Statewide Standard Treatment Protocols

Paramedic Standing Orders, Guidelines, and Policies 2018

Effective: November 5, 2018

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State of Delaware
Department of Health and Social Services
Division of Public Health
Office of Emergency Medical Services

2018 Statewide Standard Treatment Protocols, Guidelines, Policies and Paramedic Standing Orders

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INTRODUCTION

The standing orders of the Statewide Standard Treatment Protocol have been developed for use by paramedics while functioning in the Delaware Paramedic Services System. These Standing Orders replace the previous set and are initially effective on November 5, 2018. The Standing Orders are specific and should not be open to alteration. However, while many of the common, frequently encountered medical emergencies have been addressed by specific standing order, it is recognized that not all patient presentations are clear-cut, nor will all patients benefit from "recipe" treatment approaches. Standing orders do not replace the need for sound clinical judgment or the need to **contact medical control** as soon as possible.

Standing orders are not intended to provide definitive treatment, but are intended to stabilize the patient prior to transport to the hospital for definitive treatment. Deviation from standing orders may be undertaken only by direct order from an approved medical control physician serving as Medical Command within an approved facility.

The intent of these orders is two-fold: 1) promotion of statewide standardization of prehospital advanced life support services, and 2) provision of guidelines under which paramedics may initiate life-saving treatments prior to establishing contact with medical control.

The ultimate goal of the Delaware Paramedic System is to deliver viable patients to the hospital, thereby creating a positive impact on health care in Delaware.

Unless marked specifically as optional, these standing orders and equipment list are to be complied with by all paramedic agencies. All Delaware paramedic agencies must be in compliance with the ability to perform the standing orders within a period of time determined by the State EMS Director.

PARAMETERS OF PARAMEDIC PRACTICE

Paramedics are not authorized, in the State of Delaware, to function as independent providers of advanced life support services.

Paramedics function as physician extenders and, as such, participate in the practice of medicine. Paramedics may only perform advanced life support procedures when functioning as members of an on-duty Advanced Life Support (ALS) unit. Such a response unit must be from a state approved paramedic service whose paramedics are functioning under the license of the State Emergency Medical Service's Medical Director.

The prehospital provision of ALS services by a paramedic in any other situation constitutes the unlawful practice of medicine. Off duty paramedics who respond to a scene are considered good Samaritans and are only expected to perform at the level of a first responder unless activated by an agency policy or procedure.

These situations include but are not limited to: performing ALS skills while serving on Basic Life Support (BLS) units, carrying ALS equipment in personal vehicles for the purpose of responding to medical emergencies, and offering or providing paramedic services in settings other than those described above.

PARAMEDIC SCOPE OF PRACTICE

Delaware paramedics serve as physician extenders in providing prehospital advanced life support within the state, and, as specified in reciprocity agreements, in surrounding states.

The underlying objective of all paramedic activities is the rapid treatment, stabilization, and transport of the sick and injured to appropriate receiving facilities. The paramedic is authorized to provide all "first responder" and basic life support interventions in addition to the advanced life support procedures specified by this statewide standard treatment protocol, as approved by the Board of Medical Licensure and Discipline. Unless an imminent threat to life or limb necessitates immediate treatment, it is in the patient's best interest for the paramedic to obtain the chief complaint, history of present illness, pertinent past medical history, list of medications, and conduct a directed physical examination. Information gathered during the assessment is then used to guide treatment.

Paramedics respond to all calls to which they are dispatched, whether the nature of the call is medical or trauma. Paramedics evaluate and treat prehospital patients utilizing guidelines specified by these protocols. Communication is to be established with medical control as soon as possible, even if treatment of the patient does not require authorization by medical control. Treatments that do require authorization by medical control shall not be carried out on the paramedic's own initiative except under exceptional circumstances where communication with medical control is not immediately obtainable and, in the opinion of the paramedic, the patient's life may be jeopardized by further delay. At no time shall paramedics perform procedures beyond their scope of training or practice. A list of procedures ordinarily accomplished by protocol and verbal order of medical control follows and clearly defines the scope of paramedic practice. All patients evaluated by the paramedics are to be transported to the hospital. The only exceptions to this rule occur when patient care is released to another EMS agency; the patient receives an appropriate treatment and then refuses transportation to a hospital or when the patient refuses service. In some instances, medical control must be contacted for authorization per standing order.

In cases of anticipated, actual or pending public health need, paramedics may be authorized by the Director of Public Health, and the State EMS Medical Director to give immunizations and vaccinations against infectious/communicable diseases. Specific immunization standing orders, administrative procedures and modifications to protocols must be authorized and signed by the Director of Public Health the State EMS Director and the State EMS Medical Director. This standing order must meet or exceed the policy standards and guidelines established by the National Vaccine Advisory Committee of the Centers for Disease Control (CDC). Participation in the vaccination program by Delaware Paramedic Agencies is elective.

Use of the standing orders within the Statewide Standard Treatment Protocol is straightforward. When ALS providers functioning as Delaware paramedics encounter a patient meeting the proper criteria as described in the order, treatment should be initiated. The orders are designed to permit paramedics to render emergent treatment of the sick and injured. Treatment should proceed through the protocol until the patient's condition changes or stabilizes. If the change in patient condition meets the criteria for a different standing order, treatment should be altered accordingly. Once the patient is stabilized, or the orders have been completed, medical control contact should be considered. Medical control may be contacted at any point during patient care, preferably early in the course of therapy, but must be contacted in all cases, preferably before transportation is initiated, unless the trauma protocol is in use.

“Any person, agency, organization or entity who knows or in good faith suspects child abuse or neglect shall make a report in accordance with § 904 of this title (Title 16 of Delaware Code). For purposes of this section, "person" shall include, but shall not be limited to, any physician, any other person in the healing arts including any person licensed to render services in medicine, osteopathy or dentistry, any intern, resident, nurse, school employee, social worker, psychologist, medical examiner, hospital, health care institution, the Medical Society of Delaware or law enforcement agency."

Child Abuse Reporting Phone Contact:1-800-292-9582 or www.iseethesigns.org

Any person having reasonable cause to believe that an adult person is infirm or incapacitated as defined in § 3902 of this title (Title 31 of Delaware Code) and is in need of protective services as defined in § 3904 of this title shall report such information to the Department of Health and Social Services.

Division of Services for Aging and Adults with Physical Disabilities (DSAAPD): 1-800-223-9074.

National Human Trafficking Resource Center Hotline 1-888-373-7888

If an EMS provider has reasonable cause to suspect that a person is a potential victim of human trafficking, report the concern. National Human Trafficking Resource Center Hotline 1-888-373-7888 (24 hours). The NHTRC call takers are trained to assist by discussing a case in a HIPAA compliant manner.

MINIMUM SKILLS AND PROCEDURES

The following are skills and procedures that all paramedics must demonstrate proficiency in for initial certification and must maintain proficiency in for recertification. Procedures that are allowed only with approval by medical control are marked by an asterisk (*). All equipment/devices carried by or utilized by ALS agencies require the **written approval** of the State EMS Medical Director or his/her designee.

1. Patient assessment (primary and secondary surveys)
2. Obtaining vital signs including temperatures
3. Airway control (manual)
4. Use of airway adjuncts (nasopharyngeal and oropharyngeal airways)
5. Spine immobilization/stabilization
6. Cardio-pulmonary resuscitation
7. Bleeding control
8. Splinting of fractures and dislocations
9. Endotracheal intubation (oral and nasal)
10. Obtaining IV access (includes use of saline locks and accessing central lines)
11. Medication, vaccine and immunization administration (parenteral, intraosseous, endotracheal, intranasal, nebulized, oral, sublingual, and transdermal)
12. Calculation of drug dosages
13. Defibrillation/cardioversion (includes use of SAED)
14. Dysrhythmia recognition and treatment
15. External cardiac pacing
16. Use of suction equipment
17. Application of oxygen delivery devices (includes use of CPAP)
18. Use of bag-valve-mask device
19. Application of cardiac monitors
20. Venipuncture to obtain blood samples
21. Vaginal delivery
22. Eye irrigation
23. External jugular cannulation
24. Use of Magill forceps to remove foreign body from the obstructed airway
25. Pulse oximetry and CO-oximetry
26. Capnography (nasal and endotracheal)
27. 12 lead electrocardiogram (ECG)
28. Blood glucose determination and other point of care testing devices as approved by the State of Delaware Medical Directors.
29. Valsalva maneuvers (to control supraventricular tachycardia)
30. Intraosseous access for fluid/medication administration
31. Use of approved rescue airway device
32. Gastric tubes
33. Surgical/Needle cricothyrotomy
34. Needle chest decompression
35. *Presumptive diagnosis of death*
36. Use of pelvic compression devices
37. Use of approved ventilator device
38. Use of tourniquets and approved hemostatic agents
39. Use of approved mechanical chest compression device
40. Provision of post resuscitation care
41. Application of Abdominal Aorta Junctional Tourniquet (AAJT) (Optional)

PARAMEDIC RADIO/TELEPHONE REPORTS GUIDELINES

The paramedic report to medical control should be brief and concise. The goal is to provide enough vital information to medical control so that they may provide informed direction for the patient's continued care and plan for the patient's disposition. Reports generally should not exceed thirty (30) seconds in duration in order to provide economical use of time by the paramedic, the medical control physician, and nursing personnel. The paramedic is to first attempt to contact the Delaware Medical Control facility of intended patient disposition. If a paramedic does not obtain a timely response, they may contact a second Delaware Medical Control facility for orders or consultation. If an out of state hospital is the intended destination, the EMS provider should contact the closest Delaware Medical Control facility.

- For ALS Priority I patients or patients requiring online medical direction for orders or consultation following report format is acceptable:
- Paramedic unit number.
- Specific notification or requests such as (DFI, DOPA, Trauma Alert, Trauma Code, Cardiac Arrest, Stroke Alert, Heart Alert, CPAP, Sepsis Alert, etc.)
- Estimated time of arrival.
- Priority.
- Patient age.
- Patient sex.
- Chief complaint and related past medical history (i.e., patient with chest pain, history of MI and CABG or patient with altered mental status and history of insulin dependent diabetes).
- Vital signs.
- Significant physical findings (i.e., patient with shortness of breath found to have wheezing and to be hot to the touch, or the patient complaining of leg pain who has deformity of the mid thigh without distal pulses).
- Care rendered.
- Response to care.
- Orders requested.
- Run case number is required for DOPA or relay information as soon as possible prior to leaving shift

In patients who have an ALS Priority of II or III and are being treated by standing orders with no anticipated requests for orders, the following brief report format is acceptable:

- Paramedic unit number.
- Priority.
- Patient age.
- Patient sex.
- Chief complaint
- Standing Order being followed
- Estimated time of arrival.

PARAMEDIC DOCUMENTATION RECORDS POLICY

At the time of patient delivery to an approved healthcare facility, the paramedic must give a verbal report to a physician or nurse at the patient's bedside and leave identified copies of all pertinent ECGs, rhythm strips, and printed patient trend data. **All IV bags that have been mixed with a medication must be labeled at time of ED disposition.**

Patient care is not finished until a patient care report (PCR) is completed. Paramedics must complete, without exception, a written/computer report on each patient contact. All PCRs should be completed within four (4) hours of patient delivery. **Without exception, a PCR must be completed and submitted to the receiving facility before a paramedic goes off duty.**

ADULT GENERAL PATIENT CARE

INDICATIONS: *Any adult (age 15 years of age and greater) patient requiring pre-hospital medical evaluation by a prehospital healthcare provider in the State of Delaware*.

A patient is an individual who is sick, injured, wounded or otherwise incapacitated or helpless and/or seeks immediate medical attention for whom EMS has been activated. A person that denies the need for EMS but any reasonable EMS provider can see that a person(s) has an obvious injury or illness, should be considered a patient and treated as such.

The Adult General Patient Care protocol will be followed in conjunction with all other applicable protocols.

The most current version of the American Heart Association Guidelines for Cardiopulmonary Resuscitation is considered the standard for CPR within these protocols.

Respond using lights and sirens in accordance with Priority Medical Dispatch® (PMD®) protocols currently approved by Delaware EMS Medical Directors.

Perform scene survey. *Delaware EMS Medical Directors recommend that all EMS crews carry "room" carbon monoxide detectors with an audible alert on their first-in bag for provider and patient protection.*

Observe universal precautions:

- Follow your agency's infection control policy.
- Delaware EMS Medical Directors recommend wearing masks when caring for patients with active coughing. Consider masking the patient pending respiratory status.

Consider the need for additional resources.

Determine responsiveness using AVPU.

Evaluate Airway, Breathing, Circulation, and Disability, Exposing the patient as necessary.

Secure a patent airway appropriately.

Manage cervical spine appropriately.

Treat life-threatening conditions as necessary per specific treatment protocols.

Contact medical control for consideration of a needle chest decompression for non- traumatic tension pneumothorax patients.

Monitor patient via the use of pulse oximetry and/or capnography (nasal prong/ET), as appropriate.

Administer oxygen as appropriate (maintain a SpO_2 of at least 92%).

Obtain medical history (HPI, PMH, allergies, and medications).
Evaluate blood pressure, pulses, respiratory rate, and tactile (or measured) temperature. Reassess with a frequency indicated by patient condition.

Monitor blood glucose levels as appropriate.

Monitor cardiac rhythm and/or 12 lead ECG as appropriate.

Assign treatment priority and make transport decision.

Establish intravenous access with normal saline infused as appropriate.

Consider intraosseous access if IV access cannot readily be obtained for Priority 1 patients in extremis that are in need of medication or fluid resuscitation:

- Administer 20 – 40 mg lidocaine IO over 1 minute in the conscious patient if not contraindicated
- Administer 10 mL NSS rapid IO push
- All IV medications can be administered IO

Consider the insertion of an orogastric tube after the patient is successfully intubated.

Consider the administration of 8 mg Zofran (Ondansetron®) ODT, IV or IM for nausea or vomiting.

Monitor lactate level as appropriate (optional).

Monitor PT or INR level as appropriate (optional).

Contact medical control as soon as possible.

Contact medical control for BLS release if appropriate.

Secure patient in ambulance using appropriate equipment per ambulance design and agency standard operating procedures.

Consider proposed receiving facility's diversion status and inform patient (family) as appropriate.

Transport patient to an appropriate medical facility via appropriate mode of transportation without delay. Transport should be made safely and in a manner as to prevent further injury through the appropriate use of lights and sirens or no lights and sirens. **The highest medically trained practitioner engaged in patient care will determine the medically appropriate mode of transportation based upon the patient's presenting medical condition. This practitioner will communicate with the transporting EMS vehicle's operator and advise him/her as to the transport mode to be utilized.**

Patients should be taken to the approved facility's emergency department, labor and delivery area or to an inpatient bed if arranged prior to arrival at the facility. If there are questions or doubts as to the appropriate facility or point of delivery, the medical control physician will be the arbitrator. All unstable patients should be transported directly to an emergency facility.

Patients are to be transported to Delaware Office of EMS approved facilities within the EMS agency's usual operations area.

On scene direction of medical care is provided by the Delaware EMS provider with the highest level of licensure.

Patient care does not end until transfer of care of the patient to an appropriately trained health care provider is completed and the patient care report is made available and completed in the approved electronic reporting system.

Document relevant findings and treatments.

All IV bags that have been mixed with a medication must be labeled at time of ED disposition.

Priority I	**Patient suffering from an immediate life or limb threatening injury or illness.** **It is the consensus of the EMS medical directors that during transport to the hospital lights and sirens are not medically indicated for many Priority I patients.**
Priority II	**Patients suffering from an injury or illness that if left untreated could potentially threaten life or limb.** **It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for Priority II patients.**
Priority III	**Patient suffering from an injury or illness that requires medical attention but does not threaten life or limb.** **It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for Priority III patients.**

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The approved pharmacology manual should be used for medication reference.

Zofran (Ondansetron®) ODT means oral dissolving tablet

CO-oximetry may be performed as an option by agencies carrying CO monitoring equipment.

It should be noted that the General Patient Care protocol above is a guideline to be followed in as much as it aids in providing appropriate and timely medical care. The ALS provider may change the order or omit steps listed above as dictated by sound judgment of the care provider and/or presentation of the patient(s).

The following information should be passed on in either verbal or written form at the time of patient transfer: HPI, PMH, allergies, medications, vital signs, SpO2, $EtCO_2$, cardiac rhythm, prehospital treatments, and patient's response to those treatments

ACUTE RESPIRATORY DISTRESS

***INDICATIONS**: Acute exacerbation of asthma, emphysema, and reactive airway disease; cough, shortness of breath, air hunger, wheezing, diminished breath sounds, retractions, and tachypnea.*

***Contact medical control** prior to medication administration if the patient's heart rate is greater than 150 beats per minute (BPM).*

Consider nasal prong capnography.

For patients < 35 years of age in pending respiratory failure, consider the administration of 0.3 - 0.5 mg epinephrine (1 mg/mL) IM. Consider for patients older than 35 years of age with medical control approval.

Consider early CPAP for an alert patient who is able to maintain a patent airway but is, or continues to be, in moderate to severe respiratory distress.

If the patient who is short of breath has a history of asthma, emphysema, or is actively wheezing, administer up to 5 mg of albuterol via nebulizer. If wheezing continues, repeat albuterol as needed if the patient's heart rate remains < 150 BPM.

Consider the administration of 0.5 mg nebulized ipratropium bromide (Atrovent®) with albuterol.
For mild respiratory distress, consider the administration of prednisone 60 mg PO in combination with Maalox® 50 mg or other PO fluid

For moderate/severe respiratory distress secondary to asthma or COPD, administer 125 mg methylprednisolone (Solu-Medrol®) IV/IM.

For pending respiratory failure consider the administration of 2 g magnesium sulfate IV over 10 minutes for severe respiratory distress secondary to asthma or COPD.

For patients prescribed and taking levalbuterol (Xopenex®) via nebulizer, the substitution of the patient's own medication in place of albuterol is acceptable.

Usual Xopenex doses: 0.31 mg/3 mL; 0.63 mg/3 mL; 1.25 mg/3 mL

Early CPAP at the point of contact, as the first ALS procedure, is preferable to the delay of initiation in the ambulance.

CPAP equipment is optional for prehospital aeromedical services

PULMONARY EDEMA DUE TO CONGESTIVE HEART FAILURE

INDICATIONS*: Afebrile, shortness of breath, air hunger, tachypnea, tachycardia, elevated blood pressure, rales, neck vein distention, and diaphoresis.*

Consider capnography.

Apply early CPAP for an alert patient who is able to maintain a patent airway but is, or continues to be, in moderate to severe respiratory distress.

IV must be established prior to NTG administration for patients with a systolic BP ≤ 150 mmHg or for patients not currently prescribed and taking NTG

- Administer 0.4 mg nitroglycerin (NTG) SL. Repeat NTG at a higher dose of 0.8 mg NTG every 3-5 minutes. If systolic blood pressure (SBP) is less than 120 mmHg, discontinue NTG administration until SBP recovers to greater than 120 mmHg.
- Apply 1" nitroglycerin paste if systolic blood pressure is greater than 120 mmHg.

Perform and interpret 12 lead ECG.

Assessment and management of airway and breathing precedes the performance of a 12 lead ECG. Withhold nitrates and ***contact medical control*** *if the patient relates taking sildenafil (Viagra®/Revatio®) or vardenafil (Levitra®) within the last 24 hours or tadalafil (Cialis®), Adcirca® for pulmonary hypertension or any other prescription erectile dysfunction drugs within the last 48 hours.*

Afebrile is defined as no history of recent fever and no tactile temperature or a measured temperature outside the range of 36-38°Celsius (96.8° F to 100.4° F).

Early CPAP at the point of contact, as the first ALS procedure, is preferable to the delay of initiation in the ambulance.

ALTERED MENTAL STATUS

***INDICATIONS**: Incomprehensible speech, inappropriate verbal responses, inability to follow verbal commands, decreased responsiveness, or unresponsiveness.*

Obtain venous blood samples and determine serum blood glucose by glucometer.

If blood sugar is less than 60 mg/dl, administer up to 25 g of dextrose IV.

If blood sugar is less than 60 mg/dl by glucometer and intravenous access is not obtainable, administer 1 mg glucagon IM, IN.

Consider the administration of 0.25 - 2 mg naloxone (Narcan®) IV, IN, or IM to provide for a patent, self-maintained airway and adequate respirations. An additional dose of up to 2mg Narcan may be administered to maintain adequate respirations. **Contact medical control** for additional dosages of naloxone if a high potency opiate is strongly felt to have been taken.

Consider alternative causes of altered mental status.

If an insulin dependent diabetic with documented hypoglycemia due to missed meal or increased physical activity, who is not on any oral hypoglycemics and is with family/friends with the capability to consume a meal, fully awakens with EMS treatment, he (she) may refuse transport to a medical facility. Medical Control contact is optional if the above criteria have been met.

Dextrose may be mixed in a 100 mL bag of NSS and run wide open as an alternative to direct push of D50.

***Contact medical control** for consideration of sodium bicarbonate for tricyclic antidepressant overdose, glucagon for beta blocker overdose, and calcium chloride for calcium channel blocker overdose.*

Consider nasal prong EtCO2 monitoring along with pulse oximetry to ensure adequate oxygenation and ventilation.

If a glucometer fails or is not immediately available, proceed with appropriate dosage of D50 or Glucagon.

HYPERTENSIVE CRISIS

***INDICATIONS**: Three blood pressures measured five minutes apart with a diastolic BP of ≥ 120 mmHg or a MAP ≥ 150 mmHg, associated with any of the following: nausea/vomiting, headache, or visual disturbances.*

Contact medical control for consideration of the administration of 10 mg Labetalol (Trandate®) IV slowly over two (2) minutes.

Reassess vital signs. If after ten (10) minutes of initial dose the diastolic BP remains ≥ 120 mmHg, **contact medical control** for the consideration of administration of a repeat dose of 10-20 mg Labetalol (Trandate®) IV slowly over two (2) minutes.

Withhold Labetalol for CHF, any heart block, bradycardia, suspected cocaine abuse, patients in cardiogenic shock, CVA, or asthmatics.
MAP = (2 x diastolic + systolic) / 3

SUSPECTED STROKE

***INDICATIONS**: Abnormality in RACE Stroke Scale Altered mental status, seizure, speech deficit, facial droop, headache, paresthesia, and hemiparesis in the absence of trauma, weakness, ataxia, visual disturbances, nausea, vomiting, general malaise, abnormal pupillary function, or other symptoms of suspected cerebral ischemia or hemorrhage.*

Administer oxygen via nasal cannula at a quantity sufficient to maintain the oxygen saturation equal to 94%.

Place patient in a semi to high-fowler's position if possible.

If blood sugar is less than 60 mg/dl, administer up to 25 g of dextrose IV.

Administer 1mg Glucagon IM, IN if the blood sugar is less than 60 mg/dl and an IV cannot be established.

Determine onset of symptoms. Onset is defined as the last time the patient was verified as not having a neurological deficit or Last Known Well (LKW).

Contact Local Medical Control for all suspected stroke patients. Early notification of stroke alert to receiving hospital is paramount with stroke patients. Stroke alert is normally activated if onset of symptoms or Last Known Well is less than 4.5 hours.

Obtain family contact information, preferably a cell phone number.

Transport to the nearest appropriate CT-capable, Certified Stroke Center* without delay**

- For patients with RACE scale < 5 transport to nearest appropriate CT-capable Certified Stroke Center without delay.
- For patients with LKW ≥ 4.5 hours and < 24 hours (including Wake Up strokes) **and** RACE Scale ≥/= 5, or suspected hemorrhagic stroke, consider transport to an Endovascular-capable Stroke Center.
- For patients with LKW ≤ 4.5 hours and RACE scale ≥ 5 contact Local Medical Control to discuss destination.

Communicate to receiving facility the use of anticoagulants.

Perform and interpret 12 lead ECG if time permits.

Changes in hospital fibrinolytic protocols and the addition of interventional therapy may occur which could result in an interval change to this standing order.

**Certified Stroke Center by the State of Delaware or The Joint Commission (TJC).*

***The Office of Emergency Medical Services (OEMS) will periodically compile and publish a list of approved receiving facilities based on the receiving facilities level of certification and available types of care. This list should be considered when determining the most appropriate destination for patients.*

Record the highest RACE stroke score on the patient care report if only one area to record scale.

SEIZURES (ACTIVE)

INDICATIONS*:* Generalized vs partial

If no IV access:

- Administer 5 mg midazolam (Versed) IM
- Check blood sugar
- Obtain IV access
- If blood sugar <60 mg/dl, administer up to 25 g dextrose IV **OR** administer 1 mg glucagon IM if an IV cannot be established

If IV established prior to seizure:

- Administer 2 – 5 mg midazolam (Versed) IV slowly.
- If blood sugar < 60 mg/dl, administer up to 25 g dextrose IV.

For seizures secondary to eclampsia:

- Administer 5 g Magnesium Sulfate IV over 10 minutes
- Administer up to 5 mg midazolam (Versed) IV or IM.

Contact medical control *for consideration of additional midazolam (Versed®) if the patient continues to have seizures following the initial dose.*

ALLERGIC/ADVERSE REACTIONS/*DYSTONIC REACTION*

Dystonic Reaction

***INDICATIONS**: Reaction to a neuroleptic medication resulting in intermittent spasmodic or sustained involuntary contractions of muscles in the face, neck, trunk, pelvis, extremities, and the larynx.*

Consider the administration of 25-50 mg diphenhydramine (Benadryl®) IV, IM, or PO.

Moderate Allergic Reaction

***INDICATIONS**: Generalized allergic manifestations such as urticaria or history of an allergic exposure without airway compromise or shock.*

Consider the administration of 25-50 mg diphenhydramine (Benadryl®) IV, IM, or PO.

Consider the administration of prednisone 60 mg PO in combination with Maalox® 50 mg or other PO fluid.

Severe Allergic Reaction

***INDICATIONS**: Generalized allergic manifestations such as urticaria or history of an allergic exposure with:*

- *airway obstruction (partial or complete)* ***OR***
- *systolic blood pressure less than 90 mmHg with clinical evidence of shock.*

Give 0.3 - 0.5 mg epinephrine (1 mg/mL) IM, may repeat every 5 minutes times three (3), as needed.

Establish intravenous access using normal saline and administer a fluid bolus of 1000 mL.

Reassess patient -- if acute respiratory obstruction persists or systolic blood pressure is less than 90 mmHg with clinical evidence of shock, consider administration of 0.25 mg epinephrine (0.1 mg/mL)* IV over a one-minute interval.

Administer a second intravenous bolus of 1000 mL normal saline if systolic blood pressure remains less than 90 mmHg with continued evidence of clinical shock.

Administer 50 mg diphenhydramine (Benadryl®) IV. If unable to obtain intravenous access, diphenhydramine may be given IM.

Administer 125 mg methylprednisolone (Solu-Medrol®) IV. If unable to obtain intravenous access, methylprednisolone (Solu-Medrol®) may be given IM.

**Epinephrine 0.25 mg (0.1 mg/mL) may be may be mixed in a 100 mL bag of NSS and run wide open as an alternative to direct push of epinephrine.*

NON-TRAUMATIC HYPOTENSION

***INDICATIONS**: Pulse greater than 50 BPM AND systolic blood pressure less than 90 mmHg AND absence of radial pulses bilaterally and/or clinical evidence of shock (altered mental status, pale/cool/clammy skin).*

Initiate two large bore IV catheters and rapidly infuse up to 2000 mL bolus of NSS

- Withhold fluid if patient develops signs of acute CHF

After 2000 mL of fluid consider an 8-12 mcg/min norepinephrine infusion for continued hypotension not due to hypovolemia. Titrate norepinephrine to maintain systolic BP of 90-100 mmHg.

SEPSIS

INDICATIONS: *Suspicion of infection/sepsis AND 2 or more of the systemic inflammatory response syndrome (SIRS) criteria:*

Patients should have a POC lactate or ETCO2 performed if two or more of the following are present:

- *Temperature greater than 38°C (100.4° F) or less than 36°C (96.8° F)*
- *Heart rate greater than 90 BPM*
- *Respiratory rate >20*
- *Hypotension*

If POC Lactate > 4mmol/L or ETCO2 < 25 mm/Hg:

- Initiate two large bore IV catheters and rapidly infuse 30 mL/kg bolus of NSS.
- Withhold fluid if patient develops signs of acute CHF.
- After a minimum of 30 mL/kg of fluid consider an 8-12 mcg/min norepinephrine infusion for continued hypotension not due to hypovolemia. Titrate norepinephrine to maintain systolic BP of 90-100 mmHg.
- Early notification of “Sepsis Alert” to receiving hospital is paramount with sepsis patients.
- Optional administration of antibiotics as approved by Office of EMS in conjunction with local facility and county EMS medical directors.

ACUTE CORONARY SYNDROMES (ACS)

INDICATIONS: *Classic anginal chest pain OR patients whose 12 lead is suspicious for ischemia. Suspect ACS for the following presentations: classic anginal chest pain, atypical chest pain, or anginal equivalents such as dyspnea, palpitations, syncope or pre-syncope, general malaise, or DKA. All of these patients should have 12 lead performed and interpreted.*

Administer 324 mg aspirin PO if the patient has not taken an equivalent dosage within the last 60 minutes, even if patient is pain free.

IV must be established prior to NTG administration for patients with a systolic BP ≤ 150 mmHg or for patients not currently prescribed and taking NTG

- Administer 0.4 mg nitroglycerin (NTG) SL. Repeat 0.4 mg NTG every 3-5 minutes until pain, signs of ischemia, or injury resolves.
- If no change in the patient's chest pain and there are no signs of ischemia or injury, consider discontinuing SL NTG administration after 3 doses
- If systolic blood pressure (SBP) is less than 90 mmHg, discontinue NTG administration until SBP recovers to greater than 100 mmHg.

Apply 1" nitroglycerin paste early in patient contact, even if patient is pain free.

If chest pain, signs of ischemia or anxiety continue after the administration of three (3) nitroglycerin and if systolic BP is greater than 90 mmHg, consider administration of up to 200 mcg fentanyl (administered in up to 100 mcg increments given every five (5) minutes).

Contact medical control for consideration of the administration of up to 5 mg of Versed in the presence of suspected cocaine usage within the past 72 hours.

If patient displays persistent ventricular ectopy (defined as runs of V-Tach or R-on-T PVCs) refractory to oxygen and NTG administration, consider administration of 150 mg amiodarone (Cordarone®) IV infused over 10 minutes. Withhold amiodarone if the heart rate or pulse is less than 50 beats per minute.

Repeat 12 lead ECG throughout transport as necessary.

The 12 lead ECG may be deferred initially in order to stabilize the hemodynamically unstable patient.

Withhold nitrates and ***contact medical control*** *if the patient relates taking sildenafil (Viagra®/Revatio®) or vardenafil (Levitra®) within the last 24 hours or tadalafil (Cialis®, Adcirca® for pulmonary hypertension), or any other prescription erectile dysfunction drugs within the last 48 hours.*

Cardiac marker blood tests may be performed as a research study by agencies approved by the Office of Emergency Medical Services.

ST ELEVATION MYOCARDIAL INFARCTION (STEMI)

INDICATIONS: *Suspicion of ACS and a prehospital 12 lead diagnosis of STEMI. Suspect STEMI for the following presentations: classic anginal chest pain, atypical chest pain, or anginal equivalents such as dyspnea, palpitations, syncope or pre-syncope, general malaise, or DKA. All of these patients should have 12 lead performed and interpreted.*

Administer 324 mg aspirin PO if the patient has not taken an equivalent dosage within the last 60 minutes, even if patient is pain free.

Transport when practical to an emergent Percutaneous Coronary Intervention (PCI) capable facility for patients diagnosed with STEMI.

Early notification to receiving hospital is paramount in the treatment of STEMI; request a "Heart Alert".

IV must be established prior to NTG administration for patients with a systolic BP $\leq$ 150 mmHg or for patients not currently prescribed and taking NTG

- Administer 0.4 mg nitroglycerin (NTG) SL. Repeat 0.4 mg NTG every 3-5 minutes until 12 lead signs of injury resolve.
- If systolic blood pressure (SBP) is less than 90 mmHg, discontinue NTG administration until SBP recovers to greater than 100 mmHg.

Apply 1" nitroglycerin paste early in patient contact, even if patient is pain free.

Consider administration of up to 200 mcg fentanyl (administered in up to 100 mcg increments given every five (5) minutes) if systolic BP is greater than 90 mmHg (may be administered as soon as IV is established).

Contact medical control for consideration of the administration of up to 5 mg of Versed in the presence of suspected cocaine usage within the past 72 hours.

If patient displays persistent ventricular ectopy (defined as runs of V-Tach or R-on-T PVCs) refractory to oxygen and NTG administration, consider administration of 150 mg amiodarone (Cordarone®) IV infused over 10 minutes. Withhold amiodarone if the heart rate or pulse is less than 50 beats per minute.

Repeat 12 lead ECG throughout transport.

The 12 lead ECG may be deferred initially in order to stabilize the hemodynamically unstable patient.

*Withhold nitrates and **contact medical control** if the patient relates taking sildenafil (Viagra®/Revatio®) or vardenafil (Levitra®) within the last 24 hours or tadalafil (Cialis®, Adcirca® for pulmonary hypertension), or any other prescription erectile dysfunction drugs within the last 48 hours.*

HEMODYNAMICALLY COMPROMISING BRADYCARDIA

INDICATIONS*: Pulse less than 50 BPM with clinical evidence of shock (i.e., altered mental status, pale/cool/clammy skin, ischemic chest discomfort, systolic blood pressure less than 90 mmHg OR absence of radial pulses bilaterally).*

Obtain 12-lead EKG as soon as practicable.

Administer 0.5 mg atropine IV. Repeat 0.5 mg atropine IV every 3-5 minutes until a maximum of 3 mg of atropine is administered or the pulse rate is 50 BPM or greater.

Initiate transcutaneous cardiac pacing (TCP). Do not delay while awaiting IV access. Set rate at 80 per minute. Rapidly increase the output (MA) until capture occurs, or the maximum MA is reached.

- If electrical or mechanical capture is achieved, do not give atropine, unless capture is lost, and bradycardia recurs**.**

If the patient is experiencing discomfort due to pacing and the systolic blood pressure is greater than or equal to 90 mmHg, administer up to 200 mcg fentanyl (administered in up to 50 mcg increments given every five (5) minutes).

Infuse up to a 1000 mL bolus of NSS.

Frequently reassess vital signs and lung sounds

- Withhold fluid if patient develops signs of acute CHF.

Consider epinephrine IV 2-10 mcg/min if pacing and atropine prove to be ineffective. Titrate epinephrine infusion to a systolic BP of $\geq$ 90 mm/Hg.

Contact medical control *for orders to administer calcium chloride and possibly sodium bicarbonate, if the patient has a history of chronic renal failure and either hemodialysis or peritoneal dialysis.*

STABLE TACHYCARDIA

***INDICATIONS**: A wide complex tachycardia (QRS ≥ 0.12 seconds) presumed to be ventricular tachycardia (VT), with a rate exceeding 150 BPM or a narrow complex tachycardia with a rate exceeding 120 BPM (QRS < 0.12 seconds) other than sinus tachycardia. There should be no evidence of trauma, hypovolemia, fever or sepsis.*

For purposes of this Standing Order, STABLE is defined as a patient with a systolic blood pressure greater than 90 mmHg.

Obtain 12-lead EKG.

If the rhythm is a wide complex tachycardia at a rate exceeding 150 BPM:

- Administer 150 mg amiodarone (Cordarone®) IV infused over 10 minutes.

If the rhythm is a narrow complex tachycardia, other than sinus tachycardia, atrial fibrillation or atrial flutter, at a rate exceeding 150 BPM:

- Consider modified Valsalva maneuver. (Carotid massage may not be performed).
- Administer 6 mg adenosine (Adenocard®) IV rapidly.
- If there is no response to the initial 6 mg dose, administer 12 mg adenosine.
- If there is no response to the second dose, administer 12 mg maximum adenosine.
- Administer 0.25 mg/kg diltiazem (Cardizem®) IV (dose is 25 mg) over 2 minutes.
- If there is no response to the initial dose of diltiazem after 15 minutes, **contact medical control** for consideration of administration of 0.35 mg/kg diltiazem IV (maximum dose of 35 mg) over 2 minutes.

If the rhythm is a narrow complex atrial fibrillation or atrial flutter at a sustained rate exceeding 120 BPM and the patient is without signs or symptoms of congestive heart failure:

- Administer 0.25 mg/kg diltiazem (Cardizem®) IV (maximum dose is 25 mg) over 2 minutes.
- If there is no response to the initial dose of diltiazem after 15 minutes, **contact medical control** for consideration of administration of 0.35 mg/kg diltiazem IV (maximum dose of 35 mg) over 2 minutes.

If diltiazem is not available:

Metoprolol 5 mg IV given over 1-2 minutes. May be repeated every 5 minutes as needed for a total of three (3) doses or 15 mg.

***Contact medical control** for orders to administer calcium chloride and possibly sodium bicarbonate, if the patient has a history of chronic renal failure and either hemodialysis or peritoneal dialysis.*

Adenosine: potentiated by dipyridamole (Persantine), use half (1/2) doses. Use with caution with patients on carbamazepine (Tegretol), digoxin and verapamil.

Use Diltiazem (Cardizem) with caution when patients are on digoxin.

UNSTABLE TACHYCARDIA

***INDICATIONS**: A wide complex tachycardia (QRS ≥ 0.12 seconds) presumed to be ventricular tachycardia (VT), with a rate exceeding 150 BPM, or a narrow complex tachycardia (QRS < 0.12 seconds) other than sinus tachycardia, with a rate exceeding 150 BPM. There should be no evidence of trauma, hypovolemia, fever or sepsis.*

For purposes of this Standing Order, UNSTABLE is defined as systolic blood pressure less than 90 mmHg OR radial pulses are absent bilaterally, with clinical evidence of shock. Patients with altered mentation and clinical evidence of shock are UNSTABLE, even if the systolic blood pressure is greater than 90 mmHg.

Obtain 12-lead EKG as soon as practicable.

Consider adenosine administration for narrow complex tachycardia if IV access is readily available.

Consider, only if IV is already established, the administration of up to 0.1 mg/kg (up to a max of 10 mg) etomidate (Amidate©) IV prior to cardioversion of an alert patient.

Perform synchronized cardioversion using 100 joules.

Perform synchronized cardioversion using 200 joules.

Perform synchronized cardioversion using 300 joules.

Perform synchronized cardioversion using 360 joules.

Contact medical control for additional cardioversion attempts past the fourth attempt.

Infuse up to a 1000 mL bolus of NSS.

Frequently reassess vital signs and lung sounds.

- Withhold fluid if patient develops signs of acute CHF

Upon successful conversion, perform and interpret 12 lead ECG.

For wide complex tachycardia, administer 150 mg amiodarone (Cordarone®) IV infused over 10 minutes:

- If there is no response to cardioversion,
- OR upon successful conversion,
- AND if needed for a recurrence.

***Contact medical control** for orders to administer calcium chloride and possibly sodium bicarbonate, if the patient has a history of chronic renal failure and either hemodialysis or peritoneal dialysis.*

Biphasic devices may use FDA approved/recommended energy settings.

INITIATION/TERMINATION OF RESUSCITATIVE EFFORTS

INITIATION INDICATIONS: *For initiation of cardiopulmonary resuscitation for patients in cardiac arrest*

CPR shall be initiated unless one or more of the following criteria apply:

- Resuscitation would place the rescuer at significant risk of physical injury.
- The rescuer is presented with an apparently valid Delaware's Medical Orders for Scope of Treatment (DMOST) signed by a physician.
- Obvious signs of death are present, including (but not limited to) rigor mortis, dependent lividity, or injuries incompatible with life.
    - Decapitation
    - Body fragmentation
    - Severe crush injury to head (without vital signs)
    - Severe crush injury to chest (without vital signs)
    - Severe thermal burns (without vital signs)
    - Gunshot wounds to the head with lateral entrance wound and an opposite side exit wound (without vital signs)
    - Decomposition of the body:
        - Skeletalization
        - Severe bloating (without vital signs)
        - Skin slough (without vital signs)

For patients not meeting the criteria for initiation of cardiopulmonary resuscitation, withhold resuscitation and initiate medical consultation in order to complete the State of Delaware's Dead on Paramedic Arrival (DOPA) documentation.

TERMINATION INDICATIONS*: For the termination of cardiopulmonary resuscitation*

CPR in the prehospital setting may be discontinued when both of the following criteria apply:

- Patients in cardiopulmonary arrest who, despite effective chest compressions, airway management, three rounds of rhythm-specific ACLS therapy, and no less than 20 minutes of resuscitation efforts, remain in cardiac arrest without any return of spontaneous circulation.
- A decision is made in conjunction with on-line medical control that resuscitation should be terminated and the DOPA protocol will be followed.

Resuscitation may be terminated without medical control during a Multi-Casualty Incident on patients with non-salvageable injuries as determined by START® Triage. This is reserved for events where EMS resources are required for stabilization of living patients.

- Formal DOPA protocol will be initiated once resources allow.

Consider the use of capnography to assist with the decision to terminate resuscitative efforts.

Reversible causes: hypovolemia, hypoxia, hydrogen ion (acidosis), hypo / hyperkalemia, hypothermia, tension pneumothorax, tamponade, toxins, thrombosis (pulmonary), thrombosis (cardiac).

GUIDELINES REGARDING DO NOT RESUSCITATE ORDERS

INDICATIONS: *Current guidelines for do not resuscitate orders.*

Living Will*

- Living wills do not apply to out-of-hospital care.

- A living will has no impact on the decision of whether or not to initiate or continue resuscitative efforts or any other care.

Do Not Resuscitate Order (DNR)

- **Contact medical control** immediately.

Prehospital Advance Care Directive (PACD)

- **Contact medical control** immediately.

Delaware Medical Orders for Life-Sustaining Treatment (DMOST)

- A DMOST form is a medical order sheet based on the person's current medical condition and wishes.

- The DMOST form will clearly indicate the patient's wishes concerning life-sustaining treatment and CPR.

*If a question should arise regarding DNR's, PACDs, DMOST or living wills at any time during treatment, **contact medical control**.

ADULT CARDIOPULMONARY RESUSCITATION GUIDELINES

INDICATIONS: *Current AHA guidelines reflect the importance of compressions for survival from cardiac arrest. EMS practice must evolve to address this important change.*

Compressions should begin as soon as possible following EMS arrival.

- Rapid movement to the patient by providers is critical
- Treating the patient where they are found allows compressions to be started without delay. Safety issues should prompt patient movement.

Intubation can be delayed and BVM utilized for the first 6 minutes of CPR

High Quality CPR

- Mechanical chest compression device should be set to continuous
- If a mechanical chest compression device is not utilized, Perform continuous compression PIT CREW HIGH PERFORMANCE CPR.
- No pauses for ventilations.
- Ventilations on the upstroke of CPR.

Compressions should be FAST, HARD, and DEEP at a rate of 100-120 compressions per minute and to a depth of at least 2 inches.

- Faster or slower rates worsen patient outcome
- Ensure complete recoil of the chest wall prior to the next compression
- CPR should be adjusted to provide for an $EtCO_2$ reading of greater than 10 mmHg, with greater than 20 mmHg preferred to improve chance of return of spontaneous circulation (ROSC)
- No procedure (intubation, IV/IO start, etc.) should slow or stop compressions
- Interruption for defibrillation should be minimal and compressions should resume AS SOON AS shock delivery is complete.
- Frequently switch providers performing chest compressions to maintain peak performance

Ventilations

- Ventilate at 8-10 breaths per minute to decrease intrathoracic pressure
- Patients should be bagged using a one-hand squeeze
- Avoid excessive ventilation

For primary medical etiology of arrest complete a minimum of 20 minutes of compressions before moving patients off scene or initiating transport unless the use of a mechanical chest compression device has been established and is providing effective compressions.

- Patient movement on stretchers prevents effective CPR
- Effective CPR cannot be safely performed in a moving ambulance

For patient care and provider safety, the EMS medical directors support the use of an optional mechanical chest compression device.

VENTRICULAR FIBRILLATION (VF) and/or PULSELESS VENTRICULAR TACHYCARDIA (VT)

In the absence of effective CPR on arrival and when response time is greater than four (4) minutes, perform 2 minutes of CPR prior to first defibrillation or intubation.

For monitored patients with witnessed VF or pulseless VT perform chest compressions only until pads are placed, then perform up to three (3) stacked shocks before resuming CPR.

Defibrillate using 360 joules every 2 minutes.

After the third defibrillation attempt, consider changing defibrillation vector (change pad placement with new set of pads)

Perform 2 minutes of CPR between each defibrillation attempt.

Administer 1 mg epinephrine (0.1mg/mL) IV. Repeat 1 mg epinephrine (0.1mg/mL) IV every 3-5 minutes if VF or pulseless VT persists.

Consider administration of 2 g magnesium sulfate IV if Torsade de Pointes is identified.

Administer 300 mg amiodarone (Cordarone®) IV, with a repeat dose of 150 mg after 10 minutes.

Compressions will not be interrupted for longer than 10 seconds for intubation or other procedures. Intubation should be performed during pulse/rhythm check or during compressions and should be deferred until later in the resuscitation. Consider early use of rescue airway device for anticipated difficult intubation.

With return of spontaneous circulation:

- Administer 150 mg amiodarone (Cordarone®) IV infused over 10 minutes if patient has received one dose or less of amiodarone (Cordarone®).
- Maintain a MAP of 80-90 mmHg using an 8-12 mcg/min norepinephrine infusion.
- Perform and interpret 12 lead EKG
- Initiate targeted temperature management protocol.

Guidelines

Biphasic devices may use FDA approved/recommended energy settings.

It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for cardiac arrest patients.

Consider the administration of calcium chloride and possibly sodium bicarbonate if the patient has a history of chronic renal failure and either hemodialysis or peritoneal dialysis.

Reversible causes: hypovolemia, hypoxia, hydrogen ion (acidosis), hypo / hyperkalemia, hypothermia, tension pneumothorax, tamponade, toxins, thrombosis (pulmonary), thrombosis (cardiac).

PERSISTENT VENTRICULAR FIBRILLATION (VF) and/or VENTRICULAR TACHYCARDIA (VT)

INDICATIONS: *Ventricular fibrillation or pulseless ventricular tachycardia that fails to respond to ≥ 4 max energy defibrillation attempts, ≥ 3 mg epinephrine, and 450 mg amiodarone* ***OR*** *recurs > 4 times without sustained periods of ROSC.*

EXCLUSIONS: *Patient < 18 years old, traumatic cardiac arrest, or initial presenting conditions of asystole or PEA.*

Contact medical control as soon as possible when entering this protocol.

Refractory VF and/or pulseless VT:
Ensure adequate pad contact and seal during defibrillation attempts. Press firmly on pads before each defibrillation attempt.

Change vectors from sternum/apex configuration to anterior/posterior or vice versa.

Withhold additional epinephrine doses after 5 mg while patient remains in ventricular fibrillation and/or ventricular tachycardia.

Administer 0.5 mg/kg esmolol hydrochloride IV/IO (if available) prior to additional shock attempts. May repeat x1 after 5 minutes if needed.

Recurrent VF and/or pulseless VT:
Continue to utilize pad placement and joule settings that successfully converted rhythm previously.

Withhold additional epinephrine doses after 5 mg during repeat episodes of dysrhythmias.

Administer 0.5 mg/kg esmolol hydrochloride IV/IO prior to additional shock attempts. May repeat x1 after 5 minutes if needed.

Consider the administration of 2 grams magnesium sulfate IV/IO over 10 minutes for suspected hypomagnesemia or identified episodes of torsades de pointes.

ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

In the absence of effective CPR on arrival and when response time is greater than four (4) minutes, perform 2 minutes of chest compressions prior to first defibrillation or intubation.

Administer 1 mg epinephrine (0.1 mg/mL) IV. Repeat 1 mg epinephrine (0.1 mg/mL) IV every 3 to 5 minutes if asystole or PEA continues.

Infuse up to 1000 mL bolus of NSS.

Compressions will not be interrupted for longer than 10 seconds for intubation or other procedures. Intubation should be performed during pulse/rhythm check or during compressions and should be deferred until later in the resuscitation. Consider early use of rescue airway device for anticipated difficult intubation.

With return of spontaneous circulation:

- Maintain a MAP of 80-90 mmHg using an 8-12 mcg/min norepinephrine infusion.
- Perform and interpret 12 lead EKG
- Initiate targeted temperature management protocol.

Consider termination of efforts in patients who despite effective chest compressions, airway management, three rounds of rhythm-specific ACLS therapy, and no less than 20 minutes of resuscitation efforts remain in cardiac arrest without any return of spontaneous circulation.

- A decision is made in conjunction with on-line medical control that resuscitation should be terminated and the DOPA protocol will be followed.

Guidelines

It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for cardiac arrest patients.

Consider the administration of calcium chloride and possibly sodium bicarbonate, if the patient has a history of chronic renal failure and either hemodialysis or peritoneal dialysis.

Reversible causes: hypovolemia, hypoxia, hydrogen ion (acidosis), hypo / hyperkalemia, hypothermia, tension pneumothorax, tamponade, toxins, thrombosis (pulmonary), thrombosis (cardiac).

PROTOCOL FOR THE TELEMETRIC PRONOUNCEMENT OF DEATH

INDICATIONS: *Upon arrival at the scene of a patient with an illness or injury, the paramedics will follow applicable standing orders. If resuscitative efforts have been initiated, paramedics should proceed with patient assessment.*

The paramedic shall contact the medical control physician to request that the patient be pronounced dead at the scene.

Injuries which are obviously incompatible with life

- Decapitation
- Body fragmentation
- Severe crush injury to head (without vital signs)
- Severe crush injury to chest (without vital signs)
- Severe thermal burns (without vital signs)
- Gunshot wounds to the head with lateral entrance wound and an opposite side exit wound (without vital signs)

Decomposition of the body

- Skeletalization
- Severe bloating (without vital signs)
- Skin slough (without vital signs)

Absence of signs of life*

1. Pulselessness
2. Apnea
3. Fixed and dilated pupils
4. Dependent lividity
5. Generalized rigor mortis, (prior to lysis)
6. Asystole on the ECG monitor

***** All must be present for a “medical patient” to be pronounced.
****** In the case of blunt trauma patients, the medical control physician may waive requirement #4 and #5.

Only the medical control physician may pronounce a patient dead, while in direct contact with the paramedic. It is not acceptable for the information on death pronouncement to be transmitted from the paramedic to the physician through an intermediary. The medical control physician must be physically present at the radio or telephone to receive the information directly from the paramedic.

Once the medical control physician has pronounced the patient dead, the paramedic will notify the appropriate police department and the Division of Forensic Science if not already being completed by appropriate authority.

Removal of the decedent, once properly pronounced, is performed only if authorized by jurisdictional police agencies and the Medical Examiner.

Once the patient is pronounced dead, the paramedic will obtain a case number from the dispatch center. In situations where more than one patient has been pronounced dead, identification will

be assured by using the case number followed by a letter, beginning with "A" and progressing in alphabetical order (i.e. case #234567-A, #234567-B, #234567-C, etc.).

The case number is to be used by the paramedic to identify the decedent to the medical control physician for purposes of completing the death certificate.

Upon pronouncement of a patient's death, the medical control physician will immediately complete a death certificate (under pronouncing physician section). The physician will include the assigned case number on the left upper margin of the death certificate. The death certificate will then be placed in a secure, but convenient location within the medical command facility, to be retrieved by the Medical Examiner's Investigator when the death falls within the jurisdiction of the Medical Examiner, or by the family-assigned funeral director in non-Medical Examiner's cases. A base report will be completed in the usual manner.

After the patient has been pronounced dead, the paramedic will place a tag or hospital type band around the patient's right ankle (any extremity is acceptable if right ankle is not present or accessible). The band should contain the following written information:

- Case/Incident number
- Paramedic identification number
- Medical command facility name
- Medical control physician identification number
- Time and date of death pronouncement
- Other information deemed appropriate by the paramedic crew

The paramedic will notify the responsible family member that the patient is dead. Paramedics are encouraged to utilize appropriate support services to assist family members in grieving.

Upon arrival of the police, paramedic supervisor or the investigator for the Medical Examiner, the paramedics and ambulance attendants will return to active status.

- In the case of a nursing home facility resident DOPA, the patient may be turned over to a Registered Nurse or on duty clinical supervisor and units may return to active status.
- Patient under Hospice care may be turned over to a Hospice representative.

Prior to completion of his/her work shift, the paramedic will file a complete, standard run report detailing in the usual manner the pertinent aspects of the case. This paramedic run report is to be completed within 12 hours or by the end of shift if a lessor timeframe.

The circumstances of death must be investigated by the Division of Forensic Science Medical Examiner and/or the police having jurisdiction over the geographic area of pronouncement. Should the death be deemed a Medical Examiner's case, the Division of Forensic Science Medical Examiner's shall be responsible for the transportation of the body and the collection and completion of all necessary legal documents.

Should the case not be deemed a Medical Examiner's case, the body may be transported by a licensed funeral director to the funeral home of the family's choosing. The collection and completion of all necessary legal documents shall be coordinated by the funeral director.

The decedent may be taken to a hospital emergency department in select circumstances.

REFUSAL OF SERVICE

INDICATIONS: *Paramedics often respond to scenes where the patient wishes to decline service. It is important that the paramedic obtains the patient's informed consent before leaving the scene; otherwise the paramedic might be exposed to legal liability for abandonment of the patient.*
A patient is an individual who is sick, injured, wounded or otherwise incapacitated or helpless and/or seeks immediate medical attention for whom EMS has been activated. A person that denies the need for EMS but any reasonable EMS provider can see that a person(s) has an obvious injury or illness, should be considered a patient and treated as such.

Contact medical control for patients presenting or having originally presented with:

- Suspicion of intoxication by drugs or alcohol
- Past medical history or suspicion of dementia
- Any intervention performed by any other healthcare provider
- A summons of EMS to a health care facility or call initiated by a health care provider.
- Suspicion of acute mental disease or suicidal or homicidal ideation
- Suspicion of a significant head injury
- Respiratory distress
- Abnormal vital signs (normal vital signs are defined as a heart rate between 60-110 BPM, systolic blood pressure > 100 mmHg, respiratory rate 12-20 BPM, and a SpO2 reading ≥92% on room air)
- Altered mental status
- An age less than 18 years

Medical control is not required for all other patients unless concerns exist regarding the welfare of the patient. In the case of suspected patient coercion, domestic violence, abuse, etc. contact law enforcement.

Inform the patient about needed treatment and possible outcomes. Every effort should be made to persuade the patient to consent to needed health care. Consider involving family, medical control and law enforcement.

Coercing a patient or family into a Refusal of Services will lead to loss of EMS provider privilege by the State EMS Medical Director and a report to the Delaware Board of Medical Licensure and Discipline.

Discussion of refusal should be initiated by the patient or their representative.

Only EMS calls that are originally dispatched as "service call or public assist" can be entered into the Delaware Electronic Medical Reporting system as such.

Obtain a signed *Refusal of Service form* and document the informed consent process, concerns, and, if applicable, the physician number on the appropriate report(s).

ALS RELEASE TO BLS

INDICATIONS: A patient is an individual who is sick, injured, wounded or otherwise incapacitated or helpless and/or seeks immediate medical attention for whom EMS has been activated. A person that denies the need for EMS but any reasonable EMS provider can see that a person(s) has an obvious injury or illness, should be considered a patient and treated as such.

NOTE: The ALS provider must accompany patients in cases where ALS treatment is warranted, but the patient refuses to consent to these treatments. In these situations, if conditions change during transport, the patient may consent to treatment later.

- An ALS provider must perform a complete assessment and history on the patient. Some of the patient history may be provided by other responders on scene (i.e. BLS provider).
- After completing the assessment and history, the ALS provider may transfer the care to the BLS provider for transport to the hospital without contacting Medical Control UNLESS any of the following conditions exist:
    - Acute change in mental status
    - Respiratory distress
    - Chest pain of suspected cardiac origin
    - Suspicion of intoxication by drugs or alcohol
    - Abnormal vital signs (normal vital sign range for this protocol is defined as a heart rate between 60-110 BPM; systolic blood pressure between 100-150 mmHg: respiratory rate between 12-20 BPM; and a Sp02 reading of ≥ 92% on room air)
    - Suspicion of significant head injury or traumatic injury
    - ALS was not initially dispatched but was later requested by BLS
    - BLS has administered nitroglycerine, bronchodilator, epinephrine, or naloxone to the patient

- If the ALS provider performs any invasive procedure or provides medication, Medical Control must be consulted prior to transferring care
- Prior to releasing the patient for BLS transport, the BLS provider must be given a full report related to patient condition, assessment findings and history. The attending BLS provider must agree to transport the patient without ALS accompanying. If any uncertainty exists on the part of the BLS provider, ALS must accompany the patient.
- A patient care report will be written for all cases in which a patient is released to BLS. In DEMRS, select “BLS Release” under Dispatch Information-Response Disposition. In the Vitals/Treatment – Protocols Used field , select “ALS Release to BLS”
- In cases of multiple casualty incidents, standard MCI triage and transfer guidelines will apply

All cases of ALS-initiated release of patient care to BLS providers must be reviewed through the agencies’ Quality Improvement process.

PEDIATRIC GENERAL PATIENT CARE

INDICATIONS: *Any patient who is less than 15 years of age (neonates are defined as a patient age 30 days and under) requiring pre-hospital medical evaluation by a pre-hospital health care provider in the State of Delaware.*

A patient is an individual who is sick, injured, wounded or otherwise incapacitated or helpless and/or seeks immediate medical attention for whom EMS has been activated. A person that denies the need for EMS but any reasonable EMS provider can see that a person(s) has an obvious injury or illness, should be considered a patient and treated as such. *The Pediatric General Patient Care protocol will be followed in conjunction with all other applicable protocols.*

The most current version of the American Heart Association Guidelines for Cardiopulmonary resuscitation are considered the standard for CPR within these protocols.

Respond using lights and sirens in accordance with Priority Medical Dispatch® (PMD®) protocols currently approved by Delaware EMS Medical Directors.

Perform scene survey.

Observe universal precautions.

- Follow your agency's infection control policy.

Consider the need for additional resources.

Determine responsiveness using AVPU.

Evaluate Airway, Breathing, Circulation, and Disability, Exposing the patient as necessary.

Secure a patent airway appropriately.

Manage cervical spine appropriately.

Treat life-threatening conditions as necessary per specific treatment protocols.

Contact medical control for consideration of a needle chest decompression for suspected non-traumatic tension pneumothorax patients.

Assess body systems as appropriate.

Monitor patient via the use of pulse oximetry and/or capnography (nasal prong/ET), as appropriate. Monitor blood glucose level as appropriate.

Administer oxygen as appropriate (maintain a SpO_2 of at least 92%).

Obtain medical history (HPI, PMH, allergies, and medications).

Evaluate blood pressure, pulses, respiratory rate, and tactile temperature. Reassess with a frequency indicated by patient condition.

Monitor cardiac rhythm and/or 12 lead ECG as appropriate.

Assign treatment priority and make transport decision.

Establish intravenous access with normal saline infused as appropriate.

Use the current Broselow^{tm} tape or OEMS determined equivalent to estimate drug dosages.

Consider intraosseous access, if IV access cannot readily be obtained for Priority 1 patients in extremis that are in need of medication or fluid resuscitation. If IO access is obtained, all IV medications can be administered IO.

- Recommended anesthetic for infant/child responsive to pain:
- Observe recommended cautions/contraindications to using 2% preservative and epinephrine free lidocaine (intravenous lidocaine).
- Usual initial dose is 0.5 mg/kg, not to exceed 40 mg.
- Prime extension set with lidocaine.
- Note that the priming volume of the EZ-Connect® Extension Set is approximately 1.0 mL.
- For small doses of lidocaine, consider administering by carefully attaching syringe directly to needle hub (prime extension set with normal saline).
- Slowly infuse lidocaine over 120 seconds.
- Allow lidocaine to dwell in IO space 60 seconds.
- Flush with 2-5 mL of normal saline.
- Slowly administer subsequent lidocaine (half the initial dose) IO over 60 seconds.
- Repeat PRN.
- Consider systemic pain control for patients not responding to IO lidocaine.

For all other patients who are not in extremis, contact medical control for consideration of intraosseous access if IV access cannot readily be obtained for all other Priority 1 patients.

Consider the insertion of an orogastric tube if the patient is successfully intubated.

Consider the administration of 2mg Zofran for patients between 14 – 27 kg and 4mg for patients > 27 kg Zofran (Ondansetron®) ODT, IV or IM for nausea and/or vomiting.

Monitor lactate level as appropriate (optional).

Monitor PT or INR level as appropriate (optional).

Contact medical control as soon as possible.

Contact medical control for BLS release if appropriate.

Secure patient in ambulance using appropriate equipment per ambulance design and agency standard operating procedures.

Consider proposed receiving facility's diversion status and inform patient (family) as appropriate.

Transport patient to an appropriate medical facility via appropriate mode of transportation without delay. Transport should be made safely and in a manner as to prevent further injury through the appropriate use of lights and sirens or no lights and sirens. The highest medically trained

practitioner engaged in patient care will determine the medically appropriate mode of transportation based upon the patient's presenting medical condition. This practitioner will communicate with the transporting EMS vehicle's operator and advise him/her as to the transport mode to be utilized.

Patients should be taken to the approved facility's emergency department, labor and delivery area or to an inpatient bed if arranged prior to arrival at the facility. If there are questions - doubt as to the appropriate facility or point of delivery, the medical control physician will be the arbitrator.*

Patients are to be transported to Delaware Office of EMS approved facilities within the EMS agency's usual operations area.

Responsibility of care does not end until transfer care of the patient to an appropriately trained health care provider and the patient care report is made available/complete in the approved electronic reporting system. Document relevant findings and treatments.

All IV bags that have been mixed with a medication must be labeled at time of ED disposition.

Priority I — Patient suffering from an immediate life or limb threatening injury or illness. It is the consensus of the EMS medical directors that during transport to the hospital lights and sirens are not medically indicated for many Priority I patients.

Priority II — Patients suffering from an injury or illness that if left untreated could potentially threaten life or limb. It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for Priority II patients.

Priority III — Patient suffering from an injury or illness that requires medical attention but does not threaten life or limb.It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for Priority III patients.

"Any person, agency, organization or entity who knows or in good faith suspects child abuse or neglect shall make a report in accordance with § 904 of this title (Title 16 of Delaware Code). For purposes of this section, "person" shall include, but shall not be limited to, any physician, any other person in the healing arts including any person licensed to render services in medicine, osteopathy or dentistry, any intern, resident, nurse, school employee, social worker, psychologist, medical examiner, hospital, health care institution, the Medical Society of Delaware or law enforcement agency."

Child Abuse Reporting Phone Contact:1-800-292-9582 or www.iseethesigns.org

If an EMS provider has reasonable cause to suspect that a person is a potential victim of human trafficking, report the concern. National Human Trafficking Resource Center Hotline 1-888-373-7888 (24 hours). The NHTRC call takers are trained to assist by discussing a case in a HIPAA compliant manner.

National Human Trafficking Resource Center Hotline 1-888-373-7888

The approved pharmacology manual should be used for medication reference.

It should be noted that the protocol above is a guideline to be followed in as much as it aids in providing appropriate and timely medical care. The ALS provider may change the order or omit steps listed above as dictated by sound judgment of the care provider and/or presentation of the patient(s).

The following information should passed on in either verbal or written form at the time of patient transfer: HPI, PMH, allergies, medications, vital signs, SpO2, $EtCO_2$, cardiac rhythm, pre-hospital treatments, and patient's response to those treatments.

CO-oximetry may be performed as an option by agencies carrying CO monitoring equipment.

PEDIATRIC ACUTE RESPIRATORY DISTRESS

INDICATIONS: *Acute exacerbation of asthma and reactive airway disease; cough, shortness of breath, air hunger, wheezing, diminished breath sounds, retractions, and tachypnea.*

Contact medical control *prior to medication administration if the patient's heart rate is greater than 180 beats per minute.*

AGE < 1 Year
- Administer up to 6 mL normal saline nebulized
- Contact medical control for Albuterol/ipratropium bromide (Atrovent) dose

AGE 1-5 Years
- Administer 2.5 mg Albuterol nebulized. Repeat once for continued respiratory distress.
- Administer 0.25 mg ipratropium bromide (Atrovent)

AGE 6-12 Years
- Administer 5 mg Albuterol nebulized. Repeat once for continued respiratory distress
- Administer 0.25 mg ipratropium bromide (Atrovent)

AGE > 12 Years
- Administer 5 mg Albuterol nebulized. Repeat once for continued respiratory distress.
- Administer 0.5 mg ipratropium bromide (Atrovent)

For severe respiratory distress:
- Consider administration of 0.01 mg/kg epinephrine (1mg/mL) concentration IM, up to 0.3 mg.
- **Contact medical control** for consideration of administration of 50 mg/kg magnesium sulfate (up to a max dose of 2 g) IV infused over 10 minutes for continued severe respiratory distress.

For mild to moderate respiratory distress secondary to asthma:

Consider the administration of prednisone 2 mg/kg PO (up to 60 mg) in combination with Maalox® or other PO fluid **OR**

If an IV has been placed for other reasons, 2 mg/kg methylprednisolone (Solu-Medrol®) IV (up to 125 mg)

For patients prescribed and taking levalbuterol (Xopenex®) via nebulizer, substitution of the patient's own medication in place of albuterol is acceptable.

Usual Xopenex doses: 0.31 mg/3 mL; 0.63 mg/3 mL; 1.25 mg/3 mL

For suspected croup:

Administer up to 6 mL normal saline nebulized.

For continued respiratory distress, consider 0.5 mL/kg epinephrine (1 mg/mL) concentration, up to 5 mL.

PEDIATRIC ALTERED MENTAL STATUS

***INDICATIONS*:** Incomprehensible speech, inappropriate verbal responses, inability to follow verbal commands, decreased responsiveness, or unresponsiveness.

Ages 1 month to 14 years:

- Check blood sugar.
    - If blood sugar is < 60 mg/dl, administer Dextrose 25% (D25) IV at 2 mL/kg **OR**
    - Administer glucagon if no IV access is available
        - 0.5 mg if weight < 20 kg
        - 1 mg if weight ≥ 20 kg
- For respiratory depression secondary to suspected drug overdose:
    - Administer 0.1 mg/kg naloxone (Narcan), up to 2 mg, IV, IM, IO
    - Consider second dose of 0.1 mg/kg naloxone (Narcan), up to 2 mg, IV, IO

Neonates (ages 0 to 1 month)

- Check blood sugar
    - If blood sugar <40 mg/dl, administer Dextrose 10% IV at 5 mL/kg
- DO NOT administer naloxone (Narcan)

Contact medical control for direction regarding administration of:

- Sodium bicarbonate for suspected tricyclic antidepressant overdose
- Glucagon for suspected beta-blocker overdose
- Calcium Chloride for suspected calcium channel blocker overdose

PEDIATRIC SEIZURES (ACTIVE)

If no IV/IO access:

- Administer 0.2 mg/kg midazolam (Versed) IM up to a maximum dose of 5 mg.
- Check Blood sugar
- Obtain IV access
- If blood sugar < 60 mg/dl, (40 mg/dl for neonate) administer 1 mg of glucagon IM or IN (0.5mg < 1 year of age).

If IV/IO established prior to seizure:

- Administer 0.2 mg/kg midazolam (Versed) IV/IO
- If blood sugar < 60mg/dl, (40 mg/dl for neonate) administer up to 25 grams dextrose IV/IO
    - Dextrose 25% (D25) at 2mL/kg
    - Dextrose 10% (D10) at 5mL/kg for neonates

PEDIATRIC SHOCK and HYPOTENSION

INDICATIONS: *Clinical evidence of shock including: altered mental status, tachycardia, pale/cool/clammy skin, delayed capillary refill (> 2 seconds in warm environment), and/or absence of radial/brachial pulses bilaterally. Systolic BP indicators:*

- *< 60 mm Hg neonates (0-30 days)*
- *<70 mm Hg in infants (1 month – 12 months)*
- *<70 mm Hg + (2 x age in years) in children 1 – 10 years*
- *<90 mm Hg in children >10 years of age*

For heart rate less than 60 BPM refer to bradycardia protocol.

Infuse a 20 mL/kg (10 mL/kg for neonate) IV/IO fluid bolus of normal saline.

If signs of hypovolemic shock persist, boluses may be repeated at the same volume up to a maximum of 60 mL/kg (maximum of 30 mL/kg for neonate).

PEDIATRIC ALLERGIC REACTIONS

Moderate Allergic Reaction

***INDICATIONS**: Allergic manifestations such as urticaria or history with allergic exposure without airway compromise or shock.*

Age < 1 year

- **Contact medical control** to consider administration of diphenhydramine (Benadryl) PO or IM.

Age ≥ 1 year

- Consider administration of diphenhydramine (Benadryl) 1 mg/kg PO/IM, up to 25 mg

Severe Allergic Reaction

***INDICATIONS**: Generalized allergic manifestations such as urticaria or history of an allergic exposure with:*

- *Airway obstruction (partial or complete)* ***OR***
- *Clinical evidence of shock including altered mental status, confusion, delayed capillary refill, and cool, clammy, or mottled skin.*

Administer epinephrine 0.01 mg/kg (1 mg/mL) IM, up to 0.3 mg.

- Repeat every five minutes up to three (3) times as needed.

Administer normal saline 20 mL/kg IV/IO (10 mL/kg for neonates) if shock symptoms persist.

- Repeat two (2) additional times for a maximum of 60 mL/kg (30 mL/kg for neonates) as needed.

Administer 1 mg/kg diphenhydramine (Benadryl) IV/IO/IM, up to 50 mg.

Administer 2 mg/kg methylprednisolone (Solu-Medrol) IV/IO/IM up to 125 mg.

If no response to IM epinephrine, **Contact medical control** for consideration of administration of epinephrine 0.01 mg/kg (1 mg/10 mL), up to 0.25 mg IV/IO mixed in a 100 mL bag of NSS and infused for symptom improvement.

PEDIATRIC BRADYCARDIA

INDICATIONS*: Heart rate less than 60 BPM with clinical evidence of shock including: altered mental status, pale/cool/clammy skin, delayed capillary refill, and/or absence of radial/brachial pulses bilaterally.*

- *If severe cardiorespiratory compromise is present as evidenced by poor perfusion, hypotension, or clinical evidence of shock continues despite adequate ventilation and oxygenation, begin chest compressions if the heart rate remains less than 60 beats per minute.*

Administer 0.01 mg/kg epinephrine (1 mg/10 mL) IV. Repeat every 3-5 minutes.

Administer 0.02 mg/kg atropine. Minimum dose is 0.1 mg IV. Maximum single dose is 0.5 mg IV. May be repeated once in 3-5 minutes.

Age < 1 year

- Begin CPR while administering medical treatment.

PEDIATRIC TACHYCARDIA

INDICATIONS: STABLE *is defined as a patient with signs of adequate tissue perfusion, not in cardiac arrest, and not displaying the signs or symptoms of slow capillary refill, altered mental status, shock or pulmonary edema.*

Obtain 12 lead EKG on all patients

Wide complex tachycardia (QRS > 0.09 seconds) presumed to be ventricular tachycardia (VT), with a rate >180 BPM in children more than 1 year old or >220 BPM in children less than 1 year

- **Unstable wide complex tachycardia:**
  - If the child is hypotensive, has acute altered level of consciousness, or signs of shock, IMMEDIATE SYNCHRONIZED CARDIOVERSION is indicated.
  - Synchronized cardioversion: 0.5 to 1 J/kg if this is not effective increase to 2 J/kg. Cardioversion should only be attempted a total of twice.
- **Stable wide complex tachycardia**:
  - If no hypotension, altered level, or signs of shock, and the rhythm is regular with monomorphic (all QRSs look alike) consider using adenosine
  - **Contact medical control for consideration of:**
  - Administer adenosine (Adenocard®) 0.1 mg/kg IV max dose 6 mg. May repeat at 0.2 mg/kg IV max dose of 12 mg, if not effective:

Narrow complex tachycardia (QRS ≤ 0.09 seconds) other than sinus tachycardia, with a rate ≥ 180 BPM in children > 1 year old or ≥ 220 BPM in children less than 1year who have tachycardia with a pulse and poor perfusion. There should be no evidence of trauma, hypovolemia, fever or sepsis.

- **Unstable narrow complex tachycardia:**
  - If the patient exhibits signs of poor tissue perfusion, (delayed capillary refill, altered level of consciousness, shock or pulmonary edema) the following treatment modalities should be considered.
  - Synchronized cardioversion: 0.5 to 1 J/kg if this is not effective increase to 2 J/kg. Cardioversion should only be attempted a total of twice.
  - Consider sedation but not to delay cardioversion, 0.2mg/kg etomidate (Amidate®) to a max dose of 10 mg.
- **Stable narrow complex tachycardia** (SVT) at a rate exceeding 180 BPM in children > 1 year old or 220 BPM in infants less than 1.
  - Consider Vagal maneuvers (Valsalva, ice packs applied to face; Do not perform carotid massage)
  - Administer fluid bolus of 20 mL/kg (10 mL/kg for neonates) of normal saline (if no signs of pulmonary edema)
  - Administer adenosine (Adenocard®) 0.1 mg/kg IV max dose 6 mg. May repeat at 0.2 mg/kg IV max dose of 12 mg.

PEDIATRIC CARDIOPULMONARY RESUSCITATION GUIDELINES

INDICATIONS: *Current AHA guidelines reflect the importance of compressions for survival from cardiac arrest. EMS practice must evolve to address this important change.*

Compressions should begin as soon as possible following EMS arrival.

- Rapid movement to the patient by providers is critical
- Treating the patient where they are found allows compressions to be started without delay. Safety issues should prompt patient movement.

Intubation can be delayed and BVM utilized for the first 6 minutes of CPR

High Quality CPR

- Perform continuous compression PIT CREW HIGH PERFORMANCE CPR.
- No pauses for ventilations.
- Ventilations on the upstroke of CPR.
- For CPR induced consciousness **contact medical control.**

Compressions should be FAST, HARD, and DEEP at a rate of 100-120 compressions per minute and to a depth of at least one third the anterior-posterior (AP) diameter of the chest.

- Depth of 1 ½ inches (4 cm) in infants
- Depth of 2 inches (5 cm) in children
- Faster or slower rates worsen patient outcome
- Ensure complete recoil of the chest wall prior to the next compression
- ETCO2 < 15 mmHg, efforts should focus on improved CPR quality
- No procedure (intubation, IV/IO start, etc.) should slow or stop compressions.
- Interruption for defibrillation should be minimal and compressions should resume AS SOON AS shock delivery is complete.
- Frequently switch providers performing chest compressions to maintain peak performance.

Ventilations

- Ventilate at 8-10 breaths per minute to decrease intrathoracic pressure
- Patients should be bagged using a one-hand squeeze
- Avoid excessive ventilation

Complete a minimum of 20 minutes of compressions before moving patients off scene or initiating transport.

- Patient movement on stretchers prevents effective CPR
- Effective CPR cannot be safely performed in a moving ambulance

PEDIATRIC VENTRICULAR FIBRILLATION (VF) AND/OR PULSELESS VENTRICULAR TACHYCARDIA (VT)

In the absence of effective CPR on arrival and when response time is greater than four (4) minutes, perform 2 minutes of CPR prior to first defibrillation or intubation.

Defibrillate using 2 joules/kg.

Perform 2 minutes of CPR between each defibrillation attempt.

Second shock 4 joules/kg.

Subsequent shocks of 10 joules/kg or machine max

Administer 0.01 mg/kg epinephrine (0.1 mg/mL) IV. Repeat every 3-5 minutes for the duration of resuscitation.

Consider administration of 50 mg/kg magnesium sulfate IV if Torsades de Pointes is identified.

Administer 5 mg/kg amiodarone (Cordarone®) bolus IV (maximum 300 mg per dose). May be repeated twice every ten minutes if VF/VT continues. Total of all doses not to exceed 450 mg or a max total dose of 15 mg/kg.

Follow each medication administration with a single shock of at least 4 joules/kg and 2 minutes of chest compressions

Compressions will not be interrupted for longer than 10 seconds for intubation or other procedures. Intubation should be performed during pulse/rhythm check or during compressions and should be deferred until later in the resuscitation. Consider early use of rescue airway device for anticipated difficult intubation.

With return of spontaneous circulation **Contact medical control.**

Guidelines

- *Biphasic devices use FDA approved/recommended energy settings.*

- *Ventilations*
  - *Ventilate at 8-10 breaths per minute to decrease intrathoracic pressure*
  - *Patients should be bagged using a one-hand squeeze*

- *Compressions*
  - *ETCO2 < 15 mm Hg, efforts should focus on improving CPR quality*
  - *Ensure proper depth and rate of compressions and minimize hands-off time*
  - *Frequently switch providers performing chest compressions to maintain peak performance*
  - *Ensure complete recoil of the chest wall prior to the next compression*
- *It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for cardiac arrest patients.*
- *Reversible causes: hypovolemia, hypoxia, hydrogen ion (acidosis), hypoglycemia, hypo / hyperkalemia, hypothermia, tension pneumothorax, tamponade, toxins, thrombosis (pulmonary), thrombosis (cardiac).*

PEDIATRIC ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

In the absence of effective CPR on arrival and when response time is greater than four (4) minutes, perform 2 minutes of chest compressions prior to intubation.

Administer 0.01 mg/kg epinephrine (0.1 mg/mL) IV. Repeat epinephrine every 3-5 minutes.

Administer IV bolus of up to 20 mL/kg (10 mL/kg for neonates) NSS, boluses may be repeated at the same volume up to a maximum of 60 mL/kg (30 mL/kg for neonates).

Compressions will not be interrupted for longer than 10 seconds for intubation or other procedures. Intubation should be performed during pulse/rhythm check or during compressions and should be deferred until later in the resuscitation. Consider early use of rescue airway device for anticipated difficult intubation.

Guidelines

- *Ventilations*
    - *Ventilate at 8-10 breaths per minute to decrease intrathoracic pressure*
    - *Patients should be bagged using a one-hand squeeze*

- *Compressions*
    - *ETCO2 < 15 mm Hg, efforts should focus on improving CPR*
    - *Ensure proper depth and rate of compressions and minimize hands-off time*
    - *Frequently switch providers performing chest compressions to maintain peak performance*
    - *Ensure complete recoil of the chest wall prior to the next compression*

- *It is the consensus of the EMS medical directors that during transport to the hospital, lights and sirens are not medically indicated for cardiac arrest patients.*

- *Reversible causes: hypovolemia, hypoxia, hydrogen ion (acidosis), hypoglycemia, hypo / hyperkalemia, hypothermia, tension pneumothorax, tamponade, toxins, thrombosis (pulmonary), thrombosis (cardiac).*

PEDIATRIC AND ADULT TRAUMA

***INDICATIONS**: This Trauma Protocol applies to patients with any of the following field triage criteria:*

If any of the conditions are present in abnormal vital signs, obvious injury or mechanism of injury/ evidence of high energy impact, transport to a Trauma Center. Consider air medical transport.

Vital Signs:

Adults:	Glasgow Coma Scale ≤13. Systolic BP < 90 mmHg. Respiratory rate < 10 or >29.
Pediatrics:	Pediatric Glasgow Coma Scale ≤13 Refer to the Abnormal Vital Signs section of the Broselow^{tm} tape.

Patients with abnormal vital signs should be transported preferentially to the highest level trauma center practical.

Patients with GCS ≤13 or exhibiting new onset paralysis or paresis: consider direct transport to a Level I or II Trauma Center or a Maryland Level III with neurosurgical capability.

If NO for all elements in Vital Signs, proceed to Obvious Injury.

Obvious Injury:

- Penetrating injury to the torso, axilla, abdomen, head, neck, proximal extremities or groin.
- Major burns, inhalation injury, or trauma with burns.
- More than one proximal long bone fracture.
- Pelvic fracture (suspected on clinical grounds).
- Flail chest or other major chest injury
- Limb paralysis
- Major external hemorrhage.
- Amputation above wrist or ankle
- Crushed, degloved or mangled extremity
- Open or depressed skull fracture
- AVPU scale: does not respond to voice

Patients with obvious injury should be transported preferentially to the highest level trauma center practical.

After evaluation of injuries proceed to the Mechanism.

Mechanism:

- Patient ejection (partial or complete) from vehicle
- Motorcycle crash > 20 mph or rider thrown
- Death of passenger in same vehicle compartment
- Falls > 20 feet (adult)
- Falls > 10 feet (child) or 2-3 times the height of the child

- Auto-pedestrian/ auto-bicycle injury-thrown, run over or with significant (>20 mph) impact
- Vehicle telemetry consistent with high risk injury
- High risk auto crash: inner intrusion > 12" occupant/>18" anywhere

If NO for all elements in Mechanism, proceed to Extenuating Circumstances.

Extenuating Circumstances: (Not stand alone criteria for the initiation of trauma protocol or helicopter transport.)

- Pregnancy > 20 weeks
- Renal dialysis
- Age < 15 or > 55 years
- Other significant medical conditions- discuss with medical control
- Time Sensitive extremity injuries
- Required by patient condition in the judgment of the prehospital provider
- Anticoagulation medications and bleeding disorders (Factor deficiencies, ITP).

If YES to extenuating circumstances, **contact medical control** and consider transport to a specific trauma hospital with necessary resources.

If NO to all above, routine transport.

When in doubt, transport to a trauma center.

Consider Pediatric and Adult airway management protocol.

If unable to intubate, resume ventilations via BVM pending placement of an appropriate airway device.

Consider needle chest decompression for suspected TENSION pneumothorax.

Perform bilateral needle chest decompressions for trauma arrest patients (isolated penetrating head injuries excluded).

For clinical shock, administer 20 mL/kg (10 mL/kg for neonates) normal saline intravenously to a value of greater than:

- *=60 mm Hg neonates (0-30 days)*
- *=70 mm Hg in infants (1 month – 12 months)*
- *=70 mm Hg + (2 x age in years) in children 1 – 10 years*
- *=90 mm Hg for all patients > 10 years of age*

Optional equipment: for agencies utilizing lactate measuring equipment:

- When time allows for severely injured patients, obtain a lactate measurement and report to medical control.

Report EtCO2 reading to medical control on all intubated patients

For suspected unstable pelvic fractures, apply pelvic compression device per manufacturer instructions.

Bandage burned areas using dry clean dressings only. Cover the patient and provide for an appropriate warm environment to prevent heat loss.

In cases of severe hemorrhage:

- Apply direct pressure to the hemorrhaging wound
- If direct pressure is not adequate to control hemorrhage, a provider may use a tourniquet for hemorrhage that is anatomically amenable to tourniquet application and note time of application.

For hemorrhage that cannot be controlled with above, apply approved hemostatic agent with direct pressure, or through packing of the wound with gauze either impregnated with hemostatic agent or not. If packing the wound, gauze must be inserted deeply and fully and can include multiple rolls of gauze.

For adults: In setting of hemorrhagic shock from trauma less than 3 hours old, with suspected need for massive blood transfusion due to marked internal or external blood loss **AND** sustained tachycardia $\geq$ 110 BPM **AND** sustained hypotension $\leq$ 90 mmHg consider administration of 1 gm/100 mL Tranexamic acid (TXA) IV/IO over 10 minutes.

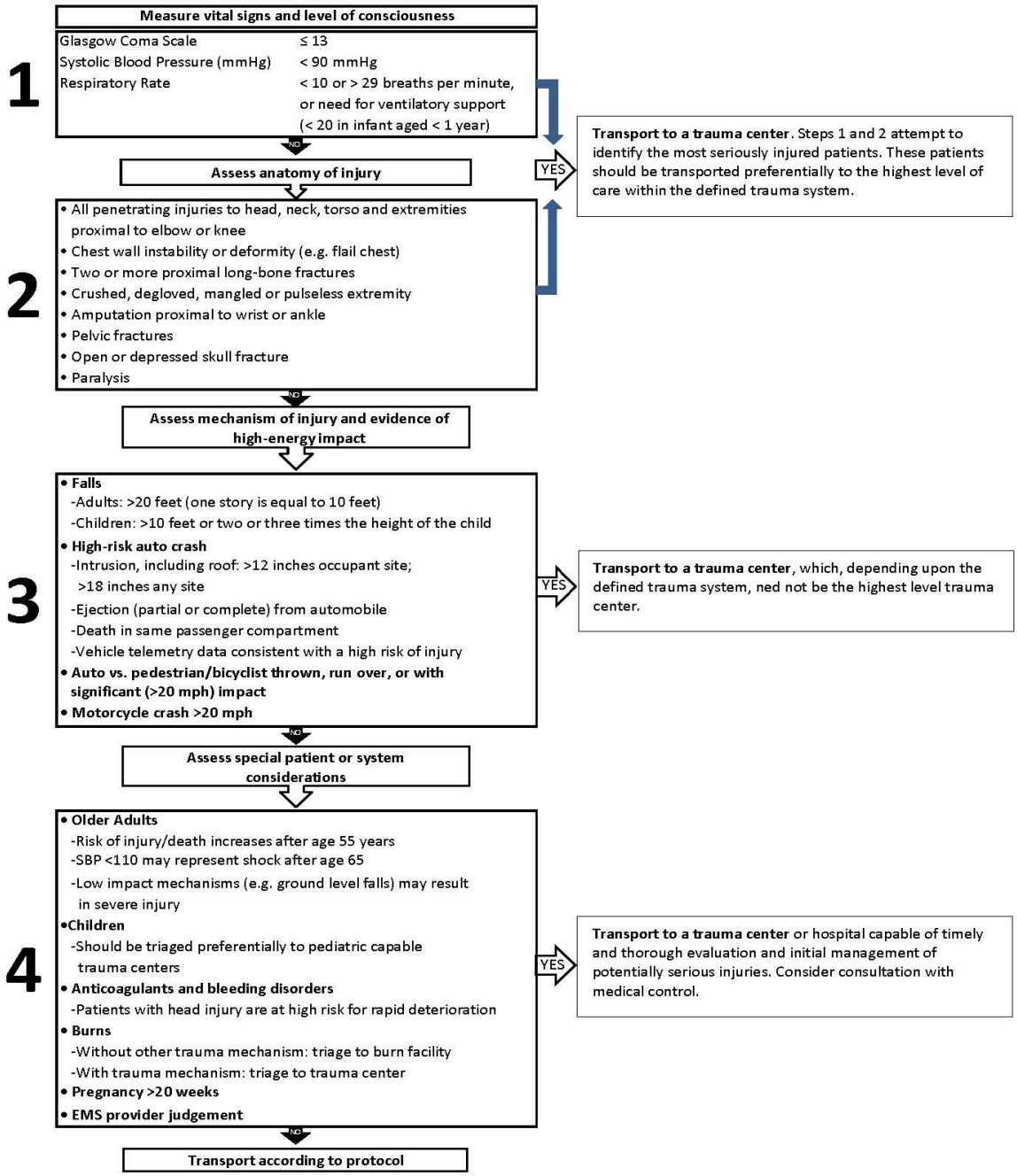
Transport considerations:

- Patients with hemorrhagic shock should be taken to the closest trauma center.
- Head or spinal trauma patients with GCS <13 or exhibiting new onset paralysis or paresis; direct transport to a trauma center with neurosurgical capabilities is preferred.
- Patients who are less than 15 years of age should be transported to a pediatric trauma center when patient condition, time and distance allow.
- Burn patients should be evaluated at the nearest trauma center.
- Consider helicopter transport if ground transport to the appropriate hospital is expected to exceed 10 minutes.
- Patients in shock with deteriorating vital signs or ongoing airway compromise should be transported to the closest trauma center

Trauma scene times should be less than 10 minutes unless there are extenuating circumstances. Reasons for scene times over ten minutes should be documented in the chart. Appropriate reasons for prolonged trauma scene times include extrication, awaiting BLS, securing scene safety, presence of multiple victims, awaiting helicopter touch down for transport to a higher level trauma center, etc.

The EMS Medical Directors support the use of an optional Abdominal Aorta & Junctional Tourniquet (AAJT).

2011 Guidelines for Field Triage of Injured Patients



When in doubt, transport to a trauma center.

PEDIATRIC AND ADULT SMOKE INHALATION

INDICATIONS: *Patients who have been found unconscious or in cardiac arrest after being rescued from a smoke inhalation situation (i.e. soot-stained face and airways, history of confinement in smoke-filled environment). This standing order also applies to firefighters who collapse with sudden cardiac arrest or unconsciousness after being involved with interior structural firefighting operations.*

Consider any decontamination to render the patient safe for treatment.

Initiate standard resuscitation procedures:

- Assess and manage the airway appropriately.
- Ensure adequate ventilation and oxygenation.
- Provide circulatory support (treat for shock, initiate CPR) as required.

Optional equipment: Determine pulse co-oximetry

Optional equipment: Perform Point of Care (POC) serum lactate testing:

- Lactate $\geq$ 10 mmol/l in the absence of severe burns or hypotension may suggest cyanide toxicity

Assess and treat other causes of altered mental status (i.e. hypoglycemia, narcotic overdose).

If patient remains unconscious or in cardiac arrest, consider administration of 5 g (2.5 g for children ages 3 to 12 years, and 1.25 g for children 3 years of age and younger) hydroxocobalamin (Cyanokit®) over 15 minutes if available. Prior to administering hydroxocobalamin:

- Draw venous blood sample
- Estimate body surface area burn percentage

Contact medical control for the consideration of direct transport to a hyperbaric center with emergent hyperbaric capabilities.

Services who stock hydroxocobalamin are encouraged to carry it in a manner that enables the drug's deployment to the scene of working structure fires with patients and incidents with extensive interior firefighting operations (for firefighter rehab).

ADULT POST RESUSCITATION CARE WITH TARGETED TEMPERATURE MANAGEMENT

INDICATIONS: *Return of Spontaneous Circulation (ROSC) in an intubated (advanced airway rescue device acceptable) cardiac arrest patient. If at any time during this protocol the patient has a loss of spontaneous circulation, discontinue cooling and treat with appropriate standing order.*

Exclusions:

- Primary traumatic arrest
- Arrest as the result of medical or traumatic hemorrhage
- Purposeful response to painful stimuli
- Less than 18 years of age

Maintain a MAP of 80-90 mmHg using an 8-12 mcg/min norepinephrine infusion.

Perform and interpret a 12 lead ECG.

Conduct a neurological assessment:

- Assess pupils (size, reactivity, equality)
- Motor response to pain

Implement Targeted Temperature Management:

- **Contact medical control** for implementation of hypothermia on patients less than or equal to 18 years of age or those that have an obviously gravid uterus.
- Patients must be transported to an induced hypothermia capable facility with preference given to a facility that can also perform percutaneous cardiac intervention (PCI).
- Expose patient and apply ice packs to axilla, groin and neck.
- For patients with visible shivering:
  - Administer 0.1mg/kg of vecuronium IV with a maximum dose of 10 mg if airway monitoring indicates adequate oxygenation and ventilation.
  - Administer up to 5 mg midazolam (Versed) may repeat in 10 minutes for a maximum dose of 10mg.
- Administer intravenous bolus of cold normal saline 30 mL/kg IV with a maximum of 2 liters.

Guidelines

- *Patients develop metabolic alkalosis with cooling, do not hyperventilate*
- *It is important to report the neurological assessment to the receiving facility*
- *Cold saline should be stored at a temperature of 4° Celsius (approximately 40° Fahrenheit).*

SELECTIVE SPINAL MOTION RESTRICTION

INDICATIONS: *Apply this guideline to all patients involved in known or suspected blunt trauma.*

Implement spinal motion restriction (rigid collar) in the following circumstances:

- Significant multiple system trauma.
- Severe head or face trauma.
- If altered mental status (including drugs, alcohol and trauma) and:
  - No history available
  - Found in setting of possible trauma (e.g., lying at the bottom of stairs or in street)
- Loss of consciousness after trauma.
- Any fall with evidence of striking head.
- Spinal pain or tenderness, including any neck pain with a history of trauma.
- Numbness or weakness in any extremity after trauma
- Patient with significantly painful distracting injury.

For Patient transport:

- If ambulatory, allow patient to move to stretcher mattress with minimal spinal motion
- If non-ambulatory, Use backboard, scoop/orthopedic stretcher, vacuum mattress, or other device to move patient to stretcher with minimal spinal motion
- Use CID may be used to further restrict spinal motion
- Transport on stretcher mattress without backboard if patient ambulatory or if scoop/orthopedic stretcher and be removed with minimal patient motion.
- Use of a scoop/orthopedic stretcher, backboard or Reeves stretcher is required for patients being transported by pre-hospital aviation.

Note*: Penetrating trauma to the extremities or core (below the clavicles) without neurologic deficit does not require board or collar.*

In certain situations the long backboard will still be used as an extrication/moving device, but plays no significant role in restricting spinal motion. If a backboard is utilized during extrication, the EMS crew may, at its discretion, remove the board prior to transport.

PATIENT RESTRAINT

INDICATIONS: *Patient care remains the primary responsibility of the EMS provider. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that evaluation of many patient parameters requires patient cooperation and thus may be difficult or impossible.*

Soft restraints are to be used only when necessary in situations where the patient is potentially violent and may be of danger to themselves or others. Patients who are clinically competent retain a right to refuse transport. EMS providers must remember that aggressive violent behavior may be a symptom of medical conditions such as but not limited to:

- Head trauma
- Alcohol/drug related problems
- Metabolic disorders (i.e., hypoglycemia, hypoxia, etc.)
- Psychiatric/stress related disorders

All restraints should have the ability to be quickly released, if necessary in an emergency.

It is medically acceptable to have a police officer follow a restrained patient's ambulance to the hospital in their police vehicle, as long as they maintain a position and contact with the transporting ambulance that will allow the officer to quickly release any restraining device that requires a key or special releasing device that they have applied in the event of a sudden deterioration in a restrained patient's condition.

This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control or allow safe transport of patients who are in the custody of law enforcement.

Patients should be transported in the supine position to ensure adequate respiratory and circulatory monitoring and management.

The prone position should be a position of last resort and rarely used. This position carries a higher risk of patient injury or death.

All restrained patients should be placed on a stretcher with adequate foam padding particularly underneath the head. Extremity restraints should be secured to the stationary portion of the stretcher frame.

Stretcher straps should still be placed on all patients as these are analogous to seatbelts during transport.

Restraints that use multiple knots or that may restrict chest wall motion are unacceptable.

Restrained extremities should be monitored for color, sensory and motor function, pulse quality, and capillary refill at the time of application and frequently thereafter. The patient's respiratory status, pulse oximetry, or waveform capnography should be monitored during transport.

After addressing and/or treating medical causes of aggressive or violent behavior, Consider the administration of up to 2.5-5 mg (use lower dose for elderly) haloperidol* (Haldol®) IM/IV for

sedation and/or up to 2.5-5 mg (use lower dose for elderly) midazolam (Versed®) IV/IM as a chemical restraint.

In patients who have escalating aggressive or combative behavior utilize Excited Delirium protocol.

Restraint documentation on the EMS report shall include:

- Reason for restraint
- Agency responsible for restraint application (i.e., EMS, Police)
- Documentation of serial cardio-respiratory status and peripheral neurovascular status

*Call medical control for haloperidol (Haldol) dosing for patients ≤ 3 yrs.

This policy is not intended for the inter-facility transport of medically cleared involuntarily committed psychiatric patients.

EXCITED DELIRIUM

INDICATIONS: *Excited delirium is currently characterized by the acute onset of bizarre or violent behaviors, including aggression, combativeness, hyperactivity, extreme paranoia, hallucinations, superhuman strength or incoherent shouting. Hyperthermia is frequently present.*

Follow Patient Restraint Protocol

After addressing and/or treating medical causes of aggressive or violent behavior, consider the administration of 5 mg/kg IM ketamine* (Ketalar®) for sedation.

- If IV has already been established prior to combative behavior, may administer 2 mg/kg IV ketamine* (Ketalar®) for sedation.

After ketamine administration prepare for Hypersecretion/salivation. If Hypersecretion/salivation occurs, consider:

- Atropine 0.1-0.3 mg IV/IO
- Atropine 0.5 mg IM

Restraint documentation on the EMS report shall include:

- Reason for restraint
- Agency responsible for restraint application (i.e., EMS, Police)
- Documentation of serial cardio-respiratory status and peripheral neurovascular status

***Contact medical control** for ketamine (Ketalar®) dosing for patients ≤ 8 yrs.

This policy is not intended for the inter-facility transport of medically cleared involuntarily committed psychiatric patients.

PEDIATRIC AND ADULT AIRWAY MANAGEMENT

***INDICATIONS**: Respiratory failure, inadequate ventilatory effort with minimal air exchange, severe dyspnea with an increased or decreased respiratory rate, retractions, difficulty speaking, extreme agitation, anxiousness, absent respirations, altered mental status, or situations where airway protective reflexes are lost (loss of gag reflex). Central cyanosis may be noted.*

Refer to Drug Facilitated (DFI) Guidelines for program requirements.

Insert appropriately sized basic airway adjunct.

Suction as needed throughout intubation procedure.

Assess the airway using the HEAVEN. (**H**ypoxemia, **E**xtremes of size, **A**natomic challenges, **V**omit/blood/fluid, **E**xsanguination/anemia and **N**eck mobility issues).

Perform endotracheal intubation and ventilate with 100% oxygen.

- Pediatric cuffed endotracheal tube ID (mm)=3.5+(age/4)

Contact medical control for implementation of Drug Facilitated Intubation (DFI)

For systems not utilizing DFI**, contact medical control** for consideration of activation of the SEDATION ONLY INDUCTION procedure.

DFI Absolute Contraindications:

- Any patient where it is anticipated that they cannot be effectively ventilated with a bag valve-mask after paralysis.
- Entrapped patients with inadequate access to the patient and airway.
- Degenerative or dystrophic neuromuscular disease (Amyotrophic lateral sclerosis, Guillain-Barre disease, myasthenia gravis or muscular dystrophy)

Succinylcholine:

- Patients who are at risk for hyperkalemia
- Personal or family history of malignant hyperthermia

DFI Relative Contraindications:

- Severe trauma to the mouth, upper, or lower airways
- Stridor or potential obstructed airway
- Morbidly obese patient
- Small mouth, short neck, or large tongue
- No rescue airway (e.g. Pediatric patients)
- Children with special health care needs (motor dysfunction)
- Succinylcholine:
  - Penetrating eye injuries
  - Renal failure

DFI Preparation:

- Two certified ALS providers, one with credentials for DFI must be present. At least one must be a Delaware Certified Paramedic.
- Pre-oxygenate the patient with 100% oxygen prior to the DFI process (NRB mask or BVM). Consider Hi-flow nasal cannula oxygenation.
- Assess for contraindications and for difficult airway anatomy. Rate the patient's neurological status (Glasgow Coma Scale).
- Apply and continuously monitor ECG and SpO_2 monitoring.
- Ensure functioning IV. (Two functioning IV's recommended.)
- Prepare equipment including:
  - Intubation gear
  - Suctioning gear (running)
  - Thomas ETT holder
  - Capnography device
  - OEMS approved rescue airway devices
  - Calculate drug dosages and prepare all medications.

Sedation Only Induction Procedure:
For patients whom succinylcholine is contraindicated, or for patients with questionable HEAVEN assessment but pharmacologic airway management is indicated. May also be utilized by Delaware EMS agencies that do not carry succinylcholine.

- Position patient properly with use of in-line stabilization for trauma patients. Consider continued use of Hi-flow nasal cannula oxygenation during DFI process. Monitor SpO_2 continuously.
- Administer 20 mg etomidate (Amidate®) IV, for large patients consider up to 0.3 mg/kg etomidate IV with a maximum dose of 40 mg for adults. For pediatric patients 0.3 mg/kg with a maximum dose of 20 mg.
- Consider administration of 100 mcg fentanyl IV. For pediatric patients 2 mcg/kg with a maximum dose of 50 mcg.
- Consider Administration of up to 5 mg midazolam (Versed®) IV. For pediatric patients 0.2 mg/kg with a maximum dose of 2.5 mg.

DFI Process:

- Position patient properly with use of in-line stabilization for trauma patients.
- Consider continued use of Hi-flow nasal cannula oxygenation during DFI process. Monitor SpO_2 continuously.
- For adults only, consider administration of 100 mcg fentanyl IV.
- Administer 1-2 mg/kg of ketamine (Ketalar®) **OR** 0.3 mg/kg of etomidate (Amidate®) IV/IO with a maximum dose of 40 mg for adults. For pediatric patients maximum dose of 20 mg
- Administer 2 mg/kg (maximum dose 200 mg) of Succinylcholine rapid IV/IO push.
  - If there is a contraindication to succinylcholine, request from Medical control to administer 1mg/kg rocuronium IV/IO
- Make no more than 3 attempts to intubate the patient (no more than 2 attempts per paramedic).
- Confirm placement and secure the endotracheal tube.

Post Intubation Management:
Verify proper endotracheal tube placement and document via the following methods:

- Visualization of tube passing through the vocal cords or the substitution of a whistle device (e.g. BAAM®) for nasotracheal intubation.
- Capnography with waveform reading should be used to continuously monitor waveform on intubated patients throughout the duration of the transport. A printout or event marker documenting the capnography with waveform should be obtained:
  - At time of tube placement
  - At any time of patient movement or transfer to another unit.
  - At time of transfer to receiving facility's stretcher
  - If Capnography fails, verify with capnometry.
  - If Capnography and capnometry fail verify with direct visualization.
- Visualization of the chest rising and falling with ventilations.
- Clearing of the ET tube with lung inflation and misting of the tube with lung deflation.
- SpO2 reading.
- Presence of bilateral breath sounds and absence of air sounds over the epigastrium.
- A printout of the trend report with the patient's heart rate, pulse oximetry and capnography readings will be presented to the receiving physician and copied for the agency's EMS medical director, regardless of intubation success.

Continued sedation:

- Administer up to 5 mg midazolam (Versed®) (0.2 mg/kg midazolam for patients under the age of 15 years) IV for continued sedation unless there is a systolic blood pressure less than 100 mmHg or as appropriate per Broselow tape (or OEMS determined equivalent) to estimate drug dosages for pediatric patients. A repeat dose is approved for continued sedation of patient if systolic blood pressure is >100 mmHg.

Rate the patient's neurological status (Glasgow Coma Scale). For continued paralysis of the intubated patient, consider administration of 1mg/kg rocuronium IV/IO OR 0.1 mg/kg vecuronium. Vecuronium (in combination with up to 5 mg of midazolam (Versed®) may be repeated once if the patient exhibits any signs of cessation of paralysis.

Consider Pain Management protocol.

Consider the insertion of a naso/orogastric tube for gastric distention for intubated patients.

Failed Intubation:
If unable to intubate but can ventilate, resume ventilations via BVM pending insertion of an approved rescue airway device.

- Insert an approved rescue airway device.
- Confirm placement and secure the rescue airway device.
  - Apply capnography and provide continual monitoring.
  - Consider continued sedation. with up to 5 mg of midazolam (Versed®)
  - With successful OEMS approved rescue airway device placement and with adequate ventilation and oxygenation, consider administration of 1mg/kg rocuronium IV/IO OR 0.1 mg/kg vecuronium. Vecuronium (in combination with up to 5 mg of midazolam (Versed®)) may be repeated once if the patient exhibits any signs of cessation of paralysis.

Failed Airway:

- If unable to intubate and cannot ventilate, perform a surgical cricothyrotomy or needle cricothyrotomy.

Ventilator Management (device dependent):

- Tidal Volume should be set to 6-8 mL/kg of ideal body weight (maximum 650 mL)
- Rate should be set:
  - 8-10 for cardiac arrest, 10 for Head injury, all others 12
  - Then titrate rate to obtain an ETCO2 as close to 35-45 mmHg for perfusing patients
- FiO_2 should be set to:
  - 100% O_2 for cardiac arrest
  - Titrate to maintain SpO_2 of at least 95% for perfusing patients

Oral endotracheal intubation is the preferred route of intubation. If unable to perform oral intubation, consider using an age appropriate rescue airway.

Capnography with waveform is to be obtained and printed upon placement of the endotracheal tube, upon any movement of the patient (i.e. transfer to the stretcher or ambulance), and upon transfer of patient care to the receiving facility.

**The use of transport ventilators may be performed by agencies approved by the Office of Emergency Medical Services.*

QA/QI Parameters: 2 attempts per paramedic; 3 attempts per patient; attempt is passage of the laryngoscope blade past the patient's lips; greater than the above attempts requires medical control approval and a variance report.

QA/QI Screen: at least three (3) endotracheal attempts per paramedic per year; at least 80% success rate; review of intubation trending data; agency EMS medical director determines if paramedic performance requires remediation; plan of remediation determined by EMS medical director in consultation with the paramedic's administration.

PEDIATRIC AND ADULT PAIN MANAGEMENT

***INDICATIONS**:* Moderate to Severe pain as assessed by physical presentation and age appropriate pain scale.

CONTRAINDICATIONS: Systolic blood pressure less than 90 mmHg (70 + (2x age in years) mmHg in the pediatric patient)

- Consider Fentanyl
  - Adult Patients: 50 - 100 mcg Fentanyl IV/IM/IN.
    - After five (5) minutes and with continued moderate to severe pain, administer 50 - 100 mcg Fentanyl IV/IM/IN.
  - Pediatric Patients: 1 mcg/kg Fentanyl IV/IM/IN up to a max dose of 50 mcg.
  - Contact medical control for additional doses of Fentanyl

- *Consider monitoring capnography.*

Continued Moderate to Severe

- Contact Medical Control to consider ketamine (Ketalar®) for severe pain not controlled by the initial dose of Fentanyl.
  - Adult Patients: 0.25 mg/kg IV over 5 minutes. Max dose of 25 mg IV

RAPID ARTERIAL OCCLUSION EVALUATION (RACE) SCALE

Rapid Arterial oCclusion Evaluation (RACE) is the most recent scale developed and is gaining popularity. RACE takes slightly more time to perform than the CPSS and LAMS, with the goal of more accurately identifying stroke severity and localizing the area affected by the stroke. RACE includes:

Facial palsy - weakness on one side of face with smile.

- Absent = 0
- Mild (some facial movement) = 1
- Moderate to severe (little to no facial movement) = 2

Arm motor function - the same test as Cincinnati and Los Angeles scales.

- Normal to mild = 0
- Moderate (able to lift arm, but unable to hold it for 10 seconds) = 1
- Severe (unable to raise arm) = 2

Leg motor function - ask the patient to lift each leg.

- Normal to mild (able to lift leg and hold for five seconds) = 0
- Moderate (able to lift, but unable to hold for five seconds) = 1
- Severe (unable to lift one leg off of bed at all) = 2

Head and gaze deviation - if the patient's head or eyes are towards one side, ask them to look towards the other side.

- Absent = 0
- Present (unable to shift gaze past midline) = 1

If a right-side deficit is found, check for aphasia (inability to say or hear words correctly). Ask the patient to close their eyes and make a fist.

- Performs both tasks correctly = 0
- Performs 1 task correctly = 1
- Performs neither task = 2

If a left-side deficit is found, check for agnosia (an inability to process sensory information). Touch their arm and ask "whose arm is this?" Then ask them to raise both hands and clap.

- Patient recognizes his/her arm = 0
- Does not recognize his/her arm or the impairment = 1
- Does not recognize his/her arm nor the impairment = 2

Emergent Large Vessel Occlusion (ELVO) is likely if the cumulative score is above 5.

Record the highest RACE stroke scale if the patient care reporting system limits reporting to a single number. If allowed, record all RACE stroke scores along with vital signs as patient evaluation proceeds.

MANDATORY ALS EQUIPMENT INVENTORY

ALS Equipment	Minimum
ALS Radio/cell phone for base station communication	1
EKG monitor/defibrillator w/ 12 lead capability (adult and pediatric) W/ trend capability for HR, PO & EtCO2	1
Pulse Oximeter (adult and pediatric)	1
Capnography - electronic with waveform capable of ET and nasal (optional) CO2 determinations	1ea pediatrics and adult
CO-oximetry device (optional)	1
Spare EKG paper	1 roll
Monitoring electrodes	18
Monitoring cables	1 set
Defibrillation pads* (adult (1) and pediatric(1)) (Combi pads)	2 pair
Pacemaker pads*	1 pair
Glucometer	1
Pelvic compression device	1
Broselow tape or OEMS approved equivalent	1
Intravenous Equipment	
Catheter, 24g Catheter, 22g	4
Catheter, 20g	4
Catheter, 18g	4
Catheter, 16g	4
Catheter, 14g, > 5cm length (chest decompression)	4
I/O needles (w/depth control mechanism for pediatrics and adults) Adult I/O needles should be available for humerus and tibial placement.	2
Administration set, 10-15gtt/mL	2
Administration set, 60 gtt/mL	2
Normal Saline solution, 1000mLmL	2
Normal Saline solution, 500mLmL	1

Intubation Equipment	Minimum
Nasopharyngeal airways	1 set
Oropharyngeal airways (0-6)	1 set
NuMask	1
Endotracheal tubes (2.5,3,3.5,4,5,6,7,8,9)	1 ea
OEMS Approved rescue airway devices adult and pediatric(LMA, Combitube. i-gel® supraglottic airway or King LT)	1 ea
Video Laryngoscope(optional)	1
Miller Blades (0,1,2,3,4)	1 set
Macintosh blades (1,2,3,4)	1 set
Laryngoscope handle, adult	1
Laryngoscope handle, pediatric	1
Magill Forceps, adult	1pr
Magill forceps, pediatric	1pr
CPAP equipment	1 set
Stylet, adult and pediatric	1
Gastric tubes (8,10,12,14,16,18)	1 set
Pertrach, Quicktrach or other approved surgical kit (4.0 mm)	1 kit
Tape, adhesive or twill	1 roll
syringes, 20mLmL	1
Bougie-flex guide intubation aid (adult and Pediatric 1 each)	2
Water based lubricant (6 packets)	1 tube
Spare laryngoscope bulb	2
Spare laryngoscope batteries	2
Medication Administration	
1mL syringes w/ 25g needles	4
3-10 mL syringes	8
19g needles	4
21g needles (1.5 in)	4
Nebulizers	2
MAD Device	1

Intravenous Equipment (cont.)	**Minimum**		**Additional Equipment**	**Minimum**
Normal Saline solution, 100mLmL	1		Dental repair kit (TEMS Protocol)	1
Blood draw device with appropriate blood tubes (optional)	2		Transport Ventilator (optional) Mechanical chest compression device (optional) Thermometer (agency medical director approved)	1
Tourniquets capable of arterial occlusion	2		Chest seals (optional)	1
OEMS approved point of care testing device for cardiac markers, PT/INR and lactate (optional)	1		Abdominal Aorta Junctional Tourniquet (AAJT) (optional)	1
OEMS approved Hemostatic Agents	1			
Site preparation material	2			

MEDICATION LIST

Acetaminophen (Paracetamol®)

Adenosine (Adenocard®)

Albuterol (Proventil®, Ventolin®)

Amyl Nitrite*

Amiodarone (Cordarone®)

Aspirin

Atropine

Bumetanide (Bumex®)…….....may be substituted for Lasix® (1 mg = 40 mg Lasix®)

Calcium chloride

Calcium Gluconate*

Dexamethasone (Decadron®, Hexadrol®) may be substituted for Solu-Medrol® (20 mg=125 mg Solu-Medrol)

Dextrose

Diazepam*

Diltiazem (Cardizem®)

Diphenhydramine (Benadryl®)

Dopamine

Epinephrine

Esmolol hydrochloride (Brevibloc) 10 mg/mL injection solution (Optional)

Etomidate (Amidate®)……80 mg per bag maximum

Fentanyl (Sublimaze®)

Furosemide (Lasix®)

Glucagon

Haloperidol (Haldol®)

Hydroxocobalamin (Cyanokit®)

Ipratropium (Atrovent®)

Ketamine (Ketalar®)……..500mg/5ml

Labetalol (Trandate®)

Levalbuterol (Xopenex®)…….may be substituted for albuterol (1 unit dose for 1)

Lidocaine (Xylocaine®)

Magnesium Sulfate

Metoprolol (Lopressor)

Methylprednisolone (Solu-Medrol®)

Midazolam (Versed®)……...20 mg per bag maximum

Morphine……....may be substituted for Fentanyl® (1 mg = 10 mcg)

MEDICATION LIST (cont.)

Naloxone (Narcan®)

Nitroglycerine

Norepinephrine

Ondansetron (Zofran®) Oxygen

Pralidoxamine*

Prednisolone (Prednisone®)

Rocuronium (Zemuron)

Sodium bicarbonate

Sodium nitrite*

Sodium thiosulfate*

Succinylcholine (OEMS approved RSI agencies)

Tranexamic Acid (TXA)

Vaccine and Immunization agents (authorized by the Director of Public Health, State EMS Director and State EMS Medical Director as stated in Paramedic Scope of Practice)

Vecuronium (OEMS approved agencies)

**Toxmedic protocols*

ALS Inter-Facility Transport

1.0 Purpose:

To delineate the requirements and responsibilities of the various agencies and individuals responsible for the inter-facility care of ALS and critical care transport (CCT) initiating within Delaware.

2.0 Justification:

The environment and needs of patients who are transported within the healthcare system are different from those of patients who are being treated / transported in the prehospital setting. Paramedics operating within the inter-facility component of the Delaware Emergency Medical Services system will adhere to the requirements within. Inter-facility paramedics will operate with an expanded scope of practice.

3.0 Definitions:

ALS Inter-facility unit: Ambulance capable of providing paramedic level care as defined by the paramedic Statewide Standard Treatment Protocols.

Critical Care Transport (CCT): An inter-facility patient transfer that requires the paramedic to perform additional ALS skills as defined by the expanded scope of practice approved by the Delaware Office of EMS.

Specialty Care Transport Unit (SCTU): Ambulance capable of providing critical care transports staffed by an inter-facility paramedic and/or registered nurse. The SCTU will contain equipment to facilitate critical care transports.

4.0 ALS Inter-Facility Specific Protocols

4.1 ADULT AND PEDIATRIC GENERAL CARE
4.2 VENTILATOR MANAGEMENT
4.3 MANAGEMENT OF PREVIOUSLY INTIATED CONTINUOUS IV INFUSIONS
4.4 BLOOD PRODUCT ADMINISTRATION

5.0 Appendix

A. Ideal/Predicated Body weight Tables
B. Antibiotic Reference List

4.1 ADULT AND PEDIATRIC GENERAL PATIENT CARE

INDICATIONS: Any patient requiring inter-facility transport that would require the level of care provided by a Delaware inter-facility paramedic.

The *Adult and Pediatric General Patient Care* protocol will be followed in conjunction with all other applicable protocols.

The ALS Inter-facility Transport protocols are in effect only in the inter-facility environment and may not be applied into the pre-hospital environment without OEMS approval.

Perform scene size-up.

Perform a patient assessment.

Consider the need for additional resources (e.g., a SCTU staffed with a registered nurse).

Receive a verbal report on the patient's conditions from the referring health care practitioner or their licensed designee.

Obtain the necessary patient records and patient belongings to accompany the patient to the receiving facility.

Ensure that a physician has agreed to receive the patient at the destination facility and appropriate transfer forms (e.g., EMTALA, medical necessity certification, and consent) have been properly completed, signed, and dated.

If the patient experiences a change in condition or circumstance they may be diverted back to the sending facility or the closest appropriate emergency department.

Maintain therapies initiated at the sending facility in the transport environment and prevent inadvertent cessation of therapy or monitoring during patient movement/transport.

Protect the patient from environmental exposures of heat, cold, sound, light, and vibration.

Utilize the appropriate mode and method of transport.

Contact Medical Control if patient's condition deteriorates, if there are questions about the legality or ethics of the patient transfer, or if the patient is receiving care unfamiliar to the paramedic.

Transfer the patient to the receiving facility.

Provide a patient report to the receiving nurse and/or physician.

Transfer accompanying patient records and patient belongings to the receiving nurse and/or physician.

Complete a patient care report.

4.2 VENTILATOR MANAGEMENT

INDICATIONS: Patients that require mechanical ventilation who have been intubated or have a surgical airway.

Assess patient (physical exam, receive sending report, review pertinent records).

Confirm patency of airway or trach.

Confirm that appropriate alarms are turned on and set to appropriate parameters.

Continuous waveform capnography must be monitored on all patients that are receiving invasive mechanical ventilation.

A bag-valve mask and oxygen source must accompany the ventilated patient during transport. This includes moving from the bedside to the ambulance and from the ambulance to the receiving bed.

For the patient currently mechanically ventilated:

When appropriate, the inter-facility paramedic should use the established ventilator settings from the referring facility.

It is imperative to critically evaluate the appropriateness and effectiveness of these settings prior to continuing them during transport.

If at any time the ventilator should fail or an alarm is receiving that cannot be corrected, immediately ventilate the patient with a bag-valve mask attached to 100% oxygen.

Utilize DOPE mnemonic (Displacement, Obstruction, Pneumothorax, and Equipment).

Verify airway placement and effectiveness (pulse ox, breath sounds, ETCO2, waveform capnography)

When not contraindicated (e.g., cervical spine trauma patients), the patient should be positioned with the head of the stretcher elevated 30-45 degrees.

Consider the value and limitation of recent (within 60 minutes) arterial blood gas (ABG) values.

Titration of ventilator settings based on ETCO2 reading that have not correlated to a reliable ABG is not supported by evidence based research.

Monitor mean airway pressure (MAP), peak inspiratory pressure (PIP), and expired tidal volume (VTe).

Ensure that plateau pressure does not exceed 35 cm H2O.

For the patient not currently mechanically ventilated *(e.g., intubation during transport)**:***

Utilize volume assist control or SIMV mode.

Set tidal volume at 4-8 mL/kg of ideal body weight (IBW)

Texts recommend using a lower tidal volume to avoid lung injury.

Set initial rate of 12-20 breaths per minute with an ETCO2 target of 35-45 mmHg

Patients that are head injured and are showing signs of impending ventilation should be ventilated with a target ETCO2 of 30-35 mmHg.

PEEP: 5 mmHg. May increase up to 10 cmH2O for pulmonary edema, ARDS, and non-fatal drowning patients.

Texts recommend increasing PEEP as a first measure to improve oxygenation before increasing tidal volume or FiO2.

FiO2: Set to 1.0. Contact Medical Control for FiO2 titration for patients not experiencing hypoxia.

Texts suggest targeting the SpO2 between 94% and 96% as a means of reducing lung injury.

I/E ratio: Utilize 1:2, consider 1:3 for patients with bronchoconstriction

Contact Medical Control for other ventilator settings than what is outlined by this protocol in a patient that previously was not receiving mechanical ventilation

The Inter-facility paramedic may utilize an appropriately equipped ventilator to provide the following modes:

- Volume and pressure assist control
- SIMV
- CPAP with a pressure of 5-15 cmH2O
- Pressure Support (matched to patient settings)
- Bi-Level (matched to patient settings)
- *Oscillation and APRV are typically not able to be performed on a transport ventilator. These patient require RN and/or respiratory therapist staffing and an appropriate ventilator capable of performing these functions.*

Consider the use of sedatives, anxiolytics, analgesics, and paralytics as needed per the Statewide Standard Treatment Protocols for the intubated patient not tolerating mechanical ventilation.

For patients being ventilated with bi-level NPPV (BiPAP) at the sending facility, maintain settings found at bedside. Contact Medical Control for changes to BiPAP settings.

For non-intubated patients that develop acute respiratory distress during transport and require non-invasive ventilation, the inter-facility paramedic shall utilize pressure support ventilation.

Transport of mechanically ventilated neonates is not within the scope of practice for inter-facility paramedics. Pediatric patients weighing < 10 kg may not be ventilated using most transport ventilators and require the use of a pediatric specialty team.

4.3 MANAGEMENT OF PREVIOUSLY INITIATED CONTINUOUS IV INFUSIONS

INDICATIONS: Any patient requiring an inter-facility transport that has an intravenous medication infusion during the out-of-facility transport time.

Inter-facility paramedics encountering medication infusions may continue the infusion via a continuous infusion.

The paramedic shall verify and document the ordered dose and rate of the medication. If the dose or rate is outside of standard parameters contact Medical Control prior to the initiation or continuation of medication.

Verify that the patient does not have a known allergy to that medication or class of medications.

If the patient has an allergy to that medication or class of medications, contact Medical Control.

If the above parameters are met, continue administration of the medication at the same dose and rate, using an OEMS approved transport pump, as ordered at the referring facility.

Monitor the patient for signs of allergic reaction. If signs of an allergic reaction occur, stop the infusion, follow appropriate protocols and contact Medical Control.

The “dose/rate” calculator on the infusion pump shall be used for all titratable infusions.

4.4 BLOOD PRODUCT ADMINISTRATION

INDICATIONS: Patients receiving whole blood, packed red blood cells (PRBC), fresh frozen plasma (FFP), cryoprecipitate, or albumin as prescribed by a licensed medical practitioner from the referring facility and will require continuous infusion during transport.

The inter-facility paramedic WILL NOT initiate any blood product infusion nor confirm the blood product order prior to initiation in lieu of a registered nurse or physician at the sending facility.

Blood infusions must be started at the sending facility for at least 15 minutes and at least 50 mL must be infused before transport can begin.

Review the most recent hemoglobin, hematocrit, and prothrombin time. These values should be documented on the patient care report (PCR).

Obtain a copy of the blood transfusion order form to include signatures of registered nurses verifying the correct patient information and blood product being transfused.

Verify the product, group, Rh type, date, time, unit number, and volume amount and document on the PCR.

Blood products must be administered via an OEMS approved transport pump.

Any change in rate of administration of blood products requires an order from Medical Control.

Continually monitor for signs of transfusion reaction:

- Temperature elevations
- Hives
- Itching
- Rash

IMMEDIATELY stop blood product infusion at the first sign of a transfusion reaction and contact Medical Control.

The inter-facility paramedic will initiate the Allergic Reaction protocol if needed for the patient experiencing a severe transfusion reaction and/or signs of anaphylaxis.

5.0 APPENDIX

Appendix A

Ideal/Predicted Body Weight Tables (ARDSnet)

Table 1: Women

HEIGHT	PBW	4 ml	5 ml	6 ml	7 ml	8 ml
4' 0" (48)	17.9	72	90	107	125	143
4' 1" (49)	20.2	81	101	121	141	162
4' 2" (50)	22.5	90	113	135	158	180
4' 3" (51)	24.8	99	124	149	174	198
4' 4" (52)	27.1	108	136	163	190	217
4' 5" (53)	29.4	118	147	176	206	235
4' 6" (54)	31.7	127	159	190	222	254
4' 7" (55)	34	136	170	204	238	272
4' 8" (56)	36.3	145	182	218	254	290
4' 9" (57)	38.6	154	193	232	270	309
4' 10" (58)	40.9	164	205	245	286	327
4' 11" (59)	43.2	173	216	259	302	346
5' 0" (60)	45.5	182	228	273	319	364
5' 1" (61)	47.8	191	239	287	335	382
5' 2" (62)	50.1	200	251	301	351	401
5' 3" (63)	52.4	210	262	314	367	419
5' 4" (64)	54.7	219	274	328	383	438
5' 5" (65)	57	228	285	342	399	456
5' 6" (66)	59.3	237	297	356	415	474
5' 7" (67)	61.6	246	308	370	431	493
5' 8" (68)	63.9	256	320	383	447	511
5' 9" (69)	66.2	265	331	397	463	530
5' 10" (70)	68.5	274	343	411	480	548
5' 11" (71)	70.8	283	354	425	496	566
6' 0" (72)	73.1	292	366	439	512	585
6' 1" (73)	75.4	302	377	452	528	603
6' 2" (74)	77.7	311	389	466	544	622
6' 3" (75)	80	320	400	480	560	640
6' 4" (76)	82.3	329	412	494	576	658
6' 5" (77)	84.6	338	423	508	592	677
6' 6" (78)	86.9	348	435	521	608	695
6' 7" (79)	89.2	357	446	535	624	714
6' 8" (80)	91.5	366	458	549	641	732
6' 9" (81)	93.8	375	469	563	657	750
6' 10" (82)	96.1	384	481	577	673	769
6' 11" (83)	98.4	394	492	590	689	787
7' 0" (84)	100.7	403	504	604	705	806

Table 2: Men

HEIGHT	PBW	4 ml	5 ml	6 ml	7 ml	8 ml
4' 0" (48)	22.4	90	112	134	157	179
4' 1" (49)	24.7	99	124	148	173	198
4' 2" (50)	27	108	135	162	189	216
4' 3" (51)	29.3	117	147	176	205	234
4' 4" (52)	31.6	126	158	190	221	253
4' 5" (53)	33.9	136	170	203	237	271
4' 6" (54)	36.2	145	181	217	253	290
4' 7" (55)	38.5	154	193	231	270	308
4' 8" (56)	40.8	163	204	245	286	326
4' 9" (57)	43.1	172	216	259	302	345
4' 10" (58)	45.4	182	227	272	318	363
4' 11" (59)	47.7	191	239	286	334	382
5' 0" (60)	50	200	250	300	350	400
5' 1" (61)	52.3	209	262	314	366	418
5' 2" (62)	54.6	218	273	328	382	437
5' 3" (63)	56.9	228	285	341	398	455
5' 4" (64)	59.2	237	296	355	414	474
5' 5" (65)	61.5	246	308	369	431	492
5' 6" (66)	63.8	255	319	383	447	510
5' 7" (67)	66.1	264	331	397	463	529
5' 8" (68)	68.4	274	342	410	479	547
5' 9" (69)	70.7	283	354	424	495	566
5' 10" (70)	73	292	365	438	511	584
5' 11" (71)	75.3	301	377	452	527	602
6' 0" (72)	77.6	310	388	466	543	621
6' 1" (73)	79.9	320	400	479	559	639
6' 2" (74)	82.2	329	411	493	575	658
6' 3" (75)	84.5	338	423	507	592	676
6' 4" (76)	86.8	347	434	521	608	694
6' 5" (77)	89.1	356	446	535	624	713
6' 6" (78)	91.4	366	457	548	640	731
6' 7" (79)	93.7	375	469	562	656	750
6' 8" (80)	96	384	480	576	672	768
6' 9" (81)	98.3	393	492	590	688	786
6' 10" (82)	100.6	402	503	604	704	805
6' 11" (83)	102.9	412	515	617	720	823
7' 0" (84)	105.2	421	526	631	736	842

Appendix B

Antibiotic Reference List

Medication	Class	Dosing Range	Time of infusion
Ampicillin (Omnipen)	Penicillins	1 – 2 gm	30 min
Ampicillin/Sulbactam (Unasyn)	Penicillins	1.5 – 3 gm	30 min
Azithromycin (Zithromax)	Macrolides	500 mg	60 min
Aztreonam (Azactam)	Other	0.5 – 2 gm	30 min-60min
Cefazolin (Ancef)	Cephalosporins	0.25 – 2 gm	30 min
Cefepime (Maxipime)	Cephalosporins	1 – 2 gm	30 min
Cefotaxime (Claforan)	Cephalosporins	1 – 2 gm	30 min
Cefotetan (Cefotan)	Cephalosporins	1 – 2 gm	30 min
Cefoxitin (Mefoxin)	Cephalosporins	1 – 2 gm	10-60 min
Ceftriaxone (Rocephin)	Cephalosporins	1 – 2 gm	30 min
Cefuroxime (Zinacef)	Cephalosporins	0.75 – 1.5 gm	30 min – 60min
Ciprofloxacin (Cipro)	Fluroquinolones	200 – 400 mg	60 min
Clindamycin (Cleocin)	Other	300 – 900 mg	30 min
Doxycycline (Vibramycin)	Tetracyclines	100 mg	60 min
Gentamycin (Garamycin)	Aminoglycosides	1 – 7 mg/kg	30 min – 60min
Levofloxacin (Levaquin)	Quinolones	250 – 500 mg 750 mg	60 min 90 min
Meropenem (Merrem)	Carbapenems	500 – 1000 mg	30 min
Metronidazole (Flagyl)	Other	250 – 750 mg	60 min
Moxifloxacin (Avelox)	Quinolones	400 mg	60 min
Nafcillin (Nafcil, Unipen)	Penicillins	0.5 – 2 gm	30 min
Oxacillin (Bactocill, Prostaphilin)	Penicillins	0.25 – 2 gm	30 min
Piperacillin/Tazobactam (Zosyn)	Penicillins	3.375 – 4.5 gm	30 min
Tobramycin	Aminoglycosides	1 – 7 mg/kg	30 min-60min
Trimethoprim/Sulfamethoxasole (Bactrim, Septra)	Sulfonamides	10 – 20 mg/kg	60 min–90min
Vancomycin Hydrochloride	Other	0.5gm - 1gm 1.25gm -1.5gm 1.75gm - 2gm 2.25gm-2.5gm	60 min 90 min 120 min 150 min

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