

A.C.C.E.S.S.



Ada County-City Emergency Services System Standing Written Orders of Ada County

WORKING TOGETHER TO SERVE ADA COUNTY

OCTOBER 2014

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

V I S I O N

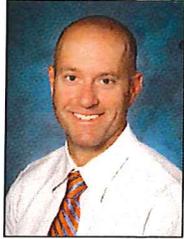
To be a premier emergency medical response and mitigation system that meets the current and future needs of Ada County.



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-City Emergency Services System. The following agencies and the medical directors have endorsed the protocols.

Working together to serve Ada County

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DRUG REFERENCES				
DRUG NAME	TRADE NAME	Transport	Non-Transport	NOTES
Acetylsalicylic Acid	<i>Aspirin, ASA</i>	YES	YES	
Adenosine	<i>Adenocard</i>	YES	YES	
Albuterol Sulfate	<i>Albuterol, Proventil, Ventolin Salbutamol</i>	YES	YES	
Amiodarone	<i>Cordarone, Pacerone</i>	YES	YES	
Atropine Sulfate	<i>Atropine</i>	YES	YES	All units 1 mg preload; transport multit dose vial
Calcium Chloride	<i>Calcium, CaC12</i>	YES	YES	
Dextrose 50% in Water	<i>Dextrose, D50, D50W, Glucose</i>	YES	YES	
Diazepam	<i>Valium, Diastat</i>	YES	YES	
Diltiazem	<i>Cardizem, Dilacor XR, Tiazac, Cartia XT, Tiamate</i>	YES		
Diphenhydramine Hydrochloride	<i>Benadryl</i>	YES	YES	
Dopamine Hydrochloride	<i>Dopamine, Intropin</i>	YES		
Epinephrine	<i>Adrenalin, Epi</i>	YES	YES	All units 1 mg preload; transport multit dose vial; all cc ampule (1:1000)
Etomidate	<i>Amidate</i>	YES	YES	
Fentanyl Citrate	<i>Sublimaze, Atiq (lollypop for PEDs)</i>	YES	YES	
Glucagon	<i>Glucagon</i>	YES	YES	
Haloperidol	<i>Haldol</i>	YES	YES	
Hydromorphone	<i>Dilaudid</i>	YES	YES	Added March 5, 2012
Ipratropium Bromide	<i>Atrovent</i>	YES	YES	
Ketamine Hydrochloride	<i>Ketamin, Ketanest, Ketaset, Ketalar</i>	YES	YES	Add April 4, 2012
Lidocaine Hydrochloride	<i>Lidocaine, Xylocaine</i>	YES	YES	
Magnesium Sulfate	<i>Mag, Mag Sulfate, MgSO4++</i>	YES	YES	
Methylprednisolone	<i>Solu-Medrol</i>	YES		
Midazolam	<i>Versed</i>	YES	YES	
Morphine Sulfate	<i>Duramorph, Morphine, MS MS04</i>	YES	YES	
Naloxone	<i>Narcan</i>	YES	YES	
Nitroglycerin	<i>Nitro, NTG, Nitrostat, Nitrol, Tridil, Nitrolingual, Nitro-Bid Ointment</i>	YES	YES	
Ondansetron	<i>Zofran</i>	YES	YES	
Oral Glucose	<i>Glucose, Insta-Glucose</i>	YES	YES	
Oxytocin	<i>Pitocin, Syntocinon</i>	YES		
Phenylephrine	<i>Neosyephrine</i>	YES	YES	
Ranitidine	<i>Zantac</i>	YES		
Sodium Bicarbonate	<i>Bicarb, NaHC03</i>	YES	YES	
Succinylcholine Chloride	<i>Anectine</i>	YES	YES	
Tetracaine Hydrochloride	<i>Pontocaine Eye, Pontocaine HCl</i>	YES	YES	
Vecuronium	<i>Norcuron</i>	YES		

SECTION: G-1

TITLE: Foundations of Patient Care

REVISED: October 15, 2014

Ada County/City 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.

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Foundations of Patient Care

- 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
- Monitoring of pulse oximetry and end tidal CO₂
- 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 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 in which EKG monitoring has been initiated for any reason will be considered ALS patients; these patients shall be attended by a Paramedic at all times.

Needle thoracostomy (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.

Protocol

G-1

Foundations of Patient Care

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SECTION: G-2

TITLE: Medical Direction

REVISED: October 15, 2014

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: October 15, 2014

Patient destination shall be based on the following:

- **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
- **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.
- **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.
- **Facilities Outside Ada County.** Request for transportation to a facility outside of Ada County must be approved by the on-duty supervisor. St. Lukes-Nampa, St. Alphonsus ER-Garrity, St. Alphonsus Nampa, and West Valley Medical Center will be the only out-of-county hospitals authorized for patient transport.
- **Trauma Patients.** Level 1 and 2 trauma patients shall be transported to Saint Alphonsus Regional Medical Center unless instructed otherwise by the on-line Medical Control.

The receiving hospital shall be notified as soon as possible in these situations to ensure rapid notification of appropriate resources.

Level 3 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 16 for Trauma Leveling Criteria for Field Providers

- **Suspected Acute Coronary Syndrome/STEMI** (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 ACS/STEMI should be transported to receiving facility with 24-hour cardiac cath lab capabilities. These currently include:

Protocol G-3

Hospital Destination

- St. Luke's Regional Medical Center-Boise
- St. Luke's Meridian Medical Center
- Saint Alphonsus Regional Medical Center-Boise
- Saint Alphonsus Nampa-Garrity
- **Brain Attack:** Destination at less than 3 hours from "last seen normal" should be taken to the closest receiving emergency department. 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.
- **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.
- **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
- 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.

Protocol
G-3

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

Hospital Destination

Protocol

G-3

Hospital Destination

SECTION: G-4

TITLE: Special Resuscitation Situations

REVISED: October 15, 2014

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
 - 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 26: 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

SECTION: G-5**TITLE: Air Medical Response****REVISED: October 15, 2014**

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, EMS 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. 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.

SECTION: G-6

PROTOCOL TITLE: Pre-hospital Integration of Care Protocol

REVISED: October 15, 2014

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 25; "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.

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.

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.

"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".

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.

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.

SECTION: G-7

TITLE: Medical Monitoring for Incident Rehabilitation

REVISED: October 15, 2014

Any licensed EMS provider in Ada County may be dispatched to the scene of a fire-related incident (structure fire, wild land fire operation, training operation or other special operations) and be assigned the task of medical monitoring as part of the Rehabilitation Group under the Incident Command structure. This protocol is intended to meet the NFPA 1584 guideline as it pertains to medical monitoring.

Medical Evaluation and Assistance

- 1. Medical Monitoring Officer** – Medical monitoring, when possible, should be conducted by ALS personnel (paramedic) or the highest medical authority available on-scene. Personnel assigned to the rehabilitation group are NOT to be actively involved in Fire-Ground Operations (i.e. fire attack, RIT, etc.).

The Medical Monitoring Officer shall evaluate:

- f* **Heart Rate**
- Respiratory Rate**
- Temperature**
- f* **Blood Pressure**
- f* **Pulse Oximetry**
- f* **Carbon Monoxide Oximetry**

After the medical evaluation, the Medical Monitoring Officer will determine a proper disposition:

- f* **Cleared and released from rehabilitation**
- Continued rehabilitation**
- f* **Medical Assistance and transport to medical facility**
- Removed from active duty due to a refusal of treatment and/or transport services**

Continued rehabilitation should consist of additional monitoring of vital signs, providing rest, providing fluids and food (if available).

Personnel whose signs and/or symptoms indicate a medical problem or traumatic injury should be considered a patient and care should be provided in accordance with Ada County EMS Protocols. All care should be recorded on a Patient Information Sheet and notification to the Incident Commander shall take place.

- Transport by ambulance: follow normal documentation guidelines
- Transport by department vehicle: complete a Refusal on the Patient Information Sheet

- 2. Medical Criteria** - Below is a list of objective measurements that anyone entering medical monitoring via the rehabilitation group must meet before being released by the Medical Monitoring Officer:

Minimum 20 minutes rest

RR < 20/min

BP Systolic < 160 and > 100

Diastolic < 100

f **SPO₂ > 95%**

f **SPCO < 5%(non-smoker) or < 8%(smoker)**

All objective criteria must be met before being released from rehab. If the individual fails to meet one or more of the criteria listed above, he/she will remain under the care of the Medical Monitoring Officer until he/she meets the established criteria. In addition to this, the individual's subjective feelings must be taken into account. Any individual that does not feel fit to return to an assignment will be given additional time.

If at the end of 40 minutes in the medical monitoring unit the individual is still unable to meet all of the objective criteria, transport should be considered and the individual will be required to be evaluated by a physician and obtain a medical release prior to returning to full duty.

- 3. Documentation** - All medical monitoring evaluations shall be recorded on the Ada County Fire Rehabilitation Monitoring Report. These forms will be submitted to the Incident Commander after the incident, which will then be reviewed and attached to the incident report.

4. Accountability

Personnel reporting to the Rehabilitation Group shall enter as crews and present themselves to the Medical Monitoring Officer. Members shall exit as crews when possible. If any member is detained in Rehabilitation for evaluation or medical treatment, the Rehabilitation Group Supervisor shall notify Command. The remaining members shall report to the Staging Area/Staging Officer.

The Rehabilitation Group Supervisor or his/her designee shall document:

- Crew designation
- Individual's name
- Vital signs (HR, RR, BP, SpO₂, SpCO)
- Associated problems
- Times of entry to and exit from the Rehabilitation Area

Individuals shall not leave the Rehabilitation Area until authorized to do so by the Rehabilitation Group Supervisor.

SECTION: G-8

TITLE: Special Needs Population

Date: October 15, 2014

GENERAL COMMENTS:

In certain patient populations there may (in rare instances) arise the need to medications that fall beyond the standard practice guidelines of the paramedic scope of practice.

These are considered time sensitive interventions and may need to be provided to the patient to prevent significant morbidity or mortality.

To be considered, the patient must have an established diagnosis and care plan as directed by their primary (or specialist) physician.

Medications need to be prescribed to that patient specifically and cannot be interchanged with other patients or family members.

BLS-Specific Care See Adult/Pediatric General Medical Care Protocol M1/PM1 (or other applicable protocol)

ILS-Specific Care See Adult/Pediatric General Medical Care Protocol M1/PM1 (or other applicable protocol)

ALS-Specific Care See Adult/Pediatric General Medical Care Protocol M1/PM1 (or other applicable protocol)

- Identify the specific condition the patient is presenting with and confirm with patient, family members or primary prescribing physician if possible.
- Ask for documentation to support condition and use of specific therapies and bring all supporting documentation and medications with patient for transport.
- Ensure that presenting complaint is congruent with indicated therapy.
- If assisting with medication:
 - Identify that medication is specific to patient
 - Ensure dose and route of administration of medication by prescription or care plan
 - Check expiration dates on any and all medications and ask about special handling instructions and that medications have been properly stored and cared for
 - Discuss risks and alternatives (i.e. transport with medications to be given in receiving ER versus prehospital administration)
 - Document consent with witness
 - Administer medications per patient specific protocols exactly as prescribed
 - Monitor for any medication reaction or hypersensitivity response
 - Expedite transport to closest appropriate facility

Protocol

G-8

SPECIAL NEEDS POULATION

PHYSICIAN PEARLS:

This protocol is designed for a very small subset of patient populations that may have time sensitive emergencies in which medications may avoid unnecessary complications.

Patients with such conditions have identified themselves with specific diagnoses and have written confirmations of care plans prior to arrival.

Special needs populations may also suffer from other common medical/traumatic emergencies and general protocols should be followed in general. If the practitioner is going to provide these adjunctive therapies, the chief complaint should be confirmed to be reasonably coupled to the proposed therapy. (i.e. a hemophilia patient with an asthma exacerbation may not be in need of immediate factor VII/IX administration)

If information is lacking or there is question regarding the proposed therapy, contact the receiving hospital for medical control or the patient's personal physician if the contact is available for guidance.

If possible, the patient should be taken to the hospital where they receive their primary specialty care for continuity.

SECTION: C-1

TITLE: Adult Cardiac and Respiratory Arrest

REVISED: October 15, 2014

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

BLS-Specific Care

- For an **unwitnessed arrest**: Consider 2 minutes of good, sustained, and effective CPR prior to defibrillation or AED attachment
- For a **witnessed arrest**, or after 2 minutes of good, effective and sustained CPR: AED use per 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

- King Airway/Supraglottic Airway as appropriate
- Obtain peripheral vascular access
 - IV: 200-500 ml 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/IO: 1 mg 1:10,000 IVP every 3-5 minutes, or
 - ETT: 2-2.5 mg of 1:1,000 diluted to 8-10 ml every 3-5 minutes.
- Consider underlying causes of cardiac arrest and treat accordingly.

Consider as appropriate:

- Sodium bicarbonate for known hyperkalemia, suspected acidosis, TCA toxicity, and prolonged resuscitation.
 - 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

- Consider dilution of Bicarb if given IO
- Calcium chloride for suspected hyperkalemia, calcium channel blocker OD, or suspected hypocalcemia
 - IV, IO: 500-1000 mg IVP
 - Administer sodium bicarbonate at 1 mEq/kg afterward for suspected hyperkalemia. **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, IO or ETT: 2 mg repeated PRN
- Dextrose 50% for hypoglycemia
 - IV/IO: 12.5-50 g
 - (Consider dilution of Dextrose if given IO or through small veins)

Physician Pearls: Outside of the Comfort One/DNR situations (see Appendix 26), 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.

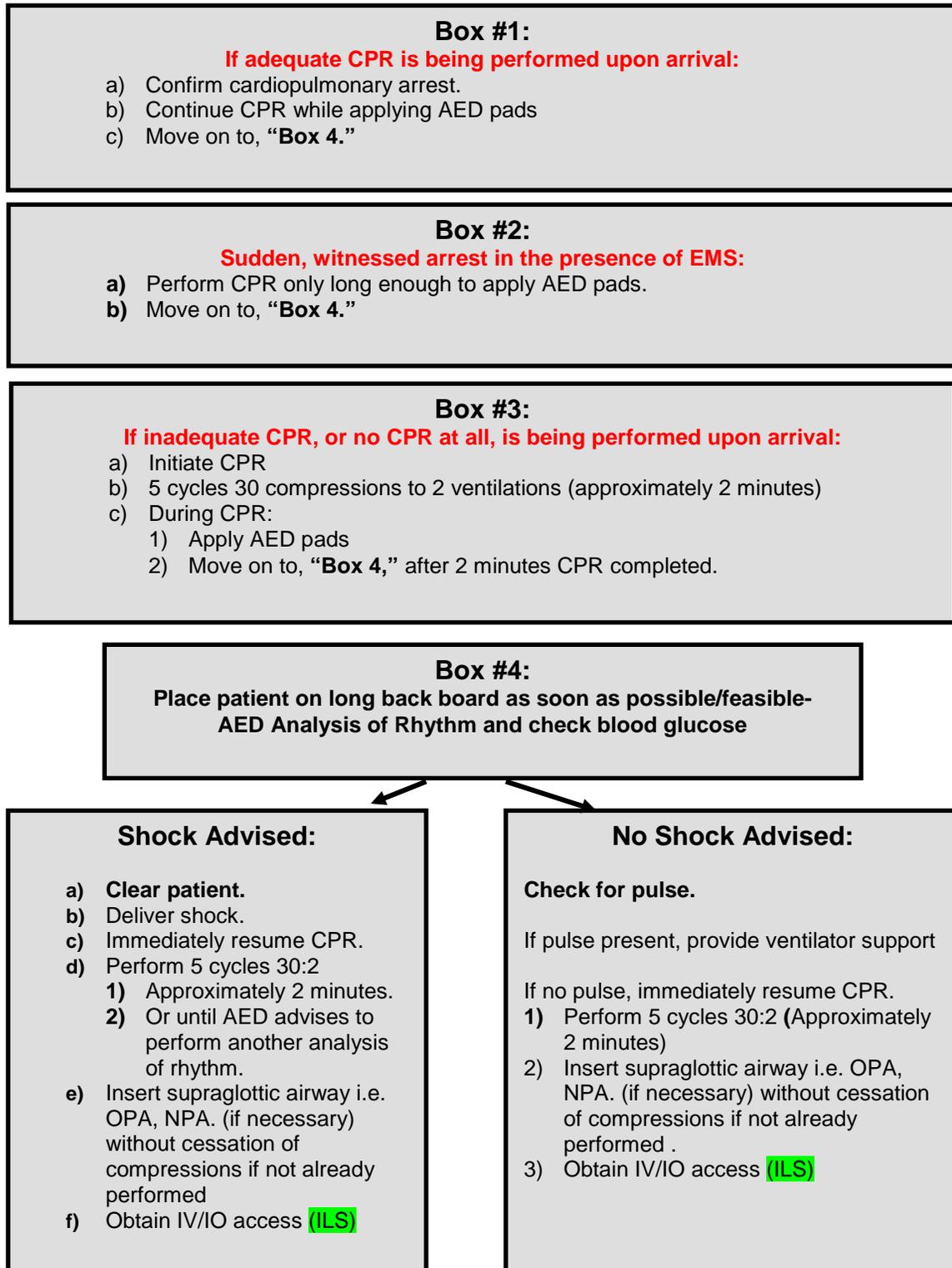
The American Heart Association (AHA) 2010 Guidelines for CPR and Emergency Cardiac Care recommends:

- 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.**
- Use waveform ETCO₂ as a gauge for effectiveness of resuscitation as well as monitoring ETT placement.

SECTION: C-2a

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

REVISED: October 15, 2014



Protocol

C-2a

Adult Cardiopulmonary Arrest – BLS/ILS

Continue the:

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

Continue this 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.)

SECTION: C-2b

TITLE: Adult Cardiopulmonary Arrest – ALS Algorithms

REVISED: October 15, 2014

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 and assess blood glucose

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** or place SGA

Asystole/PEA:

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

Protocol
C-2b

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

MEDICATION ADMINISTRATION DURING CPR:

- d) **IV/IO 1:10,000 epinephrine:**
 - 1) 1 mg with saline flush
 - 2) Repeat every 3-5 minutes as needed

OR:

- e) **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.

MEDICATION ADMINISTRATION DURING CPR:

- d) **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.

**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) **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:
 - **Hypovolemia**
 - **Hypoxia**
 - **Hydrogen ion (acidosis)**
 - **Hypo-/hyperkalemia**
 - **Hypothermia**
 - **Toxins**
 - **Tamponade, cardiac**
 - **Tension Pneumothorax**
 - **Thrombosis (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.

Protocol C-2b

Adult Cardiopulmonary Arrest – ALS

Continue the following:

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

Continue this sequence until:

- a) If ROSC after anti-arrhythmic, continue its use:

Lidocaine maintenance infusion:***

Using 4 mg/ml solution:

- 1 mg/kg bolus total=2 mg/min.
- 2 mg/kg bolus total=3 mg/min.
- 3 mg/kg bolus total=4 mg/min.

Amiodarone

1mg/min IV drip

- b) Transport/transfer of care is complete.
- c) Resuscitative efforts are terminated.
- d) 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.

SECTION: C-3

PROTOCOL TITLE: GENERAL CARDIAC CARE/ACS

REVISED: October 15, 2014

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 waiting 5 minutes between 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 3 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 least 2 single lumen established) is a desirable goal to facilitate cath lab/thrombolytic care. Avoid right wrist if possible.

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, SpO₂ 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 IV/IM/IO:
For discomfort suspicious of cardiac origin. Use with caution in patients with unstable angina.
 - 0.1 mg/kg as initial dose (max initial dose 10 mg)
 - Give slowly over 2 min
 - May repeat every 10 minutes as needed with 0.05 mg/kg (max dose of 20 mg)
 - Hold for B/P <90

If morphine allergy use:

- Fentanyl IV/IM/IO:
 - 1 mcg/kg initial dose (max initial dose 100 mcg)
 - Give slowly over 2 minutes (with the exception of IN route)
 - May repeat every 10 minutes as needed (max total dose of 200 mcg)

OR

- Dilaudid:
Adult: IV/IM: 0.5 mg slow IV push over 2-3 minutes, Q 10 minutes PRN for pain. Max 2 mg.

Anti-emetics:

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

PHYSICIAN PEARLS:

Remember that many patients will have atypical presentations, including female patients, diabetics, the elderly, and those with a history of hyperdynamic 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.

Protocol

C-3

General Cardiac Care/A.C.S.

The 12-lead ECG will include patient name, DOB, and cardiologist if available. If 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.

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.

SECTION: C-4

PROTOCOL TITLE: STEMI PROTOCOLS/FlowChart

REVISED: October 15, 2014

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 15-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/Allergies
 - POST/DNR/DNI status

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 least 2 single lumen established) is a desirable goal to facilitate cath lab/thrombolytic care. Avoid right wrist and right hand whenever possible.

Protocol

C-4

Stemi Protocol.

ALS SPECIFIC CARE:

- Refer to General Cardiac/ACS protocols C-3
- Confirm STEMI with 12-lead and transmit
 - Contact receiving hospital with STEMI alert
 - Unit ID
 - Stable vs Unstable (hemodynamic)
 - Age
 - Gender
 - Name of Cardiologist (if available)
 - STEMI confirmed in leads: _____ (Confirm 12-lead transmissions)
 - ETA
 - Stay on Hospital frequency
 - POST/DNR/DNI
- EXPECTATION is less than 10 minutes scene time

SECTION: C-5

TITLE: Adult Wide-Complex Tachycardia

REVISED: October 15, 2014

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 hemodynamically UNSTABLE patients

- Settings for manual, synchronized cardioversion
 - 200j ⇒ 300 j ⇒ 360j LP15
 - 100j => 150j => 200j MRx
 - Other monitors per manufactures recommendations
 - 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 *Sedation for Painful Procedures M-15* for medications and doses
 - Use Midazolam (Versed) for sedation in cardioversion.

Antiarrhythmics:

- Amiodarone
 - 150 mg IV infusion over 10 minutes. May repeat every 10 minutes as needed. Mix 150 mg in 20ml NS in a buretrol and drip at a rate of 120 gtts/min
- Lidocaine
 - 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

Adult Wide-Complex Tachycardia

- Adenosine (Adenocard): Consider Adenosine for **suspected SVT with aberrancy**. Use Lidocaine or Amiodorone 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 ml
- For hemodynamically STABLE patients presenting with wide complex tachycardia, antidysrhythmic therapy is indicated.
- 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 hypomagnesemia 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 buretrol 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

SECTION: C-6

PROTOCOL TITLE: Adult Narrow Complex Tachycardia

REVISED: October 15, 2014

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 Maneuvers

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

Cardioversion for Unstable patients

- Settings for manual synchronized cardioversion by the Medtronic LP12/15 or Phillips MRx. For Zoll brand monitors use manufactures recommended settings

Rhythm	Physio Control LP12/15	Philips MRx
Atrial Flutter	50j, 100j, 200j, 300j, 360j	50j, 100j, 150j
Atrial Fibrillation	100j, 200j, 300j, 360j	100j, 150j, 200j, 200j
V-Tach w/ pulse	100j, 200j, 300j, 360j	100j, 150j, 200j
SVT	50j, 100j, 200j, 300j, 360j	100j, 150j, 200j

- 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 Sedation for Painful Procedures protocol M-15 for medications and doses.
 - Use Midazolam (Versed) for sedation with cardioversion.

Adult Narrow Complex Tachycardia

Antiarrhythmics:

- Adenosine (Adenocard) Use Lidocaine or Amiodarone 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 ml

- Diltiazem (Cardizem):
 - IV: 10 mg slow over 2 minutes
 - Repeat every 10-15 minutes PRN rate control
 - Hold for WPW
 - Max dose 40 mg
 - ACCESS uses a smaller dose to avoid hypotension and other adverse effects. Higher doses may be used on medical control order

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

SECTION: C-7

TITLE: Adult Bradycardia

REVISED: October 15, 2014

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).

❖ Start at 80 ppm and 80 mA

- Consider administering Atropine 0.5mg IV/IO while preparing TCP (nothing should delay TCP in an unstable patient)
- 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, SpO₂ and/or diminished mental status
- Midazolam (Versed) IV/IM/IO:
 - IV/IO/IM: 0.5-2.5 mg slow IV push every 5-10 minutes (max dose 5 mg)
 - IN: 2.5 mg every 10 minutes (max dose of 5 mg)

Analgesia:

- **DO NOT** administer/discontinue administration if:
 - Systolic BP < 90 mmHg
 - Respiratory rate, SpO₂ and/or mental status diminishes
- Fentanyl IV/IO/IM/IN
 - 1 mcg/kg initial dose (max initial dose 100 mcg)
 - Give slowly over 2 minutes (with the exception of IN route)
 - May repeat every 10 minutes as needed (max total dose of 200 mcg)

Protocol C-7

Adult Bradycardia

- Morphine sulfate IV/IM/IO
 - 0.1 mg/kg as initial dose (max initial dose 10 mg)
 - Give slowly over 2 min
 - May repeat every 10 minutes as needed with 0.05 mg/kg (max dose of 20 mg)
- Dilaudid IV/IM:
 - *Adult Only: 0.5 mg slow IV push over 2-3 minutes. Q10 minutes PRN max of 2 mg.*

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

Vasopressors:

- For bradycardia or hypotension unresponsive to other therapies
 - Dopamine infusion:
 - 5-20 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

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

SECTION: C-8

PROTOCOL TITLE: Congestive Heart Failure/Pulmonary Edema

REVISED: October 15, 2014

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:
 - 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/inferior 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/inferior MI. Wipe off if hypotension develops
- CPAP: See also *Appendix 6*
 - **Medical Control Required if BP less than 90 systolic**
 - Initial setting at 5 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 Sedation for Painful Procedures protocol M-15 for medications and doses.**

Protocol

C-8

Congestive Heart Failure/Pulmonary Edema

Protocol C-9

SECTION: C-9

TITLE: INDUCED HYPOTHERMIA

REVISED: October 7, 2014

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
Age >16 (Adult)	shows NO purposeful pain response
Temp > 34 C/ 93.2 F	Intubated (Intubate if indicated)
SBP > 90mmHg	

EXCLUSION CRITERIA:

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

PROCEDURE:

<u>Assess and Documents:</u>	<u>Airway Control:</u>
Pupil Response	Intubate as indicated
Neuro assessment	Ventilate to a ETCO ₂ of 35. Do not hyperventilate

Sedation and Paralytics:

- Midazolam (Versed) – may be used to prevent shivering
 - IV/IO/IM: 0.5-2.5 mg slow IV push every 5-10 minutes (max dose 5 mg)
 - IN: 2.5 mg every 10 minutes (max dose of 5 mg)
- 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 **SPO₂** and **CONTINUOUS ETCO₂**
 - 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

INDUCED HYPOTHERMIA

Protocol

C-9

INDUCED HYPOTHERMIA

Target Systolic Blood Pressure : ≥ 90 mm/Hg

Vasopressors: titrate to a blood pressure of 90mm/Hg systolic.

Watch blood pressures closely!

- Dopamine infusion
 - IV: 5-20 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.

SECTION: M-1

PROTOCOL TITLE: GENERAL MEDICAL CARE

REVISED: October 15, 2014

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 SpO₂ < 95% or for patients with cardiac, respiratory, neurologic, or as needed
- Assess blood glucose level as appropriate
- Position patient as appropriate and maintain airway patency
- Maintain body temperature to a goal of normothermia
- Keep patient in safe and calm environment

In addition to standard medical history, in case of ingestion/overdose obtain:

- Name of ingested substance
- Quantity ingested
- Time of ingestion
- Has vomiting occurred

ILS SPECIFIC CARE:

- IV access (to a max of 3 attempts) or IO access if needed due to severity of underlying injury or illness, otherwise consider deferring until arrival of ALS providers
 - IV: Crystalloid solution at a TKO rate. May administer 200-500 ml if S/S of dehydration are present, repeat as needed to a maximum of 2 liters
 - Withhold fluids and maintain IV at TKO rate if patient is hemo-dynamically stable or signs and symptoms of fluid overload are present

ALS SPECIFIC CARE:

- Maintain patent airway as necessary to include CPAP and endotracheal intubation when appropriate
- Apply cardiac monitor as necessary
- 12 lead ECGs: Refer to 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 50
 - 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

SECTION: M-2

PROTOCOL TITLE: Adult Reactive Airway Emergencies

REVISED: October 15, 2014

GENERAL COMMENTS: It is imperative that the provider attempt to differentiate between a true reactive airway disorder and other respiratory emergencies such as 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 themselves

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 / Atrovent 0.5 mg nebulized
 - May use DuoNeb™ preparation for initial nebulizer
 - Repeat as needed with Albuterol 2.5 mg
 - 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 (4ml), dilute to 20ml 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

Protocol M-2

ADULT REACTIVE AIRWAY

- 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 6*
 - **Medical Control Required if BP less than 90 systolic.**
 - Initial setting at 5 cmH₂O, **MAX: 10 cmH₂O**

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 the provider’s ability to coach the patient. Instruct patient to inhale through nose and exhale through mouth as long as possible
- Monitor closely for development of pneumothorax and or hypotension

Protocol M-2

- Most patients will improve in 5-10 minutes. If there is no improvement within this time, assess for other causes and problems. Re-evaluate for intubation
- CPAP may be the treatment of choice for a patient in respiratory failure with a DNR order
- CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask or experiences continued or worsening respiratory failure

ADULT REACTIVE AIRWAY

Protocol

M-2

ADULT REACTIVE AIRWAY

SECTION: M-3

PROTOCOL TITLE: Adult Hypotension and Shock

REVISED: October 15, 2014

GENERAL COMMENTS: *Hypotension is defined as a symptomatic blood pressure less than 90 mm/Hg.* 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*

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
- Administer fluid bolus 200 – 500 ml
- Repeat as necessary for persistent hypotension to maximum of 2 liters
- Caution! Avoid repeat fluid boluses in cases of suspected cardiogenic shock with rales present

Vasopressors

- Dopamine infusion IV/IO: ***
 - IV: 2-20 mcg/kg/min
 - See “Adult Dopamine Infusion Chart” in Drug Appendix
 - 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” in Drug Appendix
 - Titrated to adequate heart rate and/or blood pressure response
 - Second line agent if patient unresponsive to dopamine

Protocol

M-3

ADULT HYPOTENSION/SHOCK

SECTION: M-4

PROTOCOL TITLE: Adult CVA

REVISED: October 15, 2014

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

- Assess patient's ability to swallow and cough, maintain airway through suction
- Assess blood glucose
- Determine time of onset of symptoms or time "last seen normal"
- 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 13*) 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/thrombolytic care. Preference is to have at the minimum 1 single lumen IV established using an 18g or larger in the right AC.

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

- Correct hypoglycemia if necessary
- Lowering BP in the face of a hemorrhagic CVA can be catastrophic
- Be prepared to treat seizures

Physician Pearls

There are few pre-hospital interventions which affect the outcome of stroke.

The most important thing we can do is expeditiously transport the patient to the closest appropriate facility (see Destination Protocol)

The second most important is to determine the time of onset of the patient's stroke symptoms. Interview family, staff, and bystanders to determine when the patient was last known to be normal (for the patient). This is the single most important piece of information for ER providers.

Consider atypical presentation of stroke, such as vertigo/ataxia with a cerebellar stroke

Protocol

M-4

ADULT CVA

SECTION: M-5

PROTOCOL TITLE: Adult Seizure Activity

REVISED October 15, 2014

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 postictal phase
- Screen for probable causes
- Ensure safe environment for patient
- If patient is female, determine if she is pregnant or has recently delivered
- Assess blood glucose

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

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

Anticonvulsant Therapies (for the actively seizing patient)

- 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: 5 mg (If no vascular access)
- **If the maximum dose of a benzodiazepine is reached without seizure control, call medical control to switch to a different benzodiazepine.**

Additional Therapies:

- Dextrose IV/IO: (If hypoglycemia is present)
 - 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 mg (U)

Protocol

M-5

ADULT SEIZURE ACTIVITY

PHYSICIAN PEARLS:

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.

SECTION: M-6

PROTOCOL TITLE: ADULT HYPOGLYCEMIA

REVISED: October 15, 2014

GENERAL COMMENTS: Symptomatic hypoglycemia is defined as BG < 80 mg/dl with an altered LOC.

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

- If hypoglycemia is confirmed by glucometry: (BG < 80 mg/dl **with** symptoms)
- 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 or oral glucose. Attempt to document volume of food/liquid ingested. If grams of sugar are known, document this as well
- 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) PO self-administered by patient
 - Repeat if BG remains < 80 mg/dl with symptoms after 5 minutes
 - Re-assess BG every 5 minutes until BG \geq 80 with a normal mental status
- Treat and released only after ALS (Paramedic) evaluation

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

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

- Dextrose 50% (D50W)
 - 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

Protocol

M-6

ADULT HYPOGLYCEMIA

Treat and Release:

1. Complete Diabetic Treat and Release checklist. Contact Medical Control if indicated.
2. Complete Refusal of Treatment and/or Transport form.
3. Attach all forms to patient care report.

SECTION: M-7

PROTOCOL TITLE: ADULT HYPERGLYCEMIA

REVISED: October 15, 2014

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*

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

- Administer IV fluids aggressively per Protocol M1

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 hyper/hypokalemia
 - Can precede malignant dysrhythmias
 - Obtain 12-lead EKG
 - Due to possibility of precipitating/accompanying AMI
 - Re-administer 200-500 ml crystalloid fluid boluses as needed
 - Reassess patient and BG following each bolus

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).

Protocol

M-7

ADULT HYPERGLYCEMIA

SECTION: M-8

PROTOCOL TITLE: Adult Vomiting/Severe Nausea/Vertigo

REVISED: October 15, 2014

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. An emphasis on a complete neurologic exam is paramount.

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

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

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

Antiemetics:

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

Protocol

M-8

ADULT VOMITING/SEVERE NAUSEA/VERTIGO

SECTION: M-9

PROTOCOL TITLE: Dehydration and Rehab

REVISED: October 15, 2014

GENERAL COMMENTS: The treat and release portion of this protocol is intended for recreational events, 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 symptom(s), 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 ml (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(e.g.: chest discomfort, SOB, altered mental status)
 - No ALS care required
- Documentation:
 - Further treatment/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

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

Protocol

M-9

Adult Dehydration and Rehab

SECTION: M-10

PROTOCOL TITLE: ADULT ALLERGIC/ANAPHYLAXIS

REVISED: October 15, 2014

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

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

- Administer Epi-Pen auto injector or (if optional module completed) Epinephrine 1:1000 0.3 mg IM
- 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 signs and symptoms every 5 minutes following administration
 - Evaluate for presence of adverse effects of epinephrine
 - Chest pain
 - Headache
 - Palpitations
 - Anxiety/tremors
- Repeat in 5 - 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 themselves

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 ml. Hold for s/s of CHF/pulmonary edema or CHF history

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

Sympathomimetics:

- Epinephrine 1:1000
 - IM: 0.3-0.5 mg
 - Repeat x1 in 5 - 10 minutes if s/s do not significantly improve
- Epinephrine Infusion for persistent hypotension (<80 mm Hg systolic) and severe refractory s/s
 - See Epinephrine infusion chart in Drug Appendix.
- Epinephrine Neb (*for laryngeal edema only*)
 - 5 mg (5 ml) epinephrine 1:1,000 nebulized undiluted

Bronchodilators:

- Nebulizer Treatment
 - Albuterol 2.5 mg (0.83% in 3 ml)
 - Ipratropium Bromide (Atrovent) 0.5 mg (0.02% in 2.5 ml)
 - 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)

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.

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

SECTION: M-11

PROTOCOL TITLE: Adult Pain Control

REVISED: October 15, 2014

GENERAL COMMENTS: Pre-hospital EMS is committed to the relief of pain and suffering in patients with acute painful conditions. Given the circumstances, complete resolution of pain may be an unachievable goal. It is therefore an acceptable goal to make pain more tolerable until definitive care can be rendered.

Providers at all levels should take a multi-faceted approach to pain control. Pain is often complex and multidimensional, and thus treatment should be individualized for each patient. Providers must be aware of the pharmacology and possible complications with every analgesic in the protocols. Documentation is essential before and after analgesic administration, and monitoring needs to be constant for changes in condition.

ALS Providers should consider decreased dosage or prolong administration intervals of sedative or analgesic medications in higher risk populations such as altered mental status, traumatic head injury, recent use/administration of other sedative medications, elderly, or known/suspected hypersensitivity.

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

- Treat underlying injury or illness as appropriate
- Consider use of splinting, elevation, ice packs, padding, breathing techniques, good communication or the use of family members to assist in calming or alleviating pain

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, SpO₂ and/or mental status diminishes

Consider use of anti-emetics with administration of analgesics especially in the setting of trauma or known sensitivity.

Protocol

M-11

ADULT PAIN CONTROL

- Fentanyl IV/IO/IM/IN
 - 1 mcg/kg initial dose (max initial dose 100 mcg)
 - Give slowly over 2 minutes (with the exception of IN route)
 - May repeat every 10 minutes as needed (max total dose of 200 mcg)
- Morphine sulfate IV/IM/IO
 - 0.1 mg/kg as initial dose (max initial dose 10 mg)
 - Give slowly over 2 min
 - May repeat every 10 minutes as needed with 0.05 mg/kg (max dose of 20 mg)
- Dilaudid IV/IM/IO
 - 0.5mg slow IV push over 2-3 minutes
 - May repeat every 10 minutes as needed (max dose 2 mg)

PHYSICIAN PEARLS:

SECTION: M-12

PROTOCOL TITLE: Adult Heat Emergencies

REVISED: October 15, 2014

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 for temperature > 103 F or 39.5 C
- Position patient as appropriate
 - Move patient to a cool area if possible
- Initiate passive cooling for temperature < 103 F or 39.5 C
- 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 ml (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 ml. 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

PHYSICIAN PEARLS:

SECTION: M-13

PROTOCOL TITLE: Adult Cold Emergencies

REVISED: October 15, 2014

GENERAL COMMENTS: 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 check for pulse for at least 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 dysrhythmias
- 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

Protocol M-13

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, administer warm IV fluids.

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 Protocol M-11

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 98.6-95.1°F

- 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

Adult Cold Emergencies: Hypothermic Cardiopulmonary Arrest:

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.**"

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 CPR 30:2, 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)

ADULT COLD EMERGENCIES

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.

SECTION: M-14

PROTOCOL TITLE: Behavioral Emergencies & Combative Patients

REVISED: October 15, 2014

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 3 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

Protocol M-14

ADULT BEHAVIORAL EMERGENCIES

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

Sedation/Anxiolysis

- 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
 - IN: 2.5 mg may repeat in 10 minutes once
- 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.

Cardiac Monitoring is strongly recommended.

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 or 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

SECTION: M-15

TITLE: Sedation for Painful Procedures

REVISED: October 15, 2014

GENERAL COMMENTS: This protocol is intended to provide guidance for sedation/patient comfort during brief painful procedures such as emergent need for relocation of injured extremity, cardioversion or other brief painful procedures.

Sedative medications should not be combined with opiate analgesics unless absolutely necessary as the combination of these medications can cause life threatening over sedation, hypotension, or other unpredictable results. Careful monitoring of patients should be employed with any administration of opiate or benzodiazepine medications.

ALS Providers should consider decreased dosage or prolong administration intervals of sedative or analgesic medications in higher risk populations such as altered mental status, traumatic head injury, recent use/administration of other sedative medications, elderly, or known/suspected hypersensitivity.

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

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

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

Adult sedatives:

- Versed
 - IV/IO/IM: 0.5-2.5 mg slow IV push every 5-10 minutes (max dose 5 mg)
 - IN: 2.5 mg every 10 minutes (max dose of 5 mg)
- Valium IV/IO/IM
 - 2-5 mg slow IV push every 5-10 minutes (max dose 10 mg)

Pediatric sedatives:

- Versed
 - IV/IO/IM: 0.05-0.1 mg/kg slow IV push every 5-10 minutes (max dose 2.5 mg)
 - IN: 0.2 mg/kg every 5-10 minutes (max dose of 2.5 mg) (Not for use in children under 2 years of age)

Protocol

M-15

Sedation for Painful Procedures

SECTION: OB-1

PROTOCOL TITLE: GENERAL OB Care

REVISED: October 15, 2014

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: *See Adult General Care protocol M-1*

- 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 with **VISUAL** inspection of the perineum.
- 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
- 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)
- IF ACTIVE LABOR and CROWNING:
 - o Follow **Childbirth Procedure** (Appendix 23)
 - o Expedite transport for:
 - <36 weeks gestation AND crowning
 - Abnormal fetal presentation
 - Severe vaginal bleeding
 - Multiple gestations
- IF ACTIVE LABOR and NO crowning:
 - o Monitor, reassess. Document duration/frequency of contractions
 - o Notify receiving facility

ILS SPECIFIC CARE: *See Adult General Care protocol M-1*

ALS SPECIFIC CARE: *See Adult General Care protocol M-1*

Protocol OB-1

GENERAL O.B. CARE

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 emergent 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
- 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:

- | | |
|--------------------------------------|---|
| - Gestational age | - Recent trauma |
| - Expected due date | - Last fetal movement felt |
| - How many pregnancies (gravida) | - Other identified problems |
| - How many live births (para) | - OB/primary physician & hospital choice |
| - How many abortions or miscarriages | - Amount and type of bleeding/discharge (if applicable) |
| - Pre-natal care | |
| - Number of fetuses | |

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

SECTION: OB-2

PROTOCOL TITLE: Obstetrical Emergency

REVISED: October 15, 2014

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

Vaginal Bleeding:

- If post-partum, massage uterus to promote contraction. Encourage breast-feeding of newborn
- If hypotensive, See Adult Hypotension and Shock protocol M-3

Seizure/Hypertension (Suspected Pre-eclampsia/Eclampsia)

- Refer to *Seizure protocol M-5*

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

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

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

Vaginal Bleeding:

Severe post-partum hemorrhage: (A loss of up to 500 ml 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

Suspected Pre-eclampsia/Eclampsia (Seizure, ALOC, or HTN)

Pre-eclampsia (hypertension, ALOC without seizure)

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 ml Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250ml NS, run at 50ml/hr (2 g/hr)

Eclampsia: (active seizures)

Magnesium sulfate

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

Benzodiazepines

Valium (diazepam)

- IV/IO: 2-10 mg every 5-10 minutes as needed to maximum 20 mg

Protocol OB-2

OBSTETRICAL EMERGENCY

- 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 \uparrow 30 mm/Hg and/or
 - Diastolic \uparrow 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 or RUQ pain, 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.

A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency. Magnesium administration should be a priority in these patients. However, IN/IM benzodiazepines may be given first due to rapidity of administration. For crews with two ALS providers, one provider should administer IN/IM benzodiazepine while the other provider establishes IV access for Magnesium.

Do not delay IN/IM administration of Midazolam for an actively seizing patient with difficult IV or IO access.

SECTION: T-1

PROTOCOL TITLE: GENERAL TRAUMA CARE

REVISED: October 15, 2014

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 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*
- 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 SpO₂
- Apply occlusive dressings to sucking chest wounds
 - Seal on 4 sides
- Apply pressure dressings to hemorrhaging injuries
- Stabilize impaled objects and leave in place
- Assess blood glucose level as indicated

- 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
- Conserve body heat

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 ml crystalloid solution for symptomatic hypotension. Repeat PRN
 - Use with caution in patients with Hx of CHF

ALS SPECIFIC CARE:

- *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)

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**

GENERAL TRAUMA CARE

Protocol

T-1

GENERAL TRAUMA CARE

SECTION: T-2

PROTOCOL TITLE: Orthopedic Injuries

REVISED: October 15, 2014

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

Clavicle and Shoulder Injuries

- Consider Sling and/or swath

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**

Protocol

T-2

ORTHOPEDIC INJURIES

SECTION: T-3

PROTOCOL TITLE: Burn Trauma

REVISED: October 15, 2014

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
- 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, follow Selective Spinal Immobilization Appendix 18
- 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
- Assisted ventilations if necessary to maintain adequate SpO₂
- 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
- 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

Protocol T-3

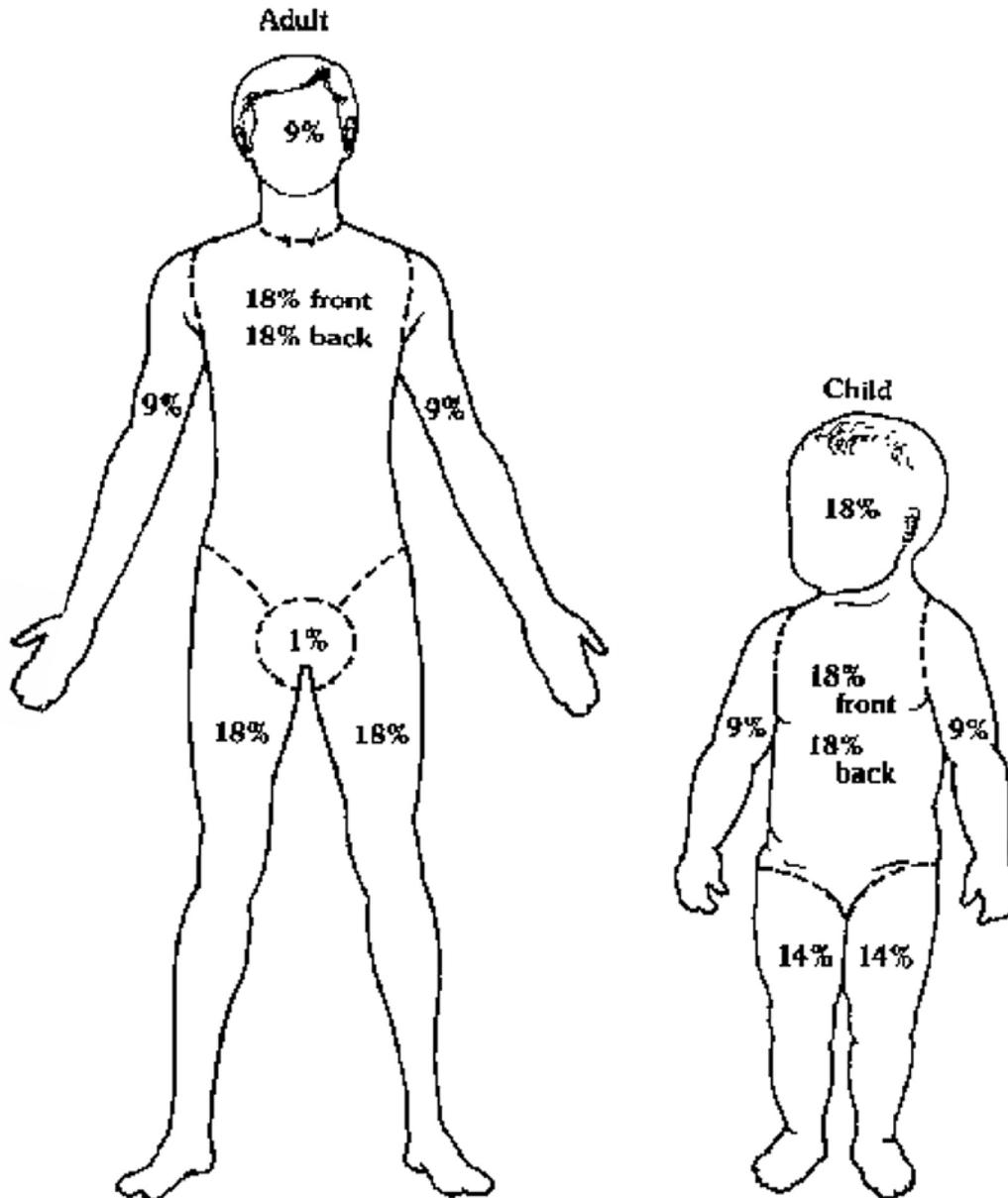
ILS SPECIFIC CARE: *See General Trauma Care Protocol T-1*

- IV Fluids:
 - Age <5yo: 125mL/hr
 - Age 6-13: 250mL/hr
 - Age >14: 500mL/hr

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 pain management see (Adult Pain Control M-11 or Pediatric Pain Control PM-07) protocols for Analgesics

BURN TRAUMA



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, 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. Cardiac monitoring and 12 lead evaluation as available. 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

SECTION: T-4

PROTOCOL TITLE: Crush Injuries

REVISED: October 15, 2014

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 follow Tourniquet Protocol T-5

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

- IV access (to a max of 3 attempts) with 2 LARGE BORE LINES
 - IV: 200-500 ml 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

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

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 ml, run at 150 ml/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

SECTION: Extremity Tourniquet**TITLE: General Tourniquet Use****REVISED: October 15, 2014**

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 or 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.

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

T-5

General Tourniquet Use

SECTION: R-1

PROTOCOL TITLE: Toxicological Emergencies

REVISED: October 15, 2014

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 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 3 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 ml 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 seizure protocol for seizure activity

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.

SECTION: R-2

PROTOCOL TITLE: Opiate Overdose

REVISED: October 15, 2014

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 Protocol M-1, PM-1, PM-9

- 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)

ILS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

ALS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

- 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

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

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

SECTION: R-3

PROTOCOL TITLE: Hyperdynamic Crisis/Overdose

REVISED: October 15, 2014

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 Protocol M-1, PM-1, PM-9

- 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 Protocol M-1, PM-1, PM-9

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

ALS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

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

Do not administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, SpO₂ and/or mental status diminishes

See Adult Behavioral Emergencies M-14 for Benzodiazepine dosing:

- Diazepam (Valium):
- Versed (midazolam) IV/IO/IM

Anti-emetics:

- Zofran (ondansetron) IV /IM/IO
 - ♦ Adult: 4 mg
 - ♦ Pediatric: 0.1 mg/kg to a maximum of 4 mg

Drug induced acute coronary syndrome (ACS) with ST changes, refer to protocol C-4

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.

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-arrhythmic of choice for polymorphic VT (Torsades), although should be used with caution when hypotension is present.

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.**

SECTION: R-4

PROTOCOL TITLE: TCA Overdose

REVISED: October 15, 2014

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 Protocol M-1, PM-1, PM-9

- Trendelenburg for hypotension
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape)

ILS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

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

ALS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

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

Specific Pharmacological Therapy

- Sodium Bicarbonate for hypotension, arrhythmia, QRS >100 ms
 - IV: 1 meq/kg IV (min 50 mEq)
 - Re-bolus in 5-10 min at 1 meq/kg if s/s persist

Anti-Arrhythmics

- Magnesium Sulfate (*for Torsades in conjunction with Sodium Bicarbonate*)
 - IV: 2 g given SLOWLY. Take 2 g (4ml), dilute to 20 ml 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
 - 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 drug index
 - Pediatric: 0.1-0.2 mcg/kg/min, see drug index
- Dopamine infusion:
 - Adult and Pediatric: 2-20 mcg/kg/min, see drug index

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*

SECTION: R-5

PROTOCOL TITLE: Organophosphate/Carbamate/Nerve Agent Exposure

REVISED: October 15, 2015

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

BLS SPECIFIC CARE: *See Protocol M-1, PM-1, PM-9, R-1*

- Scene Safety:
 - Take Personal Protective Precautions
 - Request HAZMAT 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 Bunitrol 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 (>10yo):
 - IV/IO/IM: 1-2 mg
 - ETT: 2-4 mg
 - Pediatric (2-10yo):
 - IV/IO: 1mg
 - ETT: 2mg
 - Pediatric (<2yo):
 - IV/IO/IM: 0.02 mg/kg (max 1mg)
 - ETT: 0.03 mg/kg

ORGANOPHOSPHATE EXPOSURE

Protocol R-5

ORGANOPHOSPHATE EXPOSURE

Bronchodilators:

- **Adult and pediatric:**
 - For first treatment, combine one albuterol (2.5 mg/3 ml) nebulizer and one Atrovent (0.5 mg/2.5 ml) nebulizer in reservoir of oxygen driven nebulizer unit and administer at 10 LPM
 - If Atrovent is contraindicated, use 2 albuterol nebulizers (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: See age appropriate Seizure Protocol Adult M-5 or Pediatric PM-4

- **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.
- **Peds:**
 - For mild symptoms: no treatment
 - For severe symptoms: administer 1 autoinjector
- 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.

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

ORGANOPHOSPHATE EXPOSURE

<p>“S.L.U.D.G.E.”</p> <p>Salivation (excessive production of saliva) Lacrimation (excessive tearing) Urination (uncontrolled urine production) Defecation (uncontrolled bowel movement) Gastrointestinal distress (cramps) Emesis (excessive vomiting)</p>	<p>“D.U.M.B.E.L.S.” (Muscarinic)</p> <p>Diarrhea Urination Miosis Bradycardia/Bronchospasm/Bronchorrhea Emesis Lacrimation Salivation, Secretion, Sweating</p>
<p>“B.A.M.”</p> <p>Breathing Difficulty (wheezing) Arrhythmias (Bradycardia, ventr. Arrhythmias, AV Blocks.) Miosis (pinpoint pupils)</p>	<p>Days of the Week (Nicotenic)</p> <p>Mydriasis Tachycardia Weakness Hypertension, Hyperglycemia Fasciculations</p>
<p>“Three C’s” of CNS effects</p> <p>Confusion Convulsions Coma</p>	

SECTION: R-6

PROTOCOL TITLE: Calcium Channel Blocker/Beta Blocker OD

REVISED: October 15, 2104

GENERAL COMMENTS:

BLS SPECIFIC CARE: See Protocols R-1, M-1, PM-1, PM-9

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

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

- Apply cardiac monitor and multi-function electrode (MFE) pads
- 12-lead EKG
- Contact OLMC at earliest indication of calcium channel blocker overdose

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

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
 - 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 transcutaneous pacing if it will not cause unnecessary delays

Vasopressors:

For bradycardia or hypotension unresponsive to other therapies

Epinephrine infusion

- Adult: 2-10 mcg/min, see drug index
- Pediatric: 0.1-1 mcg/kg/min, see drug index

Dopamine infusion

- Adult and Pediatric: 2-20 mcg/kg/min, see drug index

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 Epinephrine) 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.

SECTION: R-7

PROTOCOL TITLE: Sedative Overdose

REVISED: October 15, 2014

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

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

PHYSICIAN PEARLS:

The Sedative Toxidrome generally consists of:

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

Protocol

R-7

SEDATIVE OVERDOSES

SECTION: R-8

TITLE: Cyanide/Hydrogen Sulfide Poisoning

REVISED: October 15, 2014

GENERAL COMMENTS: While not normally available to field medics (outside HAZMAT responses) some of the following treatments are kept on fire/EMS supervisor rigs and at certain manufacturing facilities and may be administered by ACCESS paramedics. Begin or continue such treatment as indicated and contact MEDICAL CONTROL as soon as possible.

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

- Maintain safety. Do not enter a HOT ZONE without proper PPE. Generally speaking, Level B protection or higher is recommended
- Do not accept a patient who has not been appropriately decontaminated
- Patients suffering from Cyanide or Hydrogen Sulfide poisoning may expose providers by means of respiratory off gassing even after being decontaminated. Ensure good ventilation in enclosed spaces
- Give priority to decontamination of the eyes with water. Remove contaminated clothing and decontaminate the skin as appropriate with soap and water
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape if available)
- Obtain patient's temperature and cool/warm as necessary
- Position patient as appropriate

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

Hydroxocobalamin: (Cyanokit)

- IV initial dose: 5g administered over 15 minutes
- Depending upon severity of the exposure and clinical response to the initial dose, a second dose may be administered
- Second dose: 5g IV infused over 15-120 minutes depending upon severity of signs and symptoms

Be prepared for seizures and treat appropriately.

PHYSICIAN PEARLS:

Aggressive management of seizure activity with benzodiazepines is crucial.

Cyanide inhibits brain glutamate decarboxylase, which causes a decrease in the inhibitory neurotransmitter GABA and contributes to convulsions.

Drugs such as Benzodiazepines, which act at the GABA receptor complex, therefore can help control seizures.

SECTION: R-9

PROTOCOL TITLE: Withdrawal Syndromes

REVISED: October 15, 2014

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 Protocol M-1, PM-1, PM-9*

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, see age appropriate Seizure Protocol M-5 or PM-4

Chemical anxiolysis:

Do not administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, SpO₂ and/or mental status diminishes
- Valium (diazepam):
 - Adult: 2-5 mg every 5-10 min 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 max total dose 5 mg
 - IM: 5 mg to maximum dose 5 mg

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.

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.

SECTION: R-10

PROTOCOL TITLE: Carbon Monoxide Toxicity

REVISED: October 15, 2014

GENERAL COMMENTS:

BLS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

- 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
- 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 (SpO₂) readings will be falsely elevated.
 - Low SpO₂ readings, (i.e. < 90%) however, may be indicative of other concomitant respiratory pathology (e.g. pulmonary edema)

ILS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

ALS SPECIFIC CARE: See Protocol M-1, PM-1, PM-9

- Apply cardiac monitor and multi-function electrode (MFE) pads
- Obtain 12-lead EKG
- 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

Protocol R-10

CARBON MONOXIDE TOXICITY

- 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 SpO₂ > 92%
 - HbCO < 5% in non-smokers and HbCO < 8% in smokers
 - Document HbCO and SpO₂ readings
 - Lungs clear to auscultation
 - No other significant burn or traumatic injury
 - Completion of, “**Refusal of Treatment and/or Transportation,**” form

PHYSICIAN PEARLS

- 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

Protocol

R-10

CARBON MONOXIDE TOXICITY

SECTION: PC-1

PROTOCOL TITLE: PEDIATRIC CARDIAC/RESPIRATORY
ARREST

REVISED: October 15, 2014

BLS SPECIFIC CARE: See General Pediatric Care Protocol PM-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 current 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 PM-1

- IV/IO access as soon as possible
 - 10-20 ml/kg normal saline bolus, repeat as needed for 3 total boluses

ALS SPECIFIC CARE: See General Pediatric Care Protocol PM-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 exceed 10 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

Protocol

PC-1

PED CARDIAC ARREST

Antiarrhythmic therapy:

- Amiodarone (VF/VT)
 - 5 mg/kg
 - May repeat doses up to 15 mg/kg (max dose 300 mg)
- Amiodarone (Wide Complex Tachycardia)
 - 5 mg/kg IV/IO over 20-60 min
 - May repeat doses up to 15 mg/kg (max dose 300 mg)
- 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, metabolic 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 Hypo/hyper glycaemia Protocol (PM-6)

SECTION: PC-1a

PROTOCOL TITLE:
PEDIATRIC CARDIAC/RESPIRATORY ARREST- **BLS** and **ILS** Algorithm
REVISED: October 15, 2014

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 (**ILS**)
- 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. (**ILS**)
- 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. (**ILS**)
- c) Check rhythm every 5 cycles, continue until ALS arrives. 2 cycles 15:2

PED CARDIAC/RESPIRATORY ARREST- **BLS**/**ILS**

Protocol
PC-1a

PED CARDIAC/RESPIRATORY ARREST- **BLS**/ILS

SECTION: PC-1b

PROTOCOL TITLE:

PEDIATRIC CARDIAC/RESPIRATORY ARREST –ALS Algorithm

REVISED: October 15, 2014

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-1b

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:
 - Hypovolemia
 - Hypoxia
 - Hypo-/hyperkalemia
 - Hypoglycemia
 - Hypothermia
 - Toxins
 - Tamponade, cardiac
 - Tension Pneumothorax
 - Thrombosis (coronary or pulmonary)
 - Trauma

* 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.

Protocol PC-1b

PED CARDIAC/RESPIRATORY ARREST - ALS

PHYSICIAN PEARLS:

Outside of the Comfort One/DNR situations (Appendix 26), 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) current 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.

SECTION: PC-2

PROTOCOL TITLE: PEDIATRIC SYMPTOMATIC BRADYCARDIA

REVISED: October 15, 2014

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

Unstable/symptomatic/poor perfusion

- Aggressive oxygenation and ventilations
- Initiate chest compressions for HR < 60 with frequent 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:
 - IV/IO: 0.02 mg/kg
 - Minimum dose: 0.1 mg
 - Maximum child dose: 0.5 mg
 - Maximum adolescent dose: 1 mg
 - Repeat every 3-5 minutes as needed x 1

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 in drug section
 - 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 in drug section
 - Titrate to adequate heart rate/blood pressure response

Additional considerations:

- IV/IO Sodium bicarbonate for known hyperkalemia, metabolic 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: October 15, 2014

BLS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

- Determine patient's color category on length based resuscitation tape (Broselow Tape if available)

ILS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

ALS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

- Support airway/breathing and apply oxygen as needed
- Apply monitor and assess rhythm/rate (Normal rate <180 children; <220 infant)
- Obtain 12- Lead EKG if possible
- Consider underlying causes and treat as well
- See Protocol M-15 for sedation prior to cardioversion

Narrow Complex Tachycardia (Supraventricular, QRS \leq 0.09 sec, and regular):

If UNSTABLE (poor perfusion, AMS, CHF): Obtain vascular access and plan for synchronized cardioversion:

- Synchronized cardioversion:
 - Initial energy setting of 0.5 - 1J/kg or as per manufacturer's recommendations
 - Deliver subsequent shocks, as needed, at 2 J/kg or as per manufacturer's recommendations
- Repeat 12-Lead EKG after successful cardioversion

If STABLE:

- Vagal Maneuvers
- Adenosine
 - IV or IO: First dose: 0.1 mg/kg (max: 6 mg)
 - Subsequent doses: 0.2 mg/kg, (max: 12 mg). Repeat x1
- If unsuccessful, yet stable:
- Amiodarone
 - IV or IO: 5 mg/kg over 20-60 min (max 150mg)
- If still unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion
- Repeat 12-Lead EKG if rhythm converts

Wide Complex Tachycardia (QRS \geq 0.09sec, Variable R-R)

If **UNSTABLE** (*poor perfusion, AMS, CHF*): Obtain vascular access and plan for synchronized cardioversion:

- *Synchronized* cardioversion:
 - Initial energy setting of 0.5 – 1 J/kg or as per manufacturer's recommendations
 - Deliver subsequent shocks, as needed, at 2 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* cardioversion
 - For unstable polymorphic VT
 - Initial energy setting of 2 J/kg or as per manufacturer's recommendations
 - Deliver subsequent shocks, as needed, at 4 J/kg or as per manufacturer's recommendations

If **STABLE**:

- Amiodarone
 - IV or IO: 5 mg/kg over 20-60 min (max 150mg)
- OR
- Lidocaine
 - IV or IO: 1 mg/kg slow IV
 - Repeat 10-15 minutes x2 to a max dose of 3 mg/kg
- Magnesium sulfate (polymorphic ventricular tachycardia)
 - IV or IO: 25-50mg/kg (max 2g) over 10 minutes
 - Rapid administration can cause hypotension and respiratory compromise; monitor carefully
 - First line agent for hemodynamically STABLE polymorphic VT (torsades de pointes)
- Repeat 12-Lead EKG if rhythm converts.
- If unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion.

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:

≤ 0.09 seconds –probable Sinus Tachycardia or Supraventricular Tachycardia

≥ 0.09 seconds –probable Ventricular Tachycardia

Rate: (rates less than 180 BPM in a child, or 220 infant are usually secondary to other non-cardiac causes)

Probable Sinus Tach:

< 180 in Children or < 220 BPM in Infants

P-waves present and regular

Constant PR interval

Variability of R-R

Probable SVT:

> 180 in Children or > 220 BPM in Infants

P-waves absent/abnormal

Regular R-R and HR doesn't vary

Probable VT:

> 180 in Children or > 220 BPM in Infants

Wide QRS

Regular HR

Protocol

PC-3

PED TACHYCARDIA

SECTION: PM-1**PROTOCOL TITLE: PEDIATRIC GENERAL MEDICAL CARE****REVISED: October 15, 2014**

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 current 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
- BG as appropriate

ILS SPECIFIC CARE:

- IV access (to a max of 3 attempts) only if needed due to severity of underlying injury or illness, or marked dehydration. Otherwise defer until arrival of ALS providers
 - IV: Normal Saline at a TKO rate
 - 10-20 ml/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:

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 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.

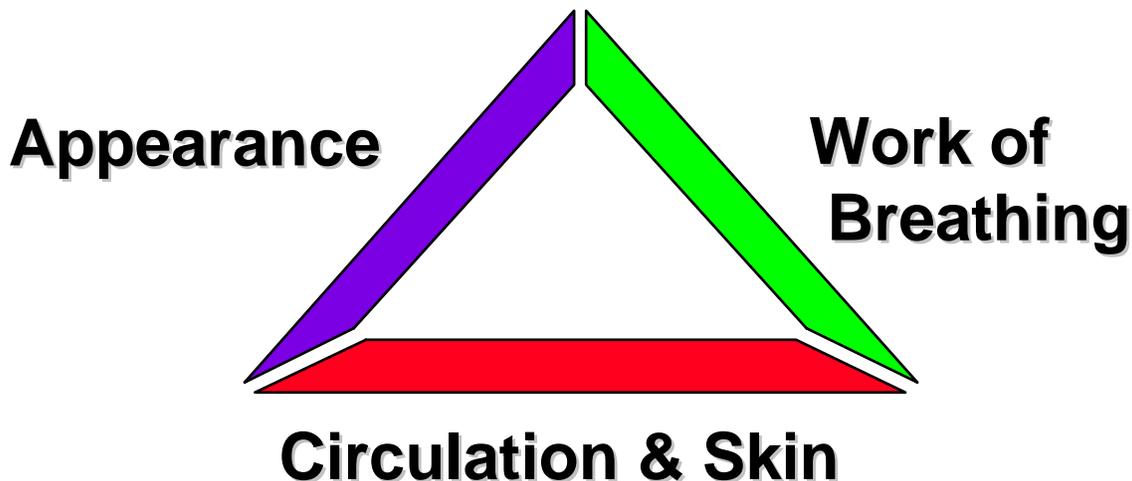
If patient's weight is unknown, the Broselow® tape should be used. When the Broselow® tape gives a more specific drug dosage than is listed in these protocols due to weight, that dosage may be used at the paramedic's discretion. **EXCEPTION: IV starting doses for Versed (Midazolam) doses in the Broselow® 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: PEDIATRIC RESPIRATORY EMERGENCIES

REVISED: October 15, 2014

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*

Wheezing

- 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)

Stridor

- 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

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

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

Wheezing

- Nebulizer
 - Albuterol 2.5 mg (0.83% in 3ml)/ Atrovent 0.5 mg (0.02% in 2.5 ml) nebulized
 - May use DuoNeb preparation for initial Neb.
 - Repeat as needed with Albuterol Only
 - Do not dilute

- Epinephrine 1:1000 for patients in severe distress
 - IM 0.01 mg/kg for severe refractory bronchospasm
- Magnesium Sulfate (if worsening after above medications)
 - 25-50 mg/kg in 100 ml infused over 2-5 min
 - Max 2 g

Corticosteroid Therapy

- Solu-Medrol
 - 1-2 mg/kg IVP

Stridor

- Epinephrine Neb (first line)
 - 3 mg (3 ml) epinephrine 1:1,000 nebulized diluted with 3ml NS for a total of 6 ml
 - Repeat x 2 as needed. Allow 2 minutes between doses.
- Epinephrine 1:1000 for patients in severe distress
 - IM 0.01 mg/kg for severe refractory stridor

All respiratory emergency patients shall have continuous ECG monitoring.

PHYSICIAN PEARLS:

The predominant cause for stridor in younger children is acute viral laryngotracheobronchitis (CROUP); Albuterol and Atrovent provide no substantial benefits due to the causation for this condition. Although less common, epiglottitis should be considered as a life threatening cause of stridor however similarly, Albuterol and Atrovent will not provide benefit to these patients. As noted above, nebulized epinephrine is the first line treatment for field personnel for these conditions.

For severe respiratory distress (in the absence of congenital heart defects), normal saline fluid boluses should be administered early (after first nebulized treatment as beta agonists and epinephrine can cause increased tachycardia and secondary hypotension. Additionally, with tachypnea, patients can manifest dehydration secondary to insensible losses of respiration and from potential underlying illness. Therefore fluid boluses should be administered liberally with these patients.

SECTION: PM-3

PROTOCOL TITLE: PEDIATRIC ALLERGY/ANAPHYLAXIS

REVISED: October 15, 2014

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 wheezing are present, see protocol PM - 2*

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 drug index for EPI Infusion chart)
- Epinephrine Neb (for stridor only)
 - 3 mg (3 ml) Epinephrine 1:1,000 nebulized diluted with 3 ml NS for a total of 6 ml.

Bronchodilators

- HHN Nebulizer
 - Albuterol 2.5 mg (0.83% in 3ml)/ Atrovent 0.5 mg (0.02% in 2.5 ml) 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 50 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)

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.

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

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: October 15, 2014

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
- Obtain BG and temperature
- 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

Anticonvulsant Therapies (for the actively seizing patient)

- Diazepam (Valium)
 - IV/IO: 0.2 mg/kg given slowly. Repeat every 5 minutes PRN max dose 10 mg
 - PR: 0.5 mg/kg
- Midazolam (Versed)
 - IN/IM: 0.2 mg/kg repeat every 5 minutes PRN. If no IV access is available (Max 10 mg)
 - IV/IO: 0.1 mg/kg every 5 minutes PRN (Max 5 mg)

If hypoglycemia is present see PM-6

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-4

PEDIATRIC SEIZURES

SECTION: PM-5

PROTOCOL TITLE: PEDIATRIC HYPOTENSION AND SHOCK

REVISED: October 15, 2014

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 patients with severe congenital heart defects.

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*

- **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:
 - 0.1-1 mcg/kg/min.; see drug index for dosing
- Dopamine infusion:
 - 2-20 mcg/kg/min.; see drug index for dosing

Protocol
PM-5

PEDIATRIC HYPOTENSION AND SHOCK

SECTION: PM-6

PROTOCOL TITLE: PEDIATRIC HYPER/HYPOGLYCEMIA

REVISED: October 15, 2014

BLS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

- Check BG
- If hypoglycemia is confirmed by glucometry:
 - BG < 60 mg/dl with symptoms
 - Normal Newborn/Neonate BG = 50-110 mg/dl

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

ILS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

- If BG >300, give 20ml/kg fluid bolus

ALS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

- If BG >300 apply cardiac monitor
- If BG <60:
 - Dextrose: 0.5-1g/kg IV/IO:
 - >3 months: D25 4ml/kg slow IV/IO. Max dose 25g (100ml)
 - Birth to 3 months; use D10 10ml/kg slow IV/IO push

Protocol PM-6

- Glucagon IM:
 - If unable to obtain IV/IO access
 - 0.02 mg/kg
 - Maximum of 1 mg (Unit)

PEDIATRICS DO NOT FALL UNDER NORMAL TREAT & RELEASE GUIDLINES DUE TO AGE. CONTACT MEDICAL CONTROL FOR T/R

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.

PED HYPER/HYPOGLYCEMIA

SECTION: PM-7

PROTOCOL TITLE: PEDIATRIC PAIN CONTROL

REVISED: October 15, 2014

GENERAL COMMENTS: Pre-hospital EMS is committed to the relief of pain and suffering in patients with acute painful conditions. Given the circumstances, complete resolution of pain may be an unachievable goal. It is therefore an acceptable goal to make pain more tolerable until definitive care can be rendered.

Providers at all levels should take a multi-faceted approach to pain control. Pain is often complex and multidimensional, and thus treatment should be individualized for each patient. Providers must be aware of the pharmacology and possible complications with every analgesic in the protocols. Documentation is essential before and after analgesic administration, and monitoring needs to be constant for changes in condition.

ALS Providers should consider decreased dosage or prolong administration intervals of sedative or analgesic medications in higher risk populations such as altered mental status, traumatic head injury, recent use/administration of other sedative medications, elderly, or known/suspected hypersensitivity.

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

- Treat underlying injury or illness as appropriate
- Consider use of splinting, elevation, ice packs, padding, breathing techniques, good communication or the use of family members to assist in calming or alleviating pain
- Length based resuscitation tape (Broselow Tape) may be helpful in determining patients weight

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

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

DO NOT administer/discontinue administration if:

- Systolic BP < 90 mmHg
- Respiratory rate, SpO₂, and/or mental status diminishes

Consider use of anti-emetics with administration of analgesics especially in the setting of trauma or known sensitivity.

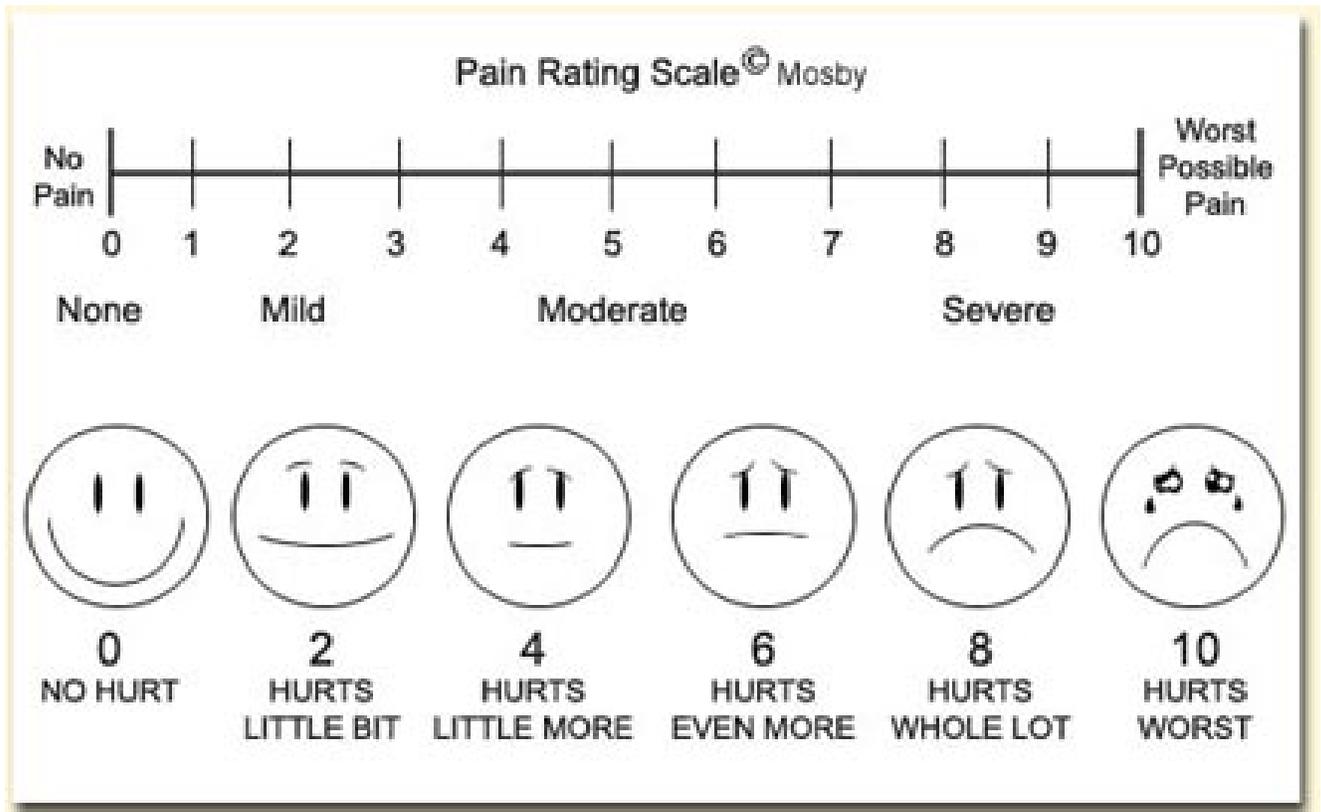
Protocol PM-7

PEDIATRIC PAIN CONTROL

Analgesia

- Fentanyl IV/IO/IM/IN
 - 1-2 mcg/kg initial dose (max initial dose 75 mcg)
 - Give slowly over 2 minutes (with the exception of IN route)
 - May repeat every 10 minutes as needed with 1 mcg/kg (max total dose of 150 mcg)
- Morphine sulfate IV/IM/IO
 - 0.1 mg/kg as initial dose (max initial dose 5 mg)
 - Give slowly over 2 min
 - May repeat every 10 minutes as needed with 0.05 mg/kg (max total dose of 15 mg)

PHYSICIAN PEARLS:



SECTION: PM-8

PROTOCOL TITLE: PEDIATRIC NAUSEA, VOMITING, VERTIGO AND DEHYDRATION

REVISED: October 15, 2014

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 Child's health, and left un-checked, progress to life-threatening shock.

BLS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

Obtain blood glucose

ILS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

ALS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

Antiemetics

- Zofran (ondansetron) IV/IM/IO
 - 0.1 mg/kg to a maximum of 4 mg

PHYSICIAN PEARLS:

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-8

PED NAUSEA, VOMITING, VERITIGO AND DEHYDRATION

SECTION: PM-9

**PROTOCOL TITLE: PEDIATRIC TOXICOLOGICAL
EMERGENCIES**

REVISED: October 15, 2014

GENERAL COMMENTS: This protocol directly supplements protocols R-1 through R-10 (Adult Toxicological Emergencies.)

BLS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

In addition to standard medical history obtain:

- Name of ingested substance
- Quantity ingested
- Time of ingestion
- Has vomiting occurred

ILS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

ALS SPECIFIC CARE: See General Pediatric Care Protocol PM-1

12 Lead ECG for all pediatric toxicological emergencies.

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: 0.1 mg/kg to max single dose of 2 mg.
Repeat PRN

Suspected TCA overdose: (do not administer Amiodarone)

- Sodium Bicarbonate for hypotension, arrhythmia, QRS >100 ms
 - IV: 1 meq/kg IV
 - Re-bolus in 5-10 min at 1 meq/kg if s/s persist
- Magnesium Sulfate (*for Torsades REFRACTORY to sodium Bicarbonate*)
 - IV or IO: 25-50 mg/kg in 100 ml infused over 2-5 min
 - Max 2 g

Protocol
PM-9

PEDIATRIC TOXICOLOGICAL EMERGENCIES

Calcium channel blocker/beta blocker ingestion

- **Calcium Chloride (for Calcium Channel Blockers Only)**
 - IV (Slow): 20 mg/kg over 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, see drug index

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/IO/IM: 0.2 mg/kg every 5-10 min PRN to a max of 10 mg
- Midazolam (Versed)
 - IV/IO: 0.1 mg/kg every 5-10 min (over 2-5 minutes if IV). Maximum dose of 2.5 mg
 - IN/IM: 0.2 mg/kg repeat every 5 min PRN. If no IV access is available (Max 5mg)

EPS:

- Benadryl (Diphenhydramine)
 - IV/IM: 1 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
 - 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

Protocol
PM-9

PEDIATRIC TOXICOLOGICAL EMERGENCIES

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APPENDIX: 1

TITLE: BASIC AIRWAY SUPPORT PROCEDURES

REVISED: October 15, 2014

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 $SPO_2 \leq 94\%$ unless otherwise contraindicated.

<u>Adjunct</u>	<u>Flow Rate</u>
Nasal Cannula	1-6 L/min
Simple Mask	8-10 L/min
Non-Rebreather Mask	12-15 + L/min
Bag-Mask w/ Reservoir	12-15 + L/min
FROPVD/ Demand Valve	(good seal)

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 VENTILATORY SUPPORT

If supplemental oxygen support is inappropriate, ineffective, or impractical, and the patient 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 tracheostomy 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 6)

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 SPO_2 , $ETCO_2$, 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 or receiving medications. 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 and documented on all intubated patients using the most appropriate device available.

ETCO₂ is a useful adjunct for determining perfusion and measuring expired CO₂ 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.

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 CO₂ 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.

APPENDIX: 2

TITLE: INTUBATION PROCEDURES

REVISED: October 15, 2014

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 ACCESS 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

II. COMPLICATIONS:

The Paramedics must be prepared to deal with, and prevent complications while placing an Endotracheal tube. These include:

- airway trauma
- laryngospasm
- hypoxia
- 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

INTUBATION

- 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

III. 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
- In non-trauma patients (especially those who are obese), elevated the head of the bed to 30 degrees

Cardiac monitor. Be alert for the possibility of bradycardia or other dysrhythmias.

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

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
- Place patient on 6+ liters nasal cannula during RSI procedures
- 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:

- Ketamine
- Succinylcholine

ORAL INTUBATION:

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 King airway) you should perform a needle or surgical cricothyrotomy
- 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
- Reconfirm placement every 5 minutes or after any patient movement

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 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 5-10ml 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 90° 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

POST INTUBATION:

This shall apply not only to patients intubated by ACCESS 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:** continued sedation is mandatory and humane. 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

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 ET_{CO}₂ 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:

Consider the endotracheal tube introducer (AKA the “Bougie”, Flexiguide). If unable to place endotracheal tube, remove front of C-collar and hold in-line stabilization while attempting intubation. If still unsuccessful, consider alternate airway access techniques (nasal, digital, crich, etc).

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 3

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

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: 3

TITLE: MEDICATION ASSISTED INTUBATION (M.A.I.) SUPPLEMENT

REVISED: October 15, 2014

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.

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. 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

Dissociative Anesthetic: Induction agent used alternatively to Etomidate.

- Ketamine: 2mg/kg SLOW IV push 1 min prior to paralytic administration

Depolarizing Neuro-muscular Blocking Agents: To be used after Etomidate or Ketamine.

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

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

Maximum dose of 0.5 mg

III. 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

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
- Place patient on 6+ liters nasal cannula during RSI procedures
- Good pre-oxygenation is a vital component to successful M.A.I. This ensures sustained oxygenation during the intubation attempt

Administer induction agent and paralytic 45-60 seconds prior to intubation:

- Ketamine or 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/Ketamine
- OR**
- Initial or second dose of Succinylcholine

INTUBATION:

See Appendix 2

POST INTUBATION MEDICATIONS:

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: 0.1 mg/kg initial dose (Max initial dose 10 mg)

Repeat at 0.05mg/kg every 10 min PRN, max total dose 20mg

PEDS: IV/IM/IO: 0.1 mg/kg (max single dose 5 mg), repeat at 0.05 mg/kg PRN every 10 min. Max of 15 mg

Fentanyl, (Sublimaze)

IV, IO, IM: 1 mcg/kg initial dose (max initial dose 100 mcg)

May repeat PRN every 10 min to a total of 200 mcg

PEDS: 1 mcg/kg (max single dose 75 mcg) repeat every 10 min PRN to a max of 150 mcg

MEDICATION ASSISTED INTUBATION

APPENDIX: 4

TITLE: KING AIRWAY PROCEDURES

REVISED: October 15, 2014

- **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 CO₂ (EtCO₂)
 - 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 SpO₂
 - 13) Record depth markings
 - 14) Secure
 - 15) Place c-collar

KING AIRWAY PROCEDURES

APPENDIX: 5**TITLE: CRICOTHYROTOMY (SURGICAL/NEEDLE/Quick Trach)****REVISED: October 15, 2014****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:**

- Surgical: patients > 8 years of age
- Needle: patients < 8 years of age
- 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

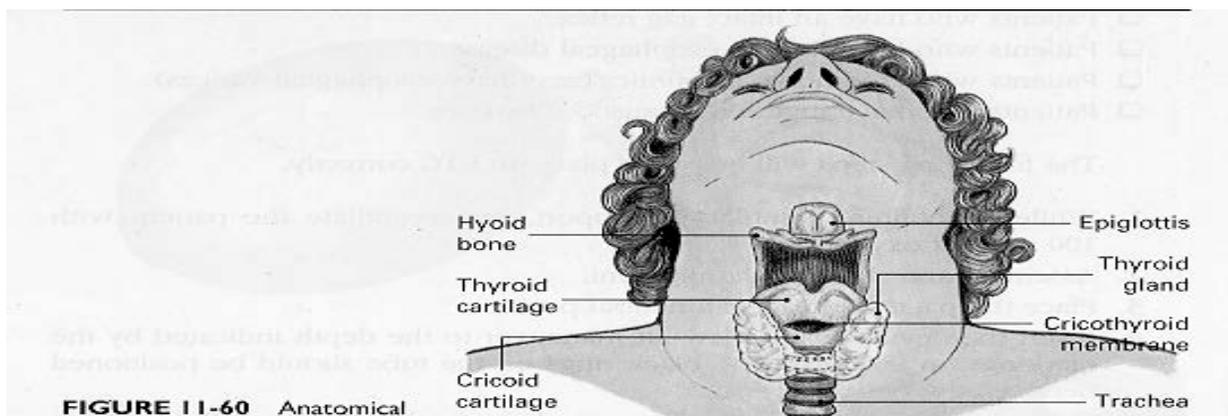
This procedure shall be utilized when all other methods of establishing a patent airway from above the glottis have failed.

RELATIVE CONTRAINDICATIONS:

1. Fractured larynx or significant damage to the cricoid cartilage or larynx.
2. Coagulopathy
3. Expanding hematoma in the area of the cricothyrotomy.

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:

SURGICAL:

- Gather and assemble the appropriate equipment:
 - a. 6.0 endotracheal tube, cut off just above the balloon port
 - b. Bougie (Flex-guide™)
 - c. #10 scalpel
 - d. Ruiz hook
 - e. Chlorhexidine swabs
 - f. Sterile gauze pad
 - g. Twill tape
 - h. Suction equipment
 - i. 10 mL syringe

- 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 Chlorhexidine swabs.
- Palpate and maintain grasp on thyroid cartilage with non-dominant hand. Make a vertical 1-2" skin incision.
- Puncture the cricothyroid membrane with the Ruiz hook. Hook the inferior edge of the thyroid cartilage and lift cephalad.
- Orient the #10 scalpel transversely and puncture the membrane, creating a large enough incision to accommodate the ET tube. Do not remove the scalpel.
- Orient scalpel blade in the vertical position, and insert bougie next to the blade, advancing the bougie caudally into trachea. Remove scalpel.
- Slide ET tube over and advance it down the bougie. Twisting the ET tube as you slide it down the bougie and through the cricothyroid membrane will make it easier to advance.
- Ensure the balloon is through the membrane and into the trachea. Remove the bougie.
- Inflate the cuff and ventilate the patient with 100% oxygen.
- Once position is confirmed, remove the Ruiz hook. NOTE: It is not uncommon to mistakenly place the ET tube into a paratracheal position (i.e. outside the trachea). Do not remove the Ruiz hook until the ET tube is confirmed to be in the trachea and functional. Secure the ET tube using twill tape.
- Verify proper tube placement by:
 - a. Auscultation of lung fields
 - b. ETCO₂ detector
 - c. Lack of subcutaneous air in the neck

NEEDLE:

- Gather and assemble the appropriate equipment:
 - a. Chlorhexidine swabs
 - b. #6 fr. Cook Needle (may also use 16 gage or larger angiocath)
 - c. 3cc Syringe
 - d. 3.0 ETT Barrel
 - e. 4 x 4
 - f. 36" twill tape
 - g. Sterile gauze pad
- 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 Chlorhexidine swabs.
- Stabilize the airway between the thumb and forefingers.
- Insert the reinforced 6 Fr Cook catheter through the skin overlying the cricothyroid membrane at a 30 degree angle caudally.
- When the needle is through the skin, aspirate for air as you advance to ensure tracheal entry. 1-2 mL of saline in the syringe will help identify presence of air bubbles.
- Advance the catheter over the needle and seat catheter hub against skin, remove the needle.
- Attach the 3.0 ETT adapter with flex tube to the hub of the catheter and begin ventilations with the BVM.
- Secure the cannula with twill tape after confirming correct placement by auscultation for breath sounds (5 point check) and ETCO₂ (may have low readings), observe the catheter for kinking.
- Consider sedation.

Notes and Precautions:

1. Hazard in performing this procedure are primarily damage to nearby structures. Major vessels are present on either side of the midline the vocal cords may be injured if the puncture is made too high and a through and through injury of the trachea may occur if the puncture is made too deep.
2. Palpation of the cricothyroid membrane is very difficult in the infant and younger child. The key to success is immobilization of the trachea throughout the procedure.

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.
2. Frank, Micahel, MD. “*Cricothyrotomy – Practice Makes Perfect.*” Journal of Emergency Medical Services. JEMS Communications.
3. Frei FJ, et al. “Cricothyrotomy using the Quicktrach Cricothyrotomy instrument set” *Anasth Intensivther Notfallmed.* 1990 Jan;25 Suppl 1:44-9.
4. Schaumann, Nikolaus M.D, et al. “*Evaluation of Seldinger Technique Emergency Cricothyroidotomy versus Standard Surgical Cricothyroidotomy in 200 Cadavers.*” *Anesthesiology.* 102(1):7-11, January 2005.
5. American Heart Association. *Airway Adjuncts*, Textbook of Advanced Cardiac Life Support. American Heart Association, 1987, p 33-34.
6. Life Flight Network: “Patient Care guidelines” Aurora, OR 97002; Life Flight Network, LLC 2010 pp 17-19

APPENDIX: 6**TITLE: CPAP****REVISED: October 15, 2014**

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, 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), acute pulmonary edema (APE), and COPD.

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.

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
- $ETCO_2 > 50\text{mmHg}$
- 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. Place patient in a sitting position or similar position of comfort
2. 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**
3. Explain the procedure to the patient
4. 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 Sedation for Painful Procedures (M-15)*
5. Assemble CPAP. Attach CPAP to O₂ source and adjust starting CPAP pressure:
 - Begin at 5 cmH₂O
 - Consider use of nebulized medications as indicated by patients clinical presentation and suspected etiology
 - Progressively increase the pressure desired cmH₂O There is better tolerance with gradual progression of pressure
 - **MAX CPAP PRESSURE:**
 - i. **CHF: 10 cmH₂O**
 - ii. **All other respiratory conditions: 5 cmH₂O**

6. 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 to ensure a 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

7. An in line nebulizer may be run simultaneously with the CPAP.

8. 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 EtCO₂
- Decline of SpO₂
- Progressive fatigue
- Ineffective tidal volume
- Respiratory or cardiac arrest

VI. Documentation:

Documentation on the patient care record should include:

- CPAP level →(10cmH₂O)
- F_iO₂ →(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. Once CPAP headset is in place, consider early administration of nitro-paste, as nitro spray may be impractical to use in CHF patients.
5. 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
6. Monitor closely for development of pneumothorax and or hypotension
7. Monitor patients closely for vomiting and or gastric distention
8. 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
9. CPAP is an acceptable treatment option for a patient with a DNR/DNI order who is in respiratory failure

APPENDIX: 7

TITLE: NEBULIZED BRONCHODILATOR TREATMENT PROCEDURE

REVISED: October 15, 2014

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 ACCESS 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 ml)
- **Ipratropium bromide** (Atrovent) 0.5 mg (0.02% in 2.5 ml) (usually combined with Albuterol). May repeat x1. Max dose Atrovent is 1mg (two nebs)
- **Epinephrine** (Adrenalin) 1:1,000 solution 5 mg/5 ml

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 mental status changes
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 appropriate pediatric nebulizer per manufacturer directions

NEBULIZED BRONCHODILATOR TREATMENT

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APPENDIX: 8

TITLE: NEEDLE THORACOSTOMY PROCEDURE

PENDING: October 15, 2014

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:

Signs of hypoxia / respiratory distress with decreased LOC with indications below.

- a. Absent breath sounds over affected side
- b. Hyperresonance over the affected side
- c. Distended neck veins
- d. Tracheal shift away from affected side
- e. Hypotension
- f. Trauma arrest / PEA
- g. Significant mechanism of blunt or penetrating chest trauma with any of the above
- h. JVD
- i. Intubated patients who become suddenly unstable or difficult to bag despite suctioning
- j. Patients with known rib fractures and SQ emphysema
- k. Other chest injuries including open chest wound(s), simple pneumothorax contusion, and flail chest.

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

NEEDLE THORACOTOMY

IV. PROCEDURE:

1. Identify the insertion site:
 - a. The second intercostal space at the midclavicular line
 - b. The fifth intercostal space, anterior midaxillary line.
2. Using aseptic technique, prepare the site with Chlorhexidine swabs.
3. Using a 6 Fr Cook Catheter (or 16 gage or larger angiocath), introduce the catheter 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 and seat catheter hub against skin, remove the needle.
5. Assess the patient for improvement in clinical status.
6. Repeat as needed if you suspect catheter is occluded due to blood, tissue or movement and if tension reoccurs.

V. REFERENCE:

1. Greenwald, Johnathan. The Paramedic Manual. Englewood, CO: Morton, 1988. Pg 123-125.
2. Life Flight Network: “Patient Care guidelines” Aurora, OR 97002; Life Flight Network, LLC 2010 pp 80

APPENDIX: 9**TITLE: LUCAS Chest Compression System****REVISED: October 15, 2014**

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
- **IMPORTANT:** To prevent the LUCAS from migrating and potentially causing an iatrogenic injury, attach the stabilization strap behind the patient's neck as near the shoulders as possible

LUCAS Chest Compression System

- 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: 10**TITLE: CARDIAC MONITORING PROCEDURES****REVISED: October 15, 2014****I. INDICATIONS:**

Patients at risk for dysrhythmias or receiving medications shall have 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 EKG MONITORING.

II. CONTRAINDICATIONS:

NONE

III. PROCEDURE:**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.**
- The acquisition of a 12-lead EKG should not significantly delay treatment or transport

APPENDIX: 11

TITLE: AED Protocol

REVISED: October 15, 2014

THIS SUPPLEMENT IS FOR BLS PERSONNEL WHEN A PARAMEDIC IS NOT PRESENT, AND AN AED IS IMMEDIATELY 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 cardiac monitors used in ACCESS 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 your AED.
2. Turn on defibrillator power and apply electrodes according to manufacturer instructions.

3. Stop CPR per AHA guidelines, 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 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 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: 12

TITLE: VAGAL MANEUVER PROCEDURE

REVISED: October 15, 2014

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:

- Suspected SVT (or other rapid, narrow tachycardia) in a stable patient.
- Unstable patients require pharmacologic or electric 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

IV. PROCEDURE:

Patients should have continuous EKG monitoring and IV access. A 12-lead EKG is preferred prior to initiation.

VAGAL MANEUVERS

Valsalva 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

Do not perform the procedure if a bruit is heard on either side.

- 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 massaging 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: 13

TITLE: Cincinnati Prehospital Stroke Scale

Updated: October 15, 2014

The Cincinnati Prehospital Stroke 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):

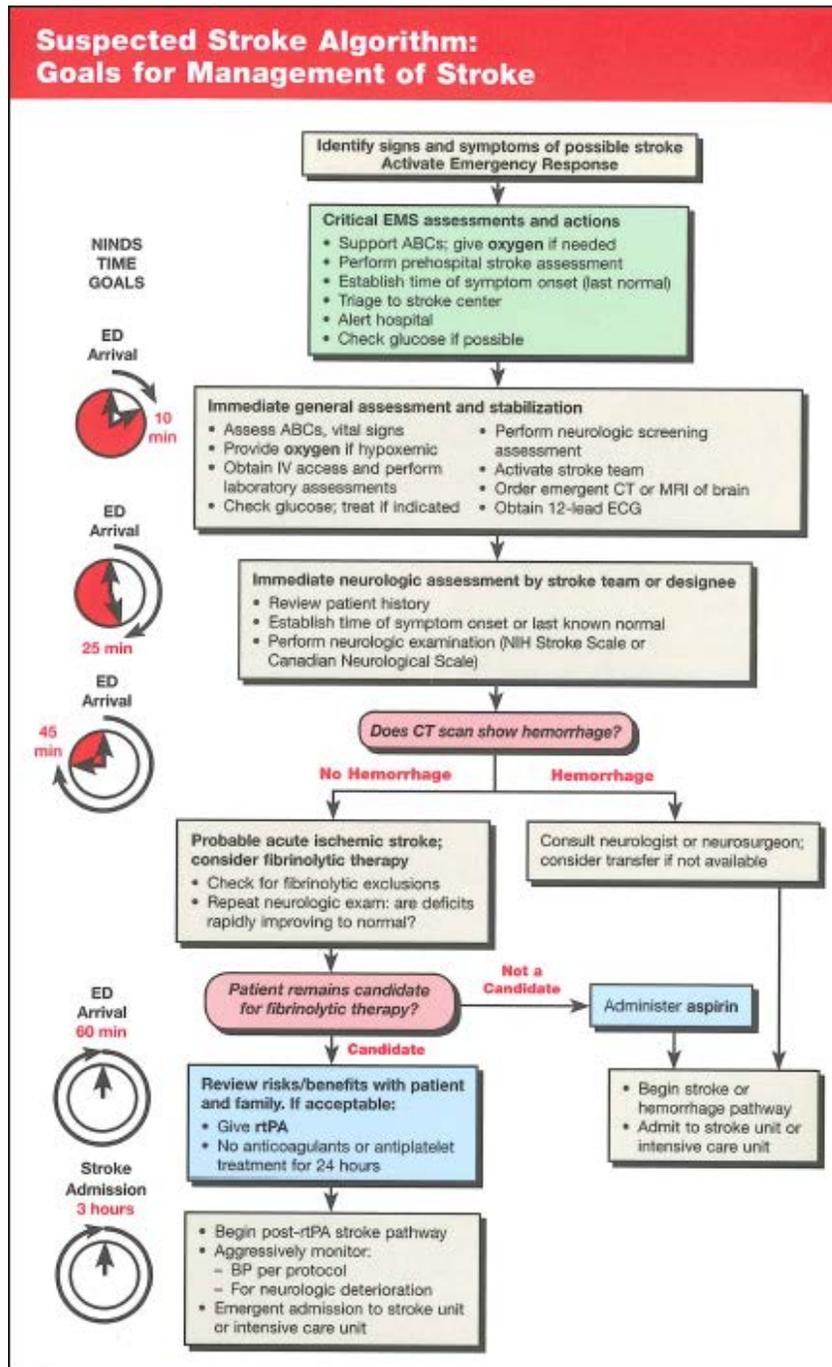
- Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)
- Abnormal – one arm does not move or one arm drifts down compared with the other



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 stroke is 72%



APPENDIX: 14**TITLE: INTRAOSSEOUS INFUSION PROCEDURES****REVISED: October 15, 2014**

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 suspected proximal vascular injury.
3. Severe pelvic trauma.
4. A previous intraosseous attempt in the same bone.

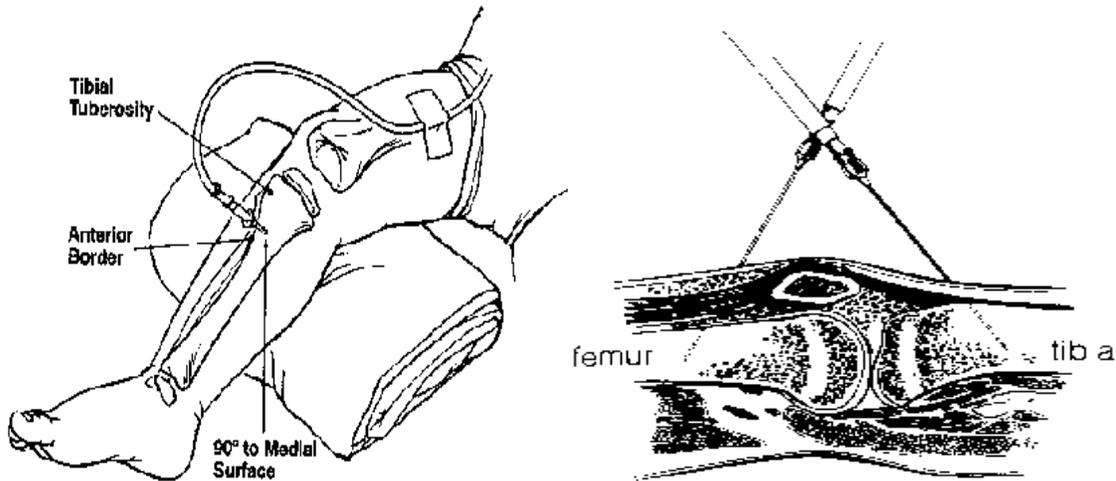
V. COMPLICATIONS:

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).

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).

- Place the patient 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.



- Using a 15-18-gauge IO bone marrow aspiration needle directed perpendicular and slightly caudad (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.
- Remove the stylet and using a syringe aspirate 1 ml of bone marrow. (This may best be accomplished by injecting 1 ml of IV solution prior to aspirating. Marrow will appear as pink or reddish aspirant.)
- Attach the IV tubing and fluids to be run using pressure bag. Observe for good flow.
- Stabilize the IO needle with 4 X 4's, kerlex rolls, and tape.

APPENDIX: 15

TITLE: EZ-IO Infusion System

REVISED: October 15, 2014

- **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 \leq 8)
 - Respiratory compromise (SpO₂ < 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)
 - 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 **not intended** 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 ml 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

EZ-10 INFUSION System

APPENDIX: 16**TITLE: Trauma Leveling Criteria****Updated: December 29, 2014**

Trauma Leveling Criteria for Field Providers**Level 1 Activation**

- SBP of 90 or less, respiratory rate <10 or >29
- Tachycardia HR >130 AND meet Level 2 criteria
- Age specific hypotension in children
 - <70mmHg + 2 x age)
 - HR > 200 or < 60
- Respiratory compromise/obstruction
- Intubation
- Inter-facility transfer pts receiving blood to maintain vital signs
- GCS 8 or less with mechanism attributed to trauma
- Major limb amputation
- Pregnancy >20 weeks gestation with leaking fluid or bleeding or abdominal pain that also meets Level 3 criteria
- Open skull fracture
- Paralysis and/or sensory deficit of an extremity
- Penetrating injury to abdomen, head, neck, chest or proximal limbs including the knee and elbow
- Emergency MD 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
- Ejection from ENCLOSED vehicle
- Burns >20% BSA 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
- Non-enclosed wheeled or mechanized transport > 20 mph
- Horse ejection or rollover
- > 12" intrusion into occupant space or vehicle
- "Star" any window or windshield
- Rollover
- Broken/bent steering wheel
- Trauma mechanism w/ change in LOC
- Amputation of one or more digits
- 10-20% TBSA (second or third degree) and/or inhalation injury

If one of the following is present increase to Level 2

- Transfer from another facility
- Taking anti-coagulants (other than aspirin alone)
- Extremes of cold or heat w/prolonged exposure
- 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.

Appendix: 17**TITLE: Selective Spinal Immobilization Protocol****REVISED: October 15, 2014**

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.

Selective Spinal Immobilization

APPENDIX: 18**TITLE: CAT Tourniquet or other similar device****REVISED: October 15, 2014**

INTRODUCTION: The Combat Application Tourniquet is an adjunct tourniquet used in ACCESS.

INDICATION: Refer to the general tourniquet SWO T-5

CONTRAINDICATIONS: Refer to the general tourniquet SWO T-5

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.

Tourniquet Use/C-A-T

APPENDIX: 19

TITLE: PATELLAR REDUCTION PROCEDURE

REVISED: October 15, 2014

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. Light medial pressure applied to the lateral aspect of the patella may facilitate ease in reduction. The patella should “pop” easily back into place as the knee approaches full extension.

PATELLAR REDUCTION

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.

APPENDIX: 20

TITLE: TASER CARE SUPPLEMENT

REVISED: October 15, 2014

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 **any** of the probes are embedded in the following areas **do not remove them and transport** 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
- Document removal procedure and any complications or comorbidities

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.

APPENDIX: 21
TITLE: NASAL/RECTAL MEDICATION PROCEDURE

REVISED: October 15, 2014

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 ml 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)
- FENTANYL (NASAL)

III. INDICATIONS:

- Status epilepticus without vascular access
- Altered mental status with suspected opiate overdose
- Pain medication administration

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 MEDICATION:

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 MEDICATION:
- 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 ml 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: 22

TITLE: DUODOTE™ PROCEDURES

REVISED: October 15, 2014

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 ACCESS Personnel and other responders through ACCESS, 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.**

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 responder's **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. Choose 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 light clothing.
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, place in appropriate sharps container.
10. Complete evacuation and decontamination procedures. Re-evaluate for need of further intervention.

V. 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.

DUODOTE™ AUTO-INJECTOR KIT

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Appendix: 23**PROTOCOL TITLE: Childbirth Procedure****REVISED: October 15, 2014**

INDICATIONS: Active labor with crowning confirmed by visual inspection.**PROCEDURE:**

1. Delivery should be controlled so as to allow a slow, controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Consider additional resources as there will be two potential patients.
3. Don mask, gloves, gown, eye protection.
4. Create a clean field around the vaginal opening with clean towels.
5. 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
6. Support the infant's head as it delivers. Apply gentle palmar counter-pressure to the head to prevent an explosive delivery.
7. If the umbilical cord is around the neck, attempt to slip it over the head. If unable to free cord from the neck, double clamp the cord (about 2 inches apart) and cut between the clamps.
8. Suction the airway (mouth and nostrils) with a bulb syringe after the head has delivered.
9. While continuing to support the head, gently lower the head to encourage delivery of the anterior shoulder.
10. Once the anterior (upper) shoulder delivers gently lift the head and anterior shoulder to allow delivery of the posterior shoulder.
11. Support the infant's body while delivering the remainder of the body. Keep the body at the level of or below the vagina so prevent loss of blood back to the placenta.
12. Clamp the cord at 6 inches and 9 inches from the neonate's abdomen and cut the cord between the clamps.
13. Vigorously dry the baby with clean, dry towels.
14. Record APGAR scores at 1 and 5 minutes.
15. Follow the **General Pediatric Care** protocol for further treatment.
16. The placenta will deliver spontaneously, usually within 5-25 minutes of the infant. Do not force the placenta to deliver or pull on the umbilical cord.
17. Massage the uterus and/or initiate breast feeding (as infant and/or maternal condition allows) to stimulate uterine contractions, decrease bleeding and initiate delivery of the placenta. If the placenta delivers, it should be retained for inspection. For post-partum hemorrhage refer to the **OB Emergencies** protocol.
18. Expedite transport following delivery of fetus. Do not delay transport for delivery of the placenta.

COMPLICATED DELIVERIES

- Code 3 transport to the closest appropriate (surgical capabilities) for ANY of the following complications

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
- Check cord for pulsation and rate
- Apply gentle pressure to presenting part and relieve pressure on the cord. Insert two fingers of gloved hand into vagina to raise the presenting part off the umbilical cord.
- Recheck cord for pulsation and rate. Keep cord moist and warm
- Administer high flow oxygen
- Rapid transport in this position with rapid notification of receiving facility

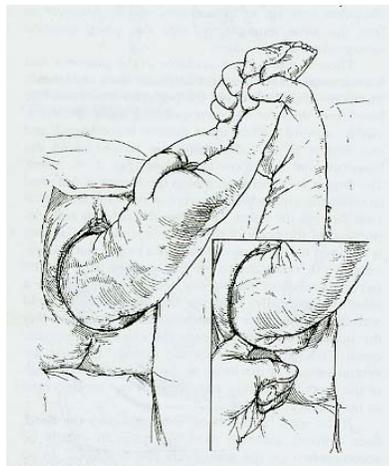
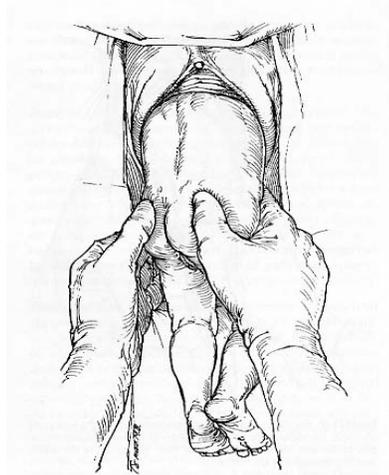
Cephalopelvic Disproportion: A condition where the babies head/body will not progress through the pelvis during delivery. Causes include large fetus, small or abnormally shaped pelvis, overdue deliveries and abnormal fetal positions.

- Immediate treatment is caesarian section
- Reposition the patient. Sometimes this will resolve the problem
- Press firmly on the Pubic Symphysis. This may open the birth canal further to allow passage of the head
-
- Rapid transport and notification of receiving facility

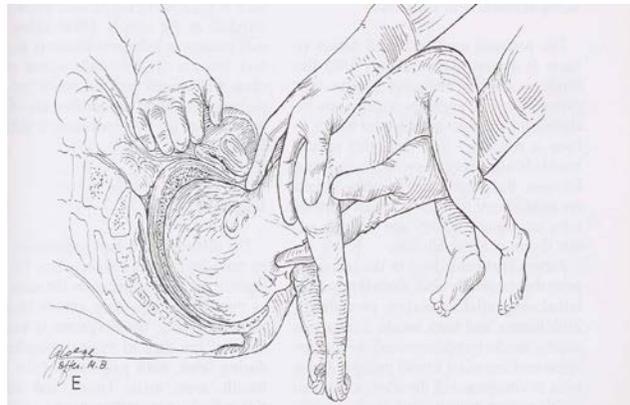
Breech/Limb Presentation: Breech presentation occurs when the buttocks or lower extremity are low in the uterus and will be the first part of the fetus delivered.

- Place mother in delivery position, elevate pelvis with pillows (Modified Trendelenburg)
- Administer high flow oxygen to mother
- See instructions/diagrams on following page

- Support the spontaneously presenting part until the back/umbilicus appear
 - 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
-
- 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.



- 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.



APPENDIX: 24**TITLE: Safe Haven Guidelines****REVISED: October 15, 2014**

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 a 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 child's best interest in mind.
- Provide any care needed, document thoroughly and contact law enforcement ASAP. This is to ensure that the child receives any medical care required.
- Unless care priorities dictate otherwise, the child should be taken to the closest 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: 25

TITLE: Integration of care reporting guidelines

REVISED: October 15, 2014

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: (<i>complete set</i>)	✓	✓
Treatment based on clinical impression:	✓	✓
ETA:	✓	✓
(Stay on Hospital Frequency)	✓	✓

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: <i>(Justified by announcing criteria)</i>	✓	✓	✓
Patient Age:	✓	✓	✓
Patient Gender:	✓	✓	✓
M echanism of Injury:	✓		
Stable vs Unstable		✓	
Last seen normal <i>(time/place)</i>			✓
Pertinent Exam Finding:		✓	✓
Pertinent I njury Finding:	✓		<input type="checkbox"/>
V ital Signs: <i>(complete set; with the LOWEST B/P recorded or any hypotension)</i>	✓	✓	✓
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.). 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: <i>(Justified by announcing criteria)</i>	✓	✓	✓
Patient Age:	✓	✓	✓
Patient Gender:	✓	✓	✓
M echanism of Injury:	✓		
Stable vs Unstable		✓	
Last seen normal <i>(time/place)</i>			✓
Pertinent Exam Finding:		✓	✓
Pertinent I Injury Finding:	✓		<input type="checkbox"/>
V ital Signs: <i>(complete set; with the LOWEST B/P recorded or any hypotension)</i>	✓	✓	✓
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: <i>(complete set)</i>	✓	✓
Treatment based on clinical impression:	✓	
PMH:	✓	✓
Medication:	✓	✓
Allergies:	✓	✓
Family Member Status:	✓	✓

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.

APPENDIX: 26**TITLE: IN-FIELD DEATH/POST/DNR****REVISED: October 15, 2014**

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 receiving facility
- 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) with ongoing ALS interventions.
- 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.

IN-FIELD DEATH/POST/DNR

IN-FIELD DEATH/POST/DNR

APPENDIX: 27**TITLE: S.O.A.P. GUIDELINES****REVISED: October 15, 2014**

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)
- Information obtained from bystanders and other sources
- Other pertinent history and information
- Response Times (Dispatch, On scene, etc.)
- History of C/C
- Pertinent Negatives

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

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.

NARRATIVE DOCUMENTATION (If documenting in the narrative form)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
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.

S.O.A.P. GUIDELINES

APPENDIX: 28

TITLE: ABBREVIATIONS

REVISED: October 15, 2014

@	AT	BCP	birth control pills
ā	before	BFD	Boise Fire Department
AAA	abdominal aortic aneurysm	BG	blood glucose
ABC circulation	airway, breathing,	BGL	blood glucose level
ABD, abd	abdomen	bicarb	bicarbonate
AC	antecubital	b.i.d.	twice per day
ACP	Ada County Paramedics	bilat	bilateral
ACL	anterior cruciate ligament	BiPAP	biphasic positive airway pressure
ACLS	Advanced Cardiac Life Support	BLE	bilateral lower extremities
ACS	Acute Coronary Syndrome	BLS	Basice Life Support
ADD	Attention Deficit Disorder	BM	bowel movement
ADHD	Attention Deficit Hyperactive Disorder	BP	blood pressure
admin	administration	bpm	beats per minute
AIDS	Acquired Immunodeficiency Syndrome	brady	bradycardia
ALS	Advanced Life Support	BS	breath sounds
am	morning	Bx	biopsy
AMA	against medical advice	C	Celsius
AMI	Acute Myocardial Infarct	C-1 to C-7	cervical vertebrae
amp	ampule	C section	cesarean section
ant	anterior	C-spine	cervical spine
A/O	alert and oriented	Ca++	calcium
APAP	acetaminophen	CA	cancer
approx	approximately	CABG	coronary artery bypass graph
appy	appendectomy	CAD	coronary artery disease
ARDS	Adult Respiratory Distress Syndrome	caps	capsule(s)
ASA	aspirin	cath	catheter
ASAP	as soon as possible	cc	cubic centimeter
ASHD	Arteriosclerotic Heart Disease	C/C	chief complaint
AV node	atrial ventricular node	CCU	Coronary Care Unit
BBS	bilateral breath sounds	CF	Cystic Fibrosis
		chemo	chemotherapy
		CHF	Congestive Heart Failure

ABBREVIATIONS

ABBREVIATIONS

chol	cholesterol	E	east
C	circulation	EBL	estimated blood loss
Cl	chlorine, chloride	EFD	Eagle Fire Department
cm	centimeter	ECG	electrocardiogram
CMS	circulation, movement sensation	ED	emergency department
CNS	central nervous system	EEG	electroencephalogram
c/o	complains of	EENT	eyes, ears, nose, throat
CO	carbon monoxide	EOM	extra ocular movement
CO ₂	carbon dioxide	Epi	epinephrine
COPD	chronic obstructive pulmonary disease	ER	emergency room
CP	chest pain	ET	endotracheal
CPAP	continuous positive airway pressure	EtCO ₂	end tidal carbon dioxide
CPR	cardiopulmonary resuscitation	ETT	endotracheal tube
CSF	cerebrospinal fluid	etc	etcetera
CT	computed axial tomography	ETOH	ethanol alcohol
CTA	clear to auscultation	eval	evaluation
C-T-L	cervical, thoracic, lumbar spine	ext	extremities, external
CVA	cerebrovasclar accident	F	Fahrenheit
DNR	do not resuscitate	Fe ⁺⁺	iron
DO	Doctor of Osteopathy	FHx	Family history
DOA	dead on arrival	Ft	feet
DOB	date of birth	f/u	follow up
DOE	dyspnea on exertion	Fx	fracture
Dr.	doctor	g	gram
DT	delirium tremens	ga	gauge
DTP	diphtheria, pertussis and tetanus	GCS	Glasgow Coma Scale
DUI	driving under the influence	gest	gestation, gestational
DVT	deep vein thrombosis	GI	gastrointestinal
Dx	diagnosis	GLF	ground level fall
D5W	5% dextrose in sterile water	GSW	gun shot wound
		Grav (I, II...)	number of pregnancies
		gtt(s)	drops
		GU	genitourinary

GYN	gynecology		
h	hour		
H+	hydrogen	l	liter
HA	headache	L	left
HC03-	bicarbonate	L-1 to L-5	lumbar vertebrae
HEENT	head, eyes, ears, nose, throat		
Hg	mercury	lab	laboratory
HHN	handheld nebulizer	lac	laceration
HIPAA	Health Insurance Portability & Accountability Act	LAD	left anterior descending coronary artery
HIV	human immunodeficiency virus	lap	laparotomy
HR	heart rate	lat	lateral
Hx	history	lb(s)	pounds
H ₂ O	water	LCA	left coronary artery
H ₂ O ₂	hydrogen peroxide	lg	large
		LLE	left lower extremity
		LLL	left lower lobe
		LLQ	left lower quadrant
ICP	intracranial pressure		
ICU	Intensive Care Unit		
ID	identification	m	meter
IDDM	insulin dependent diabetes mellitus	MAE	moves all extremities
i.e.	that is, for example	MAX	maximum
IM	intramuscular	mcg	microgram
IN	intranasal	MD	Medical Doctor
in	inches	med	medicine
inf	inferior	mEq	milliequivalent
IO	intraosseous	mg	milligrams
I & O	intake and output	Mg++	Magnesium
IV	intravenous	Mg/dL	milligrams per deciliter
		MI	Myocardial Infarct
		MICU	Mobile Intensive Care Unit
JVD	jugular venous distension	min	minute
		ml	milliliter
		mm	millimeter
K+	potassium	mmHg	millimeters mercury
kg	kilogram	mod	moderate
KFD	Kuna Fire Department	MFD	Meridian Fire Department
KVO	keep vein open	MOI	mechanism of injury

ABBREVIATIONS

MOM	Milk of Magnesia	OR	operation room
MRI	magnetic resonance imaging	ortho	orthopedics
MS	Multiple Sclerosis	OTC	over the counter
MVA	Motor Vehicle Accident	oz	ounce
MVC	Motor Vehicle Collision		
		\bar{p}	after
N	north	PA	Physician's Assistance
NICU	Neonatal Intensive Care Unit	PAD	peripheral artery disease
		palp	palpation, palpated
NIDDM	Non-insulin dependent diabetes mellitus	para (I, II...)	prior births
		path	pathology
NKA	no known allergies	PASG	pneumatic anti-shock garment
NKDA	no known drug allergies	p.c.	after meals
noct	nocturnal	PCL	posterior cruciate ligament
NP	Nurse Practitioner	PCN	penicillin
NPO	nothing by mouth	PCP	Primary Care Physician
NRB	non-rebreather mask	PDR	Physician's Desk Reference
NSAID	non-steroidal anti-inflammatory drug	PE	pulmonary embolism
		ped(s)	pediatrics
NTG	nitroglycerine	PEEP	Positive End Expiratory Pressure
N/V	nausea & vomiting		
Na+	sodium	PERL	pupils equal reactive to light
NaCl	sodium chloride	pH	hydrogen ion concentration (acidity)
NAD	no apparent distress	PICU	Pediatric Intensive Care Unit
n/c	nasal cannula	PID	pelvic inflammatory disease
Neb	nebulizer	PMHx	past medical history
neg	negative	PMD	Primary Medical Doctor
neuro	neurology	PMS	pulses, movement, sensation
NG	nasogastric tube	PND	paroxysmal nocturnal dyspnea
		p.o.	by mouth
O ₂	oxygen	postop	post-operative
O ₂ sat	oxygen saturation	preop	pre-operative
OB	Obstetrics	p.r.n., PRN	as needed
OB/GYN	Obstetrics & Gynecology	prox	proximal
OD	overdose		
OLMC	On-Line Medical Control		

psi	pounds per square inch	s	without
psych	psychiatry	S	South
Pt, pt	patient	SARMC	St. Alphonsus Regional Medical Center
P.T.	Physical Therapist or therapy		
PVD	peripheral vascular disease	sat	staturtion
PX, px	physical examination	sec	second
		SID	Sudden Infant Death Syndrome
q	every	SL	sublingual
QA	quality assurance	SLMMC	St. Luke's Meridian Medical Center
q.d.	every day	SLRMC	St. Luke Regional Medical Center
q.h.	every hour		
q2h, ...	every 2 hours	SpO2	pulse oximetry
q.i.d.	four times a day	SOB	shortness of breath
q.o.d.	every other day	S/P, s/p	status post
QRU	quick response unit	SQ, sq	subcutaneous
quad	quadriplegic	staph	staphylococcus
		SFD	Star Fire Department
R	right	STAT	immediately
RBC	red blood cell	STD	sexually transmitted disease
RCA	right coronary artery	STEMI	ST Elevation Myocardial Infarct
re:	regarding		
rehab	rehabilitation	strep	streptococcus
resp	respiration(s)	SW	stab wound
RLE	right lower extremity	Sx, sx	symptom
RLL	right lower lobe	Sz, sz	seizure
RLQ	right lower quadrant	S1 – S5	sacral vertebrae
RML	right middle lobe	s/s	signs & symptoms
RN	registered nurse		
R/O, r/o	rule out	tab (s)	tablet
ROM	range of motion	TB	tuberculosis
RR	respiration rate	tbsp	tablespoon
RT	respiratory therapist	TCA	Tricyclic antidepressant
RUE	right upper extremity	temp	temperature
RUL	right upper lobe	TIA	Transient Ischemic Attack
RUQ	right upper quadrant	t.i.d.	three times a day
Rx	prescription	TKO	to keep open
		TMJ	temporomandibular joint

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

A-fib	atrial fibrillation	↑	increase
AT, A-tach	atrial tachycardia	↓	decrease
AV	atrial ventricular	≅	approximately equal to
		~	approximately
BBB	bundle branch block	△	change
		♀	female
1 HB	first degree heart block	♂	male
2 HB	second degree heart block	⊖	no or none
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		

ABBREVIATIONS

APPENDIX: 29**TITLE: POLICE REQUESTED BLOOD DRAW****REVISED: December 2, 2014**

- An investigating officer **MUST** be present when drawing the specimen.
- Confirm the officer has lawful authority to request you perform a blood draw.
- Use kit provided by the law enforcement officer.
- Check the tubes in the kit for expiration date.
- Cleanse the blood collection site with the alcohol-free pad. **DO NOT USE ALCOHOL.**
- Perform the venipuncture. Allow the tubes to fill to maximum volume.
- Immediately after blood collection, assure proper mixing of anticoagulant powder by slowly and completely inverting the blood tube at least five times. **DO NOT SHAKE VIGOROUSLY.**
- Hand the tubes to the officer while you draw the next specimen tubes or hold them in your hand within view of the patient and officer.
- Transfer the tubes directly to the officer if you haven't already done so.
- Discard sharps in proper container.
- Specimen seals will require collector's initial where indicated.
- On the Toxicology submittal form fill out the "Sample Collected by (name, title and facility)" and Date/Time of Sample Collection. The officer is responsible for completing all other relevant information on the form.
- Document procedure on a PCR.

POLICE REQUESTED BLOOD DRAW

Title POLICE REQUESTED BLOOD DRAW

A grey square containing the white letters "RX" in a serif font.

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 A₂ & prostacyclin. Thromboxane A₂ causes platelet aggregation and vasoconstriction. Prostacyclin inhibits platelet aggregation and vasodilation. Clinically the blockage of Thromboxane A₂ predominates.
- By suppressing the formation of prostaglandins near the hypothalamus, 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 ALL 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***

The logo consists of the letters 'RX' in a white, serif font, centered within a dark gray square.

Drug Name: Adenosine

Trade Name: Adenocard

Class:

- Supraventricular Antiarrhythmic
- 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 initial 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.**

The image shows a large, white, serif 'RX' logo centered within a dark gray square background.

Drug Name: Albuterol Sulfate

Trade Name: Albuterol, Proventil, Ventolin

Class:

- Beta₂ Agonist
- Sympathomimetic

Mechanism of Action:

Acts selectively on Beta₂ 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, O₂ 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.

DRUG: ALBUTEROL

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 beta₂-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
- Amiodarone 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 20 ml 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).

Amiodarone

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 Phenyton, Procainamide, Quinidine, and Theophyline.
- 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*
 - Carbamates*
 - Mushrooms*
 - Nerve gas*
 - Other cholinergic agents*

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 mnemonic:
 - 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.



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

<p>“S.L.U.D.G.E.”</p> <p>Salivation (excessive production of saliva) Lacrimation (excessive tearing) Urination (uncontrolled urine production) Defecation (uncontrolled bowel movement) Gastrointestinal distress (cramps) Emesis (excessive vomiting)</p>	<p>“D.U.M.B.E.L.S.” (Muscarinic)</p> <p>Diarrhea Urination Miosis Bradycardia/Bronchospasm/Bronchorrhea Emesis Lacrimation Salivation, Secretion, Sweating</p>
<p>“B.A.M.”</p> <p>Breathing Difficulty (wheezing) Arrhythmias (Bradycardia, ventr. Arrhythmias, AV Blocks.) Miosis (pinpoint pupils)</p>	<p>Days of the Week (Nicotenic)</p> <p>Mydriasis Tachycardia Weakness Hypertension, Hyperglycemia Fasciculations</p>
<p>“Three C’s” of CNS effects</p> <p>Confusion Convulsions Coma</p>	

DRUG: ATROPINE SULFATE

RX

DRUG: ATROPINE SULFATE

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A large, white, serif 'RX' logo is centered within a dark gray square box in the top right corner of the page.

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 MgSO₄ 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.***

The logo consists of the letters 'RX' in a large, white, serif font, centered within a dark gray square.

Drug Name: Hydroxocobalamin 5 g
Trade Name: Cyanokit[®]

Class:

- Antidote (for known or suspected cyanide poisoning)

Mechanism of Action:

- Action of Cyanokit is the ability to bind cyanide ions
- Each hydroxocobalamin ion can bind one cyanide ion by substituting it for the hydroxo ligand linked to the trivalent cobalt ion
- Bind forms cyanocobalamin
- Cyanocobalamin is excreted in the urine

Indications:

- Known or suspected cyanide poisoning
 - Can be inhalation, ingestion or dermal exposure
- Can be used even if the presence or extent are not known
- Signs of cyanide ingestion include:
 - *Altered LOC, seizures, coma, cardiovascular collapse, vomiting, *mydriasis, tachypnea(early), bradypnea(late), hypertention(early), hypotention(late)
- Symptoms include:
 - Headache, *confusion, dyspnea, chest tightness, nausea

*(*considered significant symptoms)*

Contraindications:

- None

Precautions:

- Known anaphylactic reactions to hydroxocobalamin or cyanocobalamin
 - Allergic reaction include: anaphylaxis, chest tightness, edema, urticarial, pruritus, dyspnea, rash
- Substantial increases in blood pressure may occur following Cyanokit administration
- Patients with renal insufficiency

Dosage and Administration:

Adults:

- Add 200 mL of 0.9% Sodium Chloride into the vial
 - Vial contains 5 g of medication
- Shake for at least 60 seconds to reconstitute
- **Infuse into patient over 15 minutes**
- One vial is a complete starting dose
 - Depending on the severity of the poisoning and patient response, a second dose over 15 minutes may be infused for a total dose of 10 g.

DRUG: Cyanokit[®]

RX

DRUG: Cyanokit[®]

Pediatrics:

- **No recommended dose**

Onset:

- Depends on severity of exposure

Side Effects:

Minor:

- Chromaturia (red colored urine)
- Erythema (red skin)
- Headache
- Nausea

Major:

- Hypertention

Interactions:

- Interacts with a number of medications and blood products
- Must use a separate intravenous line or flush existing line adequately

PEARLS:

- ***Pediatric doses have not been established in US***
- ***Non-US: doses at 70 mg/kg have been used to treat pediatrics***
- ***No adjustment of dose is required for Geriatric patients***

The image shows a grey square with the letters 'RX' in a white, serif font.

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 repeated once in 20 minutes, **Max 20 mg**
- Sedation/Cardioversion/Pacing: 2-5 mg slow IV every 5-10 minutes **Max 10 mg**

DRUG: DIAZEPAM

RX

DRUG: DIAZEPAM

Dosage:**Pediatrics:**

- Seizures—0.2 mg/kg slow IV/IO (every 5 min.)
0.5 mg/kg PR.
- **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:

- CNS Depression
- Dizziness
- Drowsiness

Minor:

- 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.
- Extrapyrimal (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 B₂ 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 dependent on its effects.

1-2 $\mu\text{g/kg/min}$ --dopaminergic receptors--dilation of renal, mesenteric, and cerebral arteries

2-10 $\mu\text{g/kg/min}$ --beta receptors--inotropic, chronotropic

10-20 $\mu\text{g/kg/min}$ --alpha & beta--vasoconstriction of renal, mesenteric, and peripheral arteries and veins

>20 $\mu\text{g/kg/min}$ --Mimics pure alpha effects similar, to norepinephrine 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 $\mu\text{g/kg/min}$, occasionally up to 50 $\mu\text{g/kg/min}$, generally not exceeding 20 $\mu\text{g/kg/min}$ without medical control guidance.

Titrate to effect, run through a large vein.

Generally add two vials 200 mg to 250 ml NS, yielding 1600 $\mu\text{g/ml}$, although some alternative methods exist

Pediatrics:

2-20 $\mu\text{g/kg/min}$, with 10 $\mu\text{g/kg/min}$ is a reasonable starting dose, titrated to effect, generally not exceeding 20 $\mu\text{g/kg/min}$.

Add 6 mg x weight in kg diluted to 100 ml, to create drip.

1gtt/min (ml/hr) equals 1 $\mu\text{g/kg/min}$.

Onset:

2-4 min.

DRUG: DOPAMINE

RX

DRUG: DOPAMINE

Duration:

10-15 min

Side Effects:

Dysrhythmias	Flushing
HTN, Headache	Angina, AMI
Nausea & Vomiting	Pain
Dizziness	Ectopy
Tremors	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 ml for a 1600mcg/1 ml 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:

- β_1 --contractility, inotropic, increases AV conduction, automaticity
- β_2 --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
- Deactivated/Precipitates with alkaline solutions (NaHCO₃)
- Will increase myocardial oxygen demand
- Pulmonary edema
- Pregnancy (C)
- Geriatrics
- Protect from light

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) 3 mg (3 ml) mixed with 3 ml NS for 6ml total 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 μ g/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 ml)

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*) 3 mg (3 ml) mixed with 3 ml NS for 6ml total epinephrine 1:1,000 nebulized undiluted
- **PED Epinephrine Infusion 0.1-2 mcg/kg/min (Medical Control Call In)**

Croup & Epiglottitis:

- Epinephrine Neb (*for laryngeal edema only*) 3 mg (3 ml) mixed with 3 ml NS for 6ml total epinephrine 1:1,000 nebulized 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



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 ml with microdrip 4 mcg/ml concentration	1 mg/100 ml 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

DRUG: EPINEPHRINE

RX

DRUG: EPINEPHRINE

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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 its 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*

A large, white, serif 'RX' logo is centered within a dark gray square box in the top right corner of the page.

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)
- 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.
- Hypersensitivity
- Head injury

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/IO/IM/IN: 1 mcg/kg initial dose (max initial dose 100 mcg)
- Give slowly over 2 min (with the exception of the IN route)
- May repeat every 10 min PRN. Max total dose 200 mcg.

Pediatrics (Greater than 2 years of age):

- IV/IO/IM/IN: 1-2 mcg/kg initial dose (Max initial dose 75 mcg)
- Give slowly over 2 min (exception with IN route)
- May repeat every 10 min PRN Max dose 150 mcg.

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 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, essential in the diagnosis of abdominal pain. **Therefore medication of abdominal pain is both humane and appropriate medical care.**

RX

Drug Name: Glucagon

Trade Name: Glucagon

Class:

Pancreatic Hormone (α_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 release*)
Known Pheochromocytoma (*can precipitate substantial hypertension secondary to catecholamine release*)

Precautions:

Cardiac Disease / CAD	Hepatic disease
Geriatrics	Renal Insufficiency
Malnutrition	Pregnancy (B)
Alcoholism	

Dosage:

Adults:

Hypoglycemia:

1 mg IM

If ineffective may re-administer 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:

Hypoglycemia

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, malnutrition, 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.

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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 ACCESS SWO's**)
- One reference suggested in children 6-12 years of age: 1-3 mg IV or IM (**Not covered in ACCESS 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.

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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 Opioid 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 than 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.

A grey square containing the white letters 'RX' in a serif font.

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, O₂ 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 bronchodilation than albuterol alone.***



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 slow 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 | • Dysphoria | • Arrhythmias |
| • Hallucinations | • Hypersalivation | • CNS Depression |
| • Delirium | • N/V | • Respiratory Depression |
| • Recovery Agitation | • Anaphylaxis | |
| • Tachycardia | • Reemergence phenomenon | |
| • Hypertension | | |

Ketamine Hydrochloride

RX

Ketamine Hydrochloride

Interactions:

Additive/Potential 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 5 minutes **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 pressure—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 μ g/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 $\frac{1}{2}$ 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 $\frac{1}{2}$ 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 resuscitation has shown effectiveness only for the treatment of patients with hypomagnesemic states or polymorphic ventricular tachyarrhythmia (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 Bronchoespasm: IV: 2 g every 5 minutes, 1st line for Torsades or refractory V-Fib/Pulseless V-Tach. Take 2 g (4ml), dilute to a total of 20 ml 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 ml. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250ml NS, run at 50ml/hr (2 g/hr)

Eclamptic Seizures — IV: 4 g over 5 minutes, repeat as needed. Take 4 g, Dilute to 100 ml. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250ml NS, run at 50ml/hr (2 g/hr)

Pediatrics:

Refractory VT, VF, TDP, Refractory Bronchoespasm 25-50 mg/kg in 100 ml 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	Cardiac arrest
Itching/Rash	Circulatory collapse
Hypothermia	Complete heart block
Drowsiness	Flaccid paralysis
Respiratory depression	Absence of knee jerk
Respiratory failure	Hypotension, Diaphoresis
Bradycardia/AV block	

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.***

A grey square containing the white letters 'RX' in a serif font.

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 A₂ 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 ACCESS 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/IM: 0.2 mg/kg repeat every 5 minutes PRN. Max 10 mg.
 - IV/IO: 0.1 mg/kg every 5 –10 minutes PRN. Max 5 mg.
- **Sedation for painful procedures, cardioversion, pacing, muscular spasms, hyperdynamic drug ingestion/exposure:**
 - IV/IO/IM: 0.05-0.1 mg/kg every 5-10 min (over 2-5 minutes if IV). Maximum dose of 2.5 mg
 - IN: 0.2 mg/kg every 5-10 min. Max dose 2.5 mg
 - Not for children under 2 yrs.

Onset:

- IV: 1-3 minutes (dose dependent)
- IN: 1-5 minutes (dependent 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.

A large, white, serif 'RX' logo is centered within a dark gray square box in the top right corner of the page.

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
- Hypersensitivity
- 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/IO: 0.1 mg/kg initial dose (Max initial dose 10 mg)
 - Give slowly over 2 minutes
 - May repeat every 10 min as needed at 0.05 mg/kg
 - Max total dose 20 mg

Pediatrics:

- IV/IO/IM: 0.1 mg/kg initial dose (Max initial dose 5 mg)
 - Give slowly over 2 minutes
 - May repeat every 10 min as needed at 0.05 mg/kg
 - Max total dose 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 enhance 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 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, essential in the diagnosis of abdominal pain. **Therefore medication of abdominal pain is both humane and appropriate medical care**

A grey square containing the white letters "RX" in a serif font.

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



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 (intra-buccal) 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 $\mu\text{g}/\text{min}$, titrated for effect 5-10 $\mu\text{g}/\text{min}$ every 5 minutes up to a max of 200 $\mu\text{g}/\text{min}$ (**Hold for systolic <90, titrate up and down in 5 mcg increments**) **NTG DRIP NOT COVERED IN SWO'S**



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-parkinsonian 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 ACCESS)**
 - 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 ACCESS)**
 - 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 Gravidarum (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 patients with an intact gag reflex and who are able to handle their own secretions.

Pediatrics:

- 5-45 G PO for patients 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 milk 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:

- **In SWO's this is a medical control call in medication**
- 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
Geriatrics
Diabetes
CVD
HTN

Increased ICP
Hyperthyroidism
Pregnancy (C)
Glaucoma

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
Sneezing

Dryness
Anxiety

Side effects below are secondary to IM/IV use:

Restlessness
Tremors

Dizziness
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: 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.***

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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 ml, run at 150 ml/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 ml, run at 150ml/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)
- Hyponatremia
- 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 alkalization. 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. 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
- 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

A large, white, serif 'RX' logo is centered within a dark gray square box in the top right corner of the page.

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

PEARLS

- *Don't forget good BLS care as well.*

DRUG: TETRACAINE

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 postjunctional 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**