In children,

- Doses of greater than 3.5 mg/kg seem to increase the risk of asymptomatic EKG changes
- Ingestions greater than 1.5 mg/kg should be referred to an Emergency Department

The drug overdose history correlates reasonably well with the clinical outcome. Generally, at less than 10 mg/kg, few fatalities are found; 35 mg/kg is the approximate LD50; and 50 mg/kg, death is likely (Spiker and Biggs 1976). Patients have survived ingestions of 10 g of amitriptyline (Burks et al 1974), but overdoses as small as 500 mg have been fatal. (Manoquerra Weaver 1977).

***ALL TCA OVERDOSES SHOULD BE EVALUATED AT A HEALTHCARE FACILITY.***

*EKG screening*

Boehnert and Lovejoy in NEJM, 1985 Studied 49 patients with known first generation cyclic antidepressant overdose and found that QRS widening was an excellent predictor of complications from elevated TCA levels.

- QRS>100 msec, 1/3 of patients had seizures
- QRS>160 msec, 1/2 of patients had ventricular dysrhythmia's
- Bundle branch blocks, usually right, are also common, appearing early and persisting late
- *Persistent tachycardia is usually the first sign of toxicity*

Protocol

# R-4

# TCA OVERDOSE

Protocol
R-5

**SECTION: R-5**

**PROTOCOL TITLE: Organophosphate/Carbamate/Nerve Agent Exposure**

**REVISED: September 30, 2010**

**GENERAL COMMENTS:** *This protocol covers organophosphate, carbamates and nerve agent poisonings.*

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Scene Safety:
  - Take Personal Protective Precautions
  - Request HAZMAT/HAZMED if any risk of provider contamination
- Remove patient's clothes and soap/water decontamination at a minimum.
- Oxygenation: Supplemental oxygen as needed
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- Attempt to identify offending agent if safety permits

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Use Metriset administration set on medical patients less than 8 years of age

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

*Antimuscarinic*

- Atropine: Repeat as necessary until drying of secretions noted. No maximum dose.
  - Adult:
    - IV/IO/IM: 1-2 mg
    - ETT: 2-4 mg
  - Pediatric:
    - IV/IO/IM: 0.05 mg/kg
    - ETT: 0.03 mg/kg

*Bronchodilators:*

- Adult and pediatric:
  - For first treatment, combine one albuterol (2.5 mg/3 ml) nebule and one Atrovent (0.5 mg/2.5 ml) nebule in reservoir of oxygen driven nebulizer unit and administer at 10 LPM

ORGANOPHOSPHATE EXPOSURE

- If Atrovent is contraindicated, use 2 albuterol nebules (one for pediatric patients) for first treatment.
- Repeat as needed with albuterol treatments only

*Anticonvulsants:*

For severe signs and symptoms and/or seizure activity associated with nerve agent, organophosphate or carbamate exposure/ingestion.

- Valium (diazepam IV/IO/PR/IM
  - Adult:
    - IV/IO: 2-10 mg every 5-10 minutes as needed to a maximum of 20 mg
    - PR/IM: 5-10 mg every 5-10 minutes as needed to a maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1-0.2 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg
    - PR/IM: 0.5 mg every 5 minutes as needed to a maximum total dose of 10 mg
- Versed (midazolam) IV/IO/IN/IM
  - Adult:
    - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to a maximum of 5 mg
    - IN (intranasal): 5mg (2.5 mg each nare) to a maximum total dose 5 mg
    - IM: 5mg to maximum dose 5 mg
  - Pediatric:
    - IV/IO/IM: 0.05-0.2 mg/kg every 5-10 minutes as needed to a maximum total dose of 10 mg
    - IN/PR: 0.2-0.4 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg

- **Auto-Injectors:**

  *DuoDote Auto-Injector*: (ATNAA: Antidote Treatment Nerve Agent Auto-Injector)*

  - 2.1 mg atropine in 0.7 ml and 600 mg pralidoxime chloride in 2 ml delivered intramuscularly through a single needle

- For patients exhibiting mild to severe signs and symptoms of nerve agent or organophosphate poisoning
- Adult:
  - For mild cases of exposure/ingestion:
  - Administer 1 auto-injector
  - If, after 10-15 minutes, severe symptoms do not develop, no additional treatment is required
- If, at any time after the first dose, severe symptoms develop, rapidly administer 2 more auto-injectors.
- For severe cases of exposure/ingestion:
- Administer 3 auto-injectors in rapid succession
- No more than 3 auto-injectors should be administered to any one patient

**PHYSICIAN PEARLS**: Organophosphates irreversibly bind to cholinesterase, causing the phosphorylation and deactivation of acetylcholinesterase. The accumulation of acetylcholine at the neural synapse causes an initial overstimulation, followed by exhaustion and disruption of postsynaptic neural transmission in the central nervous system (CNS) and peripheral nervous systems (PNS). If the organophosphate /cholinesterase bond is not broken by pharmacologic intervention within 24 hours, large amounts of cholinesterase are destroyed, causing long-term morbidity or death. Carbamate poisoning exhibits a similar clinical picture to organophosphate toxicity. However, unlike organophosphates, carbamate compounds temporarily bind cholinesterase for approximately 6 hours with no permanent damage. Carbamates have poor CNS penetration and cause minimal CNS symptoms.
Administer both the Atropine AND the 2-Pam to symptomatic patients with organophosphate exposure. 2-Pam is not necessary for KNOWN/ ISOLATED carbamate exposure. While pulmonary edema may occur, Lasix is generally ineffective and not indicated.

*Decontamination and containment*

- Separate patient from causative agent. Most exposures are to liquid solutions; decon hair and folds of skin. Decon for at least 15 minutes with water and detergent.
- Decontamination takes precedence over ALS interventions.
- Decontamination should be done by qualified personnel.
- Clothes should be removed on scene, bagged by personnel wearing appropriate equipment, and left for appropriate disposal. **DO NOT** transport in ambulance or to hospital where they may contaminate other providers.
- Patient should be transported in a “patient envelope” or similar device.

*Mnemonics for nerve agent/organophosphate/Carbamate exposure*

# Protocol R-5

# ORGANOPHOSPHATE EXPOSURE

**"S.L.U.D.G.E".**

**S**alivation (excessive production of saliva)
**L**acrimation (excessive tearing)
**U**rination (uncontrolled urine production)
**D**efecation (uncontrolled bowel movement)
**G**astrointestinal distress (cramps)
**E**mesis (excessive vomiting)

**"B.A.M."**

**B**reathing Difficulty (wheezing)
**A**rrhythmias (Bradycardia, ventr. Arrhythmias, AV Blocks. )
**M**iosis (pinpoint pupils)

"Three C's" of CNS effects

**C**onfusion
**C**onvulsions
**C**oma

**"D.U.M.B.E.L.S." (Muscarinic)**

**D**iarrhea
**U**rination
**M**iosis
**B**radycardia/Bronchospasm/Bronchorrhea
**E**mesis
**L**acrimation
**S**alivation, Secretion, Sweating

**Days of the Week (Nicotenic)**

**M**ydriasis
**T**achycardia
**W**eakness
**H**ypertension, Hyperglycemia
**F**asciculations

Protocol
R-6

**SECTION: R-6**

**PROTOCOL TITLE:** Calcium Channel Blocker/Beta Blocker OD

**REVISED: April 29, 2011**

Calcium Channel Blocker/BETA BLOCKER

**GENERAL COMMENTS:**

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Maintain patent airway as necessary
- Supplemental oxygen as needed and as tolerated
- Assisted ventilations if necessary to maintain adequate $SpO_2$
- Obtain a full set of vital signs
- Assess blood glucose level as needed
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- Position patient as appropriate
- In addition to obtaining standard medical history attempt to obtain:
  - Name of ingested substance(s)
  - Quantity ingested
  - Time of ingestion
  - Has vomiting occurred?

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- If adult patient, obtain intravenous access and administer one 250-500 ml crystalloid fluid bolus (20 ml/kg over 10-20 minutes if pediatric patient) if signs and symptoms of volume depletion are present
- Use Metriset administration set on medical patients less than 8 years of age
- Withhold fluids and maintain IV at TKO rate if patient is hemodynamically stable or if signs and symptoms of fluid overload are present

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Maintain patent airway as necessary to include endotracheal intubation when appropriate.
- Apply cardiac monitor and multi-function electrode (MFE) pads if necessary.
- Bradycardia with variable degrees of AV block are common
- 12-lead EKG if indicated
- Contact OLMC at earliest indication of calcium channel blocker overdose Additional 500 ml NS boluses

# Protocol R-6

# Calcium Channel Blocker/BETA BLOCKER

*ANTIDOTES*

- **Calcium Chloride (for Calcium Channel Blocker Only)**
    - IVP (Slow): 500-1000 mg
- **Glucagon**
    - IV, IM: 1-2 mg, repeated every 5 minutes as needed and as available

Do not use diluents (e.g. propylene glycol) supplied with single use kits. Use saline Instead

*Cardiovascular Agents:*

In conjunction with fluids and glucagon

- Atropine sulfate:
    - Not indicated for complete and high degree heart blocks
    - Adult:
        - 0.5 mg IV/IO as needed every 3-5 minutes.
            - Maximum total dose 3 mg
    - Pediatric:
        - 0.02 mg/kg IV/IO
            - Minimum dose: 0.1 mg
            - Maximum child dose: 0.5 mg
            - Maximum total child dose: 1 mg
            - Maximum adolescent dose: 1 mg
            - Maximum total adolescent dose: 2 mg
            - Repeat every 3-5 minutes as needed

Cardiac pacing for patients not promptly responsive to pharmacological therapy

- **Adult and Pediatric:** Start at 80 ppm and 80 mA.
    - Consider sedation/analgesia per protocol with trancutaneous pacing if it will not cause unnecessary delays

*Vasopressors:*

For bradycardia or hypotension unresponsive to other therapies

*Epinephrine infusion*

- Adult: 2-10 mcg/min.
  - Titrated to adequate heart rate and/or blood pressure response
  - See, “Adult Epinephrine Infusion Chart”
- Pediatric: 0.1-1 mcg/kg/min.
  - Titrated to adequate heart rate and/or blood pressure response
  - See, “Pediatric Epinephrine,” preparation/infusion chart

*Dopamine infusion*

- Adult and Pediatric: 2-20 mcg/kg/min.
  - Titrated to adequate heart rate and/or blood pressure response
  - See, “Adult Dopamine,” and, “Pediatric Dopamine,” infusion charts

*Nebulized bronchodilators*

For associated bronchospasm.

- Pediatric and adult.
  - For first treatment, combine one albuterol (2.5 mg/3 mL) nebule and one Atrovent (0.5 mg/2.5 mL) nebule in reservoir of oxygen driven nebulizer unit and administer at 10 LPM
  - If Atrovent is contraindicated, use 2 albuterol nebules for first treatment
  - Repeat as needed with albuterol treatments only

# Protocol R-6

# Calcium Channel Blocker/BETA BLOCKER

**PHYSICIAN PEARLS:**

**Calcium Channel Blockers**

- Aggressive cardiovascular support is necessary for management of massive calcium channel blocker overdose. While calcium may overcome some adverse effects of CCBs, it rarely restores normal cardiovascular status
- According to many case reports, glucagon has been used with good results. However, vasopressors are frequently necessary for adequate resuscitation and should be requested early if hypotension occurs

**Beta Blockers**

- **Bradycardia with associated hypotension and shock (systolic BP <80 mm Hg, HR <60 BPM) defines severe beta-blocker toxicity.** Bradycardia by itself is not necessarily helpful as a warning sign because slowing of the heart rate and dampening of tachycardia in response to stress is observed with therapeutic levels
- While case reports have documented hypotension in the absence of bradycardia, blood pressure usually does not fall before the onset of bradycardia. Bradycardia may be isolated or accompanied by mild conduction disturbances affecting the entire cardiac conduction system from the sinus node to the intraventricular Purkinje system.
- Cardiac pacing may be effective in increasing the rate of myocardial contraction. Electrical capture is not always successful and, if capture does occur, blood pressure is not always restored. *Reserve cardiac pacing for patients unresponsive to pharmacological therapy***.** Multiple case reports describe complete neurological recovery, even with profound hypotension, if a cardiac rhythm can be sustained
- Hypoglycemia, while uncommon, occasionally occurs with beta blocker use. *Always check a BG with a suspected Beta Blocker OD*
- Agents with combined alpha- and beta-selective properties (Dopamine and Epinepherine) may be necessary to maintain blood pressure. A beta-agonist may competitively antagonize the effect of the beta-blocker. The amount of beta-agonist required might be several orders of magnitude above those recommended in standard ACLS protocols

Protocol
R-7

**SECTION: R-7**

**PROTOCOL TITLE: Sedative Overdose**

**REVISED: January 27, 2010**

**GENERAL COMMENTS:** This protocol includes alcohol, benzodiazepines, and GHB analog overdoses. It may include other CNS depressants as well. Patient care should be focused on supporting the airway, respiratory function, and preventing/mitigating self harm. Of the sedatives commonly seen, GHB analogs are some of the most unpredictable and difficult to manage.

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Physical restraints as necessary.
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- In addition to obtaining standard medical history attempt to obtain:
  - → Name of ingested substance(s)
  - → Quantity ingested
  - → Time of ingestion
  - → Has vomiting occurred?

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

Attempt to identify co-morbid factors and other medical issues, including poly-pharmaceutical involvement, and closed head injury.
Rule out hypoglycemia and other causes of altered mental status.

- Narcan (naloxone):
  If concomitant opioid ingestion suspected
  - Adult:
    - IV/IO: 0.1-2 mg slowly. Repeat as needed every 1-2 minutes to a maximum of 10 mg
    - IM/IN: 2 mg (1 mg in each nare if given IN.) Repeat as needed to a maximum of 10 mg
  - Pediatric:
    - IV/IO/IM: 0.1 mg/kg to a maximum single dose of 2 mg. Repeat as needed every 1-2 minutes

SEDATIVE OVERDOSES

# Protocol R-7

## SEDATIVE OVERDOSES

*Chemical Sedation: For combative patients.*
Administer judiciously to this patient population.

Discontinue or do not administer if:

- Systolic BP < 90 mmHg. (Adult)
- Signs and symptoms of hypoperfusion are present or develop
- Respiratory rate, $SpO_2$ and/or mental status diminishes
- Contact OLMC to exceed maximum doses

- Valium (diazepam)
  - Adult: 2-5 mg every 5-10 minutes as needed to maximum of 10 mg
  - Pediatric:
    - IV/IO: 0.1 mg/kg IV every 5-10 minutes as needed to maximum of 10 mg
- Versed (midazolam) IV/IO/IM/IN
  - Adult: 0.5-2.5 mg every 5-10 minutes as needed to maximum of 5 mg
  - Pediatric:
    - IV/IM/IO: 0.05 mg/kg every 5-10 minutes as needed to maximum of 2.5 mg
    - IN: 0.2-0.4 mg/kg to maximum of 5 mg
- Haldol (haloperidol) IV/IM/IO: Adults only.
  - 2.0-5.0 mg every 5 minutes to a maximum of 10 mg
  - May possibly lower seizure threshold
  - Consider co-administration of Benadryl to mitigate possible EPS

*Anti-emetics:*

- Zofran (ondansetron)
  - Adult: 4 mg IV/IM/IO
  - Pediatric: 0.1 mg/kg to a maximum of 4 mg
- Benadryl (diphenhydramine)
  - Adult: 25-50 mg IV/IM/IO
  - Pediatric: 1-2 mg/kg to a maximum of 25 mg

**PHYSICIAN PEARLS:**

*The Sedative Toxidrome generally consists of:*

- Sedation
- Confusion
- Delirium
- Hallucinations
- Coma
- Paresthesias
- Dysesthesias
- Diplopia
- Blurred vision
- Slurred speech
- Ataxia
- Nystagmus

**GHB (Gamma-Hydroxy Butyrate) and analogs:** Onset of signs and symptoms typically 10-40 min. post ingestion, last approximately 4-8 hours, and are cleared in typically 12-14 hours post ingestion. Signs and symptoms include: bradycardia, seizure like activity, deep sedation/CNS depression with some patients showing rapid & severe mental status changes (including combativeness), nausea and vomiting. Alcohol severely exacerbates signs and symptoms

- Be prepared to forcibly restrain patient, and ensure crew safety due to the sudden return to combativeness that is common with this drug
- Intubation is seldom needed, but if required, restrain and sedate patient to protect airway from trauma and extubation
- Most GHB analog related deaths involve co-ingestion of alcohol. Therefore alcohol consumption should be considered a significant co-morbid factor.

Protocol

R-7

# SEDATIVE OVERDOSES

Protocol
R-8

**SECTION: R-8**

**PROTOCOL TITLE:**

**REVISED:**

# BLANK

# Protocol R-8

Protocol
R-9

**SECTION: R-9**

**PROTOCOL TITLE: Withdrawal Syndromes**

**REVISED: September 30, 2010**

WITHDRAWAL SYNDROMES

**GENERAL COMMENTS:** This protocol includes withdrawal from alcohol, benzodiazepines, and GHB analogs, as they have similar presentations, physiology and treatments. A patient undergoing active withdrawal may mimic hyperdynamic toxicity, and may be difficult to diagnose. These patients have many of the same risk factors as patients in hyperdynamic crisis including agitated delirium, positional asphyxia, hyperthermia, and seizures.
Other patients withdrawing from stimulants may have severe cravings, paranoia, suicidal ideations, exhaustion, and other symptoms.
Good clinical judgment is mandatory when dealing with these situations to decide when to (and when not to) treat the patient.

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Calm low stimulus environment
- Monitor Temperature as feasible. Cool as appropriate
- If suspected hyperthermia, Allow for adequate heat dissipation
- Anticipate possible seizures
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)
- Restrain as necessary
- Obtain patient's temperature and cool/warm as necessary
- Position patient as appropriate
- Attempt to calm patient and attempt to provide low stimulus environment

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

Attempt to identify co-morbid factors and other medical issues, including poly-pharm involvement, and closed head injury.

*Anticonvulsant therapy*

- Valium (diazepam):
  - Adult:
    - IV/IO: 2-10 mg every 5-10 minutes as needed to a maximum of 20 mg
    - PR/IM: 5-10 mg every 5-10 minutes as needed to a maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1-0.2 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg
    - PR/IM: 0.5 mg every 5 minutes as needed to a maximum total dose of 10 mg

- Versed (midazolam):
  - Adult:
    - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to a maximum of 5 mg
    - IN (intranasal): 5 mg (2.5 mg each nare) to a maximum total dose 5 mg
    - IM: 5 mg to maximum dose 5 mg
  - Pediatric:
    - IV/IO/IM: 0.05-0.2 mg/kg every 5-10 minutes as needed to a maximum total dose of 10 mg
    - IN/PR: 0.2 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg

*Chemical Sedation:*

Do not administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, $SpO_2$ and/or mental status diminishes

- Valium (diazepam):
  - Adult: 2-5 mg every 5-10 minutes as needed to maximum of 10 mg.
  - Pediatric:
    - IV/IO: 0.1mg/kg IV every 5-10 minutes as needed to maximum of 10 mg
- Versed (midazolam):
  - Adult:
    - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to maximum of 5 mg
    - IN: 5 mg (2.5 mg each nare) to a maximum total dose 5 mg
    - IM: 5 mg to maximum dose 5 mg
  - Pediatric:
    - IM/IV/IO: 0.05 mg/kg every 5-10 minutes as needed to maximum of 2.5 mg
    - IN/PR: 0.2 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg
- Haldol (haloperidol):
  - 2.0-5.0 mg every 5 minutes to a maximum of 10 mg
  - May possibly lower seizure threshold
  - Consider co-administration of Benadryl to mitigate possible EPS

*Anti-emetics:*

- Zofran (ondansetron)
  - Adult: 4 mg
  - Pediatric: 0.1 mg/kg to a maximum of 4 mg
- Benadryl (diphenhydramine)
  - Adult: 25-50 mg
  - Pediatric: 1-2 mg/kg to a maximum of 25 mg

# Protocol R-9

WITHDRAWAL SYNDROMES

**PHYSICIAN PEARLS:**

General Withdrawal Symptoms:

Withdrawal does not require complete abstinence from a drug, simply reaching sub-normal (for that patient) levels can make a patient symptomatic. Early withdrawal consists of mild anxiety and craving. This progresses in severity to excessive adrenergic effects including tachycardia, hyperventilation, systolic hypertension, diaphoresis, low-grade fever, hallucinations, intense anxiety, tremor, and insomnia. Some patients (up to 50% in cases of alcohol, and GHB) may experience true delirium, severe hyperthermia and seizures.

**Comparison of GHB Analogs, Benzodiazepines, and Alcohol Withdrawal Syndromes**

| | Onset/Duration | Autonomic Instability | Neuro-Psychiatric Symptoms | Mortality |
|---|---|---|---|---|
| GHB | 1-6 Hours to 14 days | Mild | Severe | Unknown |
| Benzodiazepines | 1-3 Days | Moderate | Moderate | 1% |
| Alcohol | 6-12 Hours to 7 days | Severe | Moderate | 5-15% |

*Adapted from "GHB Withdrawal Syndrome" (Miotto & Roth, et al, March 2001)*

While the delirium associated with withdrawal is the result of abstinence rather than ingestion from certain drugs, the delirium itself continues to pose a life threat to the patient, especially with regard to restraint and pharmacologic agents used.

*Use of Haldol with patients suffering from active withdrawal from GHB, alcohol, or GHB analogs is relatively contraindicated in the prehospital setting due to these drugs effect on seizure threshold, heat production and general side effects that may complicate care.*

With marked agitation, liberal use of low dose benzodiazepines may be very helpful in relieving s/s, as well as prevention of myoclonic tremors and/or seizure activity.

Protocol
R-10

**SECTION: R-10**

**PROTOCOL TITLE: Carbon Monoxide Toxicity**

**REVISED: January 27, 2010**

CARBON MONOXIDE TOXICITY

**GENERAL COMMENTS:**

**BLS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Remove patient from potentially toxic environment prior to initiating therapy
- Attempt to ascertain CO content of environment from which patient was removed
    - NIOSH CO IDLH level: 1200 ppm
- Maintain patent airway as necessary
- Full spinal immobilization as needed
- Supplemental high flow oxygen via tight fitting non-rebreather mask for even suspected exposures
    - Dry oxygen may not be tolerated in cases of inhalation injury
        - In these instances, nebulized NS may make oxygen therapy more tolerable
- Pulse oximetry ($SpO_2$) readings will be falsely elevated.
    - Low $SpO_2$ readings, (i.e. < 90%) however, may be indicative of other concomitant respiratory pathology (e.g. pulmonary edema)
- Assist ventilations if necessary
- Apply pressure dressings to hemorrhaging injuries
- Obtain a full set of vital signs as needed
- Assess blood glucose level
- Conserve body heat

**ILS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- If adult patient, obtain intravenous access and administer one 250-500 ml crystalloid fluid bolus (20 ml/kg over 10-20 minutes if pediatric patient) if signs and symptoms of volume depletion are present
- Use Metriset administration set on medical patients less than 8 years of age
- Withhold fluids and maintain IV at TKO rate if patient is hemodynamically stable or if signs and symptoms of fluid overload are present

# Protocol R-10

# CARBON MONOXIDE TOXICITY

**ALS SPECIFIC CARE:** *See adult General Toxicological Care Protocol R-1*

- Maintain patent airway as necessary to include endotracheal intubation when appropriate.
    - In cases of inhalation injuries (i.e. caustics and superheated gases) severe upper airway edema may be present. Prepare for cricothyrotomy in these cases.
- Apply cardiac monitor and multi-function electrode (MFE) pads if necessary.
- Treat unstable dysrhythmias and vital signs as necessary and as per specific protocols.
- Obtain 12-lead EKG if indicated.
- Treat seizures see protocol M-5.
- Treat respiratory distress see protocol M-2.
- Initiate carboxyhemoglobin (HbCO) monitoring as per, "Carbon Monoxide Report,"
    - HbCO monitoring should be initiated in the following cases:
        - Smoke inhalation
        - Burn injuries
        - Medical conditions without clearly identifiable etiologies such as:
            - Altered level of consciousness.
            - Chest pain
            - Headache
            - Nausea and vomiting
            - Dizziness and lightheadedness
    - HbCO monitor readings:
        - HbCO > 12% = moderate carbon monoxide toxicity. Patients in this range should be transported to the facility of their choice
        - HbCO > 25 % = severe carbon monoxide toxicity- patients with HbCO levels > 25% should be transported to closest facility
    - Major burn injuries (airway burns, full thickness burns > 10% and partial thickness burns > 25%) take precedence over CO toxicity. Patients meeting the aforementioned criteria should be transported to St. Alphonsus Regional Medical Center in Boise

- Complete, “Carbon Monoxide Report,” form in its entirety.

    - CO exposure victims with mild toxicity (<12% confirmed by at least 2 readings from separate locations) **and** without signs/symptoms/complaints may be treated and released if they desire
    - For this to occur, the following criteria must be met

    - No alteration in mental status (as verified by a friend or family member)
    - No signs of respiratory distress with $SpO_2$ > 92%
    - HbCO < 5% in non-smokers and HbCO < 8% in smokers
    - Document HbCO and $SpO_2$ readings
    - Lungs clear to auscultation
    - No other significant burn or traumatic injury
    - Completion of, **“Refusal of Treatment and/or Transportation,”** form

- The CO Oximeter ***may*** return a false-positive reading based on patient and/or environmental conditions. Considerations regarding false-positive readings

  - **Center the nail** directly over the red light preferably by turning the finger upside down (Nail side down) as well as inverting probe so light is flashing facing you. Once the light is flashing facing up simply place the MIDDLE of the nail bed directly over the red light and close sensor. Jamming the finger in too far or not realizing a patient has a **short fingernail bed** utilizing the traditional method of pulse oximetry will cause an elevated reading. Demonstrate this if possible in training
  - Always confirm high readings with 2 additional finger measurements (Use different fingers or hand)
  - Be aware of **ambient light** such as strobes, direct sun, extra bright lights that will affect both pulse and CO oximetry
  - Fingers should be **clean** especially if full of soot from a fire
  - Finger should be **wide enough** to fit the width of sensor. If fingers are too slim (Even with some adults) than there is a chance of a false positive since the light will pass around the finger versus through the middle of the nail. This is the same rule for Pulse Oximetry
  - **Perfusion** index on the left side of the RAD 57 should be at least 2 bars. If very low perfusion exists it may not read CO and provide inaccurate pulse Oximetry as well

- Be aware of **CLUB NAILS** (Bowl shaped not flat) or irregular shapes caused by chronic hypoxia which will not allow reliable oximetry in most cases. This is common on hypoxic patients, especially COPD

Protocol
T-1

**SECTION: T-1**

**PROTOCOL TITLE: GENERAL TRAUMA CARE**

**REVISED: June 8, 2010**

**GENERAL COMMENTS**: When possible this protocol should supplement other, more specific protocols based on clinical assessments and judgment. While not specifically mentioned below, aggressive management of the airway, respiratory functions, and prevention of shock are cornerstones of solid trauma care.
In addition, rapid transport, good scene management with minimized scene times, and coordination with receiving trauma center are also important.

## BLS SPECIFIC CARE:

- Basic BLS care and assessments and v/s every 15 minutes unless unstable, then reassess and v/s every 5 minutes
- Patients with respiratory related complaints in the setting of major trauma should receive high flow oxygen, regardless of oxygen saturation. Assist ventilations as needed
- Open injuries to the neck, chest, upper abdomen or deep vascular structures should be covered with an occlusive dressing when possible
- Follow *Selective Spinal Immobilization* protocol in regard to spinal care *When in doubt, immobilize*
- Suspected head injury: Elevate head/backboard as feasible (20-30 degrees max)
- Coordinate resources to insure prompt arrival of ALS care to the patient. Update responding ALS and receiving hospital as needed
- Pregnant trauma patients: Transport in left lateral recumbent, or tilt backboard as needed
- Follow *Hospital Destination Protocol* (G-3)
- Maintain patent airway as necessary
- Full spinal immobilization per protocol
- Supplemental high flow oxygen as tolerated
- Assist ventilations if necessary to maintain adequate $SpO_2$
- Apply occlusive dressings to sucking chest wounds
    - Seal on three sides
- Apply pressure dressings to hemorrhaging injuries
- Apply tourniquet to hemorrhaging extremity injuries unresponsive to pressure dressings
- Stabilize impaled objects and leave in place
- Obtain a full set of vital signs
- Assess blood glucose level as indicated
- Elevate head of bed/backboard if head injury present/suspected

- Splint extremity injuries as needed
  - Traction (Sager) splint as needed for fractures to the proximal third and mid-shaft of femur
  - Splints, sling and swath, etc., where applicable, for other long-bone fractures and joint dislocations
- Assess neuromuscular function **before and after** splinting
- Position patient as appropriate
  - Transport pregnant trauma patients in left lateral recumbent position at approximately 30°
- Conserve body heat. Maintain patent airway as necessary

## ILS SPECIFIC CARE:

- IV access only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers. 2 IV lines for major trauma.
    - IV: 200-500 cc crystalloid solution for symptomatic hypotension. Repeat PRN
    - Use with caution in patients with Hx of CHF

## ALS SPECIFIC CARE:

- *Assess and identify causes of complaints, treat as needed*
- *Airway Management:* Secure the airway using means best determined by good clinical decision making. See “Medication Assisted Intubation” guidelines for current and anticipated clinical needs
- *Suspected Tension Pneumothorax*
    - Needle chest decompression
- *Ocular Trauma*
    - Tetracaine 1-3 gtts (hold for penetrating or open globe injury)

*Anticonvulsant therapy*

- Valium (diazepam)
  - Adult:
    - IV/IO: 2-10 mg every 5-10 minutes as needed to a maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1-0.2 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg
    - PR: 0.5 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg

- Versed (midazolam)
  - Adult:
    - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to a maximum of 5 mg
    - IN (intranasal): 5mg (2.5 mg each nare) to a maximum total dose 5 mg
    - IM: 5mg to maximum dose 5 mg
  - Pediatric:
    - IV/IO/IM: 0.05-0.2 mg/kg every 5-10 minutes as needed to a maximum total dose of 5 mg
    - IN/PR: 0.2-0.4 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg

*Analgesics and Sedatives*
*Analgesics*

Discontinue or do not administer if:

→ Systolic BP < 90 mmHg. (Adult)
→ Signs and symptoms of hypoperfusion are present or develop
→ Respiratory rate, $SpO_2$ and/or mental status diminishes
→ Contact OLMC to exceed maximum doses

- Fentanyl:
  - Adult: 25-50 mcg IV/IO/IN/IM every 5-10 minutes as needed to a maximum of 200 mcg
  - Pediatric: 1 mcg/kg slowly every 5-10 minutes as needed to a maximum total dose 100 mcg
- Morphine:
  - Adult: 2-5 mg IV/IO/IN/IM every 5-10 minutes as needed to maximum of 20 mg
  - Pediatric:
    - IV/IO: 0.1-0.2 mg/kg every 5-10 minutes as needed
    - IM: 0.2 mg/kg every 20 minutes as needed
    - Maximum dose 15 mg

# Protocol T-1

GENERAL TRAUMA CARE

**PHYSICIAN PEARLS:**

**Trauma patients**: All patients shall be stabilized and transported as rapidly and efficiently as possible. Trauma patients and patients who may benefit from specific interventional therapy (surgery, thrombolytic, cath lab) should have a goal of less than ten minutes on scene, within the bounds of quality patient care. The following groups of patients (while not all inclusive) should be considered high risk for rapid deterioration due to significant mechanism of injury:

- Penetrating wounds to head, neck, chest, back, or abdomen, or other vital structures
- Pedestrians struck by a vehicle
- Falls greater than 10 feet or twice the patient's height
- MVA with significant damage to vehicle
- MVA with rollover, patient entrapment or ejection
- Evidence of significant blunt force (starred windshield, deformed dash, steering wheel, fractured safety equipment) etc.
- Death of another occupant in same vehicle
- Motorcycle/ATV/Snowmobile accidents
- Horse rollovers

**EARLY NOTIFICATION OF THE RECEIVING FACILITY IS ESSENTIAL IN SIGNIFICANT TRAUMA CASES**

Protocol
T-2

**SECTION: T-2**

**PROTOCOL TITLE: Orthopedic Injuries**

**REVISED: January 27, 2010**

**BLS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

*General Comments*

- Consider that injuries may be distracting from more subtle signs of spinal injury. Assess accordingly
- Follow Hospital Destination Protocol for major trauma
- Do not delay transport for splinting in unstable patients

*Long Bone Orthopedic Injuries*

- Splint, position and/or ice as needed
- Traction splints as indicated for femur fractures

*Pelvic Injuries*

- Consider Pelvic Wrap with Sheet, KED or similar method

*Clavicle and Shoulder Injuries*

- Consider Sling and/or swath
- Consider injuries to adjacent structures

**ILS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

**ALS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

*Orthopedic Injuries*

- All angulated long bone fracture/dislocations with neurological or vascular compromise should be reduced as soon as possible
- Patellar dislocations may be reduced following patellar reduction guidelines at the paramedic's discretion
    - All patellar reductions should be encouraged to seek X-rays and physician evaluation.

**PHYSICIAN PEARLS:**

***EARLY NOTIFICATION OF THE RECEIVING FACILITY IS ESSENTIAL IN SIGNIFICANT TRAUMA CASES***

ORTHOPEDIC INJURIES

Protocol

# T-2

# ORTHOPEDIC INJURIES

Protocol
T-3

**SECTION: T-3**

**PROTOCOL TITLE: Burn Trauma**

**REVISED: January 27, 2010**

**GENERAL COMMENTS**: Burns should be evaluated by the depth of burn, the presence of co-morbid factors, location of burns, and BSA using the rule of 9's. In addition to normal burn care, many problems may be anticipated by assessing for the presence of co-morbid factors.

**BLS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

*Basic Burn Care*

- Patients with burns to the trunk, face, any airway passage involvement whatsoever or the presence of any co-morbid factors, should receive supplemental oxygen regardless of oxygen saturation. Assist ventilations as needed
- If the total BSA involvement is less than 10%, cooling of area with sterile water/saline or burn gel may be performed
- Keep burned area as clean as possible (aseptic)
- Prevent hypothermia
- Facial burns: Raise patient's head 30 degrees when possible to decrease swelling
- Extremity burns: Remove all jewelry; elevate extremity if possible

*Assess Burns*

- Assess for abuse, attempted suicide, etc.
- Toxic / HazMat exposure
- In the presence of blast injury, electrical burns or other major trauma mechanism, provide C-spine immobilization
- Stop the burning process
- Maintain patent airway as necessary
    - Severe burns to the face and neck may be indicative of imminent airway occlusion
- Supplemental high flow oxygen as tolerated
- Assisted ventilations if necessary to maintain adequate $SpO_2$
- Cover burns with dry sterile dressings
- Burns less than 10% TBSA may be cooled with water or saline
- Conserve body heat; burns covering a large percentage of body surface area can predispose patients to developing hypothermia
- Facial burns: raise patient's head 30° when possible to decrease swelling
- Extremity burns: remove all jewelry and elevate extremity if possible
- Assess total body surface area (TBSA) burned
    - See, "Estimating Burn Area (Using Rule of 9's)," charts under, "Key Considerations"
    - Use pediatric Rule of 9's for patients < 4 years of age

BURN TRAUMA

# Protocol T-3

# BURN TRAUMA

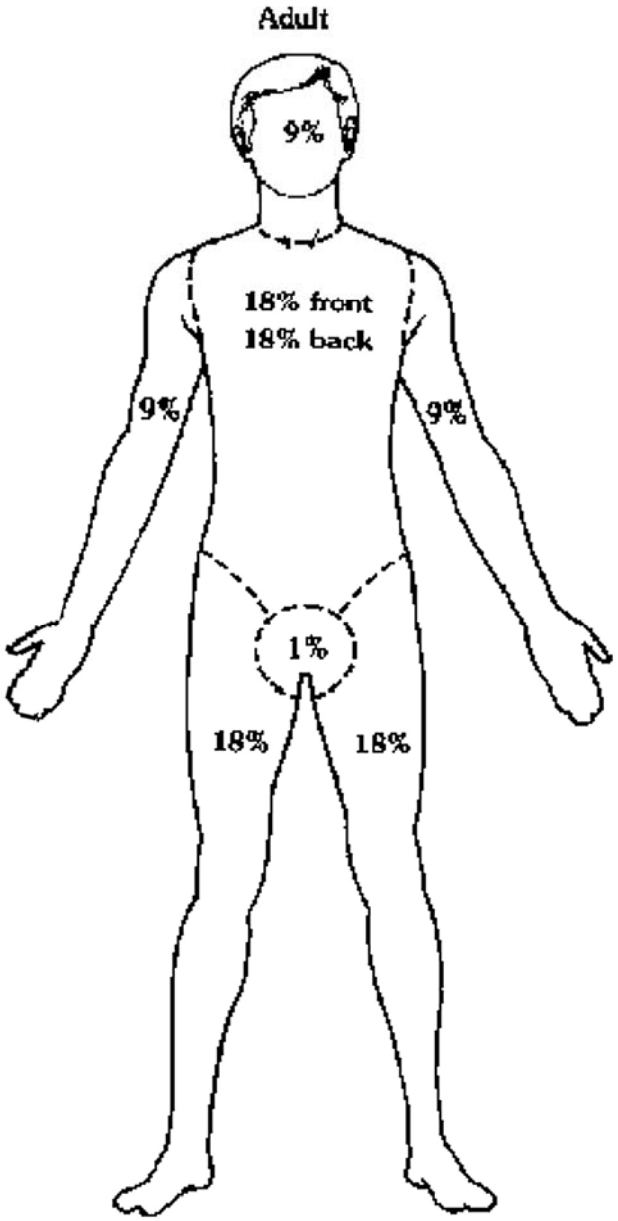
**ILS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

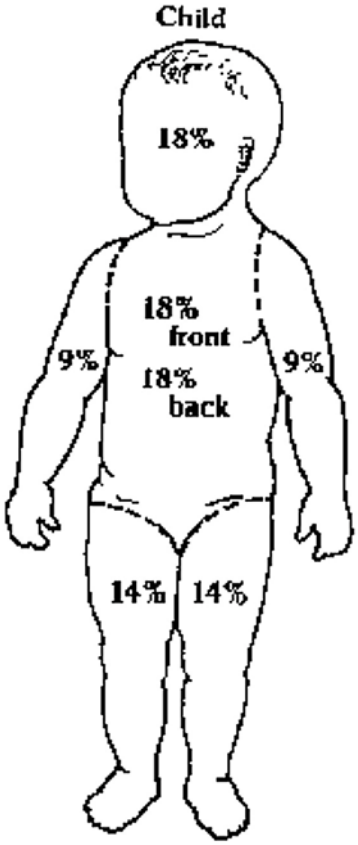
- Parkland formula for fluid resuscitation (initiate as feasible) using a crystalloid solution

| |
|---|
| (2-4cc crystalloid X Pt Weight KG) X BSA = 24 hour requirement.<br>Administer ½ of 24 hour requirement over first 8 hours |

**ALS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

- Have a high index of suspicion and a low intubation threshold when treating burn patients with possible airway involvement
- Burns are extremely painful! Strongly consider sedation and pain management
- See (M-11) protocol for Analgesics, sedatives




| Rules of Nine | Patient> 14 yrs | 5-14 yrs | Infants to 5 yrs |
|---|---|---|---|
| Head | 9% | 14% | 18% |
| Each arm (front & back) | 9% | 9% | 9% |
| Each leg (front & back) | 18% | 16% | 14% |
| Chest and Abdomen | 18% | 18% | 18% |
| Back | 18% | 18% | 18% |
| Groin | 1% | 1% | 1% |

# Protocol T-3

# BURN TRAUMA

**PHYSICIAN PEARLS:**

| Co-Morbid Factor | Considerations |
|---|---|
| Hypotension | Transport to trauma center. Hypotension is rare in acute burns, assess for hidden cause such as toxic exposure, occult hemorrhage, MI, or other cause |
| Age (<12, >55) | Transport to trauma center. Due to generally thinner skin in these age groups, it is easy to underestimate severity of burns |
| Circumferential | Transport to trauma center |
| High risk areas | Burns to genitalia, hands, feet, or face should be transported to trauma center |
| Suspected inhalation injuries | Singed nasal hairs, stridor, sooty airways, hoarse voice or history of enclosed space indicate a potential for CO poisoning or airway injury,<br>Transport to trauma center, consider aggressive and early airway management |
| Co existing major trauma | Transport to trauma center |
| Electricity (lightning) | While arrest is common, many patients will restore organized cardiac activity even with simple CPR, but will require prolonged respiratory support. Does not require a trauma center. |
| Electricity (other) | Transport to trauma center.<br>Cardiac monitoring and 12 lead evaluation as available.<br>Consider path of damage |
| Hx of renal failure or burns older than 36 hours | Do not use Succinylcholine (Anectine) |
| Blast injury | Immobilize, assess for baro-trauma, and watch for secondary devices |

Protocol
T-4

**SECTION: T-4**

**PROTOCOL TITLE: Crush Injuries**

**REVISED: October 27, 2010**

**GENERAL COMMENTS**: This protocol covers isolated extremity crush injury with entrapment.

**BLS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

- Assess for the "Six P's
- Place (but do not tighten) tourniquet on the entrapped extremity. If this is not possible, have the tourniquet standing by
    - Tighten only if precipitous hemorrhage occurs
    - May use tourniquet as prophylaxis on Medical Control or ALS instruction
- Be prepared for significant bleeding and sudden cardiac arrest when patient is freed, especially in prolonged incidents
- Maintain patent airway as necessary
- Full spinal immobilization as per protocol
- Supplemental high flow oxygen as tolerated
- Assist ventilations as necessary to maintain adequate $SpO_2$
- Obtain a full set of vital signs
- Assess blood glucose level as needed
- Elevate head of bed/backboard if head injury present/suspected
- Splint extremity injuries as needed
- Position patient as appropriate
    - Transport pregnant trauma patients in left lateral recumbent position at approximately 30°
- Conserve body heat

**ILS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

- IV access (to a max of three attempts) with TWO LARGE BORE LINES.
    - IV: 200-500 cc crystalloid solution. Repeat PRN
    - If the patient has been entrapped for more than 1 hour, fluid therapy 20 ml/kg rapid IV bolus (1 to 2 liters) using normal saline
    - Use with caution in patients with Hx of CHF
    - Ongoing fluid therapy 5 ml/kg/hr (300 to 500 ml/hr). Increase as needed for hypotension

# Protocol T-4

# CRUSH INJURIES

**ALS SPECIFIC CARE:** *See General Trauma Care Protocol T-1*

- Place a tourniquet, consider its use as prophylaxis
- Strongly consider sedation and pain management

*For Crush Injuries of major extremities with active entrapment greater than 2 hours:*

- Sodium Bicarbonate
  - IV: 1 meq/kg IV (minimum 50 meq for adults) given *IMMEDIATELY PRIOR TO RELEASE FROM ENTRAPMENT*
  - OPTIONAL INFUSION: 50-100 meq/1000 cc, run at 150 cc/hr, titrated for effect
- **Calcium Chloride (for crush injuries with hyperkalemia changes on EKG)**
  - IVP (Slow): 500-1000 mg,
  - **DO NOT GIVE IN SAME LINE AS BICARB INFUSION.**

**PHYSICIAN PEARLS:**

Victims entrapped and crushed due to heavy objects, (e.g. fallen debris from a structural collapse) present a unique challenge. These crushing objects place prolonged and continuous pressure on the extremities resulting in skeletal muscle death (rhabdomyolysis) with release of its cellular contents (myoglobin) into the plasma.

These adverse effects are known as Acute *Crush Syndrome*. After the skeletal muscle injury occurs and the crushing object is removed, the accumulated cellular toxins (myoglobin) and electrolytes (potassium) are released into circulation and may cause lethal cardiac arrhythmias, acute renal failure and sudden death. The systemic effects of Acute Crush Syndrome only occur after the object is removed and the injured extremity is reperfused. Removal of the object causes a massive fluid shift into the injured muscle, resulting in acute hypovolemia and hypotension.

*Large volumes of NS* (avoid LR) must be given to the patient intravenously both before and after the patient is released. The addition of a buffering agent, such as sodium bicarbonate, to the IV solution can help prevent the myoglobin deposition in the renal tubules and may counteract hyperkalemia as well.

- Sodium bicarbonate should not be used in crush injuries of short duration (less than 30 minutes). *Its use is indicated when evidence of distal ischemia is present. These signs are commonly known as the six "Ps."*
    - *Pain*
    - *Pallor*
    - *Pulselessness*
    - *Paralysis*
    - *Paresthesia*
    - *Poikilothermia (cool to touch)*
- Trauma patients are very susceptible to heat loss. Preservation of body heat is critical
- In MCI's multiple IV fluid types may be available. It is important to note that Lactated Ringers should be avoided (if possible) as it contains potassium and lactate

Protocol

# T-4

# CRUSH INJURIES

**SECTION: PC-1**

**PROTOCOL TITLE: PED CARDIAC/RESPIRATORY ARREST**

**REVISED: April 29, 2011**



**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol P-1*

- *For unwitnessed arrest*: Consider 2 minutes of good, sustained, and effective CPR prior to defibrillation or AED attachment
- For *witnessed* Arrest, or after 2 minutes of good, effective and sustained CPR: AED use per 2010 AHA guidelines and manufacturer recommendations
    - Adult AED's can be used in children less than 1 year of age
    - Single shocks are recommended to reduce interruption of CPR
- When possible, reduce interruptions of chest compressions
- When VF/pulseless ventricular tachycardia (VT) is present, deliver 1 shock and immediately resume CPR, beginning with chest compressions. *Do not delay resumption of chest compressions to recheck the rhythm or pulse.*
- After 5 cycles (about 2 minutes) of CPR, analyze the cardiac rhythm and deliver another shock if indicated. If a non-shockable rhythm is detected, resume CPR immediately
- Careful use of BVM, airway adjuncts. Ventilations should occur over 1-2 seconds
- Avoid hyperventilation/hyperinflation
- Notify responding ALS unit ASAP

**ILS SPECIFIC CARE:** ***See General Pediatric Care Protocol P-1***

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, otherwise defer until arrival of ALS providers
    - IV: Crystalloid solution at a TKO rate
    - 10-20 cc/kg, repeat as needed for 3 total boluses
- IO access: as needed after unsuccessful peripheral vascular access. Follow fluid administration guidelines as above

# Protocol PC-1

# PED CARDIAC ARREST

**ALS SPECIFIC CARE: *See General Pediatric Care Protocol P-1***

- Consider underlying causes of cardiac arrest and treat as well
- Defibrillation settings: (after 2 minutes of CPR unless witnessed arrest)
    - 2 - 4 J/kg SINGLE shock as needed
    - Subsequent single defibrillations at 4 J/kg
    - Higher energy levels may be considered, not to exceed10 J/kg or the adult maximum dose.

*Cardio-active Drugs*

- Epinephrine (for all Pulseless Rhythms)
    - IV/IO: 0.01 mg/kg 1:10,000 concentration every 3-5 minutes
    - ETT: 0.1 mg/kg 1:1,000 concentration every 3-5 minutes

*Antiarrhythmic therapy:*

- Lidocaine (VF, V-Tach, Refractory Torsades)
    - IV/IO: 1 mg/kg to a max of 3 mg/kg every 3-5 min.
    - ET: 2 mg/kg diluted in NS
- Magnesium Sulfate (for refractory VF/VT, First Line for Torsades)
    - IV/IO: 25-50 mg/kg
    - Max 2 g

*Consider as appropriate:*

- Sodium Bicarbonate for known hyperkalemia, bicarb acidosis (DKA, TCA), prolonged resuscitation after ROSC.
    - IV: 1 meq/kg repeated in 10 minutes at 0.5 meq/kg. Follow DKA/TCA recommendations if DKA or TCA OD is suspected
- Narcan (Naloxone) for suspected narcotic overdose.
    - IV/ETT: 0.1 mg/kg repeated PRN.
    - Max of 2.0 mg/dose
- Dextrose for hypoglycemia
    - Birth to 3 months; use D10 10ml/kg slow IV/IO push
    - >3 months; use D25 4 ml/kg slow IV/IO push
    - See Pediatric Hypoglycemia Protocol (PM-6)

Protocol
PC-1a

**SECTION: PC-1a**

**PROTOCOL TITLE:**
**PED CARDIAC/RESPIRATORY ARREST- BLS Algorithm**
**REVISED: September 29, 2010**

PED CARDIAC/RESPIRATORY ARREST-BLS

### Box #1:

**If adequate CPR is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest and resume CPR.
- **b)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor without cessation of CPR.
- **c)** Apply length based resuscitation tape.
- **d)** Move on to, **"Box 4."**

### Box #2:

**Sudden, witnessed arrest in the presence of EMS:**

- **a)** Perform CPR only long enough to apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
- **b)** Apply length based resuscitation tape.
- **c)** Move on to, **"Box 4."**

### Box #3:

**If inadequate CPR or no CPR at all, is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest
- **b)** Initiate CPR
- **c)** 5 cycles 15 compressions to 2 ventilations with two rescuers (approximately 1-2 minutes)
  - **1)** 30:2 for single rescuer CPR.
- **d)** During CPR:
  - **1)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and AED
  - **2)** Apply length based resuscitation tape.
- **e)** Infant ( < 1 year) continue CPR until ALS responders arrive.
  - **1)** Recheck rhythm every 5 cycles
- **f)** Child ( > 1 year )
  - **1)** Move to "Box #4"

### Box #4:

Child ( > 1 year)
**Shockable Rhythm ?**

### Shockable Rhythm:

- **a)** **Give 1 shock with AED**
  - **1)** Continue CPR while AED charges.
- **b)** Immediately resume CPR for 5 cycles 15:2.
- **c)** Check rhythm every 5 cycles, continue until ALS arrives.

### Not shockable Rhythm:

- **a)** Immediately resume CPR for 5 cycles 15:2.
- **b)** Check rhythm every 5 cycles, continue until ALS arrives.2 cycles 15:2

Protocol

PC-1a

# PED CARDIAC/RESPIRATORY ARREST-BLS

Protocol
PC-1b

**SECTION: PC-1b**

**PROTOCOL TITLE:**
**PED CARDIAC/RESPIRATORY ARREST- ILS Algorithm**
**REVISED: September 29, 2010**

PED CARDIAC/RESPIRATORY ARREST-ILS

### Box #1:

**If adequate CPR is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest and resume CPR.
- **b)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor without cessation of CPR.
- **c)** Apply length based resuscitation tape.
- **d)** Move on to, **"Box 4."**

### Box #2:

**Sudden, witnessed arrest in the presence of EMS:**

- **a)** Perform CPR only long enough to apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
- **b)** Apply length based resuscitation tape.
- **c)** Move on to, **"Box 4."**

### Box #3:

**If inadequate CPR or no CPR at all, is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest
- **b)** Initiate CPR
- **c)** 5 cycles 15 compressions to 2 ventilations with two rescuers (approximately 1-2 minutes)
  - **1)** 30:2 for single rescuer CPR.
- **d)** During CPR
  - **1)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and AED
  - **2)** Apply length based resuscitation tape.
  - **3)** Prepared IV/IO equipment
- **e)** Infant ( < 1 year) continue CPR until ALS responders arrive.
  - **1)** Recheck rhythm every 5 cycles
- **f)** Child ( > 1 year )
  - **1)** Move to "Box #4"

### Box #4:

Child ( > 1 year)
**Shockable Rhythm ?**

### Shockable Rhythm:

- **a)** **Give 1 shock with AED**
  - **1)** Continue CPR while AED charges.
- **b)** Immediately resume CPR for 5 cycles 15:2.
- **c)** Obtain IV/IO access without cessation of CPR.
- **d)** Check rhythm every 5 cycles, continue until ALS arrives.

### Not shockable Rhythm:

- **a)** Immediately resume CPR for 5 cycles 15:2.
- **b)** Obtain IV/IO access without cessation of CPR.
- **c)** Check rhythm every 5 cycles, continue until ALS arrives.2 cycles 15:2

Protocol

PC-1a

# PED CARDIAC/RESPIRATORY ARREST-ILS

Protocol
PC-1c

**SECTION: PC-1c**

**PROTOCOL TITLE:**
**PED CARDIAC/RESPIRATORY ARREST –ALS Algorithm**

**REVISED: August 1, 2013**

PED CARDIAC/RESPIRATORY ARREST - ALS

### Box #1:
**If adequate CPR is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest and resume CPR.
- **b)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor without cessation of CPR.
- **c)** Apply length based resuscitation tape.
- **d)** Move on to, **"Box 4."**

### Box #2:
**Sudden, witnessed arrest in the presence of EMS:**

- **a)** Perform CPR only long enough to apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
- **b)** Apply length based resuscitation tape.
- **c)** Move on to, **"Box 4."**

### Box #3:
**If inadequate CPR or no CPR at all, is being performed upon arrival:**

- **a)** Confirm cardiopulmonary arrest
- **b)** Initiate CPR
- **c)** 5 cycles 15 compressions to 2 ventilations with two rescuers (approximately 1-2 minutes)
  - **1)** 30:2 for single rescuer CPR (approx. 2 min)
- **d)** During CPR:
  - **1)** Apply defibrillation pads (pediatric pads as per manufacturer's recommendation) and cardiac monitor.
  - **2)** Apply length based resuscitation tape.
  - **3)** Prepare for endotracheal intubation.
  - **4)** Prepare IV/IO equipment.
  - **5)** Move on to, **"Box 4."**

### Box #4:
### Rhythm Check

### VF/Pulseless VT:

- **a)** **Shock @ 2 J/kg or per manufacturers recommendations.**
  - **1)** Continue CPR while defibrillator charges.
- **b)** Immediately resume CPR without pause for rhythm check.
- **c)** Perform 5 cycles 15:2 (2 rescuers)
- **d)** Check rhythm every 5 cycles
- **e)** Intubate without cessation of compressions if possible.

### Asystole/PEA:

- **a)** **No shock indicated**.
- **b)** Immediately resume CPR.
- **c)** Perform 5 cycles 15:2 (2 rescuers)
- **d)** Check rhythm every 5 cycles
- **e)** Intubate without cessation of compressions if possible.

# Protocol PC-1c

# PED CARDIAC/RESPIRATORY ARREST - ALS

## Box #5: Rhythm Check

### VF/Pulseless VT:

a) **Shock @ 4 J/kg or per manufacturers recommendations.**
   1) Continue CPR while defibrillator charges.
b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
c) Obtain IV/IO access without cessation of compressions.
d) Assess BGL.
e) ***MEDICATION ADMINISTRATION DURING CPR:***
f) **IV/IO 1:10,000 epinephrine:**
   1) 0.01 mg/kg (0.1 ml/kg) with 10 ml NS flush.
   2) Repeat every 3-5 minutes.
g) **ETT 1:1,000 epinephrine:**
   1) If unable to obtain IV/IO access.
   2) 0.1 mg/kg (0.1 ml/kg) diluted to 5 ml with NS.
   3) Repeat every 3-5 minutes.

### Asystole/PEA:

a) **No shock indicated.**
b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
c) Obtain IV/IO access without cessation of compressions.
d) Assess BGL.
e) ***MEDICATION ADMINISTRATION DURING CPR:***
f) **IV/IO 1:10,000 epinephrine:**
   1) 0.01 mg/kg (0.1 ml/kg) with 10 ml NS flush.
   2) Repeat every 3-5 minutes.
g) **ETT 1:1,000 epinephrine:**
   1) If unable to obtain IV/IO access.
   2) 0.1 mg/kg (0.1 ml/kg) diluted to 5 ml with NS.
   3) Repeat every 3-5 minutes.

## Box #6:
## Rhythm Check

### VF/Pulseless VT:

**a)** **Shock @ 4 J/kg or per manufacturers recommendations.**

**b)** Continue CPR while defibrillator charges.

**c)** Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

**d)** ***MEDICATION ADMINISTRATION DURING CPR:***

**e)** **IV/IO Amiodarone:**

- **1)** 5mg/kg. Repeat up to 15mg/kg (max dose 300mg).

**f)** **IV/IO 2% lidocaine:**

- **1)** 1 mg/kg with 10 ml NS flush.
- **2)** Repeat every 3-5 minutes as needed.
- **3)** Maximum of 3 mg/kg.

**g)** **ETT 2% lidocaine:**

- **1)** If unable to obtain IV/IO access.
- **2)** 2 mg/kg diluted to 5 ml with NS.
- **3)** Repeat every 3-5 minutes.

**h)** **IV/IO magnesium sulfate:**

- **1)** First-line agent in the treatment of torsades de pointes.
- **2)** 25-50 mg/kg to a maximum of 2 g.

**i)** After 5 cycles of CPR go back to "Box #5"

### During CPR

- **Push hard and fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- One cycle of CPR: 15 compressions then 2 breaths; 5 cycles ≈ 1 to 2 minutes
- Avoid hyperventilation
- Secure airway and confirm placement
- Rotate compressions every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
  - **H**ypovolemia
  - **H**ypoxia
  - **H**ypo-/hyperkalemia
  - **H**ypoglycemia
  - **H**ypothermia
  - **T**oxins
  - **T**amponade, cardiac
  - **T**ension Pneumothorax
  - **T**hrombosis (coronary or pulmonary)
  - **T**rauma

***** After an advanced airway is placed, rescuers no longer deliver "cycles' of CPR. Give continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/minute. Check rhythm every 2 minutes.

**PHYSICIAN PEARLS:**
Outside of the Comfort One/DNR situations (appendix T), once ALS intervention is initiated; medical control should be called prior to ceasing efforts. In addition, BLS interventions, an advanced airway, and at least 10 minutes of rhythm appropriate therapy should have been performed prior to considering termination of efforts.
The American heart Association (AHA) 2010 guidelines for CPR and Emergency Cardiac Care recommends:

- Good, sustained, and effective CPR. **"Push hard and fast".**
- **Sustained coronary perfusion is believed essential for the heart to respond to defibrillation, any interruption in compressions should be minimized or avoided.** Even brief interruptions of compressions (such as seen in the pause for ventilations or defibrillation) result in a rapid decrease of coronary perfusion.
- Change to a 1-shock protocol. Frequent or long interruptions in precordial chest compressions for rhythm analysis or rescue breathing were associated with post resuscitation myocardial dysfunction and **reduced survival rates**. The AHA notes that: *"…if 1 shock fails to eliminate VF, the incremental benefit of another shock is low, and **the resumption of CPR is likely to confer a greater value than another shock.**"* Therefore when a shockable rhythm is found, **only one shock, instead of three stacked shocks, is recommended.**

**ETT vs. IO Access:** The AHA notes that *"…administration of epinephrine by the IV route was associated with a higher rate of ROSC and survival to discharge than administration of the drugs by the endotracheal route".* **Therefore, while ETT administration of drugs in cardiac arrest is not prohibited, IO is encouraged when peripheral venous access is unsuccessful.**

Protocol
PC-2

**SECTION: PC-2**

**PROTOCOL TITLE: PED Symptomatic Bradycardia**

**REVISED: April 29, 2011**

PED SYMPTOMATIC BRADYCARDIA

**General Comments:** Symptomatic bradycardia is defined in pediatrics as hypotension or other S/S of poor perfusion, with a (relative to age) bradycardia. Most bradycardia is hypoxia related, and will usually respond to oxygenation.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*

*Stable/asymptomatic/adequate perfusion*
- Ensure adequate oxygenation, ventilation, and perfusion
- Resolve any causes of hypoxia
- Monitor closely

*Unstable/symptomatic/poor perfusion*
- Resolve any causes of hypoxia
- Aggressive oxygenation and ventilations
- Consider chest compressions with frequent (30 sec-1 min) re-evaluation for situations refractory to oxygenation
- Determine patient's color category on length based resuscitation tape (Broselow Tape)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*
- Consider underlying causes of cardiac arrest and treat as well.
- Epinephrine:
  - IV/IO: 0.01 mg/kg (0.1 ml/kg) 1:10,000 with 5-10 ml NS flush.
    - Repeat every 3-5 minutes as needed
  - ETT: 0.1 mg/kg (0.1 ml/kg) 1:1,000 diluted to 5 ml in NS.
    - Repeat every 3-5 minutes as needed
- Atropine:
  If increased vagal tone is suspected or primary AV block is present.
  - IV/IO: 0.02 mg/kg
    - Minimum dose: 0.1 mg
    - Maximum child dose: 0.5 mg
    - Maximum total child dose: 1 mg
    - Maximum adolescent dose: 1 mg
    - Maximum total adolescent dose: 2 mg
    - Repeat every 3-5 minutes as needed
  - ETT: 0.03 mg/kg
    - Repeat every 3-5 minutes as needed

*Transcutaneous Pacing:*

For bradycardia unresponsive to pharmacologic therapy:

- Consider initial rate at 80-100, initial MA at 60-80

*Vasopressors:*

Epinephrine is the preferred agent in this setting:

- Epinephrine infusion
  - 0.1-1 mcg/kg/min IV/IO
    - See, “Pediatric Epinephrine,” preparation and infusion chart
    - Titrate to adequate heart rate/blood pressure response
- Dopamine infusion :
  - 2-20 mcg/kg/min IV/IO dopamine infusion
    - See, “Pediatric Dopamine,” preparation and infusion chart
    - Titrate to adequate heart rate/blood pressure response

*Additional considerations:*

- IV/IO Sodium bicarbonate for known hyperkalemia, bicarb acidosis (DKA, TCA), or prolonged resuscitation after ROSC.
- IV/IO 1 mEq/kg
  - Repeat at 0.5 mEq/kg in 10 minutes.

**PHYSICIAN PEARLS:**
*The following information is adapted from the Medtronic Physio-control website regarding pediatric pacing.*

"Bradycardia is the most common dysrhythmia in children and is usually secondary to hypoxic events. Although noninvasive pacing may be attempted, typically bradycardias of hypoxic etiology do not respond. First line therapy is prompt airway support, ventilation and oxygenation.
Although less frequent in occurrence, children and infants do experience heart blocks and bradycardias where treatment with noninvasive pacing is indicated and could be lifesaving. Indications for pediatric noninvasive pacing are:

- Bradycardia refractory to oxygenation, and drug therapy
- 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 or lead wire fracture
- And epicardial pacing wire failure (post cardiac surgery)

The landmarks for pacing electrode placement are the same for adults and children; however placement on a child is more challenging due to the limited size of the torso. Anterior/posterior is the most common pacing electrode placement. Anterior-lateral placement is also acceptable but will take up more space on an already crowded chest. In order to obtain a clear tracing on the monitor, ECG electrodes should be placed well away from the pacing electrodes. Pediatric pacing electrodes should be used on children who weigh less than 33 pounds (15 Kg). The larger "adult" size pacing electrodes should be used as soon as they fit on a child's chest without overlap of the sternum, spine and diaphragm.

*Capture thresholds in children are similar to those in adults. This may seem odd, given the much smaller size of children. Studies indicate no relationship between body surface area, weight, and capture thresholds and although many children will achieve capture between 50-100 ma, higher current requirements are possible. The pacing rate must be set high enough to perfuse the patient."*

Protocol

# PC-2

# PED SYMPTOMATIC BRADYCARDIA

**SECTION: PC-3**

**PROTOCOL TITLE: PEDIATRIC Tachycardia**

**REVISED: August 1, 2013**

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*

- Determine patient's color category on length based resuscitation tape (Broselow Tape if available)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PC-1*

- *If Unstable/ poor perfusion*: Obtain a 12-lead if possible, otherwise proceed directly to synchronized cardioversion
- Consider underlying causes and treat as well
- *See Protocol P-10 for sedation prior to cardioversion*

***Narrow Complex Tachycardia*** (Supraventricular, QRS ≤ 0.08 sec, and regular):

- Vagal Maneuvers
- Adenosine
  - IV or IO: First dose: 0.1 mg/kg maximum*: 6 mg*
  - Subsequent doses: 0.2 mg/kg, maximum*: 12 mg*. Repeat once
- Diltiazem
  - IV/ IO: 0.25 mg/kg IV over 2 minutes (Usual dose about 20 mg)
  - May repeat in 15 minutes @ 0.35 mg/kg IV over 2 minutes.
  - Hold for WPW

- If unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion
- Assume non-cardiac causes of any tachycardia in infant patients presenting with heart rates < 220 bpm and child patients with heart rates < 180 bpm
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Obtain 12-lead if time allows
- For hemodynamically **UNSTABLE** patients presenting with narrow or wide complex tachycardias, perform immediate synchronized DC cardioversion
  - In the pediatric patient population, a narrow QRS complex is defined as a complex with duration of < 0.08 sec (2 mm.)

- Consider sedation prior to cardioversion if it will not cause unnecessary delays
  **DO NOT** administer if:
  - Signs and symptoms of shock are present
  - Low respiratory rate, SpO2 and/or diminished mental status
- Versed (midazolam)
  - 0.05 mg/kg to a maximum dose of 2.5 mg IV/IO

*Synchronized DC cardioversion*

- Initial energy setting of 0.5 J/kg or as per manufacturer's recommendations
- Deliver subsequent shocks, as needed, at 1 J/kg or as per manufacturer's recommendations

- **For hemodynamically STABLE patients presenting with narrow complex tachycardias, vagal maneuvers and antidysrhythmic therapy are indicated**

*Antidysrhythmic*

- **Adenocard (adenosine):**
  **DO NOT** administer to irregular tachycardias.
  - 0.1 mg/kg rapidly
  - Maximum initial dose of 6 mg
  - Use two syringe technique
  - If dysrhythmia is not terminated, repeat one more time at double the dose (0.2 mg/kg)
  - Maximum second dose of 12 mg
  - Use two syringe technique
- Follow each dose with a flush of at least 20 ml

- **Cardizem (diltiazem):*****
  - 0.25 mg/kg followed by 0.35 mg/kg in 15 minutes IV/IO

***Wide Complex Tachycardia*** (QRS $\geq$ 0.08sec, Variable R-R)

- Lidocaine
  - IV or IO: 1 mg/kg
  - Repeat every 3-5 minutes to a max dose of 3 mg/kg.
- Amiodarone
  - IV or IO: 5 mg/kg over 20-60 min. May repeat dose up to 15 mg/kg (max 300 mg).
- If unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion.

*Synchronized Cardioversion*

- Settings for synchronized Cardioversion:
    - 0.5 j/kg with subsequent shocks set at 1 j/kg
    - Ensure "**SYNC**" button is pressed between each desired synchronized shock

- Assume non-cardiac causes of any tachycardia in infant patients presenting with heart rates < 220 bpm and child patients with heart rates < 180 bpm
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Obtain 12-lead if time allows
- For hemodynamically unstable patients presenting with wide or narrow complex tachycardias, perform immediate synchronized DC cardioversion
    - In the pediatric patient population, a wide QRS complex is defined as a complex with duration of > 0.08 sec (2 mm)
- Consider sedation prior to cardioversion if it will not cause unnecessary delays

  **DO NOT** administer if:
    - Signs and symptoms of shock are present
    - Low respiratory rate, SpO2 and/or diminished mental status
- Versed (midazolam):
    - 0.05 mg/kg to maximum single dose of 2.5 mg. IV/IO

*Synchronized DC cardioversion:*

- Initial energy setting of 0.5 J/kg or as per manufacturer's recommendations
- Deliver subsequent shocks, as needed, at 1 J/kg or as per manufacturer's recommendations
- If unable to obtain synchronization with QRS complexes, (as with torsades de pointes) proceed with **unsynchronized** cardioversion as detailed below

*Unsynchronized DC cardioversion:*

- For unstable torsades de pointes (polymorphic wide complex tachycardia)
    - Use unsynchronized defibrillation energy settings
    - Initial energy setting of 2J/kg or as per manufacturer's recommendations
    - Deliver subsequent shocks, as needed, at 4 J/kg or as per manufacturer's recommendations

# Protocol PC-3

PED TACHYCARDIA

For hemodynamically STABLE patients presenting with wide complex tachycardias, antidysrhythmic therapy is indicated

*Antidysrhythmic therapy:*

- **Lidocaine IV/IO/ETT:**
  - 1 mg/kg initial bolus
  - Repeat every 5-10 minutes to a maximum of 3 mg/kg
- Magnesium sulfate: IV/IO
  - First line agent in treatment of hemodynamically stable polymorphic wide complex tachycardia (torsades de pointes)
  - Also indicated in treatment of refractory VF, wide complex tachycardia in the presence of suspected hypomagnesmia and life threatening ventricular dysrhythmias due to suspected digitalis toxicity
  - 25-50 mg/kg (to a maximum of 2 g) over 10 minutes
  - Rapid administration of magnesium sulfate can cause hypotension and respiratory depression. Carefully monitor both during infusion
  - To prepare:
    - Dilute calculated quantity of magnesium sulfate to 50 ml with NS in burette of Metriset
    - Start infusion with roller-clamp half open and titrate to rate of approximately 5 ml/minute

**PHYSICIAN PEARLS:**

- **Amiodarone is contraindicated if the patient is suspected of a TCA overdose.** This also applies to other drugs that widen the QRS

Use of a vagal maneuver may be useful in determining type of rhythm.

QRS Width:
≤ 0.08 seconds –probable Sinus Tachycardia or Supraventricular Tachycardia
≥ 0.08 seconds –probable Ventricular Tachycardia

Rate: (rates less than 180 BPM in a child, or 220 infant are usually secondary to other non-cardiac causes)
< 180 in Children or < 220 BPM in Infants with regular R-R: Probable Sinus Tach.
> 180 in Children or > 220 BPM in Infants with regular R-R: SVT
> 180 in Children or > 220 BPM in Infants with Variable R-R pattern: VT

**SECTION: PC-4**

**PROTOCOL TITLE: PEDIATRIC Epinephrine & Infusion Chart**
**PEDIATRIC Dopamine & Infusion Chart**

**REVISED: January 28, 2010**



Pediatric Epinephrine Preparation and Infusion

| Pediatric Epinephrine Preparation | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Weight in kg's** | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| **Milligrams epinephrine to be diluted to 100 ml in Metriset** | 1.2 | 2.4 | 3.6 | 4.8 | 6 | 7.2 | 8.4 | 9.6 | 10.8 | 12 |

| Pediatric Epinephrine Preparation | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Weight in kg's** | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| **Milligrams epinephrine to be diluted to 100 ml in Metriset** | 13.2 | 14.4 | 15.6 | 16.8 | 18 | 19.2 | 20.4 | 21.6 | 22.8 | 24 |

When the above solution is infused at the following rates, the corresponding epinephrine doses are administered.

| Pediatric Epinephrine Infusion | | | | | |
|---|---|---|---|---|---|
| **Dose** | 0.1 mcg/kg/min | 0.5 mcg/kg/min | 1 mcg/kg/min | 1.5 mcg/kg/min | 2.0 mcg/kg/min |
| **Rate** | 1 gtt/min or ml/hr | 5 gtts/min or ml/hr | 10 gtts/min or ml/hr | 15 gtts/min or ml/hr | 20 gtts/min or ml/hr |

Pediatric Dopamine Preparation and Infusion

| Pediatric Dopamine Preparation | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Weight in kg's** | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| **Milligrams dopamine to be diluted to 100 ml in Metriset** | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 |

| Pediatric Dopamine Preparation | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Weight in kg's** | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| **Milligrams dopamine to be diluted to 100 ml in Metriset** | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 | 240 |

When the above solution is infused at the following rates, the corresponding dopamine doses are administered.

| Pediatric Dopamine Infusion | | | |
|---|---|---|---|
| **Dose** | 2 mcg/kg/min | 5 mcg/kg/min | 10 mcg/kg/min |
| **Rate** | 2 gtts/min or 2 ml/hr | 5 gtts/min or 5 ml/hr | 10 gtts/min or 10 ml/hr |

| Pediatric Dopamine Infusion | | |
|---|---|---|
| **Dose** | 15 mcg/kg/min | 20 mcg/kg/min |
| **Rate** | 15 gtts/min or 15 ml/hr | 20 gtts/min or 20 ml/hr |

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**SECTION: PM-1**

**PROTOCOL TITLE: GENERAL MEDICAL CARE**

**REVISED: October 27, 2010**

**GENERAL COMMENTS: The Pediatric Medical Protocols (PM series) are meant to supplement existing adult protocols with pediatric appropriate doses, therapies, and guidelines. As a general rule pediatric doses should not exceed adult doses.**
With the implementation of the AHA 2010 ECC recommendations, the following age recommendations are made. Newborns are defined as birth to the time the infant leaves the hospital. Infants are defined as less than 1 year of age. A child is defined as 1 year to the approximate onset of puberty (as defined by secondary sex characteristics) and 100 lbs weight. This is typically 12-14 years of age.

## BLS SPECIFIC CARE:

- Basic BLS care. Obtain assessments and V/S every 15 minutes unless unstable, then reassess and obtain V/S every 5 minutes
- Coordinate resources to insure prompt arrival of ALS care to the patient. Update responding ALS units as needed
- O2 administration should be titrated for SAO2 >95%. Use NRB and high flow O2 mask for signs of distress. Assist ventilations as needed
- Patients with a respiratory complaint should receive supplemental oxygen, regardless of oxygen saturation

## ILS SPECIFIC CARE:

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, or marked dehydration. Otherwise defer until arrival of ALS providers
    - IV: Crystalloid solution at a TKO rate
    - 10-20 cc/kg, repeat as needed for 3 total boluses
- IO access: as needed for markedly critical patients after unsuccessful peripheral vascular access. Follow fluid administration guidelines as above

## ALS SPECIFIC CARE:

- Assess and identify causes of complaints, treat as appropriate.
- BG as appropriate.

*Adjunctive medications*: These medications are given for potentiation of other drugs, or for the prevention/treatment of certain side effects (nausea, EPS, etc) of drugs.

- Zofran
    - 0.1 mg/kg maximum of 4 mg
- Diphenhydramine (Benadryl)
    - IV, IM: 1-2 mg/kg
    - Max dose of 25 mg

# Protocol PM-1

GENERAL PEDIATRIC CARE

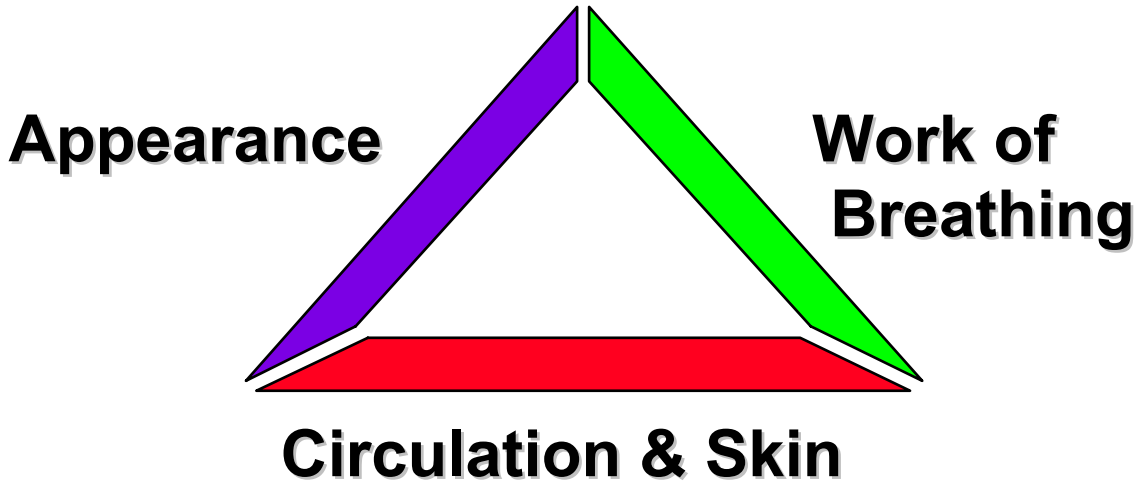
**PHYSICIAN PEARLS:**
**Basics of Pediatric Care:**
Careful use of BVM, airway adjuncts, and CONTINUOUS application of the Sellicks maneuver to help reduce/prevent aspiration.
Use padding under shoulders to ensure proper alignment.
Avoid hyperventilation/hyperinflation.
Notify responding ALS unit ASAP.
Remember that most doses for Pediatric patients are expressed in mg/kg or ml/kg.
Use a Metriset (Buretrol) for an IV administration set for all medical patients under 8 years of age. Use standard IV sets or blood tubing as needed for trauma patients under 8 years of age.
If patient's weight is unknown, the Broselow® tape should be used. When the Broselow® tape gives a more specific drug dosage than is listed in these protocols due to weight, that dosage may be used at the paramedic's discretion. **EXCEPTION: IV starting doses for Versed (Midazolam) doses in the Broselow® tape are for induction/RSI situations.**

*Pediatric Drip Rule of 6's*

To calculate a **DRUG** infusion, multiply the child's weight in kg by **6**. This amount of **DRUG** (in mg) is then added to enough IV solution to equal a total of 100 ml. When the resulting solution is infused at a rate of **1 ml/hr**, it will deliver a dosage of **1 mcg/kg/min.**

Pediatric Assessment Triangle

Pediatric patients tend to decompensate as a result of respiratory failure, shock, or a combination of the two. This can lead to cardiopulmonary failure if not promptly and adequately treated. The Pediatric Assessment Triangle is a visual aid to facilitate rapid evaluation of pediatric patients.



**SECTION: PM-2**

**PROTOCOL TITLE: PED RESPIRATORY EMERGENCIES**

**REVISED: January 28, 2010**

**GENERAL COMMENTS:** This protocol covers a wide variety of pediatric respiratory emergencies, particularly asthma, respiratory infections, and croup.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

*Bronchodilators*

- Assist the patient (or family) with his prescribed "rescue" inhaler. Use a spacer if the patient is prescribed one and has it available
    - Assisted Inhaler: 2 puffs or number of puffs as prescribed by the patient's MD
    - Repeat every 5-10 minutes or as prescribed by the patients MD
    - Use a spacer if available
    - Hold for HR >200/min.
- As an alternative, the patient (or his family) may be allowed to use their own nebulized medication
    - Hook up oxygen in lieu of a room air "condenser" and run at 6-8 LPM with the patients Hand Held Nebulizer (HHN). The patient (or family) must prepare it themselves
- Determine patient's color category on length based resuscitation tape (Broselow Tape)
- Assist the patient with his prescribed "rescue inhaler." Use a spacer if the patient is prescribed one and has it available
    - Assisted Inhaler: 2 puffs or a specific number of puffs as prescribed by patient's MD
    - Repeat every 5-10 minutes or as prescribed by patient's MD.
    - Discontinue if heart rate > 200 bpm
- As an alternative, the patient may be allowed to use his/her own nebulized medication. The QRU will offer to hook up oxygen in lieu of a room air "condenser" and run at 6-8 lpm with the patient's hand held nebulizer (HHN). The patient must prepare it him/herself

*Croup & Epiglottitis*

- Determine patient's color category on length based resuscitation tape (Broselow Tape)
- Allow patient to remain in his/her position of comfort as they have assumed this position to maximize the effectiveness of their own respirations
- Avoid agitating the patient as doing so can cause further deterioration of the respiratory status

# Protocol PM-2

PED RESPIRATORY EMERGENCIES

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Assess and treat underlying disorder.

*Bronchodilators*

- Nebulizer
  - Albuterol 2.5 mg (0.83% in 3cc)/ Atrovent 0.5 mg (0.02% in 2.5 cc) nebulized
  - May use DuoNeb preparation for initial Neb.
  - Repeat as needed with Albuterol Only
  - Do not dilute
- Magnesium Sulfate
  - 25-50 mg/kg in 100 cc infused over 2-5 min
  - Max 2 g
- Epinephrine 1:1000 for patients in severe distress
  - IM 0.01 mg/kg for severe refractory bronchospasm

*Corticosteroid Therapy*

- Solu-Medrol
  - 1-2 mg/kg IVP

*Croup & Epiglottitis*

- Epinephrine Neb (first line)
  - 5 mg (5 cc) epinephrine 1:1,000 nebulized and undiluted

**PHYSICIAN PEARLS:**

For cases of acute viral laryngotracheobronchitis (CROUP), albuterol and atrovent provide no substantial benefits due to the causation for this condition. As noted above, nebulized epinephrine is the first line treatment for Field personnel for this condition.

Pediatric patients with substernal and intercostal retractions are key findings of severe distress. If these findings are present, the patient is sick and in need of immediate treatment and follows up in an emergency department. Providers should ensure adequate oxygenation and ventilation at all times and is ready to support ventilation with BVM as needed.

Although corticosteroids are not first line treatment for respiratory disorders, administration in the early stages of treatment is beneficial. The AHA notes that *"…a comprehensive review of the literature by the Cochrane approach (including pediatric and adult patients) determined that early use of systemic steroids reduced rates of admission to the hospital"* and that *"…providers should administer steroids as early as possible to all asthma patients…*"

The anti-inflammatory effects are delayed but highly valuable in the aspect of continuing treatment. These should be administered quickly after emergency treatments are performed for patients that would benefit from this treatment modality.

Protocol

# PM-2

# PED RESPIRATORY EMERGENCIES

**SECTION: PM-3**

**PROTOCOL TITLE: PED ALLERGY/ANAPHYLAXIS**

**REVISED: May 1, 2012**

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Determine patient's color category on length based resuscitation tape (Broselow Tape)
- Administer epinephrine via auto-injector per State of Idaho epinephrine auto-injector program guidelines
- In the absence of this training and patient has his/her own epinephrine auto-injector, the EMT may assist with its administration per the following guidelines
    - Confirm prior to administration:
    - Is Epi-Pen prescribed to the patient (Right Patient?)
    - Is it an Epi-Pen of the correct dose (Right Dose?)
        - Patient weight < 30 kg (66 lbs)
            - Use Epi-Pen Junior: 0.15 mg 1:1,000 epinephrine
        - Patient weight > 30 kg (66 lbs)
            - Use Epi-Pen Adult: 0.3 mg 1:1,000 epinephrine
    - Is the Epi-Pen an intramuscular (IM) auto injector (Right route?)
    - Is the Epi-Pen expired
- Re-evaluate patient's sign and symptoms every 5 minutes following administration
    - Evaluate for presence adverse effects of epinephrine.
        - Chest pain
        - Headache
        - Palpitations
        - Anxiety/tremors
- Repeat in 10 minutes if no improvement
- *If signs of bronchospasm are present*
- Assist the patient with his/her prescribed, "rescue inhaler." Use a spacer if the patient is prescribed one and has it available
    - Assisted Inhaler: 2 puffs or a specific number of puffs as prescribed by patient's MD
    - Repeat every 5-10 minutes or as prescribed by patient's MD
    - Hold for heart rate greater than 200 bpm
- As an alternative, the patient may be allowed to use his/her own nebulized medication. The EMT will offer to hook up oxygen in lieu of a room air "condenser" and run at 6-8 lpm with the patient's hand held nebulizer (HHN). The patient must prepare it him/herself

# Protocol PM-3

# PED ALLERGY/ANAPHYLAXIS

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

*Vasoactive Drugs*

- Epinephrine 1:1,000
  - IM: 0.01 mg/kg MAX: 0.3 mg
  - Repeat x 1 in 10 minutes if s/s do not significantly improve
- **Epinephrine Infusion (see PC 4 for EPI Infusion chart)**
- Epinephrine Neb **(for laryngeal edema only)**
  - 5 mg (5 cc) Epinepherine 1:1,000 nebulized undiluted

*Bronchodilators*

- HHN Nebulizer
  - Albuterol 2.5 mg (0.83% in 3cc)/ Atrovent 0.5 mg (0.02% in 2.5 cc) nebulized. May use Duo-Neb preparation for initial Neb.
  - Repeat as needed with Albuterol Only
  - Do not dilute

*Antihistamine*

- Benadryl (Diphenhydramine)
  - IV, IM, IO: 1-2 mg/kg MAX of 25 mg.
  - PO: (If available) 25 mg (for mild cases)
- Zantac (Ranitidine) To be used in conjunction with Benadryl
  - IV, IM, IO: 1 mg/kg to a max of 50 mg
  - PO: (If available) 150mg (for mild cases)

*Sympathomimetics:*

- Epinephrine:
  - IM**:** 0.01 mg/kg (0.01 ml/kg) 1:1,000 epinephrine to a maximum of 0.3 mg (0.3 ml)
    - Repeat once in 10 minutes if needed
  - Nebulized**:** 5 mg (5 ml) undiluted 1:1,000 delivered via oxygen driven nebulizer at 10 LPM
    - For upper airway angioedema
    - Can be used while preparing for endotracheal intubation
  - IV/IO**:** 0.1-1 mcg/kg/min.
    - For states of profound hypotension (anaphylactic shock) unresponsive to three 20 ml/kg crystalloid IV/IO fluid boluses

*Nebulized bronchodilators:*

- For bronchospasm associated with allergic reactions/anaphylaxis
  - For first treatment, combine one albuterol (2.5 mg/3 ml) nebule and one Atrovent (0.5 mg/2.5 ml) nebule in reservoir of oxygen driven nebulizer unit and administer at 10 LPM
  - If Atrovent is contraindicated, use 1 albuterol nebule for first treatment
  - Repeat as needed with albuterol treatments only

*Antihistamines:*

- Benadryl (diphenhydramine)
  - 1-2 mg/kg IV/IM/IO to a maximum of 25 mg

*Corticosteroids:*

- Solu-Medrol (methylprednisolone)
  - 1-2 mg/kg IV/IM/IO to a maximum of 125 mg

**PHYSICIAN PEARLS:**

**CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one hour following treatment for return of symptoms.**

**Epinephrine Auto injector:** EMT's may administer the epinephrine auto-injector if it has been prescribed to the patient. In addition, EMT's may administer an auto-injector that HAS NOT been prescribed to the patient IF they have successfully completed additional training as required by the Department of Health and Welfare, Bureau of EMS and have been approved by ACEMSS and physicians directorate to do so. Remember that a reaction may be monophasic, biphasic or even protracted. Laryngeal edema is more common in the protracted (57%) or biphasic (40%) cases.

**Ranitidine:** Ranitidine is an adjunctive therapy to Benadryl (with or without epinephrine) in anaphylaxis & severe allergic reactions. It is not a stand-alone intervention.

**Common Presentations:** The most common symptoms were urticaria and angioedema, occurring in 88% of patients. The next most common manifestations were respiratory symptoms, such as upper airway edema, dyspnea, and wheezing.
Gastrointestinal symptoms occur most commonly in food-induced anaphylaxis, but can occur with other causes as well. Oral pruritus is often the first symptom observed in patients experiencing food-induced anaphylaxis. Abdominal cramping is also common, but nausea, vomiting, and diarrhea are frequently observed as well.
Cardiovascular symptoms of dizziness, syncope and hypotension were less common, *but it is important to remember that cardiovascular collapse may occur abruptly without the prior development of skin or respiratory manifestations.*

**PITFALLS:** It is commonly believed that all cases of anaphylaxis present with cutaneous manifestations, such as hives or mucocutaneous swelling. In fact, as previously mentioned, up to 20% of anaphylactic episodes may not involve these signs and symptoms on presentation for emergency care. Moreover, a survey of children with food-induced anaphylaxis showed that 80% of fatal reactions were not associated with cutaneous manifestations. In one study (Sampson et al) many cases of fatal food-induced anaphylaxis occurred in a biphasic clinical pattern. In these, mild oral and gastrointestinal symptoms occurred within 30 minutes of food ingestion. These symptoms resolved, only to be followed 1–2 hours later by severe respiratory symptoms and hypotension.

Individuals at great risk for a fatal reaction include those with asthma, atopic dermatitis (eczema), a prior anaphylactic history, and those who deny symptoms and therefore delaying treatment with epinephrine.

**SECTION: PM-4**

**PROTOCOL TITLE: PEDIATRIC SEIZURES**

**REVISED: November 3, 2010**

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Administer oxygen (high flow if neurological deficits or altered mental status)
- Place patient in recovery position. Prevent accidental harm
- Anticipate brief combativeness or agitation in postictal phase
- Screen for probable causes
- Position patient as appropriate.
    - Provide for patient's physical safety
- Determine patient's color category on length based resuscitation tape (Broselow Tape)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Assess for causes of seizure and treat accordingly

*Anticonvulsant Therapies*

- Diazepam (Valium)
    - IV/IO: 0.2-0.3 mg/kg given slowly. Repeat every 5 minutes PRN
    - PR: 0.5 mg/kg
    - MAXIMUM DOSAGE: 10 mg

- Versed (Midazolam)
    - Intranasal (IN): 0.2-0.4 mg/kg repeat every 5 minutes PRN. If no IV access is available
    - IV: 0.05-0.2 mg/kg every 5 –10 minutes PRN
    - MAXIMUM DOSAGE: 5 mg

Protocol

PM-4

PED SEIZURES

**PHYSICIAN PEARLS:**

When giving Midazolam, **DO NOT USE THE IV DOSAGES LISTED ON THE BROSELOW TAPE** as they are higher doses indicated for induction/RSI situations

Protocol
PM-5

**SECTION: PM-5**

**PROTOCOL TITLE: PEDIATRIC HYPOTENSION AND SHOCK**

**REVISED: January 28, 2010**

**GENERAL COMMENTS:** Use of good clinical judgment is essential.
This protocol includes shock and hypotension from a myriad of causes. When another protocol is more appropriate (i.e. Allergic Reaction) it should be followed instead. Fluid administration use should be used with caution in pediatric patents with severe congenital heart defects.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Determine patient's color category on length based resuscitation tape (Broselow Tape)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, or marked dehydration. Otherwise defer until arrival of ALS providers
    - IV: Crystalloid solution at a TKO rate
    - 10-20 cc/kg, Repeat as needed for hypotension
- IO access: as needed for markedly critical patients after unsuccessful vascular access. Follow fluid administration guidelines as above

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Positive pressure ventilations if pulmonary edema present
    - **IV/IO fluid therapy**
        - 20 ml/kg fluid boluses over 10 minutes
        - If no signs of pulmonary edema
        - Repeat up to three times as needed to a maximum of 60 ml/kg

***Pharmacologic therapy:***

If patient unresponsive to fluid therapy or if fluids are not indicated

*Vasopressors:*

- Epinephrine infusion:
    - First line agent for treatment of shock not responsive to fluids in the pediatric patient
    - 0.1-1 mcg/kg/min.
    - See, "Pediatric Epinephrine Infusion: Preparation and Administration," chart (PC-4)
    - Titrate to adequate blood pressure response
- Dopamine infusion:
    - 2-20 mcg/kg/min.
    - See, "Pediatric Dopamine Infusion: Preparation and Administration," chart (PC-4)
    - Titrate to adequate blood pressure response

PED HYPOTENSION AND SHOCK

**PHYSICIAN PEARLS:**

*DOPAMINE DRIP:* Because of its rapid elimination, dopamine can only be administered as a continuous infusion. To calculate a dopamine infusion, multiply the child's weight in kg by 6. This amount of dopamine (in mg) is then added to enough IV solution to equal a total of 100 ml. **When the resulting solution is infused at a rate of 1 ml/hr, it will deliver a dosage of 1 mcg/kg/min.**
*EPI DRIP***:** In pediatric patients with continued hypotension, epinephrine may be given as a continuous infusion (drip). The recommended starting dose is 2 mcg/kg/min. The infusion rate is reduced to maintain the desired response; usually to 0.1 to 1 mcg/kg/min. Infusion of doses greater than 5 mcg/kg/min may produce profound vasoconstriction at the site of administration.
To calculate an epinephrine drip, a simple formula for children uses **0.6** multiplied by the child's weight in kg. This amount (in mg) is then added to enough IV solution to equal a total of 100 ml. **When the resulting solution is infused at a rate of 1ml/hr, it will deliver a dosage of 0.1 mcg/kg/min. 2mcg/kg/hr is 2 ml/hr.**

**Rule of 6 quick reference**

| KG | 1 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 2.2 | 4.4 | 6.6 | 8.8 | 17.6 | 22 | 26.4 | 30.8 | 35.2 | 39.6 | 44 |
| Dopamine added to Buretrol | 6 | 12 | 18 | 24 | 48 | 60 | 72 | 82 | 96 | 108 | 120 |
| Epinephrine added to Buretrol | 0.6 | 1.2 | 1.8 | 2.4 | 4.8 | 6.0 | 7.2 | 8.2 | 9.6 | 10.8 | 12.0 |

| KG | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 48.4 | 52.8 | 57.2 | 61.6 | 66 | 70.4 | 74.8 | 79.2 | 83.6 | 88 |
| Dopamine added to Buretrol | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 | 240 |
| Epinephrine added to Buretrol | 13.2 | 14.4 | 15.6 | 16.8 | 18.0 | 19.2 | 20.4 | 21.6 | 22.8 | 24.0 |

| KG | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 92.4 | 96.8 | 101.2 | 105.6 | 110 | 114.4 | 118.8 | 123.2 | 127.6 | 132 |
| Dopamine added to Buretrol | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 |
| Epinephrine added to Buretrol | 25.2 | 26.4 | 27.6 | 28.8 | 30.0 | 31.2 | 32.4 | 33.6 | 34.8 | 36.0 |

Protocol

PM-5

# PED HYPOTENSION AND SHOCK

**SECTION: PM-6**

**PROTOCOL TITLE: PEDIATRIC HYPOGLYCEMIA**

**REVISED: September 14, 2010**

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Protect the patient from harm and keep the patient calm (if not unresponsive)
- Aggressively monitor and protect the airway. Administer supplemental oxygen as tolerated by the patient
- While current state of Idaho BLS regulations do not permit use of a glucometer by BLS personnel, it is acceptable to encourage a family member to obtain a glucometer reading if one is available. Document as appropriate

*Simple carbohydrates/sugars:*

- If the patient can hold a cup or plate without assistance, and can swallow on command, encourage the patient to consume simple carbohydrates. Attempt to document volume of food/liquid ingested. If grams of sugar are known, document this as well
- Oral Glucose
    - If simple carbohydrates are not readily available or not feasible
    - Only if patient retains an intact and self-maintained airway
    - 5-45 g of glucose paste administered orally (providing the patient can swallow on command). Glucose paste may be mixed in a liquid to make it more palatable for the patient. The EMT may stop administration when the patient returns to a full state of awareness and baseline status. NOTE: a full 45 g is not likely to be needed
- Determine patient's color category on length based resuscitation tape (Broselow Tape)
- If hypoglycemia is confirmed by glucometry: (BG < 60 ml/dl with symptoms) Normal Newborn/Neonate BG = 50-110 ml/dl
    - Assess patient's ability to orally consume carbohydrates
    - If patient is able to eat or drink effectively without **any** assistance, administer oral glucose
    - Oral Glucose
        - 5-15 g oral glucose (approximately one-half of a 24 gram tube) self administered by patient
        - Re-assess BGL following administration
        - Repeat if BGL remains < 60 mg/dl with symptoms

# Protocol PM-6

# PED HYPOGLYCEMIA

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Dextrose:
  - If hypoglycemia present
  - 0.5 to 1 g/kg of a 25% solution D25W (D50 diluted with 1:1 NS) Max dosage 25 g
  - Birth to 3 months; use D10 10ml/kg slow IV/IO push
  - >3 months; use D25 4 ml/kg slow IV/IO push
  - See Pediatric Hypoglycemia Protocol (PM-6)

- Glucagon IM:
  - If unable to obtain IV/IO access
  - 0.1 mg (U)/kg
    - Maximum of 1 mg (Unit)
  - Treat and release
  - Complete, Treat and Release," checklist
  - Complete, "Refusal of Treatment and/or Transport," form

**PHYSICIAN PEARLS:**

An inadequate amount of glucose for heat production, combined with profound diaphoresis, many hypoglycemic patients are at risk for hypothermia. Keep patient warm.

Patients who are consuming beta-blockers, or oral diabetic medications, that experience hypoglycemia are at a greater risk for relapse. These patients should have a responsible party with them after release.

Diabetics ages <12 and >65 tend to be more difficult to regulate.

The absence/presence of SZ during hypoglycemia should be assessed, and if present transport should be strongly encouraged.

The following checklist is reproduced as a reference from the *Ada County Emergency Medical Services, Treat and Release Check Sheet for Hypoglycemic Patients.*

**All items in this section must have a YES answer:**

| YES | NO | |
|---|---|---|
| | | 1. Is there a clear reason for the hypoglycemic episode? |
| | | 2. Is the patient alert and oriented? |
| | | 3. Is the patient's repeat BG above 80 mg/dl? |
| | | 4. Has the patient's BG been well controlled prior to this episode? |
| | | 5. Is the patient able to eat a complex carbohydrate meal? |
| | | 6. Does the patient have regular, on-going physician care? |
| | | 7. Is the patient comfortable with non-transport? |
| | | 8. Is the patient/guardian willing to sign a release form? |
| | | 9. Is there another responsible person with the patient? |
| | | 10. Is the patient's temperature within normal limits? (95 - 100.4 Fahrenheit) |
| | | 11The patient is free of the influence of alcohol or other CNS altering drugs? |

**ANY NO ANSWER ABOVE, REQUIRES CONTACT WITH MEDICAL CONTROL PRIOR TO RELEASE.**

Protocol

# PM-6

# PED HYPOGLYCEMIA

Protocol
PM-7

**SECTION: PM-7**

**PROTOCOL TITLE: PED HYPERGLYCEMIA**

**REVISED: January 28, 2010**

**GENERAL COMMENTS:** Symptomatic Hyperglycemia is defined as BG > 250 with signs of severe dehydration, altered LOC or shock. Rule out other causes including toxic ingestion.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Determine patient's color category on length based resuscitation tape (Broselow Tape)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Fluid Resuscitation for symptomatic patients: Especially important in pediatrics, aggressive boluses of IV solution at 10-20 cc/kg per bolus. Multiple boluses may be required, titrate based on v/s, LOC and perfusion status. Monitor for fluid overload
    - IV: Crystalloid solution at a TKO rate
    - 10-20 cc/kg, Repeat as needed

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Monitor for electrolyte based conduction disturbances
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Apply cardiac monitor and multi-function electrode (MFE) pads if necessary
- Treat unstable dysrhythmias and vital signs as necessary and as per specific protocols
    - In the presence of DKA, continuous EKG monitoring is essential to detect rhythm disturbances and changes associated with accompanying electrolyte imbalances and acidosis
    - Primary electrolyte disturbance is due to hypokalemia
        - T-wave flattening, ST-segment depression, appearance of U-waves and QT prolongation
        - Can precede malignant dysrhythmias

PED HYPERGLYCEMIA

Protocol

PM-7

PED HYPERGLYCEMIA

**PHYSICIAN PEARLS:**

- **Pediatrics do not fall under normal T/R guidelines due to age, call medical control to T/R)**

Protocol
PM-8

**SECTION: PM-8**

**PROTOCOL TITLE: PEDIATRIC PAIN CONTROL AND SEDATION**

**REVISED: January 28, 2010**

**GENERAL COMMENTS:** This Protocol supplements Protocol M-12 (Adult Pain Control and Sedation).

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Splint fractures as necessary
- Ice packs as necessary for swelling
- Determine patient's color category on length based resuscitation tape (Broselow Tape)

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

*Analgesia*

- Morphine Sulfate
  - IV/IM/IO: 0.1-0.2 mg/kg repeated every 5-10 min. PRN to a max of 15 mg
- Fentanyl Citrate (Sublimaze)
  - IV/IO/IM: 2-3 mcg/kg IVP every 5-10 min
  - Repeat to a max of 100 mcg

*Sedation for painful procedures and injuries*

- Midazolam (Versed)
  - IV/IM: 0.05-0.1 mg/kg every 5-10 min (over 2-5 minutes if IV). Maximum dose of 2.5 mg
- Diazepam (Valium)
  - IV/IO: 0.2-0.3 mg/kg every 5-10 min PRN.
  - Max of 10 mg

*Spasm*

- Midazolam (Versed)
  - IV: 0.1 mg/kg every 5-10 min (over 2-5 minutes if IV) Maximum dose of 2.5 mg
- Diazepam (Valium)
  - IV: 0.2-0.3 mg/kg every 5-10 min PRN to a max of 10 mg

*Adjunctive medications:* These medications are given for potentiation of other medications or for the prevention/treatment of certain side effects (nausea, EPS, etc) of medications used in pain control or sedation.

*Anti-emetics*

For nausea and vomiting associated with analgesic administration.

- Zofran (ondansetron) IV/IM/IO
    - 0.1 mg/kg to a maximum of 4 mg
- Benadryl (diphenhydramine) IV/IM/IO
    - 1 mg/kg to a maximum of 25 mg

**PHYSICIAN PEARLS:**

Providers at all levels should take a multi-faceted approach to pain control and sedation.

Assessment should be on the 0 → 10 scale when ever possible, using OPQRST as an assessment tool, to provide a quantitative level of discomfort and allow accurate documentation.

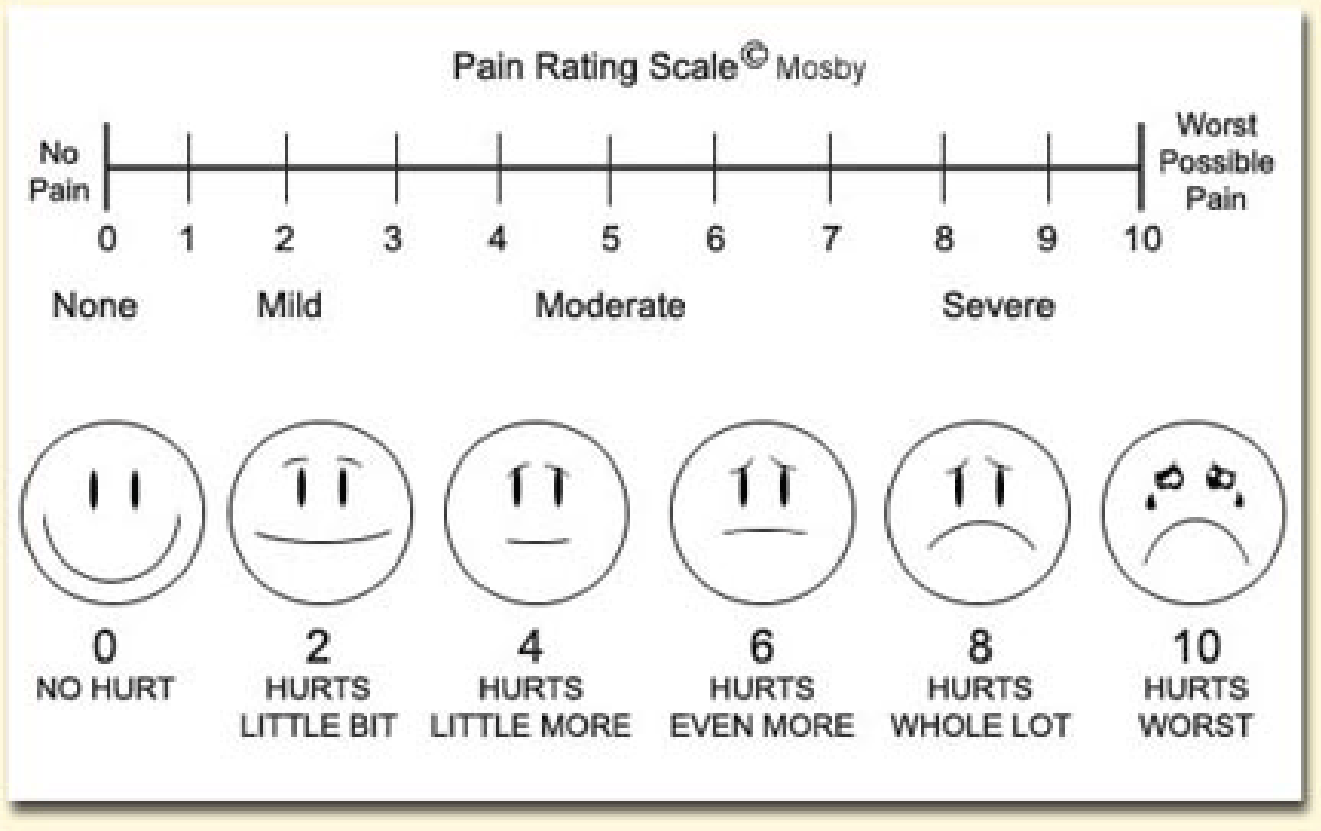
ALS Providers may decrease the dosage of any medication with sedative properties when doing so would decrease adverse effects and still potentially obtain a clinical goal.

Narcotic analgesia used to be considered contraindicated in the prehospital setting for abdominal pain of unknown etiology. It was thought that analgesia would hinder the ER physician or surgeon's evaluation of abdominal pain. It is now becoming widely recognized that severe pain actually confounds physical assessment of the abdomen and that narcotic analgesia rarely diminishes all of the pain related to the abdominal pathology. It would seem to be both prudent & humane to "take the edge off of the pain" in this situation, with the goal of reducing, not necessarily eliminating the discomfort. Additionally, in the practice of modern medicine the exact diagnosis of the etiology of abdominal pain is rarely made on physical examination alone, but also includes laboratory tests, x-ray, ultrasound, and CT scan as essential elements in the diagnosis of abdominal pain. Therefore providing analgesia for abdominal pain is both humane and appropriate medical care.

Protocol

# PM-8

## PED PAIN CONTROL AND SEDATION



Protocol
PM-9

**SECTION: PM-9**

**PROTOCOL TITLE: Pediatric Nausea, Vomiting, Vertigo and Dehydration**

**REVISED: January 28, 2010**

PED NAUSEA, VOMITING, VERITIGO AND DEHYDRATION

**GENERAL COMMENTS:** Nausea and vomiting are general complaints that can have any number of underlying causes. Care should be taken to screen for significant pathology and treat accordingly. Dehydration can have significant impact on a Childs health, and left un-checked, progress to life-threatening shock.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- IV access (to a max of three attempts) only if needed due to severity of underlying injury or illness, or marked dehydration. Otherwise defer until arrival of ALS providers
    - IV: Crystalloid solution at a TKO rate
    - 10-20 cc/kg, repeat as needed for 3 total boluses
- IO access: as needed for markedly critical patients after unsuccessful peripheral vascular access. Follow fluid administration guidelines as above

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Assess and treat underlying disorder
- BG as appropriate

*Antiemetics*

- Zofran (ondansetron) IV/IM/IO
    - 0.1 mg/kg to a maximum of 4 mg
- Benadryl (diphenhydramine) IV/IM/IO
    - 1 mg/kg to a maximum of 25 mg
- Diphenhydramine (Benadryl)
    - IV, IM: 1-2 mg/kg
    - Max dose of 25 mg

*Benzodiazepines:* To be used for inner ear pathology (vertigo, labrynthitis, etc)

- Diazepam (Valium)
    - IV: 0.2-0.3 mg/kg given slowly. Repeat every 5-10 minutes PRN
    - PR: 0.5 mg/kg
    - MAXIMUM DOSAGE: 10 mg

Protocol

PM-9

PED NAUSEA, VOMITING, VERITIGO AND DEHYDRATION

**PHYSICIAN PEARLS:**

*ALS Providers may decrease the dosage, or prolong the administration intervals of any medication with sedative properties when doing so would decrease adverse effects and still likely obtain the clinical goal.*

**Providers should assess for acute onset of Diabetes Mellitus and hyperglycemia as a cause of persistent nausea, vomiting, and dehydration. Previously undiagnosed diabetes and/or hyperglycemia should be evaluated by a physician ASAP.**

Protocol
PM-10

**SECTION: PM-10**

**PROTOCOL TITLE: PEDIATRIC TOXICOLOGICAL EMERGENCIES**

**REVISED: September 28, 2010**

**GENERAL COMMENTS:** This protocol directly supplements protocols R-1 through R-8 (Adult Toxicological Emergencies.)

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

*Seizures secondary to toxic ingestion*:
- Follow Pediatric seizure Protocol (PM-4)

*Hypotension secondary to toxic ingestion*:
- Follow Pediatric Hypotension and shock protocol (PM-5)

*Suspected (symptomatic) opiate ingestion:*
- Narcan
  - IV/ETT/IO: 0.01-0.05 mg/kg to max single dose of 2 mg. Repeat PRN

*Suspected TCA overdose: (do not administer Procainamide)*
- Sodium Bicarbonate for s/s of TCA toxicity
  - IV: 1 meq/kg IV
  - Rebolus in 5-10 min at 0.5 meq/kg if s/s persist
  - OPTIONAL INFUSION: 50-meq/1000 cc, run at 150 cc/hr, titrated for effect.
- Lidocaine (Xylocaine) *for ectopy or Ventricular Tachycardia REFRACTORY to Sodium Bicarbonate*.
  - IV or IO: 1 mg/kg
  - Max 3mg/kg
- Magnesium Sulfate *(for Torsades REFRACTORY to sodium Bicarbonate)*
  - IV or IO: 25-50 mg/kg in 100 cc infused over 2-5 min
  - Max 2 g

PED TOXICOLOGICAL EMERGENCIES

*Calcium channel blocker/beta blocker ingestion*

- **Calcium Chloride (for Calcium Channel Blockers Only)**
    - IV (Slow): 2-4 mg/kg every 10 minutes until S/S improve
- **Glucagon**
    - IV, IM, SQ: 0.1 mg/kg to a max of 1 mg every 5 minutes as needed and as available.
    - Do not use diluents (e.g. propylene glycol) supplied with single use kits. Use Normal Saline instead.
- **Epinephrine Infusion**
    - 0.1-2 mcg/kg/min

*Organophosphate Exposure*

- Atropine Sulfate
    - IV/IO/IM: 0.05 mg/kg, repeated PRN for continued symptoms

*Hyperdynamic drug ingestion/exposure (with active S/S)*

- Diazepam (Valium)
    - IV/IM: 0.2-0.3 mg/kg every 5-10 min PRN to a max of 10 mg
- Midazolam (Versed)
    - IV/IM: 0.1 mg/kg every 5-10 min (over 2-5 minutes if IV). Maximum dose of 2.5 mg
- NTG Spray: For hypertension and suspected coronary vasospasm/A.C.S.
    - SL: 0.4 mg SL spray/tab every 3-5 minutes PRN.
    - Hold for B/P <90, ingestion of Viagra use (or similar drug) within previous 24 hours. Use with caution in suspected right-sided MI

*EPS:*

- Benadryl (Diphenhydramine)
    - IV/IM: 1-2 mg/kg IVP max of 25 mg

**PHYSICIAN PEARLS:**

The following are high risk toxicological situations that should be evaluated at a hospital regardless of clinical stability. *These are the substances that, for a variety of reasons, result in the highest ICU admissions.*

- Any situation where 2 or more agents/drugs may be involved (Poly-Pharmacy ingestion). 44% of fatal pediatric overdoses involve more than one substance
- Iron Ingestions (as little as 20-60mg/kg) Iron ingestions may present with a latent period at about 1-6 hours with cardiovascular collapse occurring 12-24 hours post ingestion. Commonly found in OTC supplements, *iron ingestions are the leading cause of pediatric fatal ingestion*
- Hyperdynamic Drug Ingestions/Meth Lab exposures
- Antidepressants: Tricyclic Antidepressants (TCAs) are especially high risk
- Anticonvulsants
    - Benzodiazepines
    - Depakote
- Digitalis (Nightshade) or Digitalis containing substances. (Digoxin)
- Opiates
- Hydrocarbon-based household products:
    - Gasoline, kerosene, etc
    - Gases & fumes (huffing)
- Alcohols: Alcoholic Beverages, Wood Alcohol, Etc.
- Cleaning substances

*In addition to the above substances, the following situations and symptoms are also worrisome with suspected toxic ingestion, and should be transported to the hospital.*

- Sudden onset of:
    - Abdominal pain
    - Nausea
    - Vomiting
- Sudden onset of CNS signs:
    - Seizures
    - Coma
    - Decreased LOC
    - Bizarre behavior
    - Abnormal walking gait
- Sudden onset of unexplained illness
- Bizarre, incomplete, evasive history
    - Suspect abuse, neglect, or illegal activity.
- Pediatric patient with cardio-respiratory distress

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**SECTION: PM-11**

**PROTOCOL TITLE: General Newborn Care**

**REVISED: January 28, 2010**

**GENERAL COMMENTS:** Care is focused around an Assessment→ Action →Reassessment Cycle. These Critical re-assessments are done every 15-30 seconds, moving up and down the Inverted Pediatric Pyramid as needed.

**BLS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

*Critical Assessments*

- Critical reassessments include:
  - Heart Rate
  - Respiratory Effort/Vigor
  - Peripheral and Central Perfusion

*Critical Interventions*

- Heat Conservation and Stimulation
  - Dry, warm and use "Port-a-warm Mattress"
  - Tactile Stimulation (rub back)
- Oxygenation and Ventilations
  - Blow-by O2
  - BVM
  - Properly pad under shoulders to maintain good airway alignment
- Chest Compressions: 3 compressions:1 ventilation ratio
  - Initiate for complete cardiac arrest and for HR <60 refractory to Drying, warming, stimulation, oxygenation and ventilations

**ILS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

**ALS SPECIFIC CARE:** *See General Pediatric Care Protocol PM-1*

- Oxygenation and Ventilation
  - ETT placement for patient's refractory to BLS measures.
  - Trans-tracheal suction of meconium prior to ventilation.
  - OG to decompress stomach

***Pharmacologic therapy:***

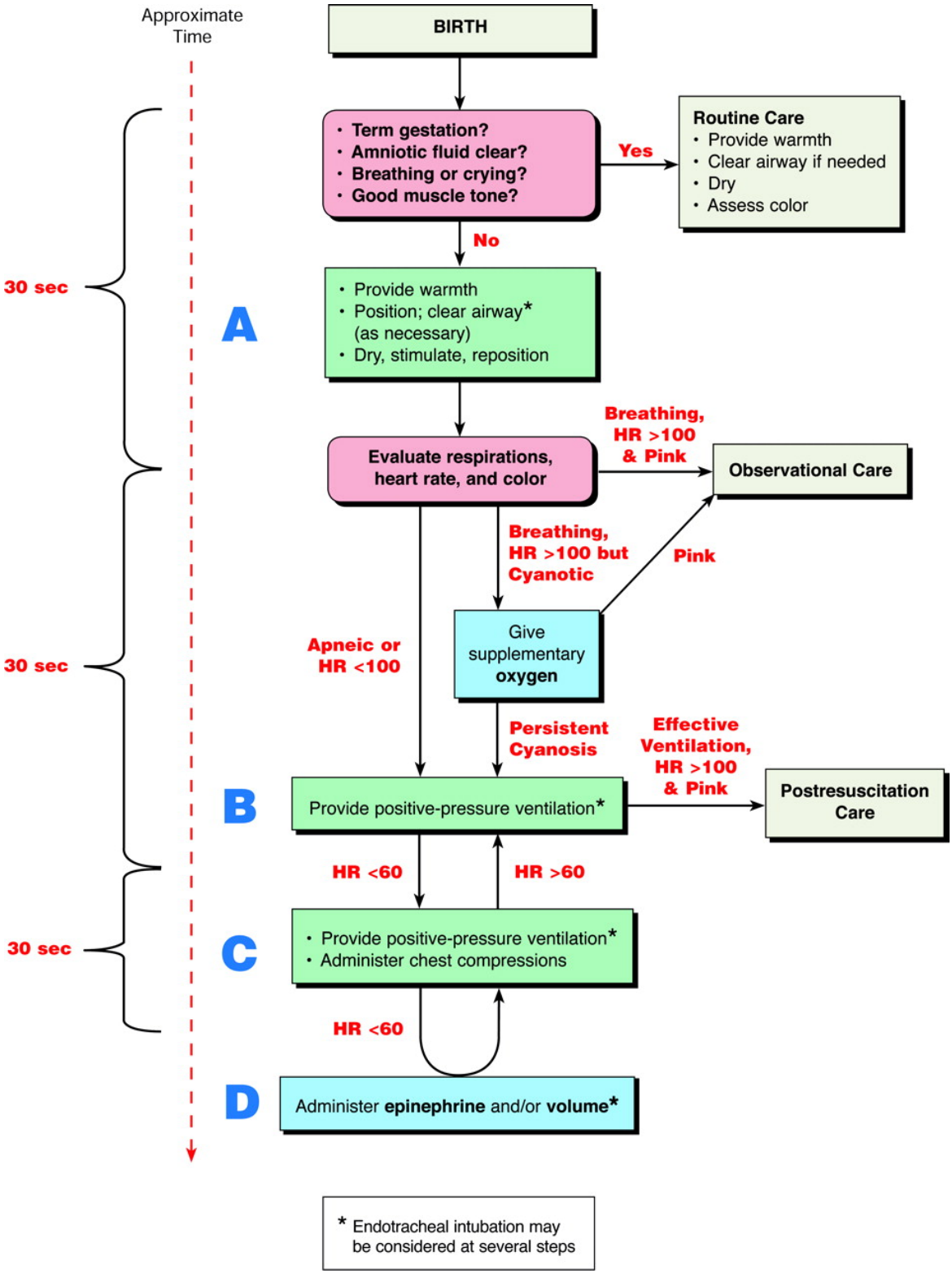
- **Epinephrine:**
  - Indicated if heart rate remains < 60 bpm despite adequate ventilation with 100% oxygen and chest compression
  - IV/IO:
    - 0.01-0.03 mg/kg 1:10,000 every 3-5 minutes as needed
  - ETT:
    - 0.03-0.1 mg/kg 1:10,000 every 3-5 minutes as needed

- Dextrose
  - For neonatal hypoglycemia.
  - Blood glucose level < 40 mg/dl
    - 2 ml/kg $D_{10}$
- Narcan (naloxone)
  - 0.1 mg/kg
  - Do not administer to newborn of a mother with history of narcotics dependence
  - Indicated if ***both*** of the following are present:
    - Continued respiratory depression after positive pressure ventilation has restored normal heart rate and color
    - History of maternal narcotic administration/ingestion within the last 4 hours

*Fluid therapy : IV/IO*

- Indicated if neonate appears to be in shock, there is evidence of blood loss (e.g. placental abrubtion/previa or blood loss from umbilical cord) and is unresponsive to resuscitation
- 10 ml/kg normal saline over 5-10 minutes
- Administer a second dose if necessary

## Neonatal Care / Resuscitation



# Protocol PM-11

# GENERAL NEWBORN CARE

## PHYSICIAN PEARLS:

Basic Newborn Care is focused around respiratory support with hypothermia and hypoglycemia close seconds.

Newborns lose heat rapidly and need to be kept warm to decrease oxygen demands and prevent metabolic acidosis.

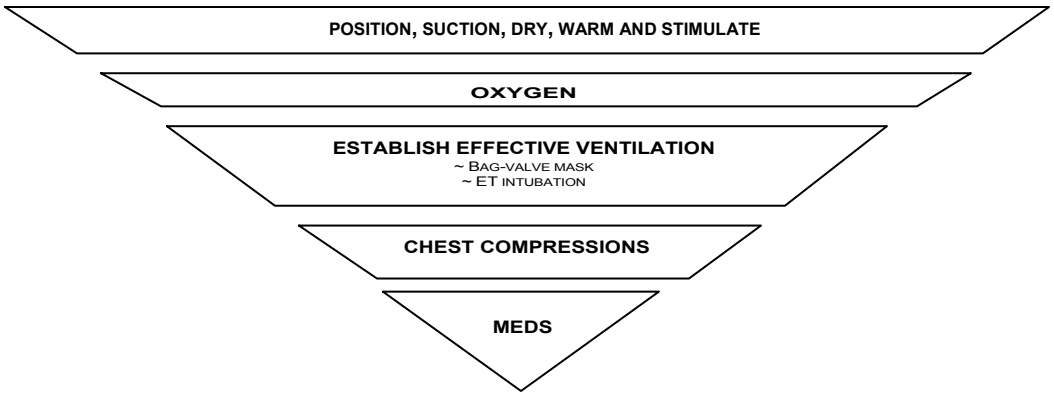
Narcan should be used with caution in narcotic depressed newborns, and only after ventilation with O2 has proved unsuccessful.

When dealing with such a short trachea, remember that movement less than 1 centimeter in endotracheal tube position can result in inadvertent extubation. Consider immobilization of entire head and neck to protect tube placement.

If there is thick meconium present in the amniotic fluid at the time of delivery, the infant should be intubated and any meconium present in the airway should be suctioned prior to stimulation using the meconium aspirator. Discard the ET tube used to suction the meconium and intubate with a clean ET tube.

Always be prepared for resuscitation at childbirth. Risk factors, while important, are poor predictors of birth asphyxia. Up to half of newborns that require resuscitation have no identifiable risk factors before birth.

Chest Compressions: The 2-thumb, (encircling-hands method) of chest compression is preferred, and is believed to provide better CPR. Depth of compression is one-third the diameter of the chest and sufficient to generate a palpable pulse. The ratio should be **APGAR** Score: Perform 1 and 5 minute APGAR assessment




| Sign | 0 | 1 | 2 |
|---|---|---|---|
| **Heart Rate** | Absent | <100 | >100 |
| **Respirations** | Absent | Slow, ineffective, irregular | Good and Crying |
| **Muscle Tone/ activity** | Limp | Some Flexion | Active Motion |
| **Reflex Irritability /Grimace** | None | Grimace | Cough or sneeze Pulls away |
| **Color** | Central Cyanosis Blue/Pale | Central Pink Peripheral Blue | Completely Pink |

RX

**Drug Name:** **Acetylsalicylic Acid**

**Trade Name:** **Aspirin, ASA**

**Class:**

- NSAID (Analgesic, anti-inflammatory)
- Anti-platelet aggregation agent
- Antipyretic

**Mechanism of Action:**

- Aspirin inhibits the formation of COX, which is responsible for the conversion of arachadonic acid to prostaglandin (the first step in the arachadonic acid cascade).
- Blocks the formation of Thromboxane $A_2$ & prostacyclin. Thromboxane $A_2$ causes platelet aggregation and vasoconstriction. Prostacyclin inhibits platelet aggregation and vasodilation. Clinically the blockage of Thromboxane $A_2$ predominates.
- By suppressing the formation of prostaglandins near the hypothalmus, aspirin promotes a return to a normal body temperature set point.
- The effects of pain relief and anti-inflammation are also related to the blockage of the arachadonic acid cascade.

**Indications:**

- Chest pain suggestive of AMI

**Contraindications:**

- Active Bleeding Disorders
- Pregnancy (D)
- Known hypersensitivity

***Relative Contraindications***:

*Asthma (Aspirin triad—hypersensitivity, asthma, nasal polyps)*

**Precautions:**

- Use with caution in patients who report allergies to any NSAID.

**Dosage:**

**Adults:**

- Four 81 mg tablets PO, chewed & swallowed.

**Pediatrics:**

- Not administered to children with an acute viral illness including varicella & influenza (Reye's Syndrome)

**Onset:**

- 15-30 minutes

**Duration:**

- 4-6 hours

**Side Effects:**

- GI Irritation (i.e. Heartburn)
- GI Bleeding
- N/V
- Hypersensitivity Reaction—bronchospasm, urticaria.
- Prolonged bleeding time

**DRUG: ACETYLSALICYLIC ACID**

RX

DRUG: ACETYLSALICYLIC ACID

**Interactions:**

- When administered together, ASA & other anti-inflammatories may cause increased side effects, and increased blood levels of both drugs.
- Administration of ASA with antacids may reduce blood levels by reducing GI absorption.

***PEARLS:***

- ***ASA should be administered to <u>ALL</u> ACS patients in the acute setting even if they are regularly taking ASA. Unless ASA has been taken by the patient immediately prior to or after the onset of symptoms.***
- ***The exception is if patients are currently taking anticoagulants, ASA should be withheld.***
- ***Toxicology:***
  - ***150-300 mg/kg—mild toxicity***
  - ***300-500 mg/kg—serious toxicity***
  - ***> 500 mg/kg—lethal toxicity***

RX

**Drug Name:** **Adenosine**

**Trade Name:** **Adenocard**

**Class:**

- Supraventricular Antiarrhytmic
- Endogenous purine nucleoside (present in all cells, wide range of metabolic roles, formed as a breakdown product of ATP.)

**Mechanism of Action:**

Slows tachycardias associated with the AV node via modulation of the autonomic nervous system without causing negative inotropic effects. It acts directly on sinus pacemaker cells and vagal nerve terminals to decrease chronotropic & dromotropic activity. Thus it:

- Slows conduction through the AV node
- Blocks reentry pathways through the AV node
- Can slow conduction in the SA node somewhat

**Indications:**

- PSVT (including WPW) refractory to vagal maneuvers

**Contraindications:**

- 2nd or 3rd degree heart block (without a functioning pacemaker)
- Sick sinus syndrome
- Known hypersensitivity
- Pregnancy (C)
- Known atrial fibrillation or atrial flutter (not effective in managing these arrhythmias)
- Irregular Wide-complex tachycardias

**Precautions:**

- **May cause refractory bronchospasm. Use with caution with COPD and Asthma.**

**Dosage:**

**Adults:**

- 6 mg rapid IV bolus followed by 20 ml flush
- No response in 1-2 minutes—12 mg
- After 2 additional minutes—12 mg

**Pediatrics:**

- 0.1 mg/kg.
- Max intial dose: 6 mg
- if no effect, 0.2 mg/kg x 2 PRN
- Maximum single dose: 12 mg

***Rapid administration (over 1-2 seconds) is imperative due to the extremely short half-life. It should be given as proximal to the heart as possible (i.e. Antecubital veins)***

**DRUG: ADENOSINE**

RX

# DRUG: ADENOSINE

**Onset:**

- 30 seconds or less

**Duration:**

- 10 seconds

**Side Effects:**

- Flushing
- Chest Pain
- Dyspnea
- Headache
- Diaphoresis
- Metallic Taste
- Dizziness, Lightheadedness
- Numbness
- Nausea/Vomiting
- Palpitations

**Interactions:**

- Additive Effects—digoxin, calcium channel blockers
- Antagonistic Effects—methylxanthines (caffeine, theophylline)
- Potentiating Effects—dipyridamole (Persantine)

***PEARLS:***

- ***Advising patient of the side effects of adenosine prior to administering can help minimize patient anxiety.***
- ***Large bore IV, antecubital access***
- ***IV wide open during administration***
- ***It may help to have your partner administer the fluid bolus***
- ***Start your EKG printout before administration, and continue printing through bolus and conversion.***
- ***Administration of adenosine will cause a period of asystole & various conversion dysrhythmias, be patient, most will transiently resolve. Those that don't convert (rare) are treated symptomatically.***
- ***Be prepared to treat life threatening problems.***

RX

**Drug Name:** **Albuterol Sulfate**

**Trade Name:** **Albuterol, Proventil, Ventolin**

**Class:**

- $Beta_2$ Agonist
- Sympathomimetic

**Mechanism of Action:**

Acts selectively on $Beta_2$ receptor sites in the lungs, relaxing bronchial smooth muscle, decreasing airway resistance, & relief of bronchospasm. Although Albuterol is beta selective, it will cause some CNS stimulation, cardiac stimulation, increased diuresis, & gastric acid secretion.

**Indications:**

- Bronchial asthma
- Bronchospasm in acute exacerbation of COPD (chronic bronchitis, emphysema)
- Bronchospasm associated with cardiac asthma
- Bronchospasm in:
  Anaphylaxis
  Burns

Toxic Inhalations

**Contraindications:**

- Known hypersensitivity
- Tachydysrhythmias

**Precautions:**

- HTN
- Lactation & Pregnancy (C)
- Diabetes
- Seizures
- Known cardiac disease
- Hyperthyroidism
  *For the above reasons, use with caution in geriatric patients.*

**CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one hour following treatment for return of symptoms.**

**Dosage:**

**Adults:**

- MDI—1-2 inhalations, 1 minute each, repeated every 15 minutes as needed.
- Nebulizer—2.5 mg via nebulizer, $O_2$ flow @ 8 L per min, normally takes 8-12 minutes to administer. May repeat as needed.
- Hyperkalemia (Intubated): 4 unit doses (10 mg) directly down ETT followed by hyperventilation.

**Pediatrics:**

- MDI—compliance with MDI difficult to achieve, nebulizer preferred.
- Nebulizer—Local respiratory experts have seen no reason to specify a different dosage for pediatrics.

RX

DRUG: ALBUTEROL

**Onset:**

- 5-15 minutes after inhalation, usually with some prompt improvement

**Duration:**

- 3-4 hours

**Side Effects:**

Mostly sympathetic responses including:

- Palpitations, Tachycardia
- Anxiety, Nervousness
- Dizziness
- HA
- Tremor
- N/V

Less frequent, but more concerning:

- HTN
- Dysrhythmias
- Chest pain

**Interactions:**

- Antagonistic Effects—Beta blockers including propranolol & esmolol.
- Additive Effects—MAOI's, TCA's, other sympathomimetics

***PEARLS:***

- ***The first dose is administered in conjunction with atrovent. Second and subsequent nebulizers are with albuterol only.***
- ***The nebulizer system can be adapted to accommodate a mask if the patient is too fatigued or working too hard to hold the nebulizer. It can also be adapted to ET administration. Both ET & mask nebulizer treatments should have an O2 flow rate of 8-10 L/min.***
- ***The medication chamber should be kept upright to ensure efficient medication administration, patients have a tendency to tilt the chamber, recheck it often. "Tap" the container toward the end of the treatment to ensure complete administration.***
- ***Monitor for dramatic increase in heart rate, development of frequent ventricular ectopy, or development of serious CNS symptoms.***
- ***Albuterol can cause hyperglycemia and hypokalemia. Both of these effects occur from stimulation of beta$_2$-receptors, resulting in gluconeogenesis and intracellular movement of potassium. These effects occur most commonly with inhalation (via nebulization) of relatively large doses of albuterol (e.g., 5—10 mg).***

RX

**Drug Name:** **Amiodarone**

**Trade Name:** **Cordarone, Pacerone**

**Class:**

- Class III antidysrhythmic.

**Mechanism of Action:**

- Prolongs duration of the action potential.
- Prolongs effective refractory period.
- Non-competitively inhibits alpha & beta receptors and possesses vagolytic & calcium channel blocking properties.
- Negative dromotrope, chronotrope, & vasodilator.

**Indications:**

- Pulseless ventricular tachycardia (VT) and ventricular fibrillation (VF).
- Ventricular tachycardia (VT) with a pulse.

**Contraindications:**

- Pulmonary Congestion
- Cardiogenic Shock
- Amiodorone Sensitivity
- Bradycardia
- Procainamide use
- TCA Overdose

**Precaution:**

- Hypotension
- Heart failure
- Long QT syndrome

**Dosage:**

**Adults:**

**Pulseless VT/VF:**

- 300 mg IV/IO initial dose, consider repeat dose of 150 mg 3-5 minutes after initial dose.

**Wide Complex Tachycardia:**

- 150 mg IV infusion over 10 minutes. May repeat every 10 minutes as needed. Mix 150 mg in 20cc NS in a buretrol and drip at a rate of 120 gtts/min.

**Pediatrics:**

**Pulseless VT/VF:**

- 5 mg/kg IV/IO. May repeat doses up to 15 mg/kg (max dose of 300 mg).

**Wide Complex Tachycardia:**

- 5 mg/kg IV/IO over 20-60 min. May repeat does up to 15 mg/kg (max dose of 300 mg).

RX

# Amiodarone

**Side Effects:**

- Hypotension
- Headache
- Dizziness
- Bradycardia
- AV nodal conduction abnormalities
- QT prolongation
- Flushing
- Salivation

**Interactions:**

- Potentiates bradycardia and hypotension with calcium channel blockers and beta blockers.
- Increases risk of AV nodal blockade with calcium channel blockers.
- May increase anticoagulation effects of Warfarin.
- May increase serum levels of Phenytion, Procainamide, Quinidine, and Theophylines.
- Should not be used with other medications which prolong the QT interval.
- Should not run through the same IV line in which Sodium Bicarb or Furosemide have been used.

**Precautions:**

- Rapid infusion may lead to hypotension.
- Terminal elimination is extremely long (half-life lasts up to 40 days).

RX

**Drug Name:** **Atropine Sulfate**

**Trade Name:** **Atropine**

**Class:**

- Parasympatholytic
- Anticholinergic Agent

**Mechanism of Action:**

- Atropine is a competitive inhibitor of acetylcholine @ muscarinic receptor sites.
- The increase of sympathetic activity seen with atropine administration is due to the drug's parasympatholytic effects.
- In the setting of *symptomatic bradycardias*, atropine decreases vagal effects on the heart resulting in increased chronotropy & dromotropy (with little or no inotropic effects).
- It is used in *cholinergic exposures* as a direct antidote for the poison.

**Indications:**

- Symptomatic Bradycardias
- Pre-intubation in children < one month of age
- Poisoning with:

| | |
|---|---|
| *Organophosphates* | *Nerve gas* |
| *Carbamates* | *Other cholinergic agents* |
| *Mushrooms* | |

**Contraindications:**

- In the arrest setting, there are no contraindications

**Non-arrest contraindications**:

- Myasthenia gravis
- Closed-angle glaucoma
- Atrial fibrillation & flutter
- Known hypersensitivity
- Thyrotoxicosis
- Urinary tract obstruction

**Precautions:**

- Atropine may actually worsen 2nd degree Type II & 3rd degree AV blocks. *Many experts go as far as to indicate atropine is relatively contraindicated in this setting & transcutaneous pacing is preferred.*
- Cardiovascular disease including: CAD & CHF
- COPD
- HTN
- Renal/hepatic disease
- Geriatrics
- Pregnancy I
- Minimum Doses <0.5 mg in adults
  <0.1 mg in children

**Smaller doses can cause a paradoxical bradycardia**.

DRUG: ATROPINE SULFATE

RX

# DRUG: ATROPINE SULFATE

**Dosage:**

**Adults:**

- Symptomatic Bradycardia: **IV**: 0.5 mg to 1 mg every 3-5 minutes.
  **Max dose**: 0.04 mg/kg (full vagal blockade).
- Poisonings: **IV/IM/ET/IO:** 1-2 mg as needed to decrease cholinergic symptoms.
  **AUTOINJECTOR (MARK 1 KIT)**: 2 mg

**Pediatrics:**

- Symptomatic Bradycardias: **IV/IO:** 0.02 mg/kg repeated every 3-5 minutes as needed.

| | | |
|---|---|---|
| Child: | Minimum—0.1 mg | Maximum—0.5 mg |
| Adolescent: | Minimum—0.1 mg | Maximum—1 mg |

  **ET:** 2-3 times the IV dose diluted in 3-5 ml NS
- Poisonings: **IV/IM**: 0.05 mg/kg IV every 3-5 minutes as needed to decrease cholinergic symptoms.
- Pediatric Pre-Intubation: **IV/IO:** 0.02 mg/kg

**Onset:**

- Rapid

**Duration:**

- 2-6 hours

**Side Effects:**

- Anticholinergic Effects: Remember the mneumonic:
  **DRY AS A BONE**—Dry mucous membranes, urinary retention, constipation
  **MAD AS A HATTER**—Restlessness, tachycardia, palpitations, HA, dizziness
  **RED AS A BEET**—Flushed, hot, & dry skin
  **BLIND AS A BAT**—Pupillary dilation (mydriasis), blurred vision (cycloplegia), photophobia
- Tachydysrhythmias, Ventricular Tachycardia/Fibrillation
- Of course…N/V

**Interactions**:

- Anticholinergics increase vagal blockade.
- Potential adverse effects when administered with digitalis, cholinergics, neostigmine.
- Enhanced effects are possible with antihistamines, procainamide, quinidine, antipsychotics, antidepressants, benzodiazepines, phenothiazines.
- When administered too soon after NaHCO3 (i.e. Without allowing sufficient fluid to flush the line), a precipitate will form.

RX

DRUG: ATROPINE SULFATE

***PEARLS:***

- ***To recognize cholinergic poisonings remember the SLUDGE, DUMBELS, and Days of the week mnemonics.***
- ***Pushing a less than the minimum dose or pushing atropine too slowly may elicit a paradoxical bradycardia.***
- ***Remember most bradycardias in pediatrics are a result of hypoxia/hypoxemia rather than a primary cardiac problem. Ventilation is always preferred over pharmacological intervention.***
- ***Avoid being splashed in the eyes with atropine.***
- ***Be prepared, on physician order, to deliver massive amounts (10-40mg) in the setting of cholinergic poisoning.***

*Mnemonics for nerve agent/organophosphate/Carbamate exposure*

| **"S.L.U.D.G.E".** | **"D.U.M.B.E.L.S." (Muscarinic)** |
|---|---|
| **S**alivation (excessive production of saliva) | **D**iarrhea |
| **L**acrimation (excessive tearing) | **U**rination |
| **U**rination (uncontrolled urine production) | **M**iosis |
| **D**efecation (uncontrolled bowel movement) | **B**radycardia/Bronchospasm/Bronchorrhea |
| **G**astrointestinal distress (cramps) | **E**mesis |
| **E**mesis (excessive vomiting) | **L**acrimation |
| **"B.A.M."** | **S**alivation, Secretion, Sweating |
| **B**reathing Difficulty (wheezing) | **Days of the Week (Nicotenic)** |
| **A**rrhythmias (Bradycardia, ventr. Arrhythmias, AV Blocks. ) | **M**ydriasis |
| **M**iosis (pinpoint pupils) | **T**achycardia |
| "Three C's" of CNS effects | **W**eakness |
| **C**onfusion | **H**ypertension, Hyperglycemia |
| **C**onvulsions | **F**asciculations |
| **C**oma | |

RX

DRUG: ATROPINE SULFATE

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RX

**Drug Name:** **Calcium Chloride**

**Trade Name:** **Calcium Chloride, Calcium, CaCl2**

**Class**:

- Electrolyte replacement

**Mechanism of Action:**

- Increase the force of cardiac contractility, by initiating myofibril shortening
- In normally functioning hearts calcium will produce positive inotropic and vasoconstrictive effects and increase systemic arterial blood pressure
- In abnormally functioning hearts calcium will produce positive inotropic effects may increase or decrease systemic vascular resistance
- It also appears to increase ventricular automaticity

**Indications:**

- Hyperkalemia
- Hypermagnesemia (Antidote for respiratory depression due to $MgSO_4$ administration)
- Hypocalcemia (Ca Blocker Overdose)

**Contraindications:**

- Hypercalcemia
- Digitalis toxicity
- VF during resuscitation

**Precautions:**

- May induce digitalis toxicity in patients receiving digoxin
- Can cause tissue necrosis & sloughing
- Pregnancy (C)
- Respiratory disease
- Cor pulmonale
- Respiratory Failure

**Dosage:**

**Adults:**

- Hyperkalemia, Asystole/PEA with suspected hyperkalemia, and Calcium Channel BLOCKER Overdose--500-1000 mg slow IV push

**Pediatrics:**

- 20 mg/kg infused slowly over 10 minutes (no faster than 100 mg/min) Max--1 g / dose

**Onset:**

- 5-15 minutes

**Duration:**

- Dose dependent (effects may persist for 4 hrs. after IV administration)

**DRUG: CALCIUM CHLORIDE**

RX

DRUG: CALCIUM CHLORIDE

**Side Effects:**

- Metallic taste
- Burning
- "Heat waves"
- Bradycardia (may cause asystole)
- Hypotension
- Cardiac arrhythmias
- Increased digitalis toxicity
- Extravasation with necrosis and sloughing
- Vasospasm in coronary and cerebral arteries.
- N/V

**Interactions:**

- Precipitates with sodium bicarbonate, epinephrine and potassium phosphate
- When given to a patient on Digoxin, can cause elevated Digoxin levels and possibly digitalis toxicity
- May antagonize the effects of Verapamil

***PEARLS:***

- ***Standard medical control and deviation guidelines apply unless otherwise stated.***
- ***To prevent tissue necrosis, make sure to administer the drug through an IV that is patent and flowing well.***
- ***Flush well between administration of calcium & sodium bicarb to avoid precipitate.***
- ***May sometimes be requested by medical control to be co-administered with Cardizem to offset hypotension in hypotensive patients.***

RX

**Drug Name:** **Dextrose 50% in Water**
**Trade Name:** **Dextrose, D50, D50W, Glucose**

**Class:**

- Monosaccharide, principal form of carbohydrate used in the body.

**Mechanism of Action:**

- Increases serum blood glucose levels

**Indications:**

- Hypoglycemia confirmed by glucometer
- Coma or seizure of unknown etiology
- Refractory cardiac arrest (controversial)

**Contraindications:**

- Intracranial Hemorrhage
- CVA
- Closed Head Injury

**Precautions:**

- Can precipitate severe neurologic impairment in alcoholic patients (Wernicke-Korsakoff's syndrome)
- This is related to thiamine deficiency and thiamine should be given before D50 in these cases
- If smaller veins are used, local venous irritation may occur.
- Infiltration may cause necrosis

**Dosage:**

**Adults:**

- ½ to 1 full amp slow IV (25 to 100 ml of 50% solution)

.

**Pediatrics:**

- Birth to 3 months; use D10 10ml/kg slow IV/IO push
- >3 months; use D25 4 ml/kg slow IV/IO push
- See Pediatric Hypoglycemia Protocol (PM-6)

**Onset:**

- Can be a minute or less to see immediate improvement, usually 5-20 minutes to see complete resolution of signs and symptoms.

**Duration:**

- Depends on the degree of hypoglycemia. Sometimes long acting insulin may cause a recurrence of hypoglycemia after the initial glucose is metabolized

**Side Effects:**

- Pain, warmth, burning upon administration.
- Phlebitis, sclerosis, and thrombosis of vein can occur
- Rhabdomyositis
- Infiltration can cause necrosis & extravasation

**Interactions:**

- None significant

**DRUG: DEXTROSE 50%**

RX

DRUG: DEXTROSE 50%

**PEARLS:**

- Symptomatic hypoglycemia nearly always means an altered mental status. Altered mental status often means a scene safety issue. **Make sure you are aware of your environment**, have the assistance you need, and leave if you become uncomfortable.
- Check a glucometer reading before administering D50 if at all possible. Repeat at least 10 minutes after.
- Use a reasonably large bore IV & and a reasonably large vein.
- Run fluid wide open while administering D50. Check venous patency often.
- Also, it is acceptable to revive a hypoglycemic patient without using the full dose. This is done based on the promptness of the patient response.
- If the patient refuses transport it is required to get them something substantive to eat and that someone will be with them for awhile.
- Commonly, there is an explanation for hypoglycemia if you look for it. Poor compliance, increased stress, decreased sleep, illness, change in insulin regiment, etc.
- If a patient becomes symptomatically hypoglycemic from oral hypoglycemics, they should generally be transported.
- The effects of long acting insulin are difficult to predict. Therefore the effects of an intentional overdose on long acting insulin, are prolonged and beyond the normal capability of the paramedic to treat and release.
- Also if a patient's family, friends, or relatives are present, they can be a good source of information about the patient's habits and their normal recovery from hypoglycemia.
- Follow the Diabetic Treat and Release protocol for diabetics who do not desire transport.

RX

**Drug Name:** **Diazepam**

**Trade Name:** **Valium, Diastat**

**Class:**

Benzodiazepine (nonbarbiturate sedative-hypnotic agent)
Anticonvulsant
Skeletal Muscle Relaxant
Schedule IV Controlled Substance

**Mechanism of Action:**

Acts at the level of the limbic, thalamic, and hypothalamic regions of the CNS through potentiation of GABA (inhibitory neurotransmitter).

Decreases neural cell activity in all regions of CNS.

Anxiety is decreased by inhibiting cortical and limbic arousal.

Promotes relaxation through inhibition of spinal motor reflex pathway, also depresses muscle & motor nerve function directly.

As an anticonvulsant, augments presynaptic inhibitions of neurons, limiting the spread of electrical activity. However, they do not alter the electrical activity of the seizure's focus.

**Indications:**

- Major motor seizures
- Status Epilepticus
- Acute anxiety
- Skeletal muscle relaxant
- Management of alcohol withdrawal symptoms
- Vertigo

**Contraindications:**

- Shock
- Coma
- Respiratory Depression
- Hypersensitivity
- Closed Angle Glaucoma

**Precautions:**

- Reduced dose for Geriatrics (some sources advocate 50%)
- Use caution when administering to patients with:Hepatic dysfunction
- Current Substance Abuse (CNS depressants, including alcohol)
- Renal insufficiency
- History of drug addiction
- Parkinson's Disease
- Myasthenia gravis
- Pregnancy (D)

**Dosage:**

**Adults:** (No faster than 5 mg/min)

- Seizures: 2-10 mg slow IV (5-10mg rectally). **Max 20 mg**
- Behavioral Emergencies: 2-5 mg slow IV every 5-10 minutes or IM repeated once in 20 minutes, **Max 20 mg**
- Sedation/Cardioversion/Pacing/ Muscle spasm/ Labrynthitis/Vertigo /Inner ear signs and symptoms: 2-5 mg slow IV every 5-10 minutes **Max 10 mg**

**DRUG: DIAZEPAM**

# RX

# DRUG: DIAZEPAM

**Dosage:**

**Pediatrics:**

- Seizures—0.2- 0.3 mg/kg slow IV/IO (every 5 min.)
  0.5 mg/kg PR. **Max 10 mg**

- Sedation/Cardioversion/Pacing/Painful Procedure/Spasm: 0.2- 0.3 mg/kg slow IV/IO every 5-10 min. **Max 10 mg**

*Valium can be given IM, but absorption via this route is variable.*

**Onset:**

IV—5 min

**Duration:**

IV—15-60 min

**Side Effects:**

**Minor**:

- CNS Depression
- Dizziness
- Drowsiness
- Lethargy
- Ataxia

**Major**:

- Respiratory Depression
- Apnea
- Hypotension
- Cardiac Arrest
- Valium Rage

**Interactions:**

Incompatible with all other drugs, NS flush should precede and follow administration.

Additive with other CNS depressants

***PEARLS:***

When administering diazepam rectally, REMOVE THE NEEDLE & LUBRICATE THE SYRINGE. The syringe must be inserted 3-5 cm, injected slowly (count slowly to three), removed slowly (count slowly to three), and the buttocks held together (again count slowly to three). Avoid injecting the medication into a stool mass.

Diazepam pushed rapidly will have more “dramatic” effects than pushed slowly.

When giving an IM injection of diazepam, use a large muscle mass (i.e. gluteal). Versed or Ativan are both more readily absorbed through the muscle mass, and may be considered a better choice in certain situations.

“Diastat” is a pre-filled tube of Diazepam specifically designed for rectal administration. It is pre-measured, and is often made available to parents by their family physician to administer to children with severe seizure disorders. Preliminary studies show it **MAY** have less incidence of respiratory depression, but all precautions still apply.

**Physician Preference: While Versed is preferred in cases without IV access due to rapid absorption IM and IN, Diazepam is still acceptable as well. If unable to control seizures after max dose of any single benzodiazepine, call medical control to continue with another benzodiazepine.**

RX

**Drug Name:** **Diltiazem**
**Trade Name:** **Cardizem, Dilacor XR, Tiazac, Cartia XT,**

**Class:**

- Calcium Channel Blocker
- Class IV antidysrhythmic

**Mechanism of Action:**

- Diltiazem inhibits the influx of extracellular calcium across both the myocardial and vascular smooth muscle cell membranes. Resulting in dilation of the coronary and systemic arteries; improved oxygen delivery to the myocardial tissue; and decreased total peripheral resistance, systemic blood pressure, and afterload.
- It is a negative dromotrope & creates refractoriness in the AV node. Its effects on calcium channels in SA and AV nodes, and peripheral vasculature are equipotent.

**Indications:**

- Atrial fibrillation & atrial flutter with a rapid ventricular response
- Multifocal atrial tachycardia
- PSVT

**Contraindications:**

- 2nd or 3rd degree AV block *(in the absence of a functioning pacemaker)*
- Sick Sinus Syndrome *(in the absence of a functioning pacemaker)*
- Cardiogenic shock
- Hypersensitivity
- Atrial fibrillation or atrial flutter associated with WPW or short PR syndrome (Lown-Ganong-Levine Syndrome)
- Ventricular tachycardia
- Wide-complex tachycardia of unknown origin
- AMI *(associated with CHF or left ventricular dysfunction)*
- Advanced aortic stenosis
- Hypotension (less than 90 mmHg)

**Precautions:**

- CHF
- Elderly
- Renal / Hepatic Impairment
- Pregnancy (C)

**Dosage:**

**Adults:**

- **DOSE**: IV: 10 mg slow over 2 minutes. Repeat every 10-15 minutes PRN rate control. **MAX 40 mg.**

**Pediatrics:**

- *Rarely required, doses are the same as adult.*
- **(Medical Control Order) 0.25 mg/kg IV over 2 minutes (Usual dose about 20 mg). May repeat in 15 minutes @ 0.35 mg/kg IV over 2 minutes**

**DRUG: DILTIAZEM**

RX

DRUG: DILTIAZEM

**Onset:**

- 2-5 minutes

**Duration:**

- 1-3 hours

**Side Effects:**

- First or second degree AV block
- Bradycardia
- Ventricular dysrhythmias
- CHF, Edema
- Hypotension, Syncope
- Flushing
- Chest pain
- Dyspnea
- Sweating
- N/V
- Dizziness
- Nervousness
- Xerostomia
- HA

**Interactions:**

- May prolong the sedative effects of midazolam.
- May enhance the effects of ASA and prolong bleeding time.
- Additive effects with antihypertensives, alpha-blockers, & diuretics.
- Should not be used in combination with IV beta-blockers. The negative inotropic, chronotropic, & hypotensive effects can induce heart failure.
- Calcium salts can antagonize the hypotensive effects, but do not seem to have an effect on AV conduction.
- Incompatible with simultaneous furosemide injection.

***PEARLS:***

- As always, unstable tachycardias with serious signs or symptoms warrant cardioversion.
- Hypotension may result and warrants careful monitoring of vital signs.
- PVCs may be present on conversion of PSVT to sinus rhythm.
- Medical Control may order (occasionally, physician preference) a pretreatment of calcium chloride for hypotensive or borderline hypotensive patients.
- Infusions are often not required prehospital with abbreviated transport times. Bolus Diltiazem has (in some studies) been shown to maintain therapeutic levels for 24-48 hours.
- ***AHA dosing for adults: 0.25 mg/kg IV over 2 minutes (Usual dose about 20 mg). May repeat in 10-15 minutes @ 0.35 mg/kg IV over 2 minutes .***

RX

**Drug Name**: **Diphenhydramine Hydrochloride**

**Trade Name**: **Benadryl**

**Class:**

Antihistamine
H1 Antagonist

**Mechanism of Action:**

- Blocks H1 receptors
  - ❖ H1—causes bronchoconstriction, contraction of gut
  - ❖ H2—causes peripheral vasodilation, secretion of gastric acid
    - o ERs use cimetidine (Tagamet) for H2 blockade
- H1 antagonists have anticholinergic properties in varying degrees
  - ❖ Probably accounts for antidyskinetic effects.
  - ❖ Also may be responsible for anti-emetic effects.

**Indications:**

- Anaphylaxis
- Allergic reactions
- Urticaria
- Sedation
- Motion Sickness / Vertigo
- Nausea and Vomiting
- Histamine release secondary to DXM Use.
- Extrapyramidal (Dystonic) reaction (pseudoparkinsonism--opisthotonos)

**Contraindications:**

Hypersensitivity
Acute asthma attack
Lower respiratory tract disease
Newborns & nursing mothers

**Precautions:**

HTN
Cardiac disease
Renal disease
Bronchial asthma
Seizures
Pregnancy category - C
Closed angle glaucoma (avoid if at all possible)

**Dosage:**

**Adults:**
25-50 mg IV or IM

**Pediatrics:**
1-2 mg/kg IV/IM/IO max dose 25 mg
PO: (If available) 25 mg (for mild cases)

**Onset:**

IM—30 min
IV—Immediate

**Duration:**
IM—4-7 hrs
IV—4-7 hrs

**DRUG: DIPHENHYDRAMINE**

RX

DRUG: DIPHENHYDRAMINE

**Side Effects:**

- Drowsiness
- Dizziness
- Incoordination
- Confusion
- Dry mouth
- Drying of bronchial secretions
- Blurred vision
- Urinary retention
- Hypotension
- Tachycardia
- Bradycardia

**Interactions:**

Additive effects—other CNS depressants
MAOIs—prolong the anticholinergic effects

***PEARLS:***

***Adjunctive therapy to epinephrine in anaphylaxis & severe allergic reactions. The Epinephrine causes immediate bronchodilation by activating $B_2$ receptors, while the diphenhydramine inhibits further histamine response.***

***Sometimes given with Phenergan, Inapsine, and Haldol as pre-treatment for dystonic effects, and for additional sedation.***

RX

**Drug Name:** **Dopamine Hydrochloride**

**Trade Name:** **Dopamine, Intropin**

**Class:**

Adrenergic Dopaminergic Catecholamine
Sympathomimetic

**Mechanism of Action:**

Naturally occurring catecholamine that is the chemical precursor of norepinephrine. Is generally dose dependant on its effects.

1-2 μg/kg/min--dopaminergic receptors--dilation of renal, mesenteric, and cerebral arteries

2-10 μg/kg/min--beta receptors--inotropic, chronotropic

10-20 μg/kg/min--alpha & beta--vasoconstriction of renal, mesenteric, and peripheral arteries and veins

>20 μg/kg/min--Mimics pure alpha effects similar, to norepinepherine like effects. It is occasionally used at this range in-hospital.

**Indications:**

- Cardiogenic Shock
- Cardiogenic Shock w/ Pulmonary Edema (CHF)
- Hypovolemic Shock / Hypotension (after fluid resuscitation)
- Neurogenic Shock
- Septic Shock

**Contraindications:**

Women on oxytocin
Tachydysrhythmias
VF/VT
Uncorrected hypovolemia
Patients with known pheochromocytoma

**Precautions:**

MAOIs,TCAs, other cardiac stimulants, vasopressors, will cause increased heart rate, and SV dysrhythmias

Will precipitate in basic, alkaline solutions

May cause necrosis, sloughing at infusion site

Pregnancy (C)

**Dosage:**

**Adults:**

2-20 μg/kg/min, occasionally up to 50 μg/kg/min, generally not exceeding 20 μg/kg/min without medical control guidance. Titrated to effect, run through a large vein.

Generally add two vials 200 mg to 250 ml NS, yielding 1600 μg/ml, although some alternative methods exist

**Pediatrics:**

2-20 μg/kg/min, with 10 μg/kg/min is a reasonable starting dose, titrated to effect, generally not exceeding 20 μg/kg/min.
Add 6 mg x weight in kg diluted to 100 ml, to create drip.
**1gtt/min (cc/hr) equals 1 μg/kg/min.**

**Onset:**

2-4 min.

**DRUG: DOPAMINE**

# RX

**DRUG: DOPAMINE**

**Duration:**

10-15 min

**Side Effects:**

Dysrhythmias
HTN, Headache
Nausea & Vomiting
Dizziness
Tremors
Flushing
Angina, AMI
Pain
Ectopy
Bradycardia
Tachycardia, Including ventricular fibrillation, ventricular tachycardia

**Interactions:**

Potentiating effects--TCAs, MAOIs, bretylium
Precipitates in Alkaline Solutions
Dopamine may cause hypotension when used concomitantly with phenytoin (Dilantin)

***PEARLS:***

- Can cause tissue necrosis and sloughing. Take care to avoid infiltration, use central intravenous access or the large veins of the arm
- Titrate dosage to patient's hemodynamic response

**Dopamine Infusion Matrix**

Recommended Infusion Rates for Dopamine

Mix 400 mg / 250 cc for a 1600mcg/1 cc concentration.

| Dose | Patient Weight | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 |
| 5 | 8 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 24 | 26 | 28 | 30 | 32 |
| 7 | 11 | 13 | 16 | 18 | 21 | 24 | 26 | 29 | 32 | 34 | 37 | 39 | 42 | 45 |
| 10 | 15 | 19 | 23 | 26 | 30 | 34 | 38 | 41 | 45 | 49 | 53 | 56 | 60 | 64 |
| 15 | 23 | 28 | 34 | 39 | 45 | 51 | 56 | 62 | 68 | 73 | 79 | 84 | 90 | 96 |
| 20 | 30 | 38 | 45 | 53 | 60 | 68 | 75 | 83 | 90 | 98 | 105 | 113 | 120 | 128 |

RX

**Drug Name:** **Epinephrine**

**Trade Name:** **Adrenalin, Epi**

**Class:**

- Adrenergic Catecholamine
- Sympathomimetic

**Mechanism of Action:**

- β1--contractility, inotropic, increases AV conduction, automaticity
- β2--bronchodilation, skeletal muscle vasodilation
- α--peripheral vasoconstriction, fight or flight response
- Small doses, beta effects dominate--vasodilation
- Large doses, alpha effects dominate--vasoconstriction, increases systemic vascular resistance, blood pressure

**Indications:**

- Hypersensitivity reactions (anaphylaxis)
- Acute bronchospasm associated with asthma or COPD (refractory to first-line agents)
- Asystole, VF, pulseless VT, PEA
- Croup & Epiglottitis

**Contraindications:**

- None in cardiac arrest, severe anaphylaxis
- Hypersensitivity

**Precautions:**

- HTN
- Ischemic heart disease
- Cerebrovascular insufficiency
- Pulmonary edema
- Pregnancy (C)
- Geriatrics
- Protect from light
- Deactivated/Precipitates with alkaline solutions (NaHCO3)
- Will increase myocardial oxygen demand

**CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one hour following treatment for return of symptoms. * Not for Treat and Release patients.**

**Dosage:**

**Adults:**

**Anaphylaxis**-

- *0.3-0.5 mg IM/SQ (1:1,000),*
- *Infusion for refractory cases: 2-10 mcg/min titrated to BP response.*
- Epinephrine Neb *(for laryngeal edema only)* 5 mg (5 cc) epinephrine 1:1,000 nebulized undiluted

**Acute bronchospasm** associated with asthma or COPD (refractory to first-line agents)

- *0.3-0.5 mg IM/SQ (1:1,000),*

**Symptomatic Bradycardia and Hypotension, Refractory Hypotension in Ca Channel Blocker/Beta Blocker OD**

- **2-10 μg/min IV Infusion. (requires medical control authorization)**

**Pulseless Rhythms**

- Standard--1 mg (1:10,000) IV every 3-5
- ET--2-2.5 x IV dose ( 1:1,000 diluted to a volume of 8-10 cc)

**DRUG: EPINEPHRINE**

RX

DRUG: EPINEPHRINE

**Pediatrics:**

**Pulseless Rhythms:**

- ET--0.1 mg/kg of 1:1000 diluted to 3-5 NS
- 0.01 mg/kg (1:10,000) IV/IO every 3-5 min.
- **NEONATES**: 0.01-0.03 mg/kg (1:10,000) IV/IO every 3-5 min.

**Anaphylaxis**

- 0.01 mg/kg (1:1,000, 0.01 ml/kg) SubQ /IM **MAX: 0.3 mg**
- Epinephrine Neb *(for laryngeal edema only)* 5 mg (5 cc) epinephrine 1:1,000 nebulized undiluted
- **PED Epinephrine Infusion 0.1-2 mcg/kg/min (Medical Control Call In)**

**Croup & Epiglottitis**:

- NEB: 5 cc of 1:1000 undiluted

**Refractory Bronchospasm (Severe**):

- 0.01 mg/kg (1:1000, 0.1 ml/kg) SubQ/IM
- ET--0.1 mg/kg of 1:1000 diluted to 3-5 NS

**Onset:**

- IV--1-2 min
- SC/IM--5-10 min

**Duration:**

- IV/SC--5-10 min

**Side Effects:**

- Anxiety
- Tachycardia
- HTN
- Angina
- Arrhythmias
- V-Fib
- N/V
- Fear
- Headache
- Pallor
- Dizziness
- Tremors

**Interactions:**

- Potentiated by--MAOIs, TCAs
- Antagonized by--Beta blockers
- Precipitates in alkaline solutions

RX

***PEARLS:***

- **I.M. Epi may be more effective than SQ Epi in shock situations.**
- Sodium bicarbonate & Furosemide will inactivate epinephrine, flush line well between administration.
- ET administration should be utilized only until IV access can be established.

**Epinephrine Infusion Matrix**

| Recommended Infusion Rate for Epinephrine | | |
|---|---|---|
| DOSE mcg/min | **1 mg/250 cc with microdrip 4 mcg/ml concentration** | **1 mg/100 cc Buritrol 10 mcg/ml concentration** |
| **2** | 30 gtt/min (ml/hr) | 12 gtt/min (ml/hr) |
| **3** | 45 gtt/min (ml/hr) | 18 gtt/min (ml/hr) |
| **4** | 60 gtt/min (ml/hr) | 24 gtt/min (ml/hr) |
| **5** | 75 gtt/min (ml/hr) | 30 gtt/min (ml/hr) |
| **6** | 90 gtt/min (ml/hr) | 36 gtt/min (ml/hr) |
| **7** | 105 gtt/min (ml/hr) | 42 gtt/min (ml/hr) |
| **8** | 120 gtt/min (ml/hr) | 48 gtt/min (ml/hr) |
| **9** | 135 gtt/min (ml/hr) | 54 gtt/min (ml/hr) |
| **10** | 150 gtt/min (ml/hr) | 60 gtt/min (ml/hr) |

To calculate a **pediatric** epinephrine drip, a simple formula for children uses **0.6** multiplied by the child's weight in kg. This amount (in mg) is then added to enough IV solution to equal a total of 100 ml.

**When the resulting solution is infused at a rate of 1ml/hr, it will deliver a dosage of 0.1 mcg/kg/min. 2mcg/kg/min. is 2 ml/hr.**

Rule of 6 quick reference

| KG | 1 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 2.2 | 4.4 | 6.6 | 8.8 | 17.6 | 22 | 26.4 | 30.8 | 35.2 | 39.6 | 44 |
| Epi added to buritrol | 0.6 | 1.2 | 1.8 | 2.4 | 4.8 | 6.0 | 7.2 | 8.2 | 9.6 | 10.8 | 12.0 |

| KG | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 48.4 | 52.8 | 57.2 | 61.6 | 66 | 70.4 | 74.8 | 79.2 | 83.6 | 88 |
| Epi added to buritrol | 13.2 | 14.4 | 15.6 | 16.8 | 18.0 | 19.2 | 20.4 | 21.6 | 22.8 | 24.0 |

| KG | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pounds | 92.4 | 96.8 | 101.2 | 105.6 | 110 | 114.4 | 118.8 | 123.2 | 127.6 | 132 |
| Epi added to buritrol | 25.2 | 26.4 | 27.6 | 28.8 | 30.0 | 31.2 | 32.4 | 33.6 | 34.8 | 36.0 |

RX

DRUG: EPINEPHRINE

RX

**Drug Name:** **Etomidate**

**Trade Name:** **Amidate**

**Class:**

- Anesthetic
- Non-narcotic sedative hypnotic

**Mechanism of Action:**

- Etomidate appears to facilitate GABA-minergic neurotransmission by increasing the number of available GABA receptors, possibly by displacing endogenous inhibitors of GABA binding *(Remembering that GABA is an inhibitory neurotransmitter)*
- Etomidate is short acting and it's effects are at least partially due to depression of the reticular activating system
- Induces sedation & amnesia
- It has minimal cardiac & respiratory depressive effects and causes no histamine release

**Indications:**

- Induction agent for intubation

**Contraindications:**

- Hypersensitivity
- Labor / Imminent Delivery
- Induction agent for intubation in patients with septic shock

**Precautions:**

- Elderly
- Hepatic/Renal disease
- Pregnancy (C)
- Safety not established under the age of 10

**Available Forms**

- 2 mg/ml vials

**Dosage:**

**Adults:**

- Intubation: 0.3 mg/kg slow IV over 30-60 seconds (usual dose is 20-30 mg) repeat as needed. Maximum dose 0.6 mg/kg

**Pediatrics:**

- 2- 8 years of age--0.3 mg/kg slow IV over 30-60 seconds. Maximum dose 0.6 mg/kg

**Onset:**

- 30 seconds

**Duration:**

- 3-5 minutes

**Side Effects:**

- N/V (especially with rapid administration)
- Dyspnea *(mostly relieved with airway positioning)*
- Dysrhythmias
- Hypotension or Hypertension
- Temporary involuntary muscle movements

**DRUG: ETOMIDATE**

RX

DRUG: ETOMIDATE

**Interactions:**

- Potentiates with other CNS depressants.
- Concurrent use of antihypertensives agents may cause hypotension

***PEARLS:***

- ***As with other sedative hypnotics, carefully monitor airway, breathing, & circulation when administering etomidate (i.e. SpO2, EKG, blood pressure)*. Be prepared to manage the airway aggressively**
- ***Can suppress adrenal hormone synthesis.***
- ***Should be given through a large, proximal vein to avoid pain at the injection site***
- ***Etomidate is not currently recommended for pediatrics under the age of 2***

RX

**Drug Name:** **Fentanyl Citrate**
**Trade Name:** **Sublimaze, Atiq (Lollypop form for Peds)**
**Class:**

- Synthetic Opiate, Narcotic Analgesic
- Opiate
- Schedule II Controlled Substance

**Mechanism of Action:**

Fentanyl is a powerful synthetic opiate with mechanism of action similar to Morphine. It is considered both faster acting and of shorter duration than Morphine. Interacts with opiate receptors decreasing pain impulse transmission at the spinal cord level and higher in the CNS. Fentanyl is a potent μ-opiate receptor agonist. Also causes peripheral vasodilatation increasing venous capacitance and decreases venous return (chemical phlebotomy) by depressing the responsiveness of alpha-adrenergic receptors. Since it decreases both preload and afterload it may decrease myocardial oxygen demand.

Fentanyl is metabolized in the liver, excreted by the kidneys, and stored in body fat.

**Indications:**

- Moderate to Severe Pain
- Adjunct for Intubation

**Contraindications:**

- Hypovolemia
- Hypotension (except as an adjunct in RSI)
- Hypersensitivity
- Head injury
- Myasthenia Gravis (causes severe muscle rigidity/)
- Patients who have taken MAOI (Anti-depressants such as Nardil and Parnate) within 14 days. MAOIs may cause paradoxical excitation, and in some cases seizures, hyperthermia, hypertension, and death.

**Precautions:**

- Respiratory depression
- Severe heart disease
- Geriatrics
- Pregnancy (C) *(increases to D if used for prolonged periods or high doses close to term)*
- May worsen bradycardia or heart block in inferior MI *(vagotonic effect)*
- Liver Failure/Kidney failure (may prolonged duration)

**Dosage:**

**Adults:**

- IV/IM: 25-50 mcg slow IV push
- MAX of 100 mcg for ACS/ischemic chest pain
- MAX of 200 mcg for Pain Control/Sedation/Intubation

**Pediatrics (Greater than 2 years of age):**

- IV, IO, IM: 2-3 mcg/kg to a max of 100 mcg
- For Intubation: 2-5 mcg/kg to a max of 100 mcg
- IN: 1-2 mcg/kg (rare, NOT COVERED IN ACEMSS SWO'S)

**Onset:**

- IV, IN, IO: 1-3 minutes
- IM:10-20 minutes

**DRUG: FENTANYL**

# RX

# DRUG: FENTANYL

**Duration:**

- 1-2 hours (typical, see precautions)
- Peak effects in 30 minutes

**Side Effects:**

- Dizziness
- Altered L. O. C.
- Hallucinations
- Euphoria
- Mental impairment
- Hypotension
- Seizures (rare)
- Lightheadedness
- Bradycardia, Tachycardia
- N/V
- CNS Depression
- Respiratory Depression
- Muscle Rigidity

**Interactions:**

- CNS depressants may enhance effects (antihistamines, antiemetics, sedatives, hypnotics, barbiturates, and alcohol.
- No not mix in line with heparin

***PEARLS***

- **Fentanyl MUST be given slowly, as chest wall muscle rigidity, seizures, and hypotension have been associated with rapid administration.**
- Fentanyl is significantly more potent than Morphine (approx. 50-100 times as potent, mg to mg). At clinically equivalent doses, Fentanyl is similar in effectiveness to morphine, with a quicker onset and shorter duration.
- Compared to other opiates (e.g. Demerol or Morphine), it has less profound adverse effects, minimal histamine release, and does not adversely affect the seizure threshold.
- Apnea and significant respiratory depression have been noted with doses > 5 mcg/kg.
- Any opiate analgesics can cause spasm of the sphincter of Oddi and the renal tract. Fentanyl is not believed to have any more adverse effect on this than Morphine.
- Narcotic analgesia <u>used</u> to be considered contraindicated in the prehospital setting for abdominal pain of unknown etiology. It was thought that analgesia would hinder the ER physician or surgeon's evaluation of abdominal pain. It is now becoming widely recognized that severe pain actually confounds physical assessment of the abdomen and that narcotic analgesia rarely diminishes all of the pain related to the abdominal pathology. It would seem to be both prudent & humane to "take the edge off of the pain" in this situation, with the goal of reducing, not necessarily eliminating the discomfort. Additionally, in the practice of modern medicine the exact diagnosis of the etiology of abdominal pain is rarely made on physical examination alone, but also includes laboratory tests, x-ray, ultrasound, and CT scan, essential in the diagnosis of abdominal pain. **Therefore medication of abdominal pain is both humane and appropriate medical care.**

RX

**Drug Name:** **Furosemide**

**Trade Name:** **Lasix**

**Class:**

Sulfonamide-type loop diuretic

**Mechanism of Action**:

Inhibits reabsorption of sodium and chloride in the ascending limb of the loop of Henle, resulting in an increased excretion of sodium, chloride, & water.

Increases renal excretion of potassium, hydrogen, calcium, magnesium, bicarbonate, ammonium, and phosphate.

It also causes decreased peripheral vascular resistance and increased peripheral venous capacitance, resulting in a subsequent decrease in left ventricular filling pressure (preload).

**Indications:**

- Pulmonary edema
- CHF
- Hypertensive Crisis

**Contraindications:**

- Hypovolemia / Dehydration
- Severe preexisting electrolyte imbalance (Hypokalemia)
- Hypersensitivity to sulfonamides

**Precautions:**

Diabetes mellitus *(may worsen control)*
Renal disease
Hepatic Disease
Anuria *(listed as a contraindication in one source)*
Pregnancy (C) *(no well-controlled studies, possible fetal abnormalities)*
May cause electrolyte imbalances

**Dosage:**

**Adults:**

CHF/Pulmonary edema: Slow IV/IM 20-80 mg, may increase to up to twice the patient's daily dose of oral furosemide.

**HTN CRISIS: (Medical Control Order) 20-80 mg slow IV push (each 20 mg over 1-2 minutes), usual dose 40mg**

**Pediatrics: (Not part of ACEMSS SWO's)**

0.5-1 mg/kg IV/IM (some texts reference a dosing range of 1-2 mg/kg) Max of 6mg/kg/day

**Onset:**

5 min, peak at 10-20 minutes

**Duration:**

6-8 hrs

**Side Effects:**

Transient or permanent loss of hearing
Tinnitis
Hypovolemia
Hypotension
Hypokalemia (+ other electrolyte imbalances)
Hyperglycemia
Hyperuricemia
Weakness
Dizziness

**DRUG: FUROSEMIDE**

RX

DRUG: FUROSEMIDE

**Interactions:**

Incompatible with any drug in syringe
Additive effects--antihypertensives, nitrates, other diuretics

***PEARLS:***

***The secret to avoiding transient/permanent deafness or tinnitis when administering furosemide is to administer it SLOWLY! "Ototoxicity increased proportionately as the rate of infusion of parenteral furosemide increased from 4 mg/min (no ototoxicity), to 5.6 mg/min (no ototoxicity), to 25 mg/min (9/15 patients developed reversible hearing loss), to 67 mg/min (10/10 patients developed tinnitus and deafness that persisted for 90 minutes)."*** **DeVito JM, Vance JR.** ***Furosemide-associated ototoxicity.*** **Clin Pharm 1983;2:507—9.**

***When administering the medication to a pregnant patient, the benefits must outweigh the risks (life or limb situation)***

***In the prehospital setting, furosemide should be administered IV if at all possible.***

***The initial effects from increased venous capacitance should be seen within about 5 minutes. Diuresis will begin within 15-30 minutes after administration.***

***Per ACEMSS SWO you may double the patient's normal PO dose.***

RX

**Drug Name:** **Glucagon**

**Trade Name:** **Glucagon**

**Class:**

Pancreatic Hormone *($\alpha_2$ cells in pancreas)*

**Mechanism of Action:**

Increases blood glucose by stimulating glycogenolysis
Inhibits conversion of glucose to glycogen
Stimulates gluconeogenesis *(metabolism of glucose in the liver)*
Relaxes smooth muscle of the GI tract *(mechanism unknown)*
Positive inotrope & chronotrope *(mechanism unknown)*

**Indications:**

Hypoglycemia
β-Blocker or Calcium Channel Blocker Toxicity *(not listed in protocols)*

**Contraindications:**

Known hypersensitivity
Known Insulinoma *(can precipitate hypoglycemia secondary to insulin relsease)*
Known Pheochromocytoma *(can precipitate substantial hypertension secondary to catecholamine release)*

**Precautions:**

Cardiac Disease / CAD
Geriatrics
Malnutrition
Alcoholism
Hepatic disease
Renal Insufficiency
Pregnancy (B)

**Dosage:**

**Adults:**

Hypoglcemia:
1 mg IM
If ineffective may readminister in 5-20 minutes.

**β-Blocker or Calcium Channel Blocker Overdose as ordered by medical control**

1-2 mg IV/IM, repeated every 5 minutes PRN. Do not use diluent (e.g. propylene glycol) supplied with single use kits. Use saline Instead.

**Pediatrics:**

Hypoglcemia
0.1 mg/kg IV/IM/SQ up to 1 mg

**β-Blocker or Calcium Channel Blocker Overdose as ordered by medical control**

0.1 mg IV/IM/IO, up to 1 mg repeated every 5 minutes PRN. Do not use diluent (e.g. propylene glycol) supplied with single use kits. Use saline Instead.

**Onset:**

IV—5-20 min
IM—30 min
SubQ—30-45

**Duration:**

1-2 hours

DRUG: GLUCAGON

RX

DRUG: GLUCAGON

**Side Effects:**

N/V
Angina (rare)
Urticaria (rare)
Dizziness (rare)

**Interactions:**

Beta blockers may interfere with glucagon's actions

***PEARLS:***

***Glucagon only works when there are normal liver stores of glycogen. Will not work in patients with chronic hypoglycemia, malnutrion, starvation. May not work in chronic alcoholism for similar reasons including hepatic disease.***

***First line treatment is always glucose. Use it as a last resort in insulin-dependent diabetics. They already have depleted stores of glycogen. Glucagon will deplete glycogen stores further and it takes some time for the stores to regenerate.***

***Treatment of a beta-blocker or calcium channel overdose with glucagon will require a call-in.***

RX

**Drug Name:** **Haloperidol**

**Trade Name:** **Haldol**

**Class:**

High-potency antipsychotic
Major tranquilizer

**Mechanism of Action:**

Blocks postsynaptic dopamine receptors ($D_2$) in the mesolimbic system (associated with mood & behavior).
The decrease in dopamine neurotransmission has been found to correlate with the antipsychotic effects.
Haloperidol possesses extremely weak anticholinergic and alpha-adrenergic receptor blocking effects.

**Indications:**

- Acute Psychosis (Consideration for patient & rescuer safety)

**Contraindications:**

Coma
Severe toxic CNS depression
Parkinson's disease *(dopamine blockade can dramatically worsen the condition)*

**Precautions:**

- Severe cardiovascular disorders *(EKG monitoring is recommended in these patients)*
- Pregnancy (C)
- Seizure disorder *(slight lowering of seizure threshold)*
- Elderly patients may require reduce dosage

**Available Forms:**

- 5 mg/ml (5 mg) in 1.0 ml ampules

**Dosage:**

**Adults:**

- 5-10 mg IV or IM maximum dosage 20 mg (reduce dosage to 0.5 to 2 mg in geriatrics)

**Pediatrics:**

- 0.5 mg IM ***(Not covered in ACEMSS SWO's)***
- One reference suggested in children 6-12 years of age: 1-3 mg IV or IM ***(Not covered in ACEMSS SWO's)***

**Onset:**

IM—10-20 minutes (one reference suggests 30-60 minutes)
IV—Data not available since it is not an FDA approved use

**Duration:**

- 12-24 hours

**Side Effects:**

Extrapyramidal reactions
Neuroleptic malignant syndrome *(hyperthermia, severe extrapyramidal dysfunction, alterations in consciousness, altered mental status, and autonomic instability)*
Orthostatic hypotension
Insomnia, restlessness
Sedation
Seizures
Respiratory depression

**DRUG: HALOPERIDOL**

RX

DRUG: HALOPERIDOL

**Side Effects:** ***Continued***

Anticholinergic effects
Tachycardia

**Interactions:**

Additive effects—may induce hypotension in patients taking antihypertensives
May decrease the activity of warfarin
Patients taking lithium may develop encephalopathic syndrome

***PEARLS:***

***IM dosage may take 10-20 minutes (or longer) to take effect. Make sure you have plenty of help on scene.***

**Use of Haldol with patients under the active influence of hyperdynamics is relatively contraindicated due to these drugs effects on seizure threshold, heat production and general side effects that may complicate care.**

RX

**DRUG NAME:** **Hydromorphone**

**TRADE NAME:** **Dilaudid**

**New: March 5, 2012**

**NOTE**: *Due to the shortage of Fentanyl Citrate in the EMS System of Ada County, the Medical Directorate has decided to utilize the trade name "Dilaudid" as an alternate narcotic pain medication; until "Fentanyl Citrate" becomes readily available*.

**Class:**

- Narcotic Analgesic
- Opiate
- Schedule II Controlled Substance

**Mechanism of Action: Mu Opoid Receptors**

Interacts with opiate receptors decreasing pain impulse transmission at the spinal cord level and higher in the CNS. Dilaudid is a potent μ- opiate receptor agonist. Also causes peripheral vasodilation increasing venous capacitance and decreases venous return (chemical phlebotomy) by depressing the responsiveness of alpha-adrenergic receptors.

**Indications**

- Moderate to severe pain in place of Fentanyl Citrate
- When morphine is contraindicated

**Contraindications:**

- Hypovolemia
- Hypotension
- Hypersensitivity
- Head injury with altered mental status
- Patients with status asthmaticus

**Precautions:**

**USE EXTREME CAUTION IF THE PATIENT HAS TAKEN ANY BENZODIAZEPINES DUE TO RISK OF OVERSEDATION. THEREFORE ADMINISTRATION OF ADDITIONAL BENZODIAZEPINES SHOULD BE AVOIDED.**

- **Approximately 7 times more potent that morphine sulfate and half life of 4-6 hours**
- **Not to be used in pediatrics**
- **Care must be taken to monitor for respiratory depression**
- **Use extreme care in geriatrics, pregnancy, hepatic or renal failure situations, patient with unstable or ongoing cardiac associated chest pain.**
- **Use cautiously in patients with renal impairment**
- **Continuous pulse oximetry is necessary with administration**

**Dosage:**

**Adult: IV/IM:** 0.5 mg, slow IV push over 2-3 minutes, Q 10 minutes PRN for pain to a maximum of 2 mg *(Limit dosage to 2 mg in severe pain)*

**Dilaudid is prepared as a concentrated solution and needs to be diluted in 9 ml of normal saline to ensure accurate dosing**

**Pediatric**: Not Indicated

**Onset: Approximately 10 to 15 minutes with peak effect in 30 minutes to 1 hour.**

**Hydromorphone (Dilaudid)**

RX

# Hydromorphone (Dilaudid)

**Duration:**

- **Half-life is 2.3 hours in a typical patient**
- **Half-life may be up to 4-6 hours and 40 hours in patients with renal impairment**

**Side Effects:**

- Dizziness
- Drowsiness
- Altered LOC
- Hallucinations
- Euphoria
- Mental Impairment
- Lightheadedness
- Bradycardia
- Tachycardia
- Hypotension
- N/V
- CNS Depression
- Respiratory Depression
- Transient Hyperglycemia

**Interactions:**

CNS depressants may enhance effects of antihistamines, antiemetics, sedatives, hypnotics, barbiturates, and alcohol.

RX

**Drug Name:** **Ipratropium Bromide**

**Trade Name:** **Atrovent**

**Class:**

- Anticholinergic

**Mechanism of Action:**

- Ipratropium antagonizes the action of acetylcholine by blocking muscarinic cholinergic receptors resulting in bronchodilation & drying of respiratory tract secretions.

**Indications:**

- Bronchial Asthma
- Bronchospasm in acute exacerbation of COPD (chronic bronchitis, emphysema)
- Bronchospasm in:
  Anaphylaxis
  Burns
  Toxic Inhalations
- *Bronchospasm associated with cardiac asthma*

**Contraindications:**

- Known hypersensitivity (because of the preservative contained in the atrovent solution, ***people allergic to peanuts & soybeans should not receive atrovent***).
- Also should not be used on patients with a known hypersensitivity to atropine, atropine derivatives, or bromide.

**Precautions:**

- Use with caution when administering it to:
  Elderly patients
  Individuals with cardiovascular disease or hypertension
- Pregnancy (B)

**CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one-hour following treatment for return of symptoms.**

**Dosage:**

**Adults:**

- Nebulizer—0.5 mg via nebulizer, $O_2$ flow @ 8 L per min, normally takes 8-12 minutes to administer. **Do not repeat. Subsequent nebulizers are with albuterol only**.

**Pediatrics:**

- Identical dosage.

**Onset:**

- 5-15 minutes

**Duration:**

- 4-6 hours

**DRUG: IPRATROPIUM BROMIDE**

RX

DRUG: IPRATROPIUM BROMIDE

**Side Effects:**

- Palpitations
- Cough, Dry Mouth
- Blurred Vision
- Anxiety, Nervousness
- Dizziness
- HA
- Rash
- N/V

**Interactions:**

- Few in the prehospital setting.

***PEARLS:***

- ***The nebulizer system can be adapted to accommodate a mask if the patient is too fatigued or working too hard to hold the nebulizer. It can also be adapted to ET administration. Both ET & mask nebulizer treatments should have an O2 flow rate of 8-10L/min.***
- ***The medication chamber should be kept upright to ensure efficient medication administration, patients have a tendency to tilt the chamber, recheck it often. "Tap" the container toward the end of the treatment to ensure complete administration.***
- ***All patients receiving nebulizer beta agonists and/or anticholinergics should be observed for at least one hour after treatment.***
- ***Patients, when appropriate, should have a cardiac monitor and have venous access established along with bronchodilator treatment***
- ***Monitor for dramatic increase in heart rate, development of frequent ventricular ectopy, or development of serious CNS symptoms.***
- ***Atrovent has some immediate effects, but peak effects are delayed. Therefore, atrovent is more appropriate for maintenance treatment than for acute bronchospasm. Thus, administration of atrovent alone is not useful in our setting. In combination with albuterol, atrovent promotes more effective, maintainable bonchodilation than albuterol alone.***

RX

**DRUG NAME: Ketamine Hydrochloride**

**TRADE NAME: Ketamine, Ketanest, Ketaset, Ketalar**

**REVISED: May 1, 2012**

**Class:**

- Dissociative anesthetic
- NMDA receptor antagonist

**Mechanism of Action: Exact mechanism unknown.**

Ketamine acts on cortex and limbic receptors, producing dissociative analgesia and sedation. Higher doses act on the Mu opioid receptor.

**Indications:**

- For use in medication assisted intubation in conjunction with a paralytic

**Relative Contraindications:**

- Most contraindications are related to the release of catecholamines increasing hypertension and tachycardia.
  - Hypertensive Crisis
  - Under the influence of methamphetamine or other similar drug
- Acute globe injury or glaucoma
  - Increased intraocular pressure
- When significant elevations in BP might prove harmful:
  - Aortic dissection
  - Acute Myocardial Infarction, angina
  - Intracranial hemorrhage
- Schizophrenia
  - Increases psychosis
- **Consider use of versed in above contraindications**

**Dosage:**

**Adults/Peds:**

- 2mg/kg <u>slow</u> IV push one minute prior to paralytic administration

**Onset:**

- 45-60 seconds
- Wait to give paralytic until onset of action

**Duration:**

- 5-15 minutes IV

**Side Effects:**

- Vivid Dreams
- Hallucinations
- Delirium
- Recovery Agitation
- Tachycardia
- Hypertension
- Dysphoria
- Hypersalivation
- N/V
- Anaphylaxis
- Reemergence phenomenon
- Arrhythmias
- CNS Depression
- Respiratory Depression

**Ketamine Hydrochloride**

**Interactions:**

**Additive/Potentiation Effects:**

- Any medication that stimulates catecholamine release will result in hypertension, tachycardia and arrhythmias
- Benzodiazepines increase respiratory and CNS depression
- Opiates will increase respiratory and CNS depression
- Sedative hypnotics will increase respiratory and CNS depression

**Physician PEARLS:**

- **Because of the dissociative state many patients sedated with ketamine do not close their eyes**
- **Ketamine is the only anesthetic producing analgesia, hypnosis and amnesic effects**
- **In usual doses, protective airway reflexes, spontaneous respirations and cardiopulmonary functions are maintained**
- **Ketamine lacks the progressive dose-response relationship**
- **Ketamine produces a dose-related increase of heart rate and blood pressure which makes Ketamine the preferred induction agent for hypotensive patients**
- **Ketamine has demonstrated beta-adrenergic and vagolytic properties, which includes beta-2 stimulation making Ketamine the ideal induction agent for people with reactive airway disease/asthma.**
- **Ketamine increases salivary and bronchial mucous gland secretion through stimulation of cholinergic receptors, however it does not require Atropine for pretreatment**
- **Try to provide a calm, quiet atmosphere**
- **A single dose of Ketamine should last 5-15 minutes**
- **Rapid administration of Ketamine will cause apnea**
- **Reemergence phenomenon is a known entity. Consider benzodiazepines for continued sedation**
- **Pregnancy Category has not been established**

RX

**Drug Name:** **Lidocaine Hydrochloride**

**Trade Name:** **Lidocaine, Xylocaine**

**Class:**

- Antidysrhythmic (Class I-B)

**Mechanism of Action:**

- Decreases ventricular automaticity *(reduces the slope of phase 4 diastolic depolarization)*
- Decreases excitability, and raises fibrillation threshold
- Helps suppress ventricular ectopy after AMI *(reduces the slope of phase 0 of action potential*)
- Decreases conduction in ischemic cardiac tissue without adversely affecting normal conduction
- Does not affect contractility

**Indications:**

- ***The revised ACLS guidelines suggest IV amiodarone be considered prior to administration of lidocaine for ventricular fibrillation or pulseless ventricular tachycardia, based on greater supporting data for amiodarone***
- Pulseless Ventricular Tachycardia, Ventricular Fibrillation.
- Ventricular Tachycardia with a pulse
- Malignant PVCs
- Wide complex tachycardias of unknown origin
- Pre-Intubation in the setting of closed head injuries and strokes

**Contraindications:**

- Advanced AV block (2nd degree Type II (Mobitz II) and 3rd degree blocks) in the absence of a functioning pacemaker
- Torsades de Pointes *(if known torsades, magnesium is the agent of choice)*
- Adams-Stokes syndrome

**Precautions:**

- Hypotension

**Dosage:**

**Adults:**

- **Pulseless VT, VF:** 1.0 to 1.5 mg/kg IV bolus, can repeat in 3-5 minutes not to exceed 3 mg/kg.
- **Ventricular ectopy, and Wide complex tachycardia:**—1.0-1.5 mg/kg slow IV bolus followed by additional doses of 0.5-0.75 mg/kg every 5minutes **not to exceed 3 mg/kg or 300 mg in 30 minutes (not including infusion).** If ectopy resolves, can set up a continuous infusion. (Be sure to rebolus @ 0.5-0.75 mg/kg in 8-10 minutes to maintain therapeutic levels of lidocaine)
- Continuous infusion—1 g in 250 ml of NS yields 4 mg/ml ran at 2 to 4 mg/min *(Start @ 2 mg/min & add 1 mg/min for each additional 1 mg/kg IV bolus)*

  *1 mg/kg bolus = 2 mg/min.*
  *1.5-2 mg/kg total bolus = 3 mg/min.*
  *2.5-3 mg/kg total bolus = 4 mg/min.*
- Pre-intubation in closed head injuries. CVA's. and cases of increased intracranial presure—1mg/kg IV bolus

**DRUG: Lidocaine**

RX

DRUG: Lidocaine

- ET Administration—2-3 mg/kg (2 times the IV dose) every 3-5 minutes PRN

**Pediatrics:**

- All situations—1 mg/kg IV/IO bolus, not to exceed 3 mg/kg
- ET Administration--1 mg/kg diluted to with NS to a total of 3-5 cc
- Continuous Infusion—20-50 μg/kg/min infusion. 120 mg in 100 ml NS yielding 1.2 mg/ml. *If a bolus dose of lidocaine has not been administered within the previous 15 minutes, administer a bolus of 1 mg/kg before initiation of the infusion*

**Onset:**

IV—30-90 sec

**Duration:**

IV—10-20 minutes for bolus

**Side Effects:**

CNS--drowsiness, dizziness, confusion, slurred speech, seizures, respiratory depression/arrest
CV--hypotension, dysrhythmias, bradycardia, cardiac arrest
Other--Nausea, vomiting

**Interactions:**

Additive cardiac depression and toxicity when used concomitantly with amiodarone, procainamide, phenytoin, quinidine, & beta-blockers

***PEARLS:***

- Always give full initial dose, but reduce all subsequent doses by ½ for elderly (>70) or with impaired hepatic function
- Lidocaine has been shown to prolong apnea when used in conjunction with neuromuscular blocking agents. This usually occurs at higher doses than the dose used for pre-intubation, but be aware
- If you have a bradycardia with PVCs, always treat the bradycardia first (atropine, pacing, etc.), then treat the PVCs
- Lidocaine jelly works well as a topical anesthetic for intubation, use it to lubricate ET tubes, but not the stylette as the viscosity of lidocaine jelly may occlude your tube
- Also 2% lidocaine has been used effectively to reduce laryngospasm during intubation. **This use is not covered in local protocols.** While visualizing the spasming cords, spray 2% lidocaine directly on the cords (should take less than ½ of the 100 mg preload)
- Lidocaine induced CNS toxicity usually presents with clinical signs of CNS stimulation followed by CNS depression. Cardiac toxicity follows CNS toxicity and usually requires very high doses
- Generally reperfusion arrhythmias following fibrinolytics are transient and do not require immediate treatment

RX

**Drug Name:** **Magnesium Sulfate**

**Trade Name:** **Mag, Mag Sulfate, MgSO4, Mg++**

**Class:**

- Antidysrhythmic
- Anticonvulsant
- CNS Depressant

**Mechanism of Action:**

- Anticonvulsant properties—reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction
- Antidysrhythmic properties—Physiological calcium channel blocker. Reduces SA node impulse formation, prolongs conduction time in myocardium

**Indications:**

- ***The 2000 ECC/AHA guidelines conclude that IV magnesium during cardiopulmonary rescuscitation has shown effectiveness only for the treatment of patients with hypomagnesemic states or polymorphic ventricular tachyardia (torsade de pointes)***
- Refractory VF, VT (with or without a pulse) *(if hypomagnesemia is suspected)*
- Refractory ventricular ectopy *(if hypomagnesemia is suspected)*
- TDP (*treatment of choice*)
- Seizure prevention and control in preeclampsia and eclampsia (*treatment of choice*)
- Suspected hypomagnesemia
- Status asthmaticus not responsive to β agonists or anticholinergics.

**Contraindications:**

- Heart block
- MI
- Hypermagnesemia

**Precautions:**

Renal insufficiency

**Dosage:**

**Adults:**

**Refractory VT, VF, TDP**, **Refractory Broncheospasm**: IV: 2 g every 5 minutes, 1st line for Torsades or refractory V-Fib/Pulseless V-Tach. Take 2 g (4cc), dilute to a total of 20 cc to make 10% solution. Do not give faster than 1 g/minute

**Preeclampsia,** — IV: 4 g over 20 minutes, repeat as needed. Take 4 g, Dilute to 100 cc. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr)

**Eclamptic Seizures** — IV: 4 g over 5 minutes, repeat as needed. Take 4 g, Dilute to 100 cc. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr

**Pediatrics:**

**Refractory VT, VF, TDP**, **Refractory Broncheospasm** 25-50 mg/kg in 100 cc Buretrol over 2-5 minutes, MAX 2 GM

**DRUG: MAGNESIUM SULFATE**

RX

# DRUG: MAGNESIUM SULFATE

**Onset:**

IV—Immediate
IM--3-4 hours

**Duration:**

IV—30-60 minutes
IM--3-4 hours

**Side Effects:**

Flushing/Sweating
Itching/Rash
Hypothermia
Drowsiness
Respiratory depression
Respiratory failure
Bradycardia/AV block
Cardiac arrest
Circulatory collapse
Complete heart block
Flaccid paralysis
Absence of knee jerk
Hypotension, Diaphoresis

**Interactions:**

Incompatible--alcohol, salicylates, sodium bicarbonate
Additive effects can occur with other CNS depressants
Concurrent use with nifedepine in the treatment of maternal hypertension can cause increased hypotension or pronounced muscle weakness & may harm the fetus
Can cause cardiac conduction abnormalities when used in conjunction with cardiac glycosides

***PEARLS***

***In some case of TDP--5-9 g have been required.***
***As a smooth muscle relaxant, it is also a potentially effective 2nd line intervention in cases of severe, refractory bronchospasm secondary to Asthma.***
***Use aggressively in the setting of eclampsia. If eclamptic seizures are refractory to Mag Sulfate, then proceed to benzodiazepines.***

RX

**Drug Name:** **Methylprednisolone**

**Trade Name:** **Solu-Medrol**

**Class:**

- Synthetic glucocorticoid
- Corticosteroid

**Mechanism of Action:**

- The anti-inflammatory actions of corticosteroids are thought to involve phospholipase $A_2$ inhibitory proteins, collectively called lipocortins. Lipocortins, in turn, control the biosynthesis of potent mediators of inflammation such as prostaglandins and leukotrienes by inhibiting the release of the precursor molecule arachidonic acid
- It inhibits acute & chronic inflammation, & stabilizes cell membranes
- Additionally, it potentiates vascular smooth muscle relaxation by beta-adrenergic agonists and may alter airway hyperactivity

**Indications:**

- Anaphylaxis
- Bronchodilator-unresponsive reactive airway disease (asthma, COPD)
- Acute spinal cord injury (with deficits)-Not covered in SWO's

**Contraindications:**

- Systemic fungal infections *(many clinicians believe this is relative as long as appropriate antimicrobial treatment is administered simultaneously)*
- TB
- Cushing's disease

**Precautions:**

***Most precautions are related to long-term steroid therapy.***

- Psychosis
- Renal/Hepatic disease
- Diabetes
- Seizure disorders
- Recent MI *(has been associated with left ventricular free-wall rupture)*
- Heart failure, Hypertension *(can cause edema)*
- Myasthenia gravis
- GI disease
- Coagulopathies
- Pregnancy (C)

**Dosage:**

**Adults:**

- IV/IM: 125 mg

**Pediatrics:**

- 1-2 mg/kg IV

**Onset:**

- 1-2 hours

**Duration:**

- 8-24 hours

DRUG: METHYLPREDNISOLONE

RX

DRUG: METHYLPREDNISOLONE

**Side Effects:**

***Most side effects seen in long-term steroid therapy***

- Sodium & water retention
- CHF
- HTN
- HA, vertigo
- Hypokalemia
- Seizures
- N/V
- Dysrhythmias

**Interactions:**

- Increases blood glucose levels, may require adjustment of insulin dosage
- Potassium-wasting effects can be exacerbated by concomitant administration of diuretics

***PEARLS:***

- ***The Brady Prehospital Pharmacology text indicates that there are no major contraindications to the use of Methylprednisolone in the emergency setting***
- ***While Solumedrol was once in common use for acute spinal cord injuries, recent clinical studies have suggested that it may be ineffective in this role, and may have adverse effects on long term recovery. The dose for this would be 30 mg/kg IV bolus (over 15 minutes) followed 45 minutes later by an infusion of 5.4 mg/kg/hr for 23 hours. Not covered in ACEMSS SWO's***

RX

**Drug Name:** **Midazolam**

**Trade Name:** **Versed**

**Class:**

- Benzodiazepine (nonbarbiturate sedative-hypnotic agent)
- Schedule IV Controlled Substance

**Mechanism of Action:**

- Acts at the level of the limbic, thalamic, and hypothalamic regions of the CNS through potentiation of GABA (inhibitory neurotransmitter).
- Decreases neural cell activity in all regions of CNS
- Anxiety is decreased by inhibiting cortical and limbic arousal
- Promotes relaxation through inhibition of spinal motor reflex pathway, also depresses muscle & motor nerve function directly
- As an anticonvulsant, augments presynaptic inhibitions of neurons, limiting the spread of electrical activity. However, it does not alter the electrical activity of the seizure's focus
- Midazolam has twice the affinity for benzodiazepine receptors than does diazepam and has more potent amnesic effects
- It is short acting and roughly 3-4 times more powerful than diazepam

**Indications:**

- Sedation prior to cardioversion & intubation
- Maintenance of sedation in mechanically ventilated patients
- Seizure control in pediatrics

**Contraindications:**

Shock
Coma
Hypersensitivity
Pregnancy (D)
Closed Angle Glaucoma

**Precautions:**

- Patients with respiratory insufficiency (asthma, COPD, etc.) are more susceptible to respiratory depression.
- Effects are enhanced by other CNS depressants.
- Elderly

**Use caution when administering to patients with:**

- Hepatic dysfunction
- Renal insufficiency
- History of drug addiction
- Parkinson's Disease
- Myasthenia gravis

**Dosage:**

**Adults:**

- **As an adjunct to intubation:**
  - **IV/IM:** IV: 0.5-5 mg, repeat every 5-10 minutes PRN,
  - **Max of 10 mg**
- **Status epilepticus, cardioversion and pacing, inner ear s/s, sedation, and muscular spasms:**
  - IV: 0.5-2.5 mg, repeat every 5-10 minutes PRN, Max of 5 mg
  - IM: 5 mg (If no vascular access)
  - **Maximum dose of 5 mg**

**DRUG: MIDAZOLAM**

RX

DRUG: MIDAZOLAM

**Pediatrics:**

- **As an adjunct to intubation:**
  - 0.1-0.2 mg/kg to a max of 5 mg/dose.
  - Repeat as needed for ongoing sedation to a max of 10 mg.
- **Seizures**—
  - IN: 0.2-0.4 mg/kg repeat every 5 minutes PRN.
  - IV: 0.05-0.2 mg/kg every 5 –10 minutes PRN.
- **Sedation for painful procedures, cardioversion, pacing, muscular spasms, hyperdynamic drug ingestion/exposure**:
  - IV/IO: 0.05-0.1 mg/kg every 5-10 min (over 2-5 minutes if IV). Maximum dose of 2.5 mg

**Onset:**

- IV: 1-3 minutes (dose dependent)
- IN: 1-5 minutes (dependant on nasal structures)

**Duration:**

- IV: 2-6 hours (dose dependent)

**Side Effects:**

**Minor:**

- N/V
- Headache
- Drowsiness
- Lethargy
- Cough
- Hiccups

**Major:**

- Respiratory Depression
- Apnea
- Paradoxical CNS stimulation (i.e. Valium Rage)
- Hypotension
- Cardiac Arrest

**Interactions:**

- Additive with other CNS depressants

***PEARLS:***

- ***Premedication with an opiate may potentiate midazolam, reducing the dose 30-50% is suggested***
- ***Can cause phlebitis and pain at the IM injection sight.***
- ***Has more potential than other benzodiazepines to cause respiratory depression and arrest. Use with extreme caution in peds. Slower administration may reduce this***
- ***Elderly, debilitated, or patients under the influence of other CNS depressants require reduced dosages***

**Physician Preference: Versed is preferred over other benzodiazepines in cases without IV access due to rapid absorption IM and IN, however may have more profound respiratory depression. Diazepam remains acceptable as well. If unable to control seizures after max dose any single benzodiazepine, call medical control to continue with another benzodiazepine.**

RX

**Drug Name:** **Morphine Sulfate**

**Trade Name:** **Duramorph, Morphine, MS, MSO4**

**Class:**

- Narcotic Analgesic
- Opiate
- Schedule II Controlled Substance

**Mechanism of Action:**

Interacts with opiate receptors decreasing pain impulse transmission at the spinal cord level and higher in the CNS. Morphine is a potent μ-opiate receptor agonist. Also causes peripheral vasodilation increasing venous capacitance and decreases venous return (chemical phlebotomy) by depressing the responsiveness of alpha-adrenergic receptors. Since it decreases both preload and afterload it may decrease myocardial oxygen demand.

**Indications:**

- Moderate to Severe Pain
- Pulmonary Edema
- Acute Coronary Syndromes

**Contraindications:**

- Hypovolemia
- Hypotension
- Patients who have taken MAOI within 14 days
- Hypersentivity
- Head injury

**Precautions:**

- Respiratory depression
- Severe heart disease
- Geriatrics
- Hepatic/Renal disease
- Pregnancy (C) *(increases to D if used for prolonged periods or high doses close to term)*
- May worsen bradycardia or heart block in inferior MI *(vagotonic effect)*
- Use with caution in patients with unstable angina.

**Dosage:**

**Adults:**

- IV/IM: 2-5 mg, repeated PRN every 5-10 minutes

*(Limit dosage to 20 mg in severe pain, HTN crisis, & 10 mg for ischemic chest pain & pulmonary edema. Hold for hypotension)*

**Pediatrics:**

- IV, IO, IM: 0.1-0.2 mg/kg, repeated PRN every 5-10 minutes to a max of 15mg
- For Intubation: 0.2-0.3 mg/kg to a max of 15 mg

**Onset:**

- IV--3-5 minutes
- IM, SubQ--15-60 minutes

**Duration:**

- 3-7 hours

**DRUG: MORPHINE SULFATE**

RX

DRUG: MORPHINE SULFATE

**Side Effects:**

- Dizziness
- Altered L. O. C.
- Hallucinations
- Euphoria
- Mental impairment
- Hypotension
- Lightheadedness
- Bradycardia, Tachycardia
- N/V
- CNS Depression
- Respiratory Depression

**Interactions:**

- CNS depressants may enchance effects (antihistamines, antiemetics, sedatives, hypnotics, barbiturates, and alcohol
- MAOIs may cause paradoxical excitation

***PEARLS***

- Morphine in RSI/MAI: Morphine has both a longer duration of action and a longer onset time than fentanyl. It takes as much as 3-5 minutes for morphine to adequately sedate a patient. In addition, morphine may not blunt the rise in ICP, tachycardia or hypertension as well as fentanyl
- Give the medication time to work, reduce the dose for elderly. Repeated doses without giving the initial dose a chance to work may result in profound CNS depression, hypotension, etc.
- Be judicious in your use of narcotic analgesics, the relief of pain and suffering is one of medicines primary goal, however don't "snow" people
- Opiate analgesics can cause spasm of the sphincter of Oddi. The sphincter of Oddi is the muscular valve surrounding the exit of the bile duct and pancreatic duct into the duodenum, at the papilla of Vater. In addition similar effects are believed to be true in renal tract. This is not a contraindication for the administration of Morphine in these situations, simply a consideration
- Narcotic analgesia <u>used</u> to be considered contraindicated in the prehospital setting for abdominal pain of unknown etiology. It was thought that analgesia would hinder the ER physician or surgeon's evaluation of abdominal pain. It is now becoming widely recognized that severe pain actually confounds physical assessment of the abdomen and that narcotic analgesia rarely diminishes all of the pain related to the abdominal pathology. It would seem to be both prudent & humane to "take the edge off of the pain" in this situation, with the goal of reducing, not necessarily eliminating the discomfort. Additionally, in the practice of modern medicine the exact diagnosis of the etiology of abdominal pain is rarely made on physical examination alone, but also includes laboratory tests, x-ray, ultrasound, and CT scan, essential in the diagnosis of abdominal pain. **Therefore medication of abdominal pain is both humane and appropriate medical care**

RX

**Drug Name:** **Naloxone**

**Trade Name:** **Narcan**

**Class:** Narcotic Antagonist

**Mechanism of Action:**

Binds competitively to opiate receptor sites, displacing narcotics & synthetic narcotics. Antagonizes all actions of narcotics

**Indications:**

- Complete or partial reversal of depression caused by narcotics or synthetic narcotics
- Coma of unknown etiology

**Contraindications:**

- Known Hypersensitivity

**Precautions:**

- Pre-existing cardiac disease
- Patients who have received cardiotoxic drugs
- Abrupt and complete reversal can cause withdrawal-type effects
- Pregnancy (B)
- Use with caution in polypharmaceutical overdoses

**Dosage:**

**Adults:**

- Repeat as needed. Failure to obtain reversal after 10 mg usually indicates another disease process or overdose on non-opioid drugs.
- IV, SQ: 0.1-2 mg PRN to a max of 10 mg
- IN/IM/ETT, IV in cardiac arrest: 2 mg

**Pediatrics:**

- 0.01-0.05 mg/kg IV, IO, IM, SubQ, ET. Repeat PRN.
- MAX 2 mg/dose

**Onset:**

- IV--1-2 minutes
- IN: 1-4 minutes
- IM, SubQ: 2-8 minutes

**Duration:**

- IV, IM, IN, ET, SubQ--30-60 minutes

**Side Effects:**

- Tachycardia
- Hypotension
- HTN
- Dysrhythmias
- N/V
- Diaphoresis

**Interactions:**

- Incompatible with alkaline drugs

**DRUG: NALOXONE**

RX

DRUG: NALOXONE

***PEARLS***

- **Many Opiates have a longer bio-availability than Narcan, therefore assess for re-sedation. Readminister Narcan as needed.**
- Failure to obtain reversal after 10 mg usually indicates another disease process or overdose on non-opioid drugs.
- Use with caution in polypharmaceutical overdoses, reversal of opiate may result in an extremely hyperdynamic patient (i.e. "speedball")
- Use just enough naloxone to reverse severe signs and symptoms (i.e. respiratory depression, loss of airway control, and hypotension). We don't need to completely wake these people up in the field. Doing so may create a situation where a patient may become combative, belligerent, and refuse transport requiring law enforcement intervention
- **If patient has obviously aspirated, consider bypassing Narcan administration and transport the patient. Intubate as required**
- Naloxone can be delivered via ET, however it normally returns a patient to near normal status with regard to LOC, respiratory status, & hemodynamics
- If pushed too rapidly, this medication will induce vomiting
- Intranasal Narcan is relatively new, having been recently studied in Denver, Colorado. It is an effective alternative that may reduce the chance of a needle stick. It is absorbed far quicker than the IM, SQ, or SL routes
- Osterwalder, et al notes that "*In 1000 clinically diagnosed intoxications with heroin or heroin mixtures, from 4 to 30 serious complications can be expected. Such a high incidence of complications is unacceptable and could theoretically be reduced by artificial respiration with a bag valve device (hyperventilation) as well as by administering naloxone in minimal divided doses, injected slowly.*"
  **This is supported by other studies and case reports as well. It is recommended that a couple of minutes of careful ventilation with a BVM (with sellicks maneuver) be performed prior to Narcan administration to decrease the incidence of (uncommon but serious) complications**

RX

**Drug Name:** **Nitroglycerin**

**Trade Name:** **NitroStat, Nitrol, Nitrolingual, Nitro-Bid Ointment, Tridil, Nitro, NTG**

**Class:**

Antianginal Agent
Nitrate
Vasodilator

**Mechanism of Action:**

Nitrates relax peripheral venous vessels, causing a pooling of venous blood and decreased venous return to the heart, which decreases preload.

Nitrates reduce both arterial impedance and venous filling pressures, resulting in a reduction of the left ventricular systolic wall tension, which decreases afterload. Decreases preload.

Results in the reduction of myocardial workload and myocardial oxygen demand.

Aids in the reversal of pulmonary edema.

It also causes some vasodilatation of coronary arteries (limited by atherosclerosis) increasing perfusion of ischemic myocardium.

Note: Nitroglycerin relaxes all other types of smooth muscle.

**Indications:**

Chest pain associated with angina
Chest pain associated with AMI
Acute pulmonary edema
Symptomatic Hypertension (Hypertensive Crisis)

**Contraindications:**

Head Injury, Increased ICP
Cerebral hemorrhage
Hypotension
Hypovolemia
Recent Viagra (sildenafil) use **(OR similar drugs)**
Hypersensitivity to nitrate
Constrictive Pericarditis, Pericardial Effusion
Severe anemia *(causes oxidation of hemoglobin to methemoglobin and could exacerbate anemia)*

**Precautions:**

Nitro deteriorates rapidly after bottle is opened, bottle should be opened and dated, and also protected from light.
Use with caution in closed-angle glaucoma, may increase intraocular pressure.
Elderly may be more susceptible to the effect of nitrates.
Hepatic disease *(metabolism may be impaired and lead to increased risk of methemoglobinemia)*
Postural hypotension.
Pregnancy (C)

**Dosage:**

**Adults:**

- Tablet—One tablet (0.4 mg) sublingual, may be repeated every 3-5 minutes, **(Hold for systolic <90)**
- Spray—1 spray (0.4 mg) under tongue, may be repeated every 3-5 minutes, **(Hold for systolic <90)**
- Ointment—0.5-1.5 inches of ointment (each inch of ointment provides 15 mg) **Hold or wipe off for systolic <90**

**Pediatrics:**

- Not normally recommended for prehospital use

**DRUG: NITROGLYCERIN**

RX

# DRUG: NITROGLYCERIN

**Onset:**

- Tablet, Spray—1-3 minutes
- Ointment—20-60 minutes
- IV—Immediate

**Duration:**

- Tablet, Spray—up to 30 minutes
- Ointment—4-8 hours
- IV—several minutes, dose dependent.

**Side Effects:**

- Headache due to vasodilation
- Hypotension, Dizziness
- N/V
- Xerostomia (Dry Mouth)
- Methemoglobinemia *(rare, usually with high doses of the IV formulation, but can be seen with normal therapeutic doses)*
- Reflex tachycardia
- Skin rash, Flushing
- Anxiety
- Agitation

**Interactions:**

Alcohol *(can theoretically produce additive hypotension)*
Aspirin results in increased serum nitrate concentrations *(may cause increased hypotension**, limited data**)*
Calcium channel blockers & beta-blockers—additive interaction can result in symptomatic orthostatic hypotension.
Sympathomimetics may antagonize the effects of nitroglycerin.
May compromise the efficacy of alteplase, TPA when administered concomitantly.

***PEARLS:***

- Do not shake canister prior to use; shaking may produce bubbles within the canister, which alters delivery of nitroglycerin
- Administer nitroglycerin by holding the canister upright with the valve head uppermost and the spray orifice as close to the opened mouth as possible
- Spray onto or under the tongue and immediately close the mouth. Do not swallow immediately after the dose is administered. Avoid inhalation of the spray
- Sublingual tablets: Place tablet under the tongue or in the buccal pouch and allow to dissolve. Do not swallow sublingual (intrabuccal) tablets
- Apply the nitroglycerin ointment with gloves and to a hair-free region of the torso. Cover with the dose-measuring application paper (may tape in place). Do not rub or massage the ointment as this will cause rapid absorption and interfere with the sustained action.
- Significant adsorption (80% of the nitroglycerin in solution) occurs with standard infusion sets made of PVC plastic. Use glass bottles only and special tubing provided by the manufacturer. Some pump tubing is OK for this use
- Wear gloves when applying paste, and avoid getting sprayed in the mouth by the spray or other NTG containing solutions. If you get ointment or IV Tridil on your skin, sit down quickly! If you get spray in your mouth, caffeinated beverages have been rumored to minimize the effects if consumed quickly (anecdotal reports)
- Orthostatic hypotension, xerostomia (dry mouth), & headache are probably the most common side effects associated with nitroglycerin administration, warn your patient
- NOTE: Patients receiving IV NTG generally are admitted to an ICU level of care. Therefore please take this into consideration when making a transportation decision
- Nitro drip—NTG drip is started at 5-10 μg/min, titrated for effect 5-10 μg/min every 5 minutes up to a max of 200 μg/min **(Hold for systolic <90, titrate up and down in 5 mcg increments) NTG DRIP NOT COVERED IN SWO'S**

RX

**Drug Name:** **Ondansetron HCL**

**Trade Name:** **Zofran, Zofran ODT**

**Class:**

Anti-emetic, Selective Serotonin (5HT3) Receptor Antagonist

**Mechanism of Action:**

Ondansetron reduces the activity of the vagus nerve, which activates the vomiting center in the medulla oblongata, and also blocks serotonin receptors in the chemoreceptor trigger zone. It has little effect on vomiting caused by motion sickness,

**Indications:**

Moderate to severe Nausea, Vomiting

**Contraindications:**

- Hypersensitivity to the drug.
- Prolonged QT syndrome
- Concurrent use of Apomorphine (Apokyn), an anti-parkasonian drug.

**Precautions:**

- Not well studied in children less than 2 years of age
- Use with caution with patients concurrently using drugs which effect QT interval (i.e. Procainamide, Amiodarone, TCA's, Haldol)
- Use with caution with hepatic impairment (consider prolonging dosage intervals or decreasing dose)

**Dosage:**

**Adults:**

- IV/IO/IM- 4 mg, repeated once in 15 minutes PRN
- ODT: **(Not carried currently by ACP)**
  - 8 mg PO once

**Pediatrics: (>2 years of age)**

- IV/IO/IM- 0.1 mg/kg IV/IO, MAX of 4 mg/Dose.
- **Contact medical control to repeat.**
- ODT: **(Not carried currently by ACP)**
  - 8-15 kg: 2 mg PO once
    15-30 kg: 4 mg PO once
    >30 kg: 8 mg PO once

**Duration:**

- 2-4 hours

**Side Effects:**

- Sedation
- Hypotension
- Tachycardia
- Angina
- EPS (Rare)
- Torsades de Pointes (rare)
- Constipation

**Interactions:**

**Additive effects with medications that prolong Q-T interval.**
Additive CNS depressant effects

**DRUG: ONDANSETRON HCL**

RX

DRUG: ONDANSETRON HCL

***PEARLS:***

- **Pregnancy Class B -** Usually safe but benefits must outweigh the risks. Ondansetron showed no benefit over the antiemetic Promethazine (Phenergan) (Pregnancy Class C) for Hyperemesis Gravida (HEG) in a double blinded randomized study. It may be used for cases refractory to other treatments/drugs..
- The rate of IV administration should not be less than 30 seconds and preferably over 2-5 minutes.
- Oral Dissolvable Tablets (Zofran ODT) are increasingly being used in the ED, clinic and pre-hospital settings, especially in pediatrics. Providers should be familiar with this route as well.
- A large, prospective, randomized, double-blind trial compared a single dose of an orally disintegrating Ondansetron tablet to placebo in children presenting to an emergency department with acute gastroenteritis. The study found that children treated with Ondansetron were less likely to vomit, had greater oral intake, were less likely to require intravenous rehydration, and had a reduced length of stay in the emergency department compared with children treated with placebo.
- Avoid use with Apomorphine (Apokyn, Uprima). Apokyn is used to treat Parkinson's disorders, and Uprima is used to treat erectile dysfunction. This is important to note because both of these compositions may promote nausea in some patients.

**Do not use Zofran concurrently with Procainamide, Haldol, or Amiodarone due to QT prolongation.**

RX

**Drug Name:** **Oral Glucose**

**Trade Name:** **Glutose, Insta-Glucose**

**Class:**

Monosaccharide
Carbohydrate

**Mechanism of Action:**

After absorption from GI tract, glucose is distributed in the tissues and provides a prompt increase in circulating blood sugar

**Indications:**

Hypoglycemia

**Contraindications:**

None

**Precautions:**

Altered L.O.C
Ascertain the patient's ability to swallow an oral preparation of glucose without airway compromise
Must be swallowed, not absorbed sublingually, or buccally

**Dosage:**

**Adults:**

- 15-45 G PO for patient's with an intact gag reflex and who are able to handle their own secretions.

**Pediatrics:**

- 5-45 G PO for patient's with an intact gag reflex and who are able to handle their own secretions

**Onset:**

10 minutes

**Side Effects:**

Nausea

**Interactions:**

None

DRUG: ORAL GLUCOSE

RX

DRUG: ORAL GLUCOSE

***PEARLS:***

- Symptomatic hypoglycemia nearly always means an altered mental status. Altered mental status often means a scene safety issue. **Make sure you are aware of your environment**, have the assistance you need, and leave if you become uncomfortable
- Check a glucometer reading before administering glucose if at all possible. Repeat at least 10 minutes after
- Also, it is acceptable to revive a hypoglycemic patient without using the entire Tube. This is done based on the promptness of the patient response.
- If the patient refuses transport it is important to get them something substantive to eat and that someone will be with them for awhile
- Commonly, there is an explanation for hypoglycemia if you look for it. Poor compliance, increased stress, decreased sleep, illness, change in insulin regiment, etc.
- If a patient becomes symptomatically hypoglycemic from oral hypoglycemics, they should generally be transported
- The effects of long acting insulin are difficult to predict. Therefore, the effects of an intentional overdose on long acting insulin are prolonged and beyond the normal capability of the paramedic to treat and release
- Also, if a patient's family, friends, or relatives are present, they can be a good source of information about the patient's habits and their normal recovery from hypoglycemia
- Follow the Diabetic Treat and Release protocol for diabetics who do not desire transport

RX

**Drug Name:** **Oxytocin**

**Trade Name:** **Pitocin, Syntocinon**

**Class:**

Hormone
Uterine Stimulant

**Mechanism of Action:**

Hormone secreted by the posterior pituitary gland. Causes rhythmic contraction of uterine smooth muscle, decreasing postpartum hemorrhage. Additionally it stimulates the mammary glands to increase lactation but does not increase mild production

**Indications:**

Prehospital--excessive postpartum hemorrhage

**Contraindications:**

Before administration it is essential to verify that the baby and placenta have been delivered and there is not an additional fetus in the uterus.

**Precautions:**

- Over stimulation of the uterus and possible rupture, monitor vital signs and uterine tone.
- HTN
- Cardiac Arrhythmias

**Dosage:**

**Adults: (Medical Control Order)**

- IV—10 U in 250 ml of NS administered at a rate to control uterine contractions.
- Infused 10u/250 ml over 5 to 10 minutes; repeat if needed and continue fundal massage.
- IM--3-10 units

**Onset:**

- IV—Immediate
- IM—3-5 minutes

**Duration:**

- IV—1 hour after infusion is stopped
- IM—2-3 hours

**Side Effects:**

- Hypertension or Hypotension
- Dysrhythmias
- Angina
- Anaphylaxis
- Fluid retention
- Pelvic hematoma
- Uterine spasm/rupture
- N/V

**Interactions:**

Other vasopressors may potentiate hypertension.

**DRUG: OXYTOCIN**

RX

DRUG: OXYTOCIN

***PEARLS:***

- **<u>In SWO's this is a medical control call in medication</u>**
- Because of the severe pain that can be induced with oxytocin, consider analgesia
- As with all medications, use the minimum dose required to achieve desired effects
- Do not give unless you are sure all fetuses have been delivered (i.e. fetus count has been confirmed by ultrasound prior to delivery)

RX

**Drug Name:** **Phenylephrine**

**Nickname:** **Neosynephrine**

**Class:**

Nasal decongestant
Sympathomimetic amine

**Mechanism of Action:**

After intranasal administration, phenylephrine stimulates alpha-adrenergic receptors on the nasal mucosa (direct effect) causing vasoconstriction of local vessels. The vasoconstrictive action decreases mucosal edema, thereby leading to a decongestant effect.

**Indications:**

Facilitation of Nasal Intubation. Minimizes bleeding.

**Contraindications:**

Hypersensitivity to sympathomimetic amines

**Precautions:** *(most are related to IV/IM use which is not normally available pre-hospital)*

| | |
|---|---|
| Child < 6 | Increased ICP |
| Geriatrics | Hyperthyroidism |
| Diabetes | Pregnancy (C) |
| CVD | Glaucoma |
| HTN | |

**Dosage:**

**Adults:**
2-3 gtts or sprays to nasal mucosa (0.25%-1.0%)
**Pediatrics:** (seldom used because of the difficulty and complication rate of nasal intubation in pediatrics)
6-12 yrs--1-2 gtts or sprays to nasal mucosa (0.25%)

**Onset:**

Immediate

**Duration:**

30 minutes-4 hours

**Side Effects:**

| | |
|---|---|
| Irritation | Dryness |
| Sneezing | Anxiety |

*Side effects below are secondary to IM/IV use:*

| | |
|---|---|
| Restlessness | Dizziness |
| Tremors | Headache |

**Interactions:**

Few when used in the adult patient nasally (not well absorbed into systemic circulation)

**DRUG: PHENYLEPHRINE**

RX

DRUG: PHENYLEPHRINE

***PEARLS:***

- More easily absorbed into systemic circulation by pediatrics
- To avoid the spread of infection, do not use the container for more than one person.
- Take the time to use this in the setting of nasal intubation; you'll reduce the incidence of uncontrollable hemorrhage significantly.

RX

**Drug Name:** **Procainamide**

**Trade Name:** **Pronestyl, Procan**

**Class:**

Antidysrhythmic (Class IA)

**Mechanism of Action:**

Suppresses ectopy in atrial & ventricular tissue, has little use on arrhythmias of nodal origin.
In normal ventricular muscle and Purkinje fibers, it suppresses phase 4 diastolic depolarization thus reducing the automaticity of all pacemakers.
It also slows intraventricular conduction, thus suppressing reentry arrythmias.
If there is ischemic tissue and conduction is already slowed, procainamide may further slow conduction and produce bi-directional block and may terminate reentry dysrhythmias.
Potent vasodilator.
Decreases chronotropy, excitability, negative dromotrope.
Modest negative inotrope.

**Indications:**

Refractory and recurrent VF, pulseless VT
Stable monomorphic or polymorphic VT
Wide-complex tachydysrhythmias of uncertain type
Malignant, refractory PCVs
Supraventricular Dysrhythmias including: PAC, PAT, A-Fib, A-Flutter, WPW

**Contraindications:**

Procainamide is mutually contraindicated in presence of TCA overdose and/or Amiodarone use.
AV blocks (especially 2nd and 3rd degree) (*unless controlled by a pacemaker*)
Torsades or QT prolongation
TCA poisoning (prolonged QT interval)
Previous (recent) use of Amiodarone
Shock

**Precautions:**

Hypokalemia
Hypomagnesemia
Pregnancy (C)
Asthma
CHF (*Listed as a relative contraindication in one source, accumulation of drug can lead to toxicity*)
Digitalis toxicity (*Listed as a relative contraindication in one source*)
Hepatic / renal dysfunction (*accumulation of drug can lead to toxicity*)
Lupus (*can precipitate an episode of SLE*)
Myasthenia Gravis (*can exacerbate muscular weakness*)

DRUG: PROCAINAMIDE

RX

# DRUG: PROCAINAMIDE

**Dosage:**

**Adults:**
OPTIONAL BOLUS IN ARREST SITUATIONS: 100 mg IVP every 5 minutes.
Initial infusion IV: Mix 1 g in 50 cc (20mg/cc) buritrol. Run 20-50 mg/min (60-150 gtts/min) until:

- Max of 17 mg/kg
- QRS widens by 50%
- Rhythm resolves
- Hypotension develops

Maintenance infusion: Mix 1 g /250 cc of NS. Run at 1-4 mg/minute (15-60 gtts/min.)

**Pediatrics:**
Perfusing ventricular arrhythmias-- 15 mg/kg IV over 30—60 minutes.
PALS does not recommend procainamide for pulseless VF/VT.

**Onset:**
IV—peak at 10-30 minutes

**Duration:**
IV--3-6 hours

**Side Effects:**

Bradycardia
Reflex Tachycardia
Hypotension, Dizziness
AV Blocks
Dysrhythmias
Skin rash
N/V
CNS depression
Seizures
Conduction delays (prolonged PR interval, QT interval, or widened QRS)
Respiratory depression/arrest *(usually with too rapid or excessive doses)*
Cardiac arrest *(usually with too rapid or excessive doses)*

**Interactions:**
Additive or Antagonistic when used with other antidysrhythmics
Additive with anticholinergics (antidepressants ***(REMEMBER TCAs),*** atropine, antihistamines, haloperidol).
Use with caution in patients taking antihypertensives.
Can potentiate the effects of depolarizing or non-depolarizing neuromuscular blockers.

**PEARLS:**

- ***With rapid injection, hypotension is common; constantly monitor blood pressure when administering in non-cardiac arrest settings***
- ***The duration of Procainamide's effect is shorter than Lidocaine, thus establishing an infusion is essential***

RX

**Drug Name**: **Ranitidine**

**Trade Name**: **Zantac**

**Class:**

Antihistamine
H2 Antagonist

**Mechanism of Action:**

- Blocks H2 receptors
  - ❖ H1—causes bronchoconstriction, contraction of gut
  - ❖ H2—causes peripheral vasodilation, secretion of gastric acid
    - o ERs use cimetidine (Tagamet) for H2 blockade

**Indications:**

- Anaphylaxis
- Allergic reactions
- Urticaria

**Contraindications:**

- Hypersensitivity
- Acute asthma attack
- Lower respiratory tract disease/Pneumonia
- Newborns & nursing mothers

**Precautions:**

- Concurrent use of other H2 inhibitors
- HTN
- Cardiac disease
- Renal disease (prolonged clearance)
- Bronchial asthma
- Seizures
- Pregnancy category - C
- Closed angle glaucoma (avoid if at all possible)

**Dosage:**

**Adults:**

50 mg IV/IO/IM (Diluted in Normal Saline)
PO: (If available) 150-300 mg (for mild cases)

**Pediatrics:**

1 mg/kg IV/IM/IO max dose 50 mg
PO: (If available) 150 mg (for mild cases)

**Onset:**

IM—20 min
IV—5-10 minutes to reach peak effect.

**Duration:**

IM—2-6 hours
IV—2-6 hours

**DRUG: RANITIDINE**

RX

DRUG: RANITIDINE

**Side Effects:**

- Drowsiness
- Dizziness
- Incoordination
- Confusion
- Dry mouth
- Drying of bronchial secretions
- Blurred vision
- Urinary retention
- Hypotension
- Tachycardia
- Bradycardia
- AV Block (rare)

**Interactions:**

Additive effects—other CNS depressants
MAOIs—prolong the anticholinergic effects

***PEARLS:***

- ***Ranitidine is an adjunctive therapy to benadryl (with or without epinephrine) in anaphylaxis & severe allergic reactions. It is not a stand-alone intervention.***

- **While the pathology of anaphylaxis is still being understood, some patients will experience prolonged or even multi-phasic reactions. The combination of an H1 and an H2 blocker has been shown in clinical trials to reduce the severity as well as the reoccurrence of anaphylactic symptoms over a significant period.**

- **A common misconception is that the majority of symptoms in anaphylaxis are the result of H1 receptors. In reality, both H1 and H2 receptors are equally important. *H2 blockers combined with H1 blockers have additive benefit over H1 blockers alone in treating anaphylaxis in general. H2 receptors are useful in treating vasodilation, possibly some cardiac effects, and glandular hypersecretion.***

RX

**Drug Name:** **Sodium Bicarbonate**

**Trade Name:** **Bicarb, NaHCO3**

**Class:** Alkalinizing Agent

**Mechanism of Action:**

In the presence of hydrogen ions, sodium bicarbonate dissociates to sodium and carbonic acid, the carbonic acid picks up a hydrogen ion changing to bicarbonate and then dissociates into water and CO2, functioning as an effective buffer and alkalinizing the blood. In summary, increases plasma bicarbonate, which can buffer metabolic acids and move TCAs and phenobarbital off receptor sites and back into circulation.

**Indications:**

- Preexisting Metabolic Acidosis (severe hypoxia, late cardiac arrest)
- Hyperkalemia
- Tricyclic or Phenobarbital Overdose

**Contraindications:**

None when used in severe hypoxia and late cardiac arrest
Metabolic & Respiratory alkalosis
Severe pulmonary edema *(administration of sodium may be detrimental)*
Hypokalemia
Hypocalcemia
Hypernatremia *(administration of sodium may be detrimental)*

**Precautions:**

Bicarbonate administration produces CO2, which crosses cell membranes more rapidly than bicarbonate, potentially worsening intracellular acidosis.
CHF *(may worsen)*
Pregnancy (C)
Infiltration can cause tissue necrosis
Renal disease

**Dosage:**

**Adults:**
1.0 mEq/kg IV bolus, may repeat ½ dose 10 minutes thereafter.

- OPTIONAL TCA Overdose/CRUSH Injury INFUSION: 50-100 mEq/1000 cc, run at 150 cc/hr, titrated for effect

**Pediatrics:**
1.0 mEq/kg IV bolus, may repeat ½ dose 10 minutes thereafter

- OPTIONAL TCA Overdose INFUSION: 50-100 mEq/1000 cc, run at 150cc/hr, titrated for effect

**Onset:**

- IV—2-10 minutes

**Duration:**

- IV—30-60 minutes

DRUG: SODIUM BICARBONATE

RX

DRUG: SODIUM BICARBONATE

**Side Effects:**

- Alkalosis
- Hyperirritability, Seizures
- Tetany (electrolyte imbalance)
- Hypernatremia
- Hyperosmolality
- Cardiac & respiratory arrest
- Lowering of serum K
- Increased binding of calcium to serum proteins
- Decreased fibrillation threshold
- Sodium and water overload
- Inhibition of oxygen release to tissue

**Interactions:**

- Calcium salts will form a precipitate and clog the IV line
- Most sympathomimetics will be deactivated by alkaline solutions
- Use relatively early in the setting of confirmed TCA overdoses, tachycardia (even before QRS widening) & CNS depression are symptomatic enough to initiate alkalinization. By the time you get to hypotension, you often are close to seizures and may be too late
- Ensure IV is patent to avoid tissue sloughing at the injection site
- Also be sure to flush IV line before & after administration to avoid inactivating sympathomimetics & precipitating with CaCl

RX

**Drug Name:** **Succinylcholine Chloride**

**Trade Name:** **Anectine**

**Class:**

- Depolarizing neuromuscular blocker.

**Mechanism of Action:**

Inhibits transmission of nerve impulses by binding with cholinergic receptor sites, antagonizing action of acetylcholine. Initial binding causes muscle fasciculation's and progresses to total paralysis, including the diaphragm. Muscle relaxation begins in the eyelids & jaw, progresses to the limbs, the abdomen, & finally the diaphragm & intercostals. Succinylcholine has absolutely no effect on consciousness

**Indications:**

- Facilitation of ET Intubation

**Contraindications:**

- Hypersensitivity
- History of malignant hyperthermia
- History of skeletal muscle myopathy (rhabdomyolysis)
- Penetrating eye injuries

**Precautions:**

- Pregnancy (C)
- Cardiac disease
- Dehydration
- Respiratory disease
- Neuromuscular disease *(prolonged effects, i.e. myasthenia gravis)*
- Severe burns *(potential for cardiac arrest & ventricular arrhythmias, usually not an acute concern)*
- Crush Injuries *(potential for cardiac arrest & ventricular arrhythmias, usually not an acute concern)*
- Must be ready to intubate as soon given, use cricoid pressure to secure airway from gastric regurgitation
- Narrow-angle glaucoma
- Elderly

**Available Forms:**

- 20 mg/ml in 10 ml vials (200 mg)

**Dosage:**

**Adults:**

- IV, IM, IO: 1-2 mg/kg rapid push, repeat once if needed

**Pediatrics:**

- IV, IM, IO: 1-2 mg/kg rapid push, repeat once if needed
- INFANTS: IV, IM, IO 2 mg/kg

**Onset:**

- IV—30-60 seconds
- IM—2-3 minutes

**Duration:**

- IV—3-5 minutes
- IM—10-30 minutes

**DRUG: SUCCINYLCHOLINE**

RX

DRUG: SUCCINYLCHOLINE

**Side Effects:**

- Sinus arrest
- Dysrhythmias
- Hypotension
- Increased intraocular pressure
- Prolonged apnea
- Hyperkalemia *(36 hours post crush trauma/ burns).* Bradycardias *(May eventually get tachycardia & hypertension as an asphyxia response)*
- Bronchospasm
- Vomiting/Aspiration
- Malignant Hyperthermia

**Interactions:**

- Theophylline users may end up with dysrhythmias
- Incompatible with barbiturates, chlorpromazine, nafcillin, alkaline solutions
- Effects enhanced by Lidocaine, Procainamide, beta blockers, magnesium sulfate, other neuromuscular blockers

**PEARLS:**

- **Physician preference is that Succinylcholine be used as a second line induction agent, if Etomidate does not work, or if Etomidate is contraindicated**
- **Succinylcholine has no effect on consciousness or pain…sedate your patients**
- **Cricoid pressure should be continuously applied until intubation is complete & the tube cuff inflated**
- The use of Succinylcholine should be part of a systematic approach to a difficult airway, and as such, not performed until all equipment, personnel, medications and safeguards are in place
- Succinylcholine should not be used unless the medic is prepared to perform a number of rescue airway techniques, **up to and including a surgical airway**.
- Children are not as sensitive as adults and may require higher dosages (2 mg/kg)
- NOTE: In both adults and children the incidence of bradycardia is higher following a second dose of Succinylcholine. Pretreatment with anticholinergic agents (atropine) may reduce the occurrence of brady arrhythmias.
- WARNING: There have been several reports of cardiac arrest following administration of Succinylcholine to apparently healthy children and adolescent patients who were subsequently found to have undiagnosed myopathies. In most cases, patients experienced acute rhabdomyolysis with hyperkalemia and cardiac arrest. Because children and adolescent patients are more likely than adults to have undiagnosed myopathies, a nondepolarizing neuromuscular blocking agent should be used for routine elective surgery in these patients. <u>Except when used for emergency tracheal intubation or in instances where immediate securing of the airway is necessary, Succinylcholine is contraindicated in children and adolescent patients</u>
- If repeated intubation attempts fail, you can usually ventilate the patient until spontaneous ventilations return (while maintaining cricoid pressure)
- Our first priority remains airway and this is a wonderful tool to manage airways if used appropriately. It is by no means benign. In its use, you must weigh the risk versus the benefits. Use anatomical assessment to estimate the chance of success and weigh that against the need of an airway

RX

**Drug Name:** **Tetracaine Hydrochloride**
**Trade Name:** **Pontocaine Eye, Pontocaine HCl, Tetracaine**
**Class:**

- Ophthalmic anesthetic

**Mechanism of Action:**
Causes a reversible blockade of nerve conduction by decreasing nerve membrane permeability to sodium. This decreases the rate of membrane depolarization thereby increasing the threshold for electrical excitability. Clinically, loss of nerve function is as follows: pain, temperature, touch, proprioception, and skeletal muscle tone.

**Indications:**

- Removal of foreign objects

**Contraindications:**

- Hypersensitivity to PABA, sulfites
- Open or penetrating globe injury

**Precautions:** *(Minor considerations for optic use)*

- Allergies
- Hyperthyroidism
- Hypertension
- Cardiac disease
- Pregnancy (C)

**Dosage:**

**Adults:**

- 1-3 gtts

**Pediatrics:**

- 1-3 gtts

**Onset:**

- 15 seconds

**Duration:**

- 15 minutes

**Side Effects:**

- Blurred vision
- Stinging
- Photophobia
- CNS stimulation *(This and below are rare in optic use)*
- CNS and CV depression
- Burning
- Lacrimation

**Interactions:**

- Decreases bacterial actions of sulfonamides
- Can antagonize the effects of cholinesterase inhibitors locally

**DRUG: TETRACAINE**

RX

DRUG: TETRACAINE

***PEARLS***

- ***Don't forget good BLS care as well.***

RX

**Drug Name:** **Vecuronium**

**Trade Name:** **Norcuron**

**Class:**

- Non-depolarizing neuromuscular blocking agent.

**Mechanism of Action:**

- Nondepolarizing agents produce skeletal muscle paralysis by blockade at the myoneural junction, competing with acetylcholine for cholinergic receptor sites and binding with the nicotinic cholinergic receptor at the postjuctional membrane
- Unlike depolarizing agents, vecuronium has little agonist activity, with no depolarizing effect at the motor endplate
- Muscle relaxation begins in the eyelids & jaw, progresses to the limbs, the abdomen, & finally the diaphragm & intercostals. Vecuronium has absolutely no effect on consciousness
- Causes little histamine or cardiovascular response

**Indications:**

- Facilitation of intubation
- Maintenance of paralysis following RSI ***(Does not include sedation!)***

**Contraindications:**

- Hypersensitivity

**Precautions:**

- Pregnancy (C)
- History of malignant hyperthermia
- Cardiac or hepatic disease
- Respiratory disease
- Narrow-angle glaucoma
- Elderly or debilitated patients
- Must be ready to intubate as soon as given, use cricoid pressure to secure airway from gastric regurgitation. Dehydration, electrolyte or acid/base imbalance *(potentiates the actions)*
- Neuromuscular disease *(prolonged effects, i.e. myasthenia gravis)*

**Dosage:**

**Adults: (Medical Control Order)**

- IV: 0.1 mg/kg, repeat PRN

**Pediatrics: (Medical Control Order)**

- IV: 0.1 mg/kg, repeat PRN
- NOTE: The dose required for induction or maintenance may be higher, but it also may last 1 ½ times as long

**Onset:**

- IV—1 minute *(good intubation conditions within 2.5-3.0 minutes)*

**Duration:**

- IV—30-60 minutes

**DRUG: VECURONIUM**

RX

DRUG: VECURONIUM

**Side Effects:**

- Side effects are rare, but with neuromuscular blockers, histamine release can cause
- Bronchospasm
- Dysrhythmias
- Hyper- or Hypotension

**Interactions:**

Opiates or anti-arrhythmics can potentiate the effects of vecuronium.

***PEARLS:***

- **Generally speaking, vecuronium is used to maintain paralysis, not to initiate paralysis (some rare exceptions apply). Vecuronium should only be given after the tube is secured and confirmed**
- **As with Succinylcholine: Vecuronium has no effect on consciousness or pain. Sedate your patients**
- **To maintain sedation on these patients, titrate your administration to the patient's vital signs (heart rate, blood pressure)**
- **Vecuronium is used locally in the prehospital setting for maintenance of paralysis following intubation because of its long paralytic effects in comparison to the rapid onset and short duration of succinylcholine**
- **Vecuronium should be considered in increased tube times (15 minutes or more), on order from medical control**

**APPENDIX: A**

**TITLE: BASIC AIRWAY SUPPORT PROCEDURES**

**REVISED: May 1, 2012**

## I. BASIC OXYGEN ADMINISTRATION

Supplemental oxygen shall be administered to all patients at risk for hypoxia/hypoxemia. Current AHA guidelines also recommend supplemental oxygen administration for patients with SPO2 ≤ 94% unless otherwise contraindicated.

| Adjunct | Flow Rate | % Oxygen Delivered |
|---|---|---|
| Nasal Cannula | 1-6 L/min | Approx. 24-44% |
| Simple Mask | 8-10 L/min | Approx. 40-60% |
| Non-Rebreather Mask | 10-12 L/min | Approx. 90-100% |
| Bag-Mask w/ Reservoir | 10-12 L/min | Approx. 100% |
| FROPVD/ Demand Valve | (good seal) | Approx. 100% |

If hypoventilation is present, utilize bag/mask or demand valve with 100% oxygen to insure adequate ventilation and oxygenation.

Other devices, such as a trach mask, venture mask, or other device may also be used based on clinical judgment and presentation of the patient.

## II. BASIC VENTILTORY SUPPORT

If supplemental oxygen support is inappropriate, ineffective, or impractical, and the patent is considered to be at risk for hypoventilation, hypoxia, or respiratory failure/compromise, then more aggressive respiratory support be indicated. Interventions include, but are not limited to,

- *Intermittent Positive Pressure Ventilation* (IPPV) using a bag valve manual resuscitator with a traditional face mask, an intra-oral mask (IOM), ETT, other advanced airway (i.e. supra-glottic airways) , or to a tracheostomys tube.
- *Flow-restricted, oxygen-powered ventilation device* (FROPVD), AKA Demand Valve, or an Elder valve, as available or indicated, using a traditional face mask, an intra-oral mask (IOM) ETT, other advanced airways (i.e. supra-glottic airways) , or to a tracheostomy tube.
- CPAP/PEEP (See appendix E)

When possible, providers should maintain strict ventilatory discipline to reduce adverse hemodynamic effects and baro-trauma, particularly during cardiac arrest, low perfusion states, and those with fragile respiratory anatomy (i.e. Asthmatics, COPD).

Providers should adjust mechanical ventilatory support based on the measured SPO2, ETCO2, and patient-ventilator synchrony/compliance. As spontaneous ventilation becomes more efficient and as concurrent medical conditions allow, the level of support may be adjusted.

## III. PULSE OXIMETRY

Pulse Oximetry monitoring shall be utilized on all patients at risk for hypoxemia. Oxygen saturation data shall be documented in the objective findings portion of patient run reports as oxygen saturation in terms of percentage (%) of hemoglobin saturation.

NOTE: Hemoglobin binding gases (CO, etc.), acidosis, and low peripheral perfusion may give false high or low pulse oximetry data.

## IV. EXPIRED CO2 MONITORING

Expired/End Tidal CO2 (ETCO2) monitoring shall be utilized on all intubated patients using the most appropriate device available. These devices include, but are not limited to:

- STAT-CAP or EASY-CAP expired CO2 monitoring devices.
- Basic End Tidal CO2 devices (for example: the Nelcor N20, or the Nonin Multi)
- Advanced End Tidal CO2 devices with wave form devices (For Example: ProPaq monitoring systems, Medtronic LifePak 12 / 15, Zoll M Series devices)

**Expired CO2 levels shall be documented as ETCO2 in terms of approximate mm/Hg (Torr).**

ETCO2 is a useful adjunct for determining perfusion and measuring expired C02 in the intubated patient. Correctly interpreted end tidal volume capnometry is an excellent method of confirming correct ET placement. It is a reliable method, but it is only a tool and has several limiting factors in its interpretation.
This does not imply the device itself has inherent defects or limitations, only that it measures the amount of C02 in the air passing through it and there are many factors affecting this quantitative analysis. Some factors that can cause false or misleading readings are:

- Pulmonary shunt – limits the perfusion of available lung parenchyma causing poor gas exchange
- Hypovolemic shock – limits available hemoglobin for gas exchange by limiting pulmonary perfusion and circulating RBC's
- Cardiogenic shock – poor gas exchange from limited perfusion of blood through the lungs
- Neurogenic shock – limits available hemoglobin for gas exchange by limiting pulmonary perfusion
- Lack of C02 production – i.e. cellular death
- Tube dislodgement, kinking, obstruction

The major limitation of any ETCO2 is the user, not the device. Appropriate decision-making must utilize all available information and good judgment. In the intubated patient with good breath sounds, fogging of the tube, equal chest excursion and direct visualization of the cords with observation of the tube passing between them, a low reading with ETCO2 is not an absolute indication for extubation. It is, however, always appropriate to recheck ET tube placement through multiple independent means if any question of patency or placement arises and Extubate promptly if ET placement cannot be satisfactory confirmed.

**NOTE:** The EASY CAP and STAT-CAP devices are disposable colormetric devices that measure ETCO2. The device attaches directly to the bag valve or mechanical ventilator and ET tube, and registers the percent of expired C02 by exhibiting a color change in its face. This color change is compared with the attached chart on the face of the device to determine the approximate percent of expired C02. These devices are simple, have nothing to calibrate or adjust, and if properly stored will react to changes in expired C02 within 30 seconds. The detector will function for approximately 1-2 hours before becoming saturated with C02, however if the patient has received Epinephrine via the endotracheal route, colormetric ETCO2 may give false readings. Once saturated, the device should be disposed of in an appropriate biohazard container.

Constant qualitative or quantitative End Tidal Capnography is preferred to the color-metric ETCO2 devices, and should be used for any transport over 10 minutes when ever available.

## V. REFERENCE:

1. "Adjuncts for Airway Control, Ventilation, and Supplemental Oxygen." Textbook of Advanced Cardiac Care Life Support. American Heart Association, 1994.

2. "Part 9: post– cardiac arrest care: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care". Circulation. 2010;122(suppl 3):S768 –S786.

# APPENDIX A

BASIC AIRWAY SUPPORT

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**APPENDIX: B**

**TITLE: INTUBATION PROCEDURES**

**REVISED: April 29, 2011**

## I. BACKGROUND

Advanced Airway Procedures and competency are the cornerstones of Paramedicine. True competency involves knowing not only how to control the airway, but when to control the airway, and selecting the best method to do so. While oral-tracheal intubation is the gold standard of securing the airway, it is not the only means available to ACEMSS paramedics. The window of opportunity in controlling the airway is often brief indeed. Good clinical judgment is paramount, coupled with critical decisiveness, and is essential to obtain the best outcomes possible for the patient.

## II. INDICATIONS AND CONTRAINDICATIONS

**ABSOLUTE INDICATIONS:**

- Cardiopulmonary arrest
- Respiratory arrest
- Comatose with non-maintainable airway
- Pronounced hypoxia
- Inadequate ventilation by BVM or other airway device.

**STRONGLY CONSIDER WITH:**

- Any patient with a decreased level of consciousness with compromised ability to manage their airway
- Airway burns or edema
- CHF with diminished respiratory drive
- Acute asthma / COPD with diminished respiratory drive
- Other Respiratory failure/distress with diminished respiratory drive
- Suspected intracranial bleed/closed head injury
- Those patients who fail to respond to positive pressure ventilation
- GCS <8 without reversible causes

**CONTRAINDICATIONS:**

None

## III. PROCEDURE

**ORAL INTUBATION:** Listed below is a general guide to the procedure. It may be modified as needed due to patient's position, anatomical features, or other conditions as needed. Prepare all equipment while hyperventilating the patient with 100% oxygen.

- Position the patient's head in the "sniffing position" (unless C-Spine Injury is suspected)
- Insert the laryngoscope blade of choice into the pharynx and visualize the glottic opening and the epiglottis by placing the blade either in the vallecula or under the epiglottis. Exert traction upward on the handle of the laryngoscope. This ***must not*** be done in a prying motion nor should the teeth be used as a fulcrum

- Insert the proper size tube into the pharynx and pass it between the vocal cords anterior to the arytenoid cartilages, approximately 1 inch in the adult and 5-10 mm. in the child
- The cuff should be inflated with 5-10cc air
- Follow confirmation procedures
- Secure the ET tube. Note the centimeter markings on the tube at the teeth
- Reconfirm placement frequently

**NASAL INTUBATION:** listed below is a general guide to the procedure. It may be modified as needed due to patient's position, anatomical features, or other conditions as needed

- Hyperventilate with high-flow oxygen for 2-3 minutes with a BVM while preparing the equipment
- Bend the tube to the approximate airway curvature to heighten the degree of success. Use of an "Endotrol" ET tube is at the discretion of the paramedic.
- Lubricate the endotracheal tube with Xylocaine gel. Spray Neosynephrine in the nare to prevent bleeding
- Insert the endotracheal tube into the nostril on a flat plane. Use of the right nostril may be easier
- Turn the tube so as to avoid the nasal turbinates. Use no more than gentle pressure to advance the tube; *NEVER FORCE THE TUBE*
- Continue advancing the tube judging position in the throat by the amount of air you can feel coming out of the tube
- If there is suddenly less air flow than noted previously, the tube is likely past the area of the epiglottis and vocal cords
- Pull back on the tube until a large amount of airflow returns
- If using a standard ET tube, turning the tube to the left and encouraging the patient to cough and then advancing the tube will assist with good placement.
- Using cricoid pressure and the BURP procedure may also facilitate passage through the cords
- When you are certain your tube is in the trachea, inflate the cuff with 5-10cc air.
- Follow confirmation procedures
- Secure the ET tube. Note the centimeter markings on the tube at the nare.
- Reconfirm placement frequently

**DIGITAL INTUBATION:** listed below is a general guide to the procedure. It may be modified as needed due to patient's position, anatomical features, or other conditions as needed

- Hyperventilate with high-flow oxygen for 2-3 minutes with a BVM and oral/nasal airway in place while you are preparing your equipment
- Insert a stylet into the ET tube and curve it to form a "J"
- Lubricate the tube with Xylocaine gel
- With a GLOVED hand, stand or kneel facing the patient opposite shoulder.
- Place the index and middle fingers into the patient's mouth until you palpate the epiglottis, usually in the midline

- Lift the epiglottis with your middle finger and slide the ET tube along the palmar surface of your index finger, guiding the tube under the the epiglottis and between the vocal cords
- Withdraw the stylet and confirm proper ETT placement
- Secure the ET tube. Note the centimeter markings on the tube.
- Reconfirm placement frequently

**Use of the endotracheal tube introducer (AKA the "Bougie", Flexiguide):** The tracheal tube introducer is used to facilitate difficult intubation. It should not be confused with the more rigid stylet, which is inserted into the ET tube and used to alter its shape prior to intubation. Unlike the stylet a bougie is inserted independently of the ET tube and is used as a guide. Since the bougie is considerably softer, more malleable, and blunter than a stylet this technique is considered to be a relatively atraumatic procedure. It is used where a difficult intubation is anticipated, or a poor view of the glottic opening has been confirmed on laryngoscopy Listed below is a general guide to the procedure. It may be modified as needed due to patient's position, anatomical features, or other conditions as needed

- Prepare the endotracheal tube introducer for use: Curve the bougie and ensure the distal tip is formed into a J (coudé) shape
- Perform a laryngoscopy, obtaining the best possible view of the glottic opening. You should always be able to view the tip of the epiglottis and, ideally, the arytenoid cartilages
- Advance the bougie, continually observing its distal tip, with the concavity facing anteriorly
- Visualize the tip of the bougie passing posteriorly to the epiglottis and (where possible) anterior to the arytenoid cartilages
- Once the tip of the bougie has passed the epiglottis, continue to advance it in the mid-line so that it passes behind the epiglottis but in an anterior direction
- As the tip of the bougie enters the glottic opening you may feel 'clicks' as it passes over the tracheal rings or the tip may stop against the wall of the airways. This suggests correct insertion, although cannot be relied upon to indicate correct positioning with 100% accuracy. If hold-up is felt, the bougie may then be withdrawn up to 5cm to avoid the ET tube impacting against the carina
- Hold the bougie firmly in place and pass the endotracheal tube over the proximal end of the bougie
- As the proximal tip of the bougie is re-exposed, carefully grasp it, assuming control of the bougie
- The ET tube should then be carefully advanced along the bougie and hence through the glottic opening, taking care to avoid movement of the bougie
- **SUCCESSFUL INTUBATION MAY BE CONSIDERABLY ENHANCED BY ROTATING THE ET TUBE 90º COUNTER CLOCKWISE, SO THAT THE BEVEL FACES POSTERIORLY.** In so doing the bougie may also rotate along the same plane but should not be allowed to move up or down the trachea.
- Once the ET tube is fully in place hold it securely as you slowly withdraw the bougie
- Inflate the cuff
- Follow normal confirmation procedures
- Secure the tube

## IV. CONFIRMATION AND DOCUMENTATION

Endotracheal tube placement shall be confirmed (and documented) by **at least 3 methods**, including:

- (**MANDATORY**) Use of STAT-CAP or EASY-CAP or other expired end tidal CO2 monitor devices on all ET tubes. Titrate ventilations to an ETCO2 of 30-40 torr.
- Direct visualization of tube passing through the vocal chords
- Auscultation for equal breath sounds **and** the absence of epigastric sounds (counts as one method)
- Observing for fogging/misting of tube
- Use of an endotracheal esophageal detector
- Improvement in patient's clinical status

Patient's head should be immobilized with a collar after intubation to prevent ET tube displacement secondary to flexion or extension of neck. Advanced airways should be reassessed for placement frequently and after any major decrease in patient's status.

Documentation shall include:

- Provider
- Number of attempts and time of successful intubation. An intubation attempt is defined as anytime:
    - The Laryngoscope blade passes the teeth w/ the providers **intent** to intubate the patient
    - The tube passes into nasopharynx or the oropharynx or
    - The digits of the hand (or any other device) are passed into the hypopharynx in an effort to pass an ETT tube
- Depth of ET tube at the lips or nares.
- Complications encountered, reasons for unsuccessful attempt if known.
- Methods of confirmation.
- Tube position just prior to turning over care to ER or D/C efforts in the field.

## V. SPECIAL SITUATIONS:

**Suspected C-Spine Injury:**
Nasal or digital intubation should be considered when possible. Also consider the endotracheal tube introducer (AKA the "Bougie", Flexiguide). If unable to place endotracheal tube, consider use of an alternate airway.

**Suspected Hypoglycemia:**
Check blood glucose and give *D50 IV* (See Hypoglycemia protocol) prior to intubation if indicated.

**Suspected Narcotic Overdose:**
Consider *Naloxone* (see suspected narcotic overdose protocol) prior to attempting intubation.

**Suspected Head Trauma/Increased ICP:**

*Lidocaine 1 mg/kg IV* for intracranial pressure control in head injured patients, patients with CNS injury (hypertensive crisis, bleed)

**Laryngeal edema**

Rarely, laryngeal edema due to burns or anaphylaxis will be severe as to result in swelling which obliterates the glottic opening. When nothing but inflamed swollen tissue is visible on laryngoscopy, instruct an assistant to push down slowly on the chest **AND MAINTAIN THE COMPRESSION.** This may result in a bubble of air becoming visible over the (hidden) glottis. Pass a bougie through the bubble and it should enter the larynx. Passage of an ET tube over the bougie should now be possible. A smaller than normal ETT should be considered due to the swelling.

Initial insertion of a bougie will facilitate trying various sizes of ET tube in the event of difficulty as the bougie can remain in position until success is achieved.

If the use of this procedure is not feasible, or is unsuccessful, consider ventilating with a BVM, use of an alternative airway or use of a surgical or needle airway.

A key to good airway management is moving promptly through unsuccessful ETT attempts to successful airway management. Delays caused by repeated attempts trying to get traditional intubation (oral) may result in hypoxia, and poor patient outcomes. Use good clinical judgment when determining when to continue with a traditional ETT, and when to rapidly proceed to other methods (including surgical cricothyrotomy).

**Intubation in children > one month of age**

Atropine Sulfate 0.02 mg/kg IV, minimum dose 0.1 mg.

**SEDATION OR USE OF PARALYTIC MAY BE REQUIRED TO CONTROL PATIENT FOR INTUBATION (CONSCIOUS PATIENT, TRISMUS, ETC.). SEE APPENDIX B**

## VI. ENDOTRACHEAL TUBE SIZE AND CHART:

| | | |
|---|---|---|
| Premature | 1 - 2.5 kg | 2.5 - 3.0 mm |
| Neonatal | 2.5 - 4.0 kg | 3.0 - 3.5 mm |
| 6 months | 6 - 9 kg | 3.5 - 4.0 mm |
| 1 year | 10 - 12 kg | 4.0 - 4.5 mm |
| 2-3 years | 13 - 15 kg | 4.5-5.0 mm |
| 4 - 5 years | 16 - 18 kg | 5.0 - 5.5 mm |
| 6 - 7 years | 19 - 23 kg | 5.5 mm |
| 8 - 10 years | 24 -30 kg | 5.5 - 6.5 mm |
| 11 - 14 years | 31- 35 kg | 6.5 - 7.0 mm |
| 15 years up | | 8.0 - 9.0 mm |

APPENDIX

B

INTUBATION

Estimating ET Tube Size: ET tube should have a diameter of approximately the size of the patient's little finger or their external nares. Use Broselow Tape for guidance with pediatric ET tube sizes.

## VII. References


1. Pitt, K., Woollard, M. *Should paramedics bougie on down? Pre-hospital Immediate Care*. 2000;4:68-70.
2. Nocera, A. *A flexible solution for emergency intubation difficulties*. *Ann Emerg Med,* 1996;27(5):665-667.
3. Woollard, M., Pitt, K. *Difficult intubation protocol: Use of the endotracheal tube introducer (gum-elastic bougie).* Internal document. Welsh Ambulance Services NHS Trust.

**APPENDIX: C**

**TITLE: MEDICATION ASSISTED INTUBATION (M.A.I.) SUPPLEMENT**

**REVISED: April 29, 2011**



## I. BACKGROUND:

Also known as *Rapid Sequence Induction (RSI)*, *Rapid Sequence Intubation(RSI)*, *Crash Airway Procedures(CAP),*and other names*,* the use of medications to assist in intubation is both life saving and risky. The paramedic should be thoroughly familiar with ALL DRUGS DISCUSSED WITHIN THIS SECTION. Endotracheal intubation in this context, should only be initiated when it can be completed in a short period of time so as not to unduly delay provision of adequate ventilation.

It is understood that the general procedure for endotracheal intubation is well known by the paramedic. This protocol is to give the paramedic guidelines as to when pharmacological agents should be used as an adjunct for endotracheal intubation.

Pharmacological agents should be used to assist the paramedic in performing intubation in patients who are difficult to intubate due to excessive gag reflex in instances for which protecting the airway is a potential life-saving maneuver. Specific examples of circumstances in which such agents could be utilized are:

- Isolated head trauma
- Cerebrovascular accidents
- Multiple system trauma
- Overdose
- Status epilepticus
- Acute pulmonary edema
- Respiratory failure
- Severe burns
- And based on anticipated clinical course

The above indications are applicable when in those instances it is necessary to manage severe respiratory distress, optimize airway protection, hyperventilate for central nervous system lesions, or to provide ventilatory assistance in the presence of hypoventilation and hypoxia when other means of doing so are ineffective or contraindicated.

## II. COMPLICATIONS:

The Paramedics must be prepared to deal with, and prevent complications while placing an Endotracheal tube. These include:

- airway trauma
- laryngeospasm
- hypoxia
- and aspiration

The worst-case scenario being a **"Can't Intubate, Can't Ventilate"** (CICV) situation. While there are many procedures endorsed in the medical community, common actions include:

- Alternating blade type and length
- Changing patient position
- Consider use of endotracheal tube introducer (AKA the "Bougie", Flexiguide)
- Attempting to ventilate with a BVM and basic airway adjuncts only.
- Attempting to place an alternative advanced airway (LMA, EOA, Combi-tube, etc)
- Needle cricothyrotomy
- Surgical cricothyrotomy
- Having another provider attempt intubation

APPENDIX

C

MEDICATION ASSITED INTUBATION

**III. MEDICATIONS *(NOT ALL INCLUSIVE)*:**

**Sedative Hypnotics**: To be used before depolarizing agents as an induction agent.

-Etomidate (Amidate): for adults and children greater than 2 years of age.

**IV, IO**: 0.2 – 0.4 mg/kg

**Depolarizing Neuro-muscular Blocking Agents:** To be used after Etomidate and/or Benzodiazepines.

- Succinylcholine Chloride (Anectine):

**IV**, **and IO**: 1-2 mg/kg, Repeat 1 time only.

**PEDS:** 1-2 mg/kg for children, 2 mg/kg for infants,

**Non Depolarizing Neuro-muscular Blocking Agents:** These are long acting paralytics to be used only after the ET is secured.

- **Vecuronium (Norcuron):** To be used only with estimated intubation times greater than 15-20 minutes, **on medical control order**. ONLY TO BE GIVEN AFTER TUBE IS CONFIRMED, AND SECURED.

**ADULTS and PEDS**: IV/IO 0.1mg/kg repeated PRN

**Benzodiazepines (BZD):** Versed is the preferred benzodiazepine in this setting.

-Midazolam (Versed)

**IV, IO, IM**: 0.5-5 mg, Max of 10mg

**PEDS:** 0.1-0.2 mg/kg IV/IO to a max of 5 mg/dose. Max of 10 mg

- Diazepam (Valium):

**IV, IM, and IO**: 5-10 mg. Repeat as needed up to max of 20 mg

**PEDS:** IV/IO: 0.2-0.3 mg/kg IV/IO PRN. Max of 20 mg

**Opiates:** Cautionary use with hypotension

-Morphine Sulfate (MS)

**IV, IO, IM:** 2-5 mg, repeat up to 20 mg as needed**.**

**PEDS:** IV/IM/IO: 0.2-0.3 mg/kg, repeated PRN every 5-10 min. Max of 15 mg.

-Fentanyl, (Sublimaze)

**IV, IO, IM:** 25-50 mcg. Max of 200 mcg.

**PEDS:** 2-5 mcg/kg. Max of 100 mcg

**Other medications used in specific situations**:

-Lidocaine (for suspected increased ICP, CVA, etc.):

**IV, IO**: 1 mg/kg

-Atropine for children > one month of age

**IV, IO**: 0.02 mg/kg. Minimum dose of 0.1 mg

## IV. PROCEDURE:

**PREPARATION**:
Have the following ready:

- Bag-valve-mask connected to functioning oxygen delivery system
- Working suction with Yankauer suction tip attached
- Full Intubation set to include:
  - Endotracheal tube(s) with stylet, syringe and intact cuff and ETT Introducer.
  - Laryngoscope with blades and bright light source.
  - Scalpel
- Alternative airway (example: Combitube, if available and appropriate)
- Endotracheal tube introducer (AKA the “bougie”, Flexiguide)
- Anticipated pharmacological agents
- Manpower
- Check to be sure that a functioning, secure vascular access device (IV or IO) is in place. Note: If unable to establish IV or IO access certain drugs may be given IM instead.
- Cardiac monitor. Be alert for the possibility of bradycardia or other dysrhythmias.

Assess the patient for likelihood of successful intubation and need for definitive airway, and the feasibility of alternative methods (Nasal ETT, BVM use only).

Ensure adequate oxygenation, with a BVM if required, while preparing the equipment

**PRE-OXYGENATION AND MEDICATION**:

**Pre-medicate as appropriate and feasible**:

- Atropine Sulfate for children > one month of age
- Lidocaine for intracranial pressure control in head injured patients, patients with CNS injury (hypertensive crisis, bleed, CVA), or for dysrhythmia control in patients at risk for ventricular dysrhythmias
- Benzodiazepines (Versed is preferred) as an option for sedation
- Opiates(Morphine is preferred) as an option for analgesia and further sedation

**Oxygenate**:

- Assist ventilations/oxygenate 2-3 minutes prior to *intubation attempt* unless patient’s situation precludes this (inability to ventilate with BVM and inability to protect airway). Oxygenate as best as possible based on patient’s condition using a BVM
- Good pre-oxygenation is a vital component to successful M.A.I. This ensures sustained oxygenation during the intubation attempt

**Administer induction agent and/or paralytic 45-60 seconds prior to intubation**:

- Etomidate
- Succinylcholine

**As patient relaxes**:

- Apply cricoid pressure to occlude the esophagus **until intubation is successfully completed, the endotracheal tube cuff is inflated, and tube position confirmed**
- After fasciculations stop (if they occur), demonstrate adequate jaw relaxation by manipulating the mandible. Jaw relaxation and decreased resistance to bag-mask ventilations indicate that the cords are paralyzed and that it is time to proceed with intubation.

**If inadequate relaxation is present, give either a:**

- Second dose of Etomidate

  **OR**
- Initial or second dose of Succinylcholine Chloride

  **OR**
- Initial or second dose of Midazolam (or other benzodiazapine)

**INTUBATION**:

**When adequate relaxation is obtained:**

- Perform endotracheal intubation. If unable to intubate during the first attempt, stop and ventilate the patient with bag-mask for 30-60 seconds.
- If initial intubation attempts fail, consider
  - Alternating blade size and type
  - Changing patient position
  - Placing an alternative airway (EOA, EGTA, Combitube, LMA, etc)
  - Ventilating the patient with the bag-mask until spontaneous ventilation returns (usually six to ten minutes)
- If endotracheal intubation fails and you are unable to ventilate the patient with the bag-mask or use an alternative airway (i.e. the combitube) you should perform a needle or surgical cricothyrotomy. Paramedics utilizing Succinylcholine Chloride are required to be competent in needle and surgical cricothyrotomy (including Quicktrach)
- Treat bradycardia occurring during intubation by temporarily halting intubation attempts and hyperventilating the patient with the bag mask and 100% oxygen
- Once intubation is complete, inflate the cuff and confirm endotracheal tube placement by standard methods, **including ETCO2**.
- Release cricoid pressure, secure endotracheal tube with commercial device if available

**PEARL: Patient outcomes are directly related to the promptness and competency with which a paramedic moves through all appropriate options while maintaining ventilation**.

**POST INTUBATION:**
This shall apply not only to patients intubated by ACEMSS personnel, but any patient that has an advanced airway (i.e. Hospital/F.D. placed ETT, Combi-tube, LMA, PTLA) in place (with good control of the airway) who comes under the care of EMS personnel. **After any change in patient position or condition, reconfirm ET placement.**

- **Secure the Tube:** Using a commercial Tube Holder when available
- **Sedation: <u>continued sedation is mandatory and humane.</u>** The need for continued sedation is based on physiologic signs (biting the tube, attempts at respirations, and combativeness.) Inadequate sedation results in increased ICP, barotrauma, and poor compliance to ventilation. Sedation should be achieved using:
    - Benzodiazapines for sedation
    - Opiates as an option for analgesia secondary to ET placement, other injuries, and as an adjunct for further sedation
    - Other medications as ordered by medical control.
- **Restraints:** Restraints should be considered for the patient to prevent any dislodgement of the tube caused by any breakthrough combativeness
- **C-Collar**: Even in non-traumatic patients, the use of a C-Collar has been shown to reduce tube dislodgement. Therefore the C-Collar is strongly encouraged
- **ETCO2:** ETCO2 monitoring is mandatory (when available). Ventilate at rate/volume to maintain ETCO2 at 35-45 mm/hg. Ventilate as needed to ETCO2 of 30-35 mm/hg for obvious head injury with increased ICP
- **Removing the BVM:** Remove the BVM from the tube during patient transfer from cot to bed (and similar activities) to prevent the BVM from pulling the tube out
- **Troubleshooting:** Frequent reassessments for complications and dislodgements. "**Don't be a D.O.P.E**."
    - D: Displacement. Extubation or right main stem intubation
    - O: Obstruction: kinked ETT, vomitus, blood, mucus, etc.
    - P: Pneumothorax
    - E: Equipment Failure

## V. REFERENCES:


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APPENDIX

C

MEDICATION ASSITED INTUBATION

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**APPENDIX: D-1**

**TITLE: KING AIRWAY PROCEDURES**

**REVISED: February 9, 2010**

- **Procedure:**
  1) Place patient in supine position.
  2) Pre-oxygenate patient via BVM to attain SpO2 of > 90%.
  3) Choose the correct KING LTS-D size, based on patient's height:
     a) **Size 3** = 4-5 feet in height
     b) **Size 4** = 5-6 feet in height
     c) **Size 5** = greater than 6 ft in height
  4) Test cuff inflation system.
     a) 60-90 ml air based on device size
     b) If no leaks are detected, deflate the cuffs being certain to remove all air
  5) Apply a water based lubricant to the beveled distal tip
  6) Position the head; ideal position is the sniffing or neutral head angle
  7) Hold the KING LTS-D at the connector with dominant hand, hold the mouth open and apply the jaw lift technique
  8) Rotate the KING LTS-D laterally 45-90° (clockwise) such that the blue orientation line is touching the corner of the mouth and then introduce the tip into the mouth and advance behind the tongue, **never force the tube**
  9) As the tube passes under the tongue, rotate tube 45-90° (counter-clockwise) back to midline such that the blue orientation line will now be facing the chin
  10) Advance the KING LTS-D until the proximal opening of the gastric access lumen is aligned with the teeth or gums
  11) Inflate the KING LTS-D cuffs with minimum volume
      a) **Size 3:** 45-60 ml
      b) **Size 4:** 60-80 ml
      c) **Size 5:** 70-90 ml
  12) Attach the BVM and assess for proof of placement
      a) Use as many as possible of the following confirmation techniques:
         1. Quantitative end tidal $CO_2$ ($EtCO_2$)
            a. Maintain at 35-45 mmHg
         2. Auscultation of gastric region and bilateral chest.
         3. Equal chest rise with assisted ventilations.
         4. Recovery/maintenance of $SpO_2$
  13) Record depth markings
  14) Secure
  15) Place c-collar

APPENDIX

# D-1

# KING AIRWAY PROCEDURES

**APPENDIX: D-2**

**TITLE: CRICOTHYROTOMY *(Needle, Surgical, and Quicktrach®)* PROCEDURE.**
**REVISED: 15 April 2006**

## I. BACKGROUND

Cricothyrotomy is an emergency life-saving procedure. It is an invasive technique which allows a patent airway to be rapidly established for temporary ventilation and oxygenation of those patients in whom airway control is not possible by other means.

## II. INDICATIONS AND CONTRAINDICATIONS

**INDICATIONS:**

- Supra-glottic airway obstruction with:
  - Foreign body obstruction
  - Laryngeal trauma
  - Edema
- Inability to intubate and ventilate after use of paralytic agent, or if other alternative airways are ineffective or not feasible.

This procedure shall be utilized when all other methods of establishing a patent airway from above the glottis have failed.

**CONTRAINDICATIONS**:

None

**COMPLICATIONS:**

- Venous hemorrhage
- Damage to arterial structures with severe hemorrhage
- Laceration of posterior tracheal wall
- Laceration of vocal chords
- Laceration of thyroid gland
- Tracheal stenosis (late)
- Creation of a false passage

## III. PROCEDURE:

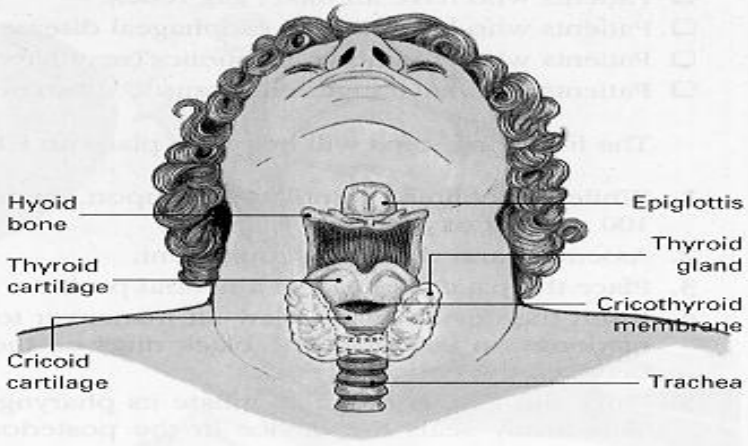


**FIGURE 11-60** Anatomical landmarks associated with the cricothyroid membrane.

# APPENDIX D-2

## CRICOTHYROTOMY

**SURGICAL:**

- Hyperextend the patient's neck (unless cervical spine injury is suspected) to bring the larynx and cricothyroid membrane to an extreme anterior position.
- Locate the cricothyroid membrane between the cricoid and thyroid cartilage by palpating the depression in the midline, caudal to the prominence of the thyroid cartilage.
- Using aseptic technique, prepare the area with betadine solution if time permits.
- Using a scalpel, make a **vertical** skin incision over the cricoid space. Minor bleeding should be ignored at this point, with any heavier venous bleeding controlled by direct pressure.
- When the cricothyroid membrane is identified, a horizontal incision should be made through the membrane. Care should be taken not to extend the incision beyond the borders of the cricothyroid space to avoid possible damage to adjacent vascular structures.
- Use the blunt handle of the scalpel or forceps to open the cricothyroid space. In some settings a "Trach Hook" may be available and used at the paramedic's discretion.
- Gently pass an appropriately sized endotracheal tube caudally through the incision. (The tube should pass easily. If resistance is felt, withdraw the tube and reassess the incision and/or the tube size.) If a cuffed tube is used, inflate the cuff to secure the airway.
- Secure the ET tube (a c-collar is optional although recommended to minimize ETT dislodgement) and apply dressing to control bleeding
- Follow standard confirmation procedures.

**NEEDLE**:

- Hyperextend the patient's neck (unless cervical spine injury is suspected) to bring the larynx and cricothyroid membrane to an extreme anterior position.
- Locate the cricothyroid membrane between the cricoid and thyroid cartilage by palpating the depression in the midline, caudal to the prominence of the thyroid cartilage.
- Using aseptic technique, prepare the area with Betadine solution if time permits.
- Using 16, 14, 12, or 10-gauge needle with a syringe attached, insert the needle into the crico-thyroid opening in a caudally.
- Advance the needle with the bevel down. Minor bleeding should be ignored at this point, with any heavier venous bleeding controlled by direct pressure.
- Attempt to aspirate air with the syringe. If the needle is correctly placed, aspiration should be easy.
- Remove the stylet.
- Attach the BVM to the hub of the needle by whatever means available. Often either the 15 mm adaptor from a 3 or a 3.5 ET tube will work. Sometimes a 3 cc syringe with a 15 mm adaptor from a 7 to 8 ET tube may also work.
- Secure the site.
- Follow standard confirmation procedures.

**QuickTrach®**:

- Place the patient in a supine position. Assure stable positioning of the neck region (place a pillow or piece of clothing under the patient's shoulders) and hyperextend the neck.
- Ensure the neck region is stabilized for puncture.
- Secure the larynx laterally between the thumb and forefinger; identify the cricoid puncture site midline between the thyroid cartilage and cricoid cartilage.
- Firmly hold and introduce the device at a 90 degree angle into the trachea.
- After puncturing the cricoid space check the entry of the needle into the trachea by aspirating air through the syringe. if air is present the needle is within the trachea.
    - **NOTE:** Should no aspiration of air be possible because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made.
- Change the angle to 60 degrees caudally and advance the device into the trachea to the level of the stopper.
- Remove the stopper. **Be careful not to advance the device further with the needle still attached.**
- Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck.
- Remove the syringe and needle.
- Secure the device in place and connect ventilation device tubing to the 15mm connector.

**REFERENCES**:

1. Board of Fire Surgeons. "*Cricothyrotomy*." Advanced Life Support Protocols. Palm Beach County, FL.: Palm Beach County Fire Rescue, 1989.
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APPENDIX

# D-2

CRICOTHYROTOMY

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**APPENDIX: E**

**TITLE: CPAP**

**REVISED: January 28, 2010**

## I. Introduction:

Continuous Positive Airway Pressure (CPAP) is a non-invasive method to provide respiratory support to certain patients. CPAP has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from shortness of breath from congestive heart failure (CHF) and acute pulmonary edema (APE).

## II. Mechanism of Action:

CPAP works by providing increased continuous gas pressures at the level of the lower airway structures, improving gas exchange in the alveoli. In patients with CHF, CPAP improves hemodynamics by reducing preload and after load.

In certain cases, CPAP is also shown to improve dyspnea associated with pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema). In these cases, *low pressure* CPAP can help overcome physiologic PEEP, to allow better gas exchange, and allow more effective administration of nebulized medications.

## III. Indications:

For ***consideration*** in moderate to severe respiratory distress secondary to asthma/reactive airway disease, near drowning, COPD, CHF, acute pulmonary edema (cardiogenic and non cardiogenic), or pneumonia who present with *any* of the following:

- Pulse oximetry < 88% not improving with standard therapy
- $ETCO_2$ > 50mmHg
- Accessory muscle use / retractions
- Respiratory rate > 25
- Wheezes, rales, rhonchi
- Signs of respiratory fatigue or failure

## IV. Contraindications:

***Physiologic***

- Unconscious, Unresponsive, or inability to protect airway.
- Inability to sit up
- Respiratory arrest or agonal respirations (Consider Intubation)
- Persistent nausea/vomiting
- Systolic Blood Pressure less than 90 mmHg
- Inability to obtain a good mask seal

***Pathologic***

- Suspected Pneumothorax
- Shock associated with cardiac insufficiency
- Penetrating chest trauma
- Facial anomalies / facial trauma
- Has active upper GI bleeding or history of recent gastric surgery

## V. Procedure:

***General***

1. Treat underlying conditions as needed
2. Asses for indications and contraindications (especially suspected pneumothorax)
3. Place patient in a sitting position or similar position of comfort
4. Assess and monitor the patient

    - Vital signs q5 min
    - Lung sounds before and after CPAP, and as feasible thereafter.
    - Attach ECG and pulse oximeter
    - **Medical Control Contact: If BP <90 systolic contact Medical Control prior to beginning CPAP**

5. Explain the procedure to the patient
6. Anticipate and control anxiety

    - The CPAP may produce anxiety in some patients. Verbal coaching is often very effective in reducing this
    - Verbally coach breathing as needed
    - In some patients, ***low dose*** benzodiazepines may be needed. See *Adult Pain Control and Sedation Protocol* (M-12)

7. Assemble CPAP. Attach CPAP to O2 source and adjust starting CPAP pressure:

    - Begin at 0-2 cmH2O
    - Consider use of nebulized medications as indicated by patients clinical presentation and suspected etiology
    - Progressively increase the pressure desired $cmH_2O$ There is better tolerance with gradual progression of pressure
    - **MAX CPAP PRESSURE:**
        - **i. CHF: 10 cmH2O**
        - **ii. All other respiratory conditions: 5 cmH2O**

8. Apply mask.

- Check for air leaks
- *Consider* having the patient hold the mask in place for a minute or so to reduce anxiety. As an option the medic may hold it in place with out a mask of good seal is obtained
- Using the head Straps: The use of the head straps is at the medics discretion based on ability to keep a continuous face mask seal weighed against the increased anxiety the head straps may cause
    - Place head strap over occipitoparietal area
    - Gently hold the delivery device to the patient's mouth and nose
    - Attach the straps, loosely at first, gradually tightening as the patient tolerates. Proceed with tightening the straps until air leaks are eliminated
- Continue to coach patient to keep mask in place and readjust as needed

9. An in line nebulizer may be run simultaneously with the CPAP.
10. Treatment should be given continuously throughout transport to ED.

***Removal of CPAP***

CPAP therapy needs to be continuous and **should not** be removed unless the patient can not tolerate the mask, requires suctioning or airway intervention, experiences continued or worsening respiratory failure, or a pneumothorax is suspected. Intermittent positive pressure ventilation and/or intubation should be *considered* if patient is removed from CPAP therapy.

***Intubation considerations***

These patients are often in a state of crisis and respiratory failure. Intubation will be inevitable in some patients regardless of the use of CPAP, and the paramedic must be prepared for rapid intervention by RSI/MAI. Indications to proceed to ET placement are (not all inclusive):

- Deterioration of mental status
- Increase of the $EtCO_2$
- Decline of $SpO_2$
- Progressive fatigue
- Ineffective tidal volume
- Respiratory or cardiac arrest

APPENDIX

E

C.P.A.P. Procedure

**VI. Documentation:**

Documentation on the patient care record should include:

- CPAP level →(10cmH2O)
- $F_iO_2$ →(100%)
- SpO2 q5 minutes
- Vital Sign q5 minutes
- Response to treatment
- Any adverse reactions
- Justification for sedation, intubation, or discontinuation of CPAP. Be specific.

**Special Notes:**

1. This procedure is specific to the Emergent PortO2Vent CPAP device. When another device is used, and there is a conflict with this procedure and the devices recommended guidelines use the manufacturers recommended guidelines when they will not result in a detriment to patient care.
2. Advise receiving hospital as soon as possible so they can prepare for the patient's arrival.
3. Do not remove CPAP until hospital therapy is ready to be placed on the patient
4. Monitor patient for gastric distension which may lead to vomiting. Consider placement of a Gastric Tube.
5. Once CPAP headset is in place, consider early administration of nitro-paste, as nitro spray may be impractical to use.
6. Success is highly dependent upon patient tolerance, and EMT-P ability to coach the patient.
    a. Instruct patient to breath in through nose and exhale through mouth as long as possible
7. Monitor closely for development of pneumothorax and or hypotension
8. Monitor patients closely for vomiting and or gastric distention
9. Inline nebulization may be utilized with CPAP in place
10. Most patients will improve in 5-10 minutes. If no improvement within this time, assess for other causes and problems. Re-evaluate for intermittent Positive pressure ventilation or Intubation
11. CPAP is an acceptable treatment option for a patient with a DNR/DNI order who is in respiratory failure

APPENDIX

E

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APPENDIX

# E

C.P.A.P. Procedure

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APPENDIX

F

**APPENDIX: F**

**TITLE: NEBULIZED BRONCHODILATOR TREATMENT PROCEDURE**

**REVISED: January 28, 2010**

NEBULIZED BRONCHODILATOR TREATMENT

## I. INDICATIONS:

- Wheezing or silent chest on exam
- Acute laryngeal edema secondary to anaphylaxis
- Epiglottitis and croup
- Decreased air exchange with a history of asthma, COPD, cardiac asthma, anaphylaxis, or toxic inhalation injury

## II. CONTRAINDICATIONS/CONSIDERATION: *medical problems complicating the situation*

- Systolic BP > 200 mmHg
- Diastolic BP > 110 mmHg
- Wide complex tachycardia
- Ischemic chest pain
- Pregnant and nursing mothers (relative)
- Sensitivity to medication (Note: Atrovent is contraindicated in patients with sensitivity to peanuts or soybeans)

## III. MEDICATIONS:

Many different medications are administered via nebulizer. Below are just the ones covered in ACEMSS SWO's. This does not preclude the use of other medications as dictated by special situations (i.e. Haz-Mat exposures, Cystic Fibrosis), as approved by medical control, orders from an attending physician, or special protocols.

- Albuterol (Proventil) 2.5 mg (0.083% in 3 cc)
- Ipratropium bromide (Atrovent) 0.5 mg (0.02% in 2.5 cc) (usually combined with Albuterol) If second or continuing nebulizer treatments are required, use Albuterol (Proventil) only, unless directed otherwise by a medical control physician
- Epinephrine (Adrenalin) 1:1,000 solution 5 mg/5 cc

## IV. PROCEDURES:

1. Patients, when appropriate, should have a cardiac monitor and venous access established with bronchodilator treatment
2. Set up the nebulizer, add medication to chamber, set for an oxygen flow rate of 6-8 L/min if using a mouthpiece, 8 - 10 L/min if using mask or ET tube. Encourage the patient to take slow, deep breaths. Insure that there is a good seal at the mouthpiece or mask, and that the nebulizer unit is held level
3. Tap the side of nebulizer chamber periodically to completely disperse medication
4. Discontinue treatment if there is a dramatic increase in heart rate, frequent ventricular ectopy develops, or the patient develops CNS symptoms
5. All patients receiving nebulized bronchodilator treatments in the field must be evaluated for at least one hour after treatment for recurrence of symptoms
6. Use Air-Bear pediatric nebulizer per manufacturer directions

# APPENDIX F

# NEBULIZED BRONCHODILATOR TREATMENT

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**APPENDIX: G**

**TITLE: NEEDLE THORACOTOMY PROCEDURE**

**REVISED: 15 April 2006**

A needle thoracotomy is an invasive procedure that allows for emergency chest decompression in patients with respiratory and/or hemodynamic compromise second to suspected tension pneumothorax.

## I. INDICATIONS:

Suspected tension pneumothorax is evidenced by:

a. Signs of hypoxia / respiratory distress
b. Absent breath sounds over affected side
c. Hyperresonance over the affected side
d. Distended neck veins
e. Tracheal shift away from affected side
f. Hypotension
g. Trauma arrest
h. Significant mechanism of blunt or penetrating chest trauma with any of the above

## II. CONTRAINDICATIONS:

Suspected diaphragmatic rupture with protrusion of bowel into chest cavity.

## III. COMPLICATIONS:

- Laceration of intercostal artery / nerve.
- May create a simple pneumothorax.
- Bowel perforation.

## IV. PROCEDURE:

1. Identify the insertion site:
   a. The second intercostal space at the midclavicular line.
   b. The fourth or fifth intercostal space, anterior midaxillary line.
2. Using aseptic technique, prepare the site with Betadine.
3. Using a 10, 14, or 16-gauge catheter over the needle, introduce the needle at a 90 degree angle over the **superior** aspect of the inferior rib into the desired intercostal space a “rush” of air is noted (a pop may be felt).
4. Advance the catheter over the needle, remove the needle and secure.
5. If time allows, a flutter valve may be formed from the tip of a surgical glove.
6. Assess the patient for improvement in clinical status.
7. Repeat as needed if you suspect catheter is occluded due to blood, tissue or movement.

## V. REFERENCE:

1. Greenwald, Johnathan. The paramedic Manual. Englewood, CO: Morton, 1988. Pg 123-125.

APPENDIX

G

NEEDLE THORACOTOMY

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**APPENDIX: H**

**TITLE: FLUID RESUSCITATION PROCEDURES**

**REVISED: June 23, 2010**

## I. INDICATIONS:

Any medical or trauma patient who may require IV medications or fluid replacement.

## II. COMMON INTRAVENOUS FLUIDS:

- **Normal Saline (250 cc bag)/Saline Lock**: Use in patients requiring venous access for a medication route, but not suspected of needing volume replacement. Generally use microdrip administration set and smaller gauge catheters (#18-22)
- **Normal Saline (1000 cc bag)**: Use in patients suspected of volume depletion, requiring volume replacement, or potentially needing rapid infusion of fluids. Generally use macrodrip or blood administration set and larger catheters (#14-18)
- **Normal Saline (with Volutrol, Buretrol, Metriset )**: Use in pediatrics and any patient with whom medication and/or fluid given must be precisely measured
- **Other Fluids**: Other crystalloid fluids may be initiated or monitored during transport as situation requires
- **Colloid Solutions:** Colloid solutions may be monitored for transport on physician order

## III. SITE / METHODS OF ACCESS:

**PERIPHERAL LINES:**

Peripheral lines are the lines of choice except as noted below. The external jugular vein is considered a peripheral vein.

**INTRAOSSEOUS LINES:**

Intraosseous access should be established in pediatric patients requiring a medication route or fluid replacement when other access to the circulatory system is not possible. Boluses may be given with 60-120 cc syringes.

APPENDIX

H

FLUID RESUSCITATION

**PRE-EXISTING VASCULAR ACCESS:**

Paramedics may use pre-existing vascular access, including PIC lines, Hickman catheters, dialysis shunts, and other devices at their discretion. Use of these lines should be based on the paramedic's comfort level with the line in question, suspected patency of the access line, patient severity, and good clinical judgment.

**IV. FLUID RESUSCITATION:**

In situations requiring rapid fluid resuscitation, multiple IV lines should be established utilizing any combination of:

Normal saline solution, short, large-bore catheters (1 ¼", 14-16)

Y-blood tubing IV administration sets (10 gtts/ml)

IV pressure infusion bags

While ILS providers are often limited in amount of volume and fluid administered by the SWO's , ILS providers may exceed those guidelines when functioning under the general direction of the paramedic in charge of the patient. Likewise, paramedics are limited only by sound clinical judgment rather than an arbitrary volume when determining volume of fluid to administer. Generally, fluid resuscitation in these patients will be initiated in route to the hospital to avoid delays in transport (except as noted in SWO's). The following are general guidelines for fluid resuscitation volume.

**Adults:** 250-500 cc bolus, repeated as needed while observing for signs and symptoms fluid overload
**Peds:** 10- 20 cc/kg bolus, repeated as needed up to 3 times

**APPENDIX: Ia**

**TITLE: INTRAOSSEOUS INFUSION PROCEDURES**

**REVISED: September 28, 2010**

## I. BACKGROUND

Intraosseous infusion is a method of gaining access to the circulatory system in infants and children, in which a specialized trocar is placed in the proximal tibia. All IV drugs and fluids may be given by the intraosseous route.

## II. ADVANTAGES OVER PERIPHERAL IV ACCESS:

1. Non-collapsible route providing rapid access in patients with circulatory collapse, obesity, burns, or edema.
2. A low complication rate.
3. Safer and easier than central line placement.
4. Rapid IV access may decrease morbidity and mortality in the critical pediatric patient.
5. The procedure can be accomplished without interrupting CPR.

## III. INDICATIONS:

1. Infant or child who appears to be 6 years of age or less. Children up to 8 years of age may be candidates for femoral site access.
2. A life or limb threatening condition exists.
   -Volume depletion (dehydration or hemorrhage)
   -Circulatory collapse
   -Cardiac arrest
   -Medication route if no other access is available
3. A peripheral IV cannot or is unlikely to be established.
4. Delay in administration of fluids or medications may increase risk to the patient.

## IV. CONTRAINDICATIONS:

1. Cellulitis overlying the site.
2. Fracture in the same bone or a proximal vascular injury.
3. Severe pelvic trauma.
4. A previous intraosseous attempt in the same bone.

## V. COMPLICATIONS:

1. Sub-periosteal infusion due to incorrect placement.
2. Extravasation due to prior attempt in same bone, or through-and-through puncture of the bone.
3. Plugging of needle with bone or marrow.
4. Growth plate damage.
5. Osteomyelitis (more common with hypertonic or irritating solutions or medications).

APPENDIX

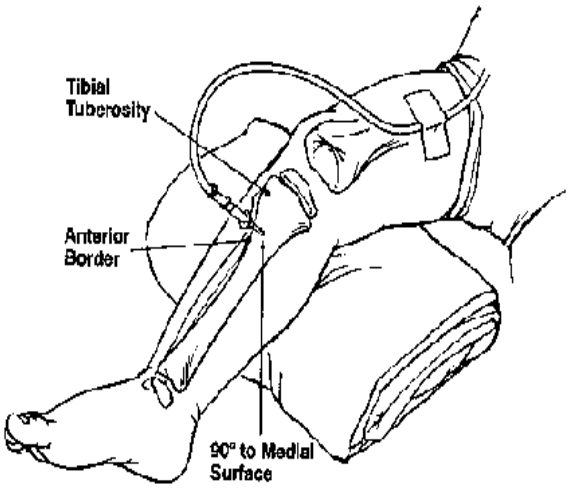
# Ia

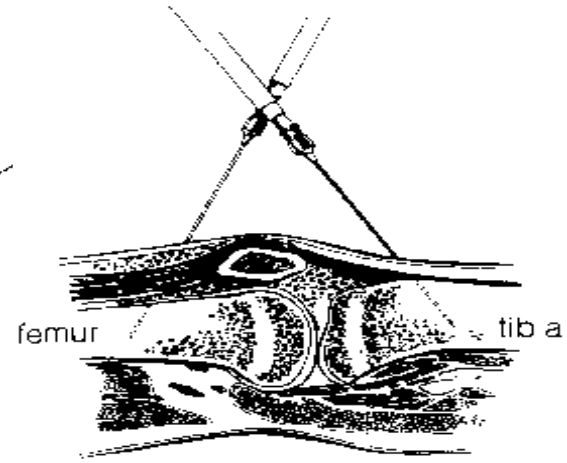
INTRAOSSEOUS INFUSION

## VI. PROCEDURE:

**Note: The proximal tibia is the preferred insertion site. Alternatives sites exist and can be used in special situations (i.e. tibia fractures).**

1. Place the infant supine and flex the knee to 30 degrees. Locate insertion site:
   - Flat anteriomedial surface of the tibia, 1 - 2 finger widths below the tibial tuberosity. After entering the skin, the needle should be directed at a slight angle (10-15° from the vertical) **caudad for proximal tibia insertion**.
   - The landmarks for femoral insertion are the lower third of the femur, approximately 3 cm above the lateral femoral epicondyles. After entering the skin, the needle should be directed at a slight angle (10-15° from the vertical): **cephalad for femoral insertions**.
   - This slight angulation minimizes the risk of trauma to the growth plate.




2. Using a 15-18-gauge IO bone marrow aspiration needle directed perpendicular and slightly caudal (or cephalad depending on approach) to the bone surface, penetrate the skin and periosteum using firm pressure. A back-and-forth twisting motion should be used in penetrating the cortex, and a “give” or “pop” will be felt as the medullary canal is entered.
3. Remove the stylet and using a syringe aspirate 1 cc of bone marrow. (This may best be accomplished by injecting 1 cc of IV solution prior to aspirating. Marrow will appear as pink or reddish aspirant.)
4. Attach the IV tubing and observe for good flow.
5. Stabilize the IO needle with 4 X 4’s, kerlex rolls, and tape.

## VII. REFERENCES:


1. Ada County EMS, “Paramedic Protocol for Intraosseous Infusion”. Standing Orders and Procedures for Paramedics. Boise, Idaho: 1987.
2. “Vascular Access”, Textbook of Pediatric Advanced Life Support. American Heart Association, 1994.

**APPENDIX: Ib**

**TITLE: EZ-IO Infusion System**

**REVISED: September 28, 2010**

- **Sizes:**
  - EZ-IO®LD **(Over 40 kg with excessive tissue from Edema, Muscle, or Obesity)**
  - EZ-IO®AD **(40 kg and over)**
  - EZ-IO® PD **(3 – 39 kg)**
    - Note: *Certain patients may require a needle set outside of their ideal weight range. "One size needle set does not fit all."*
- **Indications:**
  - Immediate vascular access needed.
  - Intravenous fluids or medications are **urgently** needed and a peripheral IV cannot be established within 90 seconds

  **AND:**
  - The patient exhibits one or more of the following:
    - An altered mental status (GCS ≤ 8)
    - Respiratory compromise ($SpO_2$ < 90% after appropriate oxygen therapy, respiratory rate < 10 or > 40 min)
    - Hemodynamic instability (Systolic BP of < 90).
  - The EZ-IO should be considered ***PRIOR to*** peripheral IV attempts in the following situations:
    - Cardiac arrest (medical or traumatic)
    - Profound hypovolemia with alteration of mental status
    - Patient in extremis with immediate need for delivery of medications and or fluids.

- **Contraindications:**
  - Fracture of the bone selected for IO infusion (*consider alternate sites*)
  - Excessive tissue at insertion site with the absence of anatomical landmarks (*consider alternate sites*)
  - Previous significant orthopedic procedures (*IO within 24 hours, prosthesis - consider alternate sites*)
  - Infection at the site selected for insertion (*consider alternate sites*)

- **Considerations:**
  - **Pain:**
    - **Insertion** of the EZ-IO® in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a peripheral IV). However, IO **infusion** for conscious patients has been noted to cause severe discomfort
    - Prior to IO syringe bolus (flush) or continuous infusion in conscious patients, SLOWLY administer Lidocaine 2% (Preservative Free) through the EZ-IO hub. *Ensure that the patient has no allergies or sensitivity to Lidocaine.*
      - EZ-IO® **AD** Slowly (30 seconds minimum) administer 20 – 40 mg Lidocaine 2%
      - EZ-IO® **PD** Slowly (30 seconds minimum) administer 0.5 mg /kg Lidocaine 2%

- **Flow rate:**
  - Due to the anatomy of the IO space, flow rates may appear to be slower than those achieved with an IV catheter.
  - Ensure the administration of an appropriate rapid **SYRINGE BOLUS (flush)** prior to infusion
  - "**No Flush = No Flow"**
    - Rapid syringe bolus (flush) the **EZ-IO® AD** with **10 ml** of normal saline.
    - Rapid syringe bolus (flush) the **EZ-IO® PD** with **5 ml** of normal saline.
    - Repeat syringe bolus (flush) as needed
  - To provide continuous infusion flow rates always use a syringe, pressure bag or infusion pump.

- **Precautions:**
  - The EZ-IO® is **<u>not intended</u>** for prophylactic use.

- **Equipment:**
  - EZ-IO® Driver
  - EZ-IO® AD or EZ-IO® PD Needle Set
  - Alcohol or Betadine Swab
  - EZ-Connect® or Standard Extension Set
  - 10 ml Syringe
  - Normal Saline (or suitable sterile fluid)
  - Pressure Bag or Infusion Pump
  - 2 % Lidocaine (preservative free)
  - EZ-IO® Yellow wristband

- **Procedure:**
- *If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain informed consent*
  - Determine EZ-IO® Indications
  - Rule out Contraindications
  - Locate appropriate insertion site (*Sites with regulatory approval include: Proximal / Distal Tibia & Proximal Humerus*)
  - Prepare insertion site using aseptic technique
  - Prepare the EZ-IO® driver and appropriate needle set
  - Prime EZ-Connect® tubing with Lidocaine for conscious patients; Normal Saline for unconscious patients
  - Stabilize site and insert appropriate needle set
  - Remove EZ-IO® driver from needle set while stabilizing catheter hub
  - Remove stylet from catheter, place stylet in shuttle and approved sharps container
  - Confirm placement
  - Connect primed EZ-Connect®
  - Slowly administer appropriate dose of Lidocaine 2% IO to conscious patients
  - Syringe bolus (flush) the EZ-IO® catheter with 3-5 cc's Normal Saline
  - Begin infusion with pressure (syringe bolus, pressure bag or infusion pump) where applicable
  - Dress site and secure tubing
  - Monitor EZ-IO® site and patient condition – Remove catheter within 24 hours

# APPENDIX

# I

EZ-IO INFUSION System

**APPENDIX: J**
**TITLE: NASAL/RECTAL MEDICATION PROCEDURE**

**REVISED: January 28, 2010**



## I. BACKGROUND:

Intranasal (IN) and Rectal (PR) administration of certain medications are alternatives when traditional vascular access (IV, IO) is not available or not desired. IN and PR administration may also be utilized when other routes (IM, SQ) would take too long to reach peak effects.

IN Midazolam has a slightly slower onset of action and peak effect compared to IV Midazolam, but acts twice as fast and has a 1-3 time higher peak plasma levels than PR and oral Midazolam. Therefore the IN route is preferred over PR for Midazolam.

IN Narcan is preferred over IM or sublingual (SL) Narcan due to the lower risk of needle sticks in a high-risk population. In addition IN Narcan has a predictable and rapid absorption rate faster than IM and comparable to SL. IV access is still the preferred method due to the possible complications with an unrecognized poly-pharm overdose.

## II. EQUIPMENT:

3 cc slip syringe, injection needle, or vial spike.
Lubricant (Lubifax or equivalent) [for rectal use only]
Atomizer [for nasal use only]
Medication of choice:

- VALIUM (RECTAL)
- VERSED (NASAL)
- NARCAN (NASAL)

## III. INDICATIONS:

- Status epilepticus without vascular access.

## IV. PROCEDURES:

**RECTAL ADMINISTRATION:**

- Draw Valium into a syringe (draw only the amount to be administered).
  *If subsequent doses are required, use the same Valium ampule with a new syringe/needle. This method is suitable for short-term use.
- **REMOVE THE NEEDLE.**
- Lubricate the syringe.
- **Carefully** insert the syringe (through the anus past the rectal sphincter) -- approximately 3 to 5 cm [Note: Be careful not to inject directly into stool mass as rectal absorption will be poor].
- ADMINISTER THE APPROPRIATE AMOUNT OF VALIUM:
  a. Up to 8 years of age: 0.5 mg/kg/dose (PRN) every 5 - 10 minutes
     **MAXIMUM DOSAGE: 10 mg**
  b. 8 years of age and over: 5-10 mg every 5-10 minutes PRN
     **MAXIMUM DOSAGE: 20 mg**
- Monitor for desired effects.

APPENDIX

J

# NASAL/RECTAL MEDICATION PROCEDURE

**NASAL ADMINISTRATION**

- Draw medication into a syringe (draw only the amount to be administered).
- **REMOVE THE NEEDLE and attach the Atomizer**
- **Carefully** insert the Atomizer into a naris
- ADMINISTER THE APPROPRIATE AMOUNT OF VERSED:
  Up to 10 years of age: 0.2-0.4 mg/kg (PRN) every 5 minutes
  **MAXIMUM DOSAGE: 5 mg**
- ADMINISTER THE APPROPRIATE AMOUNT OF NARCAN:
  Over 8 years of age: 1-2 mg every 5-10 minutes as needed
  **MAXIMUM DOSAGE: 4 mg**
- Place a gloved finger over the nares to keep the medication in for 1-2 minutes.
- Monitor for desired effects
- Avoid giving more than 2 cc per nares. If required, split the dose between each nares

**Caution: Certain conditions may make nasal administration of a medication ineffective. Epistaxis, excessive mucous, nasal trauma, and septal abnormalities may inhibit absorption. If these conditions are present, alternative routes may be advisable.**

**APPENDIX: K**

**TITLE: CARDIAC MONITORING PROCEDURES**

**REVISED: January 28, 2010**

## I. INDICATIONS:

Patients at risk for dysrhythmias shall receive continuous EKG monitoring. A rhythm strip shall accompany each EKG rhythm interpreted in written patient reports. A 12 Lead EKG shall be obtained when appropriate.

**A PARAMEDIC SHALL ATTEND ALL PATIENTS REQUIRING CONTINUOUS EKG MONITORING**. All patient contacts requiring the use of an EKG, continuous or otherwise, shall be signed by at least one paramedic. If the chart is written by an EMT, the paramedic will co-sign the chart.

## II. CONTRAINDICATIONS:

NONE

## III. PROCEDURE:

**Limb Lead placement**:

- Place electrodes in the standard Lead II configuration. (One between the right nipple and the clavicle, one between the left nipple and the clavicle, and one in the "Apex" area, between the left nipple and the iliac crest)
- As an alternative, place the appropriate leads on the anterior aspects of the appropriate limbs. This is especially useful when a 12-Lead EKG is anticipated
- Attach the black wire to the left-arm electrode (Ground), the white wire to the right-arm electrode (Negative), and the red wire to the left leg electrode. (Positive). If present, the green wire is attached to the right leg electrode, and the brown wire is attached to the chest electrode in the V1 position
- Turn the control switch to the desired lead position

**12-LEAD EKG PLACEMENT:**
Limb leads are placed on a non-bony part of the distal anterior aspect of the appropriate extremity.

Chest leads are placed as follows, shave and gently abrade the area as needed.

Left chest leads

- V1: fourth intercostal space just right of the sternum
- V2: fourth intercostal space just left of the sternum
- V3: fifth rib, between V2 and V4
- V4: fifth intercostal space, midclavicular line
- V5: fifth intercostal space, anterior axillary line
- V6: fifth intercostal space, midaxillary line

Right chest leads: (Optional)
- Placed in corresponding position on the right side of the chest
- Documented as V3R, V4R, etc. (V4R is preferred)

Posterior chest leads (V7-V9) (Optional)
- V7: Posterior axillary line, fifth intercostal space
- V8: Midscapular line, fifth intercostal space
- V9: Left of the vertebrae, fifth intercostal space

**"12-LEAD EKG RULES TO LIVE BY"**

- Watch for reciprocal (mirror image) changes opposite the site of a suspected MI
- Inferior MI with reciprocal changes in V1-V2, consider posterior MI
- Inferior MI with decreased B/P, decreased heart rate, consider right-sided MI. This is especially true if ST elevation is greater in lead III than lead II
- About 30% of left inferior MI's are also right-sided MI's
- Apparent A-Fib with regular R-R's, consider digoxin toxicity
- Right-sided MI's may need fluids before nitrates

## IV. SPECIAL CONSIDERATIONS:

- Limb lead EKG monitoring is for rhythm interpretation only. A 12-lead must be obtained to document diagnostic EKG changes (ST segment changes, Q waves, etc.)
- If a 12-lead EKG is not available, a "Modified Chest Lead" (MCL) may be obtained by monitoring lead III and placing the left leg electrode in the V1, V4, or V6 position. This shall be documented as MCL-1/4/6
- The diagnostic 12-lead EKG is intended to assist in the recognition of infarction and dysfunction. **A normal 12-lead EKG does not preclude the presence of an MI**. A 12-lead EKG may be a valuable tool to document response to treatments, triage patient severity and destination, and decrease time to definitive treatment
- The acquisition of a 12-lead EKG should not significantly delay treatment or transport
- When possible, the 12-lead EKG should be transmitted to the receiving hospital with the patients name if possible as time permits. When possible, use the software in the 12 lead EKG to label the 12 lead with the patient's name prior to transmission of the 12 lead

**APPENDIX: L**

**TITLE: AED Protocol**

**REVISED: October 27, 2010**

## THIS SUPPLEMENT IS FOR BLS PERSONNEL WHEN A PARAMEDIC IS NOT PRESENT, AND AN AED IS IMMEDIATIELY AVAILABLE.

The following procedure is generic and should be used unless the manufacturers instructions are available and give specific recommendations not covered here. Most AED units are self-instructional when power is turned on. Most Physio-Control LifePack 12's have an AED function.

An AED may be used in place of a manual defibrillator as needed to allow other essential care to be done.

---

**IF A PUBLIC ACCESS DEFIBRILLATOR (PAD) IS UTILIZED PRIOR TO YOUR ARRIVAL, SWITCH FROM PAD TO YOUR DEFIBRILLATOR AND PROCEED WITH PROTOCOL.**

INDICATIONS:

- Sudden cardiac arrest patients

**AND**

- Patients who are unresponsive, apneic, and pulseless

POTENTIAL ADVERSE EFFECTS:

- Burns to skin
- Injury to patient, self and /or bystander
- Deactivation of patient's implanted pacemaker

CONTRAINDICATIONS:

- Patients who are conscious with stable signs and symptoms.
- Patients suffering from major traumatic injury. Rapid transport is indicated.

PRECAUTIONS

- Make sure patient and environment are dry
- Avoid placing patches over pacemakers, internal defibrillators or nitroglycerin patches
- DO NOT touch the patient while the AED is assessing the patient or charging
- ENSURE that no one is touching the patient when the shock button is pushed
- NEVER analyze while moving the patient or when in a moving ambulance

1. Use BSI precautions. Perform an initial assessment. If pulseless and non-breathing (in cardiac arrest):

- For a one-person EMS response, continue with AED protocol.
- For a two-person EMS response, begin one-rescuer CPR while partner continues with AED protocol. If PAD is in place, use you're your AED.

2. Turn on defibrillator power and apply electrodes according to manufacturer instructions.

3. Stop CPR, clear patient and begin analysis of rhythm.
   - If a shockable rhythm is determined, continue with protocol.
   - If no shockable rhythm is determined and pulse is absent, continue CPR, using appropriate interventions, such as bag-valve mask, airway and oxygen. Reassess patient every two minutes. Contact medical control and make transport determination.

4. If AED advises deliver first shock.

5. Begin CPR starting with chest compression.

6. After two minutes of CPR (5 cycles) re-analyze rhythm. (If, after any rhythm analysis, the machine advises no shock, check pulse.)

7. If AED advises, clear the patient and deliver second shock.

8. Begin CPR starting with chest compression.

9. After two minutes of CPR (5 cycles) re-analyze rhythm. (If, after any rhythm analysis, the machine advises no shock, check pulse.)

10. Continue the CPR/AED sequence till ALS arrives.

**AED Use In Children and Infants**

For attempted defibrillation of children 1 to 8 years of age with an AED, the rescuer should use a pediatric dose-attenuator system if one is available. If the rescuer provides CPR to a child in cardiac arrest and does not have an AED with a pediatric dose-attenuator system, the rescuer should use a standard AED. For infants (< 1 year of age), a manual defibrillator is preferred. If a manual defibrillator is not available, an AED with pediatric dose attenuations desirable. If neither is available, and AED without a dose attenuator may be used.

**AED Pad / Paddle Placement**

The anterior-posterior and anterior-lateral locations are generally acceptable in patients with implanted pacemakers and defibrillators. In patients with implantable cardioverter-defibrillators or pacemakers, pad or paddle placement should not delay defibrillation. It might be reasonable to avoid placing the pads or paddles directly over the implanted device.

APPENDIX

M

**APPENDIX: M**

**TITLE: VAGAL MANEUVER PROCEDURE**

**REVISED: January 28, 2010**

VAGAL MANEUVERS

## I. BACKGROUND:

Vagal maneuvers are non-pharmacologic interventions used to terminate and diagnose tachy-dysrhythmias. Vagal maneuvers increase parasympathetic tone and slow conduction through the AV node.
The most common methods for stimulating the vagus nerve are Valsalva's maneuver and Carotid Sinus Massage (CSM). A safer variant of carotid sinus massage is Carotid Sinus Pressure (CSP).
Facial immersion in ice water is an acceptable alternative for pediatric patients.

## II. INDICATIONS:

- Treatment of symptomatic supraventricular tachycardia (decreased level of consciousness, angina, hypotension, congestive heart failure).
- Treatment of tachycardia of unknown etiology (supraventricular vs. ventricular) with hypoperfusion
- To differentiate supraventricular tachycardia from ventricular tachycardia in the symptomatic/decompensated patient. (Use of vagal maneuvers in this setting shall not delay synchronized cardioversion)

The Valsalva maneuver and CSM shall only be attempted when the patient's EKG is being monitored and venous access has been established. Generally, CSM shall only be attempted after the patient has failed to respond to pharmacological intervention

## III. COMPLICATIONS & SPECIAL NOTES:

- Dysrhythmias are common after conversion by vagal maneuvers. Note: Treatment is indicated only if persistent (greater than 3-5 minutes)
- Other potential complications include:
  - Asystole
  - Stroke from dislodged carotid artery thrombus in persons with atherosclerotic disease
  - Brain ischemia from occlusion of carotid artery or compromise of marginally perfused areas of brain
- It is difficult to differentiate congestive heart failure caused by tachycardia from a tachycardia caused by CHF. The symptoms of a patient with a pulse under 160 are usually not the result of a rate related problem
- Pediatric patients may respond better to facial immersion in ice water. The diving reflex causes peripheral vasoconstriction and a vagally induced decrease in heart rate
- Sometimes Vagal Maneuvers can be used to diagnose tachy-dysrhythmias.

| Tachycardia | Expected Response to Vagal Maneuvers |
|---|---|
| Sinus Tachycardia | No response or gradual slowing |
| Paroxysmal Atrial Tachycardia | No response or conversion to sinus rhythm |
| Atrial Flutter increasing block | Ventricular slowing revealing flutter waves |
| Atrial Fibrillation | Variable slowing |
| Ventricular Tachycardia | No response |

APPENDIX

M

VAGAL MANEUVERS

**IV. PROCEDURE:**

**Patients should have continuous EKG monitoring and IV access. A 12-lead EKG is preferred prior to initiation.**

**Valsalva's maneuver**: Performed by the patient (patient must be conscious and cooperative)

- Document the dysrhythmia before treating
- Explain the procedure to the patient
- Instruct the patient to inhale and hold their breath and
  - Bear down as if to have a bowel movement, and to hold this position for 20-30 seconds

    **OR**
  - Blow forcefully through a straw (or IV catheter/similar device) for as long as possible (at least 20 seconds)
- Monitor rhythm continuously
- Stop maneuver immediately if:
  - Patient becomes confused
  - HR drops below 100 BPM
  - Asystole occurs

**Carotid sinus pressure**

- Patients with high cholesterol, previous strokes, or other significant risk factors for thrombus should not have CSM performed.
- Document the dysrhythmia before treating
- Explain the procedure to the patient
- Place the patient in supine position
- Expose the neck and hyperextending slightly
- Gently palpate for carotid pulses on one side, then the other. Proceed only if bilateral carotid pulses are palpable.
- Auscultate for bruits over both carotid arteries

  **<u>Do not perform the procedure if a bruit is heard on either side.</u>**
- Turn the patient's head to the left side
- Turn the paper recorder on and leave on until the procedure is completed.
- Apply procedure:
  - (CSP) Gentle and steady pressure over the right carotid sinus and hold for 5-10 seconds.

    **OR**
  - (CSM) Gentle and steady messaging motion over the right carotid sinus for 5-10 seconds
- Pressure should be firm but should not totally occlude blood flow
- Monitor rhythm constantly throughout procedure
- Release pressure immediately if:
  - Patient becomes confused or shows signs of brain ischemia
  - HR drops below 100 BPM
  - Asystole occurs
- If asystole occurs and persists for longer than 15 sec:
  - Begin CPR
  - See asystole protocol
- If no response to the right side carotid sinus pressure, wait 2-4 minutes and repeat the procedure on the left side

**APPENDIX: N**

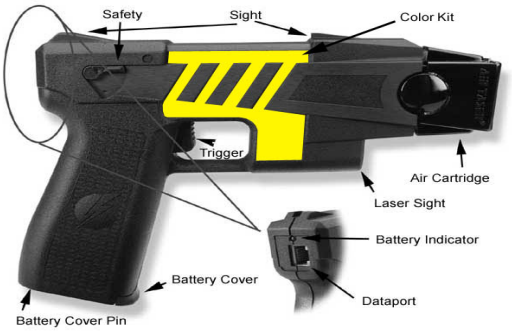
**TITLE: TASER CARE SUPPLEMENT**

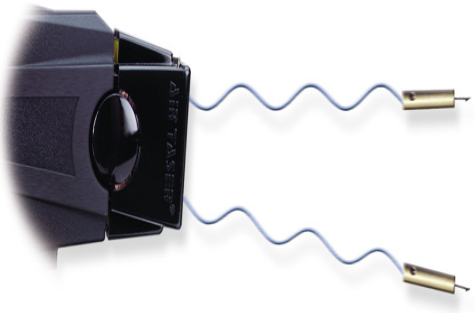
**REVISED: 15 April 2006**

***Scene Safety Consideration:***

*Before touching any patient who has been subdued using a Taser ensure that the officer/deputy has disconnected the wires from the hand held unit.*

***Taser and Probe:***



**Taser X-26**

**Taser M-26**

**Assessment of a Patient who has been Tasered**:

- Identify the location of the probes on the patient's body. *If **<u>any</u>** of the probes are embedded in the following areas **<u>do not remove them and transport</u>** the patient to an Emergency Department:*

1. Face
2. Neck
3. Groin
4. Spinal Column
   - Confer with the officer/deputy and determine the patient's condition from the time of the Taser discharge until EMS arrival
   - Assess vital signs, including ECG monitoring for potential cardiac abnormalities. If 35 years of age or older obtain a 12-Lead for evaluation
   - Determine from the patient:
     1. Date of Last Tetanus
     2. Any Cardiac History (perform a 12-lead)
     3. Any ingestion of a mind-altering stimulant (Phencyclidine (PCP), meth, etc.)

All of these assessment findings should be documented thoroughly in the Patient Care Report.

**Removal of Probe by EMS System providers:**

If the probe is located in an area not specified above it can be removed by a Paramedic or EMT. To remove the probe:

- Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site. Place your other hand/pliers firmly around the probe
- In one fluid motion pull the probe straight out from the puncture site
- Repeat procedure with second probe

Removed probes should be handled like contaminated sharps and should be placed in a urine specimen container to be provided by the officer/deputy. They will likely log the probes into evidence.

**Treatment and Follow Up Instructions:**

- Cleanse puncture sites and bandage as appropriate
- Place triple antibiotic ointment on the puncture sites
- If patient has not had a tetanus shot in the last five (5) years they should be advised to acquire one
- If the patient is combative and needs to be chemically restrained, then they must be transported to the *Emergency Department*
- All patients with altered mental status require a full assessment and *Emergency Department* evaluation

**Other Considerations:**

There have been some recent reports of deaths involving the use of a Taser on combative patients. When closely reviewed, these deaths have almost always involved improper or prone restraint, agitated delirium, hyperdynamic drugs, and hyperthermia as major co-morbid factors.

Therefore, it is imperative that these patients receive a thorough assessment for these risk factors, and are not restrained in an improper position. If a patient remains combative, or has other priority s/s (including altered LOC), then further treatment and transport is called for.

Finally, the fact that Tasers are becoming controversial makes it imperative that documentation addresses not only taser removal, but all co-morbid factors as well.

**APPENDIX: O**

**TITLE: Trauma Leveling Criteria**

**Updated: July 1, 2013**

**Trauma Leveling Criteria for Field Providers**

**Level 1 Activation**

- SBP of 90 or less, respiratory rate >24, Tachycardia > 120 at any time in adults
- Age specific hypotension in children
  - <70mmHg + 2 x age)
  - HR > 200 or < 60
- Respiratory compromise/obstruction
- Intubation
- Inter-facility transfer patients receiving blood to maintain vital signs
- GCS 8 or less with mechanism attributed to trauma
- Major limb amputation
- Trauma Arrest
- Pregnancy >20 weeks gestation with leaking fluid or bleeding or abdominal pain that also meets Level 3 criteria
- Spinal cord injury with neurologic abnormality
- Penetrating injury to abdomen, head, neck, chest or proximal limbs including the knee and elbow
- Emergency Physician Discretion

**Level 2 Activation**

- GCS 9 to 13
- Chest tube/ Needle Thoracotomy
- Pelvic Fracture (suspected)
- Two obvious long bone fractures (femur/humerus)
- Flail Chest
- Near drowning
- Cervical fracture
- Ejection from enclosed vehicle
- Burns >20% or involvement of face, airway, hands, or genitalia

**Level 3 Activation**

- Death of same car occupant
- Extrication time > 20 minutes
- Fall 2 x patient's height
- Auto vs. bike or Auto vs. Pedestrian
- Motorcycle/ ATV/snowmobile /jet ski "crashes"
- Horse ejection or rollover
- > 12" intrusion into occupant space or vehicle
- "Star" any window shield
- Rollover
- Broken / Bent steering wheel
- Assault w/ change in LOC
- Amputation of one or more digits
- Second or third degree burns < 10-20%

# APPENDIX O

SARMC TRAUMA LEVELING

**If one of the following is present consider increase to Level 2**

- Transfer from another facility
- Co-morbidities (Anti-coagulants, COPD, diabetes, CHF, etc.)
- Extremes of cold or heat w/prolonged exposure
- Presence of intoxicants or illicit drugs
- Extremes of age < = 12 or > = 65

**NOTE**: Level 3 criteria alone do not mandate transfer to the trauma center. The purpose of allowing medic discretion is to encourage initial triage of patients potentially requiring hospital admission to an appropriate receiving center and to give the provider a way to alert the hospital they are bringing in a trauma patient needing immediate evaluation.

| Call-in / Bedside Template | Medical | Trauma |
|---|---|---|
| Unit #: | ✓ | ✓ |
| Patient Age: | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ |
| Chief Complaint: | ✓ | |
| Mechanism of Injury: | | ✓ |
| Pertinent Exam Finding: | ✓ | |
| Pertinent Injury Finding: | | ✓ |
| Vital Signs: (*complete set*) | ✓ | ✓ |
| Treatment based on clinical impression: | ✓ | ✓ |
| ETA: | ✓ | ✓ |
| (Stay on Hospital Frequency) | ✓ | ✓ |

| Call-in / Bedside Template | Trauma Leveling | STEMI | Brain Attack |
|---|---|---|---|
| Unit #: | ✓ | ✓ | ✓ |
| Announce : Trauma Leveling# / "STEMI" / Brain Attack: *(Justified by announcing criteria)* | ✓ | ✓ | ✓ |
| Patient Age: | ✓ | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ | ✓ |
| Mechanism of Injury: | ✓ | | |
| Stable vs. Unstable | | ✓ | |
| Last seen normal *(time/place)* | | | ✓ |
| Pertinent Exam Finding: | | ✓ | ✓ |
| Pertinent Injury Finding: | ✓ | | |
| Vital Signs: (*complete set; with the LOWEST B/P recorded or any hypotension*) | ✓ | ✓ | ✓ |
| Treatment based on clinical impression: | ✓ | ✓ | ✓ |
| Name of Cardiologist | | ✓ | |
| ETA: | ✓ | ✓ | ✓ |
| (Stay on Hospital Frequency): | ✓ | ✓ | ✓ |

**APPENDIX: P**

**TITLE: PATELLAR REDUCTION PROCEDURE**

**REVISED: February 9, 2010**

## I. BACKGROUND:

Dislocation of the patella is quite common**.** Lateral dislocation is the most common and may be caused by flexion and external rotation of the knee with simultaneous contraction of the quadriceps tendon. The quadriceps contraction pulls the patella laterally. Common mechanisms are rotational motion of the knee with a planted foot, often seen in volleyball, tennis, basketball, football, gymnastics, and dancers. Patellar dislocations are unlikely in patients with normal patello-femoral anatomy. Medial patellar dislocations are almost always associated with direct trauma to the patella and field relocation should be approached with caution due to the higher risk of associated fractures.

## II. SIGNS & SYMPTOMS:

Clinically, patients will present with obvious deformity of the knee and a displaced patella. Swelling may be present. This injury is extremely painful.

## III. COMPLICATIONS:

Fractures accompanying patellar dislocation are not uncommon, occurring in 28%-50% of patients. The vast majority of these occur when dislocation is associated with a direct blow to the patella. Intra-articular fragments can cause degenerative arthritis if not recognized. Therefore, it is important that all patients with patellar dislocation receive radiologic follow up, even if the dislocation is reduced. Significant hemorrhage into the joint may also occur. Recurrent dislocation is often a significant problem. The younger the patient at the time of the injury, the more likely a recurrent dislocation becomes.

## IV. PROCEDURE FOR PATELLAR RELOCATION:

1. Palpate the patella for obvious deformity or crepitus. If obvious signs of fracture are present, **do not** attempt relocation. Splint the injury as found, ice the knee to prevent swelling, and transport to an appropriate facility for evaluation.
2. If possible, place the patient supine with the injured extremity elevated and flexed at 60-90 degrees. This will help relax the quadriceps muscle.
3. Smoothly and slowly straighten the extremity by lifting under the ankle. The patella should “pop” easily back into place as the knee approaches full extension.

4. If the patella is not easily reduced, the reduction may be obstructed by a fracture or hemarthrosis. Splint the injury, apply cold packs to reduce swelling, and transport the patient to an appropriate facility for further evaluation.
5. After reduction, the patient will generally experience almost complete relief of pain. Tenderness may be present along medial patellar and lateral femoral lines. The knee should be splinted and iced to prevent swelling, and the patient encouraged to have the joint examined at an appropriate medical facility.

**V. REFERENCES:**

Jensen JE, Conn RR, Hazelrigg G, HewettJE, Systematic Evaluation of Acute Knee Injuries. *Clinical Sports Medicine 4:295-312, 1985*
Stewart CE, Lower Extremity Trauma: Part II, *Journal of Emergency Medicine* Vol 28/Number 5: 64, May, 1999

**APPENDIX: Q**

**TITLE: SELECTIVE SPINAL IMMOBILIZATION PROTOCOL**

**REVISED: August 1, 2013**



## 1. BACKGROUND:

This protocol is intended to allow selective exclusion of full spinal immobilization in patients with a low index of suspicion for spinal injury and to use the long spine board and/or scoop stretchers for extrication purposes only.

## 2. INDICATIONS:

**Cervical Spine:**
In order for providers to defer cervical spine immobilization in patients with mechanical potential for injury, ALL of the following criteria must be evaluated and individually documented.

1. No posterior neck pain or tenderness.
2. No intoxication.
3. No altered level of alertness.
4. No focal neurologic deficit.
5. No painful distracting injuries.

*Note: Axial loading of cervical spine is not recommended.*

**Thoracic and Lumbar Spine:**
In order for providers to defer thoracic and lumbar spine immobilization in patients with mechanical potential for injury, ALL of the following criteria must be evaluated and individually documented.

For any patient with:

1. No tenderness of midline upper, mid or lower back.
2. No intoxication.
3. No altered level of alertness.
4. No neurologic deficit or incontinence.
5. No painful distracting injuries.

**3. PROCEDURE**

**Cervical Spine:**

If the above exclusion criteria are met, then extricate/assist the patient to the stretcher with the least manipulation of the spine as possible.

If the patient does not meet the exclusion criteria, apply a c-collar. Then utilize the appropriate transfer/extrication device (long spine board, KED, slider board or scoop stretcher, *etc.*) to move the patient to the stretcher with the least manipulation of the spine as possible.

**Thoracic and Lumbar Spine:**

If the above exclusion criteria are met, then extricate/assist the patient to the stretcher with the least manipulation of the spine as possible.

If the patient does not meet the exclusion criteria, utilize the appropriate transfer/extrication device (long spine board, KED, slider board or scoop stretcher, *etc.*) to move the patient to the stretcher with the least manipulation of the spine as possible.

Once the patient with suspected/known cervical, thoracic or lumbar spine injury is placed on the stretcher, remove the extrication device *as soon as safely possible* (provider discretion). **Keep the patient in the supine position** for transport/transfer to the appropriate destination. Any further transfers of the patient with a known or suspected spinal injury should be done with a slider board observing precautions not to manipulate the spine.

**4. DEFINITIONS:**

Posterior neck pain or tenderness is present if the patient reports pain on palpation of the midline neck from the nuchal ridge to the prominence of the first thoracic vertebra or any cervical spinous process.

Patients should be considered intoxicated if they have either of the following:

1. A history provided by the patient or an observer of intoxication or recent ingestion of alcohol or other mind altering substances such as benzodiazepines, narcotics or recreational drugs.
2. Evidence of intoxication on physical examination such as an odor of alcohol, slurred speech, ataxia, dysmetria, or other cerebellar findings or behavior consistent with intoxication.

An altered level of alertness can include any of the following:

- A Glasgow Coma Scale score of 14 or less.
- Disorientation to person, place, time, or events.
- A delayed or inappropriate response to external stimuli, or other findings.

A focal neurologic deficit is any neurologic finding on motor or sensory examination that is abnormal. This includes sensory or motor abnormalities or autonomic dysfunction.

No precise definition of a painful distracting injury is possible. This category includes any condition thought by the provider to be producing pain or anxiety sufficient to distract the patient from a second (neck) injury. Such injuries may include, but are not limited to: any long-bone fracture, a significant abdominal injury, a large open wound or crush injury, large burns, or any other injury causing acute functional impairment.

**Physician PEARLS:**

In patients at extremes of age, or patients with any underlying baseline mental dysfunction such as: dementia, other chronic neurologic conditions, rheumatoid arthritis, chronic steroid therapy, severe osteoporosis, those who are chronically bedridden require a higher level of concern. For possible cervical spine injuries in these patients a lower threshold for using a c-collar should be instituted.

Padding (inflatable mattress, towel rolls, blankets, *etc.*) is recommended when Appropriate for patient comfort.

# APPENDIX Q

# SELECTIVE SPINAL IMMOBILIZATION

**APPENDIX: R**

**TITLE: REFUSAL**

**REVISED: February 28, 2010**

## QRU Use Only

**QRU REFUSAL OF EVALUATION, TREATMENT, AND/OR TRANSPORT BY ACP AND/OR QRU:**

I, the undersigned, have been fully advised of my right to receive medical treatment and/or transportation services from _____ I, have also been fully advised of my right to receive medial evaluation, treatment and/or transportation and further realize that this refusal may be against the advice of the Emergency Medical crew members and I accept the consequences of my decision. I further release Ada County Paramedics and _____ from any harm, damage or loss caused by my refusal to permit evaluation, treatment and /or transportation.

_____

Patient's or Parent/Guardian's Signature Date Print Name

_____

Witness Signature Date Print Name

## ACP Use Only

**ADA COUNTYPARAMEDICS**
**REFUSAL OF TREATMENT/TRANSPORT AND ACKNOWLEDGEMENT OF RECEIPT OF NOTICE OF PRIVACY PRACTICES**

I, the undersigned, have been fully advised of my right to receive medical treatment and/or transportation services from Ada County Paramedics. It is my conscious decision to refuse such treatment and/or transportation and further realize that this refusal may be against the advice of the Emergency Medical crew members and I accept the consequences of my decision. I further release Ada County Paramedics from any liability for harm, damage or loss caused by my refusal to permit treatment and/or transportation. I have received a copy of ACP Notice of Privacy Practices.

_____

Patient's or Parent/Guardian's Signature Date Print Name

_____

Witness Signature Date Print Name

Primary EMS provider:_____Number:_____

# APPENDIX R

# REFUSAL

**APPENDIX: S**

**TITLE: S.O.A.P. GUIDELINES**

**REVISED: February 9, 2010**

Run Report Organization shall (when appropriate) contain the following information. Computerized charting may differ somewhat due to software parameters:

**S.O.A.P**. Format: DOCUMENT AS APPROPRIATE PER CALL

**SUBJECTIVE:**

**Subjective information**:

- Medic unit responding
- Reason for call
- Chief complaint (C/C)
- History of C/C
- Pertinent Negatives
- Information obtained from bystanders and other sources
- Other pertinent history and information
- Response Times (Dispatch, On scene, etc.)

**Misc. information (unless included elsewhere)**

- Allergies
- Medications
- Past Medical History
- Last meal,
- OPQRST (Onset, Provokes, Quality, Radiation, Severity, Time since onset)

**OBJECTIVE:**

**Physical Exam Including:**

- LOC
- Level of distress
- Skin
- HEENT
- Chest/lung sounds
- Spine C-T-L
- ABD
- Pelvis
- Extremities
- Neurological Assessments
- Cardiovascular Assessments

**Diagnostics including:**

- BG
- EKG
- SPO2
- 12-Lead EKG
- Vitals
- Motor Function
- ET CO2

**ASSESSMENT:**

Working field diagnosis - consistent with your findings and treatments

APPENDIX

S

S.O.A.P. GUIDELINES

**PLAN:**

Plan should include:

- Document patient contact time.
- ALL treatments, including name and agency of person performing ALS treatment, routes, number of attempts, medications, and doses.
- Treatment per SWO, V.O. (Verbal Order)or specific protocol.
- Results of/response to the treatment and justification for treatment.
- Equipment used.
- Method of removing patient to MICU.
- Destination hospital noted and reason for choice (i.e. patient request).
- Type of transport (non-emergency vs. emergency).
- Any changes or incidents while enroute.
- Report given to whom.
- Disposition of patient on discharge from ALS care, including the patency/position of ET tubes, mental /hemodynamic status, etc.
- Any personal possessions left, removed, or transferred to hospital staff.
- Patients, who refuse care or are treated-and-released, require documentation of informed refusal of services, etc.

**Some further notes on SOAP charting:**

- Correct spelling, grammar, legibility, proper use of medical terminology, and approved abbreviations will be used.
- Written reports should be written in BLACK ink.
- Complete patient reports and submitting a copy to the destination hospital in a reasonable amount of time.
- Most BLS reports should be completed within 30 minutes, most ALS reports in about 45 minutes.
- Reports with three (3) or more errors will be re-written.
- Reports will include a printed signature block with the printed name and Ada Number corresponding to the signature.
- Responses to treatment should include both subjective and objective changes when possible.

**APPENDIX: T**

**TITLE: IN-FIELD DEATH/POST/DNR**

**REVISED: February 9, 2010**

## I. OVERVIEW:

In the course of duty, EMS providers will encounter patients who are not candidates for resuscitation. For the purposes of this protocol, these candidates are broken into 4 categories. Patients who are not in one of these four categories should be resuscitated. These categories are:

- Obvious death / Non-salvageable patients
- Interfacility transfer with a non-POST/DNR
- POST/DNR
- Patients who are refractory to field interventions.

EMS providers should not endanger themselves to determine death of a patient. Examples of unreasonable danger include, but are not limited to:

- Bystanders or family who are hostile.
- Scenes where traffic is not reasonably controlled, or where a likelihood of an accident exists.
- Situations with a potential for exposure to weapons, fire, explosives, radiological, biological or chemical hazard where the rescuer lacks the resources or training to deal with the situation.
- Steep or vertical environments, “confined spaces”, swift water or other technical rescue environments where the rescuer lacks the resources or training to deal with the situation.

## II. OBVIOUS DEATH / NON-SALVAGEABLE PATIENTS:

When a possible DOA is encountered, personnel should avoid disturbing the scene or the body as much as possible, unless it is necessary to care for and assist other victims. The determination that a patient is DOA rests with the EMS provider on scene. In the case of a MCI, this responsibility lies with the triage team or officer. The following may be used as a guideline to support the determination that the patient is DOA:

- Absence of respiratory effort (MCI only).
- Injury incompatible with life (i.e., decapitation, severe head trauma, evisceration of the heart or brain, or burned beyond recognition).
- The patient shows signs of decomposition, rigor mortis, or dependent lividity.
- Whenever resuscitative measures (CPR) are instituted, they should be continued until arrival at a hospital, until directed by a physician to stop the resuscitation, or other circumstances dictate, unless the above criteria apply.

## III. INTERFACILITY NON-COMFORT ONE DNR/DNI:

Occasionally, during transports between hospitals or between a hospital and other facilities (i.e. HOSPICE or a nursing home), a patient may die and resuscitation may be undesired and inhumane. The following procedure will be followed:

- **When possible:** EMS personnel will secure and maintain possession of a physician order for a DNR status or DNR documentation from the patient's chart with a physician signature.
- Traditional comfort care will be done regardless of the patient's DNR status.

When a patient ceases to have signs of life **or** meets the requirement for aggressive airway management, **EMS personnel will then:**

- Contact the receiving physician (unless an order is secured in advance) for permission not to institute resuscitative measures. Document such interaction.
- If there is a delay, contact medical control at SARMC.
- Unless an order is pre-established, begin resuscitative efforts until contact with medical control is established.

**Out of state / Foreign DNR's:**

- **Out of state DNR orders**: Per Idaho Code 56-1033 a DNR order or DNR identification prepared from any other state, district or territory of the United States with a physician signature may be honored.
- **Foreign DNR Orders**: If EMS personnel receive a patient with a DNR from another country; contact will be made with the receiving physician or Medical Control.
  - If contact is delayed begin resuscitative efforts.
  - If the DNR is unreadable, begin resuscitative efforts.

## IV. IDAHO COMFORT ONE PROGRAM:

Idaho Code (Idaho Code, Title 56-1020 to 56-1035) permits DNR (Do Not Resuscitate) orders to be written for terminally ill individuals in non-institutional situations and to be honored by EMS personnel. This enables "the physician of a terminally ill person, with authorization of the person or their legal representative, to be able to issue a directive, in advance, instructing emergency medical services personnel not to perform resuscitation if called to attend those persons." This law is the only law that applies to EMS personnel outside of the hospital setting.

A LIVING WILL HAS NO LEGAL STATUS IN THE **PREHOSPITAL ENVIRONMENT** AND CANNOT BE USED (BY ITSELF) BY EMS PERSONNEL TO WITHHOLD RESUSCITATION.

The State of Idaho's **POST/DNR** order is the only document that can be honored by EMS personnel, except during an interfacility transfer situation as noted above. The law has a grandfather clause whereby Comfort-One/DNR orders that are signed before July 1, 2007, may be honored regardless of their format. **Signed and dated copies of the original form can be honored.**

## V. PATIENTS WHO ARE REFRACTORY TO FIELD INTERVENTIONS

At times, the paramedic may have begun ALS measures on a patient who does not meet the requirements for Obvious death / Non-salvageable. After extensive ALS interventions without improvement, the likelihood of survival is minimal or non-existent. Examples include:

- Patients who have been without any vital signs for at least 20 minutes (confirmed).

  **OR**

- Patients who are in Asystole (confirmed in two leads) for at least 10 minutes and have received appropriate ALS intervention.

  **OR**

- Any other unforeseen circumstances where the likelihood of survival is minimal or non-existent and aggressive ALS measures have been attempted.

**In this case the paramedic should contact medical control for permission to stop resuscitation efforts. Document thoroughly.**

APPENDIX

# T

# IN-FIELD DEATH/POST/DNR

# GENERAL

IDAHO EMS GUIDELINE

Idaho Physician Orders for Scope of Treatment/Do Not Resuscitate

**POST/DNR**

INDICATIONS:

- Patient is in respiratory or cardiac arrest

**AND**

- Patient has a **valid Idaho DNR order**.
  - Intact (original or photocopy) signed (by a physician **and** patient or surrogate), **Idaho POST/DNR** order, dated *after 1 July 2007*, or an **Idaho POST/DNR bracelet.**
  - Patient has an intact (original or photocopy) signed **Idaho Comfort ONE/DNR** order, dated *prior to 1 July 2007*.
  - Patient has a signed DNR order from another state.

**OR**

- Patient is wearing **DNR identification jewelry** (Idaho POST/DNR or Comfort ONE/DNR.)

CONTRAINDICATIONS:

- The maker of the form or physician has revoked the DNR order.
- **DNR** order (photocopy or original, bracelet or necklace) is not physically present or has been defaced or destroyed.
- Verbal or Physical Threats from Bystanders

1. Perform routine patient assessment, resuscitation, or other medical interventions while an attempt is made to determine DNR status.

2. If a **valid DNR order or DNR identification jewelry** is found, obtain reasonable assurance that the patient is the person for whom the order was written. (see items 10 and 11 of this document for examples of DNR identification jewelry)

3. If the patient is in respiratory or cardiac arrest and DNR status is confirmed:
   EMS providers WILL NOT
   - Initiate CPR
   - Provide ventilatory assistance
   - Initiate cardiac monitoring (unless to confirm death)
   - Defibrillate
   - Administer resuscitative medications

   EMS providers WILL
   - Provide comfort care
   - Provide emotional support (to the patient and family)

The Idaho EMS Bureau has taken extreme caution to ensure all information is accurate and in accordance with professional standards in effect at the time of publication. This guideline is for reference and may be modified at the discretion of the EMS Medical Director. It is recommended that care be based on the patient's clinical presentation and on authorized policies and guidelines.

# GENERAL

4. If the patient is not in respiratory or cardiac arrest, EMS providers will:
   - Attempt to determine if the patient has a POST form
   - Follow the patient's treatment choices listed in sections B and C of the Patient's POST form.

5. If resuscitative efforts have been started before learning of a **valid DNR order**, stop those resuscitative efforts. Contact medical control if questions exist.

6. If it is determined the patient does not have a **valid DNR order**, proceed with all resuscitative efforts within scope of practice. Contact medical control for any permission to discontinue.

7. Revoking a DNR order may only be done by the maker of the form (this is the patient or person who signed the Patient/Surrogate block in Section E of the POST form), or attending physician, either verbally, or by removing the bracelet or necklace or destroying the original form and/or photocopy with patient. If revoked, perform full resuscitation.

8. If the patient has severe trauma, is involved in a mass casualty incident, or there is evidence of homicide or suicide, the EMS provider is not required to attempt to locate a POST form or jewelry.

9. The DNR order may be disregarded only if there is a good faith belief the order has been revoked, to avoid confrontation or if ordered to do so by the attending physician. (An attending physician is a physician licensed in Idaho who is selected by, or assigned to, the patient and who has primary responsibility for the treatment and care of the patient. The attending physician can be an EMS on-line medical control physician.)

10. Complete the Idaho EMS Patient Care Report. State in the narrative how the patient was identified, events occurring during the EMS run, any verbal attending physician orders and patient outcome.

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11. Examples of **Idaho POST Form**

Print Form

IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST

## Idaho Physician Orders For Scope of Treatment (POST)

*THIS FORM MUST BE SIGNED BY A **PHYSICIAN** IN **SECTION E** TO BE VALID*

**If any section is NOT COMPLETE, provide the most treatment included in that section**

**EMS:** If questions arise, contact on-line Medical Control

Patient's Last Name: Lastname
Patient's First Name: Firstname
Date of Birth: 1/11/1911
☒ Male ☐ Female

**Section A** (Select only one box)

**Cardiopulmonary Resuscitation:** Patient does not have a pulse and/or is not breathing:

☐ **Resuscitate (Full Code)**

☒ **Do Not Resuscitate (No Code): Allow Natural Death; Patient does not want any heroic or life-saving measures.**

If patient is not in cardiopulmonary arrest, please follow the orders found in **B**, and **C**.

**Section B**

**Medical Interventions:** Patient has a pulse and/or is breathing:

☒ **Comfort Measures:** Please treat patient with dignity and respect. Reasonable measures are to be made to offer food and fluids by mouth and attention must be paid to hygiene. Medication, positioning, wound care, and other measures shall be used to relieve pain and discomfort. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. **These measures are to be used where patient lives, do not transfer to hospital for life-sustaining treatment. Transfer only if comfort needs cannot be met in current location.**

☐ **Limited Additional Interventions:** In addition to the care described above, you may include cardiac monitoring and oral/IV medications. Transfer to hospital if indicated but do not use intubation or advanced airway interventions. **Do not admit to Intensive Care.**

☐ **Aggressive Interventions:** In addition to the care described above, you may include endotracheal intubation, advanced airway interventions, mechanical ventilation and cardioversion as indicated. **Receiving hospital may admit to Intensive Care if indicated.**

☐ **Other Instructions:**

**Section C**

**Artificial Fluids and Nutrition:**
☐ Feeding tube ☒ No Feeding tube
☐ IV fluid ☒ No IV fluid
☐ Other Instructions:

**Antibiotics and Blood Products:**
☐ Antibiotics ☒ No Antibiotics
☐ Blood Products ☒ No Blood Products
☐ Other Instructions:

**Section D**

**Advance Directives:** The following documents also exist:
☒ Living Will ☐ DPA ☒ DPAHC ☐

**Section E**

**Patient/Surrogate Signature:**

| Firstname Lastname | Patient | Jul 3, 2007 |
|---|---|---|
| Print Patient/Surrogate Name | Relationship | Date |

**Physician Signature:**

| First Last, MD | M-123456 | Jul 3, 2007 |
|---|---|---|
| Print Physician's Name | Idaho License Number | Date |

**Discussed with:** ☒ Patient ☐ Spouse ☐ DPA ☐ DPAHC ☐ Other

The basis for these orders is: ☒ Patient's request ☐ Patient's known preference ☐

**FORM SHALL ACCOMPANY PATIENT WHENEVER TRANSFERRED OR DISCHARGED**

IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST IDAHO POST

The Idaho EMS Bureau has taken extreme caution to ensure all information is accurate and in accordance with professional standards in effect at the time of publication. This guideline is for reference and may be modified at the discretion of the EMS Medical Director. It is recommended that care be based on the patient's clinical presentation and on authorized policies and guidelines.

# GENERAL

## 12. Examples of POST/DNR identification jewelry

## 13.
## 14. Examples of Comfort One/DNR identification jewelry

DNR
ORDER
10500

*PATIENT INFORMATION*

Patient Name (print):_____ DOB:_____

Signature:_____ Gender: M___ F___

Address:_____

Legal Surrogate Name (print):_____

Signature:_____

Address:_____

The Idaho EMS Bureau has taken extreme caution to ensure all information is accurate and in accordance with professional standards in effect at the time of publication. This guideline is for reference and may be modified at the discretion of the EMS Medical Director. It is recommended that care be based on the patient's clinical presentation and on authorized policies and guidelines.

**APPENDIX: U**

**TITLE: DUODOTE™ PROCEDURES**

**REVISED: OCTOBER 1, 2010**



## I. BACKGROUND*:*

**Nerve Agent Antidote Kit (DUODOTE™)**: A **DUODOTE™**kit is an alternative way to administer atropine and 2-PAM Chloride in response to symptomatic nerve agent (or similar toxin) exposure. It replaces the **MARK I** kit in all situations. Unlike the **MARK I** kit, the **DUODOTE™**is *a single auto injector*. The **DUODOTE™** contains:

- 2.1 mg of Atropine Sulfate
- 600 mg of 2-PAM Chloride (Pralidoxime)

Like the older **MARK I** kit, the **DUODOTE™** kit is specifically designed for use on the battlefield by both medical and non-medical personnel. As a result of its durability, simplicity, and similarity to other civilian medical auto-injectors (I.E. The EPI-PEN) the **DUODOTE™** kits are being deployed into civilian medical arenas as well. The **DUODOTE™** kits are particularly useful during *"dirty" or "hot zone"* medical care because no IV is needed.

The **DUODOTE™,** as well as other similar kits, may be available to ACEMSS Personnel and other responders through ACEMSS, civil defense authorities, FEMA sponsored groups, the military, or other agencies in a time of crisis or in response to increased terrorism threat assessments.

## II. INDICATIONS

**DUODOTE™:** Any patient who is symptomatic from suspected exposure to a nerve agent, organophosphate poisoning, or similar toxin.

The Use of the **DUODOTE™**Kit is especially desirable in hazardous environments, as they can be given through clothes and NBC Suits.

### *Dose*

**Adults:** **DUODOTE™**: Administer up to three **DUODOTE™**IM as needed.
**CANA**: Administer a single CANA kit IM as needed.

**Children**: **DUODOTE™**: A single **DUODOTE™** injector can be given IM to children over 50 pounds.

.

**Infants**: The adult-size **DUODOTE™**injector should not be given to infants.

**NOTE WELL:** The above limitations are due to the 2-PAM Chloride component of the **DUODOTE™KIT. FURTHER (APPROPRIATE) DOSES OF ATROPINE ARE PERMITTED WITHIN THE BOUNDS OF THE ACEMSS STANDING WRITTEN ORDERS OR MEDICAL DIRECTION.**

APPENDIX

U

DUODOTE™ AUTO-INJECTOR KIT

## III. CONTRAINDICATIONS:

***None in the Nerve Agent / Organophosphate casualty except as noted above.***

## IV. PROCEDURE:

**Who May Use the DUODOTE™Kit?**
ACEMSS personnel may self-administer ("Self Aid") the **DUODOTE™** kit if exposure to a nerve agent, organophosphate, or similar toxin is suspected. A responders **DUODOTE™** kit may be administered by another responder if the first responder is unable to do so himself ("Buddy Aid"). Regardless, a responder should never use his/her own **DUODOTE™** kit on a patient.

**DUODOTE™** Kit should only be administered to non-responders (patients) by a Paramedic or other appropriately trained responder.

**Administration of auto-injectors:**

**DUODOTE™:** The **DUODOTE™** is a single injector; the procedure is essentially the same as for an individual MARK I Injector, ATROPEN, EPIPEN, or similar auto-injectors.

To use the auto-injector:

1. Remove **DUODOTE™** kit from protective pouch. Hold unit in dominant/strong hand by its "body".
2. Keep GREEN tip pointed down. This is the "needle" end of the auto-injector.
3. **REMOVE THE GRAY "SAFETY" CAP.** If the gray safety cap is in place, the auto injector will not fire.
4. Chose the location to inject. It should be a large muscle mass, the outer thigh is the most common site. Remove any wallets, pocket guides, or other potential obstructions. The **DUODOTE™** should be able to deploy through a couple layers of clothes.
5. Grasp the unit and position the green tip of the injector on victim's outer thigh at an approximately 90 degree angle.
6. Push firmly until auto-injector fires.
7. Hold in place for 10 seconds to ensure Atropine has been properly delivered
8. Remove the **DUODOTE™** auto injector and inspect for the (now visible) needle from the green tip. If the needle is not visible, the auto injector has not fired. Make sure the gray safety cap is removed and repeat the process.
9. Once fired, bend the needle back onto the auto-injector, place in pouch, and keep with patient so other medical personnel know it has been administered.
10. Complete evacuation and decontamination procedures. Re-evaluate for need of further intervention.

## V. NEEDLE DISPOSAL

Be careful handling used auto-injector units because communicable diseases such as hepatitis and HIV can be spread through accidental needle sticks. The usual procedure to reduce the chance of accidental needle sticks is to bend the needle back against a hard surface at a 180-degree angle and replace into the packaging

**Note:** Generally, medical protocols recommend that all sharps (needles) be placed in a sharps container for proper disposal to protect workers from exposures to blood borne illnesses. Because needle stick injuries are a major cause of these exposures, it is important to recognize that there are work practices and engineering controls that help prevent needle sticks in environments outside of a hospital, clinical laboratory, or research laboratory. According to CFR 1910.1030 (d)(2)(vii) through 1910.1030 (d)(2)(vii)(B), contaminated sharps can be bent if the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure. The **DUODOTE™** kit will be used primarily in areas outside of hospitals, clinical or research laboratories. It is prudent and a required procedure (i.e., using a one-handed technique) to bend the needle from the **DUODOTE™**kit to permanently blunt the exposed sharp until they can be disposed of properly.

## VI. OTHER CONCERNS:

The **DUODOTE™**Kit should be protected from temperatures below 32 degrees F. It may be necessary to carry next to body to keep warm.

Providers may hold **DUODOTE™**kit administration if Atropine and/or 2-Pam Chloride being administered by other routes, methods, or preparations.

**Use of the DUODOTE™ Kit is not a substitute for decontamination and use of proper protective gear**. Individuals should not rely solely upon agents such as atropine and 2-Pam Chloride to provide complete protection from chemical nerve agents and insecticide poisoning. Primary protection against exposure to chemical nerve agents and insecticide poisoning is the wearing of protective garments, including masks designed specifically for this use.

**The DuoDote™Auto-Injector is intended as an initial treatment of the symptoms of organophosphorus insecticide or nerve agent poisonings; definitive medical care should be sought immediately.**

**Evacuation and decontamination procedures should be undertaken as soon as possible. Medical Personnel assisting evacuated victims of nerve agent poisoning should avoid contaminating themselves by exposure to the victim's clothing.**

APPENDIX

# U

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APPENDIX

V

**APPENDIX: V**

**TITLE: TREAT AND RELEASE CHECK SHEET FOR HYPOGLYCEMIC PATIENTS**

**REVISED: February 9, 2010**

HYPOGLYCEMIC TREAT & RELEASE

## Hypoglycemic Treat-and-Release Check Sheet

***Name:*** _____ ***DOB:*** _____ ***Date:*** _____

| YES | NO | |
|---|---|---|
| | | 1. Is there a clear reason for the hypoglycemic episode? |
| | | 2. Is the patient alert and oriented? |
| | | 3. Is the patient's repeat BG above 80 mg/dl? |
| | | 4. Has the patient's BG been well-controlled prior to this episode? |
| | | 5. Is the patient able to eat a complex carbohydrate meal? |
| | | 6. Does the patient have regular, on-going physician care? |
| | | 7. Is the patient comfortable with non-transport? |
| | | 8. Is the patient/guardian willing to sign a release form? |
| | | 9. Is there another responsible person with the patient? |
| | | 10. Is the patient's temperature within normal limits? (95° to 100.4° Fahrenheit) |
| | | 11. The patient is free of the influence of alcohol or other CNS-altering drugs? |

**Any "No" answer above requires contact with Medical Control prior to release.**

**Time:** _____

**Facility:** _____

**Physician:** _____

**Additional Comments:** _____

APPENDIX

# V

# HYPOGLYCEMIC TREAT & RELEASE

**APPENDIX: W**

**TITLE: Safe Haven Guidelines**

**REVISED: November 16, 2010**

## I. Purpose:

To comply with Chapter 82, Title 39, Section 8201-8207, Idaho Code, the Idaho Safe Haven Act.

## II. Introduction:

Effective July 1, 2001, the Safe Haven Act went into effect statewide. This law provides freedom from prosecution for a custodial parent (defined as apparent with whom the child resides, not necessarily the mother) who gives up an child (under 30 days old) to a designated Safe Haven.
Safe Havens are defined as:

- Hospitals
- Physicians and their staff at an office or clinic
- PA's, NP's, Nurse Midwives, Nurse Anesthesiologists
- 911 medical responders (EMT-B through Paramedic)

EMS personnel may encounter any number of situations as a result of this law.

## III. Eligibility:

The Idaho Safe Haven Act offers protection from civil and criminal liability to medical personnel, law enforcement officers and staff of Safe Haven facilities as long as they are operating in "good faith". The following are required to meet that requirement:

- The presenting parent may be asked if he/she is the custodial parent (does child reside with them). Technically, only the custodial parent can submit the child and be protected under the Safe Haven Act.
- The child must be under 30 days old or if age is unknown or not disclosed, then reasonably be assumed to be less than 30 days old.
- Please ensure that the child is being given up to EMS under the Safe Haven Act. Ask specifically, "Are you giving this child up to EMS". Document any response, lack of response, language barriers, etc. This is essential to protecting EMS personnel.
- If ACP personnel are presented with a child who is not eligible for the Safe Haven Act, the child is still presented to EMS for care and normal procedures should be followed.

## III. Medical Care:

The medical care of the child comes first. Follow all protocols. The Safe Haven Act provides consent for medical care under these circumstances.

- In the event that the child does not meet the Safe Haven criteria due to age or means of presentation, then follow normal procedures keeping the baby's best interest in mind.
- Provide any care needed, document thoroughly and contact law enforcement ASAP. This is to ensure that the baby receives any medical care required.
- Unless care priorities dictate otherwise, the child should be taken to the closes appropriate medical facility for further evaluation and care.\

**IV. Confidentiality:**

The Safe Haven Act intent is to provide a means of parent(s) to present the child to authorities without fear of prosecution or persecution from friends or family. Experts agree that most children who are abandoned are abandoned by teenage mothers who have hidden the pregnancy. Therefore, confidentiality is essential to promote the use of this program.

- The parent(s) are not required to divulge their identity. If the parent(s) do give their identity or it is known through some other means, then document it normally. The information is subject to normal patient confidentiality procedures.
- The parent(s) are not required to divulge any further information what so ever. However, EMS personnel may ask some questions pertaining to any given name of the child, birthday, pertinent medical history of the child or parent(s), etc. The Patients are not required to respond.
- Please document on the billing sheet that this is a Safe Haven patient. No billing will be sent to the parent(s) in order to protect the identity of the parent(s).

**V. Documentation:**

- Any name, birthday, or medical history for the child, if disclosed.
- Name of parent(s), if disclosed.
- Any dialog offered by the parent(s) in giving the child over to EMS personnel. If there are any barriers, document them as well.
- Document that the child was turned over to hospital staff.
- Document a full and thorough head to toe exam as well as any medical care provided, per normal guidelines.

**VI. Notification:**

If the child is eligible for the Safe Haven program, EMS personnel should make the following notifications and document such on the chart. The notification should include that the child meets the Safe Haven guidelines.

- Law Enforcement Officer
- ACP Supervisor
- Receiving Medical Facility

**VII. Protection:**

The Safe Haven Act offers protection for all parties involved.

*Medical providers and their staff.*˙ from civil and criminal liability as long as they were operating on "good faith in receiving this child and performing duties under this section". Also gives permission to give professional medical care.

*Law enforcement officer* from civil and criminal liability unless they were operating in "bad faith or in violation of the provision of this chapter".

*Parent;* from criminal prosecution in abandoning the child so long as it is to a Safe Haven. However, it does not provide immunity from criminal acts committed against the child before being turned over to a Safe Haven.

APPENDIX

X

**APPENDIX: X**

**TITLE: STANDARDIZED PHYSICAL EXAM AND HISTORY**

**REVISED: September 28, 2010**

**General Comment:** In pursuit of consistency at the highest level of pre-hospital care, a standardized protocol has been developed to assist field personnel in the completion of a physical exam and history. This protocol established minimum guidelines, while also encouraging field personnel to conduct or obtain a more detailed physical exam or history as required by the specific needs of an injury or illness. Because of circumstances beyond field personnel control, it may not be possible to complete a minimum physical exam or collect history with every patient contact (e.g. safety of scene, pt compliance, environmental hazards, etc.). Reasons that a physical exam could not be completed nor a history collected must be documented.

| **Physical Exam** (with some evaluations): | | **Location in ESO** |
|---|---|---|
| Airway | Patent? | |
| | Self-Maintained? | |
| | Compromise (blood, trauma, emesis, secretions) | Assessment - HEENT |
| Breathing | Rate and quality | Vitals |
| | Lung sounds | Assessment - Chest |
| | Word per sentence? | Narrative |
| | Accessory muscle use | Assessment - Chest |
| | Cough | Assessment - Chest |
| Circulation | Present/quality/symmetry of pulses | Vitals |
| | Blood pressure (first is manual) | Vitals |
| | Stable vs. Unstable (must have multiple) | Vitals |
| Deformity | | |
| Deficit | Existing vs. new | Assessment |
| | Traumatic vs. spontaneous | Assessment |
| | Gross neurological exam | |
| | Facial symmetry, Extremity, Pupil Exam, Speech quality | Assessment |
| | Responsiveness (AVPU, GCS, CAO) | Vitals |
| Expose | PRN based on severity of pt injury/illness and current environment. | Assessment |
| Skin | Temperature, color, condition | Assessment - Skin |
| Temperature | Oral, tympanic, axillary, rectal | Vitals |
| Appearance | How found? | Narrative |
| Environment | Description of residence or location | Narrative |

Standardized Phyicasl Exam & History

# APPENDIX X

## Standardized Phyicasl Exam & History

| History: | | Location in ESO |
|---|---|---|
| Chief Complaint | Not to be confused with reason for dispatch<br>Not to be confused with field diagnosis<br>(e.g. dispatched for SOB. Pt complains of chest pressure. Field diagnosis: MI)Clinical Impression | Field and Narrative |
| | Chief complaint belongs to the pt. It can be revealing so don't leave it out even though it might not make sense given the pt's diagnosis. | |
| Hx Present Illness | Most easily obtained through use of open ended questions | Narrative |
| | OPQRST (or similar). Adults don't get this. Translate.<br>Pt may be poor source of information.<br>Nursing notes or staff report | |
| Medications | Pt report | Pt Information Tab |
| | Pt list and verify vs. found medications<br>MD on bottle? | |
| | Compliance? | Narrative |
| | Recently prescribed or new dosing? | Narrative |
| Allergies | Pt report | |
| | Pt paperwork | Pt Information Tab |
| Medical Hx | Pt report<br>Prompts as some pts need to hear examples out loud<br>Paperwork<br>Staff report<br>Dates of events? | |
| | Surgeries? Dates? | Pt Information Tab |
| Social Hx | Tobacco/Alcohol/Illicit Drug Use<br>Type?<br>Frequency?<br>Audience vs. the information that is desired | Pt information Tab |
| Recent trauma/illness | Especially related to current complaint | Narrative |
| MD List | Medication bottles | |
| | Pt paperwork | Narrative |
| Patient Safety | Asked delicately and being mindful of audience | Narrative |

APPENDIX

X

Standardized Phyicasl Exam & History

| **History:** | | **Location in ESO** |
|---|---|---|
| Access to Medical Care | PMD?<br>Is 911 front-line care? | Narrative |
| Code Status | Review of acceptable forms in SWOs<br>Discuss importance with staff or family | Pt information Tab |

Review of Systems (Subjective Information) Questioning Examples

| | |
|---|---|
| Constitution | Fatigue, Weight loss/gain, Appetite |
| Eyes | Vision changes, photophobia, pain |
| Ears, nose, mouth | HA, tinnitus, vertigo, sore, tooth ache, hoarse, discharge |
| Respiratory | SOB, sputum production, wheezing, pain with resp., cough |
| Cardiovascular | Chest pain, edema, dizzy, etc. |
| Gastrointestinal | Bleeding, eating, nausea, reflux, stool, pain, emesis |
| Genitourinal | Frequency and quality of urination, blood, odor, appearance, pain<br>LMP_____G_____P_____ |
| Musculoskeletal | Aches, joint pain, strength, trauma, fx, swelling |
| Skin | Changes, rashes, sensitivity |
| Neurological | Sensation, symmetry, quality of speech, other deficits |
| Mental state | Manner of interaction, reasonable, scared. |

Information gathered from a review of systems should be documented in the **Narrative** portion of the chart.

Standardization of Narrative

The following summarizes the information designated for inclusion into the Narrative portion of ESO.

Reason for dispatch
Pt appearance
Environment
Chief complaint
HPI
Improved limb lead description (if desired)
Compliance with meds or new dosing (if relevant)
Recent trauma/illness (if relevant)
MD List

APPENDIX

X

Standardized Phyicasl Exam & History

Pt safety (if relevant)
Access to medical care (if relevant)
Information generated from a review of systems
How pt moved
Hospital destination (a necessary repeat)
Pt improvement/deterioration
Anything not otherwise documented that is pertinent

**It is no longer necessary to revisit a list of treatments in the Narrative portion of ESO. Further, it is generally not necessary to document negative findings.**

**Physician Pearls:**

"No abnormality" can only be documented if all the areas of a standardized physical exam, or a more detailed exam that is injury/illness specific, have been completed and nothing abnormal identified. This assumes that the Paramedic is able to identify grossly abnormal conditions at the examined body locations or reviewed systems.

"No abnormality" may be a relative term. The pt may have an abnormal condition that is normal for them. The finding should be documented as an abnormality (a finding) with reference to onset or the pt's description of the finding as pre-existing or "normal".

The physical examination pick lists offered in the current web-based documentation program may be utilized, however that list supplements the areas of exam found in the standardized physical exam/history.

APPENDIX

Y

**APPENDIX: Y**

**TITLE: ABBREVIATIONS**

**REVISED: September 29, 2010**

| | |
|---|---|
| @ | AT |
| $\overline{a}$ | before |
| AAA | abdominal aortic aneurysm |
| ABC circulation | airway, breathing, |
| ABD, abd | abdomen |
| AC | antecubital |
| ACP | Ada County Paramedics |
| ACL | anterior cruciate ligament |
| ACLS | Advanced Cardiac Life Support |
| ACS | Acute Coronary Syndrome |
| ADD | Attention Deficit Disorder |
| ADHD | Attention Deficit Hyperactive Disorder |
| admin | administration |
| AIDS | Acquired Immunodeficiency Syndrome |
| ALS | Advanced Life Support |
| am | morning |
| AMA | against medical advice |
| AMI | Acute Myocardial Infarct |
| amp | ampule |
| ant | anterior |
| A/O | alert and oriented |
| APAP | acetaminophen |
| approx | approximately |
| appy | appendectomy |
| ARDS | Adult Respiratory Distress Syndrome |
| ASA | aspirin |
| ASAP | as soon as possible |
| ASHD | Arteriosclerotic Heart Disease |
| AV node | atrial ventricular node |
| BBS | bilateral breath sounds |
| BCP | birth control pills |
| BFD | Boise Fire Department |
| BG | blood glucose |
| BGL | blood glucose level |
| bicarb | bicarbonate |
| b.i.d. | twice per day |
| bilat | bilateral |
| BiPAP | biphasic positive airway pressure |
| BLE | bilateral lower extremities |
| BLS | Basice Life Support |
| BM | bowel movement |
| BP | blood pressure |
| bpm | beats per minute |
| brady | bradycardia |
| BS | breath sounds |
| Bx | biopsy |
| C | Celsius |
| C-1 to C-7 | cervical vertebrate |
| C section | cesarean section |
| C-spine | cervical spine |
| Ca++ | calcium |
| CA | cancer |
| CABG | coronary artery bypass graph |
| CAD | coronary artery disease |
| caps | capsule(s) |
| cath | catheter |
| cc | cubic centimeter |
| C/C | chief complaint |
| CCU | Coronary Care Unit |
| CF | Cystic Fibrosis |
| chemo | chemotherapy |
| CHF | Congestive Heart Failure |

ABBREVIATIONS

# APPENDIX Y

## ABBREVIATIONS

| | |
|---|---|
| chol | cholesterol |
| C | circulation |
| Cl | chlorine, chloride |
| cm | centimeter |
| CMS | circulation, movement sensation |
| CNS | central nervous system |
| c/o | complains of |
| CO | carbon monoxide |
| C02 | carbon dioxide |
| COPD | chronic obstructive pulmonary disease |
| CP | chest pain |
| CPAP | continuous positive airway pressure |
| CPR | cardiopulmonary resuscitation |
| CSF | cerebrospinal fluid |
| CT | computed axial tomography |
| CTA | clear to auscultation |
| C-T-L | cervical, thoracic, lumbar spine |
| CVA | cerebrovasclar accident |
| DNR | do not resuscitate |
| DO | Doctor of Osteopathy |
| DOA | dead on arrival |
| DOB | date of birth |
| DOE | dyspnea on exertion |
| Dr. | doctor |
| DT | delirium tremens |
| DTP | diphtheria, pertussis and tetanus |
| DUI | driving under the influence |
| DVT | deep vein thrombosis |
| Dx | diagnosis |
| D5W | 5% dextrose in sterile water |
| E | east |
| EBL | estimated blood loss |
| EFD | Eagle Fire Department |
| ECG | electrocardiogram |
| ED | emergency department |
| EEG | electroencephalogram |
| EENT | eyes, ears, nose, throat |
| EOM | extra ocular movement |
| Epi | epinephrine |
| ER | emergency room |
| ET | endotracheal |
| EtC02 | end tidal carbon dioxide |
| ETT | endotracheal tube |
| etc | etcetera |
| ET0H | ethanol alcohol |
| eval | evaluation |
| ext | extremities, external |
| F | Fahrenheit |
| Fe++ | iron |
| FHx | Family history |
| Ft | feet |
| f/u | follow up |
| Fx | fracture |
| g | gram |
| ga | gauge |
| GCS | Glasgow Coma Scale |
| gest | gestation, gestational |
| GI | gastrointestinal |
| GLF | ground level fall |
| GSW | gun shot wound |
| Grav (I, II…) | number of pregnancies |
| gtt(s) | drops |
| GU | genitourinary |

APPENDIX

Y

ABBREVIATIONS

| | |
|---|---|
| GYN | gynecology |
| h | hour |
| H+ | hydrogen |
| HA | headache |
| HC03- | bicarbonate |
| HEENT | head, eyes, ears, nose, throat |
| Hg | mercury |
| HHN | handheld nebulizer |
| HIPAA | Health Insurance Portability & Accountability Act |
| HIV | human immunodeficiency virus |
| HR | heart rate |
| Hx | history |
| $H_20$ | water |
| $H_20_2$ | hydrogen peroxide |
| ICP | intracranial pressure |
| ICU | Intensive Care Unit |
| ID | identification |
| IDDM | insulin dependent diabetes mellitus |
| i.e. | that is, for example |
| IM | intramuscular |
| IN | intranasal |
| in | inches |
| inf | inferior |
| IO | intraosseous |
| I & O | intake and output |
| IV | intravenous |
| JVD | jugular venous distension |
| K+ | potassium |
| kg | kilogram |
| KFD | Kuna Fire Department |
| KVO | keep vein open |
| l | liter |
| L | left |
| L-1 to L-5 | lumbar vertebrae |
| lab | laboratory |
| lac | laceration |
| LAD | left anterior descending coronary artery |
| lap | laparotomy |
| lat | lateral |
| lb(s) | pounds |
| LCA | left coronary artery |
| lg | large |
| LLE | left lower extremity |
| LLL | left lower lobe |
| LLQ | left lower quadrant |
| m | meter |
| MAE | moves all extremities |
| MAX | maximum |
| mcg | microgram |
| MD | Medical Doctor |
| med | medicine |
| mEq | milliequivalent |
| mg | milligrams |
| Mg++ | Magnesium |
| Mg/dL | milligrams per deciliter |
| MI | Myocardial Infarct |
| MICU | Mobile Intersive Care Unit |
| min | minute |
| ml | milliliter |
| mm | millimeter |
| mmHg | millimeters mercury |
| mod | moderate |
| MFD | Meridian Fire Department |
| MOI | mechanism of injury |

# APPENDIX Y

## ABBREVIATIONS

| | |
|---|---|
| MOM | Milk of Magnesia |
| MRI | magnetic resonance imaging |
| MS | Multiple Sclerosis |
| MVA | Motor Vehicle Accident |
| MVC | Motor Vehicle Collision |
| N | north |
| NICU | Neonatal Intensive Care Unit |
| NIDDM | Non-insulin dependent diabetes mellitus |
| NKA | no known allergies |
| NKDA | no known drug allergies |
| noct | nocturnal |
| NP | Nurse Practitioner |
| NPO | nothing by mouth |
| NRB | non-rebreather mask |
| NSAID | non-steroidal anti-inflammatory drug |
| NTG | nitroglycerine |
| N/V | nausea & vomiting |
| Na+ | sodium |
| NaCl | sodium chloride |
| NAD | no apparent distress |
| n/c | nasal cannula |
| Neb | nebulizer |
| neg | negative |
| neuro | neurology |
| NG | nasogastric tube |
| O2 | oxygen |
| O2 sat | oxygen saturation |
| OB | Obstetrics |
| OB/GYN | Obstetrics & Gynecology |
| OD | overdose |
| OLMC | On-Line Medical Control |
| OR | operation room |
| ortho | orthopedics |
| OTC | over the counter |
| oz | ounce |
| $\overline{p}$ | after |
| PA | Physician's Assistance |
| PAD | peripheral artery disease |
| palp | palpation, palpated |
| para (I, II…) | prior births |
| path | pathology |
| PASG | pneumatic anti-shock garment |
| p.c. | after meals |
| PCL | posterior cruciate ligament |
| PCN | penicillin |
| PCP | Primary Care Physician |
| PDR | Physician's Desk Reference |
| PE | pulmonary embolism |
| ped(s) | pediatrics |
| PEEP | Positive End Expiratory Pressure |
| PERL | pupils equal reactive to light |
| pH | hydrogen ion concentration (acidity) |
| PICU | Pediatric Intensive Care Unit |
| PID | pelvic inflammatory disease |
| PMHx | past medical history |
| PMD | Primary Medical Doctor |
| PMS | pulses, movement, sensation |
| PND | paroxysmal nocturnal dyspnea |
| p.o. | by mouth |
| postop | post-operative |
| preop | pre-operative |
| p.r.n., PRN | as needed |
| prox | proximal |

APPENDIX

# Y

| | |
|---|---|
| psi | pounds per square inch |
| psych | psychiatry |
| Pt, pt | patient |
| P.T. | Physical Therapist or therapy |
| PVD | peripheral vascular disease |
| PX, px | physical examination |
| q | every |
| QA | quality assurance |
| q.d. | every day |
| q.h. | every hour |
| q2h, … | every 2 hours |
| q.i.d. | four times a day |
| q.o.d. | every other day |
| QRU | quick response unit |
| quad | quadriplegic |
| R | right |
| RBC | red blood cell |
| RCA | right coronary artery |
| re: | regarding |
| rehab | rehabilitation |
| resp | respiration(s) |
| RLE | right lower extremity |
| RLL | right lower lobe |
| RLQ | right lower quadrant |
| RML | right middle lobe |
| RN | registered nurse |
| R/O, r/o | rule out |
| ROM | range of motion |
| RR | respiration rate |
| RT | respiratory therapist |
| RUE | right upper extremity |
| RUL | right upper lobe |
| RUQ | right upper quadrant |
| Rx | prescription |
| s | without |
| S | South |
| SARMC | St. Alphonsus Regional Medical Center |
| sat | staturtion |
| sec | second |
| SID | Sudden Infant Death Syndrome |
| SL | sublingual |
| SLMMC | St. Luke's Meridian Medical Center |
| SLRMC | St. Luke Regional Medical Center |
| Sp02 | pulse oximetry |
| SOB | shortness of breath |
| S/P, s/p | status post |
| SQ, sq | subcutaneous |
| staph | staphylococcus |
| SFD | Star Fire Department |
| STAT | immediately |
| STD | sexually transmitted disease |
| STEMI | ST Elevation Myocardial Infarct |
| strep | streptococcus |
| SW | stab wound |
| Sx, sx | symptom |
| Sz, sz | seizure |
| S1 – S5 | sacral vertebrae |
| s/s | signs & symptoms |
| tab (s) | tablet |
| TB | tuberculosis |
| tbsp | tablespoon |
| TCA | Tricyclic antidepressant |
| temp | temperature |
| TIA | Transient Ischemic Attack |
| t.i.d. | three times a day |
| TKO | to keep open |
| TMJ | temporomandibular joint |

# APPENDIX Y

## ABBREVIATIONS

| | |
|---|---|
| tsp | teaspoon |
| TV | tidal volume |
| Tx, tx | treatment |
| T1 – T12 | thoracic vertebrae |
| | |
| U | unit |
| UA | urinary analysis |
| Unilat | unilateral |
| U/O | urine output |
| URI | upper respiratory infection |
| UTI | urinary tract infection |
| | |
| vag | vvaginal |
| vent | ventilator |
| vert | vertical |
| VO | voice order |
| VS | vital signs |
| | |
| W | west |
| w/ | with |
| w/o | without |
| w/p/d | warm, pink, dry |
| wk (s) | week (s) |
| WNL | within normal limits |
| WPW | Wolf-Parkinson-White |
| wt | weight |
| | |
| X | time |
| | |
| y/o | year old |
| yrs | years |

# CARDIAC ARRHYTHMIAS

APPENDIX

Y

| | |
|---|---|
| A-fib | atrial fibrillation |
| AT, A-tach | atrial tachycardia |
| AV | atrial ventricular |
| BBB | bundle branch block |
| 1 HB | first degree heart block |
| 2 HB | second degree heart block |
| 3 HB | third degree heart block |
| LBBB | left bundle branch block |
| MAT | multi-focal atrial tachycardia |
| NSR | normal sinus rhythm |
| PAC | premature atrial contraction |
| PAT | paroxysmal atrial tachycardia |
| PEA | pulseless electrical activity |
| PJC | premature ventricular contraction |
| VF, V-fib | ventricular fibrillation |
| VT, V-tach | ventricular tachycardia |
| WAP | wandering atrial pacemaker |
| < | less than |
| > | greater than |
| = | equals |
| + | positive |
| - | negative |
| “ | inches |
| ‘ | feet |
| % | percent |
| 1 | primary |
| 2 | secondary |
| 3 | tertiary |
| → | leads to |
| ✓ | check |
| ↑ | increase |
| ↓ | decrease |
| ≅ | approximately equal to |
| ~ | approximately |
| △ | change |
| ♀ | female |
| ♂ | male |
| ⊘ | no or none |

ABBREVIATIONS

# APPENDIX Y

# ABBREVIATIONS

**APPENDIX: Z**

**TITLE: Integration of care reporting guidelines**

**REVISED: October 27, 2010**



**Purpose:** To provide regional EMS providers with a method to standardize the communication of patient information between primary and incoming EMS providers (EMT, Adv .EMT or Paramedic), pre-hospital EMS providers and Emergency Department staff or in-hospital specialty units/staff. This will be achieved via radio "Call-in" and verbal "Bed-side" reporting.

The use of these scripted guidelines will provide for a more cohesive and organized standard of care for the communication of both EMS providers and hospital staff throughout the region.

## I. Radio / Phone Call – In Report:

This brief (30– 45 second), but complete information set will not be questioned by the receiving radio/phone operator for further information that could be given during the bedside report (Medications, Allergies, PMH, etc.).

### General "Radio / Phone Call-In" to area Hospitals

General radio/phone guidelines will be for **Medical** (any medical call not meeting "STEMI" and "Brain Attack" criteria) and *Trauma* (any trauma call not meeting Trauma Leveling Criteria) type patients.

| Call-in / Bedside Template | Medical | Trauma |
|---|---|---|
| Unit #: | ✓ | ✓ |
| Patient Age: | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ |
| Chief Complaint: | ✓ | |
| Mechanism of Injury: | | ✓ |
| Pertinent Exam Finding: | ✓ | |
| Pertinent Injury Finding: | | ✓ |
| Vital Signs: (*complete set*) | ✓ | ✓ |
| Treatment based on clinical impression: | ✓ | ✓ |
| ETA: | ✓ | ✓ |
| (Stay on Hospital Frequency) | ✓ | ✓ |

APPENDIX

Z

INTEGRATION OF CARE REPORTING GUIDELINES

**Specialty "Radio/Phone Call-In" to area Hospitals.**

Specialty radio/phone guidelines will be for the patient who has entered into a specialty group of the hospital system (Trauma Leveling, "STEMI", "Brain Attack"). This will initiate the ED protocol for that specialty patient. (activates: Shift Coordinator and Trauma Response Team to the ED, alerts ICU and Surgery; activates: Shift Coordinator and "STEMI" Response team to the ED, alerts Cath Lab/CCU; activates "Brain Attack" Team to the ED, alerts ICU and "Brain Attack" Coordinator)

The primary pre-hospital provider on the scene of a Trauma Level, "STEMI", or "Brain Attack" patient, will call the receiving hospital moments after the specialty criteria have been met. Use mnemonic **M.I.V.T.** for trauma leveling. It is imperative that the name of the cardiologist (if known) is given in the radio report.

| **Call-in / Bedside Template** | **Trauma Leveling** | **STEMI** | **Brain Attack** |
|---|---|---|---|
| Unit #: | ✓ | ✓ | ✓ |
| Announce : Trauma Leveling# / "STEMI" / Brain Attack: *(Justified by announcing criteria)* | ✓ | ✓ | ✓ |
| Patient Age: | ✓ | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ | ✓ |
| **M**echanism of Injury: | ✓ | | |
| Stable vs Unstable | | ✓ | |
| Last seen normal *(time/place)* | | | ✓ |
| Pertinent Exam Finding: | | ✓ | ✓ |
| Pertinent **I**njury Finding: | ✓ | | |
| **V**ital Signs: (*complete set; with the LOWEST B/P recorded or any hypotension*) | ✓ | ✓ | ✓ |
| **T**reatment based on clinical impression: | ✓ | ✓ | ✓ |
| Name of Cardiologist | | ✓ | |
| ETA: | ✓ | ✓ | ✓ |
| (Stay on Hospital Frequency): | ✓ | ✓ | ✓ |

## II. Area Hospital Bedside Report.

This 45 to 60 second verbal report by the EMS provider will follow the same guideline template that is used for the General "Radio/Phone Call In". After "Treatment Based on Clinical Impression", the EMS provider will continue his/her report with PMH: Medications, Allergies, and Family Member Status. If the initial Specialty "Radio/Phone Call In" guideline template is used, the EMS provider will stand-by and remain in the patient's room. Once the Trauma, STEMI or Brain Attack response team has completed its initial assessment, and it has been documented, the Recording RN will request additional information from the EMS provider. (i.e., PMH, Medications, Allergies, Family Member status, etc.). The House Supervisor may have questions for the EMS provider as well. During this brief but complete report the receiving RN, MD or specialty team staff members will not interrupt the EMS provider. Once the report is given the receiving RN or MD then can ask the EMS provider for additional information as needed. The Patient Registrar will be given an Ada County EMS Patient Information Sheet (pink sheet) by the EMS provider with the patient's demographics. This document then will be given to the receiving RN

.

**SPECIALTY**

| Call-in / Bedside Template | Trauma Leveling | STEMI | Brain Attack |
|---|---|---|---|
| Unit #: | ✓ | ✓ | ✓ |
| Announce : Trauma Leveling# / "STEMI" / Brain Attack: *(Justified by announcing criteria)* | ✓ | ✓ | ✓ |
| Patient Age: | ✓ | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ | ✓ |
| **M**echanism of Injury: | ✓ | | |
| Stable vs Unstable | | ✓ | |
| Last seen normal *(time/place)* | | | ✓ |
| Pertinent Exam Finding: | | ✓ | ✓ |
| Pertinent I **I**njury Finding: | ✓ | | |
| **V**ital Signs: (*complete set; with the LOWEST B/P recorded or any hypotension*) | ✓ | ✓ | ✓ |
| **T**reatment based on clinical impression: | ✓ | ✓ | ✓ |
| Name of Cardiologist | | ✓ | |

**GENERAL**

| Call-in / Bedside Template | Medical | Trauma |
|---|---|---|
| Unit #: | ✓ | ✓ |
| Patient Age: | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ |
| Chief Complaint: | ✓ | |
| Mechanism of Injury: | | ✓ |
| Pertinent Exam Finding: | ✓ | ✓ |
| Pertinent Injury Finding: | | ✓ |
| Vital Signs: (*complete set*) | ✓ | ✓ |
| Treatment based on clinical impression: | ✓ | |
| PMH: | ✓ | ✓ |
| Medication: | ✓ | ✓ |
| Allergies: | ✓ | ✓ |
| Family Member Status: | ✓ | ✓ |

APPENDIX

Z

INTEGRATION OF CARE REPORTING GUIDELINES

**(Standby till Specialty Team has completed their Initial Assessment)**

- PMH:
- Medications:
- Allergies
- Family Member Status

## III. Integration of Care (prior to the transport of a patient) Report.

The Primary EMS Provider will follow the same General and Specialty guideline template that is used for the "Area Hospital Bedside Report". Note: If the initial Specialty guideline template is used, the primary EMS provider will continue his/her report with PMH: Medications: Allergies and Family Member status after treatment Based on Clinical Impression". During this brief but complete report the incoming EMS provider will not interrupt the primary EMS providers report. Once the report is given by the primary EMS provider, the incoming Paramedic then can ask the primary EMS provider for additional information.

**GENERAL**

| Call-in / Bedside Template | Medical | Trauma |
|---|---|---|
| Unit #: | ✓ | ✓ |
| Patient Age: | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ |
| Chief Complaint: | ✓ | |
| Mechanism of Injury: | | ✓ |
| Pertinent Exam Finding: | ✓ | |
| Pertinent Injury Finding: | | ✓ |
| Vital Signs: (*complete set*) | ✓ | ✓ |
| Treatment based on clinical impression: | ✓ | ✓ |
| PMH: | ✓ | ✓ |
| Medication: | ✓ | ✓ |
| Allergies: | ✓ | ✓ |
| Family Member Status: | ✓ | ✓ |

**SPECIALTY**

| Call-in / Bedside Template | Trauma Leveling | STEMI | Brain Attack |
|---|---|---|---|
| Unit #: | ✓ | ✓ | ✓ |
| Announce : Trauma Leveling# / "STEMI" / Brain Attack: *(Justified by announcing criteria)* | ✓ | ✓ | ✓ |
| Patient Age: | ✓ | ✓ | ✓ |
| Patient Gender: | ✓ | ✓ | ✓ |
| **M**echanism of Injury: | ✓ | | |
| Stable vs. Unstable | | ✓ | |
| Last seen normal *(time/place)* | | | ✓ |
| Pertinent Exam Finding: | | ✓ | ✓ |
| Pertinent **I**njury Finding: | ✓ | | |
| **V**ital Signs: (*complete set; with the LOWEST B/P recorded or any hypotension*) | ✓ | ✓ | ✓ |
| **T**reatment based on clinical impression: | ✓ | ✓ | ✓ |
| Name of Cardiologist | | ✓ | |
| PMH: | ✓ | ✓ | ✓ |
| Medications: | ✓ | ✓ | ✓ |
| Allergies | ✓ | ✓ | ✓ |
| Family Member Status | ✓ | ✓ | ✓ |

APPENDIX

Z

# INTEGRATION OF CARE REPORTING GUIDELINES

APPENDIX

Z

# INTEGRATION OF CARE REPORTING GUIDELINES

APPENDIX

AA

**APPENDIX: AA**

**TITLE: Cincinnati Prehospital Stroke Scale**

**Updated: July 25, 2011**

**The Cincinnati Prehospital Stoke Scale:**

**Facial Droop** (Have the patient show teeth or smile):

- Normal – both sides of face move equally
- Abnormal – one side of face does not move as well as the other.

Left: Normal, Right: Stroke patient with facial droop (right side of face)

**Arm Drift** (Patient closes eyes and extends both arms straight out, with palms up, for 10 seconds):

- Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)
- Abnormal – one arm does not move or one arm drifts down compared with the other

Cincinnati Prehospital Stroke Scale

APPENDIX

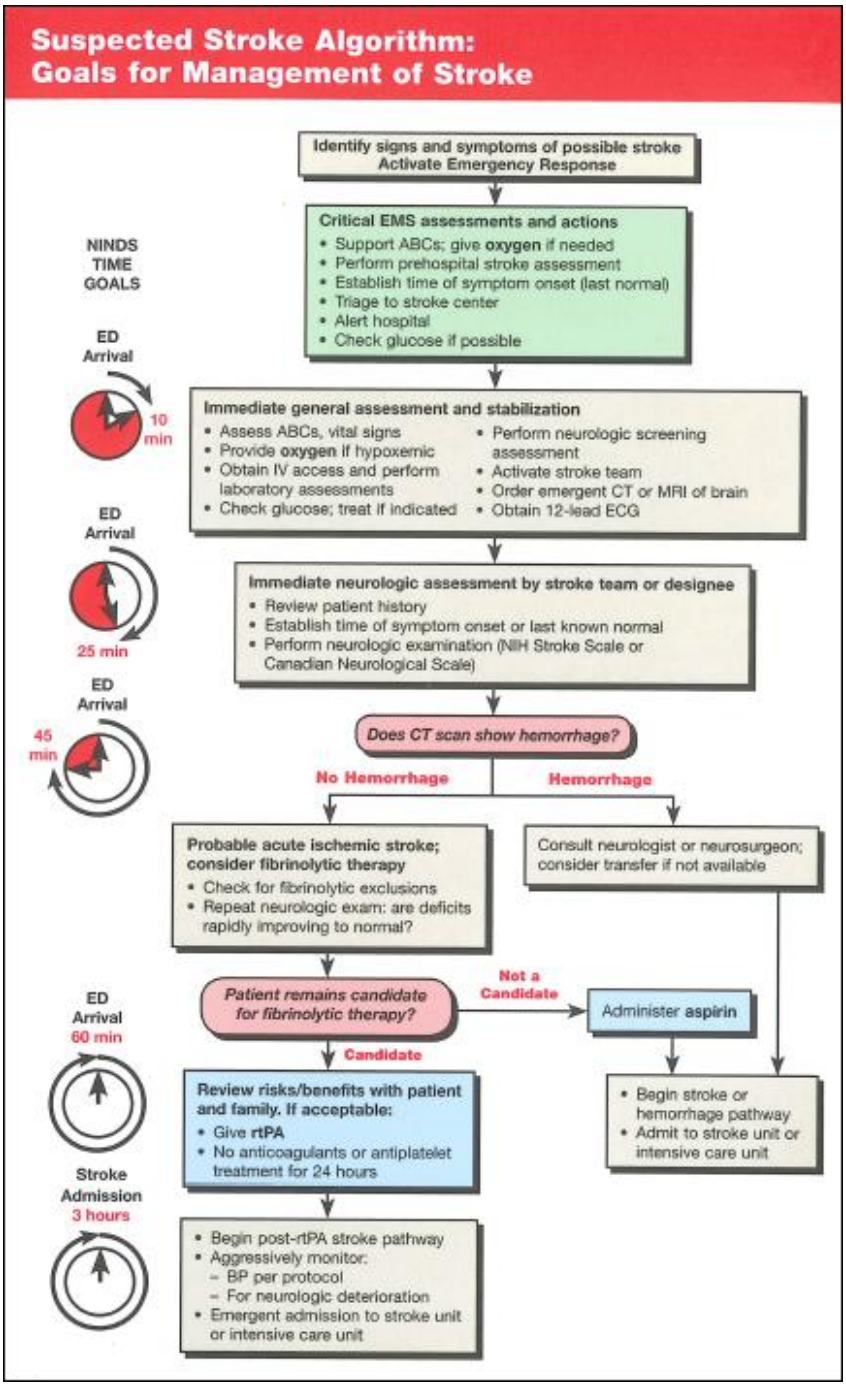
# AA

## Cincinnati Prehospital Stroke Scale

**Abnormal Speech (**Have the patient say “you can’t teach an old dog new tricks.”):

- Normal – patient uses correct word with not slurring
- Abnormal – patient slurs words, uses the wrong words, or is unable to speak

Interpretation: If any 1 of these 3 signs is abnormal, the probability of a stoke is 72%



Appendix

B B

**APPENDIX: BB**

**TITLE: BLANK**

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# Appendix

# B B

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**APPENDIX: CC**

**TITLE: LUCAS Chest Compression System**

**REVISED: May 2012**



The LUCAS Chest Compression System is designed to provide chest compressions for adult patients who are unresponsive, pulseless, and apneic. The LUCAS Chest Compression System may be utilized when CPR is appropriate as noted in the adult cardiac arrest protocol.

**Contraindications:**
Patient is too small- The LUCAS device will alarm with three fast signals when "Pause" or "Active" buttons are depressed.
Patient is too large- The upper part of the LUCAS device must lock to the back plate without compressing the patient's chest

**Instructions:**

- Confirm cardiac arrest
- Start manual compressions
- Position the bag with its top towards you
- Turn the unit on while it is in the bag to start the self-test
- Remove the LUCAS back plate from the carry bag
- Stop CPR and support the patient's head while placing the back plate under the patient, immediately below the arm pits
- Resume manual CPR
- Hold the handles on the support legs to remove the LUCAS upper part from the bag. Pull the release rings once to make sure the claw locks are open.
- Let go of the release rings and attach the support leg that is nearest to you to the back plate
- Attach the other support leg to the back plate
- Pull up once on the legs to make sure the legs are correctly attached
- Adjust the height of the suction cup by pushing the "Adjust" button and using two fingers press the suction cup down until it touches the patient's chest
- Position the suction cup immediately above the end of the sternum( the compression point is the same location as for manual CPR)
- Push the "Pause" button to lock this setting in place,
- Check for proper position. If needed, push the "Adjust" button and pull the suction cup up and readjust to the proper position
- Push the "Pause" button to lock this setting in place
- To start compressions push "Active continuous" if an advanced airway is in place or "Active 30:2" if an advanced airway is not in place
- Attach the stabilization strap behind the patient's neck as near the shoulders as possible

- Secure the patient's arms with the LUCAS arm straps
- Stop compressions by pushing the "Pause" button when lifting the patient to a backboard or stretcher
- Start compressions by pushing "Active continuous" or "Active 30:2"
- The LUCAS Chest Compression system may remain active while moving a patient when it and the patient are safely positioned on the transportation device

Appendix

DD

**SECTION: General Tourniquet Policy**

**TITLE: CAT Tourniquet or other similar device**

**REVISED: May 2, 2012**

**INTRODUCTION:** The Combat Application Tourniquet is an adjunct tourniquet used in ACEMSS.

**INDICATION:** Refer to the general tourniquet policy DD

**CONTRAINDICATIONS:** Refer to the general tourniquet policy DD

**PROCEDURE:** The C-A-T is to be placed 2-3" above the injury site, but not to be placed over a joint. The most effective placement for the C-A-T is as high on the injured extremity as possible.

**ARM:**
**1-**Put the injured extremity through the loop created by the tourniquet
**2-** Pull the free running band until the tourniquet is snug against the arm but not enough where the band exceeds the windless clip.
**3-**Turn the windless rod until hemorrhage stops.
**4-** Secure the windless rod into the windless clip.
**5-** Pass the free running band through the windless clip and secure the windless rod in place with the white "Time" strap.

**LEG:**
**1-**Completely un-feed/undo the tourniquet from its loop form until it is in strap form.
**2-**Wrap the tourniquet around the leg and feed the free running band up and down through friction adapter.
**3-** Pull the free running band until the tourniquet is snug against the leg. Note the band should not exceed the windless clip.
**4-**Turn the windless rod until hemorrhage stops.
**5-** Secure the windless rod into the windless clip.
**6-** Secure the windless rod in place with the white "Time" strap.

**Physician PEARLS:**

- Please assess CMS every 5-10 minutes
- The CAT is to only be used if hemorrhage cannot be controlled by traditional means.

Combat Application Tourniquet

Protocol

DD

# Tourniquet Use/C-A-T