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Introduction:

These standing orders were developed and approved by the Washington County-Johnson City EMS Medical Director Dr. Mark Wilkinson to provide standardization of advanced and basic life support interventions delivered to patients by EMS Paramedics and EMTs within Washington County/Johnson City. These standing orders are subject to revision and additions as determined necessary by the EMS Medical Director.

No set of standing orders can cover every possible situation. Paramedics and EMTs are expected to use common sense and provide care that is in the best interest of the patient. Progression through the Standing Order should be to the point of resolution of the medical or traumatic condition and then cease further standing order treatments. Unusual situations or any perceived need to deviate from these standing orders should be discussed with a Medical Control Physician. Any deviation from the established standard should be thoroughly documented on the patient care report.

The standing orders contained within are those advanced and basic life support measures that may be instituted prior to voice contact with a Medical Control Physician. Initiation of these orders should be on the basis of patient need and indication. If at any time the EMT-Paramedic has a question or is uncomfortable with instituting any standing order, he/she should consult with a Medical Control Physician.
GENERAL TREATMENT

Standing Orders
Universal Patient Care Standing Order

Utilize appropriate **Standard Precautions:** gloves, gowns, eye and mucous membrane protection and/or respiratory protection.

Scene safety

**Adult Assessment Guideline**
**Pediatric Assessment Guideline**
(The Broselow tape defines the pediatric patient)

Vital signs
Repeat every 15 Minutes / 5 Minutes if unstable

**Airway Standing Order**
(Assault or Pediatric)

Consider pulse oximetry
**Oxygen**

Consider cardiac monitor / 12-Lead EKG

Follow appropriate Standing Order

---

The minimal equipment required for all ALS patient calls: **Professionalism** requires that you are ready to respond to any emergency. Be aware that serious medical problems are often dispatched as vague or minimal sounding complaints.

- airway/oxygen kit
- cardiac monitor (unless clearly not indicated per pre-arrival information)
- stretcher
- other equipment dictated by the nature of the call i.e. drug box, CPAP, etc.

---

**Notes:**
- Any patient contact which does not result in an EMS transport MUST have a completed refusal form. A "patient' is someone who agrees to medical care. Arrival on a scene with multiple "potential" patients, but where none are identified and are refusing all medical assessment and care are exempt from these requirements. BUT, each individual must be offered medical assessment and care. Upon refusing, all will be listed in one narrative with contact info included. "Patient Name" will be "No Patient Found". Document details of the incident. At any time an individual gives any indication of illness or injury, they become a "patient" and require a separate and complete refusal.
- Exam: Minimal exam if not noted on the specific standing order is vital signs, mental status, and location of injury or complaint.
- Required vital signs include blood pressure, pulse, respirations, and pain/severity if applicable.
- Pulse oximetry, cardiac monitoring and documentation is dependent on the specific complaint.
- A pediatric patient is defined by the Broselow tape. If the patient does not fit on the tape, they are considered an adult.
- Orthostatic vital sign procedure should be performed in situations where volume status is in question.

Approved By: __________________________ Date: ________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Airway- Adult

Assess ABC’s, Respiratory Rate, Effort and Adequacy

Basic maneuvers first, open airway; nasal or oral AW; NRB, or BVM. Additionally, place pt on 15 lpm via NC.*

Prepare equipment including suction unit check, blade light, and ETT bulb check

BIAD/Blind Insertion Airway Device i.e. King

Consider RSI

Oral/Nasal Tracheal Intubation

Confirm tube placement with 3 different methods, document all 3 on run report. Attach waveform ETCO2 device.

Secure ETT with commercial tube holder if available. Secure pt. to LSB to reduce flexion of the neck that could cause dislodging of tube

Failed Airway SO

Contact Medical Control

NOTES:
- * The addition of the NC along with the OPA or NPA and NRB or BVM maximizes O2 to the alveoli
- Adult is defined as 13 years old or greater.
- Maintain C-Spine restriction via appropriate method for patients with suspected spinal injury.
- Monitor ETCO2 includes Combi-Tube & Quick Trach
- Do not administer Narcan to patient that has been intubated.
- Disconnect Ventilation Source (bag, vent, etc) during all pt. moves to prevent dislodging of airway
- Do not assume that hyperventilation is psychogenic, use oxygen, NOT a paper bag!
- Medic that performed intubation should reconfirm tube placement following transfer of patient at the ED

Universal Patient Care

Adequate

Pulse Oximetry

Supplemental Oxygen

Inadequate

Unsuccessful

Make adjustment: different blade, different size tube, cricoid pressure, reposition head

3 Unsuccessful Intubation Attempts

Obstructed Airway Standing Order

Obstruction

Successful

Unobstructed

Direct Laryngoscopy

Legend

FR

EMT

A

AEMT

A

EMT-P

P

P

P

FR

A

A

A

P

P

P

NOTES:
- * The addition of the NC along with the OPA or NPA and NRB or BVM maximizes O2 to the alveoli
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- Disconnect Ventilation Source (bag, vent, etc) during all pt. moves to prevent dislodging of airway
- Do not assume that hyperventilation is psychogenic, use oxygen, NOT a paper bag!
- Medic that performed intubation should reconfirm tube placement following transfer of patient at the ED

Approved By: __________________________ Date: __________________________
Mark Wilkinson 5/23/2016
Airway- Adult Failed

Universal Patient Care

Three failed intubation attempts by the senior paramedic on-scene. No more than 5 attempts total

Continue BVM

Yes

SPO2> 90% with BVM ventilation

Facial trauma or swelling?

No

If SPO2 drops <90% or if it becomes difficult to ventilate patient with BVM

Yes

Blind Insertion AW Device*

SPO2 > 90%

Continue Ventilation with BIAD

Percutaneous Cricothyroidotomy

Attach waveform ETCO2 device to monitor placement and adequacy of ventilation.

NOTES:
- Adult is defined as 13 years old or greater.
- Maintain Spinal Motion Restriction for patients with suspected spinal injury.
- "Attach waveform ETCO2". Includes BIADs & Quick Trach
- Disconnect Ventilation Source (bag, vent, etc) during all pt. moves to prevent dislodging of airway
- Do not assume that hyperventilation is psychogenic. Use oxygen, NOT a paper bag!
- Paramedic that performed intubation should reconfirm tube placement prior to and upon transfer of patient at the ED and document findings in PCR. Obtain signature of the RT or receiving physician under "Facility Signatures" and "Airway Confirmation".
- Due to the failed ET attempts, a Paramedic will be required to complete the securing of the AW, even when using a BIAD.

Approved By: __________________________ Date: __________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Indications:
- Patient cannot adequately maintain airway and has intact gag reflex
- Comatose patient unable to be controlled pharmacologically
- Inability to maintain SPO2 >90% in unconscious, teeth clenched patient
- Other conditions causing ventilatory impairment

Airway - RSI

**Preoxygenate with 100% O2 >3 mins.**
Use cricoid pressure if ventilating.

**Ensure adequate Vascular Access**
Assess airway for difficulty of intubation

Apply Cardiac Monitor and Pulse Ox - to be monitored continuously

Universal Patient Care

Try intubation with Cricoid Pressure

Unable due to clenched teeth

Placement Verified?
Confirm with 3 different methods and document all 3 in PCR.
Attach waveform ETCO2 device.

Attempt intubation with Cricoid Pressure

Successful: Secure ETT with commercial tube holder if available

For continued sedation, Versed 2 - 4 mg OR Ketamine*** 2mg/kg or 1mg/lb

If patient becomes combative or shows signs of need for prolonged paralysis...
Succinylcholine/Anectine**** 100 mg slow IV for short transport or Rocuronium Bromide 100 mg IV for longer transport

Contact Medical Control

If evidence of head injury:
Lidocaine 1.5 mg/kg IVP

In traumatic injury, consider Fentanyl/Sublimaze 50-75 mcg slow IV or IM as long as patient is hemodynamically stable

Apply C collar & secure pt. to LSB to reduce flexion of the neck that could cause dislodging of the tube

Legend

FR
EMT
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EMT-P
P

- For patients 13 years old or greater. If <13 yoa and you feel need for RSI, contact Medical Control.
- Remove front of cervical collar and maintain in-line stabilization during intubation for patients with suspected spinal injury.
- “Attach waveform ETCO2” includes BIADs/blind insertion airway devices i.e. King AW
- Disconnect Ventilation Source (bag, vent, etc) during all pt. moves to prevent dislodging of tube.
- Keep patient warm. Paralyzed patients can’t maintain temperature.
- RSI changes the normal muscle tone of the airway to the extent that it may make it impossible to ventilate the patient by mask.
- Medic that performed intubation should reconfirm tube placement following transfer of patient at the ED and obtain a confirmation signature from RT or other appropriate staff.

* BIAD /blind insertion airway device

** Etomidate adverse reactions: Too rapid of an injection may be followed by a fall in BP.

*** Ketamine - Avoid use in patients with: Hypertension, CHF, possible aneurysm and pregnancy. PREFERRED medication for continued sedation of patients with cardiovascular compromise.

**** Succinylcholine Contraindications: Personal or family hx of malignant hyperthermia, skeletal muscle myopathies, hypersensitivity to the drug, Significant burns > 24 hrs old, crush injury > 7days old, or chronic renal failure.

Approved By: ___________________________ Date: ______________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 05/15/2016
Difficult Intubation Assessment Tools

**Mallampati classification** for grading airways from the least difficult airway (class I) to the most difficult airway (class IV).

Critical, trauma or altered LOC patients may be assessed by visualizing the airway with a laryngoscope blade. This will make the assessment more difficult.

<table>
<thead>
<tr>
<th>Mallampati Class I</th>
<th>Mallampati Class II</th>
<th>Mallampati Class III</th>
<th>Mallampati Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>patient sits upright</em></td>
<td><em>tonsillar pillars and tip of uvula hidden by base of tongue</em></td>
<td><em>the soft palate is visible</em></td>
<td><em>only the hard palate is visible</em></td>
</tr>
<tr>
<td><em>head in neutral position</em></td>
<td></td>
<td><em>a difficult intubation is predicted</em></td>
<td><em>a difficult intubation is predicted</em></td>
</tr>
<tr>
<td><em>open mouth as wide as possible</em></td>
<td></td>
<td><em>consider awake intubation</em></td>
<td><em>consider awake intubation</em></td>
</tr>
<tr>
<td><em>protrudes tongue</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>soft palate</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>anterior, posterior tonsillar pillars are visible</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>uvula visible - all of it</em></td>
<td></td>
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</tbody>
</table>

**Measurement 3-3-1:**
- Should be able to lay 3 fingers under the patient’s chin running from the tip of the chin back towards the neck. Patients with a sloping neck are more difficult intubations.
- Patient should be able to open the mouth wide enough that 2 to 3 fingers could fit between the upper and lower incisors. These patients would have a smaller mouth opening.
- The patient should be able to protrude the lower jaw so that the lower teeth are 1 cm beyond the upper teeth. (Not as easily assessed)

ITLS, Sixth edition
Airway – Obstructed

<table>
<thead>
<tr>
<th>Signs of Mild Airway Obstruction:</th>
<th>Signs of Severe Airway Obstruction:</th>
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<tbody>
<tr>
<td>- Good air exchange</td>
<td>- Poor or no air exchange</td>
</tr>
<tr>
<td>- Responsive and can cough forcibly</td>
<td>- Weak, ineffective or no cough at all</td>
</tr>
<tr>
<td>- May wheeze in between coughs</td>
<td>- Increased respiratory difficulty</td>
</tr>
<tr>
<td></td>
<td>- Unable to speak</td>
</tr>
<tr>
<td></td>
<td>- Unable to move air</td>
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Universal Patient Care

Can patient cough or speak?

Yes

Encourage the patient to cough until obstruction relieved.

Obstruction relieved?

Yes

Contact Medical Control

No

Obstruction relieved?

No

Continue to assess and treat as needed.

Obstruction relieved, continue with appropriate assessment and treatment

If patient becomes unresponsive, place supine on hard surface and begin CPR, checking the mouth for foreign object before breaths.

While other staff performing CPR, view airway via direct laryngoscopy and remove object with forceps if visualized.

Obstruction relieved?

Yes

If unable to locate and remove obstruction, consider Percutaneous Cricothyroidotomy under “Airway- Failed” Do not delay transport.

NOTES:
- If success in relieving obstruction is via abdominal thrusts, encourage the patient to seek immediate medical attention at a healthcare facility to ensure they do not have a complication from abdominal thrusts.
- If patient is pregnant or obese, perform chest thrusts.
- **Infant (<1 yoa):** Perform 5 back blows and 5 chest thrusts instead of abdominal thrusts in the conscious infant, being careful to support the head and neck. Perform CPR if patient becomes unresponsive. Look in the mouth prior to ventilations and remove the object *only* if visualized.
- *Never* perform a blind finger sweep on any patient. Remove objects when visualized.
- If patient found unresponsive, breathless and you are unable to ventilate after two breaths and repositioning the head once, move to CPR and check the airway for foreign objects prior to ventilations.
- If breaths do not go in, do not attempt ventilations more than two times. Return immediately to chest compressions.

SPECIAL CONSIDERATIONS:
- If patient is pregnant or obese, perform chest thrusts.
- **Infant (<1 yoa):** Perform 5 back blows and 5 chest thrusts instead of abdominal thrusts in the conscious infant, being careful to support the head and neck. Perform CPR if patient becomes unresponsive. Look in the mouth prior to ventilations and remove the object *only* if visualized.
- *Never* perform a blind finger sweep on any patient. Remove objects when visualized.
- If patient found unresponsive, breathless and you are unable to ventilate after two breaths and repositioning the head once, move to CPR and check the airway for foreign objects prior to ventilations.
- If breaths do not go in, do not attempt ventilations more than two times. Return immediately to chest compressions.

Approved By: __________________________ Date: __________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Back Pain

**History:**
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

**Signs and Symptoms:**
- Pain (spinal or paraspinal)
- Swelling
- Pain with range of motion
- Extremity weakness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

---

**Universal Patient Care**

- **Injury or traumatic mechanism?**
  - No
    - **Orthostatic blood pressure?**
      - Positive
        - **Vascular Access**
          - **Normal Saline 500 cc bolus IV**
          - **Contact Medical Control**
    - Negative

---

**Legend**

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<thead>
<tr>
<th>FR</th>
<th>EMT</th>
<th>AEMT</th>
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<td>EMT-P</td>
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**Spinal Motion Restriction Standing Order**

- **Signs of shock?**
  - Yes
    - **Orthostatic blood pressure?**
      - Positive
        - **Vascular Access**
          - **Normal Saline 500 cc bolus IV**
          - **Contact Medical Control**
      - Negative

---

**Fentanyl/Sublimaze** 50 mcg slow IV or IM, as needed for pain, as long as patient is hemodynamically stable. May repeat one time.

---

*Fentanyl/Sublimaze Precautions:* hold if HR < 60 bpm, RR < 12/min, respiratory distress, BP <100 systolic, decreased mental status. Avoid use in pt’s who have received MAOI inhibitors within 14 days as it may produce potentially fatal reactions. SE: Apnea, laryngospasm, allergic bronchospasm, respiratory depression, arrhythmias, bradycardia, circulatory depression, hypotension, confusion, N/V, blurred/double vision, facial itching. **ANTIDOTE:** NARCAN

---

Approved By:____________________________________  Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015

---

Yes

Negative
Field Determination Of Death

**BLS & ALS crews are required to initiate CPR & ACLS unless**
clinical signs of death or appropriate paperwork are present.
The following Signs/ Symptoms must exist:

**Definitive Signs of Death:**
- Rigor Mortis (without Hypothermia)
- Dependant Lividity (pooling of blood, mottled appearance)
- Decomposition (massive breakdown of body tissue)
- Decapitation (or separation of heart, brain or vital organs)
- Incineration (total catastrophic burns)
- Devastating Injury (incompatible with life)
- Prolonged Arrest (during extrication &/or without CPR >15 minutes, etc.)

Or

**Triple Zero:**
- Apneic (No Respirations)
- Pulseless (No palpable pulse & no audible heart tones x 1 minute)
- Asystolic (present in (3) three leads for 1 minute)

And/ Or

**DNR:**
- Do Not Resuscitate (valid and signed)
- Hospice Care (with proper Advanced Healthcare Directives)
- Medic Alert (to withhold CPR and initiate DNR procedures)

**Then**

**Medical Control:**
- Contact Online Medical Control (emergency department MD, or EMS Medical Director for any consultation **if needed**)
- Direction (if unable to determine the criteria above, continue with BLS/ACLS resuscitation efforts & transport to the appropriate emergency department)

THEN

**Post Care:**
- Talk with Family (explain circumstances)
- Initiate Grief Support (contact Chaplain)
- Law Enforcement (notify appropriate agency) and Death Investigator
- Donor Card (investigate for Donor information)
- **Documentation (document thoroughly ALL findings leading to the “Field Determination Of Death”)**

---

Approved By: ______________________________________ Date: _______________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Hyperthermia

History:
- Exposure to increased temperatures and humidity.
- Past medical history / medications.
- Extreme exertion.
- Time and length of exposure.
- Poor oral intake.
- Fatigue and/or muscle cramping

Signs and Symptoms:
- Altered mental status or unconsciousness.
- Hot and dry or warm and moist skin.
- Hypotension or shock.
- Seizures
- Tachycardia, hyperventilation, hypertension

NOTES:
- Extremes of age are more prone to heat related emergencies (i.e. young and old)
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Sweating generally disappears as body temperature rises above 104 degrees F (40C)
- Monitor patient temperature and use caution to prevent overcooling.
- Repeat 20cc/kg bolus to maintain systolic BP ≥ 100.

Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Hypothermia

**History:**
- Exposure to environment even during normal temperatures.
- Exposure to extreme cold temperatures.
- Extremes of age.
- Drug use: Alcohol, barbituates.
- Wet
- Infections / sepsis
- Length of exposure.

**Signs and Symptoms:**
- Cold, clammy
- Shivering
- Mental status changes
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

---

**Universal Patient Care**

Move pt to warm environment. Remove wet clothing and apply warm blankets.

Evaluate pulse for 30 seconds to 1(one) minute (Do Not Perform CPR until No Pulse is Confirmed)

**Cardiac Monitor**

**Vascular Access** (Warm fluids if possible)

Is patient in cardiopulmonary arrest?

Yes

**Initiate CPR**

No

Continue CPR and intubate.

**Severe** hypothermia suspected:
If shockable rhythm, defibrillate once. If no response, withhold additional shocks and medications.
Continue CPR and intubate.

**Moderate** hypothermia suspected: administer shocks and meds at longer intervals. Provide rewarming.

**Universal Patient Care**

Contact Medical Control

**Legend**

- FR
- EMT
- A
- AEMT
- P
- EMT-P

---

**NOTES:**
- **Avoid** rough and/or excessive movement with the hypothermic patient. This may trigger v-fib. Perform all procedures and moves with as little movement as possible,
- S/S of varying body core temps:
  - 95ºF/mild- amnesia, poor judgment, hyperventilation, bradycardia, shivering
  - 90ºF/moderate- loss of coordination, drunken appearance, decreasing rate and depth of respirations, shivering ceases, bradycardia.
  - 85ºF/severe- decreased LOC, slow respirations, atrial fib, decreased BP, decreased HR, ventricular irritability

* To **rewarm**: heat packs to the groin, axillary and cervical areas. Utilize unit heater. Do not rub severely hypothermic patient to rewarm.

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Approved By: ________________________ Date: ________________

Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Restraint of Agitated, Uncontrollable Pt or with Presumed Excited Delirium or Psychosis

- Attempt to secure ABCs
- Administer O₂, Pulse Ox, ECG monitor
- Vascular access and administer NS @ 500cc/hr unless s/s of CHF
- Determine blood glucose and treat with appropriate standing order.

* Presence of S/S listed for uncontrollable pt. or Excited Delirium, request order* for “Mechanical Restraints” and/or “Chemical Restraints”

- Fully securing ABCs may be temporarily delayed due to pt. agitation. If pt. exhibits uncontrollable behavior that prevents the initial application or completion of performance of ABCs, proceed to “Mechanical” and/or “Chemical Restraints”
- Cool hyperthermic pt’s by use of cool water, ice packs, or remove layers clothing

Taser use by Law Enforcement:
- All patients subjected to use of the Taser device should be medically evaluated and monitored regularly if transported.
- Darts/barbs will not be removed in the field by EMS personnel.
- Darts to the eyes, mouth, face, neck and genitals or near indwelling medical devices or lines are recommended to be removed in the ED.

Notes:
- Your safety first! Law enforcement must have control of the patient and scene prior to care being rendered. Be aware of surroundings and maintain an avenue of escape.
- Abandon equipment if safety threatened.
- Do not allow patient to move about unattended. They are in familiar surroundings and may have hidden weapons.
- Be sure to consider all medical & trauma related causes for the behavior (hypoglycemia, OD, substance abuse, hypoxia, head injury, etc)
- Do not irritate the patient with a prolonged exam.
- At the discretion of the paramedic, Valium may be requested from Medical Control for the patient with extreme anxiety that is not yet violent.
- Restraints are any mechanical device or “chemical” used to limit patient movement for therapeutic and/or protective reasons.
- If the handcuffs/shackles are to be left on the patient during transport, the law enforcement personnel must accompany patient inside the EMS unit- Straps normally used on EMS stretchers, LBBs, etc. are not considered “restraints” for the purpose of this standing order.
- ANY USE OF FORCE MUST BE A NECESSARY AND/OR LAST RESORT! Must be documented thoroughly.

FR
A
EMT
A
P
EMT-P
P

Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Synthetic drugs are classified into two groups:

**Synthetic Cannabinoids** or Cannabis are herbal and chemical products that when consumed mimic the effects of Cannabis. These products are best known by the brand names K2 and Spice both of which have largely become the generic trademarks for any synthetic cannabis product. Studies are currently available which suggest an association between synthetic cannabinoids and psychosis. Responders should be aware that the use of synthetic cannabinoids can be associated with psychosis and investigate possible use of synthetic cannabinoids in patients with inexpressible psychotic symptoms. Myocardial infarctions and convulsions are also associated with use of synthetic cannabinoid products.

**Methylenedioxypyrovalerone (MPV)** or Mephedrone are commonly referred to as “Bath Salts”. MPV is a commercially available stimulant. “Bath Salts” are associated with psychosis as well. Slang names include “meph,” “drone,” “MCAT,” and “meow, meow.”

MPV is a powerful stimulant that functions as a dopamine-norepinephrine reuptake inhibitor (NDRI). It has stimulatory effects on the central nervous system and cardiovascular system. Physical symptoms include: rapid heartbeat, increase in blood pressure, vasoconstriction, sweating. Mental symptoms include: euphoria, increases in alertness & awareness, increased wakefulness and arousal, anxiety, agitation, perception of a diminished requirement for food and sleep, and intense desire to re-dose. MPV reportedly has four times the potency of Ritalin and Concerta. MPV is sometimes labeled online as legal cocaine or legal amphetamines.

The effects have a duration of roughly 3 to 4 hours, with after effects such as tachycardia, hypertension, and mild stimulation lasting from 6 to 8 hours. High doses have been observed to cause intense, prolonged panic attacks in stimulant-intolerant users, and there are anecdotal reports of psychosis from sleep withdrawal and addiction at higher doses or more frequent dosing intervals. It’s addiction potential is not fully known at this time. However, one of the effects of MPV is an intense desire to redose and there have been online reports from both professionals and users that MPV is “strongly addicting”.

**Signs / Symptoms:**
- Anxiety, agitation, confusion.
- Affect change, hallucinations.
- Delusional thoughts, bizarre behavior.
- Combative, violent.
- Expressions of suicidal / homicidal thoughts.
- Tachycardia, Seizures, increased core temperature

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**Legend**

<table>
<thead>
<tr>
<th>FR</th>
<th>EMT</th>
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<tr>
<td>A</td>
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<tr>
<td>P</td>
<td>EMT-P</td>
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</tbody>
</table>

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**Restraint of Agitated, Uncontrollable Pt or with Presumed Excited Delirium or Psychosis**

- Fully securing ABCs may be **temporarily delayed** due to pt. agitation.
- If pt. exhibits **uncontrollable behavior** that prevents the initial application or completion of performance of ABCs, **proceed to “Chemical Restraints”**
- Cool hyperthermic pt’s by use of cool water, ice packs, or remove clothing layers. **Establish IV Cooled NS @ 500cc/hr.**

---

**Crew Safety Paramount, Scene safety Request Law Enforcement and notify Shift Captain/Lieutenant**

- Attempt to **secure ABCs**
- Administer **O2, Pulse Ox, ECG monitor**
- **Vascular access.**
- Determine **blood glucose** and treat with appropriate standing order.

**Universal Patient Care**

- Remove patient from stressful environment
- Verbal techniques (establish rapport)

Continued on next page
Restraint of Agitated, Uncontrollable Patient with Presumed Synthetic Drug Use

Continued

CHEMICAL RESTRAINT

Versed/Midazolam 5mg IVP/IM/IN or Ativan/Lorazepam 4mg IM/IV or Valium 10mg IM/IV

Patient agitation may necessitate Versed first.

Patient sedated and condition improves

Yes

No

Place patient on side/supine/fowlers if they are no threat to the crew

Confirm/resume securing of ABCs along with pulse oximeter, cardiac monitor, serum glucose, exam for trauma/neuro impairment.

Monitor respirations closely.

Consider repeat dose if agitation resumes.

Versed/Midazolam 5mg IVP/IM/IN or Ativan/Lorazepam 4mg IM/IV or Valium 10mg IM/IV.

Patient agitation may necessitate Versed first.

Contact Medical Control

Failed Airway SO

RAPID SEQUENCE INTUBATION

Prepare equipment including: suction unit, laryngoscope, ETT & all checked. Have BIAD ready

Rocuronium Bromide 100mg IV

Attempt intubation with cricoid pressure.

Placement verified?

Confirm with 3 different methods and document all 3 on PCR. Attach waveform ETCO2 device

Secure pt to LBB to reduce flexion of the neck that could cause dislodging of the tube

Contact Medical Control

NOTES:
- Adult is defined as 13 years old or greater.
- Remove front of cervical collar and maintain in-line stabilization during intubation for patients with suspected spinal injury.
- “Attach waveform ETCO2” includes BIADs.
- Disconnect Ventilation Source (bag, vent, etc) during all pt. moves to prevent dislodging of tube.
- Monitor patient temperature. Paralyzed patients can’t maintain temperature. Keep them warm.
- RSI changes the normal muscle tone of the airway to the extent that it may make it impossible to ventilate the patient by mask.
- Medic that performed intubation should reconfirm tube placement following transfer of patient at the ED and obtain a confirmation signature from RT or other appropriate staff.
Vascular Access

Universal Patient Care

Assess need for IV, Emergent or potentially emergent medical / trauma condition.*

Establish Peripheral IV. Establish 2 IVs if needed and possible. Use largest catheter that can be successfully inserted.

IF UNSUCCESSFUL

External Jugular IV if life threatening event (Not a First Attempt Site)

Place pt. supine, head lowered to fill vein. Turn pts. Head to side. Locate vein (below the ear and behind the angle of the jaw).

Cleanse site well. Make venipuncture midway between angle of jaw and midclavicular line “tourniquetting” the vein lightly with one finger above the clavicle. Note blood return and advance catheter.

Place finger on skin at distal end of catheter to prevent bleeding and air entering. Place INT cap. Make sure no air enters the catheter and all air is purged from tubing prior to attaching to INT. Attach tubing to catheter. (Do Not use an INT cap without fluids attached) Secure catheter and tubing to pts. neck.

Intraosseous

Use when IV access is critical and cannot be established in 2 attempts or 90 seconds and IV access is critical

Find prominence of humeral head* by placing pt’s palm of same extremity over umbilicus. Place your palm on pt’s shoulder anteriorly. The area that feels like a “ball” is target area. Place ulnar aspect of the opposite hand along midline of upper arm laterally. Place your thumbs together over arm which identifies line of insertion. Palpate deeply as you climb up the humerus to the surgical neck. Insertion site is on the most prominent aspect of greater tubercle, 1 - 2 cm above surgical neck. Cleanse site with iodine. Hold drill at 45° angle.

Push needle tip through skin until tip rests against bone. The 5mm mark from hub must be visible above skin for confirmation of adequate needle set length. If not to the bone at this point, remove needle and look for another site or longer needle. Gently drill, until a “pop” or “give” is felt and then another 1-2 cm. Hold hub, remove drill & stylet. Aspirate bone marrow. Inject 10 cc of NS. Attach the IV line and adjust flow rate.

Existing Catheters

See “Existing Catheters” SO

Proximal tibia - extend & support lower extremity with leg slightly flexed. Locate bony prominence below knee cap. Insertion location is 2 finger widths below patella & approx. 1 finger width medial along flat aspect of the tibia. Mark insertion site & cleanse with iodine. Hold drill at 90° angle.

Concious pt.- SLOWLY administer 20-50 mg of 2% Lidocaine. Attach fluid. Unconscious pt.- flush and attach fluid. Use a pressure bag on all IO’s

Support and protect catheter with comercial device or bulky dressing

NOTES:
* The longer 45 mm needle set should be used when the proximal humerus site is used in adults.

- Do not delay transport to start IV’s unless it is needed to correct an immediate life threatening condition. Initiate them during transport whenever possible.
- Peripheral IVs should be initiated at the most distal site that can be successfully cannulated unless a larger, proximal vein is necessary for proper fluid administration.

Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Existing Catheters Access

Universal Patient Care

Assess need for IV, Life Threatening Condition or Cardiac Arrest.* Unable to establish peripheral IV in 2 attempts

Change gloves and using aseptic technique, clean catheter port with alcohol wipe. Withdraw 5-10cc of blood and discard syringe in sharps container.

Access port using aseptic technique and flush gently with 5 cc normal saline.

Signs of Infiltration or resistance flushing catheter (pain around site, swelling, redness etc..)

Do not use catheter and proceed to IO Protocol

Begin administration of IV fluids and medications.

Monitor Catheter site for signs of infiltration or clogging and discontinue use of catheter if noted.

Document procedure in the Patient Care Report (PCR)

YES

NO

Legend

| FR | EMT | AEMT | A | EMT-P | P |

NOTES:
- Do not delay transport to start IVs unless it is needed to correct an immediate life threatening condition. Initiate them during transport whenever possible.
- Peripheral IVs should be initiated at the most distal site that can be successfully cannulated unless a larger, proximal vein is necessary for proper fluid administration

Approved By: _______________________________ Date: __________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
CARDIAC STANDING ORDERS
Asystole/PEA

History:
- Past medical history
- Medications
- Events leading to arrest.
- DNR/POST form or living will

Signs and Symptoms:
- Pulseless
- Apneic
- Asystole: No electrical activity on EKG
- PEA: organized rhythm on EKG without palpable pulses

NOTES:
Search for and treat possible causes:
- Hypovolemia: Fluid challenge
- Toxins/OD: Appropriate to toxin
- Hypoxia: Ventilation
- Tension Pneumothorax: Needle Decompression
- Hyperkalemia: Sodium Bicarbonate
- Hyperglycemia: Dextrose
- Hypothermia: Warming
- Trauma: Fluid, Hyperventilate only s/s herniation syndrome

Withhold resuscitation

Confirm rhythm in three (3) leads

Universal Patient Care

Criteria for Field Determination of Death, DNR/POST forms or other appropriate paperwork on site and valid.

High Quality CPR, 30:2
Change compressors every 2 minutes.

- IV Normal Saline
- Epinephrine 1:10,000
  - 1 mg IV/IO
  - Repeat every 3 - 5 minutes

- Intubate without interrupting CPR

Continous compressions

After assuring effective ventilation and good chest compressions, and after Epi given, may consider:
Sodium Bicarbonate 1meq/kg IV/IO if prolonged arrest (15 to 20 minutes).

Meets criteria for “Termination of Resuscitation”

Contact Medical Control

Legend
FR
EMT
A
EAMT
A
P
EMT-P
P

Withhold resuscitation

Criteria for Field Determination of Death, DNR/POST forms or other appropriate paperwork on site and valid.

High Quality CPR, 30:2
Change compressors every 2 minutes.

- IV Normal Saline
- Epinephrine 1:10,000
  - 1 mg IV/IO
  - Repeat every 3 - 5 minutes

- Intubate without interrupting CPR

Continous compressions

After assuring effective ventilation and good chest compressions, and after Epi given, may consider:
Sodium Bicarbonate 1meq/kg IV/IO if prolonged arrest (15 to 20 minutes).

Meets criteria for “Termination of Resuscitation”

Contact Medical Control

NOTES:
Search for and treat possible causes:
- Hypovolemia: Fluid challenge
- Toxins/OD: Appropriate to toxin
- Hypoxia: Ventilation
- Tension Pneumothorax: Needle Decompression
- Hyperkalemia: Sodium Bicarbonate
- Hyperglycemia: Dextrose
- Hyperthermia: Warming
- Trauma: Fluid, Hyperventilate only s/s herniation syndrome
- ET dose of meds are 2 - 2.5 times the IV dose, IV/IO administration preferable. ET Epinephrine (1:1000) is 2 - 2.5 mg in 8cc NS.
- When patient is determined to meet the “Field Determination of Death” & “Termination of Resuscitation” protocols, ALL contributing criteria must be fully documented clearly and concisely in narrative.
NEW Onset Atrial Fibrillation / Flutter

**History:**
- Medications / Past medical history
- Syncope / near syncope
- Recent Drug Use
- Excessive Caffeine or Energy Drink Use
- Meds: Digoxin, Diet Pills, Decongestants, Thyroid Supplements

**Signs and Symptoms:**
- HR > 150/minute
- QRS < .12 sec
- Dizziness, CP, SOB, Palpitations

**Differentials:**
- WPW
- MI
- Hyperthyroidism
- Emotional Stress
- Electrolyte Imbalance
- Pain
- Fever
- Hypoxia
- Anemia

---

**Universal Patient Care**

**Cardiac monitor / 12-Lead ECG**

**Vascular Access**

**P**

**Stable**

**Vascular Access**

**Unstable**

**Synchronized Cardioversion 100 Joules**

**If rhythm changes go to appropriate SO**

**Contact Medical Control**

---

**Notes:**
- Large Bore IV preferred 18ga or larger for Adenosine administration. Preferred site: left AC.
- Patients with atrial fibrillation >48 hours should not be converted in the field unless unstable. This is due to increased risk of cardioembolic events. They require anticoagulant therapy prior to rhythm control.
- Stable patients may wait on expert consultation at facility due to the potential for harm from treatment.

---

Approved By: ___________________________ Date: ___________________________

Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 03/01/2016
Bradycardia

**History:**
- Past medical history.
- Medications:
  - Beta-blockers
  - Calcium channel blockers
  - Digitalis
  - Pacemaker

**Signs and Symptoms:**
- HR < 60/min or less than expected based on underlying condition or cause
- Chest pain
- Respiratory distress
- Pulmonary edema, hypotension, shock
- Altered mental status, syncope

**NOTES:**
- Do not delay transcutaneous pacing while awaiting IV access if patient is symptomatic.
- Do not delay transcutaneous pacing while waiting for atropine to take effect if patient is symptomatic.
- Use caution with Atropine in high degree AV blocks. Consider using transcutaneous pacing as first line intervention.
- Pacing contraindication: **severe hypothermia**.
- **DO Not treat PVC’s until rate is increased. PVC’s may be 2nd to hypoxia/poor perfusion**
- Remove clothing from upper body and replace with a hospital gown whenever possible.

**Legend**
- FR
- EMT
- A
- AEMT
- P
- EMT-P
- P

**Intervention Sequence**

1. **Universal Patient Care**
   - Cardiac monitor
   - 12-Lead ECG

2. **Vascular Access**
   - Hypotension
   - BP <90 systolic or signs of obvious hypoperfusion.

3. **Monitor and transport**

4. **Contact Medical Control**

5. **Transcutaneous pacing** - use w/o delay for high degree blocks.
   - **Demand Mode** - Pacer RATE 80/MIN
   - Begin at lowest/minimum energy setting.
   - **Increase mA until capture** achieved, then add 2 mA for safety margin.
   - **Assess pulse** at femoral artery or right brachial/radial
   - **May sedate** with Midazolam/Versed 2 - 5 mg

6. **Atropine 0.5mg IV** Repeat in 3-5 minutes, up to a max dose of 3 mg

7. **Dopamine 2-10 mcg/kg/min IV**

---

**Reminders:** If pulseless arrest develops, go to P.E.A. algorhythm.
- Search for and treat possible contributing factors:
  - Hypovolemia, Hypoxia, Hydrogen Ion (acidosis), Hypo/hyperkalemia, Hypoglycemia, Hypothermia
  - Toxins, Tamponade, cardiac, Tension pneumothorax, Thrombosis (coronary or pulmonary), Trauma (hypovolemia,increased ICP)

Approved By: ___________________________ Date: _______________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Ventricular Fibrillation/
Pulseless Ventricular Tachycardia

History:
- Estimated downtime.
- Past medical history / medications.
- Events leading to arrest.
- Renal failure / Dialysis.

Signs and Symptoms:
- Unresponsive, apneic, pulseless
- Ventricular fibrillation or tachycardia on EKG.

NOTES: Consider:
- Sodium Bicarbonate 1mEq/kg if prolonged arrest (>15-20 mins)
- Dextrose 50% 25 gm IV if Hypoglycemia suspected
- ET dose of appropriate drug is two (2) times normal dose. IO administration is preferred to ET.

Legend
FR
EMT
A EMT-I A
P EMT-P P

Universal Patient Care

Cardiac Arrest Standing Order

Unwitnessed: CPR for five (5) cycles

Witnessed:
Defibrillate at 200 j biphasic (or equivalent monophasic) for persistent VF/VT and resume CPR immediately for five (5) cycles

Vascular Access

Defibrillate at 200 j biphasic (or equivalent monophasic) for persistent VF/VT and resume CPR immediately- five (5) cycles

Epinephrine/Epi 1:10,000 1 mg IV
Repeat Every 3-5 min, Do Not Interrupt CPR

Defibrillate at 200 j biphasic (or equivalent monophasic) for persistent VF/VT and resume CPR immediately- five (5) cycles

Secure patient airway with endotrachael intubation. If unsuccessful, go to “Difficult Intubation” order Do Not Interrupt CPR to secure airway.

Lidocaine 1.5 mg/kg IV
If rhythm persists repeat dose .5-.75mg/kg q 5-10 min intervals until conversion or Max Dose of 3 doses or 3mg/kg Do Not Interrupt CPR

Defibrillate at 200 j biphasic (or equivalent monophasic) for persistent VF/VT and resume CPR immediately- five (5) cycles

If at any time pt. has return of pulses and stable rhythm, support ABC’s and If rhythm changes go to the appropriate protocol

Contact Medical Control

Approved By: __________________________ Date: ______________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Chest Pain
(Suspected Cardiac Event)

**History:**
- Medication, past medical history
- Allergies (morphine, aspirin, Zofran)
- Activity at onset of pain
- Pain, location, intensity (0-10), duration
- History of MI, angina, diabetes

**Signs and Symptoms:**
- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

**Universal Patient Care**

**Aspirin/324 mg max dose, preferably Baby ASA, if not taken past 24 hrs. Chew and swallow.**

**Vascular Access** (large bore if possible, AC preferable)

**Has the patient used erectile dysfunction meds within the last 48 hrs? (Ask both male and female pts.)**

**Signs and Symptoms:**
- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

**Nitroglycerin 0.4mg** sublingual if BP is above 110 mmHg, max of 3 doses

**If time allows and there is ST elevation in RV4, perform “right-side” ECG. If ST changes are present and/or there is ST elevation in V2 or V3, **DO NOT** administer Nitroglycerin**

**If at any time systolic B/P falls below 90mmHg, wipe Nitroglycerine paste from chest wall and give fluid bolus to maintain systolic B/P > 90mmHg.**

**Fentanyl 50-75 mcg IV/IO**
Repeat 1/2 dose Q 5 mins to max dose of 150 mcg

OR

**Morphine 2-4 mg Slow IV/IO**
Titrate to pain at additional doses of 2 mg, max dose of 10mg.

**Ondansetron/Zofran 4 mg Slow IV over 3-5 minutes. Repeat every 5 mins until relief or max dose of 12 mg.**

**Upon arrival at receiving facility, provide a copy of initial 12-lead ECG.**

**NOTES:**
- Rapid 12-lead acquisition is paramount. Any abnormalities or positive signs of STEMI require transmission to the ED
- **DO NOT** delay transport when STEMI identified or as patient condition indicates.
- B/P needs to be constantly monitored.
- Do not administer Nitro SL following Nitro Paste even if an IV is established.
- Remove clothing from upper body and replace with a hospital gown whenever possible.
- Upload EKG and 12-lead to PCR. If unable to upload 12 lead EKG, you must attach hard copy to insurance sheet with patient last name and PCR number on strip/s.

Approved By: ___________________________ Date: ___________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 11/30/2015
Supraventricular Tachycardia

**History:**
- Medications / Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

**Signs and Symptoms:**
- HR > 150/minute
- QRS < .12 sec
- Dizziness, CP, SOB
- Potential presenting rhythms:
  - Sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial tachycardia

---

Universal Patient Care

Cardiac monitor / 12-Lead ECG

Vascular Access

**Stable**

- Attempt **Vagal** maneuver* during preparation of Adenosine.

- Adenosine 6 mg rapid IV with rapid 20cc saline flush

- Rhythm converted?

**Yes**

- **Cardizem** If onset <48 hours or unstable.
  - 10mg Hypotensive (Systolic < 100)
  - 20mg Normotensive

- **Patients who have been in a fib longer than 48 hrs should not be converted in the field unless unstable.**

- Monitor and transport

**No**

- Adenosine 12 mg rapid IV with rapid 20cc saline flush
  - May repeat once

**IRREGULAR**

- Change in Rhythm

**Unstable**

- Consider sedation with Midazolam/Versed 2 - 5 mg IV

- Synchronized Cardioversion 100 Joules

- Escalate cardioversion current: 150, 200 Joules as needed per patient’s response

- If rhythm changes go to appropriate protocol

- Contact Medical Control

---

**NOTES:**
- **Large Bore IV** preferred 18ga or larger for Adenosine administration. Preferred site- left AC.
- **Patients with atrial fibrillation >48 hours should not be converted in the field unless unstable. This is due to increased risk of cardioembolic events. They require anticoagulant therapy prior to rhythm control.**
- Stable patients may wait on expert consultation at facility due to the potential for harm from treatment.

---

Approved By: __________________________ Date:________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 03/01/2016
SIGN SIGS AND SYMPTOMS OF ACUTE MYOCARDIAL INFARCTION

TYPICAL:

* Substernal or epigastric pain or discomfort
* Pain ranging from mild to severe / crushing
* Radiation of pain to neck, jaw, arms, or back
* Pain lasts longer than 15 minutes
* Pain not relieved by nitroglycerin
* Pain tends to occur at rest; not precipitated by exertion
* Diaphoresis
* Dyspnea
* Lightheadedness
* Nausea with or without vomiting

ATYPICAL:

* Non-retrosternal chest pain
* Atypical radiation of pain
* Discomfort in other areas of the upper body
* General weakness
* Dizziness
* Dyspnea without pain
* Diaphoresis in absence of any other S/S

FACTORS IN ATYPICAL PRESENTATION:

* Diabetes
* Female
* Elderly

The above lists are to be used as a guide only. All signs / symptoms do not have to be present to suspect a myocardial infarction. Medical control shall be contacted as needed if concerns regarding appropriate treatment arise.

NOTE:

In cases of AMI or suspected AMI and patient or family request transport to a facility that cannot appropriately manage the event (does not have cardiac services immediately available), advise patient of need to be transported to a facility that can render necessary care. Adequately document your recommendation and their acceptance or refusal of the recommendation.
Post Resuscitation

Reassess primary survey

Continue ventilatory support with 100% oxygen

Vascular Access (If not already done)

Monitor EKG, vital signs, and pulse oximetry. Maintain body temperature

Initiate a 4:1 drip of Lidocaine if it was responsible for conversion and deliver at the appropriate rate.

**Antiarrhythmics** should **NOT** be administered if the patient was converted by **defibrillation alone**. Administering medications without knowing the underlying cause of the rhythm could be detrimental to the patient.

<table>
<thead>
<tr>
<th>LIDOCAINE: (2 grams in 500 cc D5W)</th>
<th>ADMINISTERED</th>
<th>DRIP (on 60 gtt set)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mg/kg</td>
<td>2 mg/min (30 gtts/min)</td>
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<tr>
<td></td>
<td>&gt;1 - 2 mg/kg</td>
<td>3 mg/min (45 gtts/min)</td>
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<td>&gt;2 - 3 mg/kg</td>
<td>4 mg/min (60 gtts/min)</td>
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</tbody>
</table>

Consider Normal Saline 250-500 cc IV Bolus if patient remains hypotensive and lungs are clear.

Administer Dopamine 2 - 20 mcg/kg/min IV if patient remains hypotensive after fluid bolus or is hypotensive and lungs are wet. (Titrate to a systolic BP of ≥ 90 mm/Hg)

If arrest reoccurs, revert to the appropriate protocol and/or initially successful treatment

Contact Medical Control

Approved By: ____________________________________ Date: _________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Premature Ventricular Complexes

**NOTES:**
- Treatment with an antiarrhythmic is only used when significant and symptomatic.

**Simple PVCs**
Simple PVCs have the following characteristics:
- Occur beyond the T wave of the preceding QRS complex.
- Morphology is uniform.
- Occur in an isolated fashion and do not present in pairs or triplets.
- Generally exhibit constant coupling intervals with the preceding QRS complex.

This type of PVC is frequent in the general population and, as age increases, the frequency of such PVCs increases; approximately 70 percent of persons between the ages of 40 and 60 have simple PVCs, and they are seen in most individuals over age 60.

**Simple PVCs** that occur in persons without any type of cardiac disease do not require treatment. However, it is important not to overlook the fact that the majority of sudden deaths occur in persons who were previously believed to be healthy and normal. Therefore, when confronted with a patient with simple PVCs, the physician must rule out any associated cardiac or electrolyte abnormalities that may predispose the patient to sudden death. If the physician is confident that there is no associated heart disease, then this type of PVC should not place the patient at increased risk for sudden death.

**Complex PVCs**
Complex ventricular ectopy can be defined as PVCs that:
- Occur in pairs, triplets, or more prolonged runs of ventricular tachycardia (3 or more PVCs in a row).
- Fall in the vulnerable period of the cardiac cycle, (R on T).
- Have more than one morphology.

A close correlation exists between the complexity of PVCs and the risk of developing ventricular tachycardia and fibrillation in patients with cardiac disease. Patients who have complex ventricular ectopy without apparent cardiac disease only rarely experience life-threatening ventricular arrhythmias.

**Treatment**
Isolated or non-VT PVCs* are rarely treated except for needed symptomatic relief. In the setting of an acute myocardial infarction, frequent PVCs indicate the need to aggressively treat the ischemia/infarction with oxygen, nitroglycerin, morphine, and thrombolytic therapy. Simply making the PVCs diminish with lidocaine does little to the underlying pathology and can lure physicians into an invalid clinical security that the problem has been solved.

* VT is defined as three or more PVCs occurring in a row. When VT lasts for more than 30 seconds, it is arbitrarily defined as sustained ventricular tachycardia.

SO based on information from the American Heart Association and Tennessee State Protocols.

---

**AFTER** following the CP/Suspected Cardiac Event SO: UPC, Cardiac Monitor, MONA & 12 lead EKG and any of the following PVCs present, symptomatic and HR >60/min:
- Any PVC in AMI setting with associated chest pain
- Multifocal PVCs
- Unifocal and >15/minute
- Salvos/couplets/runs of V-Tach and symptomatic
- PVCs occurring near the “T-wave”

**NOTES:**

- **Lidocaine 1-1.5 mg/kg IV over 1 minute (peds. 1.0mg/kg),**
  - Repeat as needed @ 0.5-0.75 mg/kg q 5-10 minutes
  - **DO NOT DELAY TRANSPORT!**
  - If PVCs abolished, initiate Lidocaine drip at 2-4 mg/min

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<th>Contact Medical Control</th>
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ADOPTED 06/01/2015
Termination of Resuscitation
(Paramedic level ONLY)

1) Discontinuation of CPR and ALS interventions may be implemented prior to contact with Medical Control if ALL of the following criteria have been met and family present are in agreement with termination of efforts:
   1. Patient must be 18 years of age or older.
   2. Adequate CPR has been administered.
   3. An advanced airway has been placed with adequate ventilation.
   4. No evidence or suspicion of any of the following:
      a. Drug overdose / Toxic exposure
      b. Hypothermia
      c. Active internal bleeding
      d. Preceding trauma
   5. Rhythm appropriate medications and defibrillation have been administered according to WC/JC EMS Treatment Protocols for a total of three cycles of drug therapy (epinephrine) without return of spontaneous circulation (palpable pulse).
   6. Patient is in a non-shockable rhythm.
   7. All EMT-Paramedic personnel involved in the patient’s care agree that discontinuation of the resuscitation is appropriate.

2) All seven items listed above MUST be clearly documented in the patient care report narrative.

3) If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, contact Medical Control.

4) Tubes and IV lines may be removed if the patient is to be transported to or by a funeral home. If the patient is deemed a medical examiner’s case, all tubes and lines should be left in place.

5) Documentation of all patient care and encounters with the patient’s family, personal physician, medical examiner, law enforcement, and medical control should be documented in the PCR narrative.

6) EMT-Paramedic personnel are encouraged to attempt full resuscitative efforts if scene circumstances make implementation of this protocol difficult.

7) If transport has begun continue ALS and BLS procedures to the hospital.

8) After termination of efforts care is then to be focused on family support.

Approved By:____________________________________  Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 07/27/2011  Revised 08/17/2015
Torsades de Pointes
Polymorphic Ventricular Tachycardia

Assess For:
- Presence of pulses
- QRS complexes follow spindle-node pattern
- Decreased/Altered LOC
- Hypotension

- Wide (>$0.12$ secs.), irregular QRS with prolonged QT interval
- Heart Rate $>$160 BPM (if $<$160 BP, consider other causes)
- Dyspnea
- Chest pain/ discomfort, suspected AMI
- Diaphoresis
- CHF/ Pulmonary edema

Universal Patient Care Protocol

- Vascular access N/S @ TKO
- Cardiac Monitor 12 lead EKG and Transmit

Stable/Asymptomatic Torsades
Transport and Monitor closely.

Unstable/Symptomatic Torsades
- Prepare for unsynchronized cardioversion
- Administer sedative, time permitting Versed/Midazolam 2-5mg IV
- Shock @ 120j increase pm (150j & max 200j)

Stable/Symptomatic Torsades
- Magnesium Sulfate* 1-2g mixed with 6-8 ml NS for a total of 10ml solution delivered over 2-5 minutes

- Lidocaine 1-1.5 mg/kg IV Repeat @ 0.5-.75 mg/kg q 5-10 minutes to max dose of 3mg/kg
- Overdrive pacing at fixed rate of 100-120 BPM starting @ low energy level and increasing until capture achieved of desired rate.
- DO NOT DELAY TRANSPORT!

- Did rhythm convert to rate $<$160/min?
- Contact Medical Control

Legend
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EMT-P
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* Magnesium Sulfate is the antiarrhythmic of choice
Contraindications: Heart block, myocardial damage
SE: Respiratory depression, arrhythmias, hypotension (with rapid administration), hypothermia, depressed reflexes, weakness, vision abnormalities, flushing, sweating, bradycardia, drowsiness, itching/rash. Contact Medical Control if any side affects not present prior to administration of Magnesium Sulfate or worsening after administration. MD may order Calcium Gluconate as anti-dote. Calcium Gluconate dose 1gm over 2-3 minutes. Have anti-dote @ patient side when administering mag sulfate.

NOTES:
- polymorphic VT requires Immediate treatment because it is likely to deteriorate to pulseless arrest.
- Unstable can be characterized as altered LOC, hypotension and other signs of shock, i.e. pulmonary edema.
- DO NOT delay cardioversion while waiting for IV access if patient is unstable.

Approved By: Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015

P P P P P P
**Ventricular Tachycardia**

**History:**
- Past medical history
- Syncope / near syncope
- Palpatations
- Pacemaker

**Signs and Symptoms:**
- Ventricular tachycardia on EKG
- Conscious, rapid pulse
- Chest pain, shortness of breath
- Dizziness
- Rate usually greater than 150 and usually wide complex

---

**NOTES:**
* Magnesium Sulfate is the antiarrhythmic of choice for polymorphic ventricular tachycardia (Torsades de Pointes).
- If in doubt about the severity of symptoms, it is best to consider rapid cardioversion.
- **DO NOT** delay cardioversion while waiting for IV access if patient is symptomatic.

---

**Legend**
- FR
- EMT
  - A EMT-I
  - P EMT-P

---

**Universal Patient Care**

- **A** Vascular Access

---

**Consider Torsades de Pointes. Go to appropriate SO.**

---

**Pulseless V-Tach**

- **P** Ventricular Fibrillation Protocol

---

**Stable**

- **P** 
  - Adenosine 6mg rapid IV push with rapid 20cc saline flush. May repeat twice if no response in 1 to 2 minutes at 12mg rapid IV push.
  - **P** 
    - **P** Is patient symptomatic?

---

**Contact Medical Control**

---

**Unstable (chest pain, hypotension, pulmonary edema, syncope / near syncope)**

- **P** Synchronized cardioversion 100, 120, 200 joules (Consider Midazolam/Versed 2-5 mg IV for sedation)

---

**Lidocaine 1.5 mg/kg IV**

- **P** Resume attempts at cardioversion

---

**If VT becomes pulseless, go to appropriate protocol.**

---

**Synchronized cardioversion 100, 120, 200 joules (Consider Midazolam/Versed 2-5 mg IV for sedation)**

---

**Adenosine 6mg rapid IV push with rapid 20cc saline flush. May repeat twice if no response in 1 to 2 minutes at 12mg rapid IV push.**

---

**Is patient symptomatic?**

- **P** Consider cardioversion (Pre-medicate with Midazolam/Versed 2-5mg IV)

---

**Yes**

**Unstable (chest pain, hypotension, pulmonary edema, syncope / near syncope)**

---

**Synchronized cardioversion 100, 120, 200 joules (Consider Midazolam/Versed 2-5 mg IV for sedation)**

---

**Lidocaine 1.5 mg/kg IV**

---

**Resume attempts at cardioversion**

---

**If VT becomes pulseless, go to appropriate protocol.**

---

**Legend**
- FR
- EMT
  - A EMT-I
  - P EMT-P

---

Approved By: ____________________________________ Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
MEDICAL TREATMENT STANDING ORDERS
Abdominal Pain

Notes:
- Abdominal pain in women of child bearing age should be treated as an ectopic pregnancy.
- Consider the possibility of abdominal aortic aneurysm; especially in patients over 50.
- If pt. shows signs of shock, establish second large bore IV of Lactated Ringers to maintain systolic B/P of 90 mm/hg
- Give nothing by mouth.

Legend

FR
EMT
A  EMT-I  A
P  EMT-P  P

History:
- Age
- Past Medical History
- Past surgical history
- Medications
- Onset / Severity of pain
- Pain severity (1-10)
- Radiation
- Character of pain
- Fever
- Last Meal
- Improvement / Worsening
- Last bowel movement
- Menstrual history.

Signs / Symptoms
- Pain / Tenderness
- Nausea / Vomiting
- Diarrhea / Constipation
- Vaginal Bleeding
- Pregnancy
- Associated symptoms

Universal Patient Care

Consider differential diagnosis:
AMI, AAA, kidney stone, bowel obstruction, gastroenteritis, Appendicitis, liver, peptic ulcer, gallbladder, pancreatitis, pelvic problem (PID, cyst, ectopic pregnancy), spleen, diverticulitis, bladder/prostate disorder, pneumonia.

Vascular Access.
LR or Normal Saline
Run at a rate to maintain systolic B/P of 90 mm/hg

Fentanyl/Sublimaze 50-75 mcg slow IV or IM* as needed for pain, as long as patient is hemodynamically stable. May repeat one time.

Document patient's mental status and V/S prior to administering medication.

Cardiac Monitor and 12 lead SPO2 monitoring

Contact Medical Control

Ondansetron/Zofran* 4mg IV slowly over 3-5 mins. Repeat dose every 5 mins until relief or max dose of 12 mg.

Legend

FR
EMT
A  EMT-I  A
P  EMT-P  P

Approved By: __________________________ Date: __________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 03/01/2016
Allergic Reaction/Anaphylaxis

**History:**
- Patient may have a history of allergy to food, insect stings, or medication.

**Presentation:**
- Patient may present with dyspnea, hives, facial swelling, and/or wheezing.

Universal Patient Care

Is patient in severe respiratory distress or systolic BP <90?

- **Yes**
  - **Epinephrine 1:1000**
    - 0.3 - 0.5 mg IM
  - Manage airway as needed.
  - Vascular access, wide open
  - **Benedryl/Diphenhydramine**
    - 25-50 mg IM or IV
  - Cardiac monitor
  - Continued symptoms?
    - **Consider:**
      - **Epinephrine 1:1000**
        - 0.3 - 0.5 mg IM every 5-10 minutes
      - Second IV wide open
      - **Albuterol/Atrovent HHN**
  - **Consider:**
    - **Benedryl/Diphenhydramine**
      - 25-50 mg IM or IV
    - **Albuterol & Atrovent HHN**

- **No**
  - **Cardiac monitor**
  - **Vascular access**
  - **Consider:**
    - **Epinephrine 1:1000**
      - 0.3 - 0.5 mg IM
    - Contact Medical Control
    - **Consider:**
      - **Benedryl/Diphenhydramine**
        - 25-50 mg IM or IV
      - **Albuterol & Atrovent HHN**
      - **Consider:**
        - **Dopamine**
          - 5 - 20 ug/kg/min IV for refractory hypotension

**NOTES:**
- Use caution with epinephrine in patients older than 50 or those with a history of cardiac disease.
- Use caution with epinephrine if initial heart rate is >150.
- When mixing with Albuterol, use the Atrovent concentration of 0.5 mg/ 0.5 mL.

* Consider Epi 0.5 mg 1:10,000 slow IVP (if already in place)

**Solu-Medrol/Methylprednisolone- SE:** flushing, sweating, circulatory collapse, tachycardia, embolism, nausea.

Approved By: ____________________________ Date: ____________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Altered Mental Status

**History:**
- Known diabetic, medic alert tag.
- Drugs, drug paraphernalia.
- Report of illicit drug use or toxic ingestion.
- Past medical history, medications.
- History of trauma

**Signs / Symptoms:**
- Decreased mental status.
- Changes in baseline mental status.
- Bizarre behavior.
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath odor, Kussmal respiration, signs of dehydration.)

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**Legend**

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**Flowchart:**

1. **Universal Patient Care**
   - **Evaluate need for Spinal Motion Restriction**
     - **Glucose < 60**
       - **Return to baseline?**
         - **Yes**
         - **Glucagon 1 mg IM if no IV for D50**
     - **Glucose > 250**
       - **Cincinnati Prehospital Stroke Scale**
         - **Speech, Facial Droop, Arm Drift**
       - **Patient shows S/S of opioid overdose**
         - **Naloxone/Narcan 0.4 mg slow IV until respiratory depression reversed.**
       - **Repeat Naloxone/Narcan 2 mg slow IV if patient still has respiratory depression**
       - **Contact Medical Control**

**NOTES:**
- S/S Opioid overdose: Respiratory Depression, CNS Depression, Miosis/ pupil constriction
- Neonates are considered hypoglycemic if BGL < 40 mg/dl.
- Use Dextrose 25% if patient is less than 3 years of age.
- Pediatric dose of Naloxone is 0.1 mg/kg IV, IO, ET, IM, SQ
- No response and patient has diminished or absent gag reflex, secure airway by intubation (endotrachael/nasotrachael)

Approved By: ______________________ Date: ______________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
**Do Not** use this standing order if the pt. is asymptomatic or suspected of having a stroke. (refer to Suspected Stroke SO). **Contact Medical Control** immediately if pt. >65 yoa and/or presents with neurological deficits believed to be the result of HTN.

**If systolic BP >220 or diastolic B/P >120 apply Nitroglycerin Paste, 1 inch. Monitor B/P closely. If B/P drops more than 10%, remove and wipe Nitro paste off body.**

---

** universal Patient Care

- **Is systolic BP > 200 mmHg and/or diastolic BP > 120 mmHg?**
  - **No**
    - Monitor and Transport
  - **Yes**
    - **Vascular Access**
      - **Is patient symptomatic?**
        - **Yes**
          - **Contact Medical Control**
        - **No**
          - **12-lead EKG**
            - **P**
              - **If systolic BP >220 or diastolic B/P >120 apply Nitroglycerin Paste, 1 inch. Monitor B/P closely. If B/P drops more than 10%, remove and wipe Nitro paste off body.**

---

**Notes:**

- Never treat hypertension based on one set of vitals.
- Use appropriate size cuff for patient arm size as one too large or too small can skew the blood pressure reading. One too small will cause the reading to read higher than the actual blood pressure. Too large a cuff will give one too low.

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**Approved By:** Mark Wilkinson, M.D.  WC/JC EMS Medical Director  
**Date:**  
**Adopted 06/01/2015**
Hypotension (Non-Traumatic)
(No S/S of Pulmonary Edema or CHF)

- Consider all possible causes of shock, and utilize the appropriate standing order.
- Injuries may be hidden, such as; small caliber gun shot wounds, insect stings or bites.
- Consider anaphylactic reaction to food or insect envenomation.

Universal Patient Care

Cardiac monitor / 12 lead EKG

Vascular Access

Normal Saline 250-500 cc IV Bolus
Titrated to B/P of 90 mmHg systolic or greater (if no pulmonary edema)

Reassess patient:
Lung sounds clear?

Yes

No

Hypotension S/S resolved?

Yes

No

Consider:
Dopamine 5 - 20 ug/kg/min IV
(titrated to effect)

Contact Medical Control

Legend

FR
EMT
EMT-I
EMT-P
Nausea/Vomiting

Universal Patient Care

Cardiac Monitor
Consider 12-lead

IV Access Protocol

Does patient have other signs / symptoms?

Contact Medical Control

Assess for other medical conditions and utilize the appropriate protocol

Ondansetron/Zofran
4mg IV slowly over 3-5 minutes repeat every 5 minutes until relief or max dose of 12 mg
OR
Promethazine/Phenegran
12.5-25 mg IM
Document mental status and vital signs prior to administering medications

Monitor patient BP, pulse & respiratory rate frequently. Assess for level of sedation, involuntary body movement and hives

NOTES:
- Monitor patient BP, pulse & respiratory rate frequently. Assess for level of sedation, involuntary body movement and hives

Contraindications:
- Promethazine/Phenegran: <2 yoa, comatose pt., narrow angle glaucoma, prostatic hypertrophy, bladder neck obstruction.
  SE: confusion, disorientation, sedation, dizziness, fatigue, nervousness, bradycardia, tachycardia, hypotension, hypertension, vision disturbances, dry mouth, rash
- Ondansetron/Zofran:
  SE: headache, dizziness, drowsiness, fatigue, weakness, diarrhea, abdominal pain, dry mouth
Precautions: May mask ileus/ GI obstruction: may cause transient visual difficulty
Obstetrical Emergency-Preeclampsia/Eclampsia

**History:**
- Past medical history
- Hypertension medications
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

**Signs & Symptoms:**
- Hyperreflexia/exaggeration of reflexes
- Vaginal bleeding
- Abdominal Pain
- Seizures
- Hypertension / hypotension
- Severe headache
- Visual changes
- Edema of the hands & feet

---

**Universal Patient Care**

**Vascular Access**
Check **blood glucose** level if <80 mg/dl, administer **D50**

**Vaginal bleeding / Abdominal pain?**
- Yes
  - **Known pregnancy or missed period?**
    - Yes
      - Follow Abdominal Pain SO
    - No
      - 1st and 2nd Trimester
      - Left lateral position
      - Rapid transport
      - Childbirth SO

- No
  - Hypertension
    - Systolic >160, Diastolic >110 or 30 systolic or 20 diastolic point increase in pre-pregnancy B/P
    - Magnesium sulfate 4g IV/IM/IN
    - **Left lateral position**
    - **Seizure or seizure-like activity?**
      - Yes
        - Ativan 1-2 mg IV/IM/IN or Midazolam/Versed 2-5mg IVP/IN
        - Refer to “Seizure” SO
      - No
        - **Maintain Airway and oxygenate**
        - **Monitor EKG continuously**
        - **Quiet, rapid transport**
    - **Orthostatic Vitals** Hypotensive?
      - Yes
        - **Normal Saline 500 cc IV bolus**
        - **Estimated gestation**
        - **Contact Medical Control early** in management of this pt. Advise number of weeks gestation.
      - No
        - 3rd Trimester
        - **Left lateral position**
        - **Rapid transport**
        - **“Childbirth” SO**

**NOTES:**
- Severe headache, vision changes, or RUQ pain may indicate pre-eclampsia
- Maintain patient in left lateral position, and provide for comfort and reassurance.
- Record a B/P and the presence or absence of edema of every pregnant pt. examined regardless of the chief complaint.
Overdose / Toxic Ingestion

NOTES:
- Do not rely on patients history of ingestion, especially in suicide attempts.
- Abrupt reversal of opioid depression may result in nausea, vomiting, tachycardia, increased BP, tremulousness, seizures, V tach, V fib and pulmonary edema.
- Duration of opioid may outlive Naloxone. Monitor patient continuously and be prepared to repeat dose.
- Goal is to reverse respiratory depression, not fully awaken the patient.
- Bring bottles, contents, emesis to the ED.
- 12 lead EKG should be performed on all OD patients.

History:
- Ingestion or suspected ingestion of a potentially toxic substance.
- Substance ingested, route, quantity.
- Time of ingestion,
- Reason (suicidal, accidental, criminal)
- Past Medical History, medications

Universal Patient Care

Vascular Access
(Perform blood glucose check)

Suspected narcotic overdose

Naloxone/Narcan 0.4 mg slow IV/IO/IN
May repeat in 2 mins. at 2 mg.
(0.01 mg/kg for pediatrics IV/IO, Repeat at 0.1 mg/kg if not reversed)

Organophosphate poisonings

Atropine 2 mg IV,IM
(0.02 mg/kg for pediatrics IV) (0.5 - 1 mg for pediatrics IM)
Repeat until s/s subside

Contact Medical Control

Tricyclic antidepressant overdose

Sodium Bicarbonate 1 mEq/kg IV

Poisoning not addressed by this protocol

\* Pt must show these S/S: Respiratory Depression, CNS Depression, Miosis/ pupil constriction

Legend

FR
EMT
A EMT-I A
P EMT-P P

Approved By:_________________________ Date:_________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
### Respiratory Distress / CPAP

**Indications for CPAP use:**
- CHF/Pulmonary edema-COPD (asthma, emphysema, bronchitis)
- Pneumonia
- Carbon monoxide poisoning
- Near drowning
- C/O SOB without pneumothorax
- Ability to maintain an open airway (GCS>10)
- Comfort measure for DNR or DNI patient
- Organophosphate or WMD poisoning
- Pandemic/avian flu

And two or more of the following:
- RR > than 25 breaths per min
- Systolic BP above 90 mmHg
- Uses accessory muscles during respirations

**Signs & Symptoms:**
- Hypoxia
- Pale or cyanotic
- Dyspnea and/or tachypnea
- Uses accessory muscles
- Wheezing, rales or rhonchi
- Chest pain, hypertension, tachycardia
- Anxiety, restlessness, altered LOC
- Frothy sputum (severe cases)
- Diaphoretic
- Edema

**Contraindications of CPAP:**
- **Respiratory** or cardiac arrest
- **agonal** respirations
- **unconscious**
- **Diaphoresis** in the presence of low blood pressure is a relative contraindication. Use of CPAP in these patients can induce a rapid decline in patient condition. **Proceed with caution.** Perform a 12-lead EKG prior to administration of CPAP as AMI may be present.
- **AMI** - perform 12-lead prior to CPAP administration if you suspect patient is having an MI. If 12-lead positive for MI, withhold CPAP.
- **pneumothorax**
- **penetrating** chest trauma
- persistent nausea/vomiting
- **facial anomalies** / stroke obtundation / facial trauma
- Has active **upper GI bleeding** or history of recent gastric surgery
- Patient who **does not improve** or **continues to deteriorate** with CPAP.
- Inability to achieve adequate face mask fit.
- Inability of patient to cooperate with therapy.

**NOTES:**
- CPAP should **not** be used in children under 12 years of age.
- Advise receiving hospital as soon as possible so they can prepare for the patient’s arrival. Advise of the current CPAP pressure.
- Do not remove CPAP until arrival at hospital and another method of therapy is ready to be placed on the patient. Respiratory can bag the patient until they are ready to initiate bi-pap or another method of airway management. Document delays in providing airway management by the receiving hospital.
- If it becomes necessary to use NTG PO, use tablets instead of spray to prevent the spray from being dispersed on patient and EMS crew.
- CPAP devices are simple to use, but their effective application requires skill. Providers must coach their patients throughout the CPAP process and be vigilant for changes in the patient’s condition.
- With improvement in patient condition, stop at that intervention. If patient condition worsens during the course of treatment, proceed to appropriate advanced treatment or SO.
- Even though this is recognized as an EMT skill, the **paramedic** is to accompany the patient to the hospital.
- Assure adequate O2 in the portable tank and have spare ready to change when necessary.
- Waveform capnography can and should be utilized by placing the in-line ETCO2 sensor on the exhalation port of the circuit. You may also place a nasal cannula sensor on the patient without interference to mask seal.
Respiratory Distress / CPAP

Assess Airway, Breathing & Circulation
Place pt. in sitting or upright position.

Oxygen-100% 12-15 lpm NRB
RR<10 or >30 consider ventilatory assist

Does patient require immediate intervention:
CPAP for moderate to severe distress
(Intubation for imminent respiratory arrest)

P: Yes  A: No
Vascular Access

Cardiac Monitor & 12 Lead

If systolic BP < 90 mmHg,
Dopamine 5-20 mcg/kg/min IV.
Tritate to effect.

Treatments:
Nitroglycerin paste -1 inch *
(Move if systolic BP falls < 90 mmHg)
Morphine Sulfate 2-4 mg IV
Administer in 2 mg increments.

Furosemide/Lasix 1 mg/kg IV **
Max single administration 80mg:
(If on lasix at home, double patient's
total daily PO dose for IV dose)
additional doses should be given
at 10 minute intervals.

Is patient wheezing?

Contact medical control

Yes →

Confirm CPAP need per "Indications"*

Rule out "Contraindications"

Nitroglycerin paste -1 inch*
Explain CPAP procedure to the patient.

Calm/reassure pt: verbal sedation.
If patient extremely agitated
consider sedation with:
Ativan 0.5 mg - 1 mg IV or
Valium/Diazepam 2-4mg IV/IN or
Versed/Midazolam 2mg slow IV or IN

Administer CPAP per
"CPAP Procedure".
(If patient does not improve within
5 minutes, proceed to appropriate
airway SO.)

Administer nebulizer mixture of
Albuterol & Atrovent***

If patient does not improve &
CPAP has not been applied,
proceed to appropriate SO-CPAP
if >12yo or "Airway" for intubation.

*Question the patient about the use of Erectile Dysfunction medication such as Viagra, Cialis,
Levitra, etc., use in the last 24 hours. If affirmed, withhold Nitro.

** If patient is on dialysis, omit lasix and continue with Morphine Sulfate.

*** When mixing with Albuterol, use the Atrovent concentration of 0.5 mg/0.5 mL.

Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 05/15/2016
Respiratory Distress - Asthma/COPD

**History:**
- Asthma, COPD, chronic bronchitis, emphysema, CHF.
- Home treatment (oxygen, nebulizers).
- Medications (theophylline, steroids, inhalers, antibiotics, blood pressure medications).
- Toxic exposure, smoke inhalation.
- Diagnosis or S/S of pneumonia.

**Signs / Symptoms:**
- Shortness of breath, pursed lip breathing.
- Decreased ability to speak.
- Wheezing, rhonchi.
- Orthopnea.
- Use of accessory muscles.
- Fever, cough.
- Tachycardia.

**Legend:**
- FR
- EMT
- A
- EMT-I
- I
- EMT-P
- P

**Mild distress - slight increase RR, mild wheezes, good skin color:**
- Albuterol HHN, as long as HR < 160.
- Obtain Vascular Access As time permits.

**Moderate distress - marked increase in RR, wheezes easily heard, accessory muscle breathing:**
- Albuterol & Atrovent** mix continuous inhalation, HHN as long as HR < 160.
- Cardiac Monitor.
- Vascular Access.

**Severe distress - RR > twice the norm, loud wheezes or so tight no wheezes heard, pt anxious, skin ashen or gray:**
- Continue steps as needed to improve pt. condition. Stop further treatments when condition resolves.
- Albuterol & Atrovent** mix continuous inhalation, HHN as long as HR < 160.
- Vascular Access.
- CPAP Guideline***.
- Cardiac Monitor.
- Methylprednisolone/Solumedrol* 125 mg IV or IM.
- Epi 1:1000 0.3mg IM (Peds 0.01mg/kg IM, max 0.3mg).
- Patient not improving and showing S/S impending Respiratory Failure, consider RSI SO.

**NOTES:**
- EMT-I: If pt has a metered dose inhaler (MDI) that is prescribed to them, assist the pt. in using this device provided patient's maximum dose has not been met. If no change in condition, then proceed to standing order.
- If patient is unable to use the HHN, administer via mask nebulizer.
- The order of treatments may change with pt presentation or be simultaneously performed. Whatever is most beneficial to the pt.


**When mixing with Albuterol, use the Atrovent concentration of 0.5 mg/0.5 mL.**

***If patient is on a disposable CPAP mask and condition is stable, do not change to the PortO2Vent CPAP. Only change if the mask is deemed ineffective.

Approved By: __________________ Date:____________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 11/30/2015
Seizure

History:
- Witnessed or reported seizure activity.
- Past seizure history.
- Medications for seizures.
- Medic Alert tag information.

Signs / Symptoms
- Decreased mental status.
- Sleepiness
- Incontinence
- Observed seizure activity.

Universal Patient Care

Vascular Access
(Perform blood glucose check)

Cardiac monitor and SPO2

If patient is actively seizing* administer:

Diazepam/Valium 2- 5 mg IV/IN
(May repeat in 5 minutes)
(Max dose: 10 mg)
(May administer IM)

or

Midazolam/Versed 2 - 5 mg IV/IN
as an alternative or for refractory seizures
(May repeat in 5 minutes)
(Max dose: 10 mg)

Or

Ativan/Lorazepam 1-2 mg IV/IM/IN
May repeat in 5 minutes
(Max dose: 4mg)

Contact Medical Control

*Consider “eclampsia” in hypertensive female patients who are either >27 weeks gestation or those who are within 10 days postpartum. If patient had eclampsia during pregnancy the chances are increased for postpartum seizures. Treatment is the same.
Suspected Stroke

**History:**
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: Diabetes, Hypertension, ASCVD
- Atrial fibrillation
- Medications (blood thinners)

**Signs/Symptoms**
- Altered mental status
- Hypertension/hypotension
- Associated symptoms in presence of “new onset” atrial fibrillation
- Sudden weakness or numbness of the face, arm or leg
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden severe headache with no known cause

**NOTES:**
- Do not delay transport of suspected stroke patients. Perform interventions enroute to hospital
- Transport to stroke center or closest appropriate facility. Consider aeromedical transport if patient is a candidate for fibrinolytics and 3-hour window is nearing.
- Elevated BP is common with CVA- do not treat.
- Hypoglycemia may present as localized neurological deficit, especially in the elderly.
- For fibrinolytic consideration, attempt to establish time of onset of symptoms. If no one was with patient or woke up with S/S, determine time last seen normal.
- EMS goal- rapid recognition, rapid transport and rapid hospital notification.
- Stroke patients are at risk for respiratory compromise from aspiration, airway obstruction, difficulty swallowing and hypoventilation. Be prepared to suction.

**Universal Patient Care**
- Identify signs of possible stroke. Perform CPSS of MEND exam.
- Establish time of onset of symptoms.
- Stroke probable? Do not delay, TRANSPORT. Consider Altered Mental Status Standing Order
- Oxygen
- EKG
- Vascular Access and blood glucose check. Give D50 if BGL <50; >50 DO NOT treat.
- 12-lead during transport
- If possible, complete MEND exam during transport & fill out “Fibrinolytic Checklist”.
- Contact Medical Control ASAP

**MEND Examination**
Green boxes contain basic exam (CPSS)

**MENTAL STATUS**
- Level of consciousness
- Speech: “You can’t teach an old dog new tricks.”
- Questions (age, month)
- Commands (close and open eyes)

**CRANIAL NERVES**
- Facial droop (show teeth or smile)
- Visual fields (four quadrants)
- Horizontal gaze (side to side)

**LIMBS**
- Motor – Arm drift (close eyes- hold out arms)
- Leg drift (open eyes, lift each leg separately)
- Sensory- Arm, leg (close eyes, touch/pinch pt)
- Coordination- Arm, leg (finger-nose, heel-shin)

**Legend**
- FR
- EMT
- A
- EMT-I
- P
- EMT-P

**Approved By: _____________________________ Date: _____________________________**
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Pt. Name: __________________________ Date: ________________
DOB: _________________________    Age: ___________    Gender: ___________
BP/L: ________/________    R: ________/_________   HR: _______   RR: ______
Blood glucose level: ______________   (Do not treat unless <50)

Symptoms __________________________________________________________

Allergies □ NKDA   ___________________________________________________

Meds: □ ASA   □ Aggrenox □ Plavix □ Coumadin Other:________________

Past Hx ____________________________________________________________

Last Meal _____am/pm  Events Prior ________________________________

Management
Do **NOT** treat hypertension
Do **NOT** allow aspiration, keep head of bed elevated
EKG rhythm:  12-lead: __________________________________________

MEND Examination
Green boxes contain basic exam (CPSS)

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Stroke Fibrinolytic Checklist

**Inclusion Criteria:**
- □ Age 18 or older
- □ Time of onset (when patient last seen normal): _________ AM / PM
  - ED must establish as < 3 hours before treatment would begin.

**Exclusion Criteria:**
- □ History of intracranial hemorrhage?
- □ Known arteriovenous malformation, neoplasm, or aneurysm?
- □ Active internal bleeding or acute trauma (i.e. fracture)?
- □ Head trauma?
- □ Heparin received in the last 48 hours?
- □ Current use of anticoagulant? Name of drug: __________________
- □ Within 3 months of intracranial or intraspinal surgery, serious head trauma or previous stroke?
- □ Severe HA, stiff neck, LOC (indications of brain hemorrhage)

**Relative Contraindications/Precautions**
- □ Within 14 days of major surgery or serious trauma?
- □ Gastrointestinal or urinary tract hemorrhage in last 21 days?
- □ AMI in last 3 months?
- □ Post myocardial infarction pericarditis?
- □ Blood glucose <50 or >400mg/dL?

**Radio report to include:**

<table>
<thead>
<tr>
<th>Time of onset</th>
<th>LOC</th>
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<tr>
<td>History of Trauma</td>
<td>Speech deficits</td>
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<tr>
<td>Seizure at onset</td>
<td>Visual field</td>
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<tr>
<td>Motor strength</td>
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**Witness name:** __________________________________________

**Witness Phone number:** __________________________________

Paramedic:                                    Unit#
**Syncope**

**History:**
- Cardiac history.
- Females; LMP, vaginal bleeding.
- Fluid loss, vomiting, diarrhea.
- Past medical history.
- Medications

**Signs / Symptoms**
- Loss of consciousness w/ recovery.
- Lightheadedness, dizziness.
- Palpitations, slow or rapid pulse.
- Irregular pulse.
- Decreased blood pressure (Can be relative to the patients normal BP)

---

**NOTES:**
- Assess for signs & symptoms of trauma, if questionable about fall.
- **Consider dysrhythmia**, GI bleed, ectopic pregnancy, seizures.
- More than 25% of elderly syncope is due to cardiac dysrhythmias. (Note it may be transient, therefore indicating need for continuous cardiac monitoring during care)
- **IS THERE A HISTORY OF FALL WITHIN THE PREVIOUS TWO WEEKS?** (Consider sub-dural bleed, especially in the chronic alcoholic and homeless patients, who are less likely to seek treatment for falls)
TRAUMA
TREATMENT
STANDING
ORDERS
Considerations for ALS Trauma Care/ Automatic Load and GO Situation

### ARRIVAL AT SCENE
- Make a quick assessment of the overall situation.
- Survey for scene hazards
- Be aware of the number of patients.
- Note the mechanism of injury.

### RAPID TRANSPORT IS A PRIORITY
Only critical intervention skills are accomplished on the scene (pleural decompression, airway management). IV therapy, splinting, and secondary survey are to be accomplished enroute to the hospital.

### Load and Go Situations
The following situations require rapid transport:

A. Airway obstruction that cannot be quickly relieved by mechanical means (suction, forceps, intubation).

B. Conditions resulting in possible inadequate oxygenation
   1. Large open chest wound
   2. Flail chest
   3. Tension pneumothorax
   4. Major blunt chest trauma
   5. Suspected cardiac tamponade

C. Traumatic cardiopulmonary arrest.

D. Shock.

E. Head injury with unconsciousness, unequal pupils, decreasing level of consciousness, otherwise deteriorating condition.

F. Secondary survey findings include:
   1. Tender and/or distended abdomen.
   2. Bilateral femur fractures.
   3. Unstable pelvis
   4. Traumatic proximal limb amputation.

### “AUTOMATIC LOAD AND GO” SITUATIONS

#### MECHANISM:
- Falls > 20 feet or 2½ times patient height
- Death of Occupant of same vehicle
- Struck by Vehicle > 20 mph.
- Ejected from Vehicle
- Severe vehicle deformity
- Intrusion in passenger compartment
- Rollover with signs of Internal Impact

#### PHYSICAL FINDINGS
- Pulse >120 or <50
- Systolic B/P < 90
- Respiratory Rate < 10 or > 29
- GCS < 13
- Penetrating Trauma
- >2 Proximal Bone Fractures
- Flail Chest
- Burns > 15% body surface area
- Any burns to the Face or Airway

Note: “Load and Go” and “Automatic Load and Go” situations include but are not limited to those mentioned above.

### SCENE TIME
Every effort should be made to limit scene time to ten minutes. Exceptions to this shall be documented in the narrative of the run report.

### AIR TRANSPORT
Contact shift supervisor with specifics of need for air transport. Aircraft should be utilized if transport will be greater than 30 min. for any patient with life threatening injury/injuries or immediate direct benefit of a trauma center. Transport decisions shall be documented in the narrative of the run report. **Scene time should not be delayed waiting on aircraft to arrive.**

Approved By: ___________________________ Date: ___________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Let the patient know that every consideration will be given to possible reattachment, stressing that the surgeon will make the final decision. Never assume that an amputated part can or cannot be replaced successfully. Every attempt should be made to save, protect, and transport any severed part, no matter how severe the damage. Use tourniquet to control bleeding ONLY if deemed life saving and it can’t be controlled by direct pressure.

**Universal Patient Care**

**COMPLETE AMPUTATION**
- Remove gross contamination with gauze sponges moistened with NS. Place part/limb in plastic bag. Place in container with 1/3 ice and 2/3 water. Do not place part directly in water.
- Control Gross Hemorrhage
- Consider Tourniquet
- Vascular Access Protocol
- Fentanyl/Sublimaze 50mcg IV/IO repeat as needed for pain as long as patient is hemodynamically stable
- Ondansetron/Zofran 4mg IV/IO slowly over 3-5 min repeat every 5 min until relief or maximum dose of 12 mg
- Trauma Destination Guidelines
- Contact Medical Control

**PARTIAL AMPUTATION**
- Apply bulky compression dressing
- Elevate extremity
- Apply ice or cold pack
- Contact Medical Control

**Legend**
- FR
- EMT
- A - EMT-I
- P - EMT-P
Bites and Envenomations

**History:**
- History or evidence of spider bite, snake bite, or other poisonous creature.
- Time of bite
- Description of offending creature

**Signs and Symptoms:**
- Pain, soft tissue swelling or redness.
- Blood oozing from bite wound.
- Shortness of breath, wheezing or itching.
- Hypotension or shock.

---

**Universal Patient Care**

Does patient display S/S specific to another treatment protocol?

No → Position patient supine. Immobilize area or limb. Elevate if possible.

A → Vascular Access

Signs or symptoms of allergic reaction?

No → Contact Medical Control

Yes → Follow appropriate standing order

---

**Legend**

| FR | EMT | A | EMT-I | A | P | EMT-P | P |

---

Approved By: Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Burns

Universal Patient Care

Chemical burn?

Remove rings bracelets or other constricting items

Cover with sterile sheet or dressings

Apply moist dressings to burned areas.

Vascular Access

1 L Normal Saline* bolus

Cardiac monitor

Assess airway

Intubate if necessary

Fentanyl/Sublimaze 50mcg IV

if needed for pain as long as pt. is hemodynamically stable

Ondansetron/Zofran

4 mg IV over 3-5 min repeat every 5 minutes until Relief or maximum dose of 12 mg.

Signs and Symptoms:
- Burns, pain, swelling
- Dizziness / loss of consciousness
- Hypotension / shock
- Airway compromise

Consider water reactivity of chemical involved.

If eye involvement, flush affected eye/s with 1 liter of normal saline. Flush for 20 min.

Remove ALL contaminated clothing and expose burn area

Flush area with water or normal saline for 10-15 minutes

Administer in severe burns
Midazolam/Versed 1-2 mg IV

for amnesiac properties.

Repeat Fentanyl/Sublimaze 50 mcg IV as needed

Contact Medical Control

History:
- Type of exposure (heat, gas, chemical)
- Inhalation
- Time of injury
- Past medical history / medications
- Other trauma

- Normal saline is the fluid of choice for severe burn injuries.

NOTES:
- Early intubation is required in significant inhalation injuries.
- 100% oxygen is required to treat possible carbon monoxide exposure. Consider CPAP
- Use caution with moist dressings for burns that involve >10% body surface area, due to the potential for hypothermia.
- Be alert for the existence of multi-system trauma.
- DO NOT use Water Gel on unconscious pts or on pts with burns > 20% total body surface.
  If you will have a prolonged transport time and you feel that Water Gel will help your pt. even though the burn is > 20%, contact Medical Control for approval for it's use.

Approved By: __________________________ Date: __________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Crush Injury: Extrication Pending

Universal Patient Care

Spinal motion restriction as indicated and as possible for situation.

A
2 Large Bore IVs NS*/LR

A

O2, NC or NRB as needed

P
Cardiac Monitor Watch for rhythm changes.

P

NS* or LR: 500 cc IV Bolus prior to disentanglement, especially if pt trapped for extended time. Have second IV if possible.

P

Keep patient warm.

P
Contact Medical Control*

* Normal saline is the fluid of choice for severe crush injuries.

NOTES:
* In the event of extended crushing entrapment, contact medical control early for possible orders for fluid resuscitation, pain management (Fentanyl recommended) and sodium bicarb administration orders.
- Be alert to potential drop in BP when extrication completed patient removed, secondary to crush syndrome.
- All interventions made with the assurance of crew safety. NEVER jeopardize the rescuer.
## Drowning / Near Drowning

### History:
- Submersion in water regardless of depth.
- Possible history of trauma: Diving board etc.
- Time of immersion
- Temperature of water

### Signs and Symptoms:
- Unresponsive or mental status changes.
- Decreased or absent vital signs.
- Vomiting
- Coughing

### Secure the scene

### Evaluate need for Spinal Motion Restriction

### Remove patient from water

### Universal Patient Care

### Pulse present?

#### Yes

- **A** Vascular Access

#### No

### Hypothermia, hypotension, dysrhythmias present?

#### Yes

- **Follow appropriate Standing Order**

#### No

- **Contact Medical Control**

### Cardiac Arrest Standing Order

### Legend

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### NOTES:
- With cold water there is no time limit. Aggressive resuscitation should be performed on all such patients.
- Near drowning patients are highly susceptible to complications over the following several hours.
- All victims need to be transported by ambulance or POV for evaluation even if minimal injury apparent.
- Be aware that some of the private pools in this area use a salt water filtration system. This makes the near-drowning victim at risk of developing pulmonary edema.
- Consider CPAP for patient in respiratory distress after near-drowning.
Electrical Injuries

**NOTES:**

- Scene safety is of primary importance.
  - Ventricular fibrillation and asystole are the most common dysrhythmias.
  - Damage is often hidden: the most severe damage occurs in muscle, vessels, and nerves.
  - In a mass casualty incident, work with victims in full arrest. If the victim did not arrest initially, it is likely they will survive.
- Do not overlook other trauma, including falls and depending on level of energy exposed additional orthopedic injuries are possible. Consider full spinal precautions.
- In lightening injuries, most of the current will travel over the body surface and result in flash burns.
- In lightening strikes, the heart may have a spontaneous return of rhythm with a pulse, but due to thoracic muscle spasm and suppression of the respiratory center, spontaneous respirations may not resume. Cardiac arrest secondary to hypoxia will result if ventilations are not supported.
- Retrograde amnesia will be present in most patients.
- Sympathetic effects to lightening injury: vascular spasm, temporary paralysis, extremity mottling, transient HTN- resolves spontaneously in 1-2 hours, vertigo and dizziness.

---

**History:**
- Lightening or electrical exposure.
- Single or multiple victims
- Trauma secondary to fall from heights or MVA that involves powerlines.
- Duration of exposure.

**Signs and Symptoms:**
- Burns
- Pain
- Entry and exit wounds
- Hypotension or shock
- Arrest

---

**Legend**
- FR
- EMT
- EMT-I
- A
- EMT-P
- P

---

**History:**
- Lightening or electrical exposure.
- Single or multiple victims
- Trauma secondary to fall from heights or MVA that involves powerlines.
- Duration of exposure.

**Signs and Symptoms:**
- Burns
- Pain
- Entry and exit wounds
- Hypotension or shock
- Arrest

---

**Universal Patient Care**

**Pulse present?**

**Yes**

- Assess for need of Spinal Motion Restriction.
- Oxygen to keep sats at ≥98%

**No**

- Cardiac Arrest Standing Order

---

**Vascular Access**

**Large Bore**

**Cardiac monitor**

---

**Secondary survey**

Look for exit wounds, other trauma

---

**Dysrhythmia present?**

**Yes**

- Follow "Burn" Standing Order

**No**

- Contact Medical Control

---

**History:**
- Lightening or electrical exposure.
- Single or multiple victims
- Trauma secondary to fall from heights or MVA that involves powerlines.
- Duration of exposure.

**Signs and Symptoms:**
- Burns
- Pain
- Entry and exit wounds
- Hypotension or shock
- Arrest

---

**Legend**
- FR
- EMT
- EMT-I
- A
- EMT-P
- P
External Bleeding

Universal Patient Care

Bleeding Controlled

Uncontrolled Bleeding

Immediately apply direct pressure on wound

If bleeding continues apply additional dressings and pressure bandage.

Severe Bleeding

Limb

Use Tourniquet

Head, Trunk, or Neck

Use Hemostatic dressing

Vascular Access Protocol

Keep patient warm.

Proceed to appropriate protocol

Contact Medical Control

Approved By:____________________________________   Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Extremity Trauma

**History:**
- Type of injury
- Crush vs: penetrating vs: amputation
- Time of injury
- Open vs: closed wound/fracture
- Wound contamination

**Signs and Symptoms:**
- Pain, swelling
- Deformity
- Altered sensation or motor function
- Diminished pulse or capillary refill
- Decreased extremity temperature.

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**Legend**

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**Universal Patient Care**

**Vascular Access**

**Is there potential for:**
- Head Injury?
- Chest Trauma?
- Abdominal Trauma?
- Hypovolemia?

**Assess distal neurovascular function**

**Is a femur fracture present?**

- **Yes**
  - Apply traction splint to closed fracture, board splint to open fx.

- **No**
  - **Follow Appropriate Protocol**

**Fentanyl/Sublimaze 50 mcg slow IV or IM*** as needed for pain, as long as patient is hemodynamically stable. May repeat one time.**

**Or**

**Morphine Sulfate 2-4 mg IV up to 10 mg as needed for pain, as long as patient is hemodynamically stable.**

**Ondansetron/Zofran 4mg IV slowly over 3 - 5 minutes repeat every 5 minutes until relief or maximum dose of 12 mg**

**Consider:**

**Promethazine/Phenergan 12.5 - 25 mgs IV**

**IM if no IV**

**Splint according to injury.**

**Contact Medical Control**

---

*Fentanyl/Sublimaze Precautions: hold if HR < 60 bpm, RR < 12/min, respiratory distress, BP <100 systolic, decreased mental status. Avoid use in pt’s who have received MAOI inhibitors within 14 days as it may produce potentially fatal reactions. SE: Apnea, laryngospasm, allergic bronchospasm, respiratory depression, arrhythmias, bradycardia, circulatory depression, hypotension, confusion, N/V, blurred/double vision, facial itching. ANTIDOTE: NARCAN

**IV Phenergan must be diluted in 10 mL NS and administer over 1 minute. IM dose is delivered full strength and deep.**

---

Transport pt. to the most appropriate facility as set forth in the Tennessee EMS Trauma Destination Guidelines. Pts. should be delivered to a designated Level I or Level II Trauma Center if within 30 min. transport
Head Trauma

**History:**
- Time of injury
- Type of injury (blunt vs: penetrating)
- Loss of consciousness
- Bleeding
- Past medical history / medications
- Evidence of multi trauma

**Signs and Symptoms:**
- Pain, swelling, bleeding
- Altered mental status
- Unconsciousness

---

**Spinal motion restriction**

**Airway and Ventilations adequate?**
- Yes
  - High Flow O2
  - Vascular Access *
  - Cardiac Monitor

*Vascular Access* means

**Does patient present with:**
- Unequal, dilated or nonreactive pupils?
- Decerebrate posturing?
- Decreased LOC; GCS <9?
- Initial GCS or 9 that drops >2 pts?

**Blood Glucose < 70 mg/dl?**
- Dextrose 50%
- 50cc IV over 1 - 2 minutes

**Is seizure activity present?**
- Yes
  - Follow “Seizure” SO
- No
  - Contact Medical Control

---

**Legend**

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**Notes:**
- Seizure activity must be controlled per Seizure SO. A patient who has been paralyzed for RSI may still experience seizure activity without tonic clonic presentation.
- **DO NOT Hyperventilate unless** there are signs of hemiation syndrome. Routine hyperventilation has a negative affect on patient outcome.
- Low ETCO2 readings (<35) indicate hyperventilation or decreased oxygen delivery. Monitor ventilatory rates and adjust accordingly. Low ETCO2 levels may also indicate circulatory collapse or shock. High ETCO2 levels indicate hypoventilation.
- Maintain systolic BP of 120 mmHg.
- Patients with S/S of head injury and suspected of ETOH ingestion must be treated as head injury without regard to ETOH as the source.
- Elevating the head of the LSB can help relieve increased ICP/intracranial pressure.

---

*Normal saline is the fluid of choice for severe head injuries.*

---

Approved By: ______________________ Date:____________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Multiple Trauma

**History:**
- Time and mechanism of injury
- Damage to structure of vehicle
- Location in structure of vehicle
- Others injured or dead in vehicle
- Speed and details (if known) of crash
- Restraint use
- Past medical history / medications

**Signs and Symptoms:**
- Pain, swelling, bleeding
- Deformity, lesions
- Positive loss of consciousness
- Altered mental status or unconsciousness
- Hypotension or shock
- Arrest

**Universal Patient Care**

**Consider** air vs. ground transport EARLY in incident. **Notify** Captain.

**Spinal Motion Restriction**

**Vascular Access**
- 2 Large Bore IVs
- Lactated Ringers (LR/NS)

**Vital signs / Perfusion**
- Cardiac Monitor/12 lead EKG

**Secondary survey**
- Apply splints and dressings
- Continue transport / Reassess

**Legend**
- FR
- EMT
- EMT-I
- EMT-P

**Info needed on radio call in:**
- Age (approx. if unknown)
- LOC/AVPU/GCS
- VS/hemodynamic status
- MOI
- Major injuries
- ETA
- Critical info
- General impression

**If MVC add:**
- Location in vehicle
- Restraints used
- Speed
- Extrication time
- Damage to vehicle

**Notes:**
- Mechanism is a reliable indicator of the potential for injury, however also consider the patient complaint accompanied by physical evidence.
- In prolonged extrications or serious trauma, consider air transportation if appreciable time can be saved in getting the patient to definitive care.
- All Trauma patients should be administered high flow O2 via NRB to maintain adequate oxygen saturation.
- Lactated ringers is the fluid of choice for trauma. **Exceptions** are severe head trauma, burns and crush injuries.
- Critical patients should have fractures splinted during transport.
- Transport according to Tennessee Trauma Destination Guidelines.

Approved By: Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Penetrating Abdominal Trauma

Universal Patient Care

- Vascular Access 2 Large Bore IVs LR/NS
  - Assess for Tension Pneumothorax If present, perform Pleural Decompression
  - Cardiac Monitor
  - Secure object in place with bulky dressings if object is protruding from the abdomen

- Evisceration present?
  - Yes: Place sterile dressing moistened with normal saline over the organ. Seal with an occlusive dressing. DO NOT attempt to put organ back into the abdominal cavity.
  - No: Contact Medical Control

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Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Penetrating Chest Trauma

Universal Patient Care

Vascular Access
2 Large Bore IVs LR/NS

Cardiac Monitor

Assess for Pneumothorax.
If opening into thorax present, seal with occlusive dressing taped on 3 sides.

Assess for Tension Pneumothorax
If present, perform Pleural Decompression procedure

Secure object in place with bulky dressings if object is protruding from the chest

Contact Medical Control

Simple pneumothorax:
- Secondary to blunt or penetrating chest trauma

S/S:
- pleuritic chest pain
- dyspnea
- \( \nabla \) breath sounds, affected side
- hyper-resonance o affected side

Tension pneumothorax S/S:
- acute respiratory distress
- cyanosis
- Unilaterally \( \downarrow \) or absent LS
- hyper-resonance on affected side
- hypotension
- subcutaneous emphysema
- JVD
- tracheal deviation- late sign and may not be noted with visual assessment.

NOTES:
- **Never decompress** a chest unless S/S are present. Do not base decision on only one sign.
- **Reassess** chest injury patients **frequently** for signs of pneumothorax.
- Monitor chest injury patients closely for **hypoxia** and respiratory compromise, especially the elderly.
- **Arrhythmias** may be present secondary to hypoxia or trauma.
- Patients with **hx of COPD** or other lung disease are **predisposed** to tension pneumothorax.
- These patients are to be considered for **LOAD and GO** transport. **Nothing** should **delay transport** other than extrication.

Approved By: ___________________________ Date: ______________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
PURPOSE: This protocol provides guidance regarding the assessment and care of patients who have a possible spinal injury.

Events with a potential mechanism of spinal injury include but are not limited to:
* Motor vehicle crash >60 mph, rollover, or ejection (low-speed, rear-end can usually be excluded)
* Falls greater than the height of the patient or involving more than 5 stairs
* Axial loading to head/neck region (e.g., diving accident, heavy object falling onto head, contact sports)
* Significant injury above the clavicles
* Injuries involving both land and water based motorized recreational vehicles
* Accidents involving bicycles/motorcycles

Maintain manual in-line stabilization during assessment and minimize spinal movement during assessment and extrication

Neuro Exam: Any focal deficits? Motor strength is not baseline for patient or they have numbness or tingling in any extremity?

- **NO**

- **YES**

Patient > 65 or < 5 with SIGNIFICANT traumatic mechanism?

- **NO**

- **YES**

Alertness: Any alteration in patient level of consciousness?

- **NO**

- **YES**

Intoxication: Any evidence of alcohol intoxication or drug impairment?

- **NO**

- **YES**

Distracting injury: Any painful injury that might distract the patient from the pain of a c-spine injury?

- **NO**

- **YES**

Spinal Exam: Point tenderness or pain to ROM in spinal process?

- **NO**

- **YES**

Insurmountable communication barriers (e.g., deafness, or hard of hearing, language, etc)?

- **NO**

- **YES**

Assessment: Point tenderness or pain to range of motion in spinal process?

- **NO**

- **YES**

Spinal motion restriction not required

Spinal motion restriction REQUIRED

Approved By: Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Trauma Arrest

NOTES:
- Cardiac arrest following trauma is not usually due to cardiac disease. Therefore, do not rely on cardiac protocols alone. Exceptions to this are electrocution and cardiac contusion, which may cause dysrhythmias responsive to ACLS therapy.
- Search for and treat possible causes:
  - Hypovolemia: Fluid challenge
  - Hypoxia: Ventilation
  - Hydrogen ion/Acidosis: Bicarb
  - Hypoglycemia: Dextrose
  - Hypothermia: Warming
  - Toxins/OD: Appropriate to toxin
  - Tamponade, Cardiac: Rapid transport
  - Tension Pneumothorax: Needle Decompression
  - Thrombosis (coronary or pulmonary): Fluid, Hyperventilate only if s/s herniation syndrome
- Do not delay transport. Follow “Trauma Destinations Guidelines”. Goal is <10 minute scene time unless complications exist.
- ET dose of meds are 2 - 2.5 times the IV dose. IV/IO administration preferable. ET Epinephrine (1:1000) is 2 - 2.5 mg in 8cc NS.
- Consider not initiating resuscitative efforts or termination of BLS efforts based on injuries sustained. Refer to “Field Determination of Death” and “Discontinuation of Prehospital Resuscitation”. ALL contributing criteria must be fully documented clearly and concisely in narrative. Contact medical control if clarification is deemed necessary or you are ceasing resuscitation.

Universal Patient Care

Establish airway using chin-lift or jaw thrust & Spinal Motion Restriction. If unable to ventilate with above maneuvers, use the head tilt/chin lift. Ventilate with BVM & 100% 02. If unable to ventilate with above maneuvers, use head tilt/chin lift. Initiate compressions.

Secure airway & control major bleeding. “Load & Go” transport maintaining C-spine stabilization.

Follow ACLS algorithms

Does patient ventilate easily with equal breath sounds?

Yes

No

Vascular Access
- 2 Large Bore IVs LR/NS
- 20cc/kg bolus. Repeat bolus PRN.

Cardiac monitor

Contact Medical Control

Adjust tube placement & consider suction.

Yes

Improvement?

No

Perform Pleural Decompression

Legend

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PEDIATRIC TREATMENT STANDING ORDERS
Airway - Pediatric

Assess ABC’s, respiratory rate, effort and adequacy

Adequate

Basic maneuvers, first - open airway, nasal, oral airway. Bag-valve-mask

Apneic with no gag reflex

Adequate ventilation and oxygenation

Positive respirations
Positive gag reflex

Maintain ventilation with BVM & oral/nasal airway

Rapid Transport

Contact Medical Control

Obstruction

Oral Tracheal Intubation

Successful

Rapid Transport

Contact Medical Control

Unsuccessful

Consider RSI

Rapid Transport

NOTES:
- For this protocol, pediatric is defined as less than 13 years of age.
- Auscultation of BBS, epigastic sounds and capnography is mandatory for all intubations.
- Limit intubation attempts to three (3)
- If unable to intubate, continue BVM support and transport immediately.
- Monitor ETCO2 includes Combi-Tube & Quick Trach
- Disconnect Ventilation source (bag, vent, etc.) during all pt. moves to prevent dislodging of tube
- Paramedic who intubated pt. should verify tube placement at the E.D.
- Increased ICP or Vagal Reflex Bradycardia can be caused if pressure is applied by the BVM over the eyes

Approved By: _____________________________ Date: __________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Pediatric Airway – Obstructed

Signs of Mild Airway Obstruction:
- Good air exchange
- Responsive and can cough forcefully
- May wheeze in between coughs

Signs of Severe Airway Obstruction:
- Poor or no air exchange
- Weak, ineffective or no cough at all
- Increased respiratory difficulty
- Unable to cry
- Unable to move air

Universal Patient Care

Can patient make any sound or breathe?

Encourage the patient to cough until obstruction relieved.

Obstruction relieved?

If patient becomes unresponsive, place supine on hard surface and begin CPR, checking the mouth for the foreign object before breaths.

While other staff performing CPR, view airway via direct laryngoscopy and remove object with forceps if visualized.

Obstruction relieved, continue with appropriate assessment and treatment

Alternate 5 back blows and 5 chest thrusts, being careful to support the head and neck.

< 1 yoa

> 1 yoa

NOTES:
- If success in relieving obstruction is via abdominal thrusts, encourage the patient’s family to seek immediate medical attention at a healthcare facility to ensure they do not have a complication from abdominal thrusts.

SPECIAL CONSIDERATIONS:
- If patient is pregnant or obese, perform chest thrusts.
- Perform CPR if patient becomes unresponsive. Look in the mouth prior to ventilations and remove the object only if visualized.
- Never perform a blind finger sweep on any patient. Remove objects when visualized.
- If patient found unresponsive, breathless and you are unable to ventilate after two breaths and repositioning the head once, move to CPR and check the airway for foreign objects prior to ventilations.
- If breaths do not go in, do not attempt ventilations more than two times. Return immediately to chest compressions.

Approved By: ___________________________ Date: ___________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015

Obstruction relieved?

Continue to assess and treat as needed.

If unable to locate and remove obstruction, consider Percutaneous Cricothyroidotomy under “Airway-Failed” Do not delay transport.

Contact Medical Control
Pediatric Bradycardia (with a pulse)

**History:**
- Past medical history / medications
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible exposure to poisons, medications, etc.

**Signs and Symptoms:**
- Shock with hypotension
- Delayed capillary refill
- Altered LOC, sometimes with slow or absent ventilation
- Sudden collapse
- Lightheadedness or dizziness
- Syncope
- Fatigue
- Shock with hypotension

---

**Universal Patient Care**

Support ABCs as needed.
Appropriate Pediatric Airway SO with 100% oxygen

Attach Cardiac Monitor/ defibrillator
12 lead EKG

Bradydcaria still causing cardio-respiratory compromise?
(Poor perfusion, hypotension, respiratory distress)

---

**NOTES:**
- The majority of pediatric arrests are due to airway problems. DETAILED ASSESSMENT OF THE AIRWAY IS IMPERATIVE!
- Hypoxia is the most common cause of bradycardia in a child.
- Refer to Broselow tape for pediatric drug dosages
- Pacing is at a demand rate of 80, increasing the current (mA) until capture and then adding 2 mA.

---

**Epinephrine**

IV/IO: 0.01 mg/kg (1mL/10kg) of 1:10,000
ET: 0.1 mg/kg of 1:1,000
Repeat every 3-5 minutes at the same dose
If increased Vagal Tone or primary AV block

**Vascular Access**
Perform blood glucose check

**Consider Cardiac Pacing**

---

**Search for and treat possible contributing factors:**
- Hypovolemia
- Toxins
- Hypoxia
- Tamponade, cardiac
- Hypoxia (acidosis)
- Tension pneumothorax
- Hypo-/hyperkalemia
- Thrombosis (coronary or pulmonary)
- Hypoglycemia
- Hypothermia
- Trauma

**Reminders:**
- Compressions- push hard and fast
- Ensure full chest recoil

---

**Contact Medical Control**

---

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Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Childbirth / Labor

History:
- Due date
- Pre-Natal care
- Previous Deliveries
- Time contractions started and how often
- Rupture of membranes
- Time and amount of vaginal bleeding
- Sensation of fetal activity
- Past medical & delivery history
- Medications

Signs and Symptoms:
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Rupture of amniotic sac
- Contraction lasting 1 minute or more
- Contractions spaced <3 min. apart

Universal Patient Care
- Hypertension?
  - Yes
  - Inspect perineum
  - No
  - Crowning present?
    - Yes
    - Obtain OB kit, prepare for delivery
    - No
    - Vascular Access NS 1000CC/hr
      - Oxygen via NC
        - Presence of Critical Issues?
          - Childbirth Procedure
          - Newly Born SO
          - Rapid Transport

Contact Women’s Center as soon as possible. Either prior to or during transport.

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NOTES:
- Questions about prenatal care and gestation may help recognize at risk births.
- Goal is for the baby to be delivered in the hospital, but if delivery imminent, prepare for delivery where found if feasible. Consider placing patient in unit so that there is no delay should something go wrong and rapid transport is needed.

Critical Issues
- Breech/limb presentation
- Crowning
- Multiple gestation
- Nuchal cord
- Prolapsed cord
- Severe vaginal bleeding
- Shoulder distocia
  - Less than 36 weeks gestation

Breech presentation
- Encourage patient not to push
- Provide transport with ALS care
- Push vaginal wall away from baby’s face with two fingers, one on each side of nose

Limb presentation
- Do NOT attempt delivery
- Encourage patient NOT to push
- Rapid transport with ALS care
- Transport to a facility with NICU

Multiple Gestation
- Provide transport with ALS care
- Transport to facility with NICU
- If delivery unavoidable, deliver each as normal

Nuchal Cord
- Stop patient from pushing
- Unwrap cord if solution obvious
- If unable to remove cord, clamp 3 inches apart, cut cord & continue delivery

Premature Labor
- Deliver infant as normal
- Watch for hypothermia and hypoglycemia
- Transport to facility with NICU

Prolapsed Cord
- Place gloved hand against head of infant & keep pressure off cord
- Encourage patient not to push
- Elevate mother’s hips
- Rapid transport with ALS care

Shoulder Distocia
- Suction infant mouth and nose
- Blow by O2 if baby is breathing
- Do NOT pull on infant
- Provide rapid transport with ALS care

Obstetrical Emergencies SO
- Transport on left side
- Vascular Access PRN INT or TKO
- Oxygen PRN
- Monitor and reassess. Document frequency and duration of contractions.
- Contact Women’s Center

Rapid Transport
- Transport to a facility with NICU

Critical Issues
- Breech/limb presentation
- Crowning
- Multiple gestation
- Nuchal cord
- Prolapsed cord
- Severe vaginal bleeding
- Shoulder distocia
  - Less than 36 weeks gestation

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Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Newly Born

**History:**
- Due date and gestational age
- Prenatal care
- Twin pregnancy
- Meconium staining with delivery
- Delivery difficulties or complications

**Signs and Symptoms:**
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal) after stimulation
- Altered LOC: assess crying and muscle tone
- Bradycardia

---

Universal Patient Care for mother

Provide warmth to infant *

Position infant to open airway.
Suction mouth and nose with bulb syringe.

Dry infant and keep warm

- If infant is meconium stained, suction trachea
- Stimulate infant

Spontaneous respiratory effort?

- Yes
- No

Heart rate

- Below 60
  - Chest compressions and PPV**
- Above 100
  - Ventilate with 100% oxygen for 30 seconds

Positive pressure ventilation/PPV**

- Color?***
  - Yes
  - Reassess Heart rate < 60
  - APGAR at 1 and 5 min, then every 5 minutes x 3
- No
  - Monitor and reassess
  - Watch for spontaneous respirations.
  - Continue oxygen therapy
  - APGAR at 1 and 5 min

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NOTES:

* **Assessment questions** upon birth: is term gestation? amniotic fluid clear? breathing or crying? good muscle tone? If any answered "No", continue initial steps of resuscitation

** Endotracheal intubation** may be considered at several steps.

*** If **central cyanosis** present: actively dry and warm patient, continue to stimulate, provide supplemental oxygen.

- Epi 1:10,000 is recommended to be drawn up in a 1cc syringe for accuracy of administration. If given endotracheally, increase dose to 0.3 – 1 mL/kg.
- Consider Naloxone 0.1 mg/kg IV, ET, IO, IM, SQ for infant if maternal sedation with narcotics is suspected.
- Administer Dextrose 25% 2-4 cc/kg if infant blood glucose is less than 40 mg/dl.
- The Broselow Tape can also be utilized for medication dosages.
APGAR Score Guide

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<th>SIGN</th>
<th>0</th>
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<tr>
<td>Appearance</td>
<td>Blue or pale</td>
<td>Pink body with blue extremities</td>
<td>Completely pink</td>
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<tr>
<td>Pulse Rate</td>
<td>Absent</td>
<td>Slow (less than 100)</td>
<td>Greater than 100</td>
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<td>Grimace (Catheter in nares)</td>
<td>No response</td>
<td>Grimace</td>
<td>Cough or sneeze</td>
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<tr>
<td>Activity</td>
<td>Limp</td>
<td>Some flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respirations</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Good, crying</td>
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Record 1 minute and 5 minute APGAR scores.

If the 5 minute APGAR score is less than 7, additional scores should be obtained every 5 minutes for a total of 20 minutes.

The APGAR score allows for evaluation of a newborn’s condition at specific intervals after birth. DO NOT use the score to determine the need for resuscitation.
**Pediatric Head Trauma**

**History:**
- Time of injury
- Type of injury (blunt vs: penetrating)
- Loss of consciousness
- Bleeding
- Past medical history/medications
- Evidence for multi-trauma

**Signs and Symptoms:**
- Pain, swelling, bleeding
- Altered mental status
- Unconscious

---

**Universal Patient Care**

- Isolated head trauma?
  - Yes
    - Spinal motion restriction
  - No
    - Airway and Ventilations adequate?
      - Yes
        - High Flow O2
      - No
        - Vascular Access
          - Hypovolemia: 20cc/kg bolus

**Cardiac Monitor**

- Does patient present with:
  - Unequal pupils or constricted pupils?
    - Yes
      - Posturing?
        - Yes
          - Decreased LOC?
            - Yes
              - Increase in BP?
                - Yes
                  - Decrease in pulse rate?
                    - Yes
                      - Irregular respirations?
                        - No
                          - Vascular Access
                            - Hypovolemia: 20cc/kg bolus
                        - Yes
                          - Is seizure activity present?
                            - No
                              - Vascular Access
                                - Hypovolemia: 20cc/kg bolus
                            - Yes
                              - Contact Medical Control

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**NOTES:**
- If GCS < 12, consider air or rapid transport.
- Mechanism of injury extremely important
- Hypotension can develop rapidly. Administer fluids aggressively in the trauma situation. Frequently reassess lung sounds.
- Hypotension usually indicates injury or shock unrelated to the head injury.
- Assess fontanels up to age 1½ yoa.
- The most important item to monitor and document is a change in the level of consciousness.
- Elevate head of backboard 30° during transport.
- Refer to the Broselow Tape for drug dosages.

Approved By:____________________________________   Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
**Pediatric Hyperglycemia**

**History:**
- Diabetes mellitus
- Polyuria (excessive urination)
- Polydipsia (excessive thirst)

**Signs and Symptoms:**
- Altered mental status
- Unconscious
- Tachycardia, thready pulse
- Kussmaul respirations, air hunger
- Hypotension
- Dry mucous membranes
- Skin cool, dry
- Ketone odor on breath (acetone smell)
- Abdominal pain, nausea & vomiting

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**Universal Patient Care**

**High Flow O2**

Maintain airway as necessary

**Search for other causes of signs and symptoms**

No **Blood glucose check >250 mg/dL or “High”**

Yes **Vascular Access Normal Saline**

---

**Patient with S/S:**
- Dehydration
- DKA
- Vomiting

Administer fluid bolus:
20 cc/kg IV/IO

---

**Cardiac Monitor**

**SPO2**

---

**Reassess BGL**

Repeat fluid bolus PRN

---

**Contact Medical Control**

---

**NOTES:**
- Ascertain medication compliance and proper dosing.
- Determine food intake.
- Question as to possible infection or stressors.

---

Approved By: ____________________________ Date: __________________________

Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Pediatric Hypoglycemia

**History:**
- Diabetes mellitus

**Signs and Symptoms:**
- Altered mental status
- Unconscious
- Respirations slow and shallow
- Skin sweaty to diaphoretic, cool to cold
- Flaccid
- Seizures

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**Universal Patient Care**

**High Flow O2**

Maintain airway if necessary

Search for other causes of signs and symptoms

Go to appropriate SO

**Blood glucose check <80 mg/dL?**

**A**

**Vascular Access**

**A**

**Administer D25 2cc/kg IV/IO**

**A**

**If unable to establish vascular access,**

**Glucagon:** Glucagen

- <55 lbs or 8 yoa: 0.5 mg IM
- >55 lbs or 7 yoa: 1 mg IM

**Reassess BGL in 15 mins.**

Administer D25 1-2cc/kg PRN

---

D25 to be used on patients <34 kg. Use premixed syringe on patients up to 11 lbs/5 kg.

Mix D50 with normal saline at 1:1 concentration for patients over 11 lbs.

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<td>61.7</td>
<td>28</td>
</tr>
<tr>
<td>63.9</td>
<td>29</td>
</tr>
<tr>
<td>66.1</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lbs</th>
<th>Kgs</th>
</tr>
</thead>
<tbody>
<tr>
<td>68.3</td>
<td>31</td>
</tr>
<tr>
<td>70.5</td>
<td>32</td>
</tr>
<tr>
<td>72.8</td>
<td>33</td>
</tr>
<tr>
<td>75</td>
<td>34</td>
</tr>
</tbody>
</table>

**NOTES:**
- Note that D25 is administered in cc/mL increments and not milligrams and weight based.
- Consider oral glucose if patient is old enough to maintain airway during administration, is conscious and has an intact gag reflex. Administer one-half to 1 tube of oral glucose.
- Determine if insulin or oral hypoglycemic medications prescribed; time and amounts taken.
- Determine food intake.

---

Approved By: ____________________________________ Date: ______________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 05/01/2016
Pediatric Hypotension (Non-Traumatic)

**History:**
- Blood Loss
- Fluid loss from vomiting, diarrhea, or fever
- Inadequate fluid intake
- Infection
- Hypoxia
- Diabetic ketoacidosis
- Fluid leak into tissues

**Signs and Symptoms:**
- Restlessness, confusion, weakness, dizziness
- Increased HR
- Decreased BP (not systolic in compensated shock)
- Skin pale, cool/cold, clammy/diaphoretic
- Delayed capillary refill (Relative to environmental factors)

**Universal Patient Care**

Does child have decreased responsiveness or other signs of poor perfusion?

- **Yes**
  - Cardiac monitor
  - Vascular Access
  - Perform blood glucose check

- **No**
  - Evidence or history of trauma?
    - **Yes**
      - Follow Pediatric Multi-Trauma Protocol
    - **No**
      - Immediate support ventilation and give 100% oxygen. Place patient in Trendelenburg position.

**Hypotension by Systolic BP and Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term neonates (0 to 28 days)</td>
<td>&lt;60</td>
</tr>
<tr>
<td>Infants (1 to 12 mos.)</td>
<td>&lt;70</td>
</tr>
<tr>
<td>Children 1 to 10 years</td>
<td>&lt;70 + (age in years x 2)</td>
</tr>
<tr>
<td>Children &gt;10 years</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

**NOTES:**
- **Hypovolemia** is the most common cause of shock in children. Fluid loss due to diarrhea is the leading cause of hypovolemic shock.
- **Bradycardia** developing after hypotension and tachypnea is an ominous sign. Aggressive fluid resuscitation, along with management of airway and breathing, are needed to prevent cardiac arrest.
- A normal BP with other S/S of poor perfusion is indicative of compensated shock. The diastolic pressure may be increased, producing a narrowed pulse pressure.
- **Properly sized BP cuffs** have a bladder that covers 40% of the mid-upper arm circumference and extends at least 50% – 75% of the length of the upper arm.
- **Weakening of central pulses** is a worrisome sign requiring very rapid intervention to prevent cardiac arrest.

**Hypotension formula:**
- <70 mm Hg + [child's age in years x 2] mm Hg
- Typical Systolic formula, 1 – 10 yoa: 90 mm Hg + [child's age in years x 2] mm Hg

**Consider:**

- Normal Saline 20 cc/kg IV bolus Reassess and repeat until BP and tissue perfusion restored.
- Dopamine 2 - 20 ug/kg/min IV*

**Contact Medical Control**

* See Broselow Tape for drug dosages
## Normal Blood Pressures in Children by Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic BP</th>
<th>Diastolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Neonate (1st day)</td>
<td>60 - 76</td>
<td>60 - 74</td>
</tr>
<tr>
<td>Neonate (4th day)</td>
<td>67 - 83</td>
<td>68 - 84</td>
</tr>
<tr>
<td>Infant (1 mo)</td>
<td>73 - 91</td>
<td>74 - 94</td>
</tr>
<tr>
<td>Infant (3 mo)</td>
<td>78 - 100</td>
<td>81 - 103</td>
</tr>
<tr>
<td>Infant (6 mo)</td>
<td>82 - 102</td>
<td>87 - 105</td>
</tr>
<tr>
<td>Infant (1 yr)</td>
<td>68 - 104</td>
<td>67 - 103</td>
</tr>
<tr>
<td>Child (2 yr)</td>
<td>71 - 105</td>
<td>70 - 106</td>
</tr>
<tr>
<td>Child (7 yr)</td>
<td>79 - 113</td>
<td>79 - 115</td>
</tr>
<tr>
<td>Adolescent (15yr)</td>
<td>93 - 127</td>
<td>95 - 131</td>
</tr>
</tbody>
</table>

AHA PALS Provider Manual 2006

## Normal Heart Rates by Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Awake Rate</th>
<th>Sleeping Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn to 3 mos.</td>
<td>85 - 205</td>
<td>80 - 160</td>
</tr>
<tr>
<td>3 mos to 2 yrs</td>
<td>100 - 190</td>
<td>75 - 160</td>
</tr>
<tr>
<td>2 yrs to 10 yrs</td>
<td>60 - 140</td>
<td>60 - 90</td>
</tr>
<tr>
<td>&gt; 10 yrs</td>
<td>60 - 100</td>
<td>50 - 90</td>
</tr>
</tbody>
</table>

AHA PALS Provider Manual 2006

## Normal Respiratory Rates by Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Breaths per Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (&lt;1 yr)</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Toddler (1 – 3 yrs)</td>
<td>24 - 40</td>
</tr>
<tr>
<td>Preschooler (4 – 5 yrs)</td>
<td>22 - 34</td>
</tr>
<tr>
<td>School age (6 – 12 yrs)</td>
<td>18 - 30</td>
</tr>
<tr>
<td>Adolescent (13 – 18 yrs)</td>
<td>12 - 16</td>
</tr>
</tbody>
</table>

AHA PALS Provider Manual 2006
Pediatric Multiple Trauma

**History:**
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of an MVC
- Restraints
- Past medical history / medications

**Signs and Symptoms:**
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconsciousness
- Hypotension or S/S of shock
- Cardiac arrest

**Simultaneous:**
- Spinal motion restriction
- Controlling ABCs
- Control bleeding
- Oxygen
- Assess and treat per MOI

**Transport decision:**
Load & Go vs. Secondary Survey
Air vs. Ground Transport

**Universal Patient Care**

**Notes:**
- Mechanism of injury/MOI is the most reliable indicator of injury in pediatric patients
- Airway management and aggressive fluid resuscitation required in to prevent progression to cardiac arrest. Basic airway management by BVM may suffice until transport initiated or arrival at hospital.
- In prolonged extrications or serious trauma in remote locations with extended transport times, consider air transport resources.
- Interventions that do not correct an immediate life threat are to be performed during transport in the critical patient.

* Needle decompression indicated with: apprehension/agitation, increasing cyanosis, air hunger, hyperresonant breath sounds on percussion, absent breath sounds, subcutaneous emphysema, distended neck veins, tracheal displacement toward normal side. Use 14 to 16 ga catheter or smaller if indicated by patient size.

**Legend**
- FR
- EMT
- EMT-I
- EMT-P

Approved By: Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
## Pediatric Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>Patient &lt; 2 yrs</th>
<th>Patient &gt; 2 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td>To speech</td>
<td>To voice</td>
<td>3</td>
</tr>
<tr>
<td>To pain</td>
<td>To pain</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbal Response</th>
<th>Coos, babbles</th>
<th>Oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cries irritably</td>
<td>Confused</td>
<td>4</td>
</tr>
<tr>
<td>Cries to pain</td>
<td>Inappropriate words</td>
<td>3</td>
</tr>
<tr>
<td>Moans to pain</td>
<td>Incomprehensible</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor Response</th>
<th>Normal movements</th>
<th>Obeys commands</th>
<th>6</th>
<th>Withdraws-touch</th>
<th>Localizes pain</th>
<th>5</th>
<th>Withdrawal-pain</th>
<th>Withdrawal-pain</th>
<th>4</th>
<th>Abnormal flexion</th>
<th>Flexion-pain</th>
<th>3</th>
<th>Abnormal extension</th>
<th>Extension-pain</th>
<th>2</th>
<th>None</th>
<th>None</th>
<th>1</th>
</tr>
</thead>
</table>

**Total** = Eye + verbal + Motor

GCS <13 implies a serious head injury
GCS <9 indicates a profound, life-threatening neurological dysfunction

A – alert
V – verbal
P – pain
U – unresponsive
Pediatric Pulseless Arrest

History:
- Time of arrest
- Medical history / medications
- Possibility of foreign body or hypothermia.
- Congenital defect

Signs and Symptoms:
- Unresponsive
- Absent pulse
- Absent respirations

Universal Patient Care
CPR / Oxygenation

Monitor/AED

Shockable rhythm?

Yes

No

Ventricular Fibrillation / Pulseless V Tach

Shock * 2 J/kg or
or AED

Give 5 cycles CPR

A

Give epinephrine
IV/IO: 0.01 mg/kg (1:10,000, 0.1 mL/kg)
ET: 0.1 mg/kg (1:1,000, 0.1 mL/kg)
Repeat every 3 to 5 minutes.

A

Secure airway, confirm placement

Yes

No

Antiarrhythmics regimen:
Lidocaine 1mg/kg IV/IO
May repeat every 3-5 mins.
Consider: Magnesium sulfate
25 to 50 mg/kg, max 2 g
for torsades de pointes.

Asystole / PEA

Resume CPR

Vascular Access
Perform blood glucose check

Epinephrine
IV/IO: 0.01 mg/kg (1:10,000, 0.1 mL/kg)
ET: 0.1 mg/kg (1:1,000, 0.1 mL/kg)
Repeat every 3 to 5 minutes

Contact Medical Control

Search for and treat possible contributing factors:
- Hypovolemia - Toxins
- Hypoxia - Tension pneumothorax
- Hydrogen ion (acidosis) - Tamponade, cardiac
- Hypoglycemia - Thrombosis
- Hypothermia - Trauma
- Hypo-/hyperkalemia

Legend

FR
EMT
A
EMT-I
A
P
EMT-P

NOTES:
- ALWAYS SUSPECT AIRWAY PROBLEMS AS AN INITIAL CAUSE IN PEDIATRIC ARREST.
- Refer to the Broselow Tape for pediatric drug dosages.
- Maximum bolus dose of Lidocaine is 100mg. The adult max of 3mg/kg is toxic to the pediatric patient.
- 1-person CPR ratio 30:2; 2-person, 15:2. Ensure full chest recoil
- Rotate compressors every 2 minutes
- Administer drugs during CPR, only after rhythm check and as soon thereafter as possible to allow for 2 minutes of circulation before the next rhythm check. There should be a 2 minute interval between medication administration.

* Patients who have been in cardiac arrest for >2 minutes need to have 2 minutes of CPR prior to shock. Continue CPR while defibrillator / AED charges. Resume CPR immediately after each defibrillation.

** Use pediatric system for children ages 1 to 8 if available, otherwise use the adult pads.

*** Once an advanced airway is in place, cycles of CPR are replaced with continuous compressions of 100 minute and ventilations of 8-10 a minute. Avoid hyperventilation.

Approved By: _____________________________________ Date: ________________________
Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
Pediatric Respiratory Distress/Asthma

**History:**
- Asthma, chronic bronchitis, other lung disease
- Medications (theophylline, steroids, inhalers, oxygen antibiotics)
- Toxic exposure, smoke inhalation.
- Diagnosis or S/S of pneumonia
- Time of onset
- History of foreign body exposure.
- Fever or respiratory infection
- Other sick siblings

**Signs / Symptoms**
- Shortness of breath, pursed lip breathing.
- Decreased ability to speak.
- Wheezing, rhonchi.
- Orthopnea
- Use of accessory muscles.
- Fever, cough.
- Tachycardia

**Universal Patient Care**

**Vascular Access**

**Severe distress - RR > twice the norm, loud wheezes or so tight no wheezes heard, pt anxious, skin ashen or gray. Continue steps as needed to improve pt. condition.**

**Moderate distress - marked increase in RR, wheezes easily heard, accessory muscle breathing**

**Mild distress- slight increase RR, mild wheezes, good skin color**

**Albuterol continuous inhalation, HHN as long as HR <200**

**Albuterol 2.5 mg HHN if HR <200**

**May repeat continuous inhalation, HHN as long as HR <200**

**Contact Medical Control**

**NOTES:**
- **EMT-I:** If pt has a metered dose inhaler (MDI) that is prescribed to them, **assist** the pt. in using this device provided patient’s maximum dose has not been met. If no change in condition, then proceed to standing order.
- If patient is unable to use the HHN, administer via mask nebulizer.
- Ipratropium bromide/Atrovent is **not recommended** for children <12 yoa.
- Do not proceed to further treatments when condition resolves.

**Methylprednisolone/Solumedrol- Contraindications:** Premature infants, non-asthmatic bronchial disease, known hypersensitivity to the drug, psychosis, and its constituents and systemic fungal infections.

**SE:** flushing, sweating, circulatory collapse, tachycardia, embolism, nausea.

---

**Approved By:** ___________________________ **Date:** ______________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Pediatric Respiratory Distress/Croup

History:
- Viral infections resulting in inflammation of the larynx or trachea
- Seasonal, most cases occur during late fall / early winter. Gradual onset and usually at night.
- Low grade fever or respiratory infection
- Generally in ages < 3, more common in males,
- No history of obstruction (foreign body or trauma)
- Viral and contagious

Signs / Symptoms
- Shortness of breath, pursed lip breathing.
- Retractions with breathing and a barking seal like cough, hoarse voice, improves outside in cool air.
- Decreased ability to speak
- Use of accessory muscles.
- Fever
- See-saw breathing

Universal Patient Care

Vascular Access

Severe distress -
RR > twice the norm,
Cyanosis/See-Saw Respirations
Marked sternal retractions
SPO2 < 95%
Apathetic, restless or exhausted

Supportive Care
And
Supplemental O2

Moderate Distress
Marked RR increase
Accessory Muscle use
Good skin color
SPO2 > 95%
Interested in surroundings

3-5 cc NS
Via
Nebulized Treatment
Repeat as needed

If pt is not improving or condition worsens:
Contact Medical Control

Mild distress
Normal to slight increase RR,
Good skin color
SPO2 > 95%
No stridor at rest
No mental distress

Supportive Care
and
Supplemental O2

If pt. presents with audible stridor at rest consider Epi.
Refer to appropriate dose when administering.

NOTES:
- Do not withhold Epinephrine if IV access is not immediately available.
- Cardiac monitoring is indicated when administering Epinephrine.
- Do not delay transport.

Approved By: ___________________________ Date: ___________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 03/01/2016
Pediatric Seizure

**History:**
- Fever
- Medical history of seizures, seizure medications, headaches, drugs or alcohol.
- Reported seizure activity
- History of recent head injury or hypoxia 2° to HI

**Signs and Symptoms:**
- Observed seizure activity
- Altered mental status
- Hot dry skin or elevated body temperature

---

### Universal Patient Care
- Consider possible febrile seizure and cool patient.

#### Vascular Access
- **Perform blood glucose check**
- **Active seizure?**
  - Yes
  - **Diazepam/Valium**
    - 0.02 mg/kg IV or IO or **Versed 0.1mg/kg IN.**
    - Seizure persists - repeat in 4 minutes.
  - **P**
  - **If IV access not obtainable or indications are for immediate cessation of seizures:**
    - **Versed 0.1mg/kg IN**
    - **P**

#### IO access if indicated for fluids or other medication administration.
- **If seizure recurs, repeat medication**
  - **P**

#### Contact Medical Control

---

### Low blood sugar?
- See Pediatric Hypoglycemia SO
- **Monitor and reassess. Support ABCs as needed.**
- **Adm. NS or LR 20cc/kg bolus. Repeat as needed.**

---

**Legend**
- **FR**
- EMT
- **A**
- **EMT-I**
- **P**
- **EMT-P**

---

**NOTES:**
- Evaluate for: active bleeding, trauma, eye deviation, pupil equality, mouth or tongue bleeding, urinary or fecal incontinence, lack of arm or leg movement or tone.
- Document seizure: onset, duration, type, post-seizure, LOC.
- Do not delay transport.

---

Approved By: ___________________________ Date: ___________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
Pediatric Tachycardia with Pulses & Poor Perfusion

**History:**
- Past medical history
- Medications or toxic ingestion
- Drugs
- Congestive heart failure
- Respiratory distress
- Syncope or near syncope

**Signs and Symptoms:**
- Heart rate: Infant > 220
  Child > 180
- Pale or cyanotic
- Altered LOC
- Diaphoresis
- Congestion
- Tachypnea
- Syncope

**Universal Patient Care**
- Cardiac monitor. Attempt to identify cause.
- Constant pulse oximetry.
- 12-lead EKG
  - Probable Sinus Tach
    - Compatible history consistent with known cause
    - P waves present/normal
    - Variable R-R; constant PR
    - Infants: rate usually <220/min
    - Children: rate usually <180/min
  - Search for and treat "possible contributing factors".

**Evaluate QRS duration**
- Narrow QRS (<0.08 sec)
  - Probable SVT
    - Compatible history (vague, nonspecific);
      history of abrupt rate changes
    - P waves absent/abnormal
    - History of abrupt rate changes
    - Infants: rate usually >220/min
    - Children: rate usually >180/min

- Wide QRS (>0.08 sec)
  - Possible V Tach

**Possible V Tach**
- Synchronized cardioversion: 0.5 to 1 J/kg; if not effective, increase to 2 J/kg.
  - Consider Versed/Midazolam 0.1 mg/kg for sedation, but don't delay cardioversion.
  - May attempt Adenosine if it does not delay electrical cardioversion.
    0.1 mg/kg (max dose 6 mg) rapid IV.

**Consider vagal maneuvers**
- If IV access readily available:
  - Adenosine 0.1 mg/kg (max first dose 6 mg) rapid IV.
    May double first dose and repeat once PRN
    (Max second dose 12 mg)
  - Synchronized cardioversion: 0.5 to 1 J/kg; if not effective, increase to 2 J/kg. Sedate if possible, but don’t delay cardioversion.

**Contact Medical Control**

**Legend**

<table>
<thead>
<tr>
<th>FR</th>
<th>EMT</th>
<th>EMT-I</th>
<th>EMT-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

**NOTES:**
- Do not delay cardioversion while administering vagal maneuvers or meds in the unstable patient.
- If possible, obtain 12-lead EKG prior to and after vagal maneuvers, but do not delay treatment to obtain if patient unstable.
- Record and monitor EKG during vagal maneuver.

---

Approved By: Mark Wilkinson, M.D. WC/JC EMS Medical Director
Adopted 06/01/2015
MISCELLANEOUS
Every health care provider should be concerned that the patient is receiving both expedient and appropriate care. If a facility or any of its departments are backlogged and notification of diversion has been made, the EMS provider should so inform the patient. If the adult patient or parent/legal guardian of a minor continues to request transport to the facility on diversion, the impact of the absence of those resources on their condition such as delays in care, testing, surgery, etc. and the negative impact of those delays on their outcome should be relayed to the patient. They can then make an informed decision and select the recommended alternative destination or suggest one of their own. The patient does have the right to make a decision against medical advice after being made aware of the situation. They have the right to be transported to the hospital of their choice.

“The Emergency Medical Treatment and Active Labor Act is a statute which governs when and how a patient may be (1) refused treatment or (2) transferred from one hospital to another when he is in an unstable medical condition.”

“The regulations specify that a patient in a non-hospital-owned ambulance in transit is not considered to have ‘come to the emergency department’ even if the ambulance is in contact with the hospital by telephone or by radio telemetry. Further, the regulations provide that the hospital may deny access to the patient in transit if it is in ‘diversionary status’ -- that is, if it does not have the staff or facilities to accept additional patients.”

But, under EMTALA if a patient presents to a hospital they cannot refuse the patient and must perform a screening exam, stabilize the patient as necessary, and arrange for transfer if they are unable to perform the necessary and appropriate services. “A person who presents anywhere on the hospital campus and requests emergency services, or who would appear to a reasonably prudent person to be in need of medical attention, must be handled under EMTALA.”

All information given to the patient or guardian concerning the diversion and their response will be documented in the PCR.
Nerve Agent Antidote Kit/Mass Casualty Incident

**Patient History:**
- Exposure to nerve agent

**Signs & Symptoms:**
- Diarrhea
- Urination
- Miosis (pupil constriction)
- Bradycardia, bronchospasm
- Mesis & nausea
- Acramination (tears)
- Salivation, sweating, secretions, seizures
- LOC
- Tachycardia
- HTN
- Respiratory distress

**Legend**
- **FR**
- EMT
- A
- **EMT-I**
- P
- **EMT-P**

**PERSONNEL SAFETY IS THE HIGHEST PRIORITY!**
Patients must be decontaminated and in cold zone before EMS treatment.

**Universal Patient Care**

100% Oxygen and appropriate Airway SO

- Decontaminate if not done already
- Supportive care

- **Mild symptoms**
  - Increased secretions
  - Pinpoint pupils
  - General weakness
  - Runny Nose
  - HA
  - Dripping / tearing
  - Vision problems
  - Chest tightness/coughing
  - N/V / cramping
  - Tachycardia / sweating

- **Moderate symptoms**
  - "mild" symptoms
  - Respiratory distress

  **1 Nerve Agent Antidote kit**

  **CONDITION WORSENS**
  If at any time after the first dose the patient develops any additional symptoms, or if symptoms worsen, administer 2 more DuoDote injections* in rapid succession and immediately seek definitive medical care. **Maximum of 3 kits**.

  **Keep patient warm**

  **A**
  **Vascular access**

  **ECG Monitor**
  **Seizures:**
  - Diazepam/Valium 10mg (peds. 0.2 mg/kg)
  - Midazolam/Versed 2-5mg (peds. 0.1 mg/kg)

  **Contact Medical Control**

  **Severe symptoms**
  - unconscious
  - convulsions
  - apnea
  - CNS involvement
  - Increased dyspnea
  - Violent vomiting / defecation / urination
  - Muscular twitching
  - Bradycardia / convulsions
  - Unconsciousness / respiratory failure

  **Administer 3 kits** in rapid succession. **Maximum of 3 kits**.

  **Consider CPAP** for secretions.

* DuoDote® (atropine and pralidoxime chloride injection) Auto-Injector kits are to be administered in a large muscle of the mid-outter thigh and can be given through clothing making sure pockets at the injection site are empty. After opening the kit, pull off the gray safety release and be sure not to touch the green tip. Swing and **firmly push** the **green tip** straight down/90° angle against the mid-outer thigh. Continue to firmly push until you feel the injector trigger. **IMPORTANT:** After the auto-injector triggers, hold the injector firmly in place against the injection site for approximately 10 seconds.

Remove the injector from the thigh and look at **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 site selection, but push harder.

You must **tell** transport unit or receiving facility **times** antidotes administered. **Continued on next page**
Nerve Agent Antidote Kit/Mass Casualty Incident cont.

EMS SELF-administration AFTER exposure to “nerve agent”

Mild Symptoms
Inject 1 Nerve Agent Antidote kit

If exposed, immediately use personal Nerve Agent Antidote kit

Severe Symptoms
- Inject 3* Nerve Agent Antidote kits

- Wait 10 minutes. If able to
  1) Ambulate,
  2) Know who you are and,
  3) Know where you are;
  DO NOT INJECT 2nd KIT!!!
- If you need a 2nd or 3rd injection, they must only be given by a buddy.

* DuoDote® (atropine and pralidoxime chloride injection) Auto-Injector kits are to be administered in a large muscle of the mid-outer thigh and can be given through clothing making sure pockets at the injection site are empty. After opening the kit, pull off the gray safety release and be sure not to touch the green tip. Swing and firmly push the green tip straight down/90° angle against the mid-outer thigh. Continue to firmly push until you feel the injector trigger. IMPORTANT: After the auto-injector triggers, hold the injector firmly in place against the injection site for approximately 10 seconds.

Remove the injector from the thigh and look at 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 site selection, but push harder.

You must tell transport unit or receiving facility times antidotes administered.

- Repeated doses of Atropine may be required every 15 minutes after Nerve Agent kits are given until: reduced airway secretions, HR > 90bpm, reduced salivations.
- Neve Agent Antidote kits supplied to the units are for WCJC EMS personnel use only. They are not to be administered to the public. The public will be treated through Chempack deployment.
- Do not handle the patient unless they have been decontaminated. All EMS treatment should occur in the “Cold Zone” after decontamination.
- Appropriate PPE will include gloves, mask, eye protection and gown.
- ALL emergency responders are authorized to administer Nerve Agent Antidote kits from a Chempack deployment.
- There is no contraindication for the use of a Nerve Agent Antidote Kit in the case of true nerve agent exposure.
- EMS Director and/or Supervisor have the authority to activate CHEMPACK for launch to the scene.

Selfadministration
- Never pretreat with Nerve Agent Antidote kit prior to exposure and do not continue administration of remainder of kits after S/S resolve.
- NAAK overdose is caused by injecting before an exposure or injecting too much when not warranted.
- After the drug has been administered, push the needle against a hard surface to bend the needle back against the DuoDote Auto-Injector. Put the used injector back into the plastic pouch, if available. Leave used injector(s) with the patient to allow other medical personnel to see the number of DuoDote Auto-Injector(s) administered.

Tennessee Code Annotated

1200-12-2-.01
(1) During the response to emergency situations such as those precipitated by a terrorist event, emergency responders or persons may encounter patients or suffer self-exposure to toxic chemical agents requiring the immediate administration of antidotes or medications to preserve and sustain life and vital functions. Upon the exposure to a significant risk, this rule authorizes emergency treatment by use of autoinjection or intramuscular injection of such antidotes or medications as shall be approved by the Board of the State Medical Officer.

1200-12-2-.04 REPORTS
(1) Upon the administration of such antidotes or medication by autoinjection or intramuscular injection during an emergency situation, the time and use of such antidotes or medications shall be reported to the appropriate medical personnel assuming care for the patient.

1200-12-2-.05 NOTIFICATION
(1) Upon a situation or event involving suspected chemical agent or other toxic substances responding personnel shall immediately notify an emergency dispatch center and inform appropriate public safety and health officials.
Patient Controlled Analgesia

Some patients with persistent pain are treated with a regulated pump or administration device that responds to the need for pain medications. While administration of pain medications is considered a paramedic skill, the transfer of patients with these devices can be considered differently.

An EMT-I may attend the patient during transport under the following conditions:
- The patient is in control of the device or a family member or patient provided caregiver capable of monitoring, resetting and refilling the device is present during the transport.
- There is no anticipation of the need for the ambulance crew to refill or alter the medication administration rate.
- The transport is either local or of short duration (one hour or less).

Approved By:____________________________________   Date:_________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 06/01/2015
START Triage
Simple Triage and Rapid Treatment

Respirations Present

- NO
  - Reposition Head
  - Re-check breathing

- YES
  - >30/min
  - <30/min – check perfusion

Perfusion (Radial Pulse)

- ABSENT
  - Red Tag

- PRESENT
  - Check Mental Status

Mental Status

- Delayed in following commands

- Cannot follow commands

Minor Injuries - Green Tag

BLACK – Deceased
RED – Transport ASAP
YELLOW – Delayed transport
GREEN - Last transported
Blood Infusion Maintenance

Some patients requiring interfacility transport have blood products infusing at the time of transport. These infusions are initiated in a hospital and may not be completed prior to departure. The blood has undergone vigorous testing and matching to assure that there will be no adverse reactions, but the paramedic accompanying the patient must be able to recognize the clinical complications that may occur with blood administration and be ready to discontinue the infusion and treat the patient as clinically indicated.

Blood should be administered through an IV catheter that is 20 gauge or larger. The intravenous access for blood administration must be a dedicated IV line through which no other medication or solution other than normal saline may be infused.

Basic care of the patient receiving a blood transfusion:
- Get a baseline set of vital signs to include temperature.
- Assess infusion site and vital signs every 15 minutes for 2 more sets and then hourly if there have been no adverse changes noted.
- Be constantly vigilant for any changes in patient condition.

Symptoms of a reaction generally occur within the first 15 minutes or first 50 cc, but the patient should be constantly observed for clinical signs of a transfusion reaction or intravascular hemolysis.

These signs are as follows:

**General**
- Fever
- Chills, diaphoresis
- Heat or pain at infusion site
- Muscle aches, pain
- Back pain, chest pain, headache
- Flushing of the skin
- Rashes, hives, itching
- Cool/clammy or hot/flushed skin
- Bloody or discolored urine

**Cardiovascular**
- Changes in heart rate (brady or tachy)
- Changes in BP (hypo or hypertension)
- Edema
- Onset of bleeding

**Neurologic**
- Apprenision, anxiety, restlessness
- Tingling, numbness

**Respiratory**
- Cough, dyspnea
- Rales, wheezing
- Changes in respirations (in particular tachypnea)
- Bloody or discolored urine

**GI/GU**
- Nausea, vomiting
- Cramping, diarrhea

<table>
<thead>
<tr>
<th>For suspected reaction (i.e. two or more of the above symptoms):</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Immediately stop infusion</td>
</tr>
<tr>
<td>- Check and monitor vital signs to include temperature</td>
</tr>
<tr>
<td>- Maintain ABCs/CABs</td>
</tr>
<tr>
<td>- Remove bag of blood and all blood tubing.</td>
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<tr>
<td>- Infuse normal saline through new tubing at a rate to maintain blood pressure</td>
</tr>
<tr>
<td>- Administer supplemental oxygen</td>
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<tr>
<td>- Treat symptoms with appropriate Standing Order i.e. antihistamines, epi and corticosteroids as required. Resuscitation may also be necessary.</td>
</tr>
<tr>
<td>- Verify patient and blood information to the extent possible to exclude a compatibility error.</td>
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<tr>
<td>- Bag all infusion components to give to the receiving facility for further testing.</td>
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<tr>
<td>- With minor reactions, treat signs/symptoms and per patient response, continue to the destination or return to the point of origin if it is closer.</td>
</tr>
</tbody>
</table>

For severe reactions, treat and transport to the closest hospital of any type.
- When patient condition and time allows, contact both the point of origin and destination facilities with information on the reaction.

Approved By: _________________________________ Date: ________________________
Mark Wilkinson, M.D.  WC/JC EMS Medical Director
Adopted 07/30/2015
These “Guidelines” are provided as a template for the way certain job related actions can be performed and equipment is operated.
INDICATIONS

- Chest pain
- Stroke
- Suspected electrolyte imbalances
- Electrical or lightening injuries
- Upper torso trauma
- Syncope
- Pain radiating to jaw or left arm
- Respiratory distress
- Following emergency cardioversion
- Altered LOC or mental status
- Arrhythmias
- Weakness
- Diaphoresis
- Other “susicious” symptoms

APPLICATION

1. Do 12-lead immediately or as soon as patient condition allows.
2. Place patient in a supine or semi-sitting position.
3. Bare the patient’s chest enough to acquire a 12-lead EKG. Place hospital gown on patient for ease of covering. Take all steps necessary and possible to protect the patient’s dignity and privacy.
4. **Lead Placement:** Remove excess hair where needed for good lead contact.
   The four limb leads go on the four extremities as follows:
   - **V1** - fourth intercostal, right sternal border.
   - **V2** - fourth intercostal, left sternal border.
   - **V3** - equal distance between V2 and V4.
   - **V4** - fifth intercostal, left mid clavicular line.

   Leads must not be placed on top of breast tissue.

   - **V5** - anterior axillary line, same level with V4.
   - **V6** - mid axillary line, same level with V4 and V5.

5. Enter minimum information of patient age and gender into monitor.
6. Instruct patient to lie as still as possible.
7. “Acquire” 12-lead
8. In all suspected “Inferior MIs” diagnosed by the monitor and/or as evidenced by ST elevation in leads II, III and aVF, perform a V4R 12-lead.
   The only lead changed is the V4 lead from the left chest to the fifth intercostal, right mid-clavicular line.
   Patients showing elevation in this lead are at higher risk of suffering a lowered blood pressure when administered nitrates. An IV line must be in place prior to administration and monitor patient closely.
9. **Download** ECG and 12-lead to PCR in order for it to be included in the report. If unable to download, attach hard copy of strips to patient demographic sheet. All strips are to have written on them the **patients last name** and **PCR number**. A copy of the strips must be left in the ED at the time of transport as well as a copy of the completed “Chest Pain/STEMI Information Sheet”.
10. **If 12-lead reads “Acute MI” or equivalent, LBBB/left bundle branch block and/or ST elevation noted suggestive of STEMI, immediately** transmit 12-lead to receiving hospital. If time or equipment failure does not permit transmission, contact receiving hospital as soon as possible of 12-lead findings and any other supporting S/S and information in order for cath lab to be notified. Give the following information: age, gender, 12-lead interpretation, leads elevation noted in, location of reciprocal changes (if applicable), symptoms (including presence or absence of chest pain), significant vital signs and physical findings.

NOTES

1. Acquiring a 12-lead tracing should not normally prolong scene time or transport more than two(2) minutes.
2. Procedure should be performed concurrent with other assessment and care, as per the Suspected cardiac Ischemia Chest Pain Protocol, or acquired while en-route to hospital.
3. A modified 12-lead ECG may be done in cases of suspected Inferior MI if it does not delay any treatment or transport or while enroute to the hospital. The modified 12-lead involves moving V4 – V6 to the positions of V4R, V8 and V9 respectively.
   
   - V4 becomes: V4R - 5th intercostal space at right midclavicular line
   - V5 becomes: V8 - posteriorly at level with V6 at left midscapular line
   - V6 becomes: V9 - posteriorly at level with V6 left of the vertebrae

   V-8 & V-9 will be in line

The goal of immediate recognition of STEMI and relaying of that information is to reduce the “Door-to-balloon” time of these patients thus reducing myocardial damage.

CERTIFICATION

- EMT-P
- Successfully complete annual evaluation of skill inclusive of indications and technique of this procedure.
OLE paint can not be shown on Mac OS.

Diagrams below indicate which part the heart is being affected and what lead would show the changes.
Airway – Combitube

INDICATIONS
Non-breathing, unconscious adult patient

CONTRAINDICATIONS
Intact gag reflex
Patient height less than 4 feet
Allergy or sensitivity to latex
Airway obstruction
Patients with known esophageal disease (cancer, verices)
Patients with ingested caustic substances (acid, lye, etc.)
Laryngectomy patient with stoma

Use caution in drug overdose patients. Do not reverse affects of drug with Combitube in place.

APPLICATION

1. Preoxygenate with 100% O2 with OPA or NPA in place.
2. Assemble equipment to include suction, check cuffs leaving syringes attached and lubricate.
3. Wear proper BSI (minimum of gloves and eye protection).
4. Position patient’s head in a neutral position if no c-spine injury is suspected.
5. In the supine patient, insert the thumb of a gloved hand into the patient’s mouth, grasping the tongue and lower jaw between the thumb and index finger, and lift upward.
6. With the other hand, hold the Combitube with the curve in the same directions as the curve of the pharynx. Insert the tip into the mouth and advance gently along the palate and posterior surface of the oropharynx until the upper teeth are aligned between the printed rings. Caution: DO NOT FORCE THE COMBITUBE. If the tube does not advance easily, redirect it or withdraw and reinsert. Have suction available and ready whenever withdrawing tube.
7. If the Combitube is not successfully placed within 30 seconds, remove the device and hyperventilate the patient for 30 seconds using basic methods before re-attempting insertion.
8. Inflate line 1, blue pilot balloon leading the pharyngeal cuff, with 100ml of air using the 140ml (cc) syringe. (This may cause the Combitube to move slightly from the patient's mouth). Remove syringe.
9. Inflate line 2, white pilot balloon leading the distal cuff, with approximately 15ml of air using the 20ml (cc) syringe. Remove syringe
10. Begin ventilation with 100% O2 through the longer blue (distal) tube. Watch for chest rise. If auscultation of breath sounds is positive and auscultation of gastric air sounds is negative, continue ventilation.
11. If no chest rise, negative lung sounds, and/or positive gastric air sounds with ventilation through the distal tube, begin ventilation through the shorter clear (proximal) tube. Confirm ventilation with chest rise, presence of auscultated lung sounds, and absence of gastric air sounds.
12. If there is no chest rise or positive lung sounds through either tube, remove the device, oxygenate the patient 20-30 seconds as described in C above, and repeat the insertion/insertion/ventilation procedures.
13. Continue to ventilate the patient through the tube, which resulted in lung sounds using a BVM or a manually triggered oxygen delivery value at a rate of a breath every 5-6 seconds.
14. When proper placement is confirmed in the ALS setting or when ALS contact is established, attach the ETCO2 sensor for airway monitoring. Response to confirmation may be slower that ET intubation.
15. REASSESS TUBE PLACEMENT FOLLOWING EVERY PATIENT MOVEMENT.
16. If two consecutive attempts at intermediate airway placement fail to result in a proper placement and ventilation, do not attempt placement again. Ventilate the patient using basic methods and equipment and move to next method in protocol.
17. Document procedure on PCR noting necessity for Combitube, absence of contraindications, number of attempts, complications, confirmation of correct placement, lumen used to ventilate (#1 or #2), SPO2 and/or ETCO2 reading, time and who completed.

REMOVAL

There should be no need for removal in the field unless airway is/becomes misplaced or patient regains consciousness. In that instance:
1. Have suction and BVM ready for assisted ventilation.
2. Have patient in a position that reduces risk of aspiration.
3. Deflate #1/blue pharyngeal cuff first.
4. Deflate #2/white distal
deflate
deflate
5. Remove Combitube in one motion as patient exhales, being ready for patient to vomit.
6. Place patient on high concentration O2 by NRB.

NOTES:
• SUCTIONING THROUGH THE COMBITUBE: When suctioning the patient through the Combitube, always introduce the suction catheter through Tube #2 (white). Because the Combitube will usually be in the esophagus, most through-the-tube suctioning will be gastric suctioning and will result in decreased
Airway – Combitube cont.

gastric distension. In the event that the Combitube is in the trachea, suctioning of the patient's airway will result.

- **Caution:** when facial trauma has resulted in sharp broken teeth or dentures, remove denture and exercise extreme caution when passing the Combitube into the mouth to prevent the cuff from tearing.

- If C collar in place and/or c-spine injury suspected, prior to Combitube placement remove c-collar and have another caregiver maintain C spine during procedure. Replace collar and CID after successful airway management.

CERTIFICATION REQUIREMENTS

- EMT, EMT-I, EMT-P
  Successfully complete an annual skill evaluation inclusive of indication, contraindications, technique and possible complications of procedure.
Airway – Nasotracheal Intubation

INDICATIONS

- Patient in need of intubation who is breathing and with or without sedation

CONSIDERATIONS

- Orotracheal method preferred in trauma setting
- Do not attempt if basilar skull fracture suspected
- Can be achieved with or without sedation
- Excessive bleeding may occur from nose or posterior pharynx areas
- Infection more probable with nasotracheal than orotracheal intubation

APPLICATION

1. Select appropriate size ET tube, approximate size of nasal canal. Generally, same size as tube that would be used for orotracheal intubation.
2. Wear gloves and eye protection. Have suction ready. Inform patient if conscious. Sedation may be helpful.
3. Lubricate tube tip using aseptic technique.
4. Place patient's head and neck in the "sniffing position" if not contraindicated by possible neck injury. It is a bit easier for right handed operators to use the right nares, though either may be used.
5. Insert tube in nare and slowly, gently advance the ETT along the floor (inferior aspect) of the nose. Orient the tube to "aim" at the larynx. This would be slightly to the left for a tube entering the right nare. Continue to advance and enter the trachea during inspiration. Auscultate breath sounds. If position confirmed, inflate cuff and secure tube.
6. Ventilate at a rate of 10 to 12 breaths per minute or one every 5 to 6 seconds.

Placement/Position Confirmation:

Position T/Trachea:

- **Signs** are: breath sounds continue through tube, tube continues to advance, patient coughs through tube.

Position A/Anterior:

- **Signs** are: breath sounds continue through the tube, the tube stops (unable to advance further), and the patient coughs (mostly through the tube).
- **Response**: Position A can almost always be converted directly to Position T by slight withdrawal and re-advance of tube while the patient's head and neck are gradually flexed toward the chin-on-chest position.

Position L or R/Left or Right pyriform sinus/throat:

- **Signs** are: breath sounds through the tube STOP, tube stops (unable to advance), there is NO coughing. Occasionally the tube may be palpable on one side of the neck.
- **Response** L or R: Position L or R can invariably be converted into one of the other three (T, A or E) by slight withdrawal (to the point where breath sounds through tube resume) and slow rotation (back toward midline) and re-advance.

Position E/Esophagus:

- **Signs** are: breath sounds through the tube STOP, tube continues to advance, there is NO coughing.
- **Response** E: Position E can most often be converted to position T by withdrawing the tube until breath sounds through tube resume and then employing one or more of the following (separately or together):
  1. *Extend* patient's head and re-advance.
  2. Largely inflate cuff, advance tube until resistance is felt, maintain some advancing pressure on tube while cuff is slowly deflated.
  3. Apply posterior pressure on the larynx and re-advance tube. Most often, position T can be achieved.

CERTIFICATION REQUIREMENTS

- EMT-P
- Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and the possible complications of the procedure.
Airway – Nebulizer

INDICATIONS

Patients requiring nebulized administration of medication for emphysema, chronic bronchitis and asthma

Contraindications

- Patients with known hypersensitivity to Ipratropium Bromide or other Atrovent components.
- Patients with known hypersensitivity to Atropine or its derivatives. May omit the Atrovent and administer Albuterol only.

APPLICATION

1. Gather unnecessary equipment.
2. Assemble nebulizer administration set. The mouthpiece is preferable if patient is able to hold it.
3. Instill 2.5mg premixed Albuterol and 0.5mg in 0.5 mL Ipratropium bromide/Atrovent in the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 8-10 lpm or adequate flow to produce steady, visible mist.
5. Place the patient in a comfortable, upright position. Place the mouthpiece in the patient’s mouth and have them make a good lip seal around the mouthpiece. Instruct them to breathe in calmly, deeply and evenly. If unable to affectively use the mouthpiece, use the facemask.
6. Have patient close their eyes during administration to avoid getting mist in them due to affects of the Atrovent/Ipratropium Bromide on vision and narrow angle glaucoma.
7. Continue administration until medication is depleted. Tapping the reservoir near the end of administration can aid in utilizing all the medication.
8. Monitor the patient for medication effects. This should include the patient’s assessment of their response to the treatment and reassessment of vital signs, EKG and breath sounds.

<table>
<thead>
<tr>
<th>Albuterol</th>
<th>Ipratropium bromide /Atrovent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side affects</td>
<td>Side affects</td>
</tr>
<tr>
<td>uncontrollable shaking of a part of the body</td>
<td>dizziness</td>
</tr>
<tr>
<td>nervousness</td>
<td>nausea</td>
</tr>
<tr>
<td>headache</td>
<td>heartburn</td>
</tr>
<tr>
<td>nausea</td>
<td>constipation</td>
</tr>
<tr>
<td>vomiting</td>
<td>dry mouth</td>
</tr>
<tr>
<td>cough</td>
<td>difficulty urinating</td>
</tr>
<tr>
<td>throat irritation</td>
<td>pain when urinating</td>
</tr>
<tr>
<td>muscle, bone or back pain</td>
<td>frequent need to urinate</td>
</tr>
<tr>
<td>back pain</td>
<td></td>
</tr>
</tbody>
</table>

More serious side affects of both

- rash
- hives
- itching
- swelling of the eyes, face, lips, tongue, throat, hands, feet, ankles or lower legs
- hoarseness
- difficult breathing or swallowing
- fast or pounding heartbeat
- chest pain

Atrovent/Ipratropium bromide inhalation sometimes causes wheezing and difficulty breathing immediately after it is inhaled.

When solely using Atrovent, administer the 0.5 mg/2.5 mL concentration or add an aerosolized saline to the 0.5 mg/0.5 mL concentration.

There have been reports that people with peanut allergies are also allergic to Atrovent. This is not substantiated in any literature referenced or with respiratory therapists. There is a contraindication to patients with a soya lecithin hypersensitivity. Continuously monitor patients with allergy to peanuts during its administration and be prepared to remove the treatment and treat appropriately.

CERTIFICATION REQUIREMENTS

- EMT-I, EMT-P
Airway – Orotracheal Intubation

INDICATIONS

Cardiac or respiratory arrest or severe respiratory distress
Present or impending airway compromise
Other indications not stated

CONSIDERATIONS

Tube sizes:  Other equipment to assemble:
Newborn  2.5 – 3.0mm  lubafax
6 months  3.5mm  laryngoscope and blade
18 months  4.0mm  10cc syringe
3 years  4.5mm  stylette
5 years  5.0mm  stethoscope
6 years  5.5mm  capnography sensor
8 years  6.0mm  tube holder
12 years  6.5mm  O2
16 years  7.0mm  suction unit
Adult (female)  8.0 – 8.5mm  SPO2 sensor
Adult (male)  8.5 – 9mm  Monitor

APPLICATION

2. Wear gloves and a minimum of eye protection. Consider full-face protection. Have suction unit at patient’s head.
3. Attach cardiac and oxygen saturation monitors.
4. Preoxygenate the patient for 2 minutes. Do Not hyperventilate. Utilize cricoid pressure, especially during RSI.
5. Place patient in sniffing position or manually maintain C-spine throughout if trauma patient.
6. If Combitube in place in esophagus (longer tube used for ventilation) deflate blue pilot balloon/100cc.
7. Hold laryngoscope in left hand, insert blade on right, pushing tongue to left.
8. Visualize cords and maintain visualization until tube passed.
9. Immediately suction if vomitus occurs. Reoxygenate before reattempt.
10. Check tube placement by observing symmetrical rise and fall of chest with BV ventilations and fogging of the tube. Inflate cuff. Instruct personnel not to move the tube.
11. Auscultate chest and abdomen. If breath sounds on right and not on left, withdraw tube slightly until breath sounds heard. Use capnography to ensure correct placement. Waveform capnography preferable.
12. Secure tube with commercial tube holder.
13. Do not attempt intubation longer than 30 seconds.
14. Monitor breath sounds at intervals, any time dislodgment is suspected and prior to transfer of care.
15. Remove ventilation device from tube during all patient moves to minimize risk of dislodgement. Resume ventilations as soon as feasible.

CERTIFICATION REQUIREMENTS

☐ EMT-P

Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique and the possible complications of the procedure.
Airway – Quick Trach – Adult & Pediatric

INDICATIONS

- Acute upper airway obstruction unrelieved by BLS or laryngoscopy
- Unable to insert ET tube or BIAD
- Airway damage such as fractured larynx or trachea

CONSIDERATIONS

Assure all other means of airway establishment have been exhausted. **This procedure is NOT to be used as a first-line backup for failed intubation or RSI; attempt use of King Airway or other approved BIAD first!**

- If bleeding occurs at site, use direct pressure.
- Local anatomy from site:
  - Superior - larynx
  - Inferior - Thyroid gland
  - Posterior – esophagus
  - Lateral - carotid arteries
  - Midline - cricothyroid artery

APPLICATION

1. Place patient in a supine position. Assure stable positioning of the neck region by placing a pillow or other material under the patient’s shoulders and hyperextend the neck, unless cervical trauma is suspected. Great care will have to be maintained for the trauma patient, but acquiring an airway is the priority.
2. Cleanse the area with betadine or similar solution.
3. Secure the larynx laterally between the thumb and forefinger. Find the cricothyroid ligament (in the midline between the thyroid cartilage and the cricoid cartilage). This is the puncture site.
4. Firmly hold the device and puncture the cricothyroid ligament at a 90 degree angle. The opening of the trachea is achieved by dilating through the skin. This reduces the risk of bleeding as only the smallest necessary opening is made.
5. After puncturing the cricothyroid ligament, check the entry of the needle into the trachea by aspirating air through the syringe. If air is present, the needle is within the trachea. Now, change the angle of insertion to 60 degrees (from the head).
6. Advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the rear wall of the trachea.
7. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck.
8. Carefully remove the needle and syringe.
9. Secure the cannula with the neck tape.
10. Apply the connecting tube to the 15 mm connection and connect the other end to the resuscitation bag with 100% oxygen.
11. Apply waveform capnography sensors.
12. Document airway methods utilized, need for procedure, site prep, size airway used, difficulties of insertion, securing of airway device.

MONITOR

- Tube for security
- Site for bleeding or sub-q air or edema
- Neck for edema
- Trachea for shift
- BBS for continued adequate ventilation

CERTIFICATION REQUIREMENTS

- Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and the possible complications of the procedure.
Airway - Rapid Sequence Induction

INDICATIONS
- Patient who is unable to protect airway or requires ventilatory assistance
- Respiratory distress with signs of exhaustion
- Acute head injured patients that are combative, unable to effectively control airway, need hyperventilation to control intracranial pressure or that are having difficulty breathing.
- Impending airway obstruction (severe burns, airway burns, severe head injury)
- Uncontrollable patient who is threat to self and caregivers
- All standard attempts to establish airway have failed

CONTRAINDICATIONS
- History of malignant hyperthermia
- Known allergy to agents
- Penetrating eye injury
- Acute narrow angle glaucoma

PRECAUTIONS
- Pregnancy
- Dehydration
- Respiratory disease
- Severe burns
- Fractures
- Cardiac disease
- Multiple facial fractures or facial instability
- Neuromuscular disease
- Hyperkalemia
- Elderly and debilitated patients
- Renal and hepatic disease

EQUIPMENT NEEDED
- Laryngoscope
- Endotracheal tube & stylette
- 10 cc syringe
- Lubricant
- ET tube holder
- Suction unit
- Combitube
- Monitor
- SPO2 sensor
- Resuscitation bag
- Medications
- Waveform capnography

APPLICATION

Assemble and check all equipment

Adult:
2. Administer **100% oxygen by NRB** or **ventilate** patient for 2 – 3 minutes while holding **cricoid pressure** prior to intubation. This will establish an oxygen reserve for intubation attempts.
3. Continuously monitor heart rate and **SPO2**.
4. If patient has a **closed head injury**, administer **lidocaine** 1.5 mg/kg IV/IO push.
5. If patient **bradycardic**, consider **atropine** 1 mg IV/IO push.
6. Administer 20 mg **Etomidate** over 30-60 seconds through a free flowing IV. (Do NOT re-administer etomidate).
7. **Attempt intubation** while holding **cricoid pressure**.
8. If unsuccessful, administer 100 mg **succinylcholine/Anectine slow IV**. Hold **cricoid pressure while ventilating**. Wait for fasciculations to stop.
9. Attempt **intubation** while holding **cricoid pressure** and following procedure for Airway - Orotracheal Intubation
   - If **unable** to intubate within 20 seconds, provide ventilations for 30 – 60 seconds and reattempt.
   - If **bradycardia** develops during intubation attempt, stop and ventilate patient at 20/minute. If bradycardia does not resolve, administer **atropine** 1 mg IV/IO.
   - If unable to effectively ventilate the patient, consider Difficult Airway SO.
10. **Verify** correct tube placement by a minimum of three methods (visualization, auscultation of epigastrium and lung fields, colormetric ETCO2 device, waveform capnography and chest rise) and document these in PCR narrative.
11. Administer **midazolam/Versed** 2 - 4 mg IV/IO.
12. After 2 minutes (following intubation), 0.1 mg/kg **vecuronium/Norcuron** IV, if needed for prolonged paralysis

CONSIDERATIONS
- **Succinylcholine and Etomidate** only last 5-10 minutes.
- RSI changes the normal muscle tone of the airway to the extent that it may make it impossible to ventilate the patient by mask.
- Medic that performed intubation should reconfirm tube placement following transfer of patient at the ED.

Pediatric procedure on following page
Airway - Rapid Sequence Induction

Pediatric: < 12 yoa unless indicated

2. Administer 100% oxygen or ventilate patient for 2 – 3 minutes prior to intubation. This will establish an oxygen reserve for intubation attempts.
3. Continuously monitor heart rate and SPO2.
4. If patient has a closed head injury, administer lidocaine 1 mg/kg IV/IO push.
5. If patient < 10 yoa, administer atropine .02 mg/kg IV/IO push; ≥ 10 yoa 1mg IV/IO. Use with discretion in the child with existing tachycardia.
6. Administer 20 mg etomidate over 30-60 seconds through a free flowing IV. (Do NOT re-administer etomidate)
7. Administer succinylcholine/anectine 20 mg IV/IO while holding cricoid pressure. Wait for fasciculations to stop.
8. While awaiting fasciculations to stop, administer Versed .01 mg/kg IV/IO, max dose of 5 mg.
9. Attempt intubation while holding cricoid pressure and following procedure for Airway - Orotracheal Intubation
   If unable to intubate within 20 seconds, provide ventilations for 30 – 60 seconds and reattempt.
   If bradycardia develops during intubation attempt, stop and ventilate patient at 20/minute. If bradycardia does not resolve, administer atropine 1 mg IV/IO.
10. If unable to effectively ventilate the patient, consider Difficult Airway SO.
11. After 2 minutes (following intubation), for >9 yoa, administer vecuronium/Norcuron 0.1 mg/kg IV/IO, if needed for prolonged paralysis.
13. Notify Shift Captain

For drug dosages on ages not specified, contact medical control.

CERTIFICATION REQUIREMENTS

* EMT-P
  Successfully complete an annual skill evaluation inclusive of the indications, contraindications, and possible complications of the procedure.
Airway - Suctioning - Advanced

INDICATIONS
Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

APPLICATION
1. Ensure suction device is in proper working order.
2. Pre-oxygenate the patient if possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
9. Document time and result in the run report.

CERTIFICATION REQUIREMENTS
* EMT, EMT-I, EMT-P
* Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and possible complications of the procedure.

Airway - Suctioning - Basic

INDICATIONS
☐ Obstruction of the oropharynx (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep their airway clear.

APPLICATION
1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient.
9. Record the time and result of the suctioning in the run report.

CERTIFICATION REQUIREMENTS
* FR, EMT, EMT-I, EMT-P
Assessment- Adult Patient

INDICATIONS

Any patient requiring medical evaluation that is too large for the Broselow Resuscitation tape.

APPLICATION

1. Scene size-up, including the use of Standard Precautions (BSI), scene and environmental hazards, number of patients, need for more help or equipment, by-stander safety, MOI/Illness and patient/caregiver interaction.
2. Initial assessment includes a general impression (general appearance, position, activity, obvious injuries/bleeding), LOC (AVPU), control of cervical spine if trauma, status of airway, breathing, and circulation, skin color, temperature and moisture, capillary refill and major hemorrhage control.
3. Assess the need for critical intervention.
4. Assess overall priority of the patient. Determine if “Load and Go”.
5. Perform a focused history and physical exam based on the patient's chief complaint or Rapid Trauma Survey to include a baseline set of vital signs, breath and heart sounds, GCS and pupils.
7. Patients who are not critical can have a secondary exam prior to transport.
8. Perform a complete detailed exam and non-life saving interventions during transport.
9. Maintain an ongoing assessment throughout transport, to include patient response, possible complications of interventions, the need for additional interventions and assessment of evolving patient complaints/conditions.

CERTIFICATION REQUIREMENTS

*FR, EMT, EMT-I, EMT-P

Assessment – Pediatric Patient

INDICATIONS

Any child that can be measured with the Broselow Resuscitation tape.

APPLICATION

1. Scene size-up, including the use of Standard Precautions (BSI), scene and environmental hazards, number of patients, need for more help or equipment, by-stander safety, MOI/Illness and patient/caregiver interaction.
2. Initial assessment includes a general impression (general appearance, position, activity, obvious injuries/bleeding), LOC (AVPU), control of cervical spine if trauma. Also, status of airway, breathing, and circulation, skin color, temperature and moisture, capillary refill and major hemorrhage control and need for critical intervention.
3. Assess the patient using the pediatric triangle of ABC's:
   - Airway and appearance: speech/cry, muscle tone, inter-activensness, look/gaze, movement of extremities.
   - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning.
   - Circulation to skin: pallor, mottling, cyanosis.
4. Assess overall priority of the patient. Determine if “Load and Go”.
5. Perform Rapid Trauma Survey or focused history and physical exam based on the patient's chief complaint to include a baseline set of vital signs, breath and heart sounds, GCS and pupils.
7. Patients who are not critical can have a secondary exam prior to transport.
8. Perform a complete detailed exam and non-life saving interventions during transport. Pediatric patients easily experience hypothermia and should not be left uncovered longer than the time to complete the assessment. Include immunizations, allergies, medications, past medical history, last meal, and events leading up to injury or illness where appropriate.
9. Treat chief complaints per standing orders.

CERTIFICATION REQUIREMENT

*FR, EMT, EMT-I, EMT-P
Blood Glucose Analysis

INDICATIONS

• Patients with suspected hypoglycemia (diabetic emergencies)
• Change in mental status, bizarre behavior, unresponsive, etc.
• Weakness
• Seizure

EQUIPMENT

Glucometer
Lancet
Alcohol prep
Test strip
Band-Aid

APPLICATION

1. Gather and prepare equipment.
2. Clean site for finger stick, let air-dry or wipe with 4x4 and stick.
3. Place correct amount of blood on appropriate area of glucometer strip.
4. Document the glucometer reading and treat the patient as indicated by the analysis and standing order.
5. Repeat glucose analysis as indicated for reassessment after treatment and as per standing order.

CERTIFICATION REQUIREMENTS

* EMT-I, EMT-P
Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from shortness of breath from congestive heart failure and acute cardiogenic pulmonary edema. CPAP is also shown to improve dyspnea associated with pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema). In patients with CHF, CPAP improves hemodynamic by reducing preload and afterload. CPAP is also being used in the treatment of near drowning patients to disperse water out of the lungs and in carbon monoxide poisoning.

Indications:
Dyspnea / Hypoxemia secondary to congestive heart failure, acute cardiogenic pulmonary edema, pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema), impending ventilatory failure and:

- Any patient who is complaining of shortness of breath for reasons other than pneumothorax
- Is awake, alert and oriented
- Has the ability to maintain an open airway (GCS>10) and protect it from secretions.

**Must have two or more of the following:**
- Has a respiratory rate greater than 25 breaths per minute
- Has pulse ox of <94%
- Has a systolic blood pressure above 90 mmHg
- Uses accessory muscles during respirations

Contraindications:
- Pneumothorax or has suffered trauma to the chest
- Respiratory arrest or agonal respirations
- Unconscious
- Shock associated with cardiac insufficiency
- Persistent nausea/vomiting
- Facial anomalies / stroke obtundation / facial trauma
- Pt. has active upper GI bleeding or history of recent gastric surgery
- Inability to achieve adequate face mask fit.
- Inability of patient to cooperate with therapy.

**APPLICATION:**

1. Make sure the patient does not have a pneumothorax!
2. Place patient in a sitting position, feet dangling preferable, but not necessary.
3. Assess vital signs and $SpO_2$ q5 min.
4. Attach heart monitor and pulse oximeter unless patient condition requires immediate application of CPAP.
5. If BP <90 systolic contact Medical Control prior to beginning CPAP.
6. Check all connections in the O2 lines and the valve in the CPAP circuit.
7. **Port-O-Vent:** Connect O2 line to pressure connection on portable tank, or place on unit flow meter at flush.
8. **CPAP Mask:** Connect O2 line to the flow meter.

- Explain the procedure to the patient. **Port-O-Vent:** Make a 3/4 turn of the knob to the 6 o’clock position. **CPAP Mask:** Set the flow rate to 10 lpm.
- While fitting the mask to the patient, effective “verbal sedation” is important, e.g., explaining to the patient the goals of the therapy and placing the mask in the patient’s hands to “self-administer” (the **Port-O-Vent Comfort Seal** Mask is designed with thumb and finger grooves for elderly and arthritic hands to grip),
- While the patient is holding the mask, secure the neoprene head harness and inform the patient the mask can be easily removed.
- Example: “You are going to feel some pressure from the mask but this will help you breathe easier.”

Place delivery device over mouth and nose for optimal fit, comfort, seal and effective CPAP treatment. Replace the mask if cushion hardens, tears, leaks around face or mask becomes filled with patient secretions.
- Instruct patient to breathe in through their nose slowly and exhale through their mouth as long as possible (count slowly and aloud to four, then instruct to inhale slowly).
9. If condition has not improved, increase pressure until improvement is seen and remain at that pressure. **Port-O-Vent:** Make adjustments to flow, but **not to exceed 10 cmH2O/green zone.**

**CPAP mask:** Increase pressure via flow rate every 3 to 5 minutes until patient improves or **Max of 15 cmH2O.**

10. Check for air leaks

11. If nebulizer treatment is attached to the CPAP device, you will have to use another tank to provide flow to the nebulizer. If possible, wait until patient is in the ambulance and utilize the on-board flow meter to administer the nebulizer.

12. Treatment should be given continuously throughout transport to ED. If a problem arises making the CPAP inoperable, remove the tubing from the mask and ventilate the patient with a bag-valve device. If patient improves and wants to remove the devise, advise them of need to continue treatment until arrival at the ED.

13. Continue to coach patient to keep mask in place and readjust as needed

14. If respiratory status / level of consciousness deteriorate, remove device and consider bag valve mask ventilation and/or endotracheal intubation (see intubation SO) or other approved advanced airway.

15. Documentation on the patient care record should include:
   a. CPAP level (**Port-O-Vent** max of 10 cmH2O, **CPAP mask** 15cmH2O max)
   b. SpO2 q5 minutes
   c. Vital Sign q 5 minutes
   d. Response to treatment
   e. Any adverse reactions
   f. ETCO2 when utilized

Special Notes:
1. CPAP should not be used in children under 12 years of age.
2. Advise receiving hospital as soon as possible so they can prepare for the patient’s arrival. Advise of the current airway pressure.
3. Do not remove CPAP until hospital therapy is ready to be placed on the patient. **Port-O-Vent** hoses do not interchange, but the facility’s tubing can be connected to the Emergent facemask without problem. Document delays in the receiving hospital providing airway management.
4. Monitor patient for gastric distension, which may lead to vomiting.
5. Use nitroglycerine tablets to avoid nitroglycerine spray from being dispersed on patient/EMS crew.
6. CPAP devices are simple to use, but their effective application requires skill. Providers must coach their patients throughout the CPAP process and be vigilant for changes in the patient’s condition.

End-of Life considerations
For patients with valid DNR/POST or DNI/do not intubate orders, CPAP may be an acceptable alternative to intubation because DNRs do not translate into “do not provide care.” For patients requesting or needing our assistance, we are still expected to provide supportive care to increase patient comfort. CPAP can be helpful in these cases because it doesn’t commit the patient to prolonged intubation and mechanical ventilation.

Preventing and Troubleshooting Air Leaks
When the Emergent device is on a patient, we should hear the patient inhale and exhale. If we hear continuous flow, there is a leak and the tank will be depleted very, very quickly. (The challenge is that with the engine running, it is difficult to hear a leak.)

1.) The barb on the regulator is turned ON. It must be OFF and must not be used to run a treatment. A treatment must be run from a separate regulator and bottle. Because EMS is accustomed to using a regulator w/only a barb, the inclination is to turn on the barb and let it flow.

2.) Any O2 connection, which should be finger or wrench-tight. Do not use Loctite or elbows.
CPR/Cardiopulmonary Resuscitation

INDICATIONS
☑ Basic life support for the patient in cardiac arrest

APPLICATION

1. **Assess** the patient’s level of responsiveness (shake and shout).
2. If no response, **open** the patient’s **airway** with the head-tilt, chin-lift. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway. Look, listen and feel for respiratory effort for **5 – 10 seconds**.
3. If no respiratory effort, give **two rescue breaths** via mouth-to-mask or appropriately sized BVM (infant, child, adult).
4. **Check for pulse** (carotid for adults and older children, brachial for infants) for at least **5 - 10 seconds**.
5. If **no pulse**, begin **chest compressions** or if **pulse less than 60** on **infants and children** who are showing signs of poor perfusion. Perform at a rate of 100 per minute based on the following:

   - **Infant:** One person- just below nipple line on sternum, 2-3 fingers, 1/3 -1/2 the depth of the chest; **30 compressions/2 ventilations**.
   - **<1 yoa:** Two-person- two thumbs-hands encircling technique, same location and depth as above; **15 compressions/2 ventilations**.
   - **Child:** Center of sternum between nipples, heel of one hand or hands with interlocked fingers, 1/3 -1/2 the depth of the chest; **1 yoa to puberty:** One person- 30 compressions/2 ventilations; two-person- 15 compressions/2 ventilations.
   - **Adult:** Over sternum, just above the xyphoid process, hands with interlocked fingers, depth of 1.5 to 2 inches. **One or two-person- 30 compressions/2 ventilations at a rate of 100 to 120 per minute.**

6. **Check pulse and change compressors** every two minutes to allow time for rest. **Good chest compressions are crucial** to a good outcome.
7. **Push hard and fast** on the chest.
8. Allow for **full chest recoil** after each compression. This maximizes refilling of the heart.
9. **Reassess** for pulse and shockable rhythm **every 2 minutes**. Immediately resume chest compressions if a shock is delivered. If patient is 1 yoa or above, utilize an AED or monitor/defibrillator as soon as available during a witnessed arrest or within 1 minute of arrest. If longer than 1 minute from arrest, perform 2 minutes of CPR prior to use.
10. **Do not interrupt chest compressions** often or for more than 10 seconds at a time.
11. Deliver enough **air to make the patient’s chest rise** and deliver **breaths over 1 second**.
12. Use **cricoid pressure**, if enough personnel are available, during ventilations prior to an advanced airway to avoid gastric inflation. Breaths delivered with too much force and too fast increase this likelihood.
13. When advanced airway is in place, do not interrupt compressions to deliver ventilations. **Ventilate every 6 seconds without interrupting compressions. DO NOT HYPERVENTILATE!**
14. **Document** the times and procedures in the PCR.

CERTIFICATION REQUIREMENTS

- FR, EMT, EMT-I, EMT-P
- Biannual recertification

Updated to 2015 Guidelines on 4/7/16
INDICATIONS

- Unstable patient with a tachy dysrhythmia of any type
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

APPLICATION

1. Consider the use of pain or sedating medications.
2. Attach EKG leads and defib pads to chest per package recommendations ensuring there is good contact with patient skin. Chest should be dry and chest hair clipped if necessary.
3. Turn selector switch to “Monitor” and select the lead you wish to monitor. (If monitor reads “ECG LEAD OFF”, it will prevent use of the synchronization feature, but the unit will still fire. Check lead connections.)
4. Turn selector switch to “DEFIB”.
5. Press the “SYNC” soft key.
6. Set energy selection to 100 joules and charge. NOTE: Reentry SVT and atrial flutter often respond to lower energy levels: start with 50 J and increase if unsuccessful.
7. Make certain all personnel are clear of patient.
8. Press the “SHOCK” button. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may be a delay between activating the cardioversion and the actual delivery of energy.
9. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for “Defibrillation-Manual”.
10. If the patient's condition is unchanged, repeat steps 6 to 8, using 150 and 200 joules. Sync mode must be re-engaged after each attempt.
11. If the patient has not improved after three attempts of cardioversion, contact medical control.
12. Note procedure, response, and time in the run report.

CERTIFICATION REQUIREMENTS

- EMT-P
  - Successfully complete ACLS or equivalent course biennially.
Childbirth - Uncomplicated

INDICATIONS

Imminent delivery with crowning

APPLICATION

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the Newly Born SO for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

CERTIFICATION REQUIREMENTS

* FR, EMT, EMT-I, EMT-P
Childbirth - Complications

Breech Presentation:
Any presentation of a fetus other than head first is considered breech. Most women who have had prenatal care will be aware of the position of their child. Breech presentations occur in 3-4% of all term births and 25-30% in preterm births of 28 weeks gestation or less. While the incidence does increase, preterm babies are generally smaller and delivery is easier. There are 5 types of breech presentations: frank, complete, incomplete, transverse lie and limb presentation. It is not recommended vaginal delivery be attempted with any of these situations. However, the only one that can feasibly be delivered in the field is a frank breech which is where the child is buttocks first in the birth canal with the legs going up by the torso. Even then, the biggest complication is if the head gets hung up at the entrance to the birth canal. Should this happen, the infant must be provided as airway since the cord will definitely be compressed. This is done by inserting two fingers, one on each side of the nose and pushing the vaginal wall away from the baby’s face. Should the head not be delivered within 3 minutes of the trunk, continue to provide the infant with an airway and rapidly transport to the hospital with the mother’s buttocks elevated. Never attempt to provide any traction.

Cord Prolapse:
Cord prolapse occurs when the umbilical cord comes out of the uterus before the baby. This is a dangerous situation for the fetus since it is still reliant on the umbilical cord for oxygen and the cord will be between the baby and the birth canal wall during delivery. Assess for a prolapsed cord anytime the amniotic sac has ruptured. Once discovered, two fingers should be inserted to hold pressure off of the cord. The mother should be placed with hips elevated and instructed to pant during contractions to slow delivery or stop it completely. The exposed cord should be covered and kept moist and warm. Supportive care should be provided to the mother along with rapid transport.

Nuchal Cord:
A nuchal cord occurs when the umbilical cord is wrapped around the neck of the delivering infant. It can be wrapped once or multiple times. This causes an inability for the infant to receive oxygen by either normal respiration or placental exchange. It occurs most often in multiple births or hyperamnion which is a condition where there is too much amniotic fluid allowing the fetus too much freedom to move. It also occurs in about 25% if births so it is a fairly common occurrence. If the cord cannot be easily removed from the infants neck, then 2 clamps should be placed about 3 inches apart and the cord cut and removed. Treat the infant after cutting the cord as any other newborn.

Premature Labor:
Delivering a preterm baby is not different from a normal delivery. The biggest difference is that things will tend to happen faster as the child is smaller and easier to pass. Post delivery, respiratory support, heat conservation and blood loss prevention are the most important concerns. Transport should be to a NICU capable facility if at all possible.

Shoulder Distocia:
This is also known as wedged shoulders. It occurs mostly when the size of the fetus in underestimated or the pelvis refuses to separate. While it should be watched for in all births, it becomes especially more important when there has been a lack of prenatal care. The telltale sign is when the head advances with a contraction, but it retracts back into the birth canal when the contraction is over. Under no circumstances should the head be pulled in an attempt to release the child. If the head is out enough, the mouth and nose should be suctioned. It is possible for the child to breathe and supplemental blowby oxygen should be provided as well as a rapid transport. Again, transport to a NICU capable facility if at all possible.
Defibrillation – Automated/AED

INDICATIONS
Non-traumatic cardiac arrest in patients > 1 year of age.

APPLICATION
1. Confirm the cardiac arrest. Initiate CPR while the defibrillator is being set up. If there is no one to administer CPR during the application of the AED, good CPR is more important than rhythm analysis. Perform CPR until enough responders are on scene to perform CPR and AED application.
2. Turn the defibrillator on.
3. Attach the pads to the patient's chest in the proper position and with minimal interruption of compressions. Use “adult” pads on adult patients and “pediatric” pads on children. If “pediatric” pads are not available, use “adult” pads on children.
4. Stop CPR and clear the patient for rhythm analysis when the AED instructs you to do so.
5. Defibrillate if instructed to by depressing the “Shock” button. Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation. AEDs will determine the correct joules accordingly.
6. Begin CPR immediately after the shock. You will reassess the patient at the next rhythm check in two minutes.
7. Repeat steps 4 through 6 until patient regains pulses or patient care taken over by ALS (Zoll monitor/defibrillators will accept connector on Zoll AED pads removing the need for pad change).
8. If instructed, “No shock advised”, perform CPR for two minutes and then reanalyze.
10. Upon completion of call, call Rescue Sergeant to arrange for download of data from AED.

SPECIAL CONSIDERATIONS
Remove patient from standing water.
Dry victim’s chest if it is wet.
Remove medication patches and wipe off residue in the area a pad is to be placed.
Place pad 1 inch away from implanted devices.
Remove hair that would impede adherence of pad to chest.

CERTIFICATION REQUIREMENTS

FR, EMT, EMT-I, EMT-P

Defibrillation - Manual

INDICATIONS
Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

APPLICATION
1. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
2. Apply hands free pads to the patient's chest in the proper position as indicated by pads making sure they have good skin contact.
3. Set the appropriate energy level (adult – preset escalating current or 200 joules; peds - 2 joules/kg initially with repeat at 4 joules/kg).
4. Charge the defibrillator to the selected energy level.
5. Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient.
6. Deliver the shock by depressing the shock button for hands free operation.
7. Begin CPR immediately. Assess the patient for rhythm change in 2 minutes.
8. Repeat the procedure as indicated by patient response and EKG rhythm.
9. Document the dysrhythmia and the response to defibrillation with EKG strips on/with the PCR report.

CERTIFICATION REQUIREMENTS

EMT-P
Successfully complete ACLS or equivalent course biennially.
Documentation Criteria

Documentation on all patients must include the following and any other information pertinent to patient care:

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

  O – Circumstances surrounding onset of complaint  S - signs, symptoms, physical findings
  P – What provoked the complaint                     A - allergies to medications or the environment
  Q – Quality (sharp, burning, stabbing, etc.) of the complaint  M - medications, prescription or OTC
  R – Pain radiation                     P - past medical history
  S – Severity of pain on 1 – 10 pain scale  L - last oral intake
  T – Time of onset                             E - event, what happened to the patient

Documentation of patient assessment and treatments must be thorough and complete. How treatments were carried out, patient response and complications must be noted. Include as much information in the narrative as possible. **Check boxes in the PCR do not take the place of a clear, concise narrative.**

• Complete PCR as soon as possible after the transport.
• Synchronize computers as soon as PCR is complete so the receiving facility will receive the report. Do not wait until the end of the shift. If you have a concern that you will have a return trip and want to keep the information available to copy, leave the original ticket incomplete for the time being.

Patient Care Report/PCR Requirements

**Signatures:** Every PCR must have the following signatures by patient or surrogate

• HIPPA
• Authorization to File Insurance
• Facility Acceptance

If patient is not able to sign for themselves and there is no legal surrogate, note all this in narrative of PCR. Be specific as to why patient is unable to sign or why surrogate signed.

**Forms:**

Physician Certification Statement/Certificate of Medical Necessity – Must have this form completed by the transporting facility (nursing home, doctor’s office, hospital, etc) on all round trips, discharges and direct admits. Round trip CMNs do not cover unexpected transports outside the scheduled trip. It only covers Point A to Point B and back to Point A. Other destinations on that date will require another CMN. Example: Dialysis patient requires transport to ED for CP during dialysis. The emergency transport to ED does not require a form as it is emergency. The trip from the ED back home or back to dialysis will. Hospital-to-hospital transports do not require this form as they are paid for by the facility. Can be completed by the Physician, RN, PA, Nurse Practitioner, Clinical Nurse Specialist or Discharge Planner.

Notice of Exclusions from Medicare Benefits/NEMB – Medicare will not pay for all transports because they may not meet the definition of a Medicare benefit. Examples: doctor’s office visit, other means of transport available and suitable. If you do not think the transport qualifies for Medicare payment, advise the patient and have them sign the NEMB to allow us to bill the patient.

Advance Beneficiary Notice/ABN- To be completed when a patient is being transported from a facility that should have been able to be performed by their staff in the facility. Have the facility sign and advise them they will be responsible for the bill. Example: Patient transported from a skilled nursing facility/home for IV.

Baby Transports: Paper PCRs must have two specific, medical “Chief Complaints”. Acquire mother’s demographic information-social security number, DOB and address. Get baby’s name if it has one. Must have mileage.

Key Areas of EMS Liability

• Motor Vehicle Accidents
• Response delays
• Bad Refusals (abandonment)
  • Failure to consider “competency”
  • Failure to document
• Patient Care Issues
• Airway management issues
• Spinal immobilization issues
• Equipment failures or inadequate equipment

Poor Documentation = Potential Liability

Organizations are responsible for the conduct of their “Agents”.

• Documentation can be deemed “negligent” even when the care is not.
• Standard of “ordinary negligence” (“failure to act as a reasonably prudent EMT or paramedic would act under ordinary circumstances”) may apply to documentation rather than “gross negligence” (“flagrant, grossly deviating from the standard of care”).
INDICATIONS

Advanced airway patients to monitor ET tube and Combitube patency as well as hyper and hypoventilation.
To monitor respirations in the respiratory distress patients i.e. COPD, CHF, asthma, etc.
Useful in cardiac arrest patients for recognition of ROSC

APPLICATION

1. Plug appropriate tubing sensor (ET or nasal cannula) into EtCO2 module.
2. Place the module into the pouch making sure the open ended gas tube extends from the pouch.
3. Apply appropriate tubing to the patient.
4. If the patient is on oxygen, you will have to “compensate” for the O2 by changing the setting or you will not get an accurate reading.

Select
• “Param”
• “Enter” when “EtCO2” is highlighted
• “Comp”
• “Comp” again and “O2” will be highlighted
• “Enter”
• “Return”
• “Wave 2” if you want to monitor the waveforms

NOTES

The default alarm parameter settings are:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>High EtCO2 Alarm Limit</th>
<th>Low EtCO2 Alarm Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>High RR Alarm Limit</td>
<td>55mmHg</td>
<td>25mmHg</td>
</tr>
<tr>
<td>Low RR Alarm Limit</td>
<td>120 RPM</td>
<td>5 RPM</td>
</tr>
<tr>
<td></td>
<td>120 RPM</td>
<td>5 RPM</td>
</tr>
</tbody>
</table>

You may not have an opportunity to change the alarm parameters during a call, so you will have to rely on the percentages and waveforms on the screen to evaluate the effectiveness of oxygen therapy.

Normal EtCO2 in healthy patients maintaining their own airway is 35 – 45 mmHg.

The desired range in an intubated patient is 25 – 35 mmHg with 25% being near hyperventilation.

If the percentage is below 25 mmHg, evaluate the respiratory/ventilatory rate and volume. Hyperventilation and excess volume lower the EtCO2 and adjustments need to be made.

If the percentage is above 35 mmHg, evaluate the respiratory/ventilatory rate and volume. Hypoventilation and too little volume increase EtCO2 and adjustments need to be made.

Normal EtCO2 range for a patient with chronic lung disease could be as high as the 50s mmHg. Evaluate and treat symptoms per SO.

For further information on operation, refer to the Zoll Operator’s Guide. There is also information on EtCO2 monitoring on the following 3 pages.

CERTIFICATION REQUIREMENTS

[ ] EMT-P
Q/A On EtCO2 Monitoring

1. We watch the patient breathe. Why do we need a ventilation monitor?
Observation of chest movement and skin color are not optimal forms of monitoring ventilation. Chest excursion is a subjective assessment at best. Skin color provides late notification of the presence of hypoxia. The objective data presented through EtCO2 can alert caregivers to respiratory rate and apnea, hyper and hypocapnia, and evidence of obstructed ventilation.

2. We don’t give deep sedation so do we still need to use capnography?
Yes. Because there are a variety of physiologic responses to sedatives and analgesic drugs, the patient is at risk for ventilatory depression even when low doses or "milder" medications are administered. There is no way to predict how all individuals will react to a medication. A planned "Conscious Sedation" can easily become an unplanned "Deep Sedation." Plus, if a reversal medication has been administered, it is wise to continue monitoring the patient’s ventilation to ensure that the sedative/analgesic remains reversed.

3. We use a pulse oximeter on each patient so why use EtCO2 as well?
A pulse oximeter measures oxygenation and alerts caregivers to hypoxic events. Capnography measures ventilation and will alert the caregiver to ventilatory events BEFORE a pulse oximeter. In addition, a patient receiving supplemental oxygen can have an SPO2 of 100% and have an EtCO2 of 100mmHg.

4. Why do we now need to monitor EtCO2?
In addition to the findings of many researchers and societies regarding safety and outcomes, the other piece of the answer is that you finally CAN easily and accurately monitor EtCO2 for all patients using the Microstream® technology.

5. Why use EtCO2 monitoring instead of a colorimetric device?
A colorimetric device is only useful for a brief time and it then must be thrown away. It can be damaged by moisture, must be visualized in good lighting and it produces no actual EtCO2 value.
A colorimetric device is not a vigilance monitor for ongoing ETT placement assessment.
A colorimetric device has no alarms and no waveforms.
A colorimetric device cannot display respiratory rate.
EtCO2 monitoring can be used as a vigilance monitor for all intubated and non-intubated patients in all environments.

6. What waveform will I see with a Right Mainstem intubation?
The waveform shape may appear normal and the EtCO2 value may be within normal limits as well. The alveoli of the Right side are all contributing to the EtCO2 value. This is especially true in the first few moments post extubation. A chest X-ray is the only true method to identify where in the airway the tip of the ETT is positioned. The patient’s SpO2 may drop when the ETT is in the Right Mainstem bronchus.

7. What can be assessed using EtCO2 for patients with COPD?
The COPD patient is especially sensitive to changes in arterial CO2 (PaCO2). It is critical that these patients not receive too much Oxygen and that their CO2 be kept within a range that will allow them a therapeutic drive to breath. The COPD patient will show changes in the shape of their waveforms in response to bronchodilator therapy.

8. What waveform will I see for a patient with asthma?
The waveform will be rounded and likely smaller during bronchospasm, similar to the COPD patient. The waveform will become normal if a good response is gained from the delivery of bronchodilator therapy.

9. Can I use capnography with O2 delivery or while giving a breathing treatment?
YES. The set up will depend on the treatment or O2 device (O2/CO2 cannulas).

10. What will I see with a pneumothorax?
This depends on the size and location of pneumothorax. Again, if it interferes with exhalation you may see a decreased and rounded waveform.

11. What will I see with CO poisoning?
This also depends on the stage of poisoning. Initially, the patient will hyperventilate and EtCO2 will be decreased, as the patient’s LOC drops he/she may begin to hypoventilate and EtCO2 will rise. The one case I saw with CO poisoning the patient was intubated and had very high EtCO2 levels.
CAPNOGRAPHY INTERPRETATION

RESPIRATORY CYCLE:
Oxygenation: oxygen is inhaled into the lungs and carried into the blood
Ventilation: CO2 is transported back from the blood to the lungs & exhaled
Relationship between CO2 & respiratory rate (RR):
Increased RR = decreased CO2 = HYPERventilation (ETCO2 < 35) - resp. alkalosis
Decreased RR = increased CO2 = HYPOventilation (ETCO2 > 45) - resp. acidosis CAPNOGRAPHY = “The VENTILATION VITAL SIGN”:

CAPNOGRAPHY
“The VENTILATION VITAL SIGN”: INTUBATED APPLICATIONS:
Verification of ETT placement
ETT surveillance during transport
CPR: compression efficacy, early sign of ROSC, survival predictor
NON-INTUBATED APPLICATIONS:
Bronchospasm: asthma, COPD, anaphylaxis
Hypoventilation: drugs, stroke, CHF, post-ictal
Shock & circulatory compromise
Hyperventilation syndrome: biofeedback monitor

NORMAL RANGE of ETCO2: 35 – 45 mm Hg
3 QUESTIONS to ASK EVERY TIME CAPNOGRAPHY IS USED:
1. IS THE ET TUBE IN THE TRACHEA (rise and fall of detectable CO2)?
2. WHAT IS THE ETCO2 VALUE (height of the waveform)?
3. WHAT IS THE SHAPE OF THE WAVEFORM?

CAPNOGRAPHY WAVEFORM ANALYSIS:
NORMAL: “Square box” waveform; baseline CO2 = 0;
ETCO2 = 35-45 mm Hg
Management: Monitor

DISLODGED ETT: Loss of waveform, Loss of ETCO2 reading
Management: Replace ETT

ESOPHAGEAL INTUBATION: Absence of waveform,
Absence of detectable ETCO2.
Management: Re-intubate

CPR: “Square box” waveform; baseline CO2 = 0; ETCO2 = 10-15 mm Hg (possibly higher) with adequate CPR
Management: Change rescuers if ETCO2 drops < 10

11
8
"SHARKFIN" with/without prolonged expiration = Bronchospasm (asthma, COPD, allergic rxn).
Management: Bronchodilators (Albuterol, Atrovent, or epinephrine)

RISING BASELINE = Patient is rebreathing CO2:
Management: Check equipment for adequate oxygen inflow
Allow intubated patient more time to exhale.

HYPOVENTILATION: ? RR; Prolonged waveform;
baseline CO2 = 0; ETCO2 > 45 mm Hg
Management: Assist ventilations or intubate, if needed

HYPERVENTILATION: ? RR; shortened waveform; baseline
ETCO2 = 0; ETCO2 < 35 mm Hg
Management: Biofeedback if conscious, decrease assisted ventilation rate if unconscious/intubated
**Important exceptions: Severe metabolic acidosis (DKA, sepsis, salicylate poisoning, acute renal failure, methanol ingestion, tricyclic overdose) will cause tachypnea (? RR), but ETCO2 will be HIGH.
**In other words, if RR is high, but ETCO2 is also high, consider the above diagnoses. This is NOT normal!

PATIENT BREATHING AROUND ET TUBE: angled, sloping downstroke on waveform
Adult: Broken cuff or tube is too small
Pediatric: tube is too small
Management: Assess patient, oxygenation, and ventilation; may need to reintubate

Injections - SQ / IM

INDICATIONS
When medication administration is necessary and the medication must be given via the SQ or IM route or as an alternative route in selected medications.

APPLICATION
1. **Receive** and **confirm medication** order or perform according to **standing orders**.
2. **Prepare** equipment and medication expelling air from the syringe.
3. **Explain** the procedure to the patient and reconfirm patient allergies.
4. The most common site for **subcutaneous** injection is the **arm**. Injection volume should not exceed 1 cc.
5. The possible injection sites for **intramuscular** injection include the **arm**, **buttock** and **thigh**. Injection volume should not exceed 1 cc for the arm and not more than 2 cc in the thigh or buttock. If more is required, administer in two sites/limbs.
6. The **thigh** should be used for injections in **pediatric** patients and injection volume should not exceed 1 cc.
7. **Expose** the selected area and **cleanse** the injection site with alcohol. **Exception**: medication can be administered through clothing when patient is too combative to expose or in the instance of an Epi pen.
8. **Insert** the needle into the skin with a smooth, steady motion
   - SQ: 45 degree angle
   - IM: 90 degree angle
   - skin pinched
   - skin flattened
9. **Aspirate** for blood
10. **Inject** the medication.
11. **Withdraw** the needle quickly and **dispose** of properly without recapping.
12. **Z Track Method**: Pull skin slightly to the side. Inject as above and release. This does not leave the injection puncture site in the skin over the muscle puncture site, thus preventing leakage of the medication out of the body.
13. **Apply pressure** to the site.
14. **Monitor** the patient for the desired therapeutic **effects** as well as any possible **side effects**.
15. **Document** the medication, dose, route, and time on the run report.

CERTIFICATION REQUIREMENTS
* **EMT-I, EMT-P** depending on clinical condition and medication.
* Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and possible complications of the procedure.
Mucosal Atominization Device/MAD

INDICATIONS

For atomizing topical solutions across the naso and oropharyngeal mucous membranes when...
...emergency delivery of medications is needed when IV access not attainable
...emergency delivery of medications is needed when patient agitation prevents vascular access

APPLICATION

1. Disconnect MAD from included syringe.
2. Fill syringe with desired volume of solution and eliminate remaining air.
3. Connect the MAD to the syringe.
4. Place the MAD tip in the nostril or oropharyngeal cavity.
5. Compress the syringe plunger to spray atomized solution into the nasal or oropharyngeal cavity.
6. Re-use the MAD on the same patient as needed, then discard.

If using a Carpuject
1. Remove the tip from the Carpuject and replace with the MAD tip.
2. Depress the Carpuject to puncture rubber seal.
3. Eliminate air from Carpuject.
4. Place the MAD tip in the nostril or oropharyngeal cavity.
5. Compress the syringe plunger to spray atomized solution into the nasal or oropharyngeal cavity.
6. Re-use the MAD on the same patient as needed, then discard.

MEDICATIONS AND DOSAGES

1. Fentanyl: 2mcg/Kilo with max dose of 100 mcg per administration.
2. Versed: 0.25 mg/Kilo with 10 mg max recommended dose of 5-10mg in Teens / Adults.
3. Ketamine 10 mg/Kg
4. Narcan 2 mg
5. Glucagon 1 mg with repeat in 10 minutes if no improvement in L.O.C.

- IN dosages are 1.5-2 times the IV dose.
- Use the most highly concentrated form of the medication available.
- Divide amount to be administered between both nostrils
- Limit volume to max of 1 ml per nostril (0.3-0.5ml is preferred)
- Mucosal Atomization Device contains 0.1 ml of dead space. Consider this when drawing up medications.

CONTRAINDICATIONS:
- Facial/Nasal injury of trauma
- Epistaxis
- Recent inhalation drug use (Esp. cocaine based drugs)
- Excessive Rhinorrhea

CERTIFICATION REQUIREMENTS

EMT-P
Orthostatic Blood Pressure Measurement

INDICATIONS

Patient situations with suspected blood or fluid loss or dehydration.

APPLICATION

1. Assess the need for orthostatics.
2. Obtain patient's pulse and blood pressure while supine.
3. Have patient sit for one minute.
4. Obtain patient's pulse and blood pressure while sitting.
5. If pulse has increased by 20 BPM and systolic blood pressure decreased by 20 mmHg, the orthostatics are considered positive.
6. Obtain patient's pulse and blood pressure while standing.
7. Document the vital signs for all positions.
8. Determine appropriate treatment based on standing order.

CERTIFICATION REQUIREMENTS

* FR, EMT, EMT-I, EMT-P
Pleural Decompression

INDICATIONS

Tension pneumothorax as evidenced by two or more of the following;
1. Acute respiratory distress
2. Cyanosis
3. Unilaterally decreased or absent lung sounds
4. Hyperresonance on affected side
5. Hypotension
6. Subcutaneous emphysema
7. Jugular vein distention
8. Tracheal deviation- late sign and may not be noted with visual assessment

APPLICATION

1. Confirm presence of a tension pneumothorax or identify strong clinical evidence in a rapidly deteriorating patient in the setting of major trauma. (Consider in the setting of refractory PEA.)
2. Locate the insertion site at the second intercostal space at the midclavicular line on the affected side of the chest. (Alternative site: 5th intercostal space; midaxillary line).
3. Prep the insertion site with betadine or similar solution and remove the plastic cap from the needle (this allows air to exit the needle).
4. Insert a 2¼ inch, 14 gauge angiocath (1½ inch, 18 gauge angiocath in patients less than 8 years) by directing the needle just over the top of the third rib (2nd intercostal space) to avoid intercostal nerves and vessels which are located on the inferior rib borders.
5. Advance the catheter one – two inches (3/4 - 1 inch in patients less than 8 years) through the chest wall. A “pop” or “give” may be felt. Do not advance the needle any further.
6. Withdraw the needle and advance the catheter until flush with the skin. Listen for a “hiss” of air which confirms placement and diagnosis. Caution: this is frequently missed due to ambient noise.
7. Dispose of the needle properly and never reinsert into the catheter.
8. Secure the catheter and rapidly transport the patient providing appropriate airway assistance.

CERTIFICATION REQUIREMENTS

☒ EMT-P
☒ Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and possible complications of the procedure.
Pulse Oximetry

INDICATIONS

- Patients with suspected hypoxemia.
- Patients administered medications, especially sedatives
- intubated patients
- General assessment tool appropriate for any patient as determined by field staff.

Pulse oximetry is only a diagnostic tool and is not to be the only means of assessing patient oxygenation. Skin color and condition, LOC, and other means of assessment must be utilized.

APPLICATION

Zoll Monitor Pulse Oximetry

1. Select application site considering one well perfused and restricts patient movement at a minimum. The ring finger or middle finger of the non-dominant hand are preferred. Other digits may be used or the big toe or long toe if the hands are unavailable.

2. Reusable sensor:
   - Place the digit over the sensor window of the sensor. The fleshiest part of the digit should be covering the detector window in the lower half of the sensor. The tip of the finger should touch the raised digit stop inside the sensor. If the fingernail is long, it may extend over and past the finger stop.
   - The hinged tabs should open to evenly distribute the grip of the sensor along the length of the finger. Position is deemed correct when the top and bottom halves of the sensor are parallel. Complete coverage of the detector window is needed to ensure accurate data.

   **NOTE:** With smaller digits, in order to completely cover the detector window, the digit might not need to be pushed all the way to the stop. The sensor is not intended for use on the thumb or across a child’s hand or foot.

Disposable sensor:
   - Remove backing and orient the sensor so that the digit can be attached to the detector side of the sensor first.
   - Press the detector onto the fleshiest part of the finger near the tip of the finger.
   - Press down the “T” shaped adhesive end of the sensor onto the finger and secure the wings in place.
   - Wrap the sensor with the emitter positioned over the finger nail and secure the wings down one at a time around the finger. When properly applied, the emitter and the detector should be vertically aligned. Complete coverage of the detector window is needed to ensure accurate measurements. The sensor is not intended for use across a child’s hand or foot.

3. Ensuring Accurate Monitoring:
   - Choose a site that is well perfused and allows for proper alignment of the light emitter and detector.
   - Select a site that has unrestricted blood flow.
   - Ensure the sensor site is not subject to excessive motion. Excessive motion may adversely affect the performance of the sensor.
   - Do not wrap the adhesive too tightly as to restrict blood flow and do not use additional tape to secure the sensor, as this can cause venous pulsations that could potentially lead to inaccurate saturation measurements.
   - If the sensor fails to track the pulse consistently, the sensors may be incorrectly positioned Reposition the sensor or choose a different monitoring site.
   - Ensure that the signal strength bar graph indicates the presence of a strong signal associated with each heart beat.

Nonin Pulse Oximeter

Key points:
- It can be used on the adult or pediatric patient on a finger (not a thumb) that is .3 to 1 inch thick.
- Remove during defibrillation.
- Contraindicated in infants and neonates.
- Use only as an assessment adjunct.
- You will not get an accurate reading in patients suffering from carbon monoxide poisoning or with hypovolemia.
- The device may not work when circulation is reduced. Warm or rub the finger or re-position the device. Do not squeeze the device on the finger.
- In some circumstances, the device may interpret motion as good pulse quality. Minimize patient motion as much as possible.
- There are no audible alarms to alert that the patient has a poor SpO2.
- Fluctuating or very bright light, moisture, blood pressure cuffs, infusion lines, venous pulsations, insufficient pulse signals, anemia, arterial catheters, nail polish and/or artificial nails may degrade the device’s performance.
Pulse Oximetry cont.

(Nonin cont.) Make sure the sensor is placed properly.

- Insert finger, not the thumb, into the sensor with nail side up until fingertip touches the stop guide. Make sure nothing impedes the reading.
- Make sure the finger is lying flat (not on its side) and is centered within the device. For best results, keep the sensor at the patient's heart or chest level.
- If the device does not turn on, remove the finger and wait a few seconds before reinserting it.
- Allow the device to stabilize and observe about 4 seconds of continuous green-colored pulse quality before relying on the displayed values. If the display blinks yellow or red, try another finger.
- A minus sign (-) appears when it senses the finger has been removed. The last measured SpO2 and pulse rate freezes for 10 seconds and then the display goes blank.

In the following situations the pulse oximeter readings may not be accurate:

1. A reduction in peripheral pulsatile blood flow produced by peripheral vasoconstriction (hypovolemia, severe hypotension, low perfusion, cold, cardiac failure, some cardiac arrhythmias) or peripheral vascular disease may result in an inadequate signal for analysis. Be mindful that you may get a poor reading.

2. Bright overhead lights and sunlight may cause the oximeter to be inaccurate. Shivering may cause difficulties in picking up an adequate signal.

3. Pulse oximetry cannot distinguish between different forms of hemoglobin. Carboxyhemoglobin (hemoglobin combined with carbon monoxide) is registered as 90% oxygenated hemoglobin and 10% desaturated hemoglobin - therefore the oximeter will overestimate the saturation. The presence of methaemoglobin will prevent the oximeter working accurately and the readings will tend towards 85% or higher, regardless of the true saturation.

4. Nail polish, nail aberrations or fungus may cause inaccurate readings. Remove polish or move to an unaffected digit. However the units are not affected by jaundice, dark skin or anemia.

5. Malpositioned or poorly applied sensor-Data from studies of malplaced sensors showed readings as much as 50% low (reporting SpO2 in the 40% range) when the actual SpO2 was in the 90% range. Of greater importance is that the same device could over read by 25 to 30% when the actual SaO2 was in the 60% range. Displaying an artificially high reading (normal appearing value in the 90s with correlating pulse rate) could be detrimental to the patient. All clinicians using pulse oximetry should be aware of the importance of correct sensor placement and the potential error caused by misapplied sensors.

6. Localized hypoxemia- Clinicians need to be aware that this "localized hypoxemia" can occur during instances of poor peripheral perfusion. In addition, when monitoring a site with reduced blood flow, the time to see a change in SpO2 may be greatly increased when compared to a well-perfused site. Some pulse oximeters give indications that they are measuring a site with reduced pulsatility such as a flashing warning or a reduction in an indicator bar. The clinician may wish to move the sensor to a better-perfused site to assure more accurate readings and faster response time.

Other Limitations:
- Venous motion- shows false low readings
- Sickle Cell Anemia
- Low SaO2 (less than 70%)
- Sensor site temperature
- Burns
- Pressure Necrosis

The oxygen saturation should always be above 95%. In patients with long-standing respiratory disease or those with cyanotic congenital heart disease, readings may be lower and reflect the severity of the underlying disease.

Oximeters are used extensively during mechanical ventilation and frequently detect problems with oxygenation before they are noticed clinically. They help assess whether a patient's oxygen therapy is adequate. When patients are sedated, oximetry has been shown to increase safety by alerting staff to unexpected hypoxia.

Oximeters give no information about the level of CO₂/carbon monoxide and therefore have limitations in the assessment of patients developing respiratory failure due to CO₂ retention. On rare occasions oximeters may develop faults and like all monitoring equipment, the reading should always be interpreted in association with the patient's clinical condition. Never ignore a reading that suggests the patient is becoming hypoxic. Reevaluate the patient.
Restraints - Mechanical/Pharmacological

INDICATIONS
Patients with actual or potential threat to self or others.
Patients at risk or exhibiting S/S of the excitable phenomenon known as excited delirium.

APPLICATION

1. The senior personnel on scene is to evaluate the need for restraints. Restraints should be considered only as a last resort after verbal techniques have failed. They are never to be used for disciplinary reasons or for the convenience of EMS personnel.
2. Request law enforcement assistance and Contact Medical Control for restraint order.
   When the patients and/or safety of others is in jeopardy, the senior personnel on scene shall use his/her best judgment to use mechanical and/or chemical restraints if a physicians order cannot be immediately obtained or if, in their opinion, the time lapse in obtaining those orders would be detrimental to any individuals safety. In such cases, the senior personnel will contact medical control and the Shift Captain as soon thereafter as time permits.
3. Contact Shift Captain regarding the situation.
4. The least amount of restraint necessary to accomplish the desired purpose should be used. The restraints used may include padded leather devices, additional nylon straps, cravats, towels, additional sheets or Midazolam/Versed 2 mg IV or 5 mg IM or IN.
5. The restraints should not be limiting to the patient's peripheral or central circulation or respiratory status.
6. Soft restraints such as cravats or roller bandages can be used for extremity restraints.
7. Sheets may be used to limit upper body or lower extremity movement.
8. The restraints should be frequently monitored during transport. Breathing, circulation and neurovascular status of restrained parts must be monitored for impedance from the restraint. Care should be taken to insure that injuries to the patient are not aggravated by the restraints. The patient should never be left without at least one EMT or EMT-P in attendance.
9. Place pt. supine, fowlers or on side. Placing pts. prone/face down has been found to increase the incidences of sudden cardiac arrest.
10. Raise the head of the patient slightly in order to prevent aspiration unless contraindicated by the possibility of spinal injury. In that instance, the head of backboard may be elevated.
11. If using chemical restraint, an EMT-P must be in attendance providing continuous cardiac and SPO2 monitoring. Consider ETCO2 monitoring if applicable. With some medications there is a tendency for a patient to develop seizure activity as well as hyper/hypotension.
12. If transport occurs from a medical facility to a mental health facility or from one mental facility to another and transport time will exceed 45 min., a written order for a chemical agent must be obtained prior to the transport from the evaluating physician. A copy of the written order is to be attached to the patient care report.
13. In circumstances where law enforcement personnel are present and their handcuffs/shackles are used to restrain the patient, an officer with a key to the locks will remain with the patient until those particular restraints are removed. If the handcuffs/shackles are to be left on the patient during transport, the law enforcement personnel must accompany patient inside the EMS unit. Documentation on call report should include reason, type of restraints, time restraints were placed and removed.
14. Any time EMS personnel use any of the above mentioned restraining methods, the facts will be documented in the PCR and an "Incident Report" will be filled out in detail with one copy to the Shift Captain and one copy to the Operations Director. Documentation shall include the reason for use, type used and time placed and removed from pt.

CERTIFICATION REQUIREMENTS
* FR, EMT, EMT-I/mechanical only; EMT-P/both
Introduction:

As with traumatic brain injury, secondary injury to the spine often arises from increased pressure (e.g. swelling, edema, hemorrhage) or from hypoperfusion or hypoxia (e.g. vascular injury). While the optimal treatment for secondary injury has not been established, providers should protect the injury site and be cognizant of the risk of secondary injury. In some circumstances, extrication of a patient using traditional spinal immobilization techniques may result in greater spinal movement or may delay extrication. Studies suggest protecting the injury site from pressure may be as important as reducing spinal movement.

Patients with penetrating trauma require spinal motion restriction only if neurological deficit is present.

All patients who have suffered possible spinal trauma should be handled gently and spinal motion should be minimized. Even with neurological deficits caused by transection of the spinal cord, additional movement typically will not worsen an already catastrophic injury. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport to a Level 1 trauma center.

If patient requires spinal motion restriction:

- Generally patients should only be transported to the hospital on a backboard if it is necessary for patient safety (e.g., combative patient), necessary for patient movement, or patient extrication. Other devices such as XP-1, KED, or Scoop Stretcher may be used to facilitate patient movement or extrication at the discretion of the provider.

- If a backboard device has been utilized during the course of extrication or transfer it should be left in place. Apply adequate padding to prevent tissue ischemia, minimize discomfort, and limit movement.

- Self extrication of patient is allowable if the patient is capable and it has been determined that the use of long spine board or other extrication devices are not needed.

- Apply a cervical collar

- For ambulatory patients, allow the patient to sit on the stretcher, and then lie flat. The "standing take-down" should no longer be performed.

- Lay the patient flat on the stretcher, secure firmly with all straps, with cervical collar in place. Elevate the back of the stretcher only if necessary to support airway protection/respiratory function, patient compliance or other significant treatment or procedure.

- Instruct the patient to avoid moving their head or neck as much as possible.

- For conscious patients that poorly tolerate a rigid cervical collar (e.g., due to anxiety, shortness of breath), the cervical collar may be replaced with a towel roll and/or padding to minimize spinal motion.

- Patients with nausea or vomiting should be placed in a lateral recumbent position maintaining the head in a neutral position using manual stabilization, padding, pillows, and/or the patient's arm.

- Regularly reassess motor/sensory function (include finger abduction, wrist/finger extension, plantar/dorsal flexion, and sharp/dull exam if possible.

- Delivery to hospital: movement of patient to hospital stretchers should be done by limiting motion of the spine.
Splinting

TYPES

Rigid: cardboard, hard plastic, metal, wooden, vacuum
Soft: air, pillow, sling & swath
Traction

INDICATIONS

Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters.

APPLICATION

1. Manually stabilize extremity.
2. **Remove all clothing** from the extremity. Cutting the clothing is preferable so as not to move the extremity unless there is no problem maintaining immobilization by pulling the clothing off.
3. Assess and document **pulses, sensation, and motor function distal** to the injury prior to placement of the splint. If no pulses are found in the severely angulated extremity, consider gentle traction to straighten it. Sensation can be assessed in the unconscious patient by applying painful stimulus.
4. Select a site to **secure the splint both proximal and distal** to the area of suspected injury or the area where the medical device will be placed.
5. Do not secure the splint directly over the injury or device.
6. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
7. Document **pulses, sensation, and motor function after** placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
8. If a **femur fracture** is suspected, it is a closed injury and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a Sager traction splint:
   • Assess neurovascular function as in #2 above.
     • **POSITION**: Place the Sager between the patients' legs, resting the Ischial Perineal Cushion (the saddle) against the Ischial Tuberosity, with the shortest end of the Articulating Base towards the ground. In the case of a unilateral fracture, the splint should be placed in the Perineum on the side of the injury. In bilateral fractures, excluding pelvic trauma, the greatest degree of injury should be the side of placement. Apply the Abductor Bridle (thigh strap) around the upper thigh of the fractured limb. Push the Ischial Perineal Cushion gently down while at the same time pulling the thigh strap laterally under the patients' Thigh. This will seat the lower end of the cushion comfortably against the Ischial Tuberosity. Tighten the thigh strap snugly. Lift the Spring Clip to extend the Inner Shaft on the Sager until the Crossbar rests adjacent to the patients' heels.
     • **SET**: Note the absence or presence of distal pulses, check for sensation. Position the Malleolar Harness (ankle harness) beneath the heel(s) and just above the ankle(s), fold down the number of comfort cushions needed to engage all of the Ankle above the medial and lateral Malleoli. Using the attached hook and loop straps wrap the ankle harness around the Ankle to secure snugly. Pull control tabs to engage the ankle harness tightly against the Crossbar. Apply **QUANTIFIABLE DYNAMIC TRACTION**: Grasp the padded shaft of the Sager with one hand and the Traction Handle with the other, gently extend the Inner Shaft until the desired amount of traction is recorded on the Traction Scale. It is suggested to use 10% of the patients' body weight per fractured femur up to 7kg (15 lbs.) for each leg. If bilateral fractures are present the maximum amount would be 14kg (30 lbs.). At the hollow of the Knees, gently slide the large elastic Leg Cravat through and upwards to the Thigh repeating with the smaller cravats to minimize lower and mid-limb movement.
     • **SECURE**: Adjust the thigh strap at the upper Thigh making sure it is snug and secure, then firmly secure the elastic Leg Cravats. Apply the Pedal Pinion (figure 8 strap) around the Feet to prevent rotation. Note the absence or presence of distal pulses, check for sensation. Patient is now ready for transport.
9. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function on the PCR.

CERTIFICATION REQUIREMENTS

* FR, EMT, AEMT, EMT-P
Transcutaneous Cardiac Pacing

INDICATIONS

- Patients with symptomatic bradycardia (sinus, Mobitz type II second degree or third degree blocks, etc.)
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturer's guidelines.

Note: Pacing is no longer recommended for asystolic cardiac arrest due to the importance of minimizing interruptions in chest compressions and evidence that it does not improve the rate of admission or survival to hospital discharge.

APPLICATION

1. Oxygen, ECG monitor, IV (if possible) should be in place prior to pacing.
2. Confirm the presence of the dysrhythmia (include a copy of the ECG strip) and evaluate the patient's hemodynamic status.
3. Adjust the ECG size and lead for good waveform display. Verify proper R-wave detection (Zoll: heart-shaped symbol flashes with each R wave).
4. Apply MFP/pacing pads to the patient's dry, bare chest following package directions. The anterior/posterior placement is most effective for pacing. Clip with scissors (preferred method) or shave chest hair if necessary.
5. Connect pads to the Multi-Function cable.
6. Turn selector switch to PACER.
7. Set pacer output to 0 mA.
8. Set the desired demand pacing rate at 80 bpm.
9. Start at the lowest energy setting and increase the current slowly while observing the ECG screen for evidence of electrical pacing capture (widening of the QRS and a broad T wave after the pacer spike). When capture achieved, add 2 mA as a safety margin.
10. Consider the use of sedation (Versed or Valium) or analgesia (morphine sulfate of fentanyl) if patient is uncomfortable. May administer prior to pacing if time allows.
11. Document the dysrhythmia and the response to external pacing with ECG strips.

Example of “capture”

![ECG Example]

CERTIFICATION REQUIREMENTS

- EMT-P
  - Successfully complete ACLS or equivalent course biennially.
Vascular Access - External Jugular

INDICATIONS
Cardiac Arrest
Adult IV line essential to patient survival following unsuccessful extremities attempts.

APPLICATION
1. Equipment - same as extremity
2. Position patient supine, preferably with the head lowered - trendelenberg position, to distend vein and to prevent air embolism.
3. Head turned to side away from anticipated injection site if there is no suspicion of cervical spine injury. If c-spine possible, do not turn the head and have a rescuer stabilize the head.
4. Cleanse area thoroughly, preferably with betadine or similar solution.
5. Distend vein by pressing on the vein above clavicle.
6. Make puncture toward clavicle midway between angle of jaw and midclavicular line. Upon seeing a flashback, thread the catheter. Stop if you meet resistance.
7. Once the external jugular vein has been successfully cannulated, secure the catheter well. A transparent dressing is optimal and will allow you to reassess for infiltration. You can loop the IV tubing around the patient's ear for added protection against accidental dislodgment, but it is hard to tape the tubing well, especially if the patient has long hair. Another way to tape the tubing is to place it across the patient's forehead. On most IV sets this will place the injection port at the patient's forehead, allowing easy access to push drugs and a secure area to tape the tubing. If the patient is able to keep his/her head in a neutral/midline position, so much the better. If the patient is unconscious you may tape his/her head in this position or use head blocks on either side. Patients with C-collars can have them reapplied. Keeping the head in a neutral position seems to optimize IV flow.
8. Assess the insertion site frequently.

NOTES:
When venous pressure is within the normal range, the external jugular is either invisible or observable for only a short distance superior to the clavicle. Congestive heart failure (CHF) renders the external jugular vein prominent throughout its course. The external jugular is a very superficial vein and can be mobile and tend to "roll." The external jugular vein can also be positional with slight movement of the head effecting the flow of the fluid.

COMPLICATIONS:
The complications of external jugular vein cannulation are the same as for any IV start or infusion, and may include hematoma at the insertion site, cellulitis, infection, phlebitis, infiltration of IV fluid at the site, and embolism of air, blood, or catheter fragment. There is also a remote danger of puncturing the thoracic cavity and giving the patient a pneumothorax. The risk of air embolism is also present. Produced by laceration of the external jugular vein and its failure to collapse, the right heart fills with froth and practically stops blood flow through it.

CERTIFICATION REQUIREMENTS
EMT-P
EMT-IVs and Paramedics have standing orders for precautionary IV and INTs. EMT-IVs have a standing order for the insertion of an IV or INT under the following guidelines:

- The patient must have some indication that they are unstable and symptomatic (chest pain, dyspnea, hypotension, signs and symptoms of CHF, pulmonary edema or AMI or altered LOC)
- Limited to two attempts in one arm only. (Cannulation of the legs or neck not allowed)
- Drug administration will be followed by a minimum of 10cc of fluid to flush the catheter
- Blood glucose will be performed for all patients with altered mental status.
- IVs should not be attempted in an injured extremity.
- TKO indicates a flow rate of approximately 50 cc/hr.
- IVs will not be started in arms with shunts.
- IVs appropriate for patient's condition indicates: if patient is hypotensive, give a bolus of fluid; if patient’s BP is normal, run IV TKO or convert to INT.
- A bolus of fluid is 20cc/kg for all patients.

INDICATIONS

Administration of fluids for volume
Administration of medication
High likelihood of the above

CONSIDERATIONS

May be performed by EMT-I, EMT-P

**Do not attempt:**
- In fracture site
- Through skin with more than superficial damage

**Check:**
- Correct solution
- Correct administration set
- Mini drip set - 60 gtts/cc, Regular drip set - 10 gtts/cc
- Correct catheter or needle size
- Solution clear, clean and no leaks in bag

**To calculate rate:**

\[
\text{Volume to be infused} \times \text{gtts/mL of administration set} \times \frac{\text{Time to be infused in minutes}}{60}
\]

NOTE:

APPLICATION

1. Assemble all required equipment and supplies.
2. Inform patient of procedure.
3. Insure proper solution, expiration date, check bag for leaks and clear/clean solution.
4. Connect proper set, fill chamber and prime tubing or INT cap. Avoid contamination.
5. Select suitable and appropriate site starting at the most distal location with the largest catheter that will successfully cannulate the vein. Apply tourniquet.
6. Clean site thoroughly, wear gloves and eye protection.
7. Initiate cannulation, obtain flashback and advance catheter. Connect INT cap or IV tubing.
8. Remove tourniquet.
9. For INT, attach syringe with minimum of 6cc flush, draw back on plunger to get blood return and administer flush if blood enters syringe. For drip set, open clamp and insure proper flow rate. Assess site for signs of infiltration.
10. Secure IV catheter and tubing by appropriate means.
11. Document procedure to include site, aseptic site prep, catheter size, INT or tubing type (macro drip/10 gtts or micro drip/60 gtts), type of fluid administered, assessment for proper placement by 3 means (flashback, absence of swelling, pain or discoloration at the site), securing of catheter and tubing, number and location of failed attempts and by whom or notation of success on first attempt and who initiated successful attempt.

CERTIFICATION REQUIREMENTS

- EMT-I, EMT-P
Vascular Access - Intraosseous - Adult

Clinical Indications:
- Patient over 12 years old.
- Patients where rapid, regular IV access is unavailable with any of the following:
  - 2 failed attempts at IV access with appropriate sized IV for patient's weight.
  - Cardiac arrest / Respiratory failure / Respiratory arrest.
  - Multisystem trauma with severe hypovolemia. The preferred IO site for patients with lower extremity or pelvic injuries is the proximal humerus.
  - Altered mental status (GCS of 8 or less)
  - Hemodynamically unstable (Systolic BP <90)
  - Severe dehydration with vascular collapse and/or loss of consciousness.

Contraindications:
- Fracture in targeted bone.
- Excessive tissue or absence of adequate anatomical landmarks at insertion site.
- Infection at area of insertion site.
- Previous orthopedic procedure (e.g. prosthetic limb/joint) at the selected site.
- IO access in targeted bone within past 48 hours.

Relative Contraindications:
- A history of Osteogenesis Imperfecta is not an absolute contraindication, but the softness of the bone may prevent an adequate seal for infusion and may also make it difficult to adequately stabilize the IO catheter.
- It is recommended that the proximal humerus be avoided on the same side as a mastectomy.

Procedure: (Do not delay transport of patient)
1. Don personal protective equipment (gloves, eye protection, etc.).
2. "Studies and articles suggest the humerus may be a superior site for flow rates, drug delivery and management of infusion pain", therefore that will be the first site attempted.

Find the prominence of the humeral head by placing the patient's palm of the same extremity over the umbilicus and place your palm on the patient's shoulder anteriorly. The area that feels like a "ball" is the target area. Place the ulnar aspect of one hand vertically over the axilla. Place the ulnar aspect of the opposite hand along the midline of the upper arm laterally. Place your thumbs together over the arm which identifies the line of insertion. Palpate deeply as you climb up the humerus to the surgical neck. Insertion site is on the most prominent aspect of the greater tubercle, 1 - 2 cm above the surgical neck.

If the site is not suitable, extend the leg and identify the anteromedial aspect of the proximal tibia (bony prominence below knee cap). The insertion location will be 3 cm (2 finger widths) below the patella and approximately 2 cm (1 finger width) medial, along the flat aspect of the tibia.

If this site is not suitable, identify the anterior medial aspect of the distal tibia, 3 cm (2 finger widths proximal to the most prominent aspect of the medial malleolus. Palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone. For the morbidly obese patient consider rotating the foot to the mid-line position. With the knee slightly flexed, lift the foot off of the surface allowing the lower leg to "hang" dependent. This maneuver may improve your ability to visualize and access the tibial insertion site.

3. Prep the site with providone-iodine ointment or solution.
4. Hold the IO needle at a 45° for the humerus and 90° angle for either tibial location. Push he needle tip through the skin until the tip rests against the bone. The 5mm mark from the hub must be visible above the skin for confirmation of adequate needle set length. If not to the bone at this point, remove needle and look for another site or longer needle. Gently drill, until a “pop” or “give” is felt and then another 1-2 cm (25/64 to 25/32 inch which is slightly less than 1/2 inch and slightly more than 3/4 inch).

5. While holding the hub, remove the driver. Still holding the hub, remove the stylet by twisting counterclockwise and pulling. The needle should be firmly seated in the bone. Place stylet in an approved sharps container.

6. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow to verify placement. It may be normal for no blood to be aspirated. Inject 10 cc of NS to clear the lumen of the needle.

7. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
8. Stabilize and secure the needle with dressings and tape. If the humerus is used, secure the arm in place across the abdomen.

9. You may administer 20 - 50mg of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 50 mg (3 cc).
10. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
11. Document the procedure, time, and result (success) in the patient care report (PCR).

Vascular Access – Intraosseous - Pediatric

INDICATIONS

Immediate need for vascular access into the bone marrow of an unstable infant or child. Paramedic is unable to establish and IV after 2 attempts or 90 seconds of looking for a vein. Patient 0 - 12 years old.

CONSIDERATIONS

Do not attempt I.O. establishment in any of the following cases:
- Osteogenesis imperfecta/brittle-bone disorder
- In or distal to a fractured bone or recent fracture
- If the bone has already been stuck in a previous attempt
- Through a burn site or infected area
- Dermatitis at the insertion site

Fluids and medications to use:
- I.V. fluids:
  - Normal saline (D5W and LR may be used)
  - Any medication used I.V. may be given I.O.
  - Dilute Bicarb and D50 1:1

APPLICATION

1. Assemble proper equipment. Wear gloves and eye protection.
2. Inform child regarding procedure.
3. Stabilize extremity. Locate preferred insertion site of the proximal tibia, one finger width below the tibial tuberosity either midline or slightly medial to the midline.
4. Prep site with betadine or similar solution. Maintain aseptic technique.
5. Place needle perpendicular to the bone and insert with a screwing, to-and-fro motion. A “pop” may be felt as the needle penetrates the bone.
6. Remove the stylette and apply a syringe with a 10 cc saline flush. Inject to ascertain proper placement. Do not force fluid.
7. Attach IV tubing with pressure infusion device on the fluid bag. Adjust flow rate.
8. Stabilize needle with tape and bulky padding.
9. Watch for signs of extravasation into the surrounding tissue.
10. Document needle size, location and difficulties with insertion. Also, the procedure to include site, aseptic site prep, needle size, tubing type (macro drip/10 gttS or micro drip/60 gttS), type of fluid administered, assessment for proper placement by 3 means (flashback, absence of swelling, pain or discoloration at the site), securing of catheter and tubing, number and location of failed attempts and by whom or notation of success on first attempt and who initiated successful attempt.

CERTIFICATION REQUIREMENTS

- EMT-P
- Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and the possible complications of the procedure.
Wound Care

INDICATIONS
Protection and care for open wounds prior to and during transport.

APPLICATION

1. Use **Standard Precautions**, including gloves, gown, eye protection and mask as indicated.
2. With **active bleeding**, proceed through the following steps until bleeding is controlled:
   - **A. Elevate** the affected area if possible and hold **direct pressure**. Do not remove dressings if bleeding cannot be controlled. Add more dressings on top.
   - **B.** Place patient supine and head lower if possible and apply **arterial pressure** proximal to the site.
   - **C.** **Hemostatic agents** (Quick Clot, Celox, Bloodstop, etc.) may next be applied per package directions.
   - **D.** **Tourniquets** may be applied to extremities in which **severe bleeding** cannot otherwise be controlled.
3. Surface wounds can be flushed with saline as appropriate and if it would not cause recurrence of bleeding.
4. Cover wounds with sterile gauze/dressings or other appropriate dressing and secure with roller dressing or tape. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound, assessment and care in the PCR.

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Wound Care - Tourniquet

**Clinical Indications:**
- Life threatening extremity hemorrhage that cannot be controlled by other means.
- **Serious or life threatening** extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

**Contraindications:**
- Non – Extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

**Procedure:**
1. Place tourniquet proximal to wound.
2. Tighten per manufacturer instructions until hemorrhage stops and distal pulses below the placed tourniquet disappear.
3. Secure tourniquet per manufacturer instructions.
4. Note time of tourniquet application and communicate this to receiving care providers.
5. Dress wounds per standard wound care protocol.
6. If one tourniquet is not sufficient or not functional to control hemorrhage, consider applying second tourniquet more proximal to the first.
**WARNING:** THIS IS A SINGLE USE PRODUCT. The product is intended for qualified trained professionals in the plication of a tourniquet. It is not intended for the general public. Use only as directed by your EMS authority or under the supervision of a physician. Read entire instructions for use prior to using the product. Inappropriate application can result in serious injury or loss of limb. The use of any tourniquet is a LAST RESORT and should only be employed when bleeding cannot be stopped and the situation is life threatening.

**LIMITATION OF LIABILITY:** Composite Resources, Inc., its employees, agents, contractors, suppliers, and distributors shall assume no liability for injury or damage arising from the application and use of the Combat Application Tourniquet® (C-A-T®). The user assumes all risk of liability.
Combat Application Tourniquet®

Instructions for Use: Two-handed Application

To prepare for use, store the C-A-T® in its one-handed configuration

1. Apply tourniquet proximal to the bleeding site. Route the band around the limb and pass the tip through the inside slit of the buckle. Pull the band tight.

2. Pass the tip through the outside slit of the buckle. The friction buckle will lock the band in place.

3. Pull the band very tight and securely fasten the band back on itself.

4. Twist the rod until bright red bleeding has stopped and the distal pulse is eliminated.

5. Place the rod inside the clip; locking it in place. Check for bleeding and distal pulse. If bleeding is not controlled, consider additional tightening or applying a second tourniquet proximal side by side to the first and reassess.

6. Secure the rod inside the clip with the strap. Prepare the patient for transport and reassess. Record the time of application.
Instructions for Use: One-handed Application

1. Apply the tourniquet proximal to the bleeding site. Insert the wounded limb through the loop formed by the band.

2. Pull the band very tight and securely fasten the band back on itself.

3. Adhere the band around the limb. Do not adhere the band past the rod clip.

4. Tuck the rod until bright red bleeding has stopped and the distal pulse is eliminated.

5. Place the rod inside the clip, locking it in place. Check for bleeding and distal pulse. If bleeding is not controlled, consider additional tightening or applying a second tourniquet proximal side by side to the first and reassess.

6. Adhere the band over the rod, inside the clip, and fully around the limb.

Storing in the One-Handed Configuration

1. Pass the tip through the inside slit in the buckle. Pull 6” of band through, fold it back and adhere the band to itself.

2. Flatten the loop formed by the band. Place the buckle in the middle of the flattened band.

3. Fold the C-A-T® in half placing the buckle at one end. The C-A-T® is now ready to be placed in your medical kit.

Licensed and Manufactured by:
Composite Resources, Inc. 803-366-9700
485 Lakeshore Parkway, Rock Hill, SC 29730
www.composite-resources.com
Airway – Endotracheal Tube Introducer (Gum Bougie)

INDICATIONS

• Patient meets clinical indications for oral intubation (appropriate to use with any attempt).
• Predictable difficult intubation through familiarity with the patient or by difficult airway assessment via LEMON Law: Look externally; Evaluate “3-3-2 rule”; Mallampati scale; Obstructions; Neck mobility, etc.
• Adult Bougie is 15 French and designed for 6 mm and larger ET tubes.
• Pediatric size of 8 French for ETT 3.0 to 5.5.

CONTRAINDICATIONS

• Introducer larger than ETT internal diameter.

APPLICATION

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube without stylette, test cuff and prepare suction
3. Lubricate the distal end and cuff of the endotracheal tube and the distal ½ of the Endotracheal Tube Introducer (Bougie) (Note: failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT).
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick’s/BURP (Backward, Upward, Rightward Pressure – works well in “anterior” adults and small children) as needed.
5. Introduce the Bougie with curved tip anteriorly (up) and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized.
6. Once inserted, gently advance the Bougie until you meet resistance/“hold-up” (if you do not meet resistance you have a probable esophageal intubation and insertion should be reattempted or the failed airway protocol implemented as indicated). Proper placement can be anticipated by feeling the tip of the Bougie against the tracheal rings or by its turning to the right or the left (Cheney effect). Preloading the ET tube onto the Bougie will cause these sensations to be lost.
7. Withdraw the Bougie only to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie.
8. Gently advance the Bougie and loaded ET tube until you have “hold-up” again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie.
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET Tube over the Bougie passing the tube to its appropriate length.
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90° COUNTER CLOCKWISE to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require and assistant to maintain the position of the Bougie and if so desired advance the ETT).
11. Once the ETT is correctly placed, hold the ET Tube securely and remove the Bougie
12. Confirm tracheal placement, inflate the cuff with 3-10 cc of air, auscultate for equal breath sounds and reposition accordingly
13. When final position is determined, secure the ET Tube, reassess breath sounds, apply end tidal CO\textsubscript{2} monitor, and record the monitor ETCO2 readings to assure continued tracheal intubation.

CERTIFICATION REQUIREMENTS

• EMT-P
INDICATIONS

• Unconscious, apneic patient.

CONTRAINDICATIONS

• Responsive patients with an intact gag reflex
• Patients with known esophageal disease
• Patients who have ingested caustic substances
• Patients that have a functioning laryngectomy with a stoma
• The KING AW is not proven to protect the airway from the effects of regurgitation and aspiration. The risk of regurgitation and aspiration must be weighed against the potential benefit of establishing an airway.

APPLICATION

1. Choose the correct size KING, based on patient height.
2. Test cuff inflation system by injecting the maximum recommended volume of air into the cuffs (refer to Sizing Information chart). Remove all air from cuffs prior to insertion.
3. Apply a water-based lubricant to the beveled distal tip and posterior aspect of the tube, taking care to avoid introduction of lubricant in or near the ventilatory openings.
4. Have a spare KING ready and prepared for immediate use.
5. Pre-oxygenate.
6. Most patients requiring the King airway will be in cardiac arrest. Those under anesthesia will be failed intubations. Remember to maintain an appropriate depth of anesthesia. In general, the depth of anesthesia needed is a little more than that required for the insertion of an oral airway.
7. Position the head. The ideal head position for insertion of the KING is the "sniffing position". However, the angle and shortness of the tube also allows it to be inserted with the head in a neutral position.
8. Hold the KING at the connector with dominant hand. With non-dominant hand, hold mouth open and apply chin lift unless contraindicated by C-spine precautions or patient position.
9. With the KING rotated laterally 45-90 degrees such that the blue orientation line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue. Never force the tube into position.
10. As tube tip passes under tongue, rotate tube back to midline (blue orientation line faces chin).

11. Without exerting excessive force, advance KING until base of connector aligns with teeth or gums.

12. Using a syringe, inflate cuffs with the minimum volume necessary to seal the airway at the peak ventilatory pressure employed (just seal volume).

13. Depth markings are provided at the proximal end of the KING which refer to the distance from the distal ventilatory openings. When properly placed with the distal tip and cuff in the upper esophagus and the ventilatory openings aligned with the opening to the larynx, the depth markings give an indication of the distance, in cm, to the vocal cords.

14. Confirm proper position by auscultation and chest movement or verification of CO2 by capnography.

15. Readjust cuff inflation to just seal volume.

16. Secure KING to patient using a tube tamer or other commercial device. Tape may be used if a commercial device is unavailable. DO NOT COVER THE PROXIMAL OPENING OF THE GASTRIC ACCESS LUMEN OF THE KING.

18. KING LTS-D Only: The gastric access lumen allows the insertion of up to a 18 Fr diameter gastric tube into the esophagus and stomach. Lubricate gastric tube prior to insertion.

REMOVAL OF THE KING
1. Once it is in the correct position, the KING airway is well tolerated until the return of protective reflexes.

2. KING removal should always be carried out in an area where suction equipment and the ability for rapid intubations are present.

3. For KING LT(S)-D removal, it is important that both cuffs are completely deflated.

NOTES:
• High airway pressures may divert gas to the atmosphere (or stomach with KING).

• Intubation of the trachea cannot be ruled out as a potential complication of the insertion of the KING.

• After placement, perform standard checks for breath sounds and utilize an appropriate carbon dioxide monitor as required by protocol.

• Lubricate only the posterior surface of the KING to avoid blockage of the ventilation apertures or aspiration of the lubricant.

• The KING is not intended for re-use.

CERTIFICATION REQUIREMENTS
• AEMT, EMT-P

Additional info can be found at:
MEDICATION INDEX

Listed alphabetically by their most commonly called name, *generic* or *trade*.

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration whenever solution and container permit. Solutions which are not clear should not be used. They should also be inspected for color, with most being clear.
ADENOCARD/ADENOSINE

Class: Antidysrhythmic

Description

Adenosine is a naturally occurring nucleoside that slows AV conduction through the AV node. It has an exceptionally short half-life and a relatively good safety profile.

Mechanism of Action

Adenosine is a naturally occurring substance (purine nucleoside) that is present in all body cells. Adenosine decreases conduction of the electrical impulse through the AV node and interrupts AV reentry pathways in paroxysmal supraventricular tachycardia (PSVT). It can effectively terminate rapid supraventricular arrhythmias such as PSVT. The half-life of adenosine is less than 10 seconds. Because of its rapid onset of action and very short half-life, the administration of adenosine is sometimes referred to as “chemical cardioversion”. A single bolus of the drug was effective in converting PSVT to a normal sinus rhythm in a significant number (92%) of patients in the initial drug studies. Adenosine does not appear to cause hypotension to the same degree as does verapamil.

Indication

- PSVT (including that associated with Wolff-Parkinson-White syndrome) refractory to common vagal maneuvers.

Contraindications

Adenosine is contraindicated in patients with second- or third-degree heart block, sick sinus syndrome, or those with known hypersensitivity to the drug.

Precautions

Adenosine will typically cause arrhythmias at the time of cardioversion. These will generally last a few seconds or less and may include PVCs, premature atrial contractions, sinus bradycardia, sinus tachycardia, and various degrees of AV block. In extreme cases, transient asystole may occur. If this occurs, appropriate therapy should be initiated. Adenosine should be used cautiously in patients with COPD and avoided in patients with asthma. Adenosine injection should be discontinued in any patient who develops severe respiratory difficulties. Also, use caution in patients taking digoxin or digoxin and verapamil in combination.

Side Effects

Adenosine can cause facial flushing, headache, sweating, palpitations, CP or pressure, shortness of breath, lightheadedness, dizziness, and nausea, among others. Because the half-life of adenosine is so brief, side effects are generally self-limited.

Interactions

Methylxanthines (aminophylline, theophylline) may decrease the effectiveness of adenosine, thus requiring larger doses. Dipyridamole (Persantine) can potentiate the effects of adenosine. The dosage of adenosine may need to be reduced in patients receiving dipyridamole.

How Supplied

3mg/mL in 2 mL vials

Dosage

The initial dose of adenosine is 6 milligrams given as a rapid intravenous bolus over a 1-to 2-second period. To be certain that the drug rapidly reaches the central circulation, it should be given directly into a vein or into a proximal medication port of a functioning IV line. It should be followed immediately by a rapid saline flush. If the initial dose does not result in conversion of the PSVT within 1 to 2 minutes, a 12-milligram dose may be given as a rapid IV bolus. The 12-milligram dose may be repeated a second time if required. Doses greater than 12 milligrams should not be administered. Adenosine should only be given by rapid IV bolus, directly into the vein, or into the medication administration port closest to the patient.
ALBUTEROL/PROVENTIL, VENTOLIN

Class: Sympathetic Agonist

Description

Albuterol is a sympathomimetic that is selective for β2 agonist with a minimal amount of side effects. It causes prompt bronchodilation and has a duration of action of approximately 5 hours.

Mechanism of Action

Albuterol is a selective β2 agonist with a minimal amount of side effects. It causes prompt bronchodilation and has a duration of action of approximately 5 hours.

Indications

- Patients 2 years and older
- Bronchial asthma
- Reversible bronchospasm associated with chronic bronchitis and emphysema

Contraindications

History of hypersensitivity to the drug.

Precautions

As with any sympathomimetic, the patient's vital signs must be monitored. Caution should be used when administering albuterol to elderly patients and those with cardiovascular disease or hypertension. Lung sounds should be auscultated before and after each treatment. Albuterol can cause bronchospasm. Treatment should be immediately stopped and alternative treatment initiated if bronchospasm develops.

Side Effects

Albuterol can cause tremors, dizziness, bronchospasm, palpitations, anxiety, headache, nervousness, hypertension, arrhythmias, chest pain, nausea, and vomiting.

Interactions

The possibility of developing unpleasant side effects increases when albuterol is administered with other sympathetic agonists or epinephrine. β-blockers may blunt the pharmacological effects of albuterol. Albuterol should also be administered with caution in patients taking MAOIs and or tricyclic antidepressants.

Dosage

When using a small-volume nebulizer, the standard adult dose is 2.5 milligrams (supplied pre-mixed in 3 cc NS). This amount is typically delivered during 5 to 15 minutes.
ASPIRIN

Class: Platelet Aggregator Inhibitor/ Anti-Inflammatory Agent

Description
Aspirin is an anti-inflammatory agent and an inhibitor of platelet function. This makes it a useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction.

Mechanism of Action
Aspirin blocks the formation of the substance Thromboxane A5, which causes platelets to aggregate and arteries to constrict. This results in an overall reduction in mortality associated with myocardial infarction. It also appears to reduce the rate of nonfatal reinfarction and nonfatal stroke.

Indications
- New chest pain suggestive of acute myocardial infarction (AMI). Give within minutes of patient contact and even if patient has taken their daily dose. If taken less than an hour prior, administer an additional 81mg. If it has been 1 – 2 hours, administer 162 mg and longer than 2 hours, administer 324 mg. Not the times of administration.

Contraindications
Hypersensitivity to the drug, in patients with active ulcer disease and hemophilia or other bleeding disorders, renal disease, patients who are pregnant, having an asthma attack.

Precautions
Aspirin can cause gastrointestinal upset and bleeding. Enteric-coated aspirin, if available, should be used in patients who have a tendency for gastric irritation and bleeding with aspirin. Use aspirin with caution in patients who report allergies to the non-steroidal anti-inflammatory (NSAID) class of drugs. Doses higher than recommended can actually interfere with possible benefits.

Side Effects
Aspirin can cause heartburn, GI bleeding, nausea, vomiting, wheezing, and prolonged bleeding. In allergic patients it may cause bronchospasm, tightness in chest, angioedema, urticaria (hives), anaphylaxis.

Interactions
When administered together, aspirin and other anti-inflammatory agents may cause an increased incidence of side effects and increased blood levels of both drugs. Administration of aspirin with antacids may reduce the blood levels of the drug by decreasing absorption.

Dosage
The recommended dosage for aspirin is **324 mg** taken as soon as possible after the onset of chest pain. Baby aspirin (81 mg) is often preferred as it can be chewed and swallowed and is often a little more palatable as many MI patients are nauseated. Aspirin is often given as part of a thrombolytic therapy protocol.
ATIVAN/ Lorazepam

Class: Benzodiazepines

Description
Ativan is a sedative used to treat seizures and anxiety.

Mechanism of Action
Ativan has onset on 1-5 minutes given IV, IO, and IN and 15-30 min given IM. Duration is approximately 6 hours.

Indications
• Patients 2 yoa and older
• Bronchial asthma
• Reversible bronchospasm associated with chronic bronchitis and emphysema

Contraindications
Allergy to propylene glycol or benzyl alcohol

Precautions

Side Effects
Albuterol can cause tremors, dizziness, bronchospasm, palpitations, anxiety, headache, nervousness, hypertension, arrhythmias, chest pain, nausea, and vomiting.

Interactions
The possibility of developing unpleasant side effects increases when albuterol is administered with other sympathetic agonists or epinephrine. β blockers may blunt the pharmacological effects of albuterol. Albuterol should also be administered with caution in patients taking MAOIs and or tricyclic antidepressants.

Dosage
When using a small-volume nebulizer, the standard adult dose is 2.5 milligrams (supplied pre-mixed in 3 cc NS). This amount is typically delivered during 5 to 15 minutes.
ATROPINE SULFATE

Class: Anticholinergic

Description
Atropine is a parasympatholytic (anticholinergic) that is derived from parts of the *Atropa belladonna* plant.

Mechanism of Action
Atropine sulfate is a potent parasympatholytic and is used to increase the heart rate in hemodynamically significant bradycardias. Hemodynamically-significant bradycardias are those slow heart rates accompanied by hypotension, shortness of breath, chest pain, altered mental status, congestive heart failure, and shock. Atropine acts by blocking acetylcholine receptors, thus inhibiting parasympathetic stimulation. Although it has positive chronotropic properties, it has little or no inotropic effect. It plays an important role as an antidote in organophosphate poisonings. Atropine has shown to be of some use in asystole, presumably because some cases of asystole may be caused by a sudden and tremendous increase in parasympathetic tone. The mechanism by which atropine is effective in asystole is not clear. However, despite no definite proof of its value in asystole, there is little evidence that its use is harmful in this setting.

Indications
- Symptomatic bradycardia
- Asystole
- PEA
- 2nd and 3rd degree blocks* (may be useful)
- Organophosphate, carbamate, or similar acting nerve gas or poisonings

*Atropine may be considered for symptomatic bradycardia associated with second-degree Mobitz II and third-degree AV blocks. In these cases, go straight to transcutaneous pacing. Atropine may be administered while awaiting pacer set up and if it does not delay pacing.

Contraindications
None in emergency situations

Precautions
Use with caution in presence of myocardial ischemia and hypoxia.
Avoid in hypothermic bradycardia.
Small doses of atropine (<0.5 mg) may produce paradoxical bradycardia.
May cause slowing of heart rate in Mobitz II and new third-degree blocks. Be prepared to pace.
A maximum dose of 0.04 milligrams per kilogram body weight of atropine should not be exceeded except in the setting of organophosphate poisoning. If the heart rate fails to increase after a total of 0.04 mg/kg has been given, then transcutaneous pacing is indicated.

Side Effects
Tachycardia, headache, hypotension, dizziness, blurred vision, dilated pupils, dry mouth, drowsiness, delirium (elderly), anxiety, flushing, rash, N/V, abdominal pain and confusion.

Interactions
Few in the prehospital setting.

How Supplied  1mg/10mL

Dosage
- **Hemodynamically significant bradycardia.** An initial dose of 0.5 mg should be administered intravenously. This can be repeated every 3-5 minutes until a maximum dose of 0.04 mg/kg has been administered.
- **Asystole.** In the treatment of asystole, the dose should be increased to 1.0 mg. When an IV cannot be placed, atropine can be administered endotracheally. However, the dose should be increased to 2-2.5 times the intravenous dose. In this case the preferred route is IV or IO.

Atropine should be given as an IV/IO bolus in emergency situations or endotracheally when an IV or IO cannot be placed.
ATROVENT/IPRATROPIUM BROMIDE

Class: Anticholinergic

Description

Ipratropium is an anticholinergic (parasympatholytic) bronchodilator which is chemically related to atropine.

Mechanism of Action

Ipratropium is a parasympatholitic used in the treatment of respiratory emergencies. It causes bronchodilation and dries respiratory tract secretions. Ipratropium acts by blocking acetylcholine receptors, thus inhibiting parasympathetic stimulation.

Indications

- Bronchial Asthma
- Reversible bronchospasm associated with chronic bronchitis and emphysema

Contraindications

Hypersensitivity to the drug, atropine or soya lecithin. It is not indicated as the sole agent for treatment of bronchospasm where rapid response is required.

Do not use in children <12 yoa as safety and effectiveness have not been established

Precautions

Narrow angle glaucoma, prostatic hypertrophy and bladder neck obstruction. The patient's vital signs must be monitored during therapy. Caution should be used when administering it to elderly patients and those with cardiovascular disease or hypertension. Lung sounds should be auscultated before and after each treatment. Patient may experience eye pain if the solution comes into direct contact with the eyes. For this reason it is preferable to use the mouthpiece rather than the face mask during administration. Should only be used during pregnancy when clearly needed. Be aware that allergic reactions have been reported in patients with peanut allergies.

Side Effects

Ipratropium can cause temporary blurred vision, eye pain, palpitations, anxiety, dizziness, headache, nervousness, rash, angioedema, nausea, and vomiting.

Interactions

Few in the prehospital setting.

How Supplied

- 0.5 mg/2.5 mL
- 0.5 mg/.5 mL

Dosage

- Standard adult dose is 0.5 mg (supplied pre-mixed in 2.5 mL NS).
- Ipratropium administered concurrently with albuterol in the concentration 0.5 mg/0.5 mL. (If using this concentration without Albuterol, you must add 3 mL aerosolizing saline.)
Class: Antihistamine

Description
Diphenhydramine is a potent antihistamine that blocks H1 and H2 histamine receptors.

Mechanism of Action
Histamine is released from mast cells following exposure to an antigen to which the body has been previously sensitized. When released into the circulation following an allergic reaction, histamine acts on two different receptors. The first type of receptor, called H1, when stimulated causes bronchoconstriction and contraction of the gut. The second type of receptor, called H2, when stimulated causes peripheral vasodilation and secretion of gastric acids. Antihistamines are administered after epinephrine in the treatment of anaphylaxis. Epinephrine causes immediate bronchodilation by activating $\beta$2 adrenergic receptors, whereas diphenhydramine inhibits histamine release. Diphenhydramine is also useful in the treatment of dystonic reactions accompanying phenothiazine use. A dystonic, or extrapyramidal, reaction is characterized by an unusual posture, change in muscle tone, drooling, or uncontrolled movements. It is occasionally seen following the administration of antipsychotic medications (Haldol, Thorazine, Mellaril) as well as certain medications used for nausea and vomiting (Phenergan, Compazine, Reglan). Diphenhydramine, when administered, causes marked improvement, if not total resolution of the symptoms.

Indications
- Anaphylaxis, as an adjunct to epi and other standard measures.
- Allergic reactions to blood or plasma
- Dystonic (extrapyramidal) reactions (per physician order)
- Motion sickness (per physician order)

Contraindications
Hypersensitivity to the drug and other similar antihistamines. Neonates, premature infants, nursing mothers. Diphenhydramine should not be used in the management of lower respiratory diseases such as asthma.

Precautions
Use with caution in patients with narrow-angle glaucoma, stenosing peptic ulcer, pyloroduodenal obstruction, symptomatic prostatic hypertrophy or bladderneck obstruction. In pediatric patients, especially, antihistamines in overdosage may cause hallucinations, convulsions or death. As in adults, may diminish mental alertness or produce excitation. The primary drug for the treatment of severe allergic reactions, anaphylaxis, and urticaria is epinephrine. Epinephrine will reverse many of the effects of histamine. Diphenhydramine will block histamine receptors preventing subsequent stimulation by circulating histamine.

Side Effects
Hypotension, headache, palpitations, tachycardia, sedation, drowsiness, disturbed coordination, epigastric distress, N/V, thickening bronchial secretions.

Interactions
The sedative effects of diphenhydramine can be potentiated by the administration of CNS depressants (hypnotics, sedatives, tranquilizers, etc.), other antihistamines, narcotics, and alcohol.

How Supplied  50mg/mL   1mL vial

Dosage
Adult: 25 to 50 milligrams intravenously not to exceed 25mg/minute or deep intramuscular.
Pediatrics <12 yoa: 5mg/kg/day in 4 divided doses. Max dose of 300mg/day. (Translates to 1.25mg/kg one time and not to exceed 25mg/minute.)
CALCIUM GLUCONATE

Class: Calcium Supplement

Description
Calcium gluconate provides elemental calcium in the form of the cation (Ca++). Calcium is required for many physiological activities i.e. transmission of nerve impulses; contraction of cardiac, smooth and skeletal muscles; renal function; respiration; and blood coagulation. It is essential for the maintenance of the functional integrity of nervous, muscular and skeletal systems, cell membranes and capillary permeability.

Mechanism of Action
Calcium gluconate is an antidote for magnesium sulfate and can minimize some of the effects of calcium channel blocker overdose.

Indications
• Anti-dote for severe side effects of Magnesium Sulfate. (ie. Respiratory depression, arrhythmias, hypotension, depressed reflexes, bradycardia)

Contraindications
Ventricular fibrillation, hypercalcemia, digitalis toxicity, renal calculi (concretion of salts or acids in the renal system).

Precautions
It is extremely important to flush the IV line between administration of calcium gluconate and sodium bicarbonate to avoid precipitation. Calcium gluconate can cause tissue necrosis at the injection site. It should always be administered through a patent, free-flowing IV.

Side Effects/Adverse Reactions:
Tingling sensations, sense of oppression or heat waves, chalky taste following IV administration. Rapid IV injection of calcium may cause vasoconstriction, decreased blood pressure, bradycardia, arrhythmias, syncope and cardiac arrest. Use in digitalized patients may precipitate arrhythmias. Local necrosis and abscess formation may occur with intramuscular injection.

Interactions
Calcium gluconate will interact with sodium bicarbonate to form a precipitate. In addition, calcium gluconate can cause elevated digoxin levels, and possibly digitalis toxicity, when administered to patients receiving digitalis preparations.

How Supplied
1 gram/10mL vial

Dosage
For intravenous use only.
Adult: 1 gm slow IV, over 2-3 minutes.
Pediatric: 200 to 500 mg (2 to 5 mL) slow IV
50% DEXTROSE in WATER /D50W

Class: Carbohydrate

Description
Dextrose is used to describe the six-carbon sugar \( d\)-glucose, which is the principal form of carbohydrate used by the body.

Mechanism of Action
50% dextrose in water supplies supplemental glucose in cases of hypoglycemia. Serious brain injury can occur if hypoglycemia is prolonged. Thus, in hypoglycemia the rapid administration of glucose is essential. When the hypoglycemic patient is comatose, glucose cannot be given by mouth and should be given as IV D50W solution.

Indications
- Hypoglycemia

Contraindications
Hyperglycemia, delirium tremens; 50% dextrose should be used with caution in patients with increased intracranial pressure as the dextrose load may worsen cerebral edema.

Precautions
It is important to obtain a Glucometer reading before initiating an IV infusion and giving dextrose. Ensure IV patency prior to administration as infiltration of D50 may result in tissue necrosis. Localized venous irritation may occur when smaller veins are used. Hyperosmolar syndrome, resulting from excessively rapid administration may cause mental confusion and/or loss of consciousness.

Side Effects
Loss of consciousness, pulmonary edema, chills, flushing, rash, tissue necrosis and phlebitis at the injection site. Concentrated glucose solutions can cause venous irritation if administered for an extended period.

Interactions
None in the emergency setting.

How Supplied 25 grams in 50 mL

Dosage
D50 in hypoglycemia is 25 grams (50 milliliters of a 50% solution) intravenously. If an initial dose is ineffective, a second dose of 25 grams may also be given. 50% dextrose should be diluted 1:1 with sterile water or normal saline for pediatric administration (thus forming D25W) or use prepackaged D25. The pediatric dose is 0.5-1.0 gram per kilogram of body weight by slow, intravenous bolus.

Route
50% dextrose is only given intravenously and slowly.
25% DEXTROSE in WATER (D25W)

Class: Carbohydrate

Description
“Dextrose” is used to describe the six-carbon sugar d-glucose, which is the principal form of carbohydrate used by the body. D25 is primarily for the pediatric patients who have low blood glucose levels as determined by a blood glucometer. Glucose is the principal energy source utilized by the brain and other tissues.

Mechanism of Action
25% Dextrose in water supplies supplemental glucose in cases of hypoglycemia. Serious brain injury can occur if hypoglycemia is prolonged. Thus, in hypoglycemia the rapid administration of glucose is essential. When the hypoglycemic patient is comatose, glucose cannot be given by mouth and should be given as IV D50W solution.

Indications
• Hypoglycemia in patients less than 34 kg

Contraindications
Hyperglycemia, delirium tremens. May be detrimental in patients with cerebral ischemia and hemorrhage. D25 may increase cranial bleeding. It should be used with caution in patients with increased intracranial pressure as the dextrose load may worsen cerebral edema.

Precautions
It is important to perform a Glucometer reading before initiating an IV infusion and giving dextrose. Ensure IV patency prior to administration as infiltration of D25 may result in tissue necrosis. Localized venous irritation may occur when smaller veins are used. Concentrated glucose solutions can cause venous irritation if administered for an extended period.

Side Effects
Loss of consciousness, pulmonary edema, chills, flushing, rash, tissue necrosis and phlebitis at the injection site. Concentrated glucose solutions can cause venous irritation if administered for an extended period.

Interactions
None in the emergency setting.

How Supplied
2.5 grams in 10 mL = 250mg/ml (infants)
Dilute 50% dextrose 1:1 with sterile water or normal saline (thus forming D25W) if prepackaged D25 is not available or larger doses needed.

Dosage
Note that pediatric administration is weight based and mLs per kilogram, not milligrams
2 mL/kg by slow, intravenous bolus.

If an initial dose is ineffective, a second dose of 1 - 2 mL/kg may also be given.
50% dextrose can be diluted 1:1 with sterile water or normal saline (thus forming D25W) if prepackaged D25 is not available.

Route
50% dextrose is only given intravenously.
DOPAMINE/INTROPIN

Class: Sympathetic Agonist

Description
Dopamine is chemically related to both epinephrine and norepinephrine. It is used in the treatment of hypotension associated with cardiogenic shock.

Mechanism of Action.
Dopamine acts on both alpha and beta receptors. At doses ranging from 2-20 mcg/kg/minute, dopamine acts primarily on beta receptors, exerting positive inotropic effect on the heart. As the dosage of dopamine exceeds 10 mcg/kg/minute, it begins to stimulate alpha receptors, resulting in peripheral vasoconstriction. Dopamine maintains renal and mesenteric blood flow when it is used in therapeutic doses (<20mcg/kg/minute). This is due to the effect of dopamine upon special dopaminergic receptors located in these areas. Dopamine will increase the systolic blood pressure and the pulse pressure.

Indications
- Cardiogenic shock
- Neurogenic shock

Contraindications
Hypersensitivity

Precautions
Dopamine should be used with care in the presence of tachydysrhythmias. It can be deactivated by alkaline solutions (sodium bicarbonate).
Do not use if within 2 weeks use of MAOIs to prevent possible hypertensive crisis.
Do not mix with sodium bicarbonate.
Peripheral vascular disease.

Side Effects
Headache, palpitations, tachycardia, hypertension, ectopic beats, angina, wide QRS complex, peripheral vasoconstriction, N/V, diarrhea, dyspnea.

How Supplied
500mL bag 800mg total 1600mcg/mL

Dosage
Adult: infuse at a rate of 2-5 mcg/kg/min up to 20 mcg/kg/minute. Titrate to effect.
Pediatric: 5-20 mcg/kg/min titrated to effect.
EPINEPHRINE 1:1,000

Class: Sympathetic Agonist

Description
Epinephrine is a naturally occurring catecholamine. It is a potent α and β adrenergic stimulant; however, its effect on β receptors is more profound.

Mechanism of Action
Epinephrine acts directly on α and β adrenergic receptors. Its effect on β receptors is much more profound than its effect on α receptors. The effects of epinephrine include increased heart rate, cardiac contractile force, systemic vascular resistance, and blood pressure. It also causes bronchodilation due to its effect on β2 adrenergic receptors. It is occasionally used to treat the bronchoconstriction accompanying asthma, COPD, and is also effective in treating bronchoconstriction associated with anaphylaxis.

Epinephrine’s effects usually appear within 90 seconds of administration, and they are usually of short duration. Occasionally it must be readministered in 15-30 minutes if needed. Epinephrine 1:1,000 is given IM or subcutaneously to ensure a steady and prolonged action.

Indications
- Severe anaphylaxis
- Bronchospasm
- Bronchial asthma

Contraindications
Cardiac dilation
Coronary insufficiency
Pregnancy with BP in excess of 130/80. (Use only in pregnancy if the potential benefit justifies the potential risk to the fetus.)
Hypertension
Because of the cardiac effects seen with the administration of epinephrine, it should not be administered to patients with underlying cardiovascular disease or hypertension. Patients with profound anaphylactic reactions characterized by hypotension and shock, are usually peripherally vasoconstricted, which will delay absorption of the drug from the subcutaneous site of injection. In these cases, epinephrine 1:10,000 should be administered intravenously.

Precautions
Use with caution in the elderly, those with cardiovascular disease, HTN, diabetes, hyperthyroidism, psychoneurotic individuals, bronchial asthma and emphysema with degenerative heart disease.

Epinephrine may induce potentially serious cardiac arrhythmias in patients not suffering from heart disease and patients with organic heart disease or who are receiving drugs that sensitize the myocardium.

Epinephrine should be protected from light. Also, as with other catecholamines, it tends to be deactivated by alkaline solutions. Because of this, it is essential that the IV line be adequately flushed between the administration of epinephrine and sodium bicarbonate.

Tri-cyclic anti-depressants potentiate the effects of Epinephrine
Any patient receiving epinephrine 1:1,000 should be carefully monitored for changes in blood pressure, pulse, and EKG. Palpitations, anxiety, nausea, and headache are fairly common side effects.

Side Effects
Cardiac arrhythmias, hypertension, palpitations, anxiety, fear, tremulousness, headache, dizziness, nausea, and vomiting.
Because of its strong inotropic and chronotropic properties, epinephrine increases myocardial oxygen demand. Even in low doses it can cause myocardial ischemia. These effects should be kept in mind when administering epinephrine in the emergency setting. Like most of the other drugs used in emergency medicine, epinephrine is only effective when the myocardium is adequately oxygenated.

Interactions
The effects of epinephrine can be intensified in patients who are taking antidepressants.

How Supplied 1mg/mL vials

Dosage
0.3 to 0.5 milligram IM depending on the patient's weight and overall medical condition. Typically, 0.3 milligram is the usual starting dose for adults.

The dose for pediatric patients is 0.01 mg/kg subcutaneous injection.
**EPINEPHRINE 1:10,000**

**Class:** Sympathetic Agonist

**Description**

Epinephrine is a naturally occurring catecholamine. It is a potent α and β adrenergic stimulant; however, its effect on β receptors is more profound.

**Mechanism of Action**

Epinephrine acts directly on α and β adrenergic receptors. Its effect on β receptors is much more profound than its effect on α receptors. The effects of epinephrine include:

- Increased heart rate
- Increased electrical activity in the myocardium
- Increased blood pressure
- Increased cardiac contractile force
- Increased systemic vascular resistance
- Increased automaticity

Epinephrine can stimulate spontaneous firing of myocardial conductive cells. In the emergency setting it is used to convert fine ventricular fibrillation to coarse ventricular fibrillation. This change significantly increases the chances of successful electrical defibrillation. In asystole it is used to initiate electrical activity in the myocardium. Once initiated, electrical defibrillation may be attempted.

Epinephrine's effects usually appear within 90 seconds of administration, and they are usually of short duration. Therefore, it must be administered every 3-5 minutes to maintain therapeutic levels.

**Indications**

- Cardiac arrest (asystole, ventricular fibrillation, pulseless ventricular tachycardia, pulseless electrical activity)
- Severe anaphylaxis

**Contraindications**

Epinephrine 1:10,000 is contraindicated in patients who do not require extensive cardiopulmonary resuscitative efforts. With simple allergic reactions and asthma, the 1:1,000 dilution should be used and is administered subcutaneously.

**Precautions**

Epinephrine, like all catecholamines, should be protected from light. It can be deactivated by alkaline solutions such as sodium bicarbonate. Because of this, it is essential that the IV line be adequately flushed between the administration of epinephrine and sodium bicarbonate.

Tri-cyclic anti-depressants potentiate the effects of Epinephrine.

**Side Effects**

Epinephrine can cause palpitations, anxiety, tremulousness, headache, dizziness, nausea, and vomiting. Because of its strong inotropic and chronotropic properties, epinephrine increases myocardial oxygen demand. Even in low doses it can cause myocardial ischemia. When administering epinephrine in the emergency setting, these effects should be kept in mind. Like most of the other drugs used in emergency medicine, epinephrine is only effective when the myocardium is adequately oxygenated.

**Dosage**

Epinephrine 1:10,000 can be administered intravenously, intraosseously, or endotracheally (last resort).

Common doses include:

- **Cardiac Arrest (Adults).** 1.0 milligram of a 1:10,000 solution intravenously. Repeat every 3-5 minutes as required.
  If an IV cannot be started, IO access and delivery is preferred to the endotracheal route.
  The endotracheal dose should be 2 - 2.5 milligrams.

- **Severe Anaphylaxis/Severe Asthma (Adults).** Intravenous epinephrine should only be used for life-threatening severe anaphylaxis and severe asthma. Less severe cases should be treated with epinephrine 1:1,000 subcutaneously. In severe anaphylaxis/asthma the initial dose should be 0.3-0.5 milligram intravenously. The dose may be repeated every 5-15 minutes as required.
ETOMIDATE/AMIDATE

**Class:** Hypnotic, anesthetic and amnestic

**Mechanism of Action**

Etomidate is a carboxylated imidazole derivative. This short acting (3-5 minutes) intravenous hypnotic depresses the reticular-activating system and, like the barbiturates, blocks acetylcholine-dependent synaptic transmission. It also mimics the action of gamma-amino butyric acid. It is commonly used in the emergency setting as part of a rapid sequence induction to induce anesthesia or for conscious sedation. It is often used in this setting since it has a rapid onset of action and a low cardiovascular risk profile, and therefore is less likely to cause a significant drop in blood pressure than other induction agents. It has no analgesic properties.

**Indications**

Rapid sequence intubation

**Contraindications**

Hypersensitivity
Patient age less than 10

**Warnings**

Use in Labor/delivery patients only if benefit justifies potential risks to the fetus.
Use cautiously in seizures because the drug may stimulate irritable foci, leading to myotonic activity.
Use cautiously in immunosuppression, sepsis, or organ transplantation because of potential effects on adrenal function.

**Side Effects**

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**How Supplied**  2 mg/mL

**Dosage**

The dose of etomidate is 20 milligrams injected in a free flowing IV over 30 to 60 seconds. Dosage is not to be repeated. If further sedation is required, diazepam or midazolam should be considered.

**Notes**

Due to short acting time of Etomidate, additional hypnotic medication will need to be requested for continued amnesic effects.
FENTANYL/SUBLIMAZE

Class: Narcotic Analgesic / Opioid Agonist

Description
Schedule II narcotic that is a central nervous system depressant and a potent analgesic with little hemodynamic properties.

Mechanism of Action
Binds to various opioid receptors, producing analgesia and sedation

Pharmacology

Indications
Analgesic treatment/management of pain associated from a traumatic event i.e. FX or Dislocations. Abdominal / flank pain associated with kidney stones.

Contraindications
- Hypersensitivity/allergy to the drug or class.
- MAOI use.
- Caution in patients with:
  - biliary function
  - renal function
  - myasthenia gravis
  - hypotension
  - decreased CNS & respiratory functions
  - increased ICP

Precautions
- Fentanyl is a controlled Schedule II drug and has a high tendency for addiction.
- Hold for heart rate less than 60, respiratory rate less than 12, respiratory distress, blood pressure less than 100 or hemodynamic instability, decreased mental status. If in doubt, consult medical control.
- The initial dose should be appropriately reduced in elderly and debilitated patients. The effect of the initial dose should be considered in determining incremental doses.
- Should be used with caution in patients with COPD, potential for compromised respirations, liver and kidney dysfunction due to their importance in the metabolism of fentanyl, patients using other CNS depressant drugs and cardiac bradyarrhythmias.
- Fentanyl may cause muscle rigidity, particularly involving the muscles of respiration.
- If administered too fast, it may cause muscle movements of the extremities that cause be strong enough to pose patient management problems. Administer slowly.
- Naloxone (Narcan) should be available when administering Fentanyl to reduce respiratory depression.

Side Effects
Respiratory depression/arrest, bradycardia, hypotension, laryngospasms, increased ICP, arrhythmias, delerium, seizure, nausea/vomiting, confusion, dizziness

Interactions
Avoid combinations with other opioids, antihistamines, antiemetics, sedatives, and hypnotics. This may precipitate CNS effects.

How Supplied
100mcg/2mL vial

Dosage
Adult- 50-100 mcg IM or IV or IO Slow Push
Peds- 0.5-3 mcg/kg IM or IV or IO Slow Push (Consult Broselow)
GLUCAGON/GLUCAGEN

Class: Hormone/Antihypoglycemic

Description
Glucagon is a protein secreted by the alpha cells of the pancreas. Glucagon for parenteral administration is extracted from beef and pork pancreas. It is used to increase the blood glucose level in cases of hypoglycemia where an IV cannot be immediately placed.

Mechanism of Action
Glucagon is a hormone secreted by the pancreas. When released it causes a breakdown of stored glycogen to glucose. It also inhibits the synthesis of glycogen from glucose. Both actions tend to cause an increase in circulating blood glucose. In hypoglycemia the administration of glucagon increases blood glucose levels. The drug of choice in the management of insulin-induced hypoglycemia is still D50W. A return to consciousness is seen almost immediately following the administration of glucagon usually takes from 5 to 20 minutes. Glucagon is only effective if there are sufficient stores of glycogen in the liver. Glucagon exerts a positive inotropic action on the heart and decreases renal vascular resistance.

Pharmacology

Indications
• Hypoglycemia

Contraindication
• Hypersensitivity to the drug or allergy to the drug or class.
• Pheochromocytoma (a rare tumor that usually starts in the cells of one of your adrenal glands, which secretes excessive amounts of catecholamines, usually epinephrine and norepinephrine).
• Insulinoma (tumor of the pancreas).

Precautions
• Glucagon is only effective if there are sufficient stores of glycogen within the liver. In an emergency situation intravenous glucose is the agent of choice.
• Use with caution in patients with prolonged fasting, adrenal insufficiency or chronic hypoglycemia because these conditions result in low levels of releasable glucose.
• Glucagon should be administered with caution to patients with a history of cardiovascular or renal disease.

Side Effects
Although side effects are rare, glucagon can cause:
Hypotension dizziness headache nausea vomiting tachycardia hyperglycemia

Interactions
• Warfarin (Coumadin) may increase the risk of bleeding.
• beta-blockers, often used for high blood pressure or heart problems
• Phenytoin.

How Supplied
1 vial of powder- 1 mg, 1 vial sterile water for reconstitution- 1mL.
Add water to powder and gently roll vial until all particles dissolve. Should be used immediately after reconstitution.

Dosage
Adult- 1 mg IM or SQ or IV or IO Max 1 mg
Peds <55 lbs or 8 yoa 0.5 mg IM
>55 lbs or 7 yoa 1 mg IM
Max 1 mg (May consult Broselow Tape)
Ketamine Hydrochloride

**Class:** Schedule III N, nonbarbituate anesthetic

**Mechanism of Action**
A rapid-acting general anesthetic producing an anesthetic state characterized by profound analgesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, cardiovascular and respiratory stimulation, and occasionally a transient and minimal respiratory depression.

Following intravenous administration, the ketamine concentration has an initial slope (alpha phase) lasting about 45 minutes with a half-life of 10 to 15 minutes.

**Indications**
Rapid Sequence Induction/Drug Assisted Intubation, analgesic, anesthetic

**Contraindications**
In those in whom a significant elevation of blood pressure would constitute a serious hazard
Hypersensitivity

**Warnings**
Avoid in an ischemic heart or head.
Because pharyngeal and laryngeal reflexes are usually active, ketamine hydrochloride injection should not be used alone.

The intravenous dose should be administered over a period of 60 seconds. More rapid administration may result in enhanced pressor response which causes an increase in blood pressure and/or vasoconstriction.

Vomiting has been reported following ketamine hydrochloride injection administration, some airway protection may be afforded because of active laryngeal-pharyngeal reflexes. Ketamine hydrochloride injection is recommended for use in the patient whose stomach is not empty when, in the judgment of the practitioner, the benefits of the drug outweigh the possible risks.

In some patients, enhanced skeletal muscle tone may be manifested by tonic and clonic movements sometimes resembling seizures.

**Side Effects**
Blood pressure and pulse rate are frequently elevated following administration of ketamine hydrochloride injection alone. However, hypotension and bradycardia have been observed. Arrhythmia has also occurred.

**How Supplied**
100 mg/mL in 1000 mg/10 mL vial
50 mg/mL in 10 mL vial
10 mg/mL in 10 mL vial

**Dosage**
2 mg/kg or 1 mg/pound IVP

With the solution of 100 mg/mL, the dosage equation equals the same thing as moving the decimal point to the left 2 places when using the 1 mg/lb dose, i.e. 150# = 1.5 mL of Ketamine (simplest) and adding 1.5 mL of NS or sterile water. When using the 2 mg/kg dose 150#/2.2 = 68.2 kg x 2mg = 136.4mg = 1.36 mL and adding 1.36 mL of NS or sterile water.

Always check the solution as this formula will only work for the 100 mg/mL concentration.

The 100 mg/mL concentration of ketamine hydrochloride injection should not be injected intravenously without proper dilution. It is recommended the drug be diluted with an equal volume of either Sterile Water for Injection, normal Saline, or 5% Dextrose in Water.

The initial dose administered intramuscularly may range from 6.5 to 13 mg/kg (3 to 6 mg/lb). A dose of 10 mg/kg (5 mg/lb) will usually produce 12 to 25 minutes of surgical anesthesia. This requires calling for an order.

**Notes**
Barbiturates and ketamine hydrochloride injection, being chemically incompatible because of precipitate formation. Do not mix Ketamine and diazepam.
LASIX/FUROSEMIDE

Class: Loop Diuretic

Description and Mechanism of Action
Furosemide is a potent diuretic that inhibits the reabsorption of both sodium and chloride in the kidneys and that causes venous dilation. It is extremely useful in the treatment of pulmonary and systemic edema associated with congestive heart failure, kidney and liver disease. The effects of Furosemide are a two fold system. First-venous dilation which reduces preload and cardiac workload (1-5 Min. onset). Second- diuretic effect which reduces excess pulmonary and peripheral fluids (5-15 Min. onset).

Pharmacology

Indications
Congestive Heart Failure
Pulmonary Edema
Hypertensive Crisis

Contraindications
Hypersensitivity / allergy to drug or class
Allergic to Sulfa class of medications
Anuria  hypovolemia  lactation

Caution in pregnancy due to fetal abnormalities
Caution in patients with severe liver (cirrhosis), kidney/renal or diabetic history
Caution in patients with AMI and arrhythmias

Precautions
Dehydration, electrolyte depletion, and hypotension can result from excessive doses of potent diuretics. Thus, the blood pressure should be frequently monitored when furosemide is administered.
Furosemide should be protected from light.
Will have no effect on dialysis patients.

Side Effects
Circulatory collapse  headache  dizziness  hypotension
volume depletion  potassium depletion  arrhythmias  diarrhea
nausea and vomiting  muscle/abdominal cramps  weakness

Interactions
Furosemide should not be administered in the same line as amrinone (Inocor) because a chemical reaction can occur between the two, causing the formation of a precipitate in the intravenous line.
Administration of furosemide with other diuretics can lead to severe volume depletion and electrolyte imbalance.

Dosage
Adult: 40-80 mg (or twice the daily oral dose) slow IV, IM or IO Slow Push
Peds: 1 mg/kg IV or IO Slow Push (Consult Broselow)
LIDOCAINE

Class: Antiarrhythmic

Description
Lidocaine is an amide-type local anesthetic. It is frequently used to treat life-threatening ventricular dysrhythmias.

Mechanism of Action
Lidocaine has been shown to be effective in suppressing premature ventricular contractions, in treating ventricular tachycardia and some cases of ventricular fibrillation and in increasing the fibrillation or electrical stimulation threshold in acute myocardial infarction.

Lidocaine depresses depolarization and automaticity in the ventricles. It has very little effect on atrial tissues. In therapeutic doses it does not slow AV conduction and does not depress myocardial contractility. The most common cause of ventricular arrhythmias is acute myocardial infarction. Lidocaine suppresses ventricular ectopy in the setting of myocardial infarction and increases the ventricular fibrillation threshold. This prevents PVCs from inducing ventricular fibrillation. After acute myocardial infarction, the ventricular fibrillation threshold is often significantly reduced. Moreover, because electrical defibrillation tends to cause ventricular irritability, patients who have been successfully defibrillated should be treated with lidocaine.

Lidocaine is most apt to suppress ventricular arrhythmias only when the level of the drug in the blood is between 1.5 and 6.0 micrograms per milliliter of blood. A 75-milligram to 100-milligram bolus of lidocaine will maintain adequate blood levels for only 20 minutes. Therefore, once an arrhythmia is suppressed, the lidocaine bolus should be followed by a 2-4 milligrams per minute infusion to assure therapeutic blood levels. It is important to distinguish patterns of premature ventricular contractions that are likely to lead to serious arrhythmias. Premature ventricular contractions that may lead to life-threatening arrhythmias are called malignant premature ventricular contractions. These include the following:

- More than six unifocal PVCs per minute
- PVCs that appear to be coming from more than one ectopic focus (for example, multifocal PVCs)
- PVCs that occur in couplets (two PVCs together without a normal QRS complex in between)
- Runs of more than two PVCs or ventricular tachycardia
- PVCs falling in the vulnerable period of the preceding normal complex near the “T” wave/R on T.

The aforementioned premature ventricular contractions in a symptomatic patient, as well as ventricular tachycardia and ventricular fibrillation, must be treated vigorously with lidocaine.

Indications

- Ventricular tachycardia
- Ventricular fibrillation
- Symptomatic premature ventricular contractions

Contraindications

Lidocaine is usually contraindicated in second-degree Mobitz II and third-degree blocks. Lidocaine slows conduction of the electrical impulse from the atria to the ventricles. Decreased ventricular rates may accompany high-grade heart block, resulting in escape beats that are premature ventricular contractions. Whenever premature ventricular contractions occur in conjunction with bradycardia (heart rates less than 60), the bradycardia should be treated first. The drug of choice is atropine sulfate followed by external pacing if atropine is not effective. If PVCs are still present after increasing the rate and the patient is symptomatic, lidocaine should be administered.

Precautions

Central nervous system depression may occur when the dosage exceeds 300 milligrams per hour. Symptoms of central nervous system depression include a decreased level of consciousness, irritability, confusion, muscle twitching, and eventually, seizures. Exceedingly high doses can result in coma and death.

Routine prophylactic lidocaine therapy in patients with acute myocardial infarction is no longer recommended.
Lidocaine cont.

Side Effects
Lidocaine may cause drowsiness, seizures, confusion, hypotension, bradycardia, heart blocks, nausea, vomiting, and respiratory and cardiac arrest.

Interactions
Lidocaine should be used with caution when administering concomitantly with procainamide, phenytoin, quinidine, and β blockers as drug toxicity may result.

Dosage

- **Refractory Ventricular Fibrillation and Pulseless Ventricular Tachycardia.** The initial dose of lidocaine should be 1.0-1.5 milligram per kilogram body weight. Lidocaine can be repeated every 3-5 minutes at a dose of 0.5-0.75 mg/kg to a maximum of 3.0 mg/kg. A single bolus dose of 1.5 mg/kg in cardiac arrest is generally acceptable, as plasma lidocaine levels will remain therapeutic because of reduced drug elimination during CPR. Only bolus therapy should be used during CPR. Once a patient has been resuscitated, IV infusion therapy can be started to maintain therapeutic blood levels of the drug.

- **Ventricular Tachycardia with a Pulse and Symptomatic PVCs.** The initial dose of lidocaine should be 1.0-1.5 milligram per kilogram delivered over 2 – 3 minutes. Repeat boluses of 0.5-0.75 mg/kg can be repeated every 5-10 minutes as required to a maximum dose of 3.0 mg/kg. Once the arrhythmia has been suppressed, a lidocaine drip should be initiated at 2-4 mg/minute.

The dosage of lidocaine should be reduced 50% in patients over 70 years of age and in patients with liver disease, heart failure, bradycardias or conduction disturbances.

Lidocaine is generally given in an IV bolus, followed by an infusion. The bolus can be given endotracheally, however, the dose should be increased 2 to 2.5 times the IV dose. When a peripheral IV is not obtained, it is preferable to initiate and deliver cardiac arrest medications IO/Intra Osseous.
MAGNESIUM SULFATE

Class: Antiarrhythmic

Description
Magnesium sulfate is a salt that dissociates into the magnesium cation (Mg++) and the sulfate anion when administered. Magnesium is an essential element in numerous biochemical reactions that occur within the body.

Mechanism of Action
Magnesium is an essential element in many of the biochemical processes that occur in the body. It acts as a physiological calcium channel blocker and blocks neuromuscular transmission. A decreased magnesium level (hypomagnesemia) is associated with cardiac arrhythmias, symptoms of cardiac insufficiency, and sudden death. Hypomagnesemia can cause refractory ventricular fibrillation.

Indications
- Severe refractory ventricular fibrillation/pulseless ventricular tachycardia
- Torsades de pointes (multi-axial ventricular tachycardia)

Contraindications
Hypersensitivity, patients with heart block or myocardial damage.

Precautions
Magnesium sulfate should be administered slowly to minimize side effects. Any patient receiving intravenous magnesium sulfate should have continuous cardiac monitoring as well as frequent monitoring of vital signs. If possible, the knee and biceps deep tendon reflexes should be checked prior to magnesium therapy. It should be used with caution in patients with known renal insufficiency. Hypermagnesemia (elevated magnesium) can occur following magnesium sulfate administration. Calcium salts (calcium chloride or calcium gluconate) should be available as an antidote for magnesium sulfate should serious side effects occur.

Side Effects
Magnesium sulfate can cause:
Cardiac and central nervous system depression proceeding to respiratory paralysis. 

Hypotension (seen with rapid administration):
flushing sweating bradycardia decreased deep tendon reflexes drowsiness respiratory depression hypothermia arrhythmias flaccid paralysis circulatory collapse itching rash

Interactions
Magnesium sulfate in solution may result in a precipitate formation when mixed with solutions containing: Succinate (SUCCINYLCHOLINE), bicarbonates
Increases the effect of neuromuscular blockers..

Overdose
Magnesium intoxication is manifested by a sharp drop in blood pressure and respiratory paralysis. Disappearance of the patellar reflex is a useful clinical sign to detect the onset of magnesium intoxication. In the event of overdosage, artificial ventilation must be provided until calcium gluconate can be injected intravenously to antagonize the effects of magnesium.

Dosage
- **Torsades de Pointes.  1-2g mixed with 6-8 ml NS for a total of 10ml solution, delivered IV/IO over 2-5 minutes**
- **Anti-Dote for Magnesium Sulfate is Calcium Gluconate 1gm over 2-3 minutes.**
MORPHINE SULFATE

Class: Narcotic Analgesic

Description
Morphine is a central nervous system depressant and a potent analgesic. Although morphine sulfate is one of the most potent analgesics known to humans, it also has hemodynamic properties that make it extremely useful in emergency medicine.

Mechanism of Action
Morphine sulfate is a central nervous system depressant that acts on opiate receptors in the brain providing both analgesia and sedation. It increases peripheral venous capacitance and decreases venous return. Morphine also decreases myocardial oxygen demand. This action is due to both the decreased systemic vascular resistance and the sedative effects of the drug. Patient apprehension and fear can significantly increase myocardial oxygen demand and in some cases can conceivably increase the size of myocardial infarction. The hemodynamic properties of morphine make it one of the most important drugs used in the treatment of pulmonary edema. Morphine is frequently administered to patients with signs and symptoms of pulmonary edema who are not having chest pain and is the drug of choice for that condition in dialysis patients.

Indications
• Severe pain associated with myocardial infarction, kidney stones, etc.
• Pulmonary edema either with or without associated pain.

Contraindications
Hypersensitivity to the drug

Precautions
Because of its hemodynamic effects, morphine should not be used in patients who are volume depleted or severely hypotensive. Morphine causes severe respiratory depression in higher doses. This is especially true in patients who already have some form of respiratory impairment or have been taking another CNS depressant. It should not be used on patients with undiagnosed head injury for evaluation purposes as well as its effect on ICP or abdominal pain.
The narcotic antagonist naloxone (Narcan) should be readily available whenever the drug is administered. Morphine should be used with caution in elderly or debilitated patients and those with impaired renal or hepatic function, hypothyroidism, Addison’s disease, prostatic hypertrophy or urethral stricture. In asthma and pulmonary emphysema, the indiscriminate use of morphine may precipitate severe respiratory insufficiency resulting from increased viscosity of the bronchial secretions and suppression of the cough reflex.

Side Effects
Respiratory depression, bradycardia, hypotension, cardiac arrest, circulatory collapse, nausea, vomiting, abdominal cramps, blurred vision, constricted pupils, altered mental status and headache. Some SEs are caused by too rapid rate of administration.

Interactions
The CNS depression associated with morphine can be enhanced when administered with antihistamines, antiemetics, sedatives, hypnotics, barbiturates, MAOIs, tricyclic antidepressants and alcohol.

How Supplied 10 mg/1mL Carpuject

Dosage
Initial dose 2 - 4 mg IV/IO. This can be augmented with additional doses of 2 milligrams every 5 minutes and can be continued until the pain is relieved, until signs of respiratory depression occur or max dose of 10 mg.

Pediatric 0.01 mg/kg

Intramuscular injection usually requires 5 - 15 milligrams, based on the patient's weight, to attain desired effects. Morphine is routinely given intravenously in emergency medicine and is often administered with an antiemetic agent. This helps prevent the nausea and vomiting that often accompany morphine administration. The antiemetics also tend to potentiate morphine’s effects.

Morphine can be given IV, IO,IM and subcutaneously.
NARCAN/NALOXONE

Class: Narcotic Antagonist

Description
Naloxone is an effective narcotic antagonist. It has proved effective in the management and reversal of overdoses caused by narcotics or synthetic narcotic agents.

Mechanism of Action
Naloxone is chemically similar to the narcotics. However, it has only antagonistic properties. Naloxone competes for opiate receptors in the brain. It also displaces narcotic molecules from opiate receptors. It can reverse respiratory depression associated with narcotic overdose.

Pharmacology

Onset of Action
IV: 2 minutes IM, Subcutaneous: slightly less rapid

Duration of Action
IM longer than IV; may be shorter than the duration of the opiate.

Indications
☑ For the complete or partial reversal of depression caused by narcotics including the following agents:

- Morphine
- Fentanyl
- Codeine
- Heroin
- Demerol
- Methadone
- Dilaudid
- Percodan

☑ For the complete or partial reversal of depression caused by synthetic narcotic analgesic agents including the following drugs:

- Darvon
- Nubain
- Stadol
- Talwin

☑ Treatment of coma of unknown origin

Contraindications
Hypersensitivity to Naloxone hydrochloride or any of its other ingredients.

Precautions
Naloxone should be administered cautiously to patients who are known or suspected to be physically dependent on narcotics. Abrupt and complete reversal by naloxone can cause withdrawal-type effects. This includes newborn infants of mothers with known or suspected narcotic dependence.

Large doses of naloxone are required to antagonize buprenorphine since the latter has a long duration of action due to its slow rate of binding and subsequent slow dissociation from the opiod receptor. Buprenorphine antagonism is characterized by a gradual onset of the reversal effects and decreased duration of action of the normally prolonged respiratory depression.

Side Effects
Hypotension hypertension ventricular arrhythmias nausea vomiting

Side effects associated with naloxone are rare.

Interactions
Naloxone may cause narcotic withdrawal in the narcotic-dependent patient. In cases of suspected narcotic dependence, administer only enough of the drug to reverse respiratory depression

Dosage:
Adult- 0.4- 2 mg IV or SQ-IM-IO-ET (ET 0.8-4 mg diluted in 10ml nacl)
Peds- 0.01 mg/kg initial dose; 0.1 mg/kg second dose IV or SQ-IM-IO-ET (ET Consult Broselow)

Repeat doses of the medication may be necessary as the duration of action of the opiod may exceed the naloxone. Continued monitoring is necessary and additional doses may be necessary.
NITROGLYCERIN/NITROSTAT and Ointment

Class: Nitrate

Description

Nitroglycerin is a potent smooth-muscle relaxant used in the treatment of angina pectoris. It can also be used for CHF/pulmonary edema and hypertension.

Mechanism of Action

Nitroglycerin is a rapid smooth-muscle relaxant that reduces cardiac work and, to a lesser degree, dilates the coronary arteries. This results in increased coronary blood flow and improved perfusion of the ischemic myocardium. Relief of ischemia causes reduction and alleviation of chest pain. Pain relief following nitroglycerin administration usually occurs within 1 to 2 minutes, and therapeutic effects can be observed up to 30 minutes later. Nitroglycerin also causes vasodilation, which decreases preload. Decreased preload leads to decreased cardiac work. This feature, in conjunction with coronary vasodilation, reverses the effects of angina pectoris.

Indications

- Chest pain associated with angina pectoris
- Chest pain associated with acute myocardial infarction
- Acute pulmonary edema (unless accompanied by hypotension)

Contraindications

Hypersensitivity to the drug or nitrates, hypotension, patients in shock, severe bradycardia or tachycardia, RV infarction (ST elevation in RV4 in left and right sided 12-lead ECGs present and/or there is ST elevation in V2 or V3), patient use of phosphodiesterase inhibitors for erectile dysfunction within 24 to 48 hours or who may have increased intracranial pressure as they have been shown to potentiate the hypotensive effects of organic nitrates.

Precautions

Patients taking nitroglycerin may develop a tolerance for the drug, which necessitates increasing the dose. Headache is a common side effect of nitroglycerin administration and results from vasodilation of cerebral vessels. Nitroglycerin deteriorates quite rapidly once the bottle is opened. When a bottle of nitroglycerin is opened, it should be dated. Nitroglycerin should also be protected from light. Always monitor the blood pressure and the other vital signs during nitroglycerin administration.

The effects of nitroglycerin overdose are generally the results of nitroglycerin's capacity to induce vasodilatation, venous pooling, reduced cardiac output, and hypotension. These hemodynamic changes may have protean manifestations, including increased intracranial pressure, with any or all of persistent throbbing headache, confusion, and moderate fever; vertigo; palpitations; tachycardia; visual disturbances: nausea and vomiting (possibly with colic and even bloody diarrhea); syncope (especially in the upright posture); dyspnea, later followed by reduced ventilatory effort, diaphoresis, with the skin either flushed or cold and clammy; heart block and bradycardia; paralysis; coma; seizures; and death.

No specific antagonist to the vasodilator effects of nitroglycerin is known, and no intervention has been subject to controlled study as a therapy of nitroglycerin overdose. Because the hypotension associated with nitroglycerin overdose is the result of venodilatation and arterial hypovolemia, prudent therapy in this situation should be directed toward increase in central fluid volume. Passive elevation of the patient's legs may be sufficient, but intravenous infusion of normal saline or similar fluid may also be necessary. The use of epinephrine or other arterial vasoconstrictors in this setting is likely to do more harm than good.

Side Effects

Headache, flushing, dizziness, weakness, tachycardia, hypotension, orthostasis, skin rash, dry mouth, nausea, and vomiting.

Treatment with nitroglycerin may be associated with lightheadedness on standing, especially just after rising from a recumbent or seated position. This effect may be more frequent in patients who have also consumed alcohol.

Interactions

Nitroglycerin can cause severe hypotension when administered to patients who have recently ingested alcohol. It can cause orthostatic hypotension when used in conjunction with beta blockers.

Dosage

One tablet or one metered spray (0.4 mg) sublingually for routine angina pectoris. (Care should be taken to assure that tablets are not swallowed) Can be repeated at 5 minute intervals up to three times.

Ointment: 1 inch applied to applicator. (After placing the applicator with paste onto the chest or other area, spread the ointment by moving the applicator paper, but do not rub it into the skin) Tape in place.

Patient blood pressure must be acquired and documented prior to repeat doses and frequently during ointment administration.
Class: Non-depolarizing neuromuscular blocker

Description
Vecuronium is a derivative of pancuronium and is used to provide prolonged paralysis of patients who have undergone rapid sequence induction.

Mechanism of Action
It inhibits transmission of nerve impulses by binding with cholinergic receptor sites, antagonizing action of acetylcholine. Vecuronium competes with acetylcholine for cholinergic receptor sites on the post-junctional membrane. This results in paralysis of muscle fibers served by the occupied neuromuscular junction. It does not cause an initial depolarization wave as does succinylcholine. The onset of action of vecuronium is 1 minute with good to excellent intubation conditions within 2.5 - 3 minutes.

Indication
• To achieve longer-term paralysis in cases where the airway has been secured through rapid sequence induction.

Contraindications
Hypersensitivity or anaphylactic reaction to the drug.

Precautions
• Vecuronium should not be administered unless personnel skilled in endotracheal intubation are ready to perform the procedure.
• Oxygen therapy equipment should be readily available, as should all emergency resuscitative drugs and equipment.
• Vecuronium should be used with extreme caution in cases of neuromuscular disease.

Vecuronium does not effect consciousness, the pain threshold or thought processes. Administration must be accompanied by adequate anesthesia or sedation.

Side Effects
wheezing  respiratory depression  apnea  aspiration  arrhythmias  bradycardia
sinus arrest  hypertension  hypotension  itching  bronchospasm  increased intracranial pressure
erythematous reactions  angioedema  urticaria  increased intracranial pressure.

Interactions
• Certain drugs can enhance the neuromuscular blocking action of vecuronium. These include: succinylcholine, lidocaine, procaainamide, β blockers, magnesium sulfate, and other neuromuscular blockers.
• Do not reconstitute with IV solutions containing antimicrobial preservatives.

How supplied
10 mg powder; reconstitute with sterile water.
Also compatible with normal saline, bacteriostatic water and D5W

Dosage
Adult dosage: 0.1 mg/kg IV  Neuromuscular blockade should last 25-30 minutes.
Pediatric dosage 10 – 16 yoa 0.1 mg/kg IV
Pediatric dosage 1 – 10 yoa May require a slightly higher initial dose and may also require supplementation slightly more often than adults.

With succinylcholine as the intubating agent, initial doses for prolonged paralysis of 0.04 – 0.06 mg/kg will produce complete neuromuscular block with clinical duration of action of 25 – 30 minutes. If succs is used prior to vecuronium, the administration of vecuronium should be delayed until the patient starts recovering from the succs induced neuromuscular blockade.

Discard unused portion after completion of call.
OXYGEN

Class: Naturally occurring atmospheric gas

Description
Oxygen is an odorless, tasteless, colorless gas that is present in ambient air at a concentration of approximately 21%. It is an important emergency drug that is used to reverse hypoxemia; in doing so, it helps oxidize glucose to produce adenosine triphosphate (ATP), and helps reduce the size of infarcted tissue during an AMI (in patients who are hypoxemic on room air).

Indications
- Confirmed or suspected hypoxemia
- Ischemic chest pain
- Respiratory insufficiency
- Confirmed or suspected carbon monoxide poisoning and other causes of decreased tissue oxygenation (such as cardiac arrest).

Contraindications
None in the emergency setting.

Dosage
As dictated by patient condition. Generally, low dose is achieved by flowing 2-4 LPM through a nasal cannula. High dose is achieved by flowing 10 -15 LPM through a non-rebreather mask.
PHENERGAN/PROMETHAZINE

Class: Antihistamine / Antiemetic

Description
Promethazine is a phenothiazine derivative with potent antihistamine properties and anticholinergic properties.

Mechanism of Action
Promethazine possesses sedative, antihistamine, antiemetic, antimotion-sickness and anticholinergic properties. It competitively blocks histamine receptors. Clinical effects are generally apparent within 5 minutes of an IV injection and within 20 minutes of an IM injection. The duration of action of promethazine is 4-6 hours. It is an effective and frequently used antiemetic. Promethazine can be given intravenously or intramuscularly. It is often administered with analgesics, particularly narcotics, to potentiate their effect.

Indications
• Nausea and vomiting
• Motion sickness
• To potentiate the effects of analgesics
• Sedation
• Allergic reactions to blood or plasma

Contraindications
Hypersensitivity to the drug.
Comatose states
Patients who have received a large amount of depressants.
Patients <2yo because of the potential for respiratory depression

Precautions
Promethazine may impair mental and physical abilities, cause CNS depression, respiratory depression. It may lower the seizure threshold and should be used with caution in patients with seizure disorder. Care must be taken to avoid accidental intra-arterial injection which may result in gangrene of the affected extremity. It should never be administered subcutaneously. Extrapyramidal symptoms (EPS) have been reported following promethazine use. Patients with sulfite sensitivity, which is seen more frequently in asthmatics. Diphenhydramine (Benadryl) should be available.

Side Effects
Promethazine can cause drowsiness, sedation, blurred vision, hypotension, hypertension, tachycardia, bradycardia, and dizziness, seizures, hallucinations, confusion, disorientation, photosensitivity, asthma, apnea, yellowing of skin / eyes, abdominal pain

Interactions
The CNS-depressant effect of narcotics, sedative/hypnotics, and alcohol is potentiated by promethazine. An increased incidence of extrapyramidal symptoms has been reported when promethazine is administered to patients taking monamine oxidase inhibitors (MAOI).

How Supplied
25 mg/mL

Dosage
IV doses must be diluted in 6 - 8 mL NS to administer. IM doses are administered full strength.

Adult
Nausea/Vomiting 12.5-25 mg IM/IV.
Sedation 25-50 mg IM/IV (per physician request), diluted
Allergic reaction 25 mg
Max Dose 50 mg IM/ 25mg IV

Pediatrics >2 y/o
Nausea/Vomiting 0.25-1 mg/kg IM/IV Max Dose 25 mg
Sedation 2.5-25 mg IM/IV Max Dose 25 mg per physician request

Promethazine should be given by IV or deep intramuscular injection (preferred route) only. IV doses must be diluted in 10 mL NS to administer. IM doses are administered full strength. Care must be taken to avoid accidental intra-arterial injection. Subcutaneous injection is contraindicated. Treatment of phenergan overdose should be directed at supportive care.
Romazicon/Flumazenil

Class: Antidote: Benzodiazepine antagonist

Description Flumazenil, an imidazobenzodiazepine, is a benzodiazepine antagonist.

Mechanism of Action Flumazenil blocks the central effects of agents that act via the benzodiazepine receptor, by competitive inhibition. The hypnotic-sedative effects of benzodiazepines are rapidly reversed by flumazenil. However, the residual effects may reappear gradually within a few hours, depending on the dose of flumazenil, the time elapsed since the benzodiazepine agonist was given, and the dose and elimination half-life of the previously administered benzodiazepine.

Indication

- Complete or partial reversal of the central sedative effects of benzodiazepines, specifically Versed.

Contraindications

- Hypersensitivity to the drug or to benzodiazepines.
- Epileptic patients who have been receiving benzodiazepine treatment for a prolonged period. The abrupt suppression of the protective effect of benzodiazepines may induce convulsions in epileptic patients.
- In patients who are showing signs of serious cyclic antidepressant overdose

Precautions

In view of the short duration of action of flumazenil and the possible need for repeat doses, the patient should remain closely monitored until all possible central benzodiazepine effects have subsided. The immediate availability of oxygen, resuscitative equipment and skilled personnel for the maintenance of airway, ventilation and cardiac function should be ensured before the administration of any benzodiazepine or flumazenil.

Children: The safety and effectiveness of flumazenil in children below the age of 18 has not been established.

Pregnancy: flumazenil should be used during pregnancy only if the possible benefit to the patient outweighs the potential risks to the fetus.

Multiple Drug Overdosage: Particular caution is necessary when using flumazenil in cases of multiple drug overdosage, since the toxic effects (cardiac arrhythmias and/or convulsions) of other psychotropic drugs, especially tricyclic antidepressants, may increase as the effects of benzodiazepines subside.

Patients should be evaluated for the signs and symptoms of a tricyclic antidepressant overdose. A diagnostic ECG can be used to confirm the presence of these agents; a QRS duration of 0.1 seconds or greater indicates a serious overdosage with tricyclic antidepressants, which should be treated with appropriate measures. Depending on the extent of involvement of benzodiazepines in the multiple drug overdose, this may or may not include flumazenil.

If a significant improvement in the level of consciousness and respiratory function is not achieved after repeated injections of flumazenil, a non-benzodiazepine etiology must be assumed.

Side Effects

Excessively and/or rapidly injected doses of flumazenil may induce benzodiazepine withdrawal symptoms such as anxiety attacks, tachycardia, dizziness and sweating in patients on long-term benzodiazepine treatment.

Adverse Reactions

Flumazenil is generally well tolerated. Nausea and/or vomiting has been observed, particularly if opiates have been employed. Flushing has also been noted.

If patients are awakened too rapidly, they may become agitated, anxious or fearful. Transient increases in blood pressure and heart rate may also occur.

Seizures and/or cardiac arrhythmias have been observed in patients who are physically dependent on benzodiazepines, and in multiple drug overdose, particularly in the presence of tricyclic antidepressants.

Interactions

Toxicity: multiple drug overdosage. “See Precautions”.

Dosage

Initial dose is **0.2 mg** administered IV/IO over 30 seconds. Wait 1 minute. If no change, administer **0.3 mg over a 30-second** period. The maximum recommended dose is 2.0 mg.
SODIUM  BICARBONATE

Class:  Alkalinizing Agent

Description
Sodium bicarbonate is a salt that provides bicarbonate to buffer metabolic acidosis, which can accompany several disease processes.

Mechanism of Action
Combines with excessive acids to form a weak volatile acid, increases pH.

For many years sodium bicarbonate was the cornerstone of advanced cardiac life support care. Controlled studies have shown that sodium bicarbonate was ineffective in the treatment of cardiac arrest. In many instances it has actually been associated with many adverse reactions.

Sodium bicarbonate is occasionally used in the treatment of certain types of drug overdose. The most common example is drugs in the tricyclic class of antidepressants. Overdosage of these drugs has serious effects including life-threatening cardiac arrhythmias. Tricyclic antidepressant excretion from the body is enhanced by making the urine more alkaline (raising the pH). Sodium bicarbonate is sometimes administered to increase the pH of the urine to speed excretion of the drug from the body.

Indications
• Late in the management of cardiac arrest, if at all. Hyperventilation, prompt defibrillation, and the administration of epinephrine and lidocaine should always precede use of sodium bicarbonate. Because these therapies take at least 10 minutes to carry out, sodium bicarbonate should rarely be administered in the first 10 minutes of resuscitation.
• Tricyclic antidepressant overdose
• Phenobarbital overdose
• Severe acidosis refractory to hyperventilation
• Known hyperkalemia

Contraindications
When used in the management of cardiac arrest, there are no absolute contraindications.

Precautions
Sodium bicarbonate can cause metabolic alkalosis when administered in large quantities. It is important to calculate the dosage based on patient weight and size.

Inadvertent extravasation of intravenously administered hypertonic solutions of sodium bicarbonate have been reported to cause chemical cellulitis because of their alkalinity, with tissue necrosis, ulceration or sloughing at the site of infiltration.

Side Effects
Few when used in the emergency setting.

Interactions
Most catecholamines and vasopressors (i.e., dopamine and epinephrine) can be deactivated by alkaline solutions like sodium bicarbonate. Sodium bicarbonate should not be administered in conjunction with calcium chloride. A precipitate can form, which may clog the IV line or haze may result. Do not use the injection if it contains precipitate.

Dosage
Initial dose: 1 milliequivalent per kilogram of body weight initially
Subsequent doses: 0.5 milliequivalent per kilogram of body weight every 10 minutes

Pediatric Dosage: 1 mEq/kg initially followed by 0.5 mEq/kg every 10 minutes.

When possible, the dosage of sodium bicarbonate should be based on the results of arterial blood gas studies. Sodium bicarbonate should be administered only as an IV bolus.
SOLU-MEDROL/METHYLPREDNISOLONE

Class: Corticosteroid / Anti-Inflammatory

Description

Methylprednisolone is an intermediate-acting corticosteroid related to the natural hormones secreted by the adrenal cortex.

Mechanism of Action

Methylprednisolone is an intermediate-acting steroid. In general medical practice, steroids have a wide range of uses. Effective as potent anti-inflammatory agents, they are used in the management of allergic reactions. The role of steroids in the management of neurological emergencies remains controversial.

Indications

- Anaphylaxis
- Asthma
- Exacerbation of COPD

Contraindications

Premature infants, non-asthmatic bronchial disease, known hypersensitivity to the drug, psychosis, and its constituents and systemic fungal infections.

Precautions

A single dose of methylprednisolone is all that should be given in the prehospital phase of care. Long-term steroid therapy can cause gastrointestinal bleeding, prolonged wound healing, and suppression of adrenocortical steroids.

Side Effects

Seizures, fluid retention, congestive heart failure, hypertension, abdominal distention, vertigo, headache, nausea/vomiting, diarrhea, malaise, and hiccups.

Interactions

Convulsions have been reported with concurrent use of methylprednisolone and cyclosporin.

How Supplied

125 mg Act-O-Vial System

IMPORTANT – Use only the accompanying diluent or Bacteriostatic Water for Injection with Benzyl Alcohol when reconstituting. Use within 48 hours after mixing.

Directions for using the Act-O-Vial:
1. Press down on plastic activator to force diluent in the lower compartment.
2. Gently agitate to effect solution.
3. Remove plastic tab covering center of stopper.
4. Sterilize top of stopper with a suitable germicide.
5. Insert needle squarely through center of stopper until tip is just visible. Invert vial and withdraw dose.

Dosage

- 62.5 - 125 mg IV or IM
SUCCINYLCHOLINE/ANECTINE

Class: Depolarizing neuromuscular blocker

Description
Succinylcholine is an ultra short-acting depolarizing-type, skeletal muscle relaxant. Like acetylcholine, it combines with the cholinergic receptors of the motor end plate to produce depolarization. Neuromuscular transmission is thus inhibited, which renders the muscles unable to be stimulated by acetylcholine. Following IV injection, flaccid paralysis is rapid (less than 1 minute after IV administration), and with single administration lasts approximately 4 to 6 minutes. Muscle relaxation begins with the eyelids and jaw, muscles of the glottis, and finally, the intercostals and the diaphragm and all other skeletal muscles. It has no effect on consciousness.

Indication
• To achieve temporary paralysis where endotracheal intubation is indicated and where muscle tone or seizure activity inhibits it.

Contraindications
hypersensitivity to succinylcholine  personal or familial history of malignant hyperthermia
penetrating eye injuries  skeletal muscle myopathies
narrow angle glaucoma.

It is also contraindicated in patients after the acute phase of injury following major burns, multiple trauma, extensive denervation of skeletal muscle, or upper motor neuron injury, because succinylcholine administered to such individuals may result in severe hyperkalemia which may result in cardiac arrest

Precautions
• Succinylcholine should not be administered unless personnel are skilled in endotracheal intubation. Oxygen therapy equipment should be readily available.
• Fractures have been reported in children following the use of depolarizing neuromuscular blockers due to muscle fasciculation.
• Cardiac arrest and ventricular arrhythmias have been reported when succinylcholine was administered to patients with severe burns and severe crush injuries.
• To avoid distress to the patient, succs should not be administered before unconsciousness has been induced. In Emergency situations, however, it may be necessary to administer succs before unconsciousness is accomplished.

Side Effects
Cardiac arrest  malignant hyperthermia  hyperkalemia  muscle fasciculation
Respiratory depression  apnea  hypotension  jaw rigidity
Hypertension  hypotension  increased ocular pressure  excessive salivation
Aspiration  arrhythmias  increased intracranial pressure

Interactions
Certain drugs can enhance the neuromuscular blocking action of succinylcholine. These include: lidocaine, procainamide, beta-blockers, magnesium sulfate, and other neuromuscular blockers. Lidocaine is not longer seen as beneficial in the prehospital setting.

How Supplied
200mg/10mL = 20 mg/mL

Dosage
100mg slow IV/IO.
It can be administered IM if needed at a dose of 3 – 4 mg/kg, but not to exceed 150 mg total dose.
Vials are stable for up to 14 days at room temperature without significant loss of potency.

Malignant Hyperthermia
Succinylcholine administration has been associated with acute onset of malignant hyperthermia, a potentially fatal hypermetabolic state of skeletal muscle. It frequently presents as a spasm of the jaw muscles which may progress to generalized rigidity, increased oxygen demand, tachycardia, tachypnea, and extremely high fever. Successful outcome depends on recognition of early signs, such as jaw muscle spasm or generalized rigidity to initial administration of succinylcholine. Skin mottling, rising temperature, and clotting disorders may occur later in the course of the hypermetabolic process. Recognition of the syndrome is a signal for attention to increased oxygen consumption, support of circulation and institution of measures to control rising temperature. Continuous monitoring of temperature and expired CO$_2$ is recommended as an aid to early recognition of malignant hyperthermia.

Other
In both adults and children, the incidence of bradycardia, which may progress to asystole, is higher following a second dose of succinylcholine. The incidence and severity of bradycardia is higher in children than in adults. Pretreatment with atropine may reduce the occurrence of bradycardia.
Pregnancy
It is not known whether succinylcholine can cause fetal harm when administered to a pregnant woman. Succinylcholine should be given to a pregnant woman only if clearly needed.
A higher proportion of patients may be expected to show prolonged apnea to succinylcholine when pregnant.

Labor and Delivery
Succinylcholine is commonly used to provide muscle relaxation during delivery by cesarean section. While small amounts of succinylcholine are known to cross the placental barrier, under normal conditions the quantity of drug that enters fetal circulation after a single dose of 1 mg/kg to the mother should not endanger the fetus. However, since the amount of drug that crosses the placental barrier is dependent on the concentration gradient between the maternal and fetal circulations, residual neuromuscular blockade (apnea and flaccidity) may occur in the neonate after repeated high doses to, or in the presence of atypical plasma cholinesterase in, the mother.

Pediatric Use
There are rare reports of ventricular dysrhythmias and cardiac arrest secondary to acute rhabdomyolysis with hyperkalemia in apparently healthy children who receive succinylcholine. Many of these children were subsequently found to have a skeletal muscle myopathy such as Duchenne's muscular dystrophy whose clinical signs were not obvious. The syndrome often presents as sudden cardiac arrest within minutes after the administration of succinylcholine. These children are usually, but not exclusively, males, and most frequently 8 years of age or younger. There have also been reports in adolescents. There may be no signs or symptoms to alert the practitioner to which patients are at risk. Due to the abrupt onset of this syndrome, routine resuscitative measures are likely to be unsuccessful. Careful monitoring of the electrocardiogram may alert the practitioner to peaked T-waves (an early sign). Administration of IV calcium, bicarbonate, and glucose with insulin, with hyperventilation have resulted in successful resuscitation in some of the reported cases. Extraordinary and prolonged resuscitative efforts have been effective in some cases. In addition, in the presence of signs of malignant hyperthermia, appropriate treatment should be initiated concurrently.

WARNINGS: Since it is difficult to identify which patients are at risk, it is recommended that the use of succinylcholine in children should be reserved for emergency intubation or instances where immediate securing of the airway is necessary, e.g., laryngospasm, difficult airway, full stomach, or for intramuscular use when a suitable vein is inaccessible.
Valium/Diazepam

Class: Antianxiety, anticonvulsant, skeletal muscle relaxant.

Description: Benzodiazepine derivative

Mechanism of Action: In animal studies, diazepam appears to act on parts of the limbic system inducing calming effects. It has no demonstrable peripheral autonomic blocking action, nor does it produce extrapyramidal side effects. It does produce ataxia at higher doses. It had transient cardiovascular depressor effects.

Indications

- Seizure
- Anxiety
- Alcohol withdrawal for DTs, agitation, tremor, etc.
- Skeletal muscle reflex spasm
- Neuron disorders
- Tetanus

Contraindications

Known hypersensitivity, acute narrow angle glaucoma, open angle glaucoma unless receiving appropriate therapy.

Precautions

Should be administered slowly IV, 1 minute for each 5 mL, to reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling, and vascular impairment. Do not use small veins. Extreme care should be taken to avoid intra-arterial administration or extravasation. Extreme care should be used in administering to the elderly, the very ill and those with limited pulmonary reserve because of the possibility that apnea and/or cardiac arrest may occur. Patient use of barbiturates, alcohol or other CNS depressants increased risk of apnea. Should not be administered to patients in shock, coma, or in acute alcoholic intoxication with depression of vital signs. Due to the short-lived effect of diazepam after IV administration, be prepared for the return of seizure activity. Lower doses, usually 2 – 5 mg, should be used for elderly and debilitated patients.

Side Effects

Drowsiness, fatigue, ataxia (inability to coordinate movements), venous thrombosis and phlebitis and injection site.

Interactions

Do not mix or dilute with other solutions or drugs.

How Supplied

10mg/2mL Carpuject

Dosage

Adult 2 – 5 mg IV, IO or IM, Max 10 mg
Pediatric 0.02 mg/kg IV, IO or IM
Versed/MIDAZOLAM

Class: Sedative / Hypnotic

Description
Benzodiazepine with strong hypnotic and amnesic properties.

Mechanism of Action

Midazolam is a potent, but short-acting benzodiazepine CNS depressant. It is used widely in medicine as a sedative and hypnotic. It is 3-4 times more potent than diazepam. Its onset of action is approximately 3 - 5 minutes when administered intravenously and 15 minutes for adults and 5 minutes for peds when administered intramuscularly. Midazolam has impressive amnestic properties. Like the other benzodiazepines, it has no effect on pain.

Indication

• Premedication before cardioversion and other painful procedures
• Rapid sequence intubation
• Seizures
• Acute anxiety states

Contraindications

Hypersensitivity to the drug, in patients who have narrow-angle glaucoma, patients in shock, with depressed vital signs, or who are in alcoholic coma.

Precautions

Emergency resuscitative equipment must be available prior to the administration of midazolam. Vital signs and ECG must be continuously monitored during and after drug administration. Midazolam has more potential than the other benzodiazepines to cause respiratory depression and respiratory arrest. Flumazenil (Romazicon), a benzodiazepine antagonist, should be available to use as antidote if required.

Side Effects

Drowsiness, hypotension, laryngospasm, bronchospasm, dyspnea, respiratory depression, apnea, drowsiness, amnesia, altered mental status, bradycardia, tachycardia, PVCs, and retching.

Interactions

The effects of midazolam can be accentuated by CNS depressants such as narcotics and alcohol.

Dosage

When used for sedation, midazolam must be administered cautiously, as the amount of medication required to achieve sedation varies from individual to individual. Typically 1-4 milligrams are administered by slow IV injection.

Adult <60 yoa: 2 – 2.5 mg IV over 2 minutes. (It will take another 2 minutes to fully evaluate the sedative effect.)
2 – 2.5 mg IN
5 mg IM

Adult <60 yoa
& the debilitated: 1 - 1.5 mg IV over 2 minutes

Pediatric: 0.1 mg/kg slow IV/IO; IN
Zofran/Ondansetron

Class: Antiemetic

Description: Selective 5-HT₃ receptor agonist.

Mechanism of Action
Not been fully characterized.

Indications
• Nausea/vomiting prevention

Contraindications
• Hypersensitivity
• Pediatric patients <2yoa or <40 kg/88lb,

Precautions
• May mask a progressive ileus and/or gastric distention
• Use cautiously if there might be impaired liver function
• Use cautiously in recent abdominal surgery

Side Effects
allergic reaction (difficulty breathing, closing of the throat, swelling of the lips, tongue or face, hives)
Irregular heart beats muscle cramps uncontrollable movements headache agitation
Fatigue drowsiness dizziness anxiety
May cause transient visual difficulty

Interactions
None prehospital

How Supplied 4 mg/2 mL prefilled syringe

Directions for prefilled syringe
• To release plunger rod, grasp syringe and depress rod until it releases from the syringe. (This also punctures the syringes rubber stopper.)
• Attach plunger rod to the syringe barrel by inserting rod into the plunger and and turning clockwise.
• Remove Luer tip cover, Attach needle or blunt cannula if applicable.
• Expel air by pushing on the plunger rod. Do not touch the syringe tip.

Dosage
• 4 mg slow IV (2-5 minutes) or IM
ABBREVIATIONS
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AAA</td>
<td>abdominal aortic aneurysm</td>
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<tr>
<td>AB</td>
<td>abortion</td>
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<td>abdomen</td>
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<td>Abn</td>
<td>abnormal</td>
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<td>ACR</td>
<td>ambulance call report</td>
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<td>A.D.</td>
<td>right ear</td>
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<td>Adm.</td>
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<td>Admin.</td>
<td>administration</td>
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<td>A-fib</td>
<td>atrial fibrillation</td>
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<tr>
<td>AICD</td>
<td>automatic implantable cardioverter</td>
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<td>AIDS</td>
<td>acquired immune deficiency syndrome</td>
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<tr>
<td>AK</td>
<td>above knee</td>
</tr>
<tr>
<td>AM</td>
<td>before noon</td>
</tr>
<tr>
<td>AMA</td>
<td>against medical advice</td>
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<td>Amb</td>
<td>ambulatory</td>
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<td>ampule</td>
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<td>APAP</td>
<td>acetaminophen</td>
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<td>alert and oriented</td>
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<td>AS</td>
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<td>ASÀ</td>
<td>aspirin</td>
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<td>ASCAD</td>
<td>arteriosclerotic cardiovascular disease</td>
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<tr>
<td>ASHD</td>
<td>arteriosclerotic heart disease</td>
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<tr>
<td>BBS</td>
<td>bilateral breath sounds</td>
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<tr>
<td>BIAD</td>
<td>blind insertion airway device</td>
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<tr>
<td>Bilat.</td>
<td>bilateral</td>
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<tr>
<td>BK</td>
<td>below knee</td>
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<tr>
<td>BLS</td>
<td>basic life support</td>
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<tr>
<td>BM</td>
<td>bowel movement</td>
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<td>BP</td>
<td>blood pressure</td>
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<td>BR</td>
<td>bathroom</td>
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<tr>
<td>BS</td>
<td>blood sugar</td>
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<tr>
<td>BVM</td>
<td>bag valve mask</td>
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<tr>
<td>C-Spine</td>
<td>cervical spine</td>
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<tr>
<td>Cw</td>
<td>with</td>
</tr>
<tr>
<td>Ca</td>
<td>cancer</td>
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<td>CABG</td>
<td>coronary artery bypass graft</td>
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<td>Cap.</td>
<td>capsule</td>
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<td>capillary refill</td>
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<td>CC</td>
<td>chief complaint</td>
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<tr>
<td>Cc</td>
<td>cubic centimeter</td>
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<tr>
<td>CCU</td>
<td>Coronary Care Unit</td>
</tr>
<tr>
<td>CHB</td>
<td>complete heart block</td>
</tr>
<tr>
<td>Chemo</td>
<td>chemotherapy</td>
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<td>CHF</td>
<td>congestive heart failure</td>
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<tr>
<td>CHI</td>
<td>closed head injury</td>
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<tr>
<td>CID</td>
<td>cervical immobilization device</td>
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<tr>
<td>CM</td>
<td>centimeter</td>
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<tr>
<td>CNS</td>
<td>central nervous system</td>
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<tr>
<td>CO2</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td>C/O</td>
<td>complained of</td>
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<tr>
<td>COPD</td>
<td>chronic obstructive pulmonary disease</td>
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<tr>
<td>CP</td>
<td>chest pain</td>
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<tr>
<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
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<tr>
<td>CSF</td>
<td>cerebrospinal fluid</td>
</tr>
<tr>
<td>CVA</td>
<td>cerebrovascular accident</td>
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<tr>
<td>CVP</td>
<td>central venous pressure</td>
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<td>CXR</td>
<td>chest x-ray</td>
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<td>D/C</td>
<td>discharge</td>
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<td>DC</td>
<td>discontinue</td>
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<tr>
<td>D5W</td>
<td>dextrose 5% in water</td>
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<tr>
<td>DNR</td>
<td>Do Not Resuscitate</td>
</tr>
<tr>
<td>DOA</td>
<td>dead on arrival</td>
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<tr>
<td>Dsg</td>
<td>dressing</td>
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<td>Dts</td>
<td>delirium tremens</td>
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<td>D/C</td>
<td>discharge</td>
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<td>discontinue</td>
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<td>dressing</td>
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<td>Dts</td>
<td>delirium tremens</td>
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<tr>
<td>EBL</td>
<td>estimated blood loss</td>
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<td>ECC</td>
<td>emergency care center</td>
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<td>ECF</td>
<td>extended care facility</td>
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<td>ECG/EKG</td>
<td>electrocardiogram</td>
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<td>EENT</td>
<td>eyes, ears, nose &amp; throat</td>
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<td>EMA</td>
<td>emergency management agency</td>
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<td>EMS</td>
<td>emergency medical service</td>
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<td>EMT</td>
<td>emergency medical technician</td>
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<td>EMT-I</td>
<td>emergency medical technician - IV Tech</td>
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<tr>
<td>EMT-P</td>
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<td>ENT</td>
<td>ears, nose, throat</td>
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<td>EOC</td>
<td>emergency operating center</td>
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<td>ERL</td>
<td>equal reacts to light</td>
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<td>emergency trauma center</td>
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<td>ETT</td>
<td>endotracheal tube</td>
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<td>F</td>
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<td>FB</td>
<td>foreign body</td>
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<td>FBAO</td>
<td>foreign body airway obstruction</td>
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<td>Gtts.</td>
<td>Drops</td>
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<td>Abbreviation</td>
<td>Description</td>
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<td>H2O</td>
<td>water</td>
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<td>HBV</td>
<td>Hepatitis B virus</td>
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<td>HCC</td>
<td>health care center</td>
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<td>HCVD</td>
<td>hypertensive cardiovascular disease</td>
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<td>HEENT</td>
<td>head, eyes, ears, nose, throat</td>
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<td>HHN</td>
<td>hand held nebulizer</td>
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<td>HIV</td>
<td>human immunodeficiency virus</td>
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<td>HR</td>
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<td>hour</td>
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<td>HVD</td>
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<td>ICF</td>
<td>Intermediate Care Facility</td>
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<td>Intensive Care Unit</td>
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<td>ID</td>
<td>identification</td>
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<td>I.M.</td>
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<td>in.</td>
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<td>INT</td>
<td>intermittent needle</td>
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<td>joint</td>
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<td>jvd</td>
<td>jugular vein distention</td>
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<td>K</td>
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<tr>
<td>MAE</td>
<td>moves all extremities</td>
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<tr>
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<td>moves all extremities well</td>
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<td>MAMA</td>
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<tr>
<td>Mcg/kg/min</td>
<td>micrograms per kilogram per minute</td>
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<td>MDI</td>
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<td>odor resembling alcohol on breath</td>
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<td>positive end expiratory pressure</td>
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<td>past medical history</td>
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<td>po</td>
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<td>every</td>
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<tr>
<td>qt.</td>
<td>Quart</td>
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<td>rule out</td>
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<td>return of spontaneous circulation</td>
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<td>second heart sound</td>
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<tr>
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<td>subcutaneous</td>
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<td>warm and dry</td>
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<td>weeks</td>
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<td>WNL</td>
<td>within normal limits</td>
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<td>Wolfe Parkinson White Syndrome</td>
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<td>wt</td>
<td>weight</td>
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<td>W/V</td>
<td>weight by volume</td>
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<td>x</td>
<td>times</td>
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<tr>
<td>x-port</td>
<td>transport</td>
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<td>y/o</td>
<td>year(s) old</td>
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<tr>
<td>YOA</td>
<td>years of age</td>
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<td>yr.</td>
<td>Year</td>
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SYMBOLS

+ positive
- negative
% percentage
= equal
> greater than
< less than
@ at or each
Ø zero, none or no
1° primary/first degree
2° secondary/second degree
3° third degree
♀ Female
♂ Male
↑ increased
↓ decreased
yclopedia change
R Right
L Left
? questionable/possible
THE FOLLOWING MEDICATIONS ARE APPROVED FOR USE UNDER STANDING ORDERS:

EMT - PARAMEDIC

• DRUG NAME/Trade Name
  • ADENOSINE/Adenocard
  • ALBUTEROL/Proventil, Ventolin
  • ASPIRIN
  • ATROPINE
  • CRYSTALLOID SOLUTIONS/Normal Saline, Lactated Ringers
  • DEXTROSE/D50, D25
  • DIPHENHYDRAMINE/Benadryl
  • DOPAMINE
  • EPINEPHRINE 1:1,000, 1:10,000
  • ETOMIDATE/Amidate
  • FLUMAZENIL/Romazicon
  • FUROSEMIDE/Lasix
  • GLUCAGON/GlucaGen
  • HALOPERIDOL/Haldol
  • IPRASTROPIUM BROMIDE/Atrovent
  • LIDOCAINE
  • DIAZEPAM/Valium
  • MAGNESIUM SULFATE
  • METHYLPREDNISOLONE/Solu-Medrol
  • MIDAZOLAM/Versed
  • MORPHINE SULFATE
  • NALOXONE/Narcan
  • NITROGLYCERIN: paste-Nitro-Bid, spray-Nitrolingual, tablet-Nitrostat
  • ONDANSETRON/Zofran
  • OXYGEN
  • PROMETHAZINE/Phenergan
  • SODIUM BICARBONATE
  • SUCCINYLCHOLINE/Anectine
  • VECURONIUM/Norcuron

EMT-IV

• ASPIRIN
• ALBUTEROL/Proventil, Ventolin
• DEXTROSE 50% in WATER
• EPINEPHRINE 1:1000
• NITROGLYCERINE TABLET
• OXYGEN

EMT

• ASPIRIN
• ALBUTEROL/Proventil, Ventolin
• EPINEPHRINE 1:1000
• NITROGLYCERINE TABLET
• OXYGEN
I.C.E. Induced Cooling by EMS

Cardiac Arrest

Criteria for Induced Cooling, Use check list.

Advanced airway in place with ETCO2 > 20 mmHg?

Appropriate ACLS Protocol

Cold Saline Bolus 30 mL/kg I to max 2 liters

Expose Patient

Apply Ice Packs to Axilla, Neck, and Groin

Dopamine 5-20 mcg/kg/min target MAP 90-100

Reassess Temperature

>33°c and Pt shivering

Etomidate 20 mg IV/IO

Still shivering

If transport time >30 mins

Consider Rocuronium Bromide 100 mg IV

> 33°c no shivering

Shivering stops

If transport time <30 mins contact medical control for orders for Rocuronium.

Continue to Monitor Temperature and Vital Signs

Discontinue Cooling Measures

Important Temperatures

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<th>°F</th>
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<td>37°c</td>
<td>98.6°f</td>
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<tr>
<td>36°c</td>
<td>96.8°f</td>
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<tr>
<td>35°c</td>
<td>95°f</td>
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<tr>
<td>34°c</td>
<td>93.2°f</td>
</tr>
<tr>
<td>33°c</td>
<td>91.4°f</td>
</tr>
<tr>
<td>32°c</td>
<td>89.6°f</td>
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<tr>
<td>31°c</td>
<td>87.8°f</td>
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Discontinued so per Dr. Wilkinson at QA Committee MTG 4/2015

Mark Wilkinson, M.D. WC/JC EMS Medical Director

Revised 01/06/2011