Hamilton County Emergency Medical Services

Policies, Procedures and Protocols

"Setting the Standard of Care"

Hamilton County EMS
Procedures, Policies and Protocols

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Procedures, Policies and Protocols

These protocols were designed to assist in treatment of a broad range of various medical, traumatic, or other disorders. Some patients may require care not otherwise covered in these sequences. These protocols are to be considered as standing orders until medical/ trauma control is contacted. As in all pre-hospital care, medical/ trauma control should be contacted as soon as emergency conditions allow. Only those Tennessee licensed AEMT's and paramedics approved by the medical director of Hamilton County may use these protocols. All paramedics are required to be certified in both International Trauma Life Support (ITLS) and Advanced Cardiac Life Support (ACLS) may use these protocols. These guidelines will replace those currently in use across the county.

Issue Date: January 4th, 2019

Signature on File

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General Protocol Guidelines

- If any procedure/medication/assistance/deviation from protocol/something not covered is needed then contact EROC and get online medical assistance from on duty ER physician.
- If any medication dosage does not specify adult or pediatric then it is ONLY for adults.

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General Protocol Changes

Date	Version	Notes/Changes
01/04/2019	1.001	Initial Release
02/16/2019	1.002	• Grammatical corrections • Added online medical assistance reminder to General Protocol Guidelines. • Removed "Joint Commission Certified" wording from stroke protocol and destination guidelines. • Removed Albuterol/Atrovent treatment from paramedic portion of PROT-007 and then added a max breathing treatments to PROT-007 and PROT-014 • Added "not having suicidal or homicidal ideations" to refusal requirements in POLI-001. • Removed Gluconate from Calcium Chloride title in the drug sheet and bradycardia protocol. • To Prot-031 (Combative Patient) added IM/IN route and doses for Versed and added Ativan IV and IM. Also updated both respective medication sheets. • Added neonatal resuscitation to both PROT-033 and PROT-034. • Added Lidocaine to PROT-004. • Changed Mag to 1 GM in PROT-014.
07/30/2019	1.003	• Grammatical corrections • PROT-001: Changed ASA to Aspirin • PROT-007: Change µ to mcg • PROC-007: Added Only if Versed not available before Valium and Ativan choices. • MEDI-022: Added to "250" to D5W bag size for Levophed drip mixture. • Correction to pediatric Epinephrine concentration in the PROT-005. • Clarification wording on Adenosine doses in PROT-003

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Patient Refusal of Care and/or Transport

- Determine that there is a person that has a complaint of injury/illness or is presenting with ANY type of injury/illness.
- Complete patient assessment and obtain a full set of vital signs
    - If patient will not allow an assessment to be completed or vital signs to be obtained, then get Medical Control or Law Enforcement involved helping with further.
- If a patient does not wish treatment or transportation they must be:
    - Legally Competent:
        - Patient is of legal age (18) or a court emancipated minor.
    - Mentally Competent:
        - Alert and Oriented to Person, Place, Time and Situation.
            - Complete the Mini Mental Status Exam
        - Does not suffer from organic brain disease (Alzheimer's or dementia) that would potentially hinder the ability to make their own decisions.
        - Is not in a situational Medical Emergency (Hypoxia, Hypoglycemia, and Head Trauma, etc.) that can cause an altered mental status.
        - Absence of intoxication (Drugs (legal or illicit), or alcohol).
        - Is not having suicidal or homicidal ideations
            - Will need to elicit police/ sheriff help for transport
    - Will be an informed refusal. Patient will be advised of the diagnostic impression of their situation which should include the benefits of being transported to a hospital and the risks of not being transported to the hospital.
        - Have patient repeat back the risks and benefits, in front of witness if possible, to further show understanding of situation.
- Refusal will be obtained on any patient who refuses transport to a hospital or any recommended treatment.
    - Should be filled out entirely.
    - Signature of patient or legal guardian
    - Signature of witness
        - Family member, or bystanders
        - Law enforcement
        - Member or Employee of a first responder agency
        - And only as a last resort the Paramedic's partner

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Patient Refusal of Care and/or Transport Continued

- If any situation should occur where the EMS crew does not feel comfortable with the patient decision then Medical Control can be contacted for further patient treatment/transport consultation.
- Documentation of the refusal in the ePCR should include ALL of the following:
  - Patient assessment and vital signs
  - Legal competency
  - Mental competency (Results of the Mini Mental Status Exam)
  - Informed refusal including benefits and risks
  - Patient's refusal of transport and/or treatments.
  - Consultation with Medical Control.

Mini Mental Status Exam

1. Orientation to time – time of day, day, week, month, year	5 pts max
2. Orientation to place – building, street, city, state, country	5 pts max
3. Say "boy, dog, ball" and have the patient repeat it	3 pts max
4. Ask the patient to spell a word backward, or do serial 3s backward from 20	5 pts max
5. Without repeating the words, ask them to repeat the previous three words (boy, dog, ball)	3 pts max
6. Ask the patient to do the following after you have completed the request "stick out your tongue and touch your right hand to your left ear"	3 pts max
7. Ask the patient to identify your pen and watch	2 pts max
8. Ask the patient to read the following sentence then do as it says "Shut your eyes"	1 pt
9. Ask the patient to write a sentence	1 pt
10. Ask the patient to draw two overlapping pentagons (show them an example)	1 pt

A score of 21 or better is considered mentally competent by most psychiatrists for a patient to make reasonable decisions.

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Destination Guidelines: Cardiac

GOAL: To provide cardiac patients with the most appropriate transport destination dependent on patient condition and/or risk factors. Reduction of secondary transfers for cardiac patients can reduce patient mortality and morbidity.
Appropriate facilities include those capable of cardiac catheterization and rapid revascularization (percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery (CABG)) Current facilities capable of such interventions include **Erlanger (Main), Memorial Glenwood, and Parkridge (Main)** hospitals.

GUIDELINES:

- Code STEMI: EKG with injury pattern (S-T elevation of at least 1 mm in 2 or more concordant leads)
- Left Bundle Branch Block with chest pain typical for AMI
- Ischemic EKG changes typical for acute coronary syndrome
- High risk patients for cardiac conditions that are currently symptomatic for a possible cardiac event. Patients that fall in this category may have any combination of the following signs or symptoms (diaphoresis, poor skin color, unstable vital signs, nausea/vomiting, dyspnea, and unrelieved chest pain). High risk patients include but are not limited to the following conditions:
    - Male 35 and older, Females 40 and older
    - Diabetes
    - Hypertension
    - Smokers
    - Family cardiac history
    - Previous cardiac history to include recent history of CABG or PCI
- Cocaine overdose with possible coronary spasm
- Unstable cardiac arrhythmias
- Cardiac arrhythmias requiring pharmacological intervention and/or cardioversion. This includes adult medical patients who have been resuscitated by means of defibrillation, CPR, or other interventions.
- Unstable congestive heart failure patients
- Patients experiencing cardiogenic shock
- Patients experiencing malfunction of cardiac pacemakers
- Firing of implanted automatic defibrillator

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Destination Guidelines: Obstetrical/ Gynecological

GOAL: To provide the patient experiencing an obstetrical or gynecological emergency with the most appropriate transport destination dependent on patient condition and risk factors. Current facilities capable of providing OB/GYN care include Erlanger, Parkridge East and Erlanger East (normal deliveries with no history of complications and ≥ 32-week gestation).

GUIDELINES:

- Patients in labor.
- Patients whose chief complaint appears to be related to the pregnancy, or who have complications related to pregnancy.
- Unexplained vaginal hemorrhage.
- Pregnant trauma patients that are greater than 20 weeks gestation meeting trauma destination guidelines will be transported to Erlanger hospital. Patients not meeting trauma criteria may also be transported to Erlanger East or Parkridge East
- Females of child bearing age (12-50) with unexplained lower abdominal pain and associated syncope and or hypotension.
- High risk obstetrical patients that should be transported to Erlanger include but are not limited to eclampsia, cardiac, and other medical conditions that may put the mother and/or child at risk.

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Destination Guidelines: Stroke

Goal: To provide patients who have a stroke or stroke symptoms, the most appropriate transport destination dependent on neurological assessment and time of symptom onset. These guidelines strive to maximize patient outcomes by designating centers offering highest level stroke care and minimizing secondary hospital transfers. See below for transport guidelines.

Patients appropriate for a Comprehensive Stroke Center

- Any patient who has sudden onset of signs and symptoms of a possible stroke less than 24 hours.
    - Sudden weakness, numbness or tingling in face, arm and/or leg (especially on one side of the body).
    - Sudden difficulty speaking or understanding speech.
    - Sudden blurred vision (especially in one eye), loss of vision or double vision.
    - Sudden dizziness, lack of coordination
    - Sudden, severe headache with no known cause.

Patients appropriate for a Primary Stroke Center

- If a patient has a documented time of onset of signs and symptoms of an unknown time origin or greater than 24 hours then patient may be taken to the closest Primary Stroke Center.

Non-Comprehensive or Primary Stroke Center

- Any patient in which the onset of symptoms is unknown.
- The benefits of transportation to a Comprehensive Stroke Center will be explained to patient (if conscious and able to make an informed decision) and/or patient's family, or legal representative. The risks for not being transported to a Comprehensive or Primary Stroke Center will be explained to the patient and or family or legal representative.
- The patient (if conscious and able to make an informed decision) and/or patient's family, or legal representative may refuse transport to a Comprehensive or Primary Stroke Center. If so, transport to their requested facility should occur only after they sign the Refusal to be transported to a non-Comprehensive or Primary Stroke Center and transport has been approved by Medical Control.

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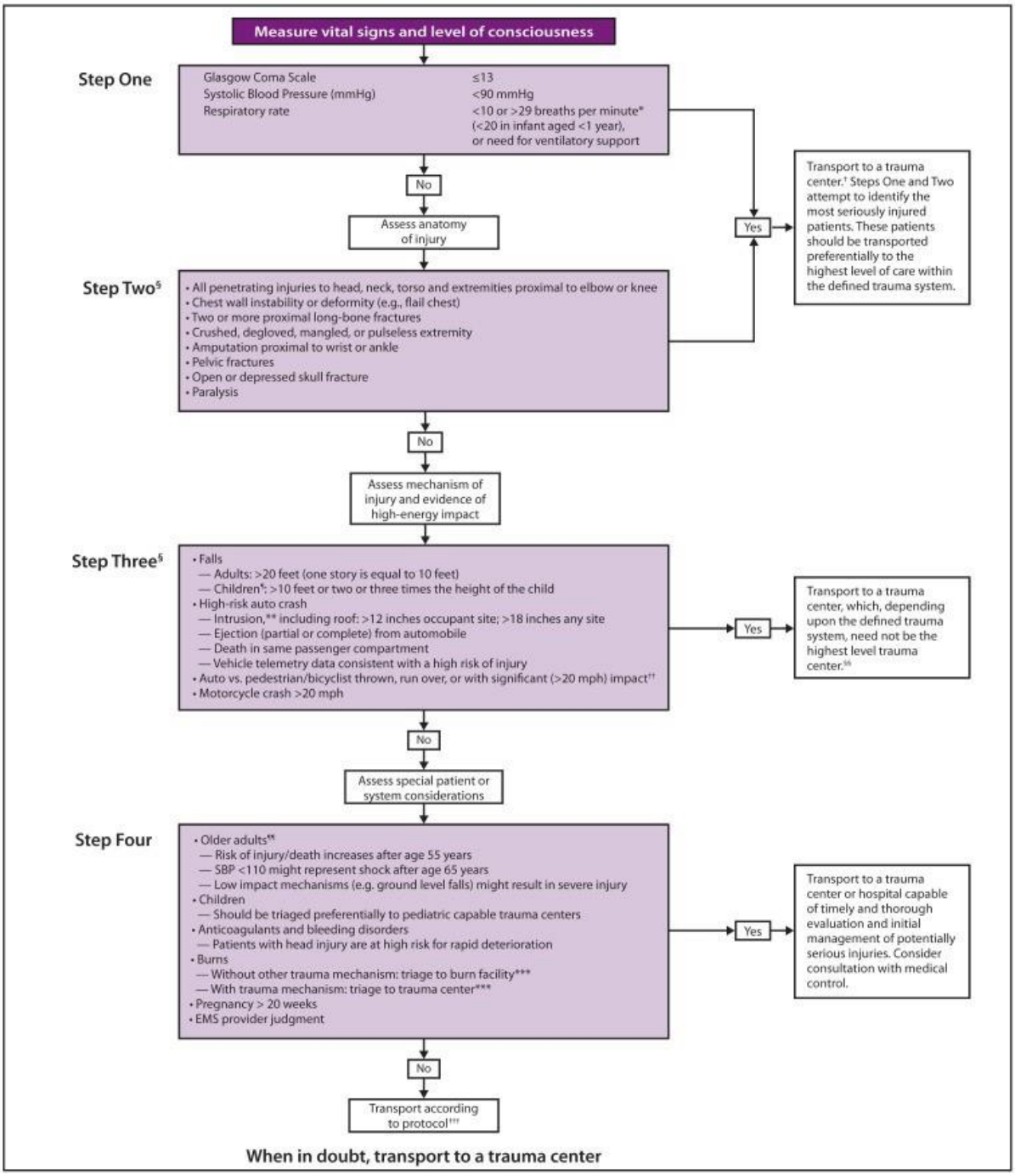
Destination Guidelines: Trauma



1

- GCS <9 with trauma mechanism
- Confirmed Systolic BP <90
- intubated patients transferred from the scene of trauma, **-OR-**
- Patients who have Tespirato ry co mpromise **or** are in need of an emergent airway as follows:
  - -Patients with Oxygen saturation < 90% on supplemental oxygen, rescue airway, or cricothyrotomy
  - -Includes intubated patients who are transferred from another facility with ongoing respiratory compromise (Does not include **patients intubated at** another facility who are now stable from a respiratory standpoint)
- New onset Quadriplegia from trauma mechanism
- Any patient receiving blood transfusions or ongoing volume resuscitation to maintain vital signs
- Gunshot wounds to the head, neck, or torso

If injury falls into any of the above category, Fire Level 1 Trauma Alert

If Not

2

- Stab wounds to the head, neck, torso
- GSW to the extremities proximal to the elbow or knee
- HR> 120 **SUSTAINED**
- New onset hemiplegia or paraplegia from trauma mechanism
- Two or more **proximal** long bone fractures (Humerus/Femur)
- Signs of significant blunt torso trauma including, but not limited to:
  - - Absent breath sounds, chest wall instability, or deformity
  - - Suspected hemothorax /pneumothorax requiring pre- hospital chest decompression (Does not include stable facility transfers with chest tube in place)
  - - Abdominal seatbelt sign
- GCS 9-13 with mechanism attributed to trauma
- Crushed, degloved, mangled, amputated or pulseless extremity **proximal** to the elbow or ankles
- Pregnancy 20 weeks with injury or significant MOI
- Hemodynamically stable intubated patients that are transferred from another facility

If injury falls into any of the above category, Fire Level 2 Trauma Alert

If Not

3

- Fall from any height on anticoagulant medication **with** signs of head trauma
- Fall > 20 feet **with** obvious signs of trauma
- Trauma with altered mental status:
  - -Amnesic to events
  - -GCS 14
  - -Positive LOC
- Questionable chest and/or abdominal injury from trauma
- Diminished pulses in an extremity with signs of trauma
- MVC with ejection
- Auto vs. Pedestrian/bicyclist thrown, run over, or with significant (>20 MPH) impact
- Transfers not meeting Level I or 2 activation criteria
- Trauma in Elderly Population (age >60 years) **with** one or both of the following:
  - - SBP < 110 (may represent shock after age 65)
  - - Patients with significant cardio or respiratory comorbidities

If injury falls into any of the above category, Fire Level 3 Trauma Alert

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Withholding of Advanced Life Support

Paramedic

Purpose: To establish guidelines for the withholding of resuscitative measures in the following situations:

- Asystole on the monitor, and
- Fixed, dilated pupils, AND
- Documented lack of CPR for greater than 10 minutes (not including / involving hypothermia, cold water immersion, lightning strike, or barbiturate coma), OR
- Decapitation, or
- Massive trauma (evacuation of cranial vault), or
- Severe blunt trauma with absence of vital signs, or
- Absence of vital signs, respirations and neurological reflexes in situations requiring prolonged resuscitation, or
- Rigor mortis, or
- Dependent lividity, or
- Properly executed state P.O.S.T (Do not Resuscitate) order
    - If DNR/POST form is used to withhold or terminate resuscitation efforts, a copy must be scanned and attached to the ePCR.
- In cases where a pediatric patient is involved further consideration of working the arrest should be taken.
- **If CPR has been initiated at any point prior to arrival, by either a first responder agency, medical staff or bystander, then Medical Control must be contacted to discontinue efforts**
    - When calling for orders to withhold or discontinue life support efforts give the following information:
        - What the cardiac monitor shows (Should be asystole)
        - Pupils should be fixed and dilated
        - Approximate downtime
        - Any obvious signs of death
        - If an advanced airway is in place, then an ETCO2.
- PARAMEDIC STOP

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Notes:

The withholding of resuscitative measures is a standing order not requiring permission of Medical / Trauma control, unless CPR was initiated prior to the arrival of HCEMS. As in all standing orders, thorough documentation is required. Any situation / occurrence with less than the first three bullet points should be referred to Medical/Trauma Control for permission to withhold.

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Withdrawal/ Discontinuation of Life Support

Paramedic

- Assessment: The following are guidelines for making the choice:
  - Asystole on ECG, confirmed in three leads (without change for 10 minutes) and
  - Fixed, dilated pupils and
  - Absence of pulse, respirations and neurological reflexes
- In Addition to:
  - EMS Provider documented lack of CPR for 10 minutes
  - Prolonged resuscitation in the field without hope for survival
  - Other signs of death in the absence of hypothermia, cold water drowning, lightning strikes, or barbiturate induced coma
  - Decapitation
  - Massive trauma such as evacuation of cranial vault
  - Severe blunt trauma with absence of vital signs and pupillary responses
  - Properly executed P.O.S.T. (Do not Resuscitate) order
    - If DNR/POST form is used to withhold or terminate resuscitation efforts, a copy must be scanned and attached to the ePCR.
  - **IF CPR has been initiated at any point prior to arrival, by either a first responder agency, medical staff, or bystander, then Medical Control must be contacted to discontinue efforts**
  - When calling for orders to withhold or discontinue life support efforts give the following information:
    - What the cardiac monitor shows (Should be asystole)
    - Pupils should be fixed and dilated
    - Approximate downtime
    - Any obvious signs of death
    - If an advanced airway is in place, then an ETCO2.
- PARAMEDIC STOP

Notes:

- Discontinuation shall only be done with online Medical / Trauma control. Medical / Trauma control may choose to discontinue Life Support in the field and pronounce a patient dead at the scene. ***Once transport has begun, Life Support will be continued!***

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Terminally Ill Patient

Paramedic

- Maintain a calm environment and avoid performing measures beyond basic life support.
- Elicit as much information from persons present who are familiar with the patient's condition as possible.
- Obtain and document the name and telephone number of the patient's physician if possible.
- Maintain BLS procedures and contact Medical Control as soon as possible. Provide full information on the patient's present condition, history, and name of the patient's physician and telephone number.
- Medical Control will direct the management of the call
- Accept DNR/POST forms (original or copy):
    - If DNR/POST form is used to withhold or terminate resuscitation efforts, a copy must be scanned and attached to the ePCR.
- State approved forms
- Signed order in patient's medical records: nursing home, hospice, or home care
- If the patient's private physician intervenes in person or by telephone the AEMT / Paramedic shall:
    - Provide the physician with information on the patient's condition,
    - Inform the physician that they must make medical control contact through Med Comm.,
    - Request the physician to contact HCEMS Medical Direction through EROC at (423) 778-9633.
    - At no time should any orders be taken over a phone, or in person, except from designated medical direction.
- PARAMEDIC STOP

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Blood Glucose Monitoring

AEMT and Paramedic

Qualifications to Perform:

- Tennessee licensed AEMT or Paramedic.
- On-going demonstration of proficiency.

Indications:

- Loss of consciousness.
- Altered Mental Status (AMS), Confusion / combativeness.
- Signs of stroke, including unilateral hemiplegia or speech difficulties.
- Seizures.
- Profound bradycardia.
- Severe illness or injury in a known or suspected diabetic.
- Ingestion / overdose with iron, aspirin, alcohol, insulin, oral diabetic agents, or beta blockers.
- Severe dehydration.
- Severe liver disease.
- Patients, who suffer a major traumatic closed head injury, should have glucose measurements to exclude hypoglycemia as a contributing or treatable factor.

Contraindications:

- None.

Notes:

- Test strips need to have the date they were opened clearly and legibly written on the outside of the container.
- Test strips MUST be discarded 30 days after they have been opened.

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Combat Application Tourniquet (CAT)

AEMT and Paramedic

Indications:

- To control bleeding when:
  - Life-threatening limb hemorrhage is not able to be controlled with direct pressure or other simple measures.
  - Traumatic amputation with uncontrolled bleeding.

Procedure:

- Determine if bleeding is life-threatening.
- Apply direct pressure.
- Expose the extremity by removing clothing in proximity to the injury.
- Place tourniquet a minimum of 2 inches proximal to the injury.
- Route the band around the limb and pass it through the inside slit of the buckle.
- Pull the band tight.
- Pass the band through the outside slit of the buckle.
  - The friction buckle will lock the band into place.
- Pull the band very tight and securely fasten the band back on itself.
- Twist the rod until the bright red blood has stopped AND the distal pulse is eliminated.
- Place the rod inside the clip locking it in place.
- Re-check for bleeding and distal pulse.
  - If bleeding is not controlled then consider additional tightening or applying a second tourniquet, proximal side by side to the first.
- Secure the rod inside the clip with the strap.
- Record the time of application.
- Dress wounds.
- Include tourniquet usage in radio report to receiving hospital.

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Combat Application Tourniquet (CAT) Continued

- Transport patient according to HCEMS Destination Guidelines and Trauma Destination Scheme.
- If you do you do not have Combat Application Tourniquet, then find another non-commercial item to use.
- If the tourniquet is going to be on for greater than two hours, contact Medical Control for further guidance.

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Continuous Positive Airway Pressure (CPAP)

AEMT and Paramedic

Indications:

- Hypoxemia secondary to Congestive Heart Failure (CHF), and Pulmonary Edema (PE).
- Patient (>30kg) is conscious with spontaneous respirations and able to maintain and protect own airway.
- Inclusion of two or more of following signs/ symptoms
    - Pulmonary Edema
    - Accessory muscle usage
    - Retractions of intercostal muscles
    - Respiratory rate greater than 25.
        - SpO2≤ 90%
    - Decreased ability to speak due to dyspnea
    - Continuous use of breathing treatments with no improvement

Contraindications:

- Any patient who is in need of mechanical ventilation.
- Any circumstance in which endotracheal intubation is needed to protect airway.
- Penetrating Chest Trauma
- Severe Hypotension
- Persistent Nausea/Vomiting
- Obtunded
- Facial lacerations (Manufacturer's Contraindication)
- Laryngeal trauma (Manufacturer's Contraindication)
- Gastrointestinal bleeding (Manufacturer's Contraindication)
- Recent gastric surgery (Manufacturer's Contraindication)
- Basilar Skull Fracture (Manufacturer's Contraindication)

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Continuous Positive Airway Pressure (CPAP) Continued

- Emphysematous Bulla (Manufacturer's Contraindication)
- Hypovolemia (Manufacturer's Contraindication)
- Suspected Pneumothorax

Procedure:

- Full assessment of patient condition
- Obtain vital signs, attach cardiac monitor, pulse oximetry, ETCO2 (before and during), and O2 therapy appropriate while assessing and setting up for CPAP.
- Determine need for CPAP (from above criteria)
- Explain procedure to patient and encourage (coach) patient to allow forced ventilation
- Assemble CPAP equipment
    - 5 – 10 cm H2O for CHF, pulmonary edema, near drowning, possible aspiration or pneumonia
    - 2.5 – 5 cm H2O for COPD
- Make sure O2 regulator is set to zero (0)
- Connect generator directly to 50 psi regulator, listen for leaks
- Verify that the device is free of obstructions and verify proper valve function
- Place mask over the patients face and adjust straps to create seal and secure the mask firmly in place.
- Evaluate the response of the patient by assessing breath sounds, Oxygen saturation (2 – 3 minutes post treatment), and general appearance.
- Maintain SpO2 of 95% or greater
- If SpO2 not greater than 95% or no improvement in patient condition then increase to 10 cm H2O adapter.
- Continually monitor the patient, vital signs every 5 minutes, and observe closely for complications.

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Continuous Positive Airway Pressure (CPAP) Continued

- If patient requires a nebulized treatment, then use t-shaped adapter for administration of Albuterol (Proventil) 2.5 mg/ 3 ml Saline combined with Atrovent (Ipratropium) 0.5 mg/ 2.5 ml saline
- If patient condition does not improve within 15 – 20 minutes, then consider discontinuing CPAP and assess the need for mechanical ventilation and intubation.
- **DO NOT WITHHOLD VENTILATION OR INTUBATION IF PATIENT CONDITION INDICATES THE NEED FOR IT.**
- Documentation should include (but not limited to)
    - Adapter used
    - Vitals Signs
    - Effects/ Adverse reactions
    - Pre and post Oxygen saturation
    - ETCO2

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EZ-IO

AEMT and Paramedic

Indications

- Intravenous fluid or medications needed **AND**
- Peripheral IV cannot be established in 2 attempts or 90 Seconds (from start of attempts) **AND** the patient exhibits one or more of the following:
    - Altered mental status (GCS of 8 or less)
    - Respiratory Compromise (SaO2 of 80% or less following appropriate oxygen therapy, and/or respiratory rate <10 or >40/min)
    - Hemodynamically unstable Blood Pressure (Systolic BP<90)
- IV access is preferred; however, IO may be considered prior to peripheral IV attempts in the following situations:
    - Cardiac Arrest (Medical or Trauma)
    - Profound hypovolemia with an altered mental status

Contraindications

- Fracture of the tibia or femur (for tibia insertion)- may consider the alternate tibia if no trauma involved in it
- Fracture of the humerus (for humeral head insertion)- may consider alternate humerus if no trauma involved in it
- Previous orthopedic procedures (ex: IO within previous 24 hours, knee replacement, shoulder replacement)
- Infection at insertion site
- Significant edema
- Excessive tissue at insertion site
- Inability to locate landmarks

Considerations

- Flow Rates: Due to the anatomy of the IO space you will note flow rates to be slower than those achieved with peripheral IV access.
    - Ensure administration of 10mL rapid bolus with syringe.
    - Use a pressure infuser bag for fluid challenge.

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EZ-IO (Continued)

- Pain (conscious patients only): Insertion of the IO device in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV. However, fluid administration into the IO space is very painful and the following measures should be taken for conscious patients:
    - Prior to IO bolus or flush on a conscious **adult** patient, SLOWLY administer 20 – 50 mg of 2% Lidocaine. (Paramedic Only)
    - Prior to IO bolus or flush on a conscious **pediatric** patient, SLOWLY administer 0.5 mg/kg 2% Lidocaine. (Paramedic Only)

Precautions

- The EZ IO is not intended for prophylactic use.
- The EZ IO infusion system requires specific training prior to use.

Patient Sizing

- IO Needles.
    - 15-gauge 15 mm (Pink color coded) needle is for any patient weighing 3 – 39 kg.
    - 15-gauge 25 mm (Blue color coded) needle is for any patient weighing ≥ 3 kg.
    - 15-gauge 45 mm (Yellow color coded) needle is for any patient weighing > 40 kg.
- Primary insertion site: Should IO access be warranted then the tibia shall be the insertion site of choice if possible.
- Alternate Insertion Site: Should IO access be warranted and it is not available via the tibia insertion site due to contraindications or inability to access the site due to patient entrapment and vascular access is imperative the IO may be placed in the humeral head.
- For pediatric patients use a length-based assessment tape to determine pediatric weight.

Landmarks

- Tibia:
    - Three important landmarks- the patella, the tibial tuberosity (if present), and the flat aspect of the Medial Tibia
    - The tibial tuberosity is often difficult or impossible to palpate on very young patients. The traditional approach for IO insertion in small patient's- where the tibial tuberosity cannot be palpated- is to identify the insertion site- "**TWO FINGER WIDTHS BELOW THE PATELLA and then medial along the flat aspect of the tibia."**

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EZ-IO (Continued)

- The traditional approach to IO insertion in slightly larger patients- where the tibial tuberosity can be appreciated- generally suggests- **"One finger width distal to the tibial tuberosity along the flat aspect of the medial tibia."**
- **The EZ-IO should be inserted two fingers widths below the patella (kneecap) and one finger medial (toward the inside) to the tibial tuberosity.**
- **For the morbidly obese patient-** consider rotating the foot to the mid-line position (foot straight up and down). With the knee slightly flexed, lift the foot off of the surface allowing the lower left to "hang" dependent. This maneuver may improve your ability to visualize and access the tibial insertion site.

- Humerus:
  - Place the patient is a supine position.
  - Expose the shoulder and place the patient's arm against the patient's body.
  - Rest the elbow on the stretcher with the forearm on the abdomen. Palpate and identify the mid-shaft humerus and continue palpating toward the humeral head. As you near the shoulder you will note a small protrusion. This is the base of the greater tubercle insertion site. With the opposite hand "pinch" the anterior and inferior aspects of the humeral head confirming the identification of the greater tubercle. This will ensure that you have identified the midline of the humerus itself. The insertion site is approximately two finger widths inferior to the coracoid process and the acromion.
  - **Do not attempt insertion medial to the Intertubecular Groove or the Lesser Tubercle**

Procedure for EZ-IO Insertion

1. Determine that the EZ IO is indicated.
2. Ensure that there are no contraindications present.
3. Locate the proper insertion site.
4. Clean the insertion site with alcohol wipes.
5. Prepare the EZ IO driver and needle set.
6. Stabilize the extremity (leg or arm).
7. Position the driver at the insertion site with the needle at 90-degree angle to the surface of the bone.

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EZ-IO (Continued)

8. Push the needle set through the skin until you feel the tip of the needle set encounter the bone. Apply firm steady pressure on the driver and power through the cortex of the bone. Stop when the needle flange touches the skin or a sudden resistance is felt. **Stop on the POP.** This indicates entry into the bone marrow cavity.
9. Grasp the hub firmly with one hand and remove the driver from the needles set.
10. While continuing to hold the hub firmly, rotate the stylet counter clockwise and remove it from the needle set. Dispose of the stylet properly in a sharps container.
11. Confirm Proper placement of the EZ IO catheter tip:
    - **a.** The catheter stands straight up at a 90-degree angle and is firmly seated in the tibia.
    - **b.** Blood is sometimes visible at the tip of the stylet.
    - **c.** Aspiration of a small amount of marrow with a syringe.
12. Attach a primed extension set to the hub and flush the IO space with 10 cc of Normal Saline.
    - **a. NO FLUSH – NO FLOW**
13. If the patient is conscious, administer Lidocaine 2% 20 – 50 mg (0.5mg/kg for pediatric patient) slowly **PRIOR** to the initial bolus.
14. Initiate the infusion. Use of mechanical means to pressure infuse is recommended to maintain adequate flow rates.
15. Apply the wrist band (yellow band that comes with the kits…must have date and time on it) and dressing.
16. Secure IO Needle set.

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External Cardiac Pacing

Paramedic

Indications:

- Symptomatic or Unstable Sinus Bradycardia
  - Unresponsive to Atropine, or
  - Unable to initiate IV access
- Type II 2nd degree AV block (Mobitz Type II) and 3rd degree AV block (complete heart block)
  - External cardiac pacing is class I (definitely helpful)
  - External cardiac pacing is recommended before Atropine
  - Rhythm often associated with anteroseptal acute myocardial infarctions. Can progress to 3rd degree AV block
  - ATROPINE is not the first choice. Atropine may worsen conditions in myocardial ischemia and VF or VT
- Procedure:
- Apply pacing pads (Quick Combo Pads) and 4 lead monitor cable
  - *Patient must be connected to leads to pace!*
- Turn on pacing module
- Select rate at 60 per minute
- Increase amps delivered until capture
  - Once capture has been achieved increase energy by an additional 10 amps
    - Palpate pulse for mechanical capture
- **Contact medical control before pacing pediatric patients.**

Notes:

External pacing is always uncomfortable for the patient. Contact Medical Control as early as possible to consider sedative medication options such as Versed, Valium, or Morphine. TOC

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Supplemental Oxygen

This protocol is meant to provide simple guidelines as to when a patient needs supplemental oxygen. Follow these guidelines, which are applicable to all levels of training, unless otherwise specific oxygen therapy is called for in an individual protocol.

- A.B.C.s
  - Use airway adjuncts as appropriate to patient condition and licensure level.
- Place patient in position of comfort unless specific positioning is required by the situation per appropriate protocols.
- Obtain vital signs, to include pulse oximetry and ETCO2 (where indicated).
- If pulse oximetry reading is unobtainable and patient has an altered mental status, is unconscious, or has signs/symptoms of hypoxia, then provide 15 lpm of O2 by non-rebreather mask or other airway adjunct as appropriate to patient condition.
- Supplemental oxygen is only necessary if pulse oximetry measures less than 92%, and should be used to maintain and O2 saturation of 94% or higher.
- For major trauma patients and stroke patients, provide a minimum of 2 liters of supplemental O2 by nasal cannula regardless of O2 saturation.
- If the patient is on home oxygen then continue their oxygen therapy at least at the level they are on at home.

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Hamilton County EMS
Policies, Procedures, and Protocols

Medication Assisted Intubation

Indications:

- Acute head injury where a patient is combative with a need for airway.
- Severely combative patients that cannot be controlled without risk of further injury.
- Prophylaxis for airway burns or inhalation injuries.
- Patients who need ventilator assistance or airway protection and other conventional methods have failed.

Contraindications:

- History of malignant hyperthermia
- Known allergy to agents
- Hyperkalemia (succinylcholine)
- Severe burns greater than 12 hours (succinylcholine)

AEMT

- Patient Assessment and monitoring the A.B.C.s.
- Pre-oxygenate patient with 100% Oxygen for at least 2 minutes.
- Pulse oximetry.
- IV or INT, whichever is appropriate for patient condition.
- AEMT STOP

Paramedic

- Cardiac monitor.
- Limb restraints, as needed, to protect the airway.
- Sedative (Choose only one):
    - Versed:
        - Adult: 0.1 mg/kg, given at 1 mg/minute boluses not to exceed 8 mg.
            - If the systolic blood pressure is less than 100 mm/Hg then use caution, and a maximum dose of 4 mg.
        - Pediatric: 0.1 mg/kg given until slurring of the speech, eyelids close, reflex disappears, up to a maximum dose of 5 mg.

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Policies, Procedures, and Protocols
Medication Assisted Intubation Continued

- Only if Versed not Available:
  - Ativan (Optional for Pediatrics): 0.1 – 0.2 mg/kg given IV/IO up to a max of 4 mg.
  - Valium (Optional for Pediatrics): 0.2 – 0.3 mg/kg given IV/IO up to a max dose of 10 mg.

- When patient becomes relaxed, perform intubation.
  - Confirm tube placement by visualization, bilateral breath sounds and absence of gastric sounds, condensation in the tube, use end-tidal CO2 function on the cardiac monitor, use CO2 detector if cardiac monitor is not available, and the esophageal intubation detector.
  - If intubation is unsuccessful X2 attempts and ventilation with manual resuscitator is ineffective then consider:
    - Supraglottic airway
    - Needle cricothyroidotomy OR
    - Call for a supervisor to perform the Quick Trach II procedure on patient's greater than 12 years of age.
- Secure airway and ventilate according to patient condition. Refer to the post intubation protocol.
- Contact Medical Control as soon as patient condition allows.
- PARAMEDIC STOP

TOC

Supervisor/ Senior Paramedic/ Tactical Paramedic

- If no sedative has been given, then consider Ketamine:
  - Adult: 2 mg/kg IV/IO
  - Pediatric: Greater than 3 months old then it is 1 mg/kg IV/IO
- Paralytic (Choose one):
  - Rocuronium
    - Adult: 0.6 mg - 1.0 mg/kg IV/IO.
    - Pediatric (≤ 17 y/o): 0.6 mg/kg.
    - If Rocuronium is given, then do not follow up with Norcuron for the maintenance dose.

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Policies, Procedures, and Protocols
Medication Assisted Intubation Continued

- Anectine (Succinylcholine)
  - Adult: 1.0-1.5mg/kg over 30 seconds IVP.
  - Pediatric:
    - <12 years of age give 1.5 – 2.0 mg/kg over 30 seconds IV/IO
    - >12 years of age give 1.0 – 1.5 mg/kg over 30 seconds IV/IO
- Intubate when patient is apneic and fasciculations (will not have fasciculations with Rocuronium) have stopped.
  - Confirm tube placement by visualization, bilateral breath sounds and absence of gastric sounds, condensation in the tube, use end-tidal CO2 function on the cardiac monitor, use CO2 detector if cardiac monitor is not available, and the esophageal intubation detector.
  - If intubation is unsuccessful X2 attempts and ventilation with manual resuscitator is ineffective then consider:
    - Supraglottic airway,
    - Needle cricothyroidotomy OR,
    - A Quick Trach II procedure on patient's greater than 12 years of age.
- To maintain control of airway, administer Norcuron (not needed if paralytic was Rocuronium)
  - Adult: 0.1mg/kg IV/IO
  - Pediatric: 0.1 -0.2 mg/kg IV/IO
- Secure airway and ventilate according to patient condition. Refer to post intubation protocol.
- Contact Medical Control as soon as patient condition allows.
- SUPERVISOR STOP

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Notes:

- The use of paralytics is a skill that is used by Supervisors, Senior Paramedics and Tactical Paramedics who have been trained, and credentialed by the Medical Director. Tactical Paramedics are only allowed to use this procedure when activated and acting as a Tactical Paramedic.

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Policies, Procedures, and Protocols

Medication Assisted Intubation Continued

- **RSI should only be used after conventional methods have failed. Any patient who requires a stable airway and is difficult to intubate because of uncooperative behavior (as induced hypoxia, closed head injury, or hypotension is a candidate for this procedure). RSI is a procedure of necessity, not convenience.**
- AHA ACLS Guidelines deemphasized placement of advanced airway in initial resuscitation- consider supraglottic airway device.

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Video Laryngoscopy

Supervisor/ Senior Paramedic/ Tactical Paramedic

Indications:

- Any patient who is in need of an advanced airway placement where there have been two previous unsuccessful attempts.
- Any patient who is considered to be a potential difficult oral intubation (A class 3 or 4 on the Mallampati Score or Grade 3 or 4 on the Cormack-Lehane Classification System).

Contra-Indications:

- Any patient whom the device blade will not fit into the oral cavity.

Procedure:

- Gather equipment for video laryngoscope intubation
- Channeled Blade
    - Notes:
        - Minimum of 18 mm mouth opening required
        - No stylet required
        - Accommodates a 6.0 to 8.0 ET Tube
    - Attach camera to channeled blade and power camera on
    - Lubricate posterior aspect, tip and channel of the channeled blade
        - Avoid getting lubricant on the camera
    - Insert blade into the vallecula
        - View should not be a close-up view
    - Advance ET tube in slow 1 cm progressions with corrections after each movement
- Standard Blade
    - Notes:
        - Minimum of 13 mm mouth opening required
        - Stylet required and shaped to a 60 - 70° curve
        - Freehand guiding of the ET Tube

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Video Laryngoscopy (Continued)

- Attach camera to standard blade and power camera on
- Insert stylet into ET tube and shape stylet to mirror contour of the standard blade (60 - 70°)
- Lubricate posterior aspect and tip of the standard blade
  - Avoid getting lubricant on the camera
- Insert blade midline and use a tongue/ jaw lift
- Insert blade into the vallecula
  - View should not be a close-up view
  - Lift device as needed for optimal view
- Direct ET tube along the underside of the standard blade
- Once tube has passed through the vocal cords:
  - Partially retract the stylet before advancing the ET tube OR
  - Turn the tube clock wise 90° as you pass the tube through the laryngeal inlet

- Potential problems or issues
  - Avoiding the chest in patients with a small oropharynx, large tongue, or large body
    - If not contra-indicated elevate the head or place in a ramped position
    - Manually open the mouth
    - Use a lateral insertion technique with the display disconnected from the blade if needed.
      - Introduce channeled blade from the left
      - Introduce standard blade from the right
  - Problem lifting the epiglottis, with the blade in the vallecula, to visualize the laryngeal inlets change approach and directly elevate the epiglottis

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Hamilton County EMS
Policies, Procedures, and Protocols

Needle Chest Decompression

Paramedic

Qualifications to perform:

- Tennessee licensed Paramedic,
- Completion of in-service training,
- Approval of Service Medical Director,
- On-going demonstration of proficiency

Indications:

- Critical evidence of tension pneumothorax,
- Markedly diminished or absent breath sounds unilaterally, subcutaneous emphysema, distended neck veins (may be absent in a hypovolemic patient),
- Respiratory distress / hypoxia in the presence of penetrating or blunt chest trauma,
- Profound hypotension in the presence of penetrating or blunt chest trauma,
- Decreased lung compliance (difficulty with mechanical ventilation),
- Tracheal shift away from the affected side is a late sign, rarely found,
- Cardiac arrest with PEA rhythm, especially if asthmatic / COPD or if difficulty ventilating patient,
- Cardio respiratory decompensation following intubation and positive pressure ventilation, with decreased lung compliance (difficulty with mechanical ventilation).

Contraindications:

- If patient has stable vital signs, even with absent breath sounds, DO NOT perform a chest decompression.
- Must confirm appropriate endotracheal tube position if patient is intubated.
- Must have signs / symptoms of hypoxia, respiratory distress, or hypotension in addition to signs of pneumothorax.

Equipment:

- 14 or 16 gauge IV catheter, 2.5” catheter minimum,
- 5 or 10cc syringe, with 1 or 2ml of saline within syringe,
- Skin antiseptic (betadine).

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Needle Chest Decompression (Continued)

Paramedic

Procedure:

- Cleanse skin of anterior chest with betadine.
- Identify affected side (decreased breath sounds on affected side). Trachea may or may not be deviated away from affected side (remember this is rarely seen).
- Identify landmarks:
    - Angle of Louis at junction of manubrium and sternal body is palpable landmark for junction of 2nd rib and sternum.
    - Second intercostal space is below 2nd rib.
    - Catheter puncture site is the 2nd intercostal space, just over the top edge of the 3rd rib, where it intersects an imaginary line through the midpoint of the clavicle (midclavicular line).
- With syringe attached to the IV catheter, enter the chest cavity at the 2nd intercostal space, midclavicular at a 90-degree angle with the chest wall. Aspirate for "bubbles" as you advance the syringe pull the needle before advancing the catheter. Correct placement will generally necessitate advancing the catheter up to the hub. Closely observe for redevelopment of signs and symptoms of tension pneumothorax. Optimally, a longer decompression specific catheter should be used.
- Contact Med Comm. with response to decompression and to prepare receiving hospital for formal chest tube insertion.

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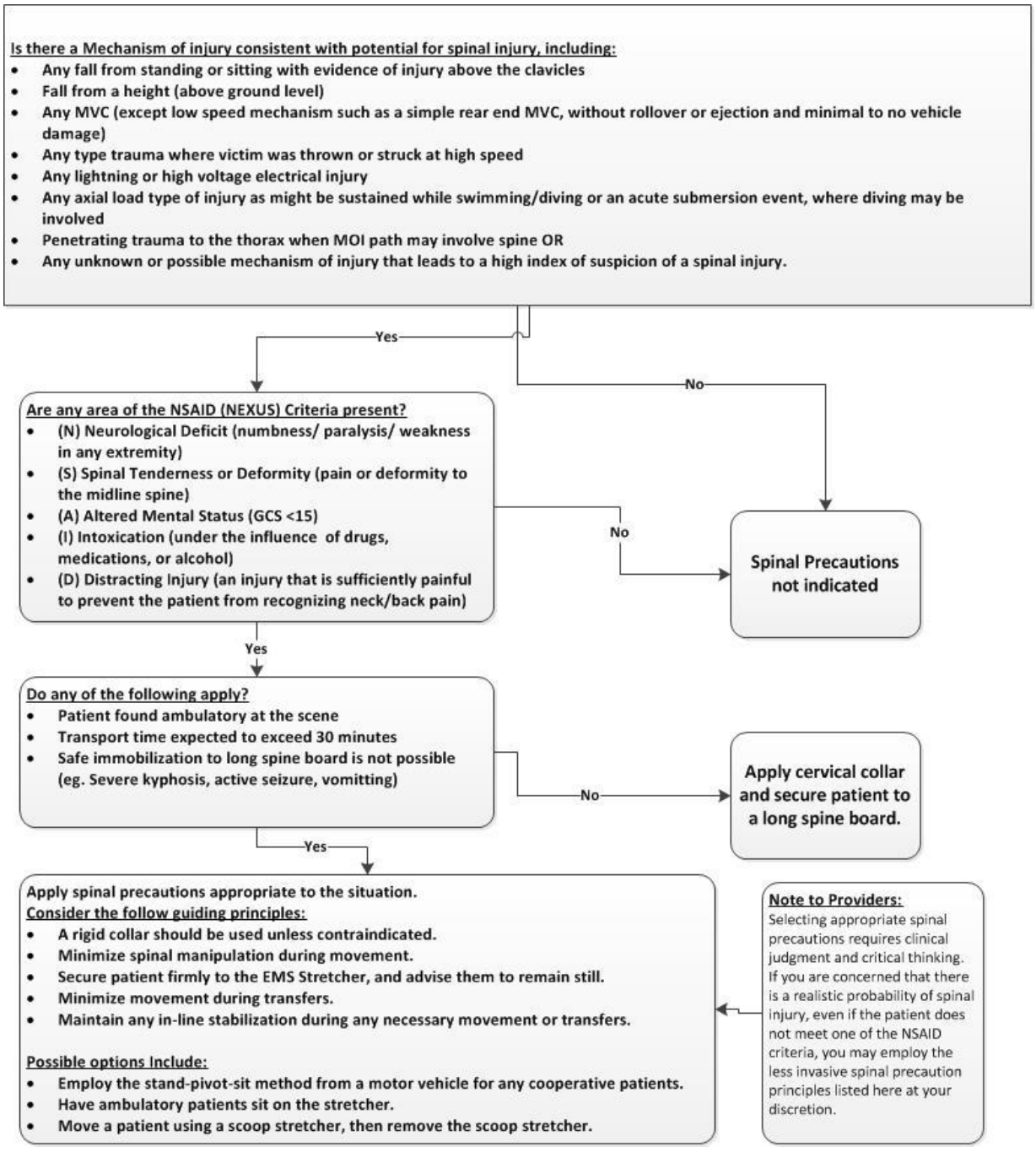
Hamilton County EMS
Policies, Procedures, and Protocols

Selective Spinal Precaution

Paramedic



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Policies, Procedures, and Protocols

Selective Spinal Precaution

- If a First Response Agency has put patient in a full spinal package, the Hamilton County Paramedic responsible for patient care and transport, or the on-scene Hamilton County EMS Supervisor, using their judgment, may go through the Selective Spinal Precaution Decision and determine whether a change, or alteration, of the present chosen spinal precaution may be needed if the patient meets the selective spinal precautions, then during the second assessment in the back of the unit, and prior to transport, may choose to log roll the patient off of the long spine board and lie them flat on the stretcher.
- At no time should the c-collar be removed once one has been put in place.

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Tracheostomy Tube Insertion

Paramedic

- Be sure all involved wash their hands. Put on clean gloves.
- Insert obturator into new tracheostomy tube.
- Attach ties (Do this before putting the tube in your patient's neck.). Place tube with ties attached in the opened package nearby.
- Place rolled towel or blanket under the patient's shoulders.
- Have your partner restrain the arms while you cut the ties and remove the tube. (If no partner, swaddle the child securely.)
- Lubricate new tube and remove the old tube. (If cuffed, deflate pilot balloon before removing.)
- Gently insert the new tube, pushing back, then down, in an arcing motion. DO NOT FORCE
- Immediately remove the obturator as you hold the tube in place with your finger.
- Fasten the Velcro tie straps at the back of neck
- Throw away the old ties (If cuffed, re-inflate pilot balloon)

Notes:

- Needed Equipment
  - Replacement tube with ties attached
  - Towel or blanket for roll
  - Water based lubricant
  - Helper to hold or blanket to swaddle

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Capnography

Paramedic

Indications:

- Capnography shall be used as soon as possible in conjunction with any advanced airway management adjunct, including endotracheal, cricothyrotomy, Blind Insertion Airway Device (BIAD) or BVM
- Capnography is recommended to be used on all patients treated with CPAP, Magnesium, and/or Epinephrine for respiratory distress.

Procedure:

- Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
- Note CO_2 level and wave form changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
- Capnography shall remain in place with the airway and be monitored throughout the prehospital care and transport.
- Any loss of CO_2 detection or waveform indicates an airway problem and should be documented.
    - Color metric capnography may be utilized.
- Capnography should be monitored as procedures are performed to verify or correct the airway problem.
- Document the procedure and results on/with the Patient Care Report.
- In all patients with a pulse, an $ETCO_2$>20 is anticipated. In the post-resuscitation patient, no effort should be made to lower $ETCO_2$ by modification of the ventilatory rate. Further, in post-resuscitation patients without evidence of ongoing, severe bronchospasm, ventilatory rate should never be <6 breaths per minute.
- In the pulseless patient, an $ETCO_2$ waveform with an $ETCO_2$ value >10 may be utilized to confirm the adequacy of an airway to include BVM and advanced devices when SpO_2 will not register.

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Hamilton County EMS
Policies, Procedures, and Protocols

Intubation and Post Intubation

Paramedic

Indications:

- An unconscious unresponsive patient who is apneic or has an inadequate respiratory effort.
- Inability to adequately ventilate a patient with a Bag Valve Mask and simple airway adjunct such as an oropharyngeal or nasopharyngeal airway and maintain a secure airway.

Procedure:

- Prepare your equipment.
- Position patient and ventilate with 100% oxygen
- Using laryngoscope, visualize the vocal cords.
    - Each attempt should be limited to no greater than 30 seconds.
    - Pass endotracheal tube the vocal cords through direct visualization or when hearing/feeling "clicks" while using a bougie
- Confirm tube placement and document on the patient care report (ePCR)
    - Visualization of tube passing through the cords
    - Esophageal intubation detector
    - Bilateral breath sounds (4 points) and absence of epigastric sounds
    - Colormetric CO2 Detector (Only if waveform capnography is not available)
    - Waveform capnography
- Ventilate Rates:
    - Adult: 8 – 10 Breaths per minute.
    - Child/Infant: 12 – 20 Breaths per minute.
- Maintain EtCO2: target of 35 – 45 mmHg
    - Head injuries: 30-35 mmHg
    - Severe asthma, goal 40-50 mmHg, will start >50 mmHg

- All other patients should be between 35-45 mmHg

- Start PEEP at 5 cmH2O and increase if needed
  - If patient was on CPAP before being intubated then continue that pressure with PEEP.
- Monitor Cardiac Monitor and Vital Signs
- Maintain SAO2 > 94%
- If patient shows signs of awakening, moving after intubation, anxiety or agitation:
  - Versed:
    - Adult: 0.1 mg/kg, given at 1 mg/minute boluses not to exceed a max of 8 mg.
    - OR Consider:
  - Fentanyl:
    - Adult: 50 – 75 mcg IV/IO repeat every 5 minutes as need to a maximum of 300 mcg
    - Pediatric:
      - <50 kg's then 1mcg/kg IV/IO to a max of 25mcg.
      - >50 kg's then 1mcg/kg IV/IO to a max of 50mcg.
    - OR Consider:
  - Ketamine:
    - Adult: 2 mg/kg IV/IO
    - Pediatric: Greater than 3 months old then it is 1 mg/kg IV/IO

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Supervisor/ Senior Paramedic/ Tactical Paramedic

- If patient movement threatens secure airway despite sedatives above, consider long term paralytic:
  - Rocuronium
    - Adult: 0.6 - 1.0 mg/kg IV/IO
    - Pediatric (≤ 17 y/o): 0.6 mg/kg IV/IO

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Intubation and Post Intubation Continued

- Norcuron (Only if Rocuronium was not given):
  - Adult: 0.1mg/kg IV/IO
  - Pediatric: 0.1 mg/kg IV/IO

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Policies, Procedures, and Protocols

Blind Insertion Airway Device (BIAD): iGel

AEMT and Paramedic

Qualifications to Perform:

- Tennessee licensed EMR, EMT, AEMT or Paramedic.
- On-going demonstration of proficiency.
- Credentialed by HCEMS Medical Director.

Device Sizing:

Patient Size	iGel Size	Weight (kg)
Neonate	1	2-5 kg
Infant	1.5	5-12 kg
Small Pediatric	2	10-25 kg
Large Pediatric	2.5	25-35 kg
Small Adult	3	30-60 kg
Medium Adult	4	50-90 kg
Large Adult	5	90+ kg

Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask.
- Intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- This airway does not prevent aspiration of stomach contents.
- This is an alternative to a Combitube and is considered a supraglottic airway (SGA)

Contraindications:

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

Hamilton County EMS
Policies, Procedures, and Protocols

Blind Insertion Airway Device (BIAD): iGel Continued

Procedure:

- Pre-Oxygenate the patient with 100% Oxygen.
- Select the appropriate tube size for the patient.
- Remove the device from the protective cradle and carefully examine for any signs of damage.
- Place water-soluble jelly in the middle of the protective cradle.
- Lubricate the back of the i-Gel on the non-inflatable cuff and ensure no lubricant is in the cuff and lubricate each side and the tip of the non-inflatable cuff.
- Grasp along the integral bite block and face the cuff outlet toward the patient's chin.
- Insert the i-Gel into the mouth in the direction of the hard palate.
- Glide the device down and back along the hard palate with continuous, gentle pressure, until resistance is met.
- Tape to secure or use a commercial tube holder.
- Connect the i-Gel to an BVM and assess for breath sounds and air entry.
- Follow "Intubation/Post Intubation" Procedure Protocol for evaluation of device placement verification and post device placement.
- It is required that the airway be monitored continuously through Capnography and Pulse Oximetry.
- Re-verify i-Gel placement after every move and upon arrival in the ED.
- Document the procedure, time, and result (success) on/with the patient care report (ePCR)

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Hamilton County EMS
Policies, Procedures, and Protocols

Blind Insertion Airway Device (BIAD): Combitube

AEMT and Paramedic

Qualifications to Perform:

- Tennessee licensed EMR, EMT, AEMT or Paramedic.
- On-going demonstration of proficiency.
- Credentialed by HCEMS Medical Director.

Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask.
- Intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be > 5 feet and >16 years of age and must be unconscious.
- This airway does not prevent aspiration of stomach contents.
- This is an alternative to an iGel and is considered a supraglottic airway (SGA)

Contraindications:

- Patient who is < 5 feet and < 16 years of age.
- Patients who are conscious with a gag reflex.
- Known esophageal disease (cancer, varices)
- Ingestion of caustic substances
- Stoma or functional surgical airway
- Partial or complete FBAO

Procedure:

- Preoxygenate the patient with 100% O2 via BVM simple airway adjunct in place.
- Lubricate the distal end of the tube.
- Grasp the patient s tongue and jaw with your gloved hand and pull forward.
- Gently insert the tube until the teeth are between the printed black rings.
- Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 100 cc of air.
- Inflate line 2 (white pilot balloon) leading to the distal cuff with 15 cc of air.

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Blind Insertion Airway Device (BIAD): Combitube Continued

- Ventilate the patient through the longer blue tube.
    - Auscultate for breath sounds and sounds over the epigastrium.
        - Look for the chest to rise and fall.
    - If breath sounds are positive and epigastric sounds are negative, continue ventilation through the blue tube. The tube is in the esophagus.
        - In the esophageal mode, stomach contents can be aspirated through the #2, white tube relieving gastric distention.
    - If breath sounds are negative and epigastric sounds are positive, attempt ventilation through the shorter, #2 white tube and reassess for lung and epigastric sounds.
    - If breath sounds are present and the chest rises, you have intubated the trachea and continue ventilation through the shorter tube.
- The device is secured by the large pharyngeal balloon.
- Follow "Intubation/Intubation" Procedure Protocol for evaluation of device placement verification and post device placement.
- It is required that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.
- Document the procedure, time, and result (success) on/with the patient care report (ePCR)

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Hamilton County EMS
Policies, Procedures, and Protocols

Needle Cricothyrotomy

Indications:

- Management of an airway when standard airway procedures cannot be performed or have failed in a patient > 12 years old.
- Typically involves patients with one or more of the following:
  - Airway obstruction by uncontrolled bleeding into the oral cavity and/or vomiting
  - Severe maxillofacial trauma – blunt, penetrating, or associated with mandibular fracture
  - Laryngeal foreign body that cannot be removed expeditiously
  - Swelling of upper airway structures
  - Infection (e.g., epiglottitis, Ludwig's angina)
  - Allergic reaction or hereditary angioedema
  - Chemical or thermal burns to the epiglottis and upper airway

Contraindications:

- Age < 3 years or estimated weight < 15 kg
- Ability to maintain airway utilizing less invasive procedures
- Conscious patient
- Moving ambulance
- Midline neck hematoma or massive subcutaneous emphysema

Paramedic

- Call for sergeant/ supervisor intercept
- Pre-oxygenate patient when possible.
- Locate cricothyroid membrane at the inferior portion of the thyroid cartilage (with head in neutral position, membrane is approximately 3 finger widths above the sternal notch).
- Have assistant hold skin taunt over membrane and locate the midline.
- Prep area with betadine if possible.
- Insert 12/14-gauge catheter downward through the midline of the cricothyroid membrane at a 45º - 60º angle towards the carina while applying negative pressure to the syringe.
- Verifies needle has entered the trachea by aspirating air into the syringe.

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Needle Cricothyrotomy Continued

- Advance catheter the rest of the way and remove the needle.
- Attach jet insufflation device that is attached to oxygen with supply tubing and ventilate for 1 (one) second on and 4 (four) seconds off.
- At no point will the paramedic let go of the needle cricothyrotomy unless a more prominent device is being inserted by a sergeant/ supervisor.
- PARAMEDIC STOP

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Supervisor/ Senior Paramedic/ Tactical Paramedic

- Prep equipment for the Quick Trach II
- Pre-oxygenate patient when possible.
- Locate cricothyroid membrane at the inferior portion of the thyroid cartilage (with head in neutral position, membrane is approximately 3 finger widths above the sternal notch).
- Have assistant hold skin taunt over membrane and locate the midline.
- Prep area with betadine if possible.
- Insert device at a 90º angle aimed inferiorly and puncture the skin and continue with firm, steady pressure and aspirating for air during insertion.
- Change the level of insertion to a 45º angle and advance to the level of the red stopper.
- Remove green connector until you hear a click and slide the catheter down just a little bit to cover the end of the needle.
- Removes red stopper.
- Slides plastic cannula into the trachea until flange rests on the neck and remove the needle.
- Attach the neck tape to hold device secure.
- Using a syringe, inflate the cuff for the pilot balloon until the cuff is firm.
- Follow "Intubation/Post Intubation" Procedure Protocol for evaluation of device placement verification and post device placement.
- It is required that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.
- Document the procedure, time, and result (success) on/with the patient care report (ePCR)

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Policies, Procedures, and Protocols

Acute Coronary Syndrome/ STEMI

AEMT

- A.B.C.s
- Place patient in position of comfort.
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Suction airway and assist ventilations, if required.
- Establish IV NS or INT. (**DO NOT DELAY TRANSPORT FOR IV)**
    - IV should be established in the Antecubital (AC) vein if possible to help facilitate expediency in diagnostic tests.
- Assist patient with administration of NTG up to 3, unless patient becomes hypotensive, (<100 mm/hg systolic), monitor and record patient's blood pressure every (5) minutes. **Remember to ask if the patient is taking any phosphodiesterase inhibitor medications (Viagra, Levitra, Cialis).**
- Administer Aspirin, (324mg PO chewed). If the patient has already taken Aspirin, then ascertain the dosage that they took. If the dose is less than 324 mg then give 81 mg baby Aspirin to reach the dosage of 324 mg. CONTRAINDICATION: Patient with known allergy to Aspirin or patient who has already received 324 mg Aspirin, or blood thinners (To include such medicines as Plavix) within 24 hours. If Aspirin is not given, then document the reason why it was not given.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac Monitor
    - Obtain 12 Lead EKG within 10 minutes of patient contact
- If the patient shows an ST Elevation Myocardial Infarction, possible ST elevation, or has significant signs to show an acute MI is suspected, and the patient is going to be

transported to a hospital participating in the Code STEMI program, the 12 lead will be transmitted to that hospital.

- The 12 lead should be transmitted as soon as patient condition allows.
- The 12 lead will be transmitted using the cardiac monitor manufactures recommendations.
- The transmitted copy WILL have the patient's last name and age entered prior to transmission, and if patient condition and time allows the patient's first name, last name, and date of birth will be added.
- If the default alarm has indicated a failure for the ECG transmission being sent, then another attempt should be made as patient condition and times allow.
- If the transmission cannot be sent for any reason the receiving facility should be notified that no transmission is being sent. (Patients who meet the criteria for a Code STEMI will be transported to the most appropriate facility: Erlanger, Memorial, or Parkridge)

- Initiate a second IV.
- If pain is unrelieved by NTG then administer an analgesic:
  - Adult:
    - Morphine Sulfate 2-10mg IV/IO (diluted in 9cc of Normal Saline) may be repeated as ordered by Medical Control, OR
    - Fentanyl 50 – 100 mcg IV/IO
    - Zofran 4 mg IV for nausea
- If patient EKG is showing an inferior MI then perform a right sided 12 lead by moving V4R and V5R to the same location on right side.
  - Two indicators are:
    - A patient that has a border line or low systolic blood pressure, or
    - they have a larger ST segment in lead III than they do in lead II.
  - These patients should be treated with a 200 ml fluid bolus and **EXTREME CAUTION** should be used if Nitro or Morphine is administered.
- CONTACT MED COMM AS SOON AS PATIENT CONDITION ALLOWS WITH A POSSIBLE CODE STEMI ALERT!
- PARAMEDIC STOP

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Acute Coronary Syndrome/ STEMI Continued

Notes:

- The stretcher, cardiac monitor, and oxygen shall be carried into the scene on all Chest Pain Calls!
- **CHECK BLOOD PRESSURE IN BOTH ARMS PRIOR TO ADMINISTRATION OF NTG. IF THERE IS A DIFFERENCE OF 8-10 MM/HG BETWEEN THE READING, THEN SUSPECT POSSIBLE AORTIC ANEURYSM.**

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Bradycardia

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Attach monitor and get a 12 lead EKG.
- If patient is stable, then transport in position of comfort and contact Medical Control as needed for further.
- If patient is showing signs of symptomatic bradycardia, hypotension, decreased or altered level of consciousness or signs and symptoms of inadequate tissue perfusion, then:
  - Consider Atropine 0.5 mg IV/IO. May repeat to a total dose of 3mg. Do not delay pacing.
  - If the rhythm is a high degree block prepare for transcutaneous pacing (use immediately if patient has a high degree block such as a 2nd degree type II or 3rd degree AV block). Set rate to approximately 60/min and set mA until capture is achieved and then increase by 10 mA once mechanical capture has been confirmed.
    - Check to make sure that patient has a pulse with pacing through either a central or peripheral pulse location.
  - Consider Epinephrine drip 2 - 10 mcg/min.
  - Consider toxins:
    - Beta blocker toxicity – Glucagon 5mg IV
    - Calcium Channel Blocker Toxicity
    - Opioid Toxicity – 2mg Narcan

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Policies, Procedures, and Protocols
Bradycardia Continued

- Organophosphate Toxicity – Atropine 2mg with pralidoxime 1-2 gram over 15 – 30 minutes

- If pediatric patient:
  - Start CPR if heart rate is <60/min with poor perfusion.
  - Recheck pulse after 2 minutes if poor perfusion
    - Give Epinephrine 0.01mg/kg 1:10,000 IV/IO every 3-5 minutes or 0.1mg/kg 1:1000 ETT
    - If due to increased vagal tone or AV block then give Atropine 0.02 mg/kg.
      - Minimum atropine dose is 0.1mg and max dose is 1mg.
    - Complete heart block then transcutaneous pacing
- Contact Medical Control.
- PARAMEDIC STOP

Notes:

1. Signs and Symptoms
   a. Heart Rate <60.
   b. Systolic BP <90.
   c. CHF / Pulmonary Edema.
   d. Altered Mental Status.
   e. MI or Ischemia on 12 lead EKG
   f. Chest Pains.
   g. Shortness of Breath.
   h. Light-headedness.
2. Beware of Ventricular Escape Beats and do not suppress with Lidocaine.
3. Treat the patient and NOT the heart rate: Asymptomatic patients do not require aggressive treatment of bradycardia.
4. Non-Cardiac causes of bradycardia: Hypoxia, Increased Intracranial pressure, Hypothermia, Pain / Nausea (Vasovagal response), Medications / Drugs – Calcium Channel Blockers, Beta – Blockers, Digoxin.
5. Consider Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hypo/ Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax,

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Bradycardia Continued

Thrombosis (coronary or pulmonary), and Trauma (hypovolemia/ increased ICP). See causes addendum!

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Tachycardia

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Attach monitor and get a 12 lead EKG. Determine if rhythm is a narrow or wide complex tachycardia.
- **Regular Narrow Complex** QRS (≤0.12 seconds =3 small blocks with a rate > 150, SVT)
  - Stable Patient:
    - Attempt vagal maneuvers (if it will not delay medications/cardioversion)
      - Infants/young children: Apply ice to face
      - Older children: Carotid sinus massage/ Valsalva maneuver
      - Adults: Valsalva maneuver
    - If unsuccessful then administer Adenosine:
      - Adult: max 6 mg IV/IO bolus followed by a rapid normal 20 ml saline flush for first dose
      - Pediatric: 0.1 mg/kg, immediately flush with 5cc normal saline.
    - If unsuccessful then administer Adenosine:
      - Adult max 12 mg IV/IO bolus followed by a rapid normal 20 ml saline flush for the subsequent doses
    - Consult Medical Control for:
      - If unsuccessful then consider Amiodarone 150 mg over 10 minutes
  - Unstable Patient:
    - If patient is conscious then give Versed 2-5 mg IV/IO. Do not delay cardioversion for sedation.
    - Synchronized Cardioversion:

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Tachycardia Continued

- Adult: 100 joules.
- Pediatric: 0.5 – 1.0 J/kg; if unsuccessful increase to 2 J/kg.
    - Give 2nd shock and consider Amiodarone at 5 mg/kg over 20 – 60 minutes before delivering 3rd shock.

- **Irregular Narrow Complex** QRS (atrial fibrillation, atrial flutter with RVR, rate >140)
    - Stable Patient:
    - Administer Cardizem 0.25 mg/kg up to 20 mg over 2 minutes.
        - **Use caution with patient's over 55 years old. Consider using a half dose (10 mg).**
        - **Warning Cardizem is incompatible with Lasix, sodium bicarbonate, and valium.**
        - Start an IV drip of Cardizem at 10 mg/hr.
        - Obtain a second 12 lead and monitor vitals signs for changes, specifically becoming hypotensive.
        - If no response after 1st dose of Cardizem then contact Medical Control and consider a second bolus at 0.35 mg/kg over 2 minutes and continue to monitor vital signs.
    - Unstable patient:
        - If patient is conscious then give Versed 2-5 mg IV/IO. Do not delay cardioversion for sedation.
        - Synchronized Cardioversion at 100 - 120 joules.
- **Regular Monomorphic Wide Complex** QRS (>0.12 seconds)
    - Stable Patient:
        - If patient has a history of SVT with aberrancy, or prior conversion with Adenosine then administer:
            - Adenosine 6 mg IV/IO bolus followed by a rapid normal 20 ml saline flush
            - If unsuccessful then administer Adenosine 12 mg IV/IO bolus followed by a rapid normal 20 ml saline flush
        - If patient is without a history of SVT with aberrancy or prior conversion with adenosine then administer Amiodarone 150 mg IV/IO over 10 minutes
        - Consult Medical Control
    - Unstable Patient:

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Tachycardia Continued

        - If patient is conscious then give Versed 2-5 mg IV/IO. Do not delay cardioversion for sedation.
        - Cardioversion at 100 joules
            - **Attempt to sync, if no sync and patient is unstable then defibrillate.**
            - May repeat if needed, check pulses and evaluate for cardiac arrest if no conversion.
- **Irregular Monomorphic Wide Complex** QRS (>0.12 seconds)
    - Stable Patient:
        - Administer Amiodarone 150 mg IV/IO over 10 minutes
        - Consult Medical Control
    - Unstable Patient:
        - If patient is conscious then give Versed 2-5 mg IV/IO. Do not delay cardioversion for sedation.
        - Cardioversion at 200 joules
            - **Attempt to sync, if no sync and patient is unstable then defibrillate.**
            - May repeat if needed, check pulses and evaluate for cardiac arrest if no conversion.

Notes:

- If at any point patient goes into cardiac arrest, then go to appropriate protocol for treatment.
- Primary survey focusing on Airway/Breathing/Circulation.
- EKG monitor:
    - Rate > 150 beats per minute, although some patients may have cardiovascular instability with heart rates < 150 beats per minute.
    - Narrow complex QRS (<0.12 sec = 3 small blocks)
    - Wide complex QRS (>0.12 sec = 3 small blocks)
- Unstable Patient:
    - Persistent Chest pain.
    - Shortness of breath.
    - Light-headedness.

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Tachycardia Continued

  - Hypotensive with a systolic BP<90.
  - CHF / Pulmonary Edema.
  - Altered mental status.
  - Myocardial infarction / Ischemia on 12 lead EKG.
  - Other signs of shock
- Consider Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hypo/ Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), and Trauma (hypovolemia/ increased ICP). See causes addendum!

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Policies, Procedures, and Protocols

Ventricular Fibrillation/ Pulseless Ventricular Tachycardia

AEMT

- Assessment (ABC's)
- Begin high quality chest compressions with a rate between 100 – 120 compressions per minute.
    - Never stop compressions for more than 10 seconds
    - The metronome on Lifepack 15 should be utilized to help with timing.
- Ventilate patient with 100% oxygen and establish an airway appropriate to patient's condition, monitor pulse oximetry
- If AED is available or AED function on Lifepack 15 then it may be utilized.
- Establish an IV/IO of Normal Saline
- AEMT STOP

Paramedic

- Attach patient to the cardiac monitor
- Defibrillation one time after VF/ Pulseless VT rhythm confirmation
    - Biphasic monitor:
        - Adult:
            - 200 joules.
            - Subsequent defibrillations will be at 120-200 joules or higher.
        - Pediatric patients:
            - Defibrillate as soon as possible
            - Start a 2 J/kg
            - Second and subsequent shocks will be at 4 J/kg
    - After defibrillation perform 5 cycles (approx. two minutes) of high-quality CPR before performing another rhythm check.
- Administer Epinephrine:
    - Adult: 1 mg 1:10,000 IV/IO push every 3 – 5 minutes
    - Pediatric: 0.01mg/kg 1:10,000 IV/IO every 3-5 minutes push or 0.1mg/kg 1:1000 ETT
- Continue with 5 Cycles (approx. two minutes) of High-Quality CPR between rhythm checks and defibrillate patient dependent on the rhythm

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Ventricular Fibrillation/ Pulseless Ventricular Tachycardia Continued

- Administer an anti-arrhythmic
  - Adult:
    - Amiodarone: 300 mg IV/IO push and repeat after five (5) minutes at 150 mg IV/IO push OR
    - Lidocaine: 1.5 mg / kg IV/IO push; repeat q 3-5 minutes to maximum dose of 3 mg/kg. After conversion to NSR, begin drip at 2-4 mg / min.
  - Pediatric:
    - Amiodarone 5 mg/kg to a max of 300 mg and may be repeated at 15 mg/kg to a max of 150 mg. OR
    - Lidocaine: 1 mg/kg IV / IO per dose. Infusion: 20-50 mcg/kg/min.
- Continue with 5 Cycles (approx. two minutes) of High-Quality CPR between rhythm checks and defibrillate patient dependent on the rhythm.
- If the resuscitation is prolonged or there is suspected acidosis, then consider administration of Sodium Bicarbonate
  - Adult: 1 mEq/kg IV/IO push followed by 0.5 mEq/kg IV/IO push every 10 minutes.
  - Pediatric: 1 mEq/kg IV/IO and may repeat at 0.5 mEq IV/IO every 10 minutes
- If rhythm is Torsades de Pointes then administer Magnesium Sulfate 1 – 2 gm slow IV/IO push over two minutes
- PARAMEDIC STOP

Notes:

- Defibrillation should not be delayed for any reason
- Consider causes of the arrest. Refer to the HCEMS H's and T's Chart in the reference section.
- Consider transport of patient after performing CPR/defibrillation cycles, securing an airway, and administration of the first two rounds of medications.
- AHA ACLS Guidelines deemphasized placement of advanced airway in initial resuscitation- consider supraglottic airway device.
- Compressions should not be interrupted for longer than 10 seconds when doing CPR.

a. This includes rhythm, pulse and airway checks.

- During CO2 monitoring, a sudden and rapid elevation of CO2 levels is an indicator of return of spontaneous circulation (ROSC).

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Hamilton County EMS
Policies, Procedures, and Protocols

Asystole/PEA

AEMT

- Assessment (ABC's), determine downtime
- Begin high quality chest compressions with a rate between 100 – 120 compressions per minute.
    - Never stop compressions for more than 10 seconds
    - The metronome on Lifepack 15 may be utilized to help with timing.
- Ventilate patient with 100% oxygen and establish an airway appropriate to patient's condition, monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- AEMT STOP

Paramedic

- Attach the patient to the cardiac monitor
- Administer Epinephrine:
    a. Adult: 0.01mg/kg 1:10,000 IV/IO push or 0.1mg/kg 1:1000 ETT every 3 – 5 minutes
    b. Pediatric: 0.01 mg/kg 1:10,000 IV/IO push every 3 – 5 minutes
- Continue with 5 Cycles (approx. two minutes) of High-Quality CPR between rhythm checks and defibrillate patient dependent on the rhythm
- If the resuscitation is prolonged or there is suspected acidosis then consider the administration of Sodium Bicarbonate 1 mEq/kg IV/IO push followed by 0.5 mEq/kg IV/IO push every ten (10) minutes.
- PARAMEDIC STOP

Notes:

- Asystole must be confirmed in two leads and documented in the PCR
- Consider causes of the arrest. Refer to the H's and T's Chart.
- AHA ACLS Guidelines deemphasized placement of advanced airway in initial resuscitation- consider supraglottic airway device.
- Compressions should not be interrupted for longer than 10 seconds when doing CPR.

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Asystole/PEA

a. This includes rhythm, pulse and airway checks.

- During CO2 monitoring, a sudden and rapid elevation of CO2 levels is an indicator of return of spontaneous circulation (ROSC).

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Post Resuscitation

AEMT

- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
  - Suction and assist ventilations as needed
- Establish an IV/IO of Normal Saline
- Obtain vital signs and monitor pulse oximetry
  - If systolic is less than 90 mmHg the administer 250 ml fluid bolus.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Raise head of stretcher 30º
- AEMT STOP

Paramedic

- Obtain 12 Lead EKG, transmit
- Medications:
  - If anti-arrhythmic administered:
    - If Amiodarone:
      - Adult: 300mg IV/IO
        - If one dose given and arrhythmia persists, give second dose 150 mg
      - Pediatric: 5 mg/kg, may repeat X2
    - If Lidocaine:
      - Adult: Start infusion drip at 2-4 mg/min
      - Pediatric: 20-50 mcg/kg/min
- Continue ventilatory support to maintain ETCO2 >20,
  - Adults:
    - Respiratory rate 10 – 12/ min.
  - Pediatrics
    - Infant-preschool min respiratory rate should be 30.
    - School age – min respiratory rate should be 20.
- If patient is intubated then refer to the post intubation protocol.
- If patient does not tolerate ET tube and needs advanced airway placement then refer to medication assisted intubation protocol.
- PARAMEDIC STOP

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Allergic/Anaphylactic Reaction

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Obtain vital signs and monitor pulse oximetry
- If patient is exhibiting signs of respiratory distress/failure or shock, or systemic uticaria then:
  - Administer Epinephrine 1:1000
    - Adult: 0.3-0.5 mg **IM**. Repeat in 15 minutes if needed.
    - Pediatric: 0.01 ml/kg **IM** to a max dose of 0.3 mg. May repeat three times as needed at 15-minute intervals each
  - Albuterol (Proventil) 2.5 mg in 3ml saline combined with Atrovent (Ipratropium) 0.5 mg in 2.5 ml saline via nebulizer (adult and pediatric).
    - If wheezing persists may repeat to a max of three treatments
    - If patient is, < 20 kg's give only Albuterol
- Establish an IV/IO of Normal Saline
  - If patient is Hypotensive then administer a fluid bolus of 20 ml/kg. Repeat one time if needed.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG
- If response to IM Epinephrine is inadequate then administer an Epinephrine 1:10,000 infusion
  - Adult: 2-10 mcg/min.
  - Pediatric: 0.1 mcg/kg/min
- Administer Benadryl:
  - Adult: 50 mg IV/IO or IM (if no other access is available)
  - Pediatric: 1 mg/kg IV/IO or IM (If no other access is available) to a max dose of 50 mg.

- Administer Solu-Medrol
  - Adult: 125 mg IV/IO.
    - 62.5 mg IV/IO if patient is on chronic steroid therapy.
  - Pediatric: Will not be given in the field. Will hold off for oral medicines to be given in ER if needed.
- Contact Medical Control
- PARAMEDIC STOP

Notes:

- Severe is defined as pending airway compromise requiring intubation or vascular collapse.
- Acute onset with rapid progressions of signs and symptoms.
- Look for exposure: foods, drugs, bites, stings, etc.
- Contact with a known allergen or an item that is known to have a high possibility to cause and allergic reaction.
- Dyspnea from minor to severe with audible wheezing upon contact or through auscultation or decreased air exchange on auscultation.
- Generalized uticaria (hives), erythema (redness of skin from inflammation), angioedema (rapid swelling of tissue) that is more pronounced in the face and neck.
- Chest tightness or the inability to take a deep breath.
- A Change in voice or difficulty in swallowing.

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Hamilton County EMS
Policies, Procedures, and Protocols

Stroke/ CVA

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient is position of comfort, usually sitting, keep patient warm, and protect extremities.
- Obtain vital signs and monitor pulse oximetry
- Complete three parts of the MEND exam while on scene:
  - Speech: You can't teach an old dog new tricks.
  - Facial Droop: Show teeth and smile
  - Motor- Arm Drift: Close eyes and hold out arms.
- Establish an IV/IO of Normal Saline (Use only NS) and set the flow at a Keep Vein Open (KVO) rate. **(DO NOT DELAY TRANSPORT TO ESTABLISH AN IV)**
  - IV, 18 gauge or larger, should be established in the Antecubital (AC) vein if possible to help facilitate expediency in diagnostic tests.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- If patient condition has deteriorated, intubate patient to maintain oxygenation (If patient is unruly or to control anxiety administer Versed 2-8 mg IV/IO, **under direction of Medical Control.**
- Administer Narcan 2mg IVP, if opioid overdose is suspected or patient has respiratory depression, or is miotic (excessive smallness or contraction of pupils).
- Complete the rest of the MEND exam if time and patient condition permits
- Contact Med Comm. and advise that the patient is a possible STROKE ALERT.
- PARAMEDIC STOP

Notes:

- Questions that need to be asked of all potential Stroke/CVA patient's (This information should be given to hospital staff or stroke team and documented in ePCR):
  - Patient Age
  - Time of last known well
  - Name and Phone number of family (especially if witnessed)
  - Anticoagulant medications (Eliquis, Predaxa, Xarelto, Coumadin, etc.)
  - Baseline health (ambulatory, bedridden, etc.)
  - Blood pressure
    - Also, any meds given to control blood pressure
  - History of prior stroke
  - Seizure History
- Transportation to a Comprehensive Stroke Center for patients who meet the criteria described within the Stroke Destination Guidelines should be recommended to the patient, family, or legal representative after full explanation of the benefits of transportation or risks of being transported to a non-Comprehensive Stroke Center.
  - Refer to HCEMS Stroke Destination Guidelines for further
- If a patient or their legal designee does not want the patient transported to a comprehensive stroke center then a refusal must be obtained.
  - Refer to HCEMS refusals protocol

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Hyperglycemia/ Hypoglycemia

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in the position of comfort
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline. If patient shows signs of dehydration, then consider a fluid bolus of 250 – 500 ml.
- Obtain a blood glucose reading.
    - If reading is above 250 mg/dl for an adult or 200 mg/dl for pediatric then:
        - Adult: administer a fluid bolus of normal saline 10 – 20 ml/kg and then reassess the blood sugar.
        - Pediatric: administer 20 ml/kg of Normal Saline over 1 hour. If patient is hypotensive then the 20 ml/kg of Normal Saline should be given as a fluid bolus.
    - If reading is below 60 mg/dl for patients 2 months and older or 40 mg/dl for a newborn up to 2 months then:
        - Adult: administer D50W 25 gm IV/IO followed by a 20 ml bolus of normal saline and then reassess the blood sugar.
            - If an IV cannot be established or patient is combative then proceed with Glucagon 1.0 mg IM.
            - If patient is alert and oriented with patent airway and ability to swallow then may use Oral Glucose 15 GM administered between the cheek and gum.
        - Newborn/Infant: D10- 2.5 ml/kg IV/IO (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10 or another way to make up D10 is to expel 40 ml of D50 then draw up 40 ml of normal saline)
        - Child (> 6 months up to 2 years old): D25- 2.0 mg/kg IV/IO
        - If patient is alert and oriented with patent airway and ability to swallow then may use oral glucose 15 GM administered between the cheek and gum.

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Hyperglycemia/ Hypoglycemia

- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Recheck blood sugar as needed en-route to the ER.
- PARAMEDIC STOP

Notes:

- If patient is on a long acting insulin the patient should be encouraged to go to the hospital and you must go through medical direction before obtaining a refusal.
- Long Acting Insulins (not all inclusive):
    a. Lantus: Last up to 24 hours
    b. Levemir: Lasts 18-23 hours
    c. Toujeo: Lasts more than 24 hours
    d. Tresiba: Lasts up to 42 hours

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Hypertensive Crisis

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in position of comfort
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- In the event of uncontrolled epistaxis:
  - Have the patient lean forward to prevent excess blood in the stomach and then apply direct pressure over nares.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Diastolic pressure must be above 115mm/hg and the patient must be symptomatic! (If systolic blood pressure is <220 mmHg contact Medical control)
- If systolic blood pressure is >220 mmHg and/or diastolic is > than 140 mmHg:
  - Nitroglycerin 0.4 mg SL, repeated every 3 – 5 minutes with vital sign checks between each administration, until blood pressure drops 15%. **OR**
  - Lopressor (Metoprolol)
    - 5 mg IV/IO every 15 minutes to a max of 15 mg
    - Maximum initial fall in B/P would not exceed 25% of presenting value.
    - Call medical control in patients with suspected stroke or stroke like symptoms
- Consider Morphine Sulfate 2 – 5 mg slow IV bolus
- PARAMEDIC STOP

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Nausea/Vomiting

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline if patient is showing signs of dehydration or for medication administration.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Administer an anti-emetic:
  - Adult:
    - Zofran 4 mg IV/IO (Give over at least 30 seconds but 2-5 minutes preferred, ok for pregnancy after the 1st trimester) OR
    - Phenergan IV/IO 12.5 mg
  - Pediatric:
    - Zofran 0.15 mg/kg to a max dose of 4 mg IV/IO (Give over at least 30 seconds but 2-5 minutes preferred)
- PARAMEDIC STOP

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Pain Management

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in the position of comfort unless contraindicated by the spinal precaution protocol.
- Obtain vital signs and monitor pulse oximetry.
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Administer an analgesic **(choose one)**:
    - Adult:
        - If pain is minor or moderate, then give supportive (non-medicated) care and continue transport.
        - Morphine Sulfate 2-10mg IV/IO (diluted in 9cc of Normal Saline). May be repeated as ordered by Medical Control, OR
        - Fentanyl 50 – 100 mcg IV/IO. May be repeated one time.
        - As an alternative, Toradol 30mg IV/IO may be used. Use ½ dosage with elderly
    - Adult who is a chronic opiate user and has severe pain:
        - Ketamine 0.2 mg/kg IV push over 60 seconds to a max of 20 mg.
            - May repeat X1 after 15 minutes.
    - Pediatric:
        - If pain is minor or moderate, then give supportive (non-medicated) care and continue transport.
        - 10 – 15 mg/kg of Tylenol PO, if recent history of illness
        - Morphine 0.1 mg/kg IV/IO to a max dose of 5 mg. OR

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Pain Management Continued

- Fentanyl:
  - <50 kg's then 1mcg/kg IV/IO to a max of 25mcg.
  - >50 kg's then 1mcg/kg IV/IO to a max of 50mcg.
- If patient becomes nauseated or starts vomiting, then treat per the appropriate protocol.
- Contact Medical Control as time and patient condition allows.
- PARAMEDIC STOP

Notes:

- Contraindication (Toradol): Hypersensitivity, asthma, severe renal disease, severe hepatic disease peptic ulcer disease, L&D, lactation, CV bleeding, and patient's allergic to aspirin, and diabetes.

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Pulmonary Edema/ Symptomatic Heart Failure

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
  - Suction and assist ventilations as needed
- Consider usage of CPAP per the CPAP procedure protocol.
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- NTG spray 0.4mg S.L. (monitor B/P every 5 minutes)
  - Max of 3 doses
- ***In the presence of deteriorating v/s or cardiogenic shock:***
  - Consider intubating the patient, suction patient as needed, oxygenate patient as needed. Monitor ETCO2.
- If hypotensive consider:
  - Levophed 2 – 20 mcg/min titrated to effect and starting at 2 mcg/min titrated to a max of 20 mcg/min. (Contact Med Control before administering) OR
  - Dopamine 2 – 20 mcg/kg/min titrated to effect and starting at 2 mcg//kg/min titrated to a max of 20 mcg/kg/min. (Contact Med Control before administering)
- Contact Med Comm. as needed for further.
- PARAMEDIC STOP

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Pulmonary Edema/ Symptomatic Heart Failure Continued

Notes:

- NTG should not be used in the presence of hypotension, indications of a right sided MI, or an altered mental status.
- If the patient requires intubation then refer to the medication assisted intubation (RSI) protocols.

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Respiratory Distress

AEMT

- Assess patient (ABC's)
  - Cyanosis will be a late sign in pediatric respiratory distress.
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Monitor end-tidal CO2.
- If patient has deteriorated, then intubate patient to maintain oxygenation.
- Initiate CPAP for adult patient with moderate or severe respiratory distress and SBP greater or equal to 90mhg. See CPAP procedure
- If suspected allergic reaction/anaphylaxis see Allergic/Anaphylactic reaction protocol
- see specific condition for treatment options below
- PARAMEDIC STOP

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Respiratory Distress Continued

Notes:

CONDITION SPECIFIC TREATMENT

- Asthma
  - Albuterol (Proventil) 2.5 mg in 3ml saline combined with Atrovent (Ipratropium) 0.5 mg in 2.5 ml saline via nebulizer (adult and pediatrics).
    - If wheezing persists may repeat to a max of three treatments
    - If patient is <20 kg's then Albuterol only
  - Administer Solu-Medrol 125mg IV/IO push.
    - Adults only unless patient is unstable and an IV has already been established due to deterioration of patient condition).
  - If no improvement then administer Mag Sulfate:
    - Adult: 1 GM IV/IO, given over 20 minutes
    - Pediatric: 50 mg/kg IV/IO to a max of 1 GM slow IV/IO push (only if patient is unstable and an IV has already been established due to deterioration of patient condition).
- Foreign Body Airway Obstruction:
  - 100% O2 via BVM
  - Infants: 5 back blows, 5 Chest Thrusts (Repeat as needed alternating with ventilation attempts)
  - Adult and child: Abdominal Thrusts (Repeat as needed alternating with ventilation attempts)
  - If foreign body is visible then remove with Magill forceps.
  - Continue airway support and vent with BVM as needed
  - Reassess, support ABC's
  - Intubate if necessary

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Respiratory Distress Continued

- Chronic Obstructive Pulmonary Disease (COPD):
  - If patient's showing obvious signs of hypoxia or who are in, or imminent, respiratory failure or arrest, ventilated with a bag valve mask and 100% oxygen with consideration of an advanced airway of needed.
  - Avoid intubation if possible.
  - Albuterol (Proventil) 2.5 mg in 3ml saline combined with Atrovent (Ipratropium) 0.5 mg in 2.5 ml saline via nebulizer.
  - Administer Solu-Medrol 125mg IV/IO push.
    - If wheezing persists may repeat to a max of three treatments
- Croup (stridor, hoarse, barking cough, signs and symptoms of upper airway infection)
  - 100% O2
  - Consider nebulized epinephrine 1:1000:
    - 0.5 ml/kg (when concentration is 1:1) to a max dose of 5 ml via nebulizer.
  - BVM/ ET Tube as needed for patient condition (If Epiglottitis is suspected then only intubate if absolutely necessary)
  - Reassess, support ABC's
- Possible Epiglottitis ("sick", fever, tripod position, excessive drooling)
  - **Keep patient calm**, use parents for this if feasible.
  - 100% O2 (via blow-by)
  - BVM/ ET Tube as needed for patient condition (If Epiglottitis is suspected then only intubate if absolutely necessary)
  - Avoid suctioning. Let patient lean forward to allow drainage of drool.
  - Continue airway support and vent with BVM as needed
  - Reassess, support ABC's
  - Do not start an IV unless absolutely necessary
- Tracheostomy Tube Issues
  - Reasons
    - Dislodged or decannulated
    - Obstructed
    - Pneumothorax
    - Equipment
  - Consider changing out. (Refer to tracheostomy tube insertion protocol)

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Seizures

AEMT

- Assess patient (ABC's)
- Protect patient from injury
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
    - Suction and assist ventilations as needed
- Place patient in a position of comfort.
- If trauma noted treat per Selective Spinal Precautions Protocol
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline (Do not delay transport for IV/IO)
- If febrile, cool patient as needed and follow hyperthermia protocol.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Consider causes of seizure and treat per appropriate protocol
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- If patient is actively seizing, prolonged, or status epilepticus then administer:
    - Adult:
        - Ativan (Lorazepam) 1-2 mg slow IV/IO push (repeat as needed up to max 6mg) OR
        - Versed (Midazolam) 1-2 mg slow IV/IO push (repeat as needed up to max 6mg) or
        - Valium (Diazepam) 5-10mg slow IV/IO push
        - If no IV then Versed (Midazolam) 10mg IM
    - Pediatric:
        - Ativan (Lorazepam): 0.1 mg/kg IV/IO/IN to a max of 4 mg repeat in 4 minutes as needed or
        - Versed: 0.1 mg/kg IV/IO to a max of 4 mg or

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Seizures Continued

- Valium (Diazepam): 0.15-0.2 mg/kg IV/IO to max dose of 10mg or
- If No IV then Versed 0.2 mg/kg IM/IN (Max of 10 mg) or Midazolam 0.5 mg/kg Buccal (Max 10mg)

- If an opioid overdose is suspected then administer Narcan 2mg IV/IO/IN push.
- Contact Medical Control for further if needed.
- PARAMEDIC STOP

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Unconscious/Unresponsive

AEMT

- Assess patient (ABC's)
    - Assess for trauma, head trauma, hypothermia, hemiparesis, and sepsis. If something specific is found, then go to that protocol for further.
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- If an opioid overdose is suspected, then treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- If patient has a history of substance abuse of alcohol, or current alcohol consumption then consider Thiamine 100mg IV/IO push.
- PARAMEDIC STOP

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Abdominal Trauma

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Spinal immobilization as indicated by mechanism of injury.
- Control any life-threatening hemorrhaging.
- Dress and bandage abdominal injuries as appropriate:
    - Penetrating Object: Stabilize object. DO NOT REMOVE OBJECT!
    - Evisceration: Cover with saline soaked trauma dressing.
- Rapid transport to trauma center, with early notification.
- Obtain vital signs and monitor pulse oximetry
- IV/IO of LR or NS with flow rate as appropriate to patient condition. If blood pressure is less than 90 mm/Hg systolic then give a 20 cc/kg fluid bolus to a max of 1 liter of fluids.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor
- Monitor ABC's and continue supportive care.
- PARAMEDIC STOP

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Shock/ Hypoperfusion

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Spinal immobilization per patient condition and as outlined by the spinal precaution protocol.
- If patient is showing signs of hypoperfusion then elevate the foot of the long spine board slightly to put the patient in a Trendelenberg position.
- If patient is pregnant then place patient on their left side, or tilt the board to place patient on the left side.
- Obtain vital signs and monitor pulse oximetry
- Keep patient warm
- IV/IO of LR or NS with flow rate as appropriate to patient condition. If blood pressure is less than 90 mm/Hg systolic then give a 20 cc/kg fluid bolus to a max of 1 liter of fluids.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Contact and follow any additional treatment per Medical Control.
- If hypotensive and fluids are not working then consider:
  - Levophed 2 – 20 mcg/min titrated to effect and starting at 2 mcg/min titrated to a max of 20 mcg/min. (Contact Med Control before administering) OR
  - Dopamine 2 – 20 mcg/kg/min titrated to effect and starting at 2 mcg//kg/min titrated to a max of 20 mcg/kg/min. (Contact Med Control before administering)
- Determine cause and treat appropriately:
  - Anaphylactic (See anaphylaxis protocol)
  - Cardiogenic: history, correct dysrhythmias
  - Hypovolemic: Control Bleeding, IV Fluids (see above)
  - Neurogenic: note deficiencies and progression

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Shock/ Hypoperfusion Continued

- Septic: Maintain body temperature, check blood sugar and give fluid bolus of normal saline or lactated ringers of 30 ml/kg.

- PARAMEDIC STOP

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Burns

AEMT

- With safety in mind, remove patient from source.
- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place in position of comfort if possible.
- Remove any jewelry that may become restricting should swelling occur.
- Make sure that any contaminated or potentially contaminated patient is decontaminated or cleared by Hazmat prior to being transported.
- Chemical Burns:
  - Brush off excess powders or fluids.
  - Irrigate with sterile water or saline for 20 minutes during transport.
- Electrical Burns:
  - Assess for entrance and exit wounds.
  - Immobilize all associated injuries to include C-Spine.
  - Apply dry sterile dressing or burn sheets to burn injury areas.
- Thermal Burns:
  - Cool the burn using sterile water or cool tap water for 20 minutes to stop the burn process. (Do not delay transport of critically ill or injured patients for cooling)
  - Cover burns with dry sterile dressings or burn sheets.
- DO NOT use commercial manufactured burn treatment products. DO NOT remove if applied prior to arrival.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline or Ringers Lactate
  - If hypotensive then 20 cc/kg fluid bolus, repeat once as needed.
  - If not hypotensive then IV fluids at 10 cc/kg/hr
  - Consider a second line with normal saline or lactated ringers if TBSA is >15%
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

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Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
    - Treat any dysrhythmias per appropriate cardiac protocol
- Administer an analgesic per the pain management protocol.
- PARAMEDIC STOP

Notes:

- All electrical injuries/burns should be evaluated by a physician.
- All burns greater than 10% total body surface area and that are partial thickness or higher should use the Parkland Formula:
    a. 4 mL x %TBSA x weight (kg) for up to the first 8 hours

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Bleeding Control

AEMT and Paramedic

Clinical Indications:

- Protection and care for open wounds
- Serious hemorrhage that cannot be controlled by other means

Contraindications (Hemostatic agents and wound packing):

- Open wounds involving the abdominal, thoracic, and cranial cavities.

Procedure:

- Use personal protective equipment including gloves, gown and mask as indicated by patient condition and presentation.
- If actively bleeding, then apply a dressing using direct pressure. If bleeding does not stop then apply more dressing using direct pressure.
- If wound is deep enough to be packed and is not in an area contraindicated, then:
    - Apply direct pressure to the wound. Insert fingers into the wound at the target area.
    - Pack the wound with hemostatic gauze, or regular gauze if hemostatic agent not available. Wound must be packed tightly.
    - Apply very firm pressure on wound for 3-8 minutes.
- Apply a snug dressing over wound and bandage in place.
- If wound continues to bleed significantly, then apply tourniquet.
    - Refer to Combat Application Tourniquet Procedure Protocol

Notes:

- Check pulses motor and sensation before and after wound care.

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Head Injury

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Spinal immobilization per patient condition as outlined by the spinal precaution protocol.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
  - Goal to maintain systolic blood pressure >110 mmHg to maintain cerebral perfusion (more with cerebral herniation syndrome)
  - Establish a second line with normal saline or lactated ringers as indicated
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Rapid transport to an appropriate level trauma center.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- PARAMEDIC STOP

Notes:

- Increase ventilating rate of the patient **ONLY** if they begin to exhibit signs of cerebral herniation syndrome i.e.: Patient begins to have seizures, posturing, or rapid increase in blood pressure without fluid overload.
  - Maintain ETCO2 at 30 to 35 mmHg.
  - Ventilate adults 20 per minute
  - Ventilate children greater than 1 year old at 25 per minute
  - Ventilate infants at a rate of 30/min

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Taser Injuries

AEMT

- Assure Scene safety
- Assess patient (ABC's)
- Try to gather as much information from the police officers as to circumstances leading to Taser deployment, to better understand the patient's level of competence.
- Confirm that the Air Taser has been shut off and the probe is no longer connected to the Taser gun.
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Dart Removal:
    - Evaluate the anatomical location of the probes puncture zones. High-risk / sensitive zones will require transport to a medical facility for removal. They include:
        - Eyes, ears, nose, mouth, and neck. (Darts to scalp, and low risk areas of forehead and cheek, can be removed in the field, but these wounds may require assessment by a physician.)
        - Breast.
        - Genitals.
        - Hands or Feet.
        - Joints.
    - Prior to probe removal inform all involved in treatment that you are about to remove the contaminated sharp.
    - Utilize PPE. Place hand in the form of a "V" around the Taser dart in order to stabilize the surrounding skin and to keep loose skin from coming up with the dart. Firmly grasp the probe and with one smooth hard jerk, remove the probe for patient's skin.

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Taser Injuries Continued

- Examine the probe and the patient closely to make sure the probe tip did not break off during removal. Accordingly, it is important that the person removing the barb visually inspect it to make sure that the tip is fully intact. If the barb remains in the patient, the patient will be transported to a medical facility for removal.
- Be careful to avoid accidental needle sticks when removing the probes.
- Promptly dispose of the probe immediately after removal and examination to ensure that it is intact. Place in an appropriate sharps disposal container. If the probes are to fall into the law enforcement chain of custody ensure it is placed in an appropriate container that contains no other sharps.
- Provide wound care by cleansing the affected area with saline, and apply a band-aid. Inform patient of basic wound care and the need to seek additional care in event that signs of infection occur (redness-fever-drainage-swelling-etc.).

- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG (If patients' demeanor will not allow the attachment of the cardiac monitor then document the reasons)
  - Treat any arrhythmia per appropriate protocol.
- Clear and thorough documentation is required in the body of the report narrative whether EMS transports the patient.
  - If patient is having some cardiac arrhythmia, new or old, chest pain or dyspnea then they MUST be transported to the ER.
- PARAMEDIC STOP

Notes:

1. EMS personnel may be requested to assess patients after Taser deployment, and / or to remove Air Taser probes lodged in a subject's skin. A thorough assessment must be completed and documented on all such patients. If the patient is combative and you are unable to perform assessment contact Medical Control for medical direction. A refusal must be completed and signed by patient and / or officer responsible for patient. Be

Taser Injuries Continued

aware that secondary injuries may result from falls sustained after the Taser device has been deployed.

2. Violent and combative behavior may be secondary to intoxication, psychosis, hypoxia, hypoglycemia, OD or CNS infection.

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Thoracic Trauma

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Spinal immobilization per patient condition and outlined by the spinal precaution protocol.
- Obtain vital signs and monitor pulse oximetry
- Stabilization of the chest injury
    - Occlusive dressing for any open chest wall injuries at the rib margin and above
    - Bulky dressing splint for rib fractures and/or flailed segment
- Rapid transport to an appropriate level trauma center
- IV/IO of LR or NS with flow rate as appropriate to patient condition. If blood pressure is less than 90 mm/Hg systolic then give a 20 cc/kg fluid bolus to a max of 1 liter of fluids.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
    - Monitor end-tidal CO2
- Intubate as needed for adequate ventilations (see Conscious Sedation and Drug Assisted Intubation (RSI) Protocol).
- Chest decompression as indicated for tension pneumothorax. **(MUST MEET AT LEAST THREE OF THE CRITERIA LISTED BELOW)**
    - Acute respiratory distress, cyanosis
    - Unilaterally decreased breath sounds or absent breath sounds
    - Hyper-resonance of chest unilaterally
    - Jugular vein distention
    - Subcutaneous Emphysema
    - Acute Traumatic Chest Injury, ecchymosis or obvious rib fractures

  - History of COPD of other chronic lung disease with pre-disposes patient to spontaneous pneumothorax
  - Hypotension
  - Tracheal deviation away from the effected side
  - Arrhythmia
  - Oxygen saturation <90%
- Continue to monitor ABC's, breath sounds, O2 saturation and supportive care
- PARAMEDIC STOP.

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Traumatic Arrest

AEMT

- Assess patient (ABC's)
- Begin high quality chest compressions with a rate between 100 – 120 compressions per minute.
    - The metronome on Lifepack 15 may be utilized to help with timing.
- Ventilate patient with 100% oxygen and establish an airway appropriate to patient's condition, monitor pulse oximetry
- IV/IO of LR or NS with flow rate as appropriate to patient condition.
    - Give a 20 cc/kg fluid bolus to a max of 1 liter of fluids.
- Place patient in a spinal package
- Obtain vital signs and monitor pulse oximetry
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Patient will be rapidly and safely transported to a Level 1 Trauma Center.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Utilize end-tidal CO2 function of the cardiac monitor.
    a. In the absence or failure of ETCO2 then use colormetric capnography
- Chest decompression as indicated for thoracic trauma (see thoracic trauma protocol for chest compression criteria).
- Go to appropriate ACLS protocol for the rhythm that is presenting.
- Early notification to Med Comm.
- PARAMEDIC STOP

Notes:

- Look for treatable causes:
    - Tension pneumothorax, airway obstruction, hypovolemia. Refer to additional causes addendum.

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Drug Ingestion/ Overdose

AEMT

- Don proper protective equipment as needed.
  - Refer to Fentanyl Protection and Exposure Protocol
- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position appropriate for patient condition.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- If patient is showing signs and symptoms of shock, then administer a 20 cc/kg fluid bolus.
- If an opioid overdose is suspected then give Narcan:
  - Adult: 2 mg IV/IO/IN
    - Repeat as needed.
  - Pediatric: 0.1 mg/kg IV/IO to a max of 2mg titrated to effect.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
  -
- If suspected alcohol abuse, then give 100mg Thiamine IV/IO.
- If patient has ingested drugs within one hour and has no altered mental status or increased risk of aspiration, then give Activated Charcoal (1-2 G/kg, PO or NGT) if not contraindicated.
  - Does not work with:
    - Heavy metals (iron, zinc, lead, arsenic, and mercury)
    - Inorganic ions (lithium, potassium, sodium, fluoride, and iodine)
    - Hydrocarbons/essential oils

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Drug Ingestion/ Overdose Continued

  - Toxic alcohols (ethylene glycol, methanol, and isopropanol)
  - Acids/bases
  - Organophosphates
- If patient is convulsing, then treat as appropriate per the seizure protocol.
- PARAMEDIC STOP

Notes:

- Use needed safety precautions
- Make sure that any contaminated or potentially contaminated patient is decontaminated or cleared by Hazmat or Fire Department prior to being transported.
- Treatments specific to known substances or exposures
  - Carbon Monoxide: oxygen
  - Narcotics: Narcan (See above for dosage)
  - Organophosphates: Atropine 0.1 mg/kg IV/IO every 10 minutes
  - Phenothiazines: Diphenhydramine (Benadryl) 1 mg/kg IV/IO/IM
  - Tricyclic Anti-depressants- Sodium Bicarbonate
  - Occular Exposure: Flush Eyes with Normal Saline for 15-20 minutes. Do not delay transport for flushing, do it en-route if needed.
  - Dermal Exposure: Remove clothes and jewelry and brush away any powder and then flush with Normal Saline for 15-20 minutes. Do not delay transport for flushing, do it en-route if needed.
  - Inhaled exposure: Treat with oxygen and aggressive airway management.

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Fentanyl Protection and Exposure

AEMT and Paramedic

AT NO POINT SHOULD A CONTAMINATED OR POTENTIALLY CONTAMINATED PATIENT BE TRASNPORTED IN AN HCEMS AMBULANCE BEFORE BEING DECONTAMINATED BY THE FIRE DEPARTMENT OR HAZMAT TEAM AT THE SCENE.

Indications and Equipment:

- Minimal: Response to a situation where it is suspected that fentanyl may be present but no fentanyl products are visible. (Example: An EMS response to a suspected fentanyl overdose or law enforcement operation where intelligence indicates fentanyl products are suspected but are not visible on scene)
    - Gloves (Latex or Nitrile)
- Moderate: Response to a situation where small amounts of fentanyl products are visible. (Example: An EMS response to a suspected fentanyl overdose or law enforcement operation where fentanyl products are suspected and small amounts are visible on scene)
    - Gloves (Latex or Nitrile)
    - Disposable N100, R100 or P100 FFR or greater mask
    - Safety Goggles/Glasses
    - Wrist/Arm Protection (duty uniform, jacket, coveralls: Tyvek Suit)
- High: Response to a situation where liquid fentanyl or large amounts of fentanyl products are visible. (Example: A fentanyl storage or distribution facility, fentanyl milling operation, or fentanyl production laboratory)
    - Entry by Hazmat Team Only

Decontamination:

- Wash hands with soap and water immediately after a potential exposure and after leaving a scene where fentanyl is known or suspected to be present to avoid potential exposure and to avoid cross contamination. They should take care not to break the skin during the decontamination process and to cover all open wounds.
- Do not use hand sanitizers or bleach solutions to clean contaminated skin.

- All contaminated clothing should be removed and laundered, being careful not to disturb any areas of contamination.
- Shower immediately after a potential exposure.
- Decontamination of reusable PPE and equipment should be done according to the manufacturer's recommendations. Contaminated single use PPE should be placed in labeled durable 6 mil polyethylene bags and disposed of appropriately.

Notes:

- Do not eat, drink, smoke, or use the bathroom while working in an area with known or suspected fentanyl.
- Do not touch the eyes, mouth, and nose after touching any surface potentially contaminated with fentanyl.
- Avoid performing tasks or operations that may aerosolize fentanyl due to increased exposure risks. Activities that aerosolize fentanyl require higher levels of PPE and should be conducted by appropriately trained personnel.
- Should an exposure occur then treat per appropriate protocol.

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Hyperthermia/Fever

AEMT

- Scene Safety
- Assess patient (ABC's)
- Start passive cooling:
  - Remove from heat source with safety in mind
- Loosen clothing Obtain baseline oral temperature
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Start Active Cooling if temperature is >104°F.
  - Remove clothing
  - Cool with room temperature water
  - Apply cold packs to neck, axillary, and groin (Do this only if room temperature water is not available or is not working)
- Obtain vital signs and monitor pulse oximetry
- If pediatric patient showing signs of illness with fever >101 then:
  - IV NS KVO only if patient has been vomiting or seizing, administer a 20 cc/kg fluid bolus if patient is tachycardic or hypotensive.
  - If patient has a history of recent illness then give Tylenol 10 – 15 mg/kg PO if patient has had none in the last four (4) hours.
  - Place cool packs to neck, axillary, and femoral areas. (Avoid causing the patient to shiver)
- DO NOT COOL PATIENT TO THE POINT OF SHIVERING
- Establish an IV/IO of Normal Saline
  - If patient is hypotensive then administer a 20 ml/kg fluid bolus. Repeat once if needed.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

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Hyperthermia/ Fever

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- PARAMEDIC STOP

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Hypothermia

AEMT

- Scene safety
- Handle patient gently as jarring or rough handling may cause ventricular fibrillation. Do not allow patient to walk or exert themselves.
- Assess patient (ABC's). **(Evaluate pulse for one full minute. No CPR until NO PULSE is confirmed)**
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Remove patient from cold environment with safety in mind
    - Remove any wet clothing
    - Warm patient with warm blankets or thermal blankets
    - Apply heat packs, wrapped in a barrier (sheet, abdominal pad, etc) against critical areas of the body: trunk, head, neck, chest, axillary, and groin.
    - **DO NOT ATTEMPT TO WARM EXTREMITIES.**
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of warm Normal Saline at 75 – 100 ml/hr
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Assess for the possibility of alcohol or illicit drug usage.
- Give nothing by mouth to the patient.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG. **Most dysrhythmias require no other therapy (sinus bradycardia, atrial fibrillation, atrial flutter)**
- Core temperature >86 degrees F treatment per ACLS protocols. Core temperature <86 degrees F CPR as indicated if patient is in V-Fib defibrillate one time (200 joules with a biphasic monitor and 360 with a monophasic monitor). If defibrillation is unsuccessful continue CPR.
- Contact Medical Control for additional orders.

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Hypothermia

- PARAMEDIC STOP

Notes:

- Mild Hypothermia (90˚ - 95˚ F)
  - Exposure to cold
  - Consider head trauma, illness, or metabolic disorder
  - Evidence of alcohol or drug use
  - Shivering
  - Altered mental Status
  - Decreased muscle tone and uncoordinated movement
  - Pale, dry or wet skin
  - Slurred Speech
  - Lethargy
- Moderate Hypothermia (82˚ - 89˚ F)
  - Signs of mild hypothermia
  - Altered mental status with a decreased responsiveness
  - Decreased respiratory rate
  - Bradycardia
  - Pale, cyanotic, or mottled skin
  - Absence of shivering
  - Stiffening of the muscles
  - Edema and swelling from frostbite
- Severe Hypothermia (<81˚ F)
  - Signs of minor and moderate hypothermia
  - Extreme disorientation and stuporous behavior
  - Unresponsiveness
  - Slow, shallow, or absent respirations
  - Bradycardia
  - ECG indicates atrial fibrillation, J-waves, other dysrhythmias, or ventricular fibrillation

- Cyanotic or mottled skin
- An overall "mimic" of death of the body

HYPOTHERMIC, APNEIC AND PULSELESS

- Start CPR
- If ventricular fibrillation or ventricular tachycardia is present, then defibrillate one (1) time at 200 Joules. Cease with electrical activity after single defibrillation until the body has been adequately re-warmed (>86˚F).
- BVM assistance and intubation with 100% oxygen.
- IV access. IO if unable to get an IV due to vasoconstriction.
- Administer an infusion of warm fluids.

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Medical Management of Symptoms of Organophosphorus Insecticide or Organophosphorus Nerve Agent Poisoning

The DuoDote Auto-Injector is intended as an initial treatment of the symptoms of organophosphorus insecticide or organophosphorus nerve agent poisoning. To achieve maximum effectiveness, these antidotes must be administered as quickly as possible, once an emergency worker or other person has mild symptoms of nerve agent poisoning. Definitive medical care should be sought immediately following injection.

Description: Nerve agents are very toxic organophosphorus compounds (insecticides, weed killer). Some agents are more likely than others to pose a toxic hazard by inhalation, and some agents are likely to last longer than others. Under mild weather conditions, the liquids are clear, colorless, and mostly odorless. They cause biologic effects by inhibiting acetylcholinesterase (nerve conduction that affects many organ systems), thereby allowing acetylcholine to accumulate and cause hyperactivity in the muscles, glands and nerves.

People can be exposed to organophosphorus nerve agents and insecticides through contact with the skin or eyes and by ingestion or inhalation. A person's clothing can also absorb and re-release toxic vapors from these compounds for up to 30 minutes after contact, which can expose more people to the nerve agent. Because vapors from some nerve agents and insecticides are heavier than air, they can sink to low-lying areas and create a greater exposure hazard there.

People can begin to experience symptoms of poisoning within minutes of exposure:

- Mild symptoms will occur before severe symptoms
- Severe symptoms will appear within 5 minutes after significant inhalation exposure
- death can occur within 5 minutes after the onset of seizures and respiratory arrest

Auto-Injector Use: This is specific to the disaster setting.

1. Pre-measured doses in auto-injectors should be safe for most adults.
2. The DuoDote auto-injector consisting of atropine (2.1mg total dose per injection) and pralidoxime chloride (2 PAM Cl) (600mg total dose per injection), may be administered by qualified emergency personnel and designated emergency responders who have had adequate training in on-site recognition and treatment of nerve and or organophosphate (insecticide weed killer) agent intoxication in the event of a chemical nerve agent release.

3. The antidotes are to be used after the recognition of the existence of a potential chemical or organophosphate (insecticide, weed killer) agent release in an area.
4. Three (3) DuoDote Auto-Injectors should be available for each patient (including first responders and emergency medical personnel) at risk for organophosphorus poisoning: one (1) for mild symptoms plus two (2) for severe symptoms.

OBSERVANT: A Quick-Reference Mnemonic for Use in the Field

_Others:
_Breathing:
_Secretions:
_Eyes:
_Rhinorrhea:
_Voiding:
_Arrhythmia:
_Nausea:
_Twitching:

affected suddenly
difficulty breathing, chest tightness drooling, airway secretions, sweating tearing, miosis, blurred vision excessive runny nose
involuntary urination/defecation tachycardia, bradycardia stomach cramps, vomiting muscle twitching, convulsions

Contraindications: In the presence of life-threatening poisoning by organophosphorus nerve agents or insecticides, there are no absolute contraindications to the use of DuoDote.

Precautions:
1. When symptoms of poisoning are not severe, DuoDote should be used with extreme caution in people with heart disease, arrhythmias, recent myocardial infarction, severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal insufficiency, chronic pulmonary disease, or hypersensitivity to any component of the product.
2. Organophosphorus nerve agent poisoning often causes bradycardia but can be associated with a heart rate in the low or normal range.
3. Morphine, theophylline, aminophylline, succinylcholine, reserpine, and phenothiazine type tranquilizers should be avoided in treating personnel with organophosphorus poisoning.

Pediatric Use: Safety and effectiveness of DuoDote in pediatric patients have not been established. Pediatric patients should be referred to EMS personnel for treatment.

Use in Pregnancy: DuoDote is pregnancy Category C and should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

How to administer Auto-Injectors:

1. The DuoDote is one injector containing both atropine and 2 PAM Cl; it delivers the antidote
m proper sequence.
2. The medication can be administered through the clothing. Check injection site to avoid buttons and possible objects in pockets.
3. Form a fist around the injector without covering the needle.
4. With your other hand, pull off the Gray Safety Release. The Duo-Dote Auto-Injector is now ready to be administered.
5. Swing and push the green tip straight down (90° angle) against mid-outer thigh. Continue to push until you feel the auto-injector trigger.
6. Hold injector in place for at least 10 seconds.
7. Look at the green tip. If the needle is visible, the drug has been administered. If the needle is not visible, check to be sure the Gray Safety Release has been removed, and then repeat above steps beginning with Step 5, but push harder.
8. Push exposed needle against a hard surface until it bends back, then put the used auto-injector back in the plastic pouch
9. Keep used injector(s) with the patient so other medical personnel will be aware of how many injections were administered.

Signs, Symptoms, and Treatment:

1. Identify symptoms of nerve agent poisoning: Individuals may not have all symptoms

MILD
Salivation (excessive drooling) Excessive, unexplained teary eyes Excessive unexplained runny nose

Blurred vision, miosis (excessive constriction of the pupils) Acute onset of stomach cramps
Nausea and/or emesis (vomiting)
Tremors throughout the body or muscular twitching Tachycardia or bradycardia
Unexplained wheezing, coughing, or increased airway secretions, Chest tightness or difficulty breathing

SEVERE
Strange or confused behavior
Severe difficulty breathing or copious secretions from lungs/airway Severe muscular twitching and general weakness
Involuntary urination and defecation Convulsions
Loss of consciousness,
Respiratory arrest (possibly leading to death)

2. Notify Communications/Medical Control

TREATMENT OF MILD SYMPTOMS

FIRST DOSE: In the situation of known or suspected organophosphorus poisoning, administer one (1) DuoDote injection into the mid-lateral thigh if the patient experiences two or more MILD symptoms of nerve gas or insecticide exposure.
Emergency medical services personnel with mild symptoms may self-administer a single dose of DuoDote.
Wait 10 to 15 minutes for DuoDote to take effect. If, after 10 to 15 minutes, the patient does not develop any of the SEVERE symptoms listed above, no additional DuoDote injections are recommended, but definitive medical care should ordinarily be sought immediately. For emergency medical services personnel who have self-administered DuoDote, an individual decision will need to be made to determine their capacity to continue to provide emergency care.

ADDITIONAL DOSES: If, at any time after the first dose, the patient develops any of the SEVERE symptoms listed above, administer two (2) additional DuoDote injections in rapid succession, and immediately seek definitive medical care.

TREATMENT OF SEVERE SYMPTOMS

If a patient has any of the SEVERE symptoms listed above, immediately administer three (3) DuoDote injections into the patient's mid-lateral thigh in rapid succession, and immediately seek definitive medical care.
No more than three doses of DuoDote should be administered unless definitive medical care (e.g., hospitalization, respiratory support) is available.

Note: Persons who are mistakenly injected with DuoDote should avoid potentially dangerous overheating, avoid vigorous physical activity and seek medical attention as soon as feasible.

Pharmacodynamics:

Atropine

Atropine reduces secretions in the mouth and respiratory passages, relieves airway constriction, and may reduce centrally-mediated respiratory paralysis. In severe organophosphorus poisoning, a fully atropinized patient may develop or continue to have respiratory failure and may require artificial respiration and suctioning of airway secretions. Atropine may cause thickening of secretions.

Atropine-induced parasympathetic inhibition may be preceded by a transient phase of stimulation, especially on the heart where small doses first slow the rate before characteristic tachycardia develops due to paralysis of vagal control. Atropine increases heart rate and reduces atrioventricular conduction time. Adequate atropine doses can prevent or abolish bradycardia or asystole produced by organophosphorus nerve agents.

Atropine may decrease the degree of partial heart block which can occur after organophosphorus poisoning. In some patients with complete heart block, atropine may accelerate the idioventricular rate; in others, the rate is stabilized. In some patients with conduction defects, atropine may cause paradoxical atrioventricular (A-V) block and nodal rhythm.

Atropine will not act on the neuromuscular junction and has no effect on muscle paralysis or weakness, fasciculations or tremors; pralidoxime is intended to treat these symptoms.

Systemic doses of atropine slightly raise systolic and lower diastolic pressures and can produce significant postural hypotension. Such doses also slightly increase cardiac output and decrease central venous pressure. Atropine can dilate cutaneous blood vessels, particularly the "blush" area (atropine flush), and may inhibit sweating, thereby causing hyperthermia, particularly in a warm environment or with exercise.

Pralidoxime Chloride

Pralidoxime chloride has its most critical effect in relieving respiratory muscle paralysis. Because pralidoxime is less effective in relieving depression of the respiratory center, atropine is always required concomitantly to block the effect of accumulated acetylcholine at this site. Pralidoxime has a minor role in relieving muscarinic signs and symptoms, such as salivation or bronchospasm.

Side Effects
Muscle tightness and sometimes pain may occur at the injection site.

Atropine
The most common adverse effects of atropine can be attributed to its antimuscarinic action and include dryness of mouth, blurred vision, dry eyes, photophobia, confusion, headache, dizziness, tachycardia, palpitations, abdominal pain, nausea, vomiting, and heat intolerance.

Pralidoxime
Pralidoxime chloride's adverse effects include changes in vision, dizziness, headache, drowsiness, nausea, tachycardia, increased blood pressure, muscular weakness, dry mouth, emesis, rash, dry skin, hyperventilation, decreased renal function, excitement, manic behavior, and transient elevation of liver enzymes and creatine phosphokinase.

When atropine and pralidoxime are used together, the signs of atropinization may occur earlier than might be expected when atropine is used alone.

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Envenomation

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Immobilize extremity
    - Elevate wound to a neutral position (if able)
- Remove any constricting clothing/jewelry
    - Document in PCR whom/where items have been left
- Treat wounds as needed
- Mark outer edges of swelling and note time
- Application of Ice Packs
    - If the bite is a snake bite then DO NOT apply ice
    - If the bite is a spider or Wasp/Bee sting then apply ice packs.
- IV/IO of LR or NS with flow rate as appropriate to patient condition. If blood pressure is less than 90 mm/Hg systolic then give a 20 cc/kg fluid bolus to a max of 1 liter of fluids.
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Reassure and calm patient
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- If patient begins to have an allergic/anaphylactic reaction, then go to the appropriate protocol for further treatment
- Consider the need for an analgesic and refer to Pain Management Protocol.
- Contact Medical Control for further if needed.
- PARAMEDIC STOP

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Policies, Procedures, and Protocols
Envenomation

Notes:

- If possible determine the type of snake with EMS crew safety in mind
  - DO NOT attempt to capture or approach the snake
- Do not delay transport

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Combative/Acutely Agitated Patient

AEMT

- Have enough personnel to safely restrain the patient
- Have airway support equipment readily available
- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
- Attempt verbal de-escalation techniques.
- Address areas that may exacerbate the patients' behavior
    - Comfort measures/ positioning
    - Actively listen to patient
    - Lighting (typically reduced)
    - Pain assessment/ treatment
    - Noisy/ "busy" environment
- Place patient in a position of comfort.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- Treat hyperthermia if present and treat per appropriate protocol.
    - If suspected Excited Delirium Syndrome then:
        - Ice Packs
            - Each side of neck
            - Axilla
            - Groin
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.

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Combative/Acutely Agitated Patient (Continued)

  - If patient's behavior does not allow attachment of cardiac monitor then do so as soon as conditions and patients behavior allow.
- If verbal de-escalation techniques do not work then consider sedative:
  - Versed (Midazolam):
    - Adult: 0.1 mg/kg, given at 1 mg/minute boluses not to exceed 8 mg or 5 mg IM/IN, may repeat PRN if the SBP >100 to a cumulative dose of 10 mg (5 mg if age ≥65)..
  - Ativan (Lorazepam):
    - 5 mg IM/IN, may repeat PRN if the SBP >100 to a cumulative dose of 10 mg (5 mg if age ≥65).
  - If Versed has not been given to sedate patient and excited delirium is suspected, then consider Ketamine:
    - If IV has been established, administer Ketamine 1 mg/kg IV/IO
    - If IV is NOT established, administer Ketamine 4 mg/kg IM
- Consider treatable causes and treat per specific protocol for each
  - If physical restraints are used then local law enforcement must be involved
  - Wrist or ankle restraints must be accomplished by local law enforcement
  - Sheet restraint shall be across the chest, pelvis or legs.
  - Patient must be restrained supine or in a lateral recumbent position and NEVER in a prone position during transport.
- Reassess patient
  - Check vital signs often
- Monitor patient's mental and respiratory status closely during transport
- PARAMEDIC STOP

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Combative/Acutely Agitated Patient (Continued)

Notes:

- Document full reason on the usage of the Combative Patient Protocol
- Purpose:
  - To prevent harm to patient and / or others.
- Indications:
  - Should only be utilized when necessary and only in situations where patient is exhibiting behavior that places a danger to the patient or others.

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Submersion Emergencies

AEMT

- Scene safety
- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
    - Refer to the Oxygen Therapy Protocol for guidance
    - If ventilations are needed then gastric decompression, by NG or OG, may be necessary to ensure adequate ventilations or respirations.
- Spinal immobilization for patients with history of diving accident, mechanism of spinal injury is present, patient is unconscious, or history of incident is unclear.
    - Spinal immobilization prior to removing patient from water.
- Remove wet clothing and maintain patient's body temperature.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor and obtain a 12 lead EKG.
- Treat dysrhythmias according to appropriate ACLS algorithm protocol
- PARAMEDIC STOP

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Obstetrics

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a position of comfort.
  - Keep patient compartment of the ambulance warm for the mother and newborn.
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline **(DO NOT DELAY TRANSPORT FOR IV)**
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- If delivery is imminent, consider the need for another unit or first responder agency for assistance.
- AEMT STOP

Paramedic

- Cardiac monitor
- Support body as it delivers
- If the head delivers spontaneously, deliver as noted on a normal delivery
- After delivery, clamp cord @ 8-10 inches and cut cord between clamp. (Suction mouth and nose prior to delivery of chest).
- If birth is term gestation, baby is breathing/crying and has good tone
  - Provide warmth
  - Clear airway if necessary
  - Dry
  - Ongoing evaluation
- If birth is not term gustation, baby is not breathing/crying or has poor tone
  - Warm
  - Clear airway if needed
  - Dry
  - Stimulate
- If heart rate below 100, gasping or apnea give positive pressure ventilation via BVM.
  - Pulse can be obtained by palpating the umbilical cord

- If heart rate below 60 consider intubation and start chest compressions 120 compressions/minute
    - If heart rate is still below 60 bpm give Epinephrine 1:10,000 0.01mg IV/IO every 3-5 minutes
    - Check blood sugar if below 40 give D10 2.5mL/kg (D10: 2mL of D50 mixed with 8mL normal Saline)
    - Give Normal Saline bolus 10mL/kg IV/IO
- Most newborns requiring resuscitation will respond to ventilation/BVM, compressions and/or epinephrine
- Those not responding consider hypovolemia, pneumothorax and/or hypoglycemia
- Check APGAR score @ 1 and 5 minutes after delivery.
- If complications occur, follow appropriate protocol. Be sure to encourage mother!
- Encourage mother to nurse as soon as baby delivers.
- Perform fundal massage as needed in order to help reduce bleeding and cramping.
- Deliver placenta and transport with patients. Do not pull on the cord to deliver the placenta.
- Observe for and treat for shock.
- Watch for multiple births.
- If mother begins to seize, then go to pre/eclampsia protocol:
- PARAMEDIC STOP

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Abnormal Delivery

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in a semi-fowlers position
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline **(DO NOT DELAY TRANSPORT FOR THE IV)**
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- If delivery is imminent, consider the need for another unit or first responder agency for assistance.
- AEMT STOP

Paramedic

- Cardiac monitor.
- Allow delivery to progress spontaneously
- Support body as it delivers
  - If the head delivers spontaneously, deliver as noted on a normal delivery
  - If the head does not deliver within 4-6 minutes, then insert a gloved hand into the vagina to create an airway for the newborn and **Transport Emergency Traffic to the Hospital**
- If cord is looped around neck (Nuchal Cord):
  - Gently slip it over patient's head. If unable to perform procedure, clamp cord in two places and cut between clamps and continue with the birth.
    - If the cord is cut then the baby must be delivered.
- If there is a prolapsed cord:
  - Place patient in Trendelenburg or knee to chest position.
  - Insert gloved hand into the vagina and gently push the infants head off the cord.
  - Do not remove your hand until relieved by the hospital staff.
  - **Transport emergency traffic to the hospital.**
- If there is a limb presentation

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Abnormal Delivery (Continued)

  - Place mother in a Trendelenburg position
  - Transport emergency traffic to the hospital
- If there is shoulder dystocia:
  - Perform McRobert's Maneuver:
    - Bring patient's knees up towards her chest and thighs towards the abdomen. If the shoulders do not release in 30 seconds then:
    - Apply suprapubic pressure in a downward lateral direction. If the shoulders do not release in 30 seconds, then:
    - Have the mother roll over on all four and encourage her to push to release the shoulders.
- After delivery, clamp cord @ 8-10 inches and cut cord between clamp (if not already completed).
- If birth is term gestation, baby is breathing/crying and has good tone
  - Provide warmth
  - Clear airway if necessary
  - Dry
  - Ongoing evaluation
- If birth is not term gustation, baby is not breathing/crying or has poor tone
  - Warm
  - Clear airway if needed
  - Dry
  - Stimulate
- If heart rate below 100, gasping or apnea give positive pressure ventilation via BVM.
  - Pulse can be obtained by palpating the umbilical cord
- If heart rate below 60 consider intubation and start chest compressions 120 compressions/minute
  - If heart rate is still below 60 bpm give Epinephrine 1:10,000 0.01mg IV/IO every 3-5 minutes
  - Check blood sugar if below 40 give D10 2.5mL/kg (D10: 2mL of D50 mixed with 8mL normal Saline)
- Give Normal Saline bolus 10mL/kg IV/IO
- Check APGAR score @ 1 and 5 minutes after delivery.
- PARAMEDIC STOP

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Pre-Eclampsia/ Eclampsia

AEMT

- Assess patient (ABC's)
- Oxygen and airway maintenance appropriate to patient condition
  - Refer to the Oxygen Therapy Protocol for guidance
- Place patient in the left lateral recumbent position
- Obtain vital signs and monitor pulse oximetry
- Establish an IV/IO of Normal Saline
- Obtain a blood glucose reading. If needed treat per appropriate protocol.
- AEMT STOP

Paramedic

- Cardiac monitor
- If patient has seizure activity:
  - Protect airway.
  - Administer Magnesium Sulfate 4 gm in 250 ml bag of dextrose 5% (D5W) over 10-20 minutes.
  - Continuously monitor airway and SAO2 as Magnesium Sulfate can cause respiratory depression.
- PARAMEDIC STOP

Medical Control

- Contact Medical Control
- For blood pressure > 160/110 and not seizing.
  - Magnesium Sulfate 4g in 250ml bag of dextrose 5% over 10-20 minutes
  - NTG 0.4mg S.L.
- If seizures are uncontrolled:
  - Valium 2-5mg IV (repeat prn with Medical Control consult) or

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Pre-Eclampsia/ Eclampsia Continued

- Ativan 2 mg IV
- Versed 2 mg IV
- Additional Magnesium Sulfate unless max has been administered.
- Intubation to protect airway.

Notes:

- Definitive treatment is delivery, thus rapid transport is indicated

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Frequent Causes Addendum (The H's and T's)

Hypovolemia
ECG and Monitor Changes: Narrow Complex and a Rapid Rate
History and Physical Exam: History, Flat Neck Veins
Recommended Treatment: Volume Replacement

Hypoxia
ECG and Monitor Changes: Slow Rate
History and Physical Exam: Cyanosis and airway problems
Recommended Treatment: Oxygenation and ventilation

Hydrogen Ion (Acidosis)
ECG and Monitor Changes: Smaller Amplitude QRS Complexes
History and Physical Exam: Diabetes, bicarbonate responsive preexisting acidosis, renal failure
Recommended Treatment: Sodium Bicarbonate, Increased ventilation with target rate of 18 – 20.

Hyperkalemia (High Potassium)
ECG and Monitor Changes: Wide Complex QRS, T Waves Taller and Peaked, P wave get smaller, QRS Widens, Sine-Wave PEA.
History and Physical Exam: History of Renal Failure, Diabetes, Recent Dialysis, Dialysis Fistulas, Medications
Recommended Treatment: Sodium Bicarbonate, Glucose, Calcium Chloride if the QRS is wide, Possibly Albuterol

Hypokalemia (Low Potassium)
ECG and Monitor Changes: T Waves Flatten, Prominent U Waves, QRS Widens, QT Prolongs, Wide-Complex Tachycardia
History and Physical Exam: Abnormal Loss of Potassium, Diuretic Use
Recommended Treatment: Add Magnesium if in Cardiac Arrest

Hypothermia
ECG and Monitor Changes: J or Osborne Waves
History and Physical Exam: History of Exposure to cold, Low Central Body Temperature
Recommended Treatment: Active and Passive Rewarming

Tablets (Drug Overdose)
ECG and Monitor Changes: Various Effects on the ECG, Predominately Prolongation of the QT Interval
History and Physical Exam: Bradycardia, Pupils, Neurologic Exam, Scene Evidence
Recommended Treatment: Intubation, Activated Charcoal, Opioid Antagonist

Tamponade (Cardiac)
ECG and Monitor Changes: Narrow Complex, Rapid Rate
History and Physical Exam: History, No pulse felt during CPR, Vein Distention
Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)

Tension Pneumothorax
ECG and Monitor Changes: Narrow Complex, Slow Rate (Hypoxia)
History and Physical Exam: History, No pulse felt during CPR, Neck vein distention, tracheal deviation, unequal breath sounds, difficulty with patient ventilation
Recommended Treatment: Needle chest decompression

Thrombosis Heart (Acute Massive MI)
ECG and Monitor Changes: Abnormal 12-lead ECG: Q-Waves, ST-segment changes, T-Waves, inversions
History and Physical Exam: Cardiac History
Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)

Thrombosis Lungs (Acute Massive Pulmonary Embolism)
ECG and Monitor Changes: Narrow Complex, Rapid Rate
History and Physical Exam: History, No pulse felt during CPR, distended neck veins, prior test for DVT (Deep vein thrombosis) or PE
Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)

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Pediatric Assessment

General Assessment

1. Pediatric Assessment Triangle (PAT)
    - Appearance: Muscle tone, interaction, consolably, look/ gaze, or speech/ cry. A decrease in appearance may be a sign of a serious underlying illness or injury.
    - Work of Breathing: Increased work of breathing, nasal flaring, intercostals retractions, decreased or absent respiratory effort, abnormal breath sounds. Abnormalities in work of breathing or abnormal breathing patterns, use of accessory muscles, or extra sounds in breathing may be a sign of a serious respiratory illness or injury.
    - Circulation: Abnormal skin color or bleeding. Pale, mottled, bluish or gray may indicate poor perfusion, poor oxygenation, or both. Flushed skin suggests fever or toxicity. Diaphoresis suggests significant distress, which may be related to a cardiac problem or hyperthermia.
2. Determine condition of the patient
    - Life threatening: Start lifesaving interventions and transport immediately
    - Not life threatening: Continue with systematic assessment to further determine condition.

Be aware of a pediatric patient who's appearance might seem normal but they may yet have a life-threatening problem

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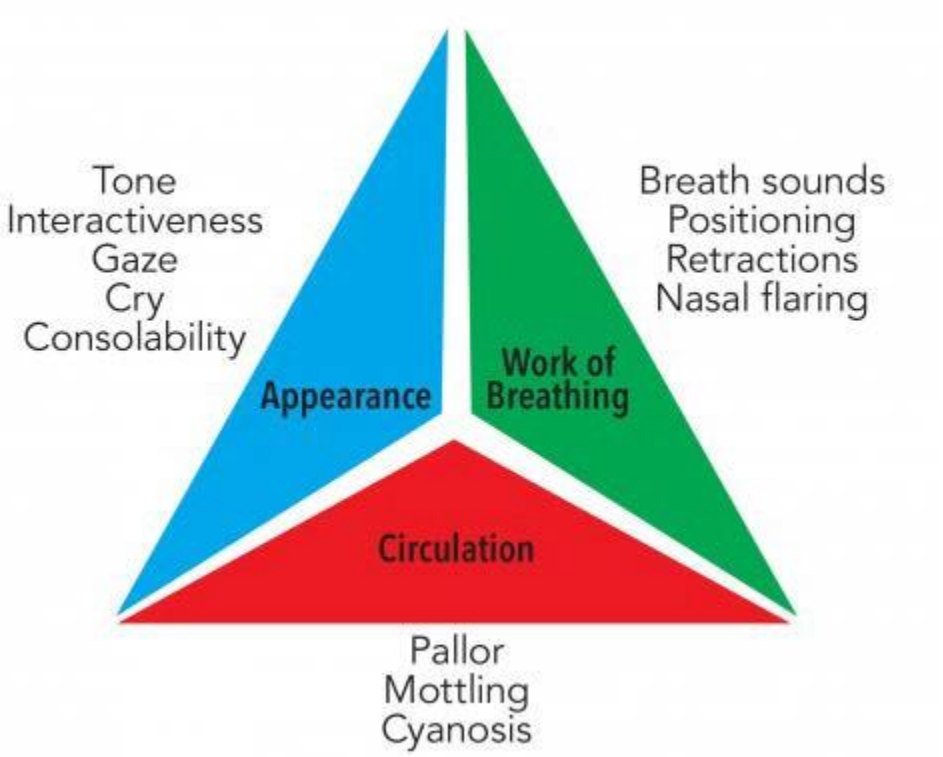
Pediatric Assessment Continued



Primary Assessment

1. Airway
    - Look for movement of the chest or abdomen
    - Listen for breath sounds and movement
    - Feel the movement of air at the nose and mouth
2. Breathing
    - Respiratory Rate
    - Respiratory Effort
    - Tidal Volume
    - Airway and Lung Sounds
    - Pulse oximetry

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Pediatric Assessment Continued

3. Circulation
    - Skin color and temperature
    - Heart rate
    - Heart rhythm
    - Blood pressure
    - Pulses (peripheral and central)
    - Capillary refill
4. Disability
    - AVPU Pediatric Response Scale
        (a) A: Alert- The child is awake, active and responds appropriately to parents and external stimuli
        (b) V: Voice- The child only responds when you or the parent calls the child's name or speaks loudly.
        (c) P: Painful- The child only responds to painful stimuli
        (d) U: Unresponsive: The child does not respond to any stimuli
    - Glasgow Coma Scale (GCS)
    - Pupil response
5. Exposure
    - Undress the seriously ill or injured child as is appropriate to facilitate a focused physical examination. Remove clothing one area at a time to carefully assess the child then recover with the clothes or blanket to protect privacy of child and keep the child warm.

Secondary Assessment

1. Focused History:
    - S: Signs and Symptoms
    - A: Allergies
    - M: Medications
    - P: Past (pertinent) Medical History

Pediatric Assessment Continued

- L: Last Meal
- E: Events Prior to

2. Detailed Physical Examination
    - Do a thorough head to toe physical exam. The severity of the illness or injury should determine the extent of the physical exam.

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APGAR Scoring

APGAR Scoring Chart

Clinical Sign	0 Points	1 Point	2 Points
Appearance	Blue/Pale	Body Pink Extremities Blue	Completely Pink
Pulse	Absent	Below 100/minute	Above 100/minute
Grimace	No response	Grimace	Cries
Activity	Limp	Some flexion of extremities	Action motion
Respiratory	Absent	Slow/Irregular	Good strong cry

The APGAR score should be calculated after birth of the infant. The five (5) clinical signs are evaluated according to the scoring system detailed above. Each sign is assigned points to be totaled. A total score of 10 indicates that the infant is in the best possible condition. A score of 4 to 6 indicates moderate depression and a need for resuscitative measures.

DO NOT delay resuscitation efforts to obtain APGAR score. Obtain APGAR at 1 and 5 minutes after delivery.

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SEPSIS: Pre-Hospital Screening

SEPSIS Pre-Hospital Screening Chart

This is to be used as a guide only for recognizing SEPSIS. No hospital at the moment uses the terminology of Code SEPSIS or Code Severe SEPSIS.

S.I.R.S (Systemic Inflammatory Response Syndrome) (2 or more)	**Infection** (Source of Infection) (1 or more)	**Severe Sepsis** (Organ Dysfunction) (1 or more)
Resp: ≥ 20 Heart Rate: ≥ 90 Glucose: ≥ 150 Temp: ≥ 38 (100.5) ≤ 36 (96.5) WBC: ≥ 12,000 ≤ 4,000 (If available from nursing home or other transferring facility)	Cough Painful urination Diagnosis of UTI Abscess Sign of skin infection Flu symptoms Recent chemotherapy Presence of vas cath Presence of urinary catheter Sick contacts (recent exposure)	Altered Mental Status Systolic BP O2 sat 92% Signs of poor skin perfusion (i.e. poor cap refill, mottled skin, etc.) Lactate Level > 2 (if available from nursing home or other transferring facility.)
2 or more SIRS criteria + 1 or more sources of infection + and $ETCO_2$ ≤ 25 **2.1 = CODE SEPSIS**		
2 or more SIRS criteria + 1 or more possible sources of infection + 1 or more organ dysfunction criteria= **2.1.1 = CODE SEVERE SEPSIS**		
In the event of a **CODE SEPSIS** OR **CODE SEVERE SEPSIS**, initiate the following Cardiac Monitor O_2 to maintain ≥ 92% sat 2 large bore IVs Notify receiving hospital and identify patient of a possible SEPSIS patient.		

Sepsis: Pre-Hospital Screening

REMEMBER…SEPSIS KILLS MORE THAN STROKE AND STEMI COMBINED!!!

The 6-hour window is closing!!!

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Quality Improvement and Documentation Guidelines

This is a guide to help Documentation on all patients and QI/QA Review. This is not intended to replace critical thinking.

All patients transported by EMS should have at least two sets of vital signs assessed and documented. Initial set of vitals will include blood pressure (systolic/diastolic), pulse rate, respiratory rate, pulse oximetry, Glasgow Coma Scale (GCS) and blood glucose if indicated, and the time they were assessed must be recorded.

- All medications taken by the patient should be listed on the report. If medications are taken to ER document in narrative who the medications were left with.
- When documenting the presumed presence of alcohol that is based solely upon breath odor, do so in the following manner: "Patient's breath has the odor that is commonly associated with the consumption of alcohol."

OPQRST and **SAMPLE** are the acronyms for the United States DOT EMS and Paramedic patient assessment curriculum.

O – Circumstance surroundings on the **onset** of complaint **P –** What **provoked** (or provokes) the complaint? Environment **Q –** Describe the **quality** (sharp, burning, stabbing counter etc.) of the complaint? **R –** Where does the pain **radiate?** **S –** Describe the **severity** of the pain on a 1-10 scale 1 (minimal) – 10 (maximum) **T – Time** of onset?	**S –** Signs, symptoms, physical exam findings **A –** Allergies to medications or the environment **M –** Medications, prescription or over the counter **P –** Past medical history **L –** Last oral intake **E –** Event, what happened to the patient
ABDOMINAL PAIN/PROBLEMS 1. Location of pain 2. Distension 3. Tenderness/radiation 4. Nausea/Vomiting/Diarrhea 5. Urinary complaints 6. LMP if applicable 7. Vaginal bleeding/discharge if applicable 8. Treatment/reassessments Report given and signature of RN	**ALCOHOL INTOXICATION** 1. Patient's breath has odor of ETOH 2. Patient admits to drinking (type, amount, time frame) 3. Speech (normal, slurred) 4. Gait (normal, unsteady) 5. Any obvious injuries noted 6. Blood glucose level 7. Level of consciousness 8. Treatment/reassessments Report given and signature of RN
ALTERED MENTAL STATUS 1. OPQRST, SAMPLE as appropriate 2. ETOH/Substance use	**ASSAULT/FIGHT** 1. OPQRST, SAMPLE as appropriate 2. Method of assault

3. Any obvious injuries noted 4. Blood glucose level 5. Normal mental status 6. EKG and strip attached 7. Treatment/reassessments Report given and signature of RN	3. Any obvious injuries or pain 4. Loss of consciousness, how long 5. Treatment/reassessments Report given and signature of RN
AIRWAY OBSTRUCTION 1. Can patient speak/forcibly cough 2. Is patient moving air 3. Inspiratory stridor 4. What caused obstruction 5. Duration of obstruction 6. Treatment/reassessments Report given and signature of RN	**ALLERGIC REACTION** 1. Cause of reaction 2. Dyspnea 3. Facial/airway edema 4. Chest pain 5. Rash/Itching 6. Urticaria/Hives 7. Treatment/reassessments Report given and signature of RN
ANIMAL BITE/STING 1. Type of animal or insect 2. Location of bite(s)/Sting 3. Edema at site 4. Rabies/immunization status of animal if appropriate 5. Treatment/reassessments Report given and signature of RN	**ATRAUMATIC GI BLEED** 1. Nausea, vomiting, diarrhea, constipation 2. Active bleeding 3. Bloody emesis/stool, how long? 4. Abdominal pain, location and quality 5. Treatment/reassessments Report given and signature of RN
BURN 1. Burn source (flame, chemical, electricity) 2. Environment (enclosed, outside) 3. Entrance/exit wounds if appropriate 4. Burn surface area and thickness 5. Facial, oral, nasal areas singed 6. Chest pain/dyspnea 7. Treatment/reassessments 8. Consider Cyanide Antidote Report given and signature of RN	**CARDIAC ARREST** 1. Events prior to onset 2. Description/location of patient on arrival 3. Estimated down time 4. Treatment/reassessments Report given and signature of RN
CHEST PAIN 1. OPQRST and SAMPLE as appropriate 2. Factors relieving or increasing pain 3. Dyspnea, cough 4. Nausea, vomiting 5. Diaphoresis 6. Aspirin within past 12 hours 7. Treatments/reassessments Report given and signature of RN	**CHF/PULMONARY EDEMA/SOB** 1. Chest pain 2. Dyspnea 3. Nausea, vomiting 4. Diaphoresis 5. JVD/lower extremity edema 6. Treatments/reassessments Report given and signature of RN
DEATH 1. Last time patients seen or talked to	**DIABETIC** 1. OPQRST and SAMPLE as appropriate

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2. Position/Location of body 3. Any movement of body made by EMS 4. Any injuries noted 5. Dependent lividity/ rigor mortis 6. EKG strip in two leads attached Released to	2. Nausea/vomiting/recent illness 3. Pre/Post treatment of blood glucose level 4. Treatment/reassessments Report given and signature of RN
HYPERTENSION 1. Chest pain/dyspnea 2. Nausea/vomiting 3. Headache/mental status 4. Neuro Assessment 5. Treatments/Reassessments Report given and signature of RN	**HYPER/HYPOTHERMIA** 1. Approximate ambient air temperature 2. Estimate exposure time 3. Type of environment (inside, outside, wet) 4. Loss of consciousness 5. Fluid intake 6. Skin turgor/condition 7. ETOH/Substance abuse 8. Treatments/reassessments Report given and signature of RN
INHALATION INJURY (TOXIC GAS/SMOKE) 1. Type of gas 2. Duration of exposure 3. Area of exposure (enclosed room) 4. Heated environment 5. Burns/singing (oral, nasal, facial area) 6. Treatments/reassessments Report given and signature of RN	**POISONING/DRUG INGESTION** 1. Name of substance 2. Amount 3. Route of intake 4. How long ago 5. Vomiting since ingestion as appropriate 6. Intentional vs. Unintentional 7. ETOH/substance use 8. Oral mucosa burns if appropriate 9. Treatments/reassessments Report given and signature of RN
PREGNANCY/OB DELIVERY **<u>Separate report required for mother and each delivery</u>** **Non-Delivery** 1. Abdominal Pain 2. Gravida/Para/Abortion 3. Length of gestation/estimated due date 4. Edema (pedal)/BP/Headache/Visual Disturbance 5. Vaginal bleeding/discharge – if yes, describe 6. Treatments/reassessments 7. Report given and signature of RN Last time fetal movement	**REFUSALS** Documentation of: 1. Competency 2. MMSE 3. Lack of Trauma 4. Situation 5. Ability to make good decisions Safety of patient is assured by caretakers, family, etc.
Delivery 1. Multiple fetuses 2. Mucous plug resented 3. Membranes ruptured – if yes, is amniotic fluid clear? Crowning as appropriate	**SEIZURES** 1. OPQRST and SAMPLE as appropriate 2. Obvious injures (mouth, head, tongue) 3. Duration and number of events 4. Incontinence 5. Level of consciousness (postictal)

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	6. Treatments/reassessments Report given and signature of RN
NEONATE 1. Time of birth 2. Thoroughly dried and warmed 3. Oral and nasal suctioning 4. Meconium present 5. APGAR at 1 and 5 minutes 6. General appearance 7. Treatments/Reassessments Report given and signature of RN	**STROKE/CVA/TIA** 1. OPQRST and SAMPLE as appropriate 2. Onset and duration of symptoms 3. Headache/Vision disturbances 4. Thrombolytic screening and stroke screen 5. Treatments/Reassessments Report given and signature of RN
SYNCOPE/FAINTING/WEAKNESS 1. OPQRST and SAMPLE as appropriate 2. Injuries, chest pain, dyspnea, nausea 3. Vertigo/postural/TILT changes 4. New or changed medications 5. Last meal 6. Blood glucose level 7. EKG 8. ETOH/Substance use 9. Treatments/Reassessments Report given and signature of RN	**TRAUMA** 1. OPQRST and SAMPLE as appropriate 2. Description of event 3. Weapon (size, caliber, depth of penetration) if applicable 4. Description of damage, estimated speed, airbag deployment as applicable 5. Patient protection as applicable 6. Tourniquet use 7. Level of or Loss of consciousness 8. Obvious injuries and area of pain 9. Palpation/assessment of injured areas 10. Disability (PMS/SMC intact) 11. Treatments/reassessments Report given and signature of RN TOC

Hamilton County EMS
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Acetaminophen (Tylenol)

Class
Antipyretic.

Mechanism of Action
Reduces fever by causing vasodilatation and sweating.

Indications
Reduce fever and common cold.

Contraindications
Hypersensitive to drug.

Precautions
None with children.

Adverse reactions
Headache, liver problems and failure, myocardial damage when doses of 5-8 g/d are ingested daily for several weeks or 4 g/d over 1 year.

How supplied
Suspension liquid with 80 mg per ½ teaspoon (160 mg per 5 ml)

Route
PO

Pediatric Dosage
10-15 mg/kg

0-3 months	40 mg
4-11 months	80 mg
1-2 years	120 mg
2-3 years	160 mg
4-5 years	240 mg
6-8 years	320 mg
9-10 years	400 mg

Acetaminophen (Tylenol) Continued

11 years	480 mg

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Activated Charcoal

Class
Adsorbent

Mechanism of Action
Adsorbs toxic substances from the GI Tract; Onset of action is immediate.

Indications
Most oral poisonings and medication overdoses; can be used after evacuation of poisons.

Contraindications
Oral administration to comatose patient, altered mental status or unable to protect their airway; after ingestion of corrosives, caustics or petroleum distillates (ineffective and may induce vomiting); simultaneous administration with other oral drugs.

Adverse Reactions
May induce nausea and vomiting; may cause constipation; may cause black stools.

Drug Interactions
Bonds with and generally inactivates whatever it is mixed with, e.g., syrup of ipecac.

How supplied
25 gm (black powder) / 125 ml bottle (200 mg/ml)
50 gm (black powder) / 250 ml bottle (200 mg/ml)

Dosage and Administration
Note, if not in Pre-mixed slurry, dilute with 1-part charcoal/ 4 parts water.

Adult: 1-2 gm/kg PO or via NGT

Pediatric: 1-2 gm/kg PO or via NGT

Duration of action
depends upon GI function; will act until excreted.

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Activated Charcoal Continued

Special Considerations
Often used in conjunction with magnesium citrate
Must be stored in a closed container
Does not adsorb cyanide, lithium, iron, lead and arsenic.

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Adenosine (Adenocard)

Class
Endogenous Nucleotide

Mechanism of action
Slows conduction time through the AV Node; can interrupt re-entrant pathways; slows heart rate; acts directly on sinus pacemaker cells. Is drug of choice for PSVT. Can be used diagnostically for stable, wide-complex tachycardias of unknown type after two doses of Lidocaine.

Indications
Conversion of PSVT to sinus rhythm. May convert PSVT due to Wolff-Parkinson-White syndrome.
Not effective in converting atrial fibrillation / flutter.

Contraindications
Second or third-degree block or Sick Sinus Syndrome
Atrial flutter / atrial fibrillation
Ventricular Tachycardia
Hypersensitivity to adenosine

Adverse Reactions
Facial flushing, shortness of breath, chest pain, headache, paresthesia, diaphoresis, palpitations, hypotension, nausea, metallic taste.

Drug Interactions
Methylxanthines (theophylline-like drugs) antagonize the effects of adenosine.
Dipyridamole (Persantine) potentiates the effects of adenosine
Carbamazepine (Tegretol) may potentiate the AV Node blocking effects of adenosine.
May cause bronchoconstriction in asthmatic patients.

How Supplied
Three mg/ml in 2-ml flip-top vials for IV injection

Dosage and Administration
Adult: 6 mg over 1-3 seconds; If no response after 1-2 minutes, administer 12 mg over 1-3 seconds, Maximum total dose = 30 mgs.
Pediatric: 0.1 - 0.2 mg/kg rapid IV; maximum single dose = 12 mgs.

Duration of action
Onset and peak effects in seconds; duration 12 seconds.

Special Considerations
Short half-life limits side effects in most patients.

Pregnancy safety: Category C.

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Albuterol (Proventil, Ventolin)

Class
Sympathomimetic, bronchodilator.

Mechanism of Action
Selective b-2 agonist which stimulates adrenergic receptors of the sympathomimetic nervous system resulting in smooth muscle relaxation in the bronchial tree and peripheral vasculature.

Indications
Treatment of bronchospasm in patients with reversible obstructive airway disease (COPD/asthma). Prevention of exercise-induced bronchospasm.

Contraindications
Known prior hypersensitivity reactions to Albuterol.
Tachycardia dysrhythmias, especially those caused by digitalis.
Synergistic with other sympathomimetics

Adverse Reactions
Often dose-related and include restlessness, tremors, dizziness, palpitations, tachycardia, nervousness, peripheral vasodilatation, nausea, vomiting, hyperglycemia, increased blood pressure and paradoxical bronchospasm

Drug Interactions
Tricyclic antidepressants may potentiate vasculature effects.
Beta-blockers are antagonistic.
May potentiate hypokalemia caused by diuretics.

How Supplied
Solution for aerosolization: 0.5% (5 mg/ml)
Metered Dose Inhaler: 90 mcg/metered spray (17 gm canister with 200 inhalations)

Dosage and Administration
Adult: Administer 2.5 mg. Dilute 0.5 ml of 0.5% solution for inhalation with 2.5 ml normal saline in nebulizer and administer over 10-15 minutes.
MDI: 1-2 inhalations (90-180 mcg). Five minutes between inhalations

Pediatric: Administer solution of 0.01 - 0.03 ml (0.05 - 0.15 mg/kg/ dose diluted in 2 ml of 0.9% Normal Saline. May repeat every 20 minutes three times.

Duration of Action
Onset in 5-15 minutes with peak effect in 30-minutes - two hours and duration of 3-4 hours.

Special Considerations
Pregnancy Safety: Category C.
Antagonized by beta-blockers (e.g., Inderal, Lopressor).
May precipitate angina pectoris and dysrhythmias.
Should only be administered by inhalation methodology in pre-hospital management.

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Amiodarone (Cordarone)

Class
Antidysrhythmic.

Mechanism of Action
Prolongation of Action Potential; non-competitive alpha and beta sympathetic blocking effects; Calcium channel blocking effects.

Indications
Suppression of Ventricular Fibrillation refractory to defibrillation, CPR and a vasopressor.
Suppression of Ventricular Tachycardia refractory to cardioversion.

Contraindications
Second or Third Degree heart block.
Medication-induced Ventricular dysrhythmias.
Hypotension, Bradycardia, Torsades de Pointes.
Profound Sinus Bradycardia.

Adverse Reactions
Hypotension, Bradycardia, Pulseless Electrical Activity, Congestive Heart Failure.
Nausea, fever, abnormal Liver Function Tests, Thrombocytopenia.

Drug Interactions
Will precipitate with Sodium Bicarbonate: incompatible.
Compatible with: Dopamine, Dobutamine, Lidocaine, NTG, Norepinephrine.

How Supplied:
150 mg in 3 ml vials.
150 mg in prefilled syringes.

Dosage and Administration
Adult: 150 - 300 mg slow IV Push over 1-2 minutes in 10 cc Normal Saline.

Duration of Action:
Onset: Within 5-15 minutes.

Peak Effect: Variable.

Duration: Variable

Special Considerations
Pregnancy safety: Category C
Maintain at room temperature and protect from light in storage (light protection not required during administration).
Hypotension usually responsive to slowing infusion rate, IV Normal Saline.
Administer cautiously in patients with Heart Failure or poor systolic function.
May be especially effective in high-risk patients with recent acute MI.

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Hamilton County EMS
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Aspirin

Class:
Platelet inhibitor, anti-inflammatory agent.

Mechanism of Action:
Prostaglandin inhibition.

Indications:
New onset chest pain suggestive of Acute Myocardial Infarction.

Contraindications:
Hypersensitivity.
Gastrointestinal bleeding.

Adverse Reactions:
Heartburn.
GI bleeding.
Nausea, vomiting.
Wheezing in allergic patients.
Prolonged bleeding.

Drug Interactions:
Use with caution in patients allergic to NSAIDS.

How Supplied:
81mg chewable tablets

Dosage and Administration:
324 mg PO.

Duration of Action:
Onset: 30-45 minutes.

Peak effect: variable.

Duration: Variable.

Special Considerations:
Pregnancy Safety: Category D.
Not recommended in pediatric population.

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Atropine Sulfate

Class:
Anticholinergic agent.

Mechanism of Action:
Parasympatholytic: inhibits action of acetylcholine at postganglionic parasympathetic neuroeffector sites.
Increases heart rate in life-threatening brady dysrhythmias.

Indications:
Hemodynamically significant bradycardia.
Drug of choice for organophosphate poisoning.
Bronchospastic pulmonary disorders.
Medically assisted intubation.

Contraindications:
Tachycardia.
Hypersensitivity.
Unstable cardiovascular status in acute hemorrhage and myocardial ischemia.
Narrow-angle glaucoma.

Adverse Reactions:
Headache, dizziness, palpitations, nausea and vomiting.
Tachycardia, dysrhythmias, anticholinergic effects (blurred vision, dry mouth, urinary retention).
Paradoxical bradycardia when pushed slowly or at low doses.
Flushed, hot dry skin.

Drug Interactions:
Potential adverse effects when administered with digoxin, cholinergics, physostigmine.
Effects enhanced by antihistamines, procainamide, quinidine, antipsychotics, benzodiazepines and antidepressants.

How Supplied:
Prefilled syringes: 1.0 mg in 10 ml of solution.

Dosage and Administration:
Adult:
- Brady dysrhythmias: 0.5 - 1.0 mg IV every 3-5 minutes as needed to maximum total dose of 3.0 mg. (may be given Endotracheally if IV not established: 2.0 mg followed by 2.0 ml of Normal Saline Solution).

Pediatric:
- Brady dysrhythmias: 0.2 mg / kg IV / ET / IO (minimum single dose 0.1 mg, maximum single dose 1.0 mg). If administered via ET, follow with 2.0 ml sterile Normal Saline Solution.

Duration of Action:
Onset: Immediate.
Peak Effect: Rapid to 1-2 minutes.
Duration: 2-6 hours.

Special Considerations:
Pregnancy Safety: Category C.
Moderate doses dilate pupils.

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Hamilton County EMS
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Bumetanide (Bumex)

Class:
Diuretic

Mechanism of Action:
Bumetanide is a potent diuretic with a rapid rate on onset and a short duration of action.

Indications:
Congestive heart failure
Pulmonary edema

Contraindications:
Hypersensitivity to bumetanide or to other sulfonamides; anuria, markedly elevated BUN; hepatic coma, severe electrolyte deficiency.

Adverse reactions:
Bumetanide can cause muscle cramps, dizziness, hypotension, headache, nausea, and vomiting.

Interactions:
Can potentiate the effect of the various antihypertensive agents and should be used in caution in patients taking these.

How supplied:
Ampules containing 0.5 mg in 2 ml of solvent (0.25 mg per ml). It is also supplied in 2-, 4-, and 10-ml vials containing 0.25 mg per ml.

Dosage and administration:
The usual dose of bumetanide is 0.5 to 1 mg given during a period of 1 to 2 minutes. Can be given either by IV or intramuscular routes. In the emergency setting, the IV route is preferred.

Duration of action:
Intramuscular about 40 minutes. Within a few minutes following IV administration. Diuresis is usually complete within 4 hours of IM administration and 2 to 3 hours after IV administration.

Special Considerations:
Safe use during pregnancy, in nursing mothers and children under 18 years of age not established. Usage in pregnancy should be limited to life-threatening situations in which the benefits of using bumetanide outweigh the risks.
Cautious use: hepatic cirrhosis, ascites.

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Calcium Chloride

Class
Electrolyte.

Mechanism of Action
Increases cardiac contractile state (positive inotropic effect).
May enhance ventricular automaticity.

Indications
Hypocalcemia, magnesium sulfate overdose, hyperkalemia, calcium channel blocker toxicity.
Adjunctive therapy in treatment of insect bites and stings.

Contraindications
Hypercalcemia, VF during cardiac resuscitation; digitalis toxicity.

Adverse Reactions
Bradycardia, asystole, hypotension, peripheral vasodilation, metallic taste, local necrosis, coronary and cerebral artery spasm, nausea, vomiting.

Drug Interactions
May worsen dysrhythmias secondary to digitalis.
May antagonize effects of Verapamil.
Flush line before and after administration of sodium bicarbonate.

How Supplied
10% solution in 10 ml ampules, vials and prefilled syringes (100 mg/ ml).

Dosage and Administration
Adult: 2-4 mg/kg of 10% solution slowly IV over 5 minutes; may repeat in 10 minutes.
Pediatric: 20 mg/kg/dose of 10% solution slow IV/ IO (maximum: 1 gm dose); (may repeat in 10 minutes.)

Duration of Action
Onset: 5-15 minutes.
Peak effects: 3-5 minutes.

Duration: 15-30 minutes but may persist for 4 hours (dose dependent).

Special Considerations
Pregnancy safety: Category C.
For pediatrics: if calcium gluconate is unavailable, 1-2 ml of 10% calcium chloride solution, diluted with IV fluid, may be substituted.

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Dextrose

Class
Carbohydrate, hypertonic solution.

Mechanism of Action
Rapidly increases serum glucose levels.
Short-term osmotic diuresis.

Indications
Hypoglycemia, altered level of consciousness, coma of unknown etiology, seizure of unknown etiology, status epilepticus (controversial).

Contraindications
Intracranial hemorrhage, delirium tremens, ineffective without thiamine,

Adverse Reactions
Extravasation leads to tissue necrosis.
Warmth, pain, burning, thrombophlebitis, rhabdomyolysis.

Drug Interactions
Sodium bicarbonate, coumadin.

How Supplied
25 gm/ 50 ml prefilled syringes (500 mg/ml)

How to Mix (if needed)
D25 push out 25ml and replace with 25ml of NS
D10 push out 40ml and replace with 40ml of NS

Dosage and Administration
Adult: 12.5-25 gram slow IV; may be repeated as necessary.
Pediatric: 0.5-1 gm/kg/dose slow IV; may be repeated as necessary.

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Dextrose Continued

Duration of Action
Onset: less than 1 minute.
Peak effects: variable.
Duration: Variable.

Special Considerations
Administer thiamine prior to D50 in known alcoholic patients.
Draw blood sugar before administering.
Do not administer to patients with known CVA unless hypoglycemia documented.

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Diazepam (Valium)

Class
Benzodiazepine, sedative-hypnotic, anticonvulsant.

Mechanism of Action
Potentiates effects of inhibitory neurotransmitters.
Raises seizure threshold.
Induces amnesia and sedation.

Indications
Acute anxiety states, acute alcohol withdrawal, muscle relaxant, seizure activity, agitation.
Analgesia for medical procedures (fracture reduction, cardioversion).
Delirium tremens.
Medically assisted intubation
Pre-eclampsia/Eclampsia

Contraindications
Hypersensitivity, glaucoma. coma, shock, substance abuse, head injury.

Adverse Reactions
Respiratory depression, hypotension, drowsiness, ataxia, reflex tachycardia, nausea, confusion, thrombosis and phlebitis.

Drug Interactions
Incompatible with most drugs, fluids.

How Supplied
10 mg/5 ml prefilled syringes, ampules, vials and Tubex.

Dosage and Administration
Seizure activity: **Adult**: 5-10 mg IV q 10-15 minutes prn (5 mg over 5 min.) (maximum dose = 30 mgs.)
Seizure activity: **Pediatric**: 0.2-0.3 mg/kg/dose IV every 15-30 minutes (no faster than 3 mg over 5 minutes) (max. = 10 mg/kg). Rectal diazepam: 0.5 mg/kg via 2" rectal catheter and flush with 2-3 ml air after administration.

Sedation for cardioversion: 5- 15 mg IV over 5-10 minutes prior to cardioversion.

Duration of Action
Onset: 1-5 minutes.
Peak effect: minutes.
Duration: 20-50 minutes.

Special Considerations
Pregnancy safety: Category D
Short duration of anticonvulsant effect.
Reduce dose 50% in elderly patient.

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Diltiazem HCL (Cardizem)

Class:
Calcium channel blocker.

Mechanism of Action:
Block influx of calcium ions into cardiac muscle: prevents spasm of coronary arteries.
Arterial and venous vasodilator.
Reduces preload and afterload.
Reduces myocardial oxygen demand.

Indications:
Control of rapid ventricular rates due to atrial flutter, atrial fibrillation, PSVT.
Angina pectoris.

Contraindications:
Hypotension, sick sinus syndrome, second or third degree AV block
Cardiogenic shock.
Wide-complex tachycardias.

Adverse Reactions:
Bradycardia, second or third-degree AV blocks, chest pain, CHF, syncope.
V-Fib, V-tach, nausea, vomiting, dizziness, dry mouth, dyspnea, headache.

Drug Interactions:
Caution in patients using medications that affect cardiac contractility.
In general, should not be used in patients on Beta-blockers.

How Supplied:
25 mg / 5 ml vial; 50 mg / 10 ml vial.
Non - refrigerated: LYO-JECT syringe.

Dosage and Administration:
Adult: Initial bolus: 0.25 mg/ kg (average dose 20 mg) IV over two (2) minutes. If inadequate response, may re-bolus in 15 minutes: 0.35 mg / kg IV over two (2) minutes. Maintenance

infusion of 5-15 mg / hour (125 mg/ 25 ml of Cardizem in 100ml of D5W or NS to give a concentration of 1mg/ml).
Pediatric: not recommended.

Duration of Action:
Onset: 2-5 minutes.
Peak effect: Variable.
Duration: 1-3 hours.

Special Considerations:
Pregnancy safety: category C.
Use in caution in patients with renal or hepatic dysfunction.
PVCs may be noted at time of conversion of PSVT to sinus rhythm.

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Diphenhydramine (Benadryl)

Class
Antihistamine; anticholinergic.

Mechanism of Action
Blocks cellular histamine receptors; decreases vasodilation; decreases motion sickness. Reverses extrapyramidal reactions.

Indications
Symptomatic relief of allergies, allergic reactions, anaphylaxis, acute dystonic reactions (phenothiazines).
Blood administration reactions; used for motion sickness, hay fever.

Contraindications
Asthma, glaucoma, pregnancy, hypertension, narrow angle glaucoma, infants, patients taking Monoamine Oxidase Inhibitors.

Adverse Reactions
Sedation, hypotension, seizures, visual disturbances, vomiting, urinary retention, palpitations, dysrhythmias, dry mouth and throat, paradoxical CNS excitation in children.

Drug Interactions
Potentiates effects of alcohol and other anticholinergics, may inhibit corticosteroid activity, MAOIs prolong anticholinergic effects of diphenhydramine.

How Supplied
50mg vials (IV or IM)

Dosage and Administration
Adult: 25 - 50 mg IM or IV or P.O.
Pediatric: 1-2 mg/kg IV, IO slowly or IM to a max of 50 mg. If given PO: 5 mg./ kg./ 24 hours.

Duration of Action
Onset: 15-30 minutes.
Peak effect: 1 hour.

Duration: 3-12 hours.

Special Considerations
Not used in infants or in pregnancy: Category B.
If used in anaphylaxis, will be in conjunction with epinephrine, steroids.

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Dopamine (Intropin)

Class
Sympathomimetic, inotropic agent.

Mechanism of Action
Immediate metabolic precursor to Norepinephrine. Increases systemic vascular resistance, dilate renal and splanchnic vasculature. Increases myocardial contractility and stroke volume.

Indications
Cardiogenic, septic or spinal shock, hypotension with low cardiac output states.
Distributive shock.

Contraindications
Hypovolemic shock, pheochromocytoma, tachydysrhythmias, VF.

Adverse Reactions
Cardiac dysrhythmias, hypertension, increased myocardial oxygen demand, extravasation may cause tissue necrosis.

Drug Interactions
Incompatible in alkaline solutions.
MAOIs will enhance effects of dopamine.
Beta blockers may antagonize effects of dopamine.

How Supplied
200 mg / 5 ml - 400 mg / 5 ml prefilled syringes, ampules for IV infusion.
400 mg in 250 ml D5W premixed solutions.

Dosage and Administration
Adult: 2- 20 mcg / kg / min. titrated to patient response.
Pediatric: 2 - 20 mcg / kg / min. titrated to patient response.

Duration of Action
Onset: 1-4 minutes.
Peak Effect: 5-10 minutes.

Duration: Effects cease almost immediately after infusion shut off.

Special Considerations
Pregnancy safety not established.
Effects are dose-dependent
Dopaminergic response: 2-4 mcg / kg / min.: dilates vessels in kidneys; inc. urine output.
Beta-adrenergic response: 4- 10 mcg / kg / min.: Increased chronotropy and inotropy
Adrenergic response: 10-20 mcg / kg / min.: Primarily alpha stimulant / vasoconstriction.
Greater than 20 mcg / kg / min.: reversal of renal effects / override alpha effects.
Always monitor drip rate.
Avoid extravasation injury.

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Epinephrine (Adrenalin)

Class
Sympathomimetic.

Mechanism of Action
Direct acting alpha and beta agonist
Alpha: bronchial, cutaneous, renal and visceral arteriolar vasoconstriction.
Beta 1: positive inotropic and chronotropic actions, increases automaticity.
Beta 2: bronchial smooth muscle relaxation and dilation of skeletal vasculature
Blocks histamine release.

Indications
Cardiac arrest, asystole, electromechanical dissociation, VF unresponsive to initial defib.
Severe bronchospasm, asthma, bronchiolitis.
Anaphylaxis, acute allergic reactions.

Contraindications
Hypertension, hypothermia, pulmonary edema, coronary insufficiency, hypovolemic shock.

Adverse Reactions
Hypertension, dysrhythmias, pulmonary edema, anxiety, psychomotor agitation, nausea, angina, headache, restlessness.

Drug Interactions
Potentiates other sympathomimetics.
Deactivated by alkaline solutions.
MAOIs may potentiate effects of epinephrine.

How Supplied
1 mg / ml (1:1,000); 0.1 mg / ml (1:10,000) ampules and prefilled syringes.

Dosage and Administration
Adult
Allergic reactions and asthma: 0.3 - 0.5 mg (0.3 - 0.5 ml 1:1000) IM
Anaphylaxis: 0.3 - 0.5 mg (3-5 ml 1:10,000) IV

Cardiac: (asystole, PEA, VF)
1 mg IV push every 3-5 minutes.
Endotracheal: 2 mg with 1 ml fluid every 3-5 minutes.

Pediatric

Allergic reactions and asthma: 0.01 mg/kg (0.01 ml/kg) IM to maximum of 0.5 mg.
Cardiac: (asystole, PEA, VF)
Standard initial dose: 0.1 ml/kg (1:10,000) IV, IO.

Duration of Action

Onset: Immediate.
Peak Effects: Minutes.
Duration: Several minutes.

Special Considerations

Pregnancy safety: category C.
Syncope in asthmatic children.
If given ET, may dilute in sterile NS (10 ml in adults).

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Fentanyl Citrate (Sublimaze)

Class
Narcotic analgesic

Mechanism of Action
The principle actions of therapeutic values are analgesic and sedative. Fentanyl is a narcotic analgesic with a rapid onset and short duration of action. Subsequent alterations in respiratory rate and alveolar ventilations may actually last longer than the analgesic effects of the medication. Fentanyl appears to have less emetic effects than that of other narcotic agents.

Indications
Pain Management
Intubation and Post intubation

Contraindications
Severe hemorrhage, shock, and known hypersensitivity.

Adverse Reactions
As with all medications, the patient's vital signs should be monitored (cardiac monitor, SpO2, B/P, EtCO2). Fentanyl may produce bradycardia which can be treated with atropine. It should be used with caution in patients with any brady dysrhythmias. Caution should be used in patients taking MAOI's due to the possibility of unpredictable potentiating effects. Narcan should be readily available to counteract the effects of Fentanyl if need be.

Drug Interactions
Other medications with CNS depressant effects have an additive effect when administered with Fentanyl.

How Supplied
50 mcg/ mL (100 mcg/ 2mL) ampules

Dosage and Administration
ACS/STEMI: 50-100 mcg IV/IO
Post intubation: Adult: 50-75 mcg IV/IO to a max of 300 mcg

Pediatric: <50 kg's then 1 mcg/kg IV/IO to a max of 25 mcg, >50 kg's 1 mcg/kg IV/IO to a max of 50 mcg

Pain management: Adult: 50-100 mcg IV/IO

Pediatric:<50 kg 1 mcg/kg IV/IO to a max of 25 mcg;> 50 kg 1 mcg/kg IV/IO to a max of 50 mcg.

Duration of Action
Onset: Immediate
Peak effect: 3 – 5 minutes (IV)
Duration: 30 – 60 minutes

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Glucagon

Class
Hyperglycemic agent, pancreatic hormone, insulin antagonist.

Mechanism of Action
Increases blood glucose by stimulating glycogenesis.
Unknown mechanism of stabilizing cardiac rhythm in beta-blocker overdose.
Minimal positive inotrope and chronotrope.
Decreases GI motility and secretions.

Indications
Altered level of consciousness when hypoglycemia is suspected.
May be used as inotropic agent in beta-blocker overdose.

Contraindications
Hyperglycemia, hypersensitivity.

Adverse Reactions
Nausea, vomiting.
Tachycardia, hypertension.

Drug Interactions
Incompatible in solution with most other substances.
No significant drug interactions with other emergency medications.

How Supplied
1 mg ampules (requires reconstitution with diluent provided)

Dosage and Administration
Adult: 0.5 - 1 mg IM, SC, or slow IV; may repeat q 20 minutes PRN.
Pediatric: 0.03 - 0.1 mg / kg / dose (not to exceed 1 mg) q 20 min. IM, IO, SC, slow IV.

Duration of Action
Onset: I minute.
Peak effect: 30 minutes.

Duration: Variable (generally 9-17 minutes).

Special Considerations
Pregnancy safety: Category C.
Ineffective if glycogen stores depleted.
Should always be used in conjunction with 50% dextrose whenever possible.
If patient does not respond to second dose glucagon, 50% dextrose must be administered.

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Glucose - Oral

Class
Hyperglycemic.

Mechanism of Action
Provides quickly absorbed glucose to increase blood glucose levels.

Indications
Conscious patients with suspected hypoglycemia.

Contraindications
Decreased level of consciousness, nausea, vomiting.

Adverse Reactions
Nausea, vomiting.

Drug Interactions
None.

How Supplied
Glucose pastes and gels in various forms.

Dosage and Administration
Adult: 15 grams. Should be sipped slowly by patient until clinical improvement noted.
Pediatric: Same as adult.

Duration of Action
Onset: Immediate.
Peak Effect: Variable.
Duration: Variable.

Special Considerations
As noted in indications section.

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Ipratropium (Atrovent)

Class
Anticholinergic.

Actions
Causes bronchodilation, dries respiratory tract secretions.

Indications
Bronchial asthma, reversible bronchospasm associated with chronic bronchitis and emphysema.

Contraindications
Patients with history of hypersensitivity to the drug, should not be used as primary agent in acute treatment of bronchospasm.

Precautions
Blood pressure, pulse, and EKG must be constantly monitored.

Side Effects
Palpitations, dizziness, anxiety, tremors, headache, nervousness, dry mouth.

Dosage
Small-volume nebulizer: 0.5 mg in 2.5 ml saline in a small volume nebulizer (typically administered with a ß agonist).

Routes
Inhalation only.

How Supplied
Bullet: 0.02% in 2.5 ml.
0.5mg in 2.5 ml

Pediatric Dosage
Safety in children has not been established.

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Ketamine (Ketamine hydrochloride)

Class
Rapid acting dissociative anesthetic

Mechanism of Action
Noncompetitive NMDA receptor antagonist, blocks glutamate. Acts directly on cortex and limbic system. At sedation doses, produces cataleptic-type state in which patient is completely dissociated from surroundings. Ketamine produces strong bronchodilator properties and potentiates catecholamines and relaxes bronchiolar smooth muscle.

Indications
Medically assisted intubation
Excited delirium

Contraindications
Hypersensitivity
Patients in whom a significant elevation of BP would constitute a serious hazard
MAOI in the past 14 days

Adverse Reactions
Elevation of blood pressure and heart rate shortly after injection, usually returns to preanesthetic values within 15 minutes.
Respiratory depression
Apnea
Increase in intracranial pressure.
Nausea and vomiting
Laryngospasm
Emergence reactions

Drug Interactions
Incompatible with diazepam.

How supplied
500 mg/10 mL vial
1,000mg/10mL vial

100mg/1 mL vial- must be diluted prior to administration

Dosage and Administration
Note: Should be given slow IVP over 60 seconds. More rapid administration may result in respiratory depression and enhanced pressor response**.**

Adult: Medically assisted intubation: 2 mg/kg IV/IO. Combative/acutely agitated/excited delirium: 1mg/kg IV/IO or 4 mg/kg IM
Pediatric: Greater than 3 months: 1 mg/kg IV/IO

Duration of Action
Onset: Usually within 30 seconds if given IV. 3-4 minutes if given IM.
Peak effect:
Duration: IV 5-10 minutes and 12-25 minutes for IM.

Special Considerations
Use caution in the elderly.
Purposeless and tonic-clonic movements of extremities may occur during the course of anesthesia.(Hypertonia)
May affect brain development in children under 3 or an unborn baby whose mother receives this medication in late pregnancy (usually if given for 3 hours or more).

Pregnancy safety:
Maybe harmful to an unborn baby.

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Ketorlac Tromethamine (Toradol)

Class
Nonsteroidal anti-inflammatory (NSAID) Analgesic.

Mechanism of Action
NSAID that also exhibits peripherally acting non-narcotic analgesic activity by inhibiting prostaglandin synthesis.

Indications
Short-term management of moderate to severe pain.

Contraindications
Allergy to salicylates or other NSAIDs
Patients with history of asthma.
Bleeding disorders, especially GI related (peptic ulcer disease).
Renal failure.

Adverse Reactions
Anaphylaxis due to hypersensitivity.
Nausea, GI bleeding, Sedation, hypotension or hypertension, rash, headache, edema.

Drug Interactions
May increase bleeding time in patients taking anticoagulants.

How supplied
15 or 30 mg in 1 ml or 60 mg in 2 ml vials.

Dosage and Administration
Adult: 30-60 mg IM.
Pediatric: Not recommended.

Duration of Action
Onset: 10 minutes.
Peak effect: 1-2 hours.
Duration: 2-6 hours.

Special Considerations
Pregnancy safety: Category C.
Use with caution in elderly patient.
May be given IV in lower dosage (15-30 mg).

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Levophed (Norepinephrine Bitartrate)

Class
Sympathomimetic

Mechanism of Action
Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increase in systemic blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation, though norepinephrine is a weaker beta stimulator than dopamine.

Indications
Hypotension when fluid administration has failed or not possible.
Post Cardiac Arrest

Contraindications
Should not be given to patients who are hypotensive from blood volume deficits except as an emergency measure to maintain coronary and cerebral artery perfusion until blood volume replacement therapy can be completed. In this case the following may occur: severe peripheral and visceral vasoconstriction, decreased renal perfusion and urine output, poor systemic blood flow despite "normal" blood pressure, tissue hypoxia, and lactate acidosis.

Adverse Reactions
Severe headache
Bradycardia
Cardiac arrhythmias
Ischemic injury due to potent vasoconstrictor action and tissue hypoxia
Severe hypertension (overdosage)
Reflex bradycardia (overdosage)
Decreased cardiac output (overdosage)

Drug Interactions
Use extreme caution in patients receiving MAOI's or antidepressants of the triptyline or imipramine types.

How Supplied
4mg/4mL vial

How to mix
4mg/4mL mixed in 250 ml of D5W = 16 mcg/ml

Dosage and Administration
2-20 mcg/min titrated to effect

Duration of Action
Onset: Immediate
Peak effect: Rapid
Duration: 1-2 minutes following discontinuation of the infusion

Special Considerations:
Because of the potency of Levophed and because of varying response to pressor substances, the possibility always exists that dangerously high blood pressure may be produce with overdoses of this pressor agent. Be sure to record the blood pressure every two minutes until the desired blood pressure is obtained, then every 5 minutes if administration is to be continued.
Should be given in a large vein, preferably the AC.

Pregnancy Safety:
Category C

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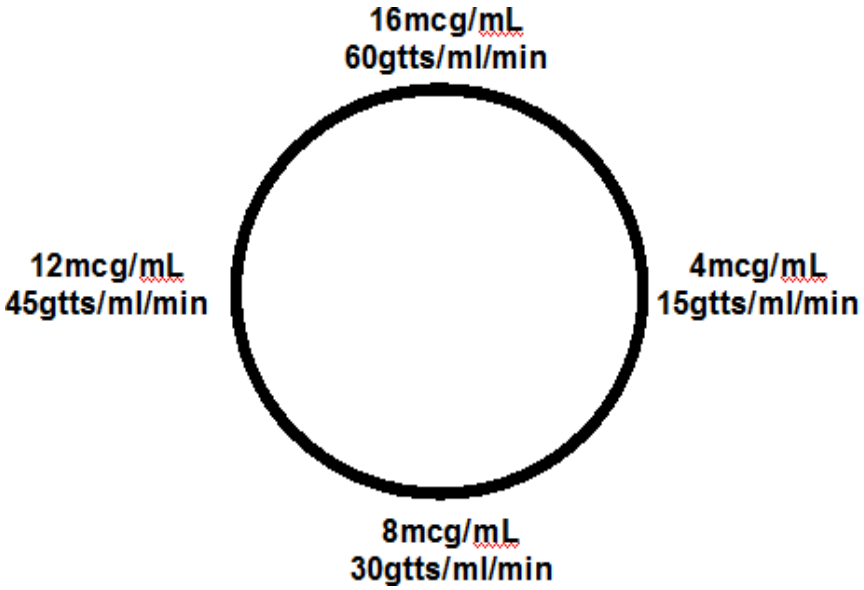
Norepinephrine Drip



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Lidocaine HCL (2%)

Class
Antidysrhythmic.

Mechanism of Action
Decreases automaticity by slowing the rate of spontaneous Phase 4 depolarization.

Indications
Suppression of ventricular dysrhythmias (V-tach, VF).
Prophylaxis against recurrence after conversion from V-tach, VF.

Contraindications
Second degree and third-degree blocks in absence of artificial pacemaker). Hypotension.
Stokes Adams Syndrome.

Adverse Reactions
Slurred speech, seizures, altered mental status, confusion, lightheadedness, blurred vision, bradycardia.

Drug Interactions
Apnea induced with succinylcholine may be prolonged with high doses of Lidocaine.
Cardiac depression may occur in conjunction with IV Dilantin.
Procainamide may exacerbate the CNS effects.
Metabolic clearance decreased in patients with liver disease or those patients taking beta-blockers.

How Supplied
100 mg in 5 ml solution prefilled syringes.
1 and 2 gram additive syringes.
100 mg in 5 ml solution ampules.
1 and 2 gram vials in 30 ml of solution.

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Dosage and Administration
Adult:

Cardiac arrest VT/ VF: 1.5 mg / kg IV/IO push; repeat q 3-5 minutes to maximum dose of 3 mg/kg. After conversion to NSR, begin drip at 2-4 mg / min.
VT with pulse: 1-1.5 mg / kg IV/IO Push; then 0.50 - 0.75 mg / kg q 5-10 min. to max. of 3 mg/kg. Start drip at 2-4 mg/min. ASAP.
VF prophylaxis: 0.5 mg/kg IV/IO Push; additional boluses 0.5 mg/kg in 8-10 minutes up to 2 mg/kg. Start drip at 2-4 mg/min. ASAP.
IM dose: 300 mg (4 mg/kg) of 2% solution.
Pain management for IO bolus/drip: 20-50 mg of 2% solution
Pediatric:
VF or Pulseless V-tach: 1 mg/kg IV / IO per dose. Infusion: 20-50 mcg/kg/min.
PVCs with pulse: 1 mg/kg IV / IO per dose. Infusion: 20-50 mcg/kg/min.
Pain management for IO bolus/drip: 0.5 mg/kg of 2% solution

Duration of Action
Onset: 1-5 minutes.
Peak Effect: 5-10 minutes.
Duration: Variable. (15 min - 2 hours).

Special Considerations
Pregnancy safety: Category B.
Reduce maintenance infusions by 50% if patient is over 70 years of age, has liver disease, or is in CHF or shock.
A 75-100 mg bolus maintains levels for only 20 minutes.
If bradycardia occurs with PVCs, treat the bradycardia with atropine.
Exceedingly high doses of Lidocaine can result in coma or death.
Avoid Lidocaine for reperfusion dysrhythmias after thrombolytic therapy.
Cross-reactivity with other forms of local anesthetics.

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Lopressor (Metoprolol)

Class
Sympathetic blocker (B2 selective)
Class II Antiarrhythmic

Mechanism of Action
Selectively blocks B2-adrenergic receptors (cardioprotective)

Indications
Hypertensive crisis

Contraindications
Hypersensitivity
Heart rate less than 45 bpm
Systolic BP less than 100 mmHg
Heart block
Shock
History of Asthma

Adverse Reactions
Bradycardia
Heart block
Congestive heart failure
Depression
Bronchospasm

Drug Interactions
Digitalis Glycosides and beta-blockers slow AV conduction and decrease heart rate. Concomitant use can increase the risk of bradycardia. Monitor heart rate and PR interval. Calcium Channel Blockers may produce an additive reduction in myocardial contractility because of negative chronotropic and inotropic effects.

How Supplied
5mg/5mL

Dosage and Administration
Adult: 5mg IV/IO (slow IVP) every 15 minutes as needed to a max of 15 mg
Pediatric: Safety in children has not been established

Duration
Onset of action: Immediate
Peak effect: 1.5-2 hours
Duration of action: 5-8 hours

Special Considerations
Use with caution in patients with impaired hepatic function.

Pregnancy safety: Category C

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Lorazepam (Ativan)

Class
Benzodiazepine; sedative; anticonvulsant.

Mechanism of Action
Anxiolytic, anticonvulsant and sedative effects; suppresses propagation of seizure activity produced by foci in cortex, thalamus and limbic areas.

Indications
Initial control of status epilepticus or severe recurrent seizures.
Severe anxiety.
Sedation.

Contraindications
Acute narrow-angle glaucoma.
Coma, shock or suspected drug abuse.

Adverse Reactions
Respiratory depression, apnea, drowsiness, sedation, ataxia, psychomotor impairment, confusion.
Restlessness, delirium.
Hypotension, bradycardia.

Drug Interactions
May precipitate CNS depression if patient is already taking CNS depressant medications.

How Supplied
2 and 4 mg / ml concentrations in 1 ml vials.

Dosage and Administration
Note: When given IV or IO, must dilute with equal volume of sterile water or sterile saline; When given IM, Lorazepam is not to be diluted.
Adult: 2-4 mg slow IV at 2 mg / min. or IM; may repeat in 15-20 minutes to maximum dose of 8 mg. For sedation: 0.05 mg / kg up to 4 mg IM.

For Behavioral: 1mg IV, may repeat once in 5 minutes if SBP >100 or 2mg IM may repeat once in 10 minutes if SBP >100

Pediatric: 0.05 - 0.20 mg / kg slow IV, IO slowly over 2 minutes or IM; may repeat in 15-20 minutes to maximum dose of 0.2 mg / kg.
Medically Assisted intubation 0.1-0.2 mg/kgIV/IO

Duration
Onset of action: 1-5 minutes.
Peak effect: variable.
Duration of action: 6-8 hours.

Special Considerations
Pregnancy safety: Category D.
Monitor BP and respiratory rate during administration.
Have advanced airway equipment readily available.
Inadvertent arterial injection may result in vasospasm and gangrene.
Lorazepam expires in 6 weeks if not refrigerated.

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Magnesium Sulfate

Class
Electrolyte.

Mechanism of Action
Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholinesterase release at the myoneural junction; manages seizures in toxemia of pregnancy; induces uterine relaxation; can cause bronchodilation after beta-agonists and anticholinergics have been used.

Indications
Seizures of eclampsia (Toxemia of pregnancy).
Torsades de Pointes.
Hypomagnesemia.
TCA overdose-induced dysrhythmias.
Digitalis-induced dysrhythmias.
Class IIa agent for refractory VF and VT after administration of Lidocaine.
Respiratory distress

Contraindications
Heart blocks.
Renal diseases.

Adverse Reactions
Respiratory and CNS depression.
Hypotension, cardiac arrest and asystole may occur.
Facial flushing, diaphoresis, depressed reflexes.
Circulatory collapse.

Drug Interactions
May enhance effects of other CNS depressants.
Serious changes in overall cardiac function may occur with cardiac glycosides.

How Supplied
2 ml and 20 ml vials of a 50% solution.

Dosage and Administration
Adult: Seizure activity associated with pregnancy: 1-4 gm IV push over 3 minutes. For Torsades de Pointes or Refractory VF/VT: 1-2 grams IV push over 1-2 minutes. For Respiratory distress Adult 1 Gram.
Pediatric: Not recommended.

Duration of Action
Onset: Immediate.
Peak effect: variable.
Duration: 3-4 hours.

Special Considerations
Pregnancy safety: Recommended that drug not be given in the 2 hours before delivery, if possible.
IV calcium gluconate or calcium chloride should be available as antagonist if needed.
The "cure" for toxemia is delivery of the baby.
Use with caution in patients with renal failure.
Magnesium sulfate is being used for acute MI patients in some systems under Medical Direction.

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Methylprednisolone (Solu-Medrol)

Class
Anti-inflammatory glucocorticoid.

Mechanism of Action
Synthetic steroid that suppresses acute and chronic inflammation; potentiates vascular smooth muscle relaxation by beta-adrenergic agonists;

Indications
Acute Spinal cord trauma.
Anaphylaxis
Bronchodilator for unresponsive asthma.

Contraindications
Premature infants.
Systemic fungal infections.
Use with caution patients with GI bleeding.

Adverse Reactions
Headache, hypertension, sodium and water retention.
CHF, hypokalemia, alkalosis, peptic ulcer disease, nausea, vomiting.

Drug Interactions
Hypoglycemic responses to insulin and hypoglycemic agents may be blunted.
Potassium-depleting agents may exacerbate hypokalemic effects.

How Supplied
40, 125, 500 and 1,000 mg vials.

Dosage and Administration
Adult: Acute spinal cord injury: 30 mg / kg IV over 30 minutes followed by infusion: 5.4 mg/kg/hr. Asthma, COPD: 1-2 mg / kg IV.
Pediatric: Acute spinal cord trauma: 30 mg / kg IV over 30 minutes; infusion: 5.4 mg / kg / hr. Asthma: 1-2 mg / kg / dose IV.

Duration of Action
Onset of action: 1-2 hours.
Peak effects: Variable.
Duration of action: 8-24 hours.

Special Considerations
Pregnancy safety: not established.
Not effective if spinal cord injury greater than 8 hours.
Crosses the placenta and may cause fetal harm.

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Midazolam (Versed)

Class
Short-acting benzodiazepine CNS depressant.

Mechanism of Action
Anxiolytic and sedative properties similar to other benzodiazepines.
Memory impairment.

Indications
Sedation, Anxiolytic prior to endotracheal or nasotracheal intubation.
Administer for conscious sedation.

Contraindications
Glaucoma, shock, coma, alcohol intoxication, overdose patient.
Depressed vital signs.
Concomitant use with other CNS depressants, barbiturates, alcohol, narcotics.

Adverse Reactions
Hiccough, cough, over-sedation, nausea, vomiting, injection site pain, headache, blurred vision.
Hypotension, respiratory depression and arrest.
Drug Interactions
Should not be used in patients who have taken CNS depressant.

How Supplied
2, 5, 10 ml vials (1 mg / ml).
1, 2 , 5, 10 ml vials (5 mg/ ml).

Dosage and Administration
Adult: 2.0 - 2.5 mg slow IV over 2-3 minutes; may be repeated to total maximum: 0.1 mg / kg) or 5 mg IM/IN, may repeat PRN if the SBP >100 to a cumulative dose of 10 mg (5 mg if age ≥65).
Pediatric: Not recommended.

Duration of Action
Onset: 1-3 minutes IV and dose dependent.

Peak effect: variable.
Duration: 2-6 hours and dose dependent.

Special Considerations
Pregnancy safety: category D.
Administer immediately prior to intubation procedure.
Requires continuous monitoring of respiratory and cardiac function.
Never administer as IV bolus.

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Morphine Sulfate

Class
Opioid analgesic. (Schedule II drug).

Mechanism of Action
Alleviates pain through CNS actions
Suppresses fear and anxiety centers in brain.
Depresses brain stem respiratory centers.
Increases peripheral venous capacitance and decreases venous return.
Decreases preload and afterload, decreasing myocardial oxygen demand.

Indications
Analgesia for moderate to severe acute and chronic pain (use with caution).
Severe CHF, pulmonary edema.
Chest pain associated with acute MI.

Contraindications
Head injury, exacerbated COPD, depressed respiratory drive, hypotension.
Undiagnosed abdominal pain, decreased level of consciousness.
Suspected hypovolemia.
Patients who have taken MAOIs within past 14 days.

Adverse Reactions
Respiratory depression, hypotension, decreased level of consciousness, nausea, vomiting.
Bradycardia, tachycardia, syncope, facial flushing, euphoria, bronchospasm, dry mouth.

Drug Interactions
Potentiates sedative effects of phenothiaxines.
CNS depressant may potentiate effects of morphine.
MAOIs may cause paradoxical excitation.

How Supplied
10 mg in 1 ml of solution, ampules

Dosage and Administration

Adult: 1-3 mg IV, IM, SC every 5 minutes titrated to maximum of 10 mg.
Pediatric: 0.1 - 0.2 mg / kg / dose IV, IO, IM, SC every 5 minutes titrated to max. of 5 mg.

Duration of Action
Onset: Immediate.
Peak effect: 20 minutes.
Duration: 2 - 7 hours.

Special Considerations
Pregnancy safety: Category C.
Morphine rapidly crosses the placenta.
Safety in neonate not established.
Use with caution in geriatric population and those with COPD, asthma.
Vagotonic effect in patient with acute inferior MI (bradycardia, heart block).
Naloxone should be readily available as antidote.

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Naloxone (Narcan)

Class
Narcotic antagonist.

Mechanism of Action
Competitive inhibition at narcotic receptor sites.
Reverse respiratory depression secondary to depressant drugs.
Completely inhibits the effect of morphine.

Indications
Opiate overdose, coma.
Complete or partial reversal of CNS and respiratory depression induced by opioids
Narcotic agonist
Morphine, heroin, hydromorphone (Dilaudid), methadone.
Meperidine (Demerol), Paregoric, Fentanyl (Sublimaze).
Oxycodone (Percodan), codeine, propoxyphene (Darvon).
Narcotic agonist and antagonist
Butorphanol (Stadol).
Pentazocine (Talwin).
Nalbuphine (Nubain).
Decreased level of consciousness.
Coma of unknown origin.

Contraindications
Use with caution in narcotic-dependent patients.
Use with caution in neonates of narcotic-addicted mothers.

Adverse Reactions
Withdrawal symptoms in the addicted patient.
Tachycardia, hypertension, dysrhythmias, nausea, vomiting, diaphoresis

Drug Interactions
Incompatible with bisulfite and alkaline solutions.

How Supplied
0.4 mg/ml, 1 mg/ml ampules

Dosage and Administration
Adult: 0.4 - 2.0 mg IV, IM, SC, or ET (diluted); min. recommended = 2.0 mg.; repeat at 5 minute intervals to 10 mg maximum dose. (Medical Control may request higher amounts).
Pediatric: 0.1 mg / kg / dose IV, IM, SC, ET (diluted); maximum of 0.8 mg; if no response in 10 minutes, administer an additional 0.1 mg / kg /dose.

Duration of Action
Onset: within 2 minutes.
Peak effect: variable.
Duration: 30-60 minutes.

Special Considerations
Pregnancy safety: category B.
Seizures without causal relationship have been reported.
May not reverse hypotension.
Use caution when administering to narcotic addicts (violent behavior, etc.).

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Nitroglycerin (Nitrostat, Tridil and Others)

Class
Vasodilators.

Mechanism of Action
Smooth muscle relaxant acting on vascular, bronchial, uterine and intestinal smooth muscle. Dilation of arterioles and veins in the periphery, reduces preload and afterload, decreases the work load of the heart and, thereby, myocardial oxygen demand.

Indications
Acute angina pectoris.
Ischemic chest pain.
Hypertension.
CHF, pulmonary edema.

Contraindications
Hypotension, hypovolemia.
Intracranial bleeding or head injury.

Adverse Reactions
Headache, hypotension, syncope, reflex tachycardia, flushing.
Nausea, vomiting, diaphoresis, muscle twitching.

Drug Interactions
Additive effects with other vasodilators.

How Supplied
0.4 mg (1/150 grain).
NTG spray: 0.4 mg - 0.8 mg under the tongue.

Dosage and Administration
Adult:
Tablets: 0.3 - 0.4 mg SL; may repeat in 3-5 minutes to maximum of 3 doses.
NTG spray: 0.4 mg under the tongue; up to 3 sprays
Pediatric: not recommended.

Duration of Action
Onset: 1-3 minutes.
Peak effect: 5-10 minutes.
Duration: 20-30 minutes or. if IV, 1-10 minutes after discontinuation of infusion.

Special Considerations
Pregnancy safety: category C.
Hypotension more common in geriatric population.
NTG decomposes if exposed to light or heat.
Must be kept in airtight containers.
Active ingredient may have a stinging effect when administered SL.

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Oxygen

Class
Naturally occurring atmospheric gas.

Mechanism of Action
Reverses hypoxemia.

Indications
Confirmed or expected hypoxemia.
Ischemic chest pain.
Respiratory insufficiency.
Prophylactically during air transport.
Confirmed or suspected carbon monoxide poisoning.
All other causes of decreased tissue oxygenation.
Decreased level of consciousness.

Contraindications
Certain patients with COPD, emphysema who will not tolerate Oxygen concentrations over 35%.
Hyperventilation.

Adverse Reactions
Decreased level of consciousness and respiratory depression in patients with chronic CO2 retention.
Retrolental fibroplasia if given in high concentrations to premature infants. (maintain 30-40% 02)

Drug Interactions
None.

How Supplied
Oxygen cylinders (usually green and white) of 100% compressed oxygen gas).

Dosage and Administration
Adult:
Cardiac arrest and Carbon Monoxide poisoning: 100%.

Hypoxemia: 10-15 L/ min. via non-rebreather.
COPD: 0-2 L/ min. via nasal cannula. Be prepared
to provide ventilatory support if higher concentrations of oxygen needed.
Pediatric: Same as for adult with exception of premature infant.

Duration of Action
Onset: Immediate.
Peak effect: not applicable.
Duration: Less than 2 minutes.

Special Considerations
Be familiar with liter flow and each type of delivery device used.
Supports possibility of combustion.

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Promethazine (Phenergan)

Class
Antihistamine.

Mechanism of Action
H-1 Receptor antagonist; blocks action of histamine; possesses sedative, anti-motion, antiemetic and anticholinergic activity; potentiates the effects of narcotics to induce analgesia.

Indications
Nausea, vomiting, motion sickness.
Sedation for patient in labor.
Potentiation of analgesic effects of narcotics.

Contraindications
Hypersensitivity.
Coma, CNS-depressed patients from alcohol, barbiturates, narcotics.
Reye's Syndrome.

Adverse Reactions
Sedation, dizziness, impairment of mental and physical ability.
Dysrhythmias, nausea, vomiting, hyperexcitability.
Hallucinations, convulsions and sudden death when used in children.

Drug Interactions
Additive with other CNS depressants.
Increased extrapyramidal effects with MAOIs.

How Supplied
25 and 50 mg / ml in 1 ml ampules.

Dosage and Administration
Adult: 12.5 -25.0 mg IV or deep IM. Half dose in elderly.
Pediatric: 0.5 - 1.0 mg / kg / dose IM.

Duration of Action
Onset: IV: immediate.

Peak effect: 30-60 minutes.
Duration: 4-6 hours.

Special Considerations
Pregnancy safety; Category C.
Use cautiously in patients with asthma, peptic ulcer disease and bone marrow suppression.
Do not use in children with vomiting of unknown etiology.
Avoid intraarterial injection.
IM injection is preferred route.

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Rocuronium Bromide (Zemuron)

Class
Nondepolarizing neuromuscular blocking agent

Mechanism of Action
It acts by competing for cholinergic receptors at the motor end-plate. This action is antagonized by acetylcholinesterase inhibitors, such as neostigmine and edrophonium.

Indications
An adjunct to general anesthesia to facilitate medically assisted intubation and provides skeletal muscle relaxation during mechanical ventilation. It has no known effect on consciousness, pain threshold or cerebration. Therefore, its administration must be accompanied by adequate anesthesia or sedation.

Contraindications
Hypersensitivity to Rocuronium or other neuromuscular blocking agents.

Adverse Reactions
Severe anaphylactic reactions to neuromuscular blocking agents have been reported.
Transient hypotension
Hypertension
Respiratory depression
Bronchospasm

Drug Interactions
Incompatible when mixed with diazepam, lorazepam, ketorolac, methylprednisone and furosemide. If Rocuronium is to be administered via the same IV line, make sure to adequately flush the line prior to administration.

How Supplied
10 mg/mL, 10 mg vial
100 mg/10 mL

Dosage and Administration
Adults: 0.6-1.0 mg/kg IV/IO
Pediatrics: 0.6 mg/kg IV/IO

Duration of Action
Onset: Immediate
Peak effect: Less than 3 minutes.
Duration: 30 minutes

Special Considerations
Upon removal from refrigeration to room temperature use within 60 days.
Conditions associated with an increased circulatory delayed time, i.e. cardiovascular disease or advanced age, may be associated with a delay in onset time.
May be associated with increased pulmonary resistance, so use caution in patients with pulmonary hypertension or valvular heart disease.
In patients with myasthenia gravis or myasthenic (Easton-Lambert) syndrome, small doses of non-depolarizing neuromuscular blocking agents may have profound effects.
Use with caution in patients with clinically significant hepatic impairment.

Pregnancy safety
Category C. Should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

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Sodium Bicarbonate 8.4%

Class
Buffer, alkalinizer.

Mechanism of Action
Reacts with hydrogen ions to form water and carbon dioxide thereby acting as a buffer for metabolic acidosis.

Indications
Known pre-existing bicarbonate-responsive acidosis.
Upon return of spontaneous circulation after long arrest interval.
TCA overdose.
Hyperkalemia.
Phenobarbital overdose.
Alkalinization for treatment of specific intoxications.

Contraindications
Metabolic and respiratory alkalosis.
Hypocalcemia and hypokalemia.
Hypocloremia secondary to GI loss and vomiting.

Adverse Reactions
Metabolic alkalosis, hypokalemia, hyperosmolarity, fluid overload.
Increase in tissue acidosis.
Electrolyte imbalance and tetany, seizures.
Tissue sloughing at injection site.

Drug Interactions
May precipitate in calcium solutions.
Half-lives of certain drugs may increase through alkalinization of the urine.
Vasopressors may be deactivated.

How Supplied
50 mEq in 50 ml of solvent.

Dosage and Administration
Adult: 1 mEq / kg IV; may repeat with 0.5 mEq / kg every 10 minutes.
Pediatric: same as for adult.

Duration of Action
Onset: 2-10 minutes.
Peak effect: 15-20 minutes.
Duration: 30-60 minutes.

Special Considerations
Pregnancy safety: Category C.
Must ventilate patient after administration.
Whenever possible, blood gas analysis should guide use of bicarbonate.
Intracellular acidosis may be worsened by production of carbon dioxide.
May increase edematous states.
May worsen CHF.

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Succinylcholine (Anectine)

Class
Depolarizing neuromuscular blocker, paralyzing agent.

Mechanism of Action
Bind to the receptors for acetylcholine.

Indications
To facilitate intubation.
To terminate laryngospasm.
To promote muscle relaxation.
To facilitate electroconvulsive shock therapy.

Contraindications
Acute narrow angle glaucoma.
Penetrating eye injuries.
Inability to control airway or support ventilations with oxygen and positive pressure.

Adverse Reactions
Apnea, malignant hyperthermia, dysrhythmias, bradycardia, hypertension, hypotension, cardiac arrest.
Hyperkalemia, increased intraocular pressure, fasciculations.
Exacerbation of hyperkalemia in trauma patients.

Drug Interactions
Effects potentiated by Oxytocin, beta blockers and organophosphates.
Diazepam may reduce duration of action.

How Supplied
40 mg in 2 ml ampule (20 mg / ml).
100 mg in 5 ml ampule (20 mg / ml).
Multidose vial.

Dosage and Administration
Adult: 1-2 mg / kg rapid IV; repeat once if needed.
Pediatric: 1 - 1.5 mg / kg dose rapid IV/ IO; repeat once if needed.

Duration of Action
Onset: 1 minute.
Peak effect: 1-3 minutes.
Duration: 5 minutes.

Special Considerations
Pregnancy safety: Category C.
EMS use primarily to facilitate endotracheal intubation.
If the patient is conscious, explain the effects of the drug before administration.
Consider premedication with atropine, particularly in pediatric age group.
Premedication with Lidocaine may blunt any increase in intracranial pressure during intubation.
Diazepam or midazolam should be used in any conscious patient undergoing neuromuscular blockade.

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Thiamine

Class
Vitamin (B1)

Mechanism of Action
Combines with ATP to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. The brain is extremely sensitive to thiamine deficiency.

Indications
Coma of unknown origin.
Delirium tremens.
Beriberi.
Wernicke's encephalopathy.

Contraindications
None

Adverse Reactions
Hypotension from too rapid injection or too high a dose.
Anxiety, diaphoresis, nausea, vomiting.
Rare allergic reaction.

How Supplied
1,000 mg in 10 ml vial (100 mg / ml).

Dosage and Administration
Adult: 100 slow IV or IM.
Pediatric: 10-25 mg slow IV or IM.

Duration of Action
Onset: Rapid.
Peak effects: variable.
Duration: Dependent upon degree of deficiency.

Special Considerations
Pregnancy safety: Category A.

Large IV doses may cause respiratory difficulties.
Anaphylaxis reactions reported.

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Vecuronium (Norcuron)

Class
Paralytic agent.

Mechanism of Action
Non-depolarizing neuromuscular blocking agent, paralytic.

Indications
To facilitate intubation.
To terminate laryngospasm.
To promote muscle relaxation.
To facilitate electroconvulsive shock therapy.

Contraindications
Acute narrow angle glaucoma.
Penetrating eye injuries.
Inability to control airway or support ventilations with oxygen and positive pressure.
Newborns.
Myasthenia gravis.
Hepatic or renal failure.

Adverse Reactions
Apnea, weakness, salivation, PVCs, tachycardia.
Transient hypotension, increased blood pressure.

Drug Interaction
Use of inhalational anesthetics will enhance neuromuscular blockade.

How Supplied
10 mg / 10 ml vecuronium bromide vials with diluent.
20 ml vials (20 mg vecuronium) without diluent.

Dosage and Administration
Adult: 0.1 mg / kg IV Push; maintenance dose within 25-40 minutes: 0.01 - 0.05 mg/kg IV push.

Pediatric: 0.1 mg / kg IV, IO. maintenance dose within 20-35 minutes: 0.01-0.05 mg/kg IV push.

Duration of Action
Onset: 30 seconds.
Peak effects: 2.5 - 3.0 minutes.
Duration: 25-30 minutes.

Special Considerations
Pregnancy safety: Category C.
If patient is conscious, explain the effect of the medication before administration and always sedate the patient before using vecuronium.
Intubation and ventilatory support must be readily available.' Monitor the patient carefully.
Vecuronium has no effect consciousness or pain.
Will not stop neuronal seizure activity.
Heart rate, cardiac output are increased.
Decrease doses for patients with renal disease.

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Zofran (Ondansetron Hydrochloride)

Class
Gastrointestinal Agent, Antiemetic

Mechanism of Action
Selective serotonin (5-HT3) receptor antagonist.

Indications
Nausea and Vomiting

Contraindications
Hypersensitivity to Ondansetron.

Adverse reactions
Hypotension, tachycardia, constipation, depressed CNS activity, dizziness and light-headedness, diarrhea, constipation, dry mouth, increase in liver aminotransferases, and hypersensitivity reactions.

Precautions
Use with caution in elderly patients and patients with renal impairment.

How supplied
2 mg/ml in a 2 ml vial for a total 4 mg

Dosage and Administration
Adult
4 mg slow IVP over 2-5 minutes (Give over no less than 30 seconds)

Pediatric
Children 2 years or older: 0.1 mg/kg slow IVP over 2-5 minutes (Give over no less than 30 seconds)

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