Buechel Fire-Emergency Medical Services

Patient Care Protocols

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Chief

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Medical Director
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General Protocols
On-Scene Medical Personnel

► The medical care provided at the scene is the responsibility of the highest level of EMS provider who has responded by usual dispatch systems to that scene. Passersby who stop to help, even though possibly more highly trained than the system providers, may not assume responsibility (except as outlined below) but may be allowed to help in care at the discretion of the lead EMS provider and assuming they have proof of licensure.

► When an EMS provider, under medical control (on- or off-line), arrives at the scene of an emergency, the provider acts as the agent of medical control.

► Any healthcare provider (MD, PA, RN, nurse midwife, non-KY licensed EMS provider, etc.) who is not an active member of the responding EMS unit, and who is either at the scene at the time of EMS’ arrival or arrives after an EMS unit provider has initiated care, and who desires to continue to participate, should be put in touch with the on-line medical control physician.

► At no time should an EMS provider provide care outside of their scope of training and/or protocols.

► In the event that a Mass Casualty Incident (MCI) is declared, all Providers should follow the Mass Casualty Incidents Uniform Prehospital MCI Procedure outlined in this document or similar approved Incident Command System.
Use of Lights and Sirens

Purpose

The estimated EMS fatality rate (12.7 per 100,000 workers) is more than twice the national rate. Vehicles crashes of all types remain the leading cause of death in EMS. The use of Lights and Sirens in the transport of a patient from the scene to the hospital by EMS personnel should be consistent with “best practices”, be medically defensible and conform to Kentucky state law. It is not without risk and should be used only when there is a likely benefit to the patient. This is to ensure the safety of our patients, our staff, our citizens and ourselves.

Policy

KRS 189.910 to KRS 189.950 outline the legal parameters under which an emergency vehicle may be exempt from certain traffic regulations. The vehicle operator should be familiar with these statutes. Specifically:

189.940 Exemptions from traffic regulations.

➤ The speed limitations set forth in the Kentucky Revised Statutes do not apply to emergency vehicles:
   ◆ When responding to emergency calls; or
   ◆ To police vehicles when in pursuit of an actual or suspected violator of the law; or
   ◆ To ambulances when transporting a patient to medical care facilities; and
   ◆ The driver thereof is giving the warning required by subsection (5)(a) and (b) of this section.

No portion of this subsection shall be construed to relieve the driver of the duty to operate the vehicle with due regard for the safety of all persons using the street or highway.

The law permits such emergency vehicles only on emergency calls or when transporting to a medical care facility to utilize lights and sirens. EMS personnel are instructed to follow the state laws and use lights and sirens while going to the hospital only when it is medically necessary for the patient to be rapidly transported. Rapid transport to the scene may be necessary in certain instances to evaluate the situation for possible life threats. It is then that the EMS personnel in charge of patient care will make the appropriate transportation decision. Although time is typically saved, studies have shown the savings to be from less than one minute to less than four minutes and rarely clinically significant to the patient. Transport in this manner is not without risk to the patient. The EMS personnel in charge will have to weigh the risks and benefits to the patient, and document this rationale on the EMS run form. This policy does not restrict the EMS personnel from changing a non-emergency transport back into an emergency transport if conditions change.
**Determination of Death - Dead on Scene**

If it appears that a patient you have been called to attend is dead, this protocol shall be followed prior to final determination.

1. The Paramedic shall determine and document that the following signs of death are present:
   - Unresponsiveness
   - Apnea
   - The absence of a palpable pulse at the carotid site
   - Bilaterally fixed and dilated pupils; and
   - Asystole determined in two (2) leads on an electrocardiograph in accordance with the American Heart Association guidelines, except in cases of trauma or when presented with a standard form or identification evidencing a patient’s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation).

2. The Paramedic shall determine, in addition, that one (1) or more of the following factors or conditions exist:
   - Lividity of any degree
   - Rigor mortis of any degree (in the non-hypothermic patient)
   - The presence of venous pooling in the body
   - Damage or destruction of the body which is incompatible with life, or
   - A standard form or identification evidencing a patient’s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation).

3. If the Paramedic has determined and documented that the conditions above (sections 1 and 2) have been met, the Paramedic may declare the patient dead.

4. The Paramedic may contact the on duty MEDICAL CONTROL for advice and assistance in making a determination required by this protocol.

5. If ANY patient meets the criteria described above as a non-resuscitation candidate, access to the scene should be limited as much as possible with due care to disturb the scene as little as possible. As in all cases of out-of-hospital deaths, every effort should be made to console family, friends, survivors, and witnesses without interfering with ongoing investigations.
Determination of Death - Dead on Scene continued

6. The Paramedic shall document all items required on the Kentucky EMS Ambulance Run Report including the usual patient assessment, medical history, and surrounding events information. It is especially important to note:

- Body position and location when discovered, including differences from when last seen alive.
- Patient condition when last seen alive.
- Clothing and condition of clothing.
- Conditions of residence/business/location found.
- Statements made on the scene by significant individuals.
- Any unusual circumstances.

7. If the Paramedic determines a patient to be dead, the paramedic shall remain on the scene until the arrival of a law enforcement officer or until the Paramedic is released from the scene by the coroner.

IT IS TO BE EXPRESSLY UNDERSTOOD THAT IN THE EVENT OF ANY UNCERTAINTY AS TO THE PATIENT STATUS, THE CREW IS TO INITIATE NORMAL RESUSCITATIVE EFFORTS
1. A Paramedic may discontinue resuscitation if, prior to transport:
   a. The patient has suffered cardiac arrest.
   b. The Paramedic has attempted and documented the resuscitative efforts specified in the Asystole Protocol including successful endotracheal intubation, IV access, and IV administration of Epinephrine and Atropine.
   c. The resuscitative efforts were unsuccessful; and
   d. The patient meets the following criteria:
      - Unresponsiveness
      - Apnea
      - The absence of a palpable pulse at the carotid site
      - Bilaterally fixed and dilated pupils; and
      - Asystole determined in two (2) leads on an electrocardiograph in accordance with the American Heart Association guidelines, except in cases of trauma or when presented with a standard form or identification evidencing a patient’s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation).

2. A Paramedic may discontinue resuscitation initiated by someone if:
   a. The patient has suffered cardiac arrest;
   b. The patient meets the following criteria:
      - Unresponsiveness
      - Apnea
      - The absence of a palpable pulse at the carotid site
      - Bilaterally fixed and dilated pupils; and
      - Asystole determined in two (2) leads on an electrocardiograph in accordance with the American Heart Association guidelines, except in cases of trauma or when presented with a standard form or identification evidencing a patient’s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation).
   c. The Paramedic shall determine, in addition, that one (1) or more of the following factors or conditions exist:
      - Lividity of any degree
      - Rigor mortis of any degree (In the non-hypothermic patient)
      - The presence of venous pooling in the body
      - Damage or destruction of the body which is incompatible with life, or
      - A standard form or identification evidencing a patient’s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation).
      - Appropriate Kentucky MOST Form
Determination of Death - Discontinuance of Resuscitation by a Paramedic continued

3. The Paramedic shall contact the on duty MEDICAL CONTROL, for advice and assistance prior to making the determination. MEDICAL CONTROL approval must be obtained prior to the discontinuance of resuscitative efforts.

4. The Paramedic shall document all items required on the Kentucky EMS run report including, the usual patient assessment, medical history and surrounding events information. It is especially important to note:
   - Body position and location when discovered, including differences from when last seen alive.
   - Patient condition when last seen alive.
   - Clothing and condition of clothing.
   - Condition of residence/business/location found.
   - Statements made on the scene by significant individuals.
   - Any unusual circumstances.

IT IS TO BE EXPRESSLY UNDERSTOOD THAT IN THE EVENT OF ANY UNCERTAINTY AS TO THE PATIENT STATUS, THE CREW IS TO INITIATE NORMAL RESUSCITATIVE EFFORTS
Kentucky Emergency Medical Services
Do Not Resuscitate (DNR) Order

Person’s Full Legal Name _______________________________________________________________

Surrogate’s Full Legal Name (if applicable) _______________________________________________

I, the undersigned person or surrogate who has been designated to make health care decisions in accordance with Kentucky Revised Statutes, hereby direct that in the event of my cardiac or respiratory arrest that this DO NOT RESUSCITATE (DNR) ORDER be honored. I understand that DNR means that if my heart stops beating or if I stop breathing, no medical procedure to restart breathing or heart function, more specifically the insertion of a tube into the lungs, or electrical shocking of the heart or cardiopulmonary resuscitation (CPR) will be started by emergency medical services (EMS) personnel.

I understand this decision will not prevent emergency medical services personnel from providing other medical care.

I understand that I may revoke this DNR order at any time by destroying this form, removing the DNR bracelet, or by telling the EMS personnel that I want to be resuscitated. Any attempt to alter or change the content, names, or signatures on the EMS DNR form shall make the DNR form invalid.

I understand that this form, or a standard EMS DNR bracelet must be available and must be shown to EMS personnel as soon as they arrive. If the form or bracelet is not provided, the EMS personnel will follow their normal protocols which could include cardiopulmonary resuscitation (CPR) or other resuscitation procedures. I understand that should I die, EMS personnel will require this form and/or bracelet for their records.

I give permission for information about this EMS DNR Order to be given to the prehospital emergency medical care personnel, physicians, nurses, or other health care personnel as necessary to implement this directive.

I hereby state that this ‘Do Not Resuscitate (DNR) Order’ is my authentic wish not to be resuscitated.

Person/Legal Surrogate Signature ______________________________________________________ Date ________________________________

Subscribed and sworn to before me by ___________________________________________ to be his/her own free act and deed, this ______ day of ________________, 20________.  

________________________________________________________________________, Notary Public

My commission expires: ________________________________

In lieu of having this Form notarized, it may be witnessed by two persons not related to the individual noted above.

WITNESSED BY:
1. __________________________________________
2. __________________________________________

This EMS Do Not Resuscitate Form was approved by the Kentucky Board of Medical Licensure at their March 1995 meeting.

I certify that an EMS Do Not Resuscitate (DNR) form has been executed.

Person’s Name (print or type) _______________________________________________________

Person’s or Legal Surrogate’s Signature ______________________________________________
INSTRUCTIONS

PURPOSE

This standardized EMS DNR Order has been developed and approved by the Kentucky Board of Medical Licensure, in consultation with the Cabinet for Human Resources. It is in compliance with KRS Chapter 311 as amended by Senate Bill 311 passed by the 1994 General Assembly, which directs the Kentucky Board of Medical Licensure to develop a standard form to authorize EMS providers to honor advance directives to withhold or terminate care.

For covered persons in cardiac or respiratory arrest, resuscitative measures to be withheld include external chest compressions, intubation, defibrillation, administration of cardiac medications and artificial respiration. The EMS DNR Order does not affect the provision of other emergency medical care, including oxygen administration, suctioning, control of bleeding, administration of analgesics and comfort care.

APPLICABILITY

This EMS DNR Order applies only to resuscitation attempts by health care providers in the prehospital setting (i.e., certified EMT-First Responders, Emergency Medical Technicians, and Paramedics) — in patients' homes, in a long-term care facility, during transport to or from a health care facility, or in other locations outside acute care hospitals.

INSTRUCTIONS

Any adult person may execute an EMS DNR Order. The person for whom the Order is executed shall sign and date the Order and may either have the Order notarized by a Kentucky Notary Public or have their signature witnessed by two persons not related to them. The executor of the Order must also place their printed or typed name in the designated area and their signature on the EMS DNR Order bracelet insert found at the bottom of the EMS DNR Order form. The bracelet insert shall be detached and placed in a hospital type bracelet and placed on the wrist or ankle of the executor of the Order.

If the person for whom the EMS DNR Order is contemplated is unable to give informed consent, or is a minor, the person's legal surrogate shall sign and date the Order and may either have the form notarized by a Kentucky Notary Public or have their signature witnessed by two persons not related to the person for which the form is being executed or related to the legal health care surrogate. The legal health care surrogate shall also complete the required information on the EMS DNR bracelet insert found at the bottom of the EMS DNR Order form. The bracelet shall be detached and placed in a hospital type bracelet and placed on the wrist or ankle of the person for which this Order was executed.

The original, completed EMS DNR Order or the EMS DNR Bracelet must be readily available to EMS personnel in order for the EMS DNR Order to be honored. Resuscitation attempts may be initiated until the form or bracelet is presented and the identity of the patient is confirmed by the EMS personnel. It is recommended that the EMS DNR Order be displayed in a prominent place close to the patient and/or the bracelet be on the patient's wrist or ankle.

REVOCATION

An EMS DNR Order may be revoked at any time orally or by performing an act such as burning, tearing, canceling, obliterating or by destroying the order by the person on whose behalf it was executed or by the person's legal health care surrogate.

IT SHOULD BE UNDERSTOOD BY THE PERSON EXECUTING THIS EMS DNR ORDER OR THEIR LEGAL HEALTH CARE SURROGATE, THAT SHOULD THE PERSON LISTED ON THE EMS DNR ORDER DIE WHILE EMS PREHOSPITAL PERSONNEL ARE IN ATTENDANCE, THE EMS DNR ORDER OR EMS DNR BRACELET MUST BE GIVEN TO THE EMS PREHOSPITAL PERSONNEL FOR THEIR RECORDS.
**Trauma Triage**

**Purpose**

Victims of major trauma have better outcomes when transported to a designated trauma center in a timely manner. The American College of Surgeons (ACS) has developed triage criteria that is useful in identifying patients that may benefit from evaluation at a trauma center.

In general, consider the following guidelines:

It is in the best interest of the patient to be transported to a designated trauma center if the patient meets ACS criteria and a designated trauma center is within thirty minutes transport time.

Patients with a compromised airway may be best served by transport to the closest hospital with rapid transfer to a trauma center.

Consider air medical resources but do not delay transport unnecessarily. (See Helicopter Criteria for Scene Transport).
**Trauma Triage Criteria Algorithm**

**American College of Surgeons Trauma Triage Criteria**

**Step One**

- Glasgow Coma Scale $\geq$ 14 or $<14$
- Systolic blood pressure $\geq$ 90 or $<90$
- Respiratory rate $\geq$ 10 or $>29$
- Revised Trauma Score (see Table 2) $<11$

**YES**

Take to trauma center; alert trauma team. Steps 1 and 2 attempt to identify the most seriously injured patients in the field. In a trauma system, these patients would preferentially be transported to the highest level of care within the system.

**NO**

Assess anatomy of injury.

**Step Two**

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
- Flail chest
- Combination trauma with burns
- Two or more proximal long-bone fractures
- Pelvic fractures
- Open and depressed skull fracture
- Paralysis
- Amputation proximal to wrist and ankle
- Major burns (see Chapter 14: Guidelines for the Operation of Burn Units)

**YES**

Take to trauma center; alert trauma team. Steps 1 and 2 attempt to identify the most seriously injured patients in the field. In a trauma system, these patients would preferentially be transported to the highest level of care within the system.

**NO**

Evaluate for evidence of mechanism of injury and high-energy impact.

**Step Three**

- Ejection from automobile
- Falls $>20$ feet
- High-speed auto crash
  - Initial speed $>40$ mph
  - Major auto deformity $>20$ inches
  - Intrusion into passenger compartment $>12$ inches
- Auto-pedestrian/auto-bicycle injury with significant ($>5$ mph) impact.
- Pedestrian thrown or run over.
- Motorcycle crash $>20$ mph or with separation of rider from bike.

**YES**

Contact medical direction and consider transport to a trauma center. Consider trauma team alert.

**NO**

**Step Four**

- Age $<5$ or $>65$
- Cardiac disease, respiratory disease
- Insulin-dependent diabetes, cirrhosis, or morbid obesity
- Pregnancy
- Immunocompromised patients
- Patients with bleeding disorder or patient on anticoagulants.

**YES**

Contact medical direction and consider transport to trauma center. Consider trauma team alert.

**NO**

Reevaluate with medical direction.

**WHEN IN DOUBT, TAKE TO A TRAUMA CENTER.**
Verified Trauma Centers in or near Kentucky

<table>
<thead>
<tr>
<th>Trauma Facility</th>
<th>Level</th>
<th>State</th>
<th>City</th>
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<tbody>
<tr>
<td>Deaconness Hospital</td>
<td>II</td>
<td>IN</td>
<td>Evansville</td>
</tr>
<tr>
<td>Taylor Regional Hospital</td>
<td>III</td>
<td>KY</td>
<td>Campbellsville</td>
</tr>
<tr>
<td>University of Kentucky Hospital</td>
<td>I</td>
<td>KY</td>
<td>Lexington</td>
</tr>
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<td>University of Louisville Hospital</td>
<td>I</td>
<td>KY</td>
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</tr>
<tr>
<td>St. Francis Medical Center</td>
<td>III</td>
<td>MO</td>
<td>Cape Girardeau</td>
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<tr>
<td>The University Hospital</td>
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<td>OH</td>
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<tr>
<td>Cabell Huntington Hospital</td>
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<td>WV</td>
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Landing Zone and Safety. Without exception, safety is air medical service’s top priority.

Requesting a helicopter

- Private Citizens - call 9-1-1.
- Police, fire and EMS - Request a helicopter through the appropriate agency, such as your dispatch center, with the following information:
  - Location cross street
  - Location LAT/LONG coordinates
  - Any prominent features at the scene
  - Notify all involved communications centers if any other air medical service has been contacted and the status of that agency. Always inform all communications centers if other aircraft are anticipated to be in the area.
  - Your call-back number
  - Scene radio frequency and CTCSS tone
  - Call sign of LZ (Landing Zone) Command. One person should be designated to coordinate LZ setup and communicate with responding aircraft. This person should not be involved with patient care.
  - Weather, including low ceilings, poor visibility, icing, and high winds
  - Patient status, such as number, condition, age, approximate patient weight, mechanism of injury, and hazards
  - LZ details. The preferred landing zone is 100 x 100 feet.
  - ALWAYS RELAY ANY INFORMATION PERTAINING TO HAZMAT TO THE COMMUNICATIONS CENTER WHEN REQUESTING AIR MEDICAL SERVICE.

Important Tips

- Never approach the aircraft until instructed to do so and only as instructed by the pilot or flight crew aboard
- Approach angles over obstacles should be less than 20 degrees
- Always keep LZ clear of people and other potential hazards
- Under no circumstances should you ever approach the aircraft from the rear
Landing Zone Setup

▶ Set up the LZ as follows:
  ♦ SIZE should be 100 feet by 100 feet
  ♦ LEVEL: Select a LZ as level as possible (minimal slope)
  ♦ LANDING SURFACE: Select a hard surface, grassy surface, or hard-packed snow. Avoid loose dirt, dust, or powder snow.
  ♦ CLEAR OVERHEAD free of obstructions such as wires, antennas, or poles
  ♦ CLEAR AREA free of debris, large rocks, posts, stumps, vehicles, people, animals, and other hazards
  ♦ MARK THE AREA clearly using five weighted cones or beacons, one at each corner of the LZ and one on the side that wind is coming from
  ♦ SELECT AN ALTERNATE LZ. Plan for an alternate LZ because the pilot may determine your LZ to be unsafe.
  ♦ HAZMAT: Always relay any information pertaining to HAZMAT to the communications center when requesting air medical service. Always inform the pilot and medical crew of HAZMAT. When selecting a LZ find a site at least 1/4 to 1 mile UPWIND from the incident depending on the type and materials involved. Avoid low areas where vapors may collect. The patient must be removed from the hot zone. All patients must be decontaminated PRIOR to flight.

When the helicopter is overhead

▶ Air medical service will establish radio contact on the assigned frequency with LZ Command three to five minutes out. Describe the following:
  ♦ LZ location
  ♦ Lighting
  ♦ Hazards
  ♦ Overhead wires, including wires along the approach path to the LZ
  ♦ Obstructions
  ♦ Slope
  ♦ Surface conditions
  ♦ Wind direction and speed if known
  ♦ Maintain radio contact at all times until the helicopter has landed, loaded, and departed the area.
Night Landing Zone

- **DO NOT SHINE LIGHTS DIRECTLY AT THE HELICOPTER**
- Set up night landing zones with five strobes or other secured lights. Do not use cones, flares, or tape to mark the site.
- Emergency vehicles may be parked so their headlights intersect the middle of the landing site and/or parked underneath wires to mark them. Turn strobes of emergency vehicles off as the aircraft approaches.
- Lights may be shown onto poles indicating wires between the poles
- Night landing zones always require good communications, lighting, and alertness
- Turn off all emergency lights after aircraft has started approach
- One strobe should be on the side that the wind is coming from
- If no strobes are available mark with other lighting systems
- If no other portable lights are available, cross headlight beams into the wind at the center of the landing zone
Helicopter Utilization Criteria for Scene Response

Purpose:

Air Medical Services (AMS) are a valuable, yet limited resource. It is important that Emergency Medical Service personnel utilize consistent and appropriate criteria when requesting an air medical service for assistance with patient care and transport. The following represents a combination of the current criteria in use throughout the state. These criteria are consistent with national AMS utilization criteria. It is important that review of appropriate helicopter utilization be a part of EMS training, as well as a component of the agency and regional level retrospective quality assurance process.

Criteria:

1. The helicopter is an air ambulance and an essential part of the EMS system. It may be considered in situations wherein:
   ✷ The use of the helicopter would speed a patient's arrival to the hospital capable of providing definitive care and this is felt to be significant to the patient's condition, or;
   ✷ If specialized services offered by the air medical service would benefit the patient prior to arrival at the hospital.

2. The following criteria should be used when considering use of an air medical service:
   ✷ The patient's condition is a "life or limb" threatening situation demanding intensive multidisciplinary treatment and care. This may include but not be limited to:
     ✷ Patients with physical findings defined in the adult and pediatric major trauma protocols (see attached)
     ✷ Critical burn patients (see attached)
     ✷ Critically ill medical patients requiring care at a specialized center to include, but not be limited to: acute stroke or ST elevation MI.
     ✷ Patients in cardiac arrest who are not hypothermic should be excluded from these criteria

3. Dispatch, Police, Fire or EMS will evaluate the situation/condition and if necessary, may place the helicopter on standby.
4. The helicopter may be requested to respond to the scene when:
   • ALS personnel request the helicopter.
   • BLS personnel request the helicopter, when ALS is delayed or unavailable.
   • In the absence of an EMS agency, any emergency service may request the helicopter, if it is felt to be medically necessary.

5. When EMS arrive, they should assess the situation. If the MOST HIGHLY TRAINED EMS PERSONNEL ON THE SCENE determine, that the helicopter is not needed, it should be cancelled as soon as possible.

6. When use of air medical services is not specifically defined by the protocol, the on scene EMS provider should establish communication with medical control to discuss the situation with the on line physician.

7. Air medical services may be considered in situations where the patient is inaccessible by other means or, if utilization of existing ground transport services threatens to overwhelm the local EMS system.

8. The destination facility will be determined by the AMS crew based upon medical appropriateness with consideration for patient preference and on line medical direction, in compliance with regional protocols.

9. An EMS service should not wait on the scene or delay transport waiting for the helicopter to arrive. If the patient is packaged and ready for transport, the EMS service should initiate transport to the hospital and reassign the landing zone. The helicopter may intercept with an ambulance during transport at an alternate-landing site.

**THIS IS A GUIDELINE AND IS NOT INTENDED TO SPECIFICALLY DEFINE EVERY CONDITION IN WHICH AIR MEDICAL SERVICES SHOULD BE REQUESTED. GOOD CLINICAL JUDGEMENT SHOULD BE USED AT ALL TIMES.**

**Transfer of Patient Care, Documentation and Quality Assurance:**

1. As with other instances where care of a patient is transferred, it is expected that all patient related information, assessment findings and treatment will be communicated to the flight crew.

2. At the completion of the EMS call, all of the details of the response, including, but not limited to all patient related information, assessment findings and treatment must be documented.

3. As with all EMS responses, helicopter utilization, the treatment and transportation of patients will be reviewed as a part of a Quality Assurance process.
Guidelines for Helicopter Utilization Criteria for Scene Response

ADULT MAJOR TRAUMA

1. GCS less than or equal to 13
2. Respiratory Rate less than 10 or more than 29 breaths per minute
3. Pulse rate is less than 50 or more than 120 beats per minute
4. Systolic blood pressure is less than 90mmHg
5. Penetrating injuries to head, neck, torso or proximal extremities
6. Two or more suspected proximal long bone fractures
7. Suspected flail chest
8. Suspected spinal cord injury or limb paralysis
9. Amputation (except digits)
10. Suspected pelvic fracture
11. Open or depressed skull fracture

PEDIATRIC MAJOR TRAUMA

1. Pulse greater than normal range for patient's age
2. Systolic blood pressure below normal range
3. Respiratory status inadequate (central cyanosis, respiratory rate low for the child's age, capillary refill time greater than two seconds)
4. Glasgow coma scale less than 14
5. Penetrating injuries of the trunk, head, neck, chest, abdomen or groin
6. Two or more proximal long bone fractures
7. Flail chest
8. Combined system trauma that involves two or more body systems, injuries or major blunt trauma to the chest or abdomen
9. Spinal cord injury or limb paralysis
10. Amputation (except digits)

CRITICAL BURNS

1. Greater than 20% Body Surface Area (BSA) second or third degree burns
2. Evidence of airway/facial burns
3. Circumferential extremity burns

**Note that for patients with burns and coexisting trauma, the traumatic injury should be considered the first priority and the patient should be triaged to the closest appropriate trauma center for initial stabilization.**
CRITICAL MEDICAL CONDITIONS

1. Suspected Acute Stroke
   • Positive Cincinnati Pre-hospital Stroke Scale
   • Total prehospital time (time from when the patient's symptoms and/or signs first began to when the patient is expected to arrive at the Stroke Center) is less than two (2) hours.

2. Suspected Acute Myocardial Infarction
   • Chest pain, Shortness of breath or other symptoms typical of a cardiac event
   • EKG findings of
     o ST elevation 1mm or more in 2 or more contiguous leads OR
     o LBBB (QRS duration >.12msec and Q wave in V1 or V2
Abuse and Neglect – Child, Elder or other Vulnerable Individuals

To provide the process for identification, assessment, management and reporting of patients with suspected physical abuse (children, elderly, or other vulnerable individuals), exploitation, and/or neglect.

PROCEDURE FOR ASSESSMENT

► Treat and document only physical injuries requiring immediate attention using the appropriate medical treatment protocol, without causing undue emotional trauma for non-life-threatening injuries.
► Secure and bag (in paper), whenever possible, any clothing or items that could be preserved for evidence.
► Interview with patient shall be conducted calmly, with respect and privacy, and should include close observation for
  • Over-sedation
  • Inappropriate fears
  • Avoidance behaviors
  • Poor parent-child bonding
  • Inappropriate interaction with caregiver
► Do not address specifics of abuse or neglect.
► Obtain pertinent history relating to presenting injuries.
► Carefully and specifically, document verbatim any patient statements of instances of rough handling, sexual abuse, alcohol/drug abuse, verbal or emotional abuse, isolation or confinement, misuse of property, threats, and gross neglect such as restriction of fluids, food, or hygiene.
► Note problems with living conditions and environment.
► Note any of the following potential indicators of an abusive history or environment
  • Unsolicited history provided by the patient
  • Delay in seeking care for injury
  • Injury inconsistent with history provided
  • Conflicting reports of injury from patient and care-giver
  • Patient unable, or unwilling, to describe mechanism of injury
  • Lacerations, bruises, ecchymosis in various stages of healing
  • Multiple fractures in various stages of healing
  • Scald burns with demarcated immersion lines without splash marks
  • Scald burns involving anterior or posterior half of extremity
  • Scald burns involving buttocks or genitalia
  • Cigarette burns
  • Rope burns or marks
  • Patient confined to restricted space or position
  • Pregnancy or presence of sexually transmitted disease in a child less than 12 years
Abuse and Neglect – Child, Elder or other Vulnerable Individuals continued

SPECIAL CONSIDERATIONS

► Law enforcement may be contacted at the discretion of the EMS provider, however assure the safety of EMS personnel before entering the scene.
► If patient is not transported, the suspected abuse must still be reported. If a parent/guardian refuses treatment of a minor child whom you feel needs medical attention, contact law enforcement immediately.
► Careful and specific documentation is vital because the “story” often changes as the investigation proceeds.
► Minors do not need parental consent for treatment of sexually transmitted diseases (KRS 214.185).
► A minor 12 years of age or older may voluntarily submit himself to treatment for drug dependency as defined in KRS 214.185.
► Child Abuse: You must make a verbal report. Informing hospital personnel does not fulfill your legal reporting responsibilities.
► Child Abuse/Elder Abuse: KRS 620.030, if you have reason to believe a child/elder is being abused or neglected, you are obligated to report it. Call 1-800-752-6200: Department of Community Based Services or local law enforcement. (KRS 620.030/KRS 209.030).
**Crime Scene/Preservation of Evidence**

If you believe a crime has been committed, contact law enforcement immediately. Protect yourself and other EMS personnel. You will not be held liable for failing to act if a scene is not safe to enter. Initiate patient contact and medical care only after law enforcement has deemed the scene is safe.

► Do not touch or move anything at a crime scene unless it is necessary to do so for patient care.
► Have all EMS providers use the same path of entry and exit.
► Do not walk through fluids on the floor.
► Observe and document original location of items moved by crew.
► When removing patient clothing, leave intact as much as possible.
► Do not cut through clothing holes made by gunshot or stabbing.
► If you remove any items from the scene, such as an impaled object or medication bottle, document your action and advise investigating officers.
► Do not sacrifice patient care to preserve evidence.
► Consider requesting a law enforcement officer to accompany the patient in the ambulance to the hospital.
► Document statements made by the patient or bystanders on the EMS patient care report.
► Inform staff at the receiving hospital this is a “crime scene” patient.
► If the patient is obviously dead, contact medical control for directions to withhold resuscitative measures and do not touch the body.
► For traffic accidents, preserve the scene by parking away from skid marks and debris.
Sexual Assault

It is of the utmost importance that the sexual assault survivor feel acceptance and support regardless of his/her emotional response.

Do not evaluate or pass judgment on the credibility of the circumstances of the assault.

► Routine Patient Care.
► Identify yourself to the patient and assure them that they are safe and in no further danger.
► Contact law enforcement if they have not been notified.
► If no life-threatening situation is present, prehospital care may require waiting for police to secure the scene which is a potential crime scene.
► Try to attend to maintenance of forensic evidence. Try not to cut through tears or stains in clothing. Do not cleanse any skin area more than necessary, to provide immediate care.
► Advise the patient not to eat, drink, smoke, bathe, change clothing or go to the bathroom if at all possible to preserve any forensic evidence. If they must urinate, request that they do not wipe.
► If the patient changed clothes after the attack, each piece of clothing should be separately bagged in a PAPER BAG and brought to the hospital with the patient.
► If possible, suggest the victim take other clothing to be worn home.
► When transporting the patient, it is preferable whenever possible, to have a same sex provider as the primary provider. If the assault is a same sex assault, a provider of the opposite sex may be preferable to the patient.
► For privacy and confidentiality, minimize radio communication and consider land line communication to hospital.
► IF possible, transport to a facility that has the capability of performing a SEXUAL ASSAULT FORENSIC EXAMINATION.
Restraint Protocol - Prehospital

PURPOSE

On occasion, EMS personnel must render care to patients who are either a danger to themselves or to others. Physical restraint devices for such patients are intended to minimize the risk of bodily harm both to the patient and to EMS personnel caring for the patient. The intent of this protocol is to establish consistent guidelines among EMS personnel for the safe use of patient physical restraint devices in the field.

DEFINITION

Physical restraints are restrictive devices which are intended to promote EMS personnel and patient safety by preventing the movement of a patient’s limbs and/or body.

RERAINT DEVICES

A. Soft (cloth) restraints: The primary physical restraint device used in the prehospital setting.
B. Gurney straps (Velcro, Buckle): may also be used to supplement the soft restraints.
C. Cravats may be used if soft restraints are not available.
D. Metal handcuffs: EMS personnel shall not apply handcuffs. They shall be limited to situations where the patient is exceptionally combative and assistance is not readily available for placement of soft restraints AND police personnel are involved in the run. If handcuffs are in use, the police officer shall transport in the ambulance along with the EMS personnel and shall be given deference in the use of handcuff devices.
E. Leather restraints: Shall be limited to patients that cannot be restrained by other means. If leather restraint is locked, the restraint key shall always be in the possession of the EMS personnel who is monitoring the patient during transport.
F. Chest restraints: Consisting of gurney straps and/or rolled sheet (five-point) shall be used for exceptionally combative patient as needed. The chest restraint shall never interfere with adequate ventilatory motion of chest wall muscles and diaphragm.
G. NOT AUTHORIZED: Any use of any restraint type not authorized by this policy is prohibited. Examples of unauthorized restraint types include: chemical restraints not specifically authorized by the Board, tape, rope, or other binding materials or physical choke holds.
GENERAL POLICY

Restraints are to be used only when necessary in situations where the patient is violent or potentially violent and may be a danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of a medical condition such as but not limited to:

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<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Shock</td>
<td>Drug/alcohol intoxication</td>
<td>Toxicological ingestion</td>
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<tr>
<td>Hypertension</td>
<td>Seizure</td>
<td>Electrolyte imbalance</td>
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<td>Myocardial ischemia/infarction</td>
<td>Dysrhythmias</td>
<td>Hypoxia</td>
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<td>Stroke</td>
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<td>Hypoglycemia</td>
<td>Head trauma</td>
<td>Agitated Delirium</td>
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<td>Pulmonary embolism</td>
<td>Metabolic disorders</td>
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Protocol

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

2. The least restrictive means shall be employed.

3. Verbal de-escalation
   a. Validate the patient's feelings by verbalizing the behaviors the patient is exhibiting and attempt to help the patient recognize these behaviors as threatening.
   b. Openly communicate, explaining everything that has occurred, everything that will occur, and why the imminent actions are required.
   c. Respect the patient's personal space (i.e. asking permission to touch the patient, take pulse, examine patient, etc.).
EMS personnel shall use an escalating scale of restraint options whereby the level of verbal or physical containment is appropriate to the patient’s presenting situation.

4. Assistance is Readily Available to EMS Personnel for Patient Restraint:
   a. Cooperative patient with mildly impaired judgment: Verbal Containment; may or may not use soft restraints.
   b. Aggressively uncooperative patient with severely impaired judgment: Soft restraints applied to all extremities (four point restraint). A chest (five point restraint) may be used only if the patient is exceptionally combative.

5. Assistance Is not Readily Available to EMS Personnel for Patient Restraint:
   a. Cooperative patient with mildly impaired judgment: Soft restraints applied to all four extremities (four point restraint).
   b. Aggressively uncooperative patient with severely impaired judgment: Temporary application of cravats, only if other restraint devices are not readily available. Soft restraints shall always be applied when assistance is available and the patient situation is controlled either in the prehospital setting or the receiving hospital setting. Leather restraints shall always be removed after arrival at the receiving hospital when additional personnel is available.

EMS personnel shall first try to restrain patients in the lateral position. The supine position is permitted if EMS personnel are unable to safely place the patient in the lateral position due to their combativeness. The applied restraints shall be attached to the gurney frame. EMS personnel shall frequently assess the patient to ensure that the restrained patient’s airway is patent, distal limb circulation is adequate, and that restraints can be released quickly should the patient require cardiopulmonary resuscitation. Airway and suction equipment shall always be available for the restrained patient. EMS personnel shall never leave the restrained patient unattended.

**IT IS NEVER OK TO TRANSPORT A PATIENT IN A PRONE POSITION OR HOBBL ED.** If a patient has been restrained by police in a prone position this patient must be turned to a supine position for transport.

If a combative patient aggressively breaks away (escapes) from EMS personnel, the patient shall not be pursued unless there is adequate assistance from the appropriate public safety agency to secure the scene and assure safety.
Restraint Protocol - Prehospital continued

EMS personnel shall always seek assistance from the appropriate public safety agency to assist with securing the scene. Restraint placement should be managed by police personnel whenever possible. EMS personnel must remain on the scene and available to assist the officer and to assess the patient once the restraints are applied. If the police declare that the scene is not safe, EMS personnel may retreat to safety until the police are able to make the scene safe.

All EMS personnel shall receive training by their individual employer in the use of any restraint devices listed in this guideline that they utilize.

In the event that a patient is spitting or biting, place the patient on a non-rebreather mask with high flow oxygen flowing to the mask unless medically contraindicated. Monitor the patient’s airway continuously while the mask is on the patient.

Physical Restraints

1. All restraints should be easily removable by EMS personnel.

2. Restraints applied by law enforcement (i.e. handcuffs) require law enforcement officer to remain available to adjust restraints as necessary for the patient’s safety. The policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.

3. Restrained extremities should be monitored for color, nerve, and motor function, pulse quality and capillary refill at the time of application and at least every 15 minutes.

NOTE: The patient needs to be assessed and monitored as you would any other medical patient. Keep in mind that there is likely a medical reason that this person is out of control.
Documentation of Restraints

1. Patient restraint shall be documented on the run sheet and address any or all the following appropriate criteria:

   a. That an emergency existed and the need for treatment was explained to the patient.
   b. That the patient refused treatment or was unable to consent to treatment (such as unconscious patient).
   c. Evidence of the patient's lack of decision-making capacity.
   d. Failure of less restrictive methods of restraint (if conscious, failure of verbal attempts to convince the patient to consent to treat).
   e. Assistance of law enforcement officials with restraints, or orders from medical control to restrain the patient, or any exigent circumstances requiring immediate action, or adherence to system restraint protocols.
   f. That the treatment and/or restraints were for the patient's benefit and safety.
   g. The type of restraint employed (soft, leather, mechanical).
   h. Any injuries that occurred during or after the restraint.
   i. The limbs restrained ("four points").
   j. Position in which the patient was restrained.
   k. Circulation checks every 15 minutes or less (document findings and time).

2. The behavior and/or mental status of the patient before and after the restraint.
CAUTION: OVERSTEPPING THE BOUNDRIES OF RESTRAINT MAY BE PERCEIVED AS BATTERY, ASSAULT, CIVIL RIGHTS VIOLATION OR FALSE IMPRISONMENT.

This is a controversial and dangerous area within the law. Each individual service utilizing this protocol should consult appropriate legal consultation.

**KRS 503.110 Use of force by person with responsibility for care, discipline, or safety of others.**

1. The use of physical force by a defendant upon another person is justifiable when the defendant is a person responsible for the operation of or the maintenance of order in a vehicle or other carrier of passengers and the defendant believes that such force is necessary to prevent interference with its operation or to maintain order in the vehicle or other carrier, except that deadly physical force may be used only when the defendant believes it necessary to prevent death or serious physical injury.

2. The use of physical force by a defendant upon another person is justifiable when the defendant is a doctor or other therapist or a person assisting him at his direction, and:

   a. The force is used for the purpose of administering a recognized form of treatment which the defendant believes to be adapted to promoting the physical or mental health of the patient; and

   b. The treatment is administered with the consent of the patient or, if the patient is a minor or a mentally disabled person, with the consent of the parent, guardian, or other person legally competent to consent in his behalf, or the treatment is administered in an emergency when the defendant believes that no one competent to consent can be consulted and that a reasonable person, wishing to safeguard the welfare of the patient, would consent.
Patient Transport

An ill or injured child must be restrained directly to the cot in a manner that prevents ramping or sliding in a collision.
► A belt/strap looped over each shoulder and attached to a non-sliding cot member.
► A soft, sliding, or breakaway connector holding the shoulder straps together on chest.
► Belt/strap anchored to non-sliding cot member and routed over thighs, not around waist.

Note: Standard belt systems do not adequately secure child to the cot during a crash.

Ill or injured child/infant (5 to 80 lbs) who can tolerate a semi-upright position may be secured using a child passenger safety seat.
► Use a convertible child safety seat that has a front and rear belt path.
► Position safety seat on cot facing the foot-end with backrest fully elevated.
► Consider removing mattress.
► Secure safety seat with 2 pairs of belts in both the forward & rear positions.
► Place the shoulder straps of the harness through slots just below child’s shoulders.
► For infants, place rolled towels on sides of child to maintain centered position.

Note: Non-convertible safety seats cannot be secured properly to the cot.

For infants who cannot tolerate a semi-upright position or who must lie flat:
► Use car bed, if available, that can be secured against both rearward and forward motion.
► Position car bed across cot so child lies perpendicular to cot.
► Fully raise cot’s backrest and anchor car bed to cot with 2 belts.
► Fasten car bed harness snugly to infant.
Use of Child Passenger Safety Seat after Involvement in Motor Vehicle Crash

Child safety seats may be used after involvement in a minor crash. All of the following must apply to be considered a minor crash.

► Visual inspection including inspection under movable seat padding does not reveal any cracks or deformation.
► The vehicle in which the child safety seat was installed was capable of being driven from the scene of the crash.
► The vehicle door nearest the child safety seat was undamaged.
► There were no injuries to any of the vehicle occupants.
► The air bags (if any) did not deploy.
Safe Infants Act - Safe Infants Protocol for Prehospital Providers

Any parent or person acting on behalf of the parent may come to a police station, firehouse, EMS station, or hospital unannounced and leave a newborn infant. When this event occurs, the police officer, firefighter, EMS worker, or hospital worker **SHALL** accept the infant. This situation must meet the following criteria.

1. The newborn infant must be medically determined to be less than 72 hours old.
2. The newborn infant cannot have indicators of child abuse, maltreatment, or neglect after birth.

► Perform a primary and secondary survey of the infant and initiate any necessary procedure to protect the child’s health and safety. Keep the newborn warm especially the head.
► Consider rapid glucose determination.
► Kentucky law requires that any care provider who suspects child abuse, neglect, or maltreatment SHALL report it. You should call the Department for Community Based Services (DCBS) hotline at 1-800-752-6200 to make your report. You have no authority to detain, follow or pursue the parent.
► Summon EMS for transport of the infant.
► Notify your supervisor and follow any policies and procedures your agency has implemented.
► Retrieve and open an “Abandoned Infant Pack”. Complete the enclosed checklist.
► Place the numbered band around the ankle of the infant.
► Ensure that the band’s stub remains attached to the Medical Information Form and copy the stub number directly onto the Medical Information Form.
► You will offer the parent information regarding medical needs of the mother who is post partum, a written explanation of the parent’s legal rights, and services available to the parent, which have been provided in the packet.
► Newborn infants should be transported in an age appropriate car seat if available. Otherwise, newborns should be transported using appropriate immobilization measures.
► Newborn infants may be fed with SIMILAC or ENFAMIL if a lengthy transport time is anticipated. Newborns normally eat 2-2.5 ounces of formula at feeding. Feeding is not advised for any infant that is experiencing any respiratory or circulatory abnormality.
Safe Infants Act - Safe Infants Protocol for Prehospital Providers

KRS211.951, 2216B.190, 311.6526, 405.075 and 620.355 is known as the Thomas J. Burch Safe Infants Act. The law provides a safe place for unwanted newborn babies. Parents may now leave an unwanted infant with any Kentucky EMS provider, police station, fire station or hospital without consequence. I hope that preventing any unwanted newborn from being left in a dangerous or deadly environment.
Safe Infants Act - How to Keep Yourself Healthy

You’ve Just Had a Baby! – “Copy and Provide to Mother”

You have made a courageous decision to leave your baby in the safe and good care of a hospital, police station, fire station or emergency medical services (EMS) provider. Your baby will be well taken care of and, eventually, be adopted into a safe, loving, permanent home. Now it’s time to make sure that you are healthy.

It’s a good idea to see a doctor or go to the health department for an examination. For information about your local health department, call (800) 462-6122.

*What is normal after you’ve just had a baby? It takes your body about three to six weeks to return to its pre-pregnant state. You may experience several normal changes to your body during the first few days and weeks after delivery.*

**Vaginal bleeding:** This is blood coming from the uterus. It is a sign that the uterus is healing. At first, it is like a heavy period. The bleeding will start out as bright red, change to pink, and then change to a clear or yellow discharge. You should stop bleeding after three weeks. There should never be large blood clots or a foul odor.

What to do: Use sanitary pads only (no tampons). Do not take tub baths until the bleeding stops. Call a doctor if the bleeding becomes bright red again, you pass large clots or there is a foul odor.

**Abdominal cramping:** This is a sign that the uterus is contracting back down to its normal size. These cramps are like mild menstrual cramps and will last a few days.

What to do: Take an over-the-counter pain reliever.

**Breast engorgement:** This means the breasts are becoming full and very sore, and it is a sign that the breasts are filling with milk. This happens around the third day after delivery. Your breasts will become swollen, firm, tender and warm to the touch. Severe breast engorgement should not last more than 36 hours.

What to do: Wear a good-fitting support bra at all times and remove it only for showers. Apply an ice pack to the breasts for 20 minutes, four times a day. Avoid things that will stimulate the breasts. Avoid heat and hot showers.

**Postpartum ‘blues’:** Most women feel depressed for one to two weeks after delivery. You may feel angry, sad, tired and unable to sleep or eat during this time. These feelings are brought on by the many changes that take place in your body and brain during and after delivery.
What to do: Know that this is normal and will go away. Find a family member or close friend to talk to about your feelings. Call a doctor if these feelings do not go away or if they intensify.

Call a doctor if you have any of these warning signs:

- Heavy, bright red vaginal bleeding
- Foul-smelling vaginal discharge
- Dizziness or fainting
- Fever above 100.4 degrees F
- Pain around your vaginal area that does not go away or gets worse
- Pain or burning when you empty your bladder
- Pain or swelling in your legs
- Red streaks or painful new lumps in your breasts
- Cramps that are more painful than normal menstrual cramps
- Nausea and vomiting
- Chest pain or cough
- Feeling so sad that you aren’t able to take care of yourself
- Feelings that you might hurt yourself

Do these things to take care of yourself after your delivery:

- Rest as much as you can. Your normal energy will return in a few weeks.
- Eat healthy foods. Drink six to eight glasses of water a day. If you have prenatal vitamins, continue to take one a day.
- Continue to wear a good-fitting bra for about three weeks.
- Change your pad every time you go the bathroom to prevent infection in the vaginal area. Wipe yourself from front to back every time you urinate or have a bowel movement. Wash your hands every time you change your pad or go to the bathroom.
- Do not take a tub bath for three weeks. Take showers only.
- Gradually resume your normal physical activity. Don’t lift anything over 10 pounds. Don’t drive a car for one week. Don’t climb stairs for one week (if you have to climb steps, climb one step at a time).
- Avoid sexual intercourse for at least six weeks after delivery. Do not have intercourse if you are still bleeding vaginally. It is possible to become pregnant before you start having periods again, so talk to a doctor about ways to prevent another pregnancy.
Safe Infants Act - How to Keep Yourself Healthy - continued

You’ve Just Had a Baby! – “Copy and Provide to Mother”

- Get a medical examination four to six weeks after delivery. Your doctor or health department will keep your records confidential to protect you against any invasion of personal privacy.

For information about:

- Family planning and contraception, call (800) 462-6122.
- Substance abuse counseling, call, toll free, (888) 729-8028.
- Domestic violence and abuse, call (800) 752-6200.

For information about health care specific to women, log onto: http://chfs.ky.gov/dph/ach/mch.htm

Important!

If you left your baby at a safe place and have decided that you want your baby back, contact the Kentucky Cabinet for Health and Family Services at (800) 752-6200. If you do not contact the Cabinet within 30 days after leaving your newborn, the Cabinet will proceed with termination of parental rights and place your baby for adoption.

A copy of this material may be obtained from the following Web site: http://chfs.ky.gov/dcbs/dpp/Child_Safety.htm

For more information about the Safe Infants Act, call (800) 752-6200
**Bloodborne/Airborne Pathogens**

**BLOODBORNE PATHOGENS**

Emergency Medical Services personnel should assume that all bodily fluids and tissues are potentially infectious with bloodborne pathogens including HIV (causing AIDS) and HBV (causing hepatitis), and must protect themselves accordingly by use of body substance isolation (BSI).

Body substance isolation procedures include the appropriate use of hand washing, protective barriers (such as gloves, masks, goggles, etc.), and care in the use and disposal of needles and other sharp instruments. EMTs are also encouraged to obtain the hepatitis B vaccine series to decrease the likelihood of hepatitis B transmission. EMTs who have exudative lesions, weeping dermatitis, or open wounds should refrain from all direct patient care and from handling patient-care equipment as they are at increased risk of transmission and reception of bloodborne pathogens through these lesions. Transmission of bloodborne pathogens has been shown to occur when the blood of the infected patient is able to come in direct contact with the blood of the health-care worker.

EMTs who have had a direct bloodborne pathogen exposure should immediately wash the exposed area with soap and water and a suitable disinfectant. The exposed area should then be covered with a sterile dressing. Upon arrival at the destination hospital, after responsibility for the patient has been transferred to the emergency department, the EMT should thoroughly cleanse the exposed site, complete a state of Kentucky Emergency Response/Public Safety Worker Incident Report Form, and sign in to the Emergency Department as a worker’s compensation patient. The only exception to this latter step is when the squad has a designated exposure officer and medical advisor wherein the exposed EMT has definitive and immediate medical care elsewhere.

**AIRBORNE PATHOGENS**

EMTs who believe they have been exposed to an airborne pathogen may proceed as above in getting timely medical care. It is expected that a properly filled out Patient Care Report will allow hospital infection control staff to contact EMTs involved in patient care where that patient was subsequently found to have a potential airborne pathogen such as Tuberculosis, Neisseria meningitis, SARS, etc.

**Airborne Personal Protective Equipment (APPE)**

- **Recommended APPE consists of a N95 respirator, prior fit testing is recommended.**
- **Apply APPE if the patient presents with the following signs or symptoms**
  - Cough
  - Fever
  - Rash
Bloodborne/Airborne Pathogens continued

► Limit the number of personnel in contact with suspected patients to reduce the potential of exposure to other providers and bystanders.
► Patients suspected of being infected with a possible airborne pathogen should be masked if tolerated.
► Patients requiring oxygen therapy should receive oxygen through a mask with a surgical mask placed over the oxygen mask to block pathogen release. Close monitoring of the patient’s respiratory status and effort should be maintained.
► APPE should be in place when performing suctioning, airway management and ventilation assistance (Bag-Valve-Mask) for suspect patients.
► Limit procedures that may result in the spread of the suspected pathogen, e.g. nebulizer treatments.
► Exchange of fresh air into the patient compartment is recommended during transport of patient with a suspected airborne pathogen.
► Early notification to the receiving hospital should be made such that the receiving hospital may enact its respective airborne pathogen procedures.

DECONTAMINATION

► In addition to accepted decontamination steps of cleaning surfaces and equipment with an approved solution and proper disposal of contaminated disposable equipment, the use of fresh air ventilation should be incorporated (open all doors and windows to allow fresh air after arrival at the hospital).
► All personnel in contact with the patient should wash their hands thoroughly with warm water and an approved hand-cleaning solution.
► Ambulances equipped with airborne pathogen filtration systems should be cleaned and maintained in accordance with manufacturer guidelines.
Adult Medical Protocols
Routine Patient Care Guidelines - Adult

All levels of provider will complete an initial & focused assessment on every patient, and as standing order, use necessary and appropriate skills and procedures for which the provider has been trained and certified or approved to perform in order to maintain the patient’s airway, breathing, and circulation.

Initial Assessment

Scene Size-Up
► Review dispatch information.
► Assess the scene for safety, mechanism of injury, number and location of patients.
► General impression of patient.
► Assess need for body substance isolation.
► Notify the receiving facility as early as possible.
► Request additional resources as needed: e.g. ALS intercepts, air medical transport, additional ambulances, extrication, hazardous materials team, etc.
► Use Incident Management/Command System (IM/CS) when possible.

Level of Consciousness
► Assess level of consciousness using the AVPU scale.
► Manually stabilize the patient’s cervical spine if trauma is involved or suspected.
► Apply and use AED and initiate cardiopulmonary resuscitation in accordance with current guidelines, as trained and credentialed, if indicated.

Airway
► Assess the patient for a patent airway.
► Open the airway using a head-tilt/chin-lift, or a jaw thrust if suspicious of cervical spine injury.
► Suction the airway as needed.
► Consider an oropharyngeal or nasopharyngeal airway.
► Consider advanced airway interventions as appropriate and if trained in use.

Breathing
► Assess patient’s breathing taking note of rate, rhythm, and quality of the respirations. Assess lung sounds.
► Look for nasal flaring or accessory muscle usage.
► Assess the chest for symmetrical chest rise, intercostal or supraclavicular retractions, instability, open pneumothorax, tension pneumothorax, or other signs of trauma.
► Treat foreign body airway obstruction in accordance with current guidelines.
**Routine Patient Care Guidelines – Adult continued**

- Assist ventilations when the respiratory rate is less than 10 per minute or greater than 40 for adults, or when the patient exhibits signs of impending respiratory failure.

**Circulation**
- Assess the patient’s pulse taking note of rate, rhythm, and quality.
- Look for and control any obvious gross bleeding.
- Assess patient’s skin color, temperature, and moisture.
- IV access and fluid resuscitation as appropriate for the patient’s condition per appropriate protocol. After IV is established, administer fluids to maintain systolic blood pressure >90 mmHg. Routes of medication administration when written as “IV” can also include “IO”.

**Disability**
- Movement of extremities.
- Facial asymmetry.
- Speech.

**Expose**
- Expose and examine head, neck, chest, abdomen, pelvis and back.

**Secondary Assessment**

**Head-to-toe Survey**

**Neurological Assessment**
- Glasgow Coma Score.

**Assess Vital Signs**
- Respiration.
- Pulse.
- Blood pressure.
- Capillary refill.
- Skin condition.
  - Color.
  - Temperature.
  - Moisture.
- Lung sounds.

**Obtain Medical History**
- Symptoms.
- Allergies.
- Medication.
- Past Medical History.
- Last Oral Intake.
- Events leading to Illness or Injury.

**Other Assessment Techniques**
- Cardiac Monitoring.
- Pulse oximetry.
- Glucose determination.
- Temperature.
- End-tidal CO₂.
Acute Coronary Syndromes - Adult

Basic Standing Orders

► Routine Patient Care
► Oxygen should be withheld in ACS patients with normal oxygen saturation. Oxygen by non-rebreather mask or by nasal cannula to maintain oxyhemoglobin levels of 94%
► Aspirin 324 mg PO (chewable) If patient states they cannot take ASA due to “stomach problems” or “doctors orders”, call medical control for guidance
► Facilitate administration of patient’s own nitroglycerin if SBP > 90, every 5 minutes up to 3
► Avoid NTG for patients who have taken Sildenafil (Viagra), Cialis (tadalafil) or Levitra (vardenafil) in past 48 hours
► Complete the following fibrinolytic questionnaire (below)
► Minimize scene time
► Consider ALS intercept

Advanced Standing Orders

► IV access and administer fluids to maintain systolic blood pressure > 90 mmHg.
► Nitroglycerin 0.4mg SL every 5 minutes while symptoms persist if SBP > 90 mmHg.

Paramedic Standing Orders

► Place patient on monitor.
► Obtain a 12 lead EKG and transmit to the ED (if possible).
► If EKG suggests AMI, consider morphine, 2mg IVP every 5 minutes up to 10 mg if pain persists and SBP > 90. Morphine should be used with caution in unstable angina / non STEMI.
► Consider Fentanyl 25-50 mcg for patients with a morphine allergy or known right ventricular infarction
► If EKG suggests AMI and patient tachycardic (HR > 100) and hypertensive (systolic BP > 140 mm Hg) administer metoprolol 5mg IV every 5 minutes up to 3 doses.
► Treat dysrhythmias PRN; refer to appropriate protocol.
► Contact Receiving Facility to possibly Activate Cath Lab Team.
Fibrinolytic Questionnaire

► No current or recent active bleeding within last month
► No LP, spinal anesthesia, or stroke within last month
► No known bleeding disorder or clinical suspicion of aortic dissection
► SBP <180 at baseline or after Rx with NTG and/or metoprolol

Prehospital Fibrinolytic Checklist*

Step 1
Has patient experienced chest discomfort for greater than 15 minutes and less than 12 hours?

YES

NO

Does ECG show STEMI or new or presumably new LBBB?

YES

STOP

NO

Step 2
Are there contraindications to fibrinolysis?
If ANY of the following is CHECKED YES, fibrinolysis MAY be contraindicated.

- Systolic BP >180 to 200 mm Hg or diastolic BP >100 to 110 mm Hg
- Right vs left arm systolic BP difference >15 mm Hg
- History of structural central nervous system disease
- Significant closed head/facial trauma within the previous 3 months
- Stroke >3 hours or <3 months
- Recent (within 2-4 weeks) major trauma, surgery (including laser eye surgery), GI/GU bleed
- Any history of intracranial hemorrhage
- Bleeding, clotting problem, or blood thinners
- Pregnant female
- Serious systemic disease (eg, advanced cancer, severe liver or kidney disease)

Step 3
Is patient at high risk?
If ANY of the following is CHECKED YES, consider transfer to PCI facility.

- Heart rate ≥100/min AND systolic BP <100 mm Hg
- Pulmonary edema (rales)
- Signs of shock (cool, clammy)
- Contraindications to fibrinolytic therapy
- Required CPR

*Contraindications for fibrinolytic use in STEMI are viewed as advisory for clinical decision making and may not be all-inclusive or definitive. These contraindications are consistent with the 2004 ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction.

†Consider transport to primary PCI facility as destination hospital.

Acute Coronary Syndromes Algorithm

Acute Coronary Syndromes Algorithm—2015 Update

1. Symptoms suggestive of ischemia or infarction

2. EMS assessment and care and hospital preparation:
   - Monitor, support ABCs. Be prepared to provide CPRI and defibrillation
   - Administer aspirin and consider oxygen, nitroglycerin, and morphine if needed
   - Obtain 12-lead ECG; if ST elevation:
     - Notify receiving hospital with transmission or interpretation; note time of onset and first medical contact
     - Notified hospital should mobilize hospital resources to respond to STEMI
   - If considering prehospital fibrinolysis, use fibrinolytic checklist

3. Concurrent ED assessment (<10 minutes)
   - Check vital signs; evaluate oxygen saturation
   - Establish IV access
   - Perform brief, targeted history, physical exam
   - Review/complete fibrinolytic checklist; check contraindications
   - Obtain initial cardiac marker levels, initial electrolyte and coagulation studies
   - Obtain portable chest x-ray (<30 minutes)

4. ECG interpretation

5. ST elevation or new or presumably new LBBB; strongly suspicious for injury
   **ST-elevation MI (STEMI)**
   - Start adjunctive therapies as indicated
   - Do not delay reperfusion

6. Time from onset of symptoms <12 hours?
   - <12 hours
     - Reperfusion goals:
       - Therapy defined by patient and center criteria
       - Door-to-balloon inflation (PCI) goal of 90 minutes
       - Door-to-needle (fibrinolysis) goal of 30 minutes

7. >12 hours

8. Troponin elevated or high-risk patient
   - Consider early invasive strategy if:
     - Refractory ischemic chest discomfort
     - Recurrent/persistent ST deviation
     - Ventricular tachycardia
     - Hemodynamic instability
     - Signs of heart failure
   - Start adjunctive therapies (e.g., nitroglycerin, heparin) as indicated

9. ST depression or dynamic T-wave inversion; strongly suspicious for ischemia
   **High-risk non-ST-elevation ACS (NSTE-ACS)**

10. Normal or nondiagnostic changes in ST segment or T wave
    **Low-/Intermediate-risk ACS**

11. Consider admission to ED chest pain unit or to appropriate bed for further monitoring and possible intervention.

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**Basic Standing Orders**

- **B**
  - Routine Patient Care – with focus on CPR. Airway management as appropriate and trained.
  - Apply and use AED if available.
  - For Trauma:
    - Minimize on-scene time or consider termination of efforts or not attempting resuscitation (see Determination of Death Protocol)
  - Consider ALS intercept.

**Advanced Standing Orders**

- **A**
  - Consider treatable causes: overdose/poisoning hypothermia; treat as per specific protocol.
  - IV access and administer fluids at wide open.
  - Airway management as appropriate and trained.
  - For Trauma, do not delay transport for IV, advanced airway, or medications.

**Paramedic Standing Orders**

- **P**
  - For Ventricular Fibrillation (VF)/Pulseless Ventricular Tachycardia (VT)
    - If bystander CPR is not being performed, CPR until an AED or defibrillator is available; then defibrillation (all energy levels are defibrillator and local protocol dependent) as soon as possible followed immediately by CPR for 5 cycles/2 min.; then rhythm check; repeat defibrillation attempts for VF/VT after each 5 cycles of CPR.
    - Establish IV/IO access and advanced airway.
    - Epinephrine (1:10,000) 1 mg IV; repeat every 3-5 minutes.
    - Consider Amiodarone, or Magnesium.

  - For ASYSTOLE or Pulseless Electrical Activity (PEA)
    - Continue CPR for 5 cycles/2 min.
    - Epinephrine (1:10,000) 1 mg IV; repeat every 3-5 minutes.
    - Continue CPR for 5 cycles/2 min. between interventions; stop only for rhythm check or return of circulation.
    - Advanced airway management.
    - NOTE: IV/IO administration of medications is preferred to administration via ETT.
    - For Trauma Arrest—consider bilateral needle chest decompression.
Cardiac Arrest Algorithm

BLS Healthcare Provider Adult Cardiac Arrest Algorithm—2015 Update

1. Verify scene safety.
2. Victim is unresponsive. Shout for nearby help. Activate emergency response system via mobile device (if appropriate). Get AED and emergency equipment (or send someone to do so).
3. Look for no breathing or only gasping and check pulse (simultaneously). Is pulse definitely lost within 10 seconds?
   - Normal breathing, has pulse
   - No normal breathing, has pulse
   - No breathing or only gasping, no pulse
4. Provide rescue breathing: 1 breath every 5-6 seconds, or about 10-12 breaths/minute. Activate emergency response system (if not already done) after 2 minutes. Continue rescue breathing: check pulse about every 2 minutes. If no pulse, begin CPR (go to "CPR" box). If possible opioid overdose, administer naloxone if available per protocol.
5. CPR
   - Begin cycles of 30 compressions and 2 breaths. Use AED as soon as it is available.
   - AED arrives.
6. Check rhythm. Shockable rhythm?
   - Yes, shockable: Give 1 shock. Resume CPR immediately for about 2 minutes (until prompted by AED to allow rhythm check). Continue until ALS providers take over or victim starts to move.
   - No, nonshockable: Resume CPR immediately for about 2 minutes (until prompted by AED to allow rhythm check). Continue until ALS providers take over or victim starts to move.

By this time in all scenarios, emergency response system or backup is activated, and AED and emergency equipment are retrieved or someone is retrieving them.
**Bradycardia (Symptomatic) - Adult**

Definition: Heart rate < 60 and inadequate clinical perfusion (e.g. acute altered mental status, ongoing chest pain, hypotension or other signs of SHOCK.

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**Basic Standing Orders**

- Routine Patient Care.
- Consider ALS intercept.

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**Advanced Standing Orders**

- Establish IV access.

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**Paramedic Standing Orders**

- If available, perform 12-lead EKG.
- Consider atropine 0.5 mg IVP (1 mg via ETT) every 3-5 minutes to total of 3mg.
- Consider transcutaneous pacing if available. Attempt capture at 80 bpm at minimum output and increase until capture achieved. Use without delay for high degree block (Type II second degree block or third degree block).
- Consider procedural sedation prior to pacing:
  - Midazolam 2.5 mg IV, may repeat once in 5 minutes
  - Consider Epinephrine (2 to 10 ug/min) or Dopamine (2 to 10 ug/kg/min) infusion while awaiting Pacer or if pacing ineffective.
  - Consider Glucagon 2-5 mg IV, IM or SQ over 2-5 minutes in adults for suspected overdose of a beta-blocker or calcium channel blocker.
Adult Bradycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradyarrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. Persistent bradyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Monitor and observe
   - No

5. Yes
   - Atropine
     - If atropine ineffective:
       - Transcutaneous pacing
       - Dopamine infusion
       - Epinephrine infusion
   - Consider:
     - Expert consultation
     - Transvenous pacing

Doses/Details

Atropine IV dose:
- First dose: 0.5 mg bolus.
- Repeat every 3-5 minutes.
- Maximum: 3 mg.

Dopamine IV infusion:
- Usual infusion rate is 2-20 mcg/kg per minute.
- Titrated to patient response; taper slowly.

Epinephrine IV infusion:
- 2-10 mcg per minute infusion. Titrated to patient response.

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**Tachycardia - Adult**

**Basic Standing Orders**

- Routine Patient Care.
  - Provide high-flow oxygen and consider assisting ventilation.
  - Monitor blood pressure and oximetry. Identify and treat reversible causes.
  - Consider ALS intercept.

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure > 90mmHg.

**Paramedic Standing Orders**

- Identify rhythm using cardiac monitor and 12-lead ECG if available.
- **Unstable**
  - (Hypotension, altered mental status, signs of poor perfusion)
    - Synchronized cardioversion
      - For V-Tach: 100J, 200J, 300J, 360J
      - For A- Fib:200J
      - For PSVT, A-flutter: 50J, 100J, 200J, 300J, 360J
      - For Polymorphic V-Tach: 200J, 300J, 360J or biphasic equivalents, based on manufacturers recommendations
    - Consider procedural sedation if practicable (Midazolam 2.5 mg IV or Diazepam 5 mg IV)
- **Stable**
  - PSVT or narrow complex tachycardia (with ventricular rate consistently greater than 140-150 BPM)
    - Consider vagal maneuvers (avoiding carotid sinus massage in the elderly).
    - If vagal maneuvers fail, give adenosine 6 mg rapid IVP, repeat dose of 12 mg X 2 as needed.
Paramedic Standing Orders

► Stable continued

Atrial fib, atrial flutter with narrow complex (With Ventricular Rate consistently greater than 140-150 BPM)
♦ Monitor and transport

For VT or uncertain wide complex tachycardia
♦ Monitor and transport. Monomorhic VT that is stable consider 150 mg Amiodarone over 10 minutes.

For polymorphic VT / torsades
♦ Monitor and transport. Consider Magnesium Sulfate 2 Grams in 100 ml normal saline over 10 minutes

For Known WPW
♦ Monitor and transport

If patient becomes unstable during monitoring and transport, treat as unstable.
Tachycardia Algorithm - Adult

Adult Tachycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically ≥150/min if tachyarrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

3. Persistent tachyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Synchronized cardioversion
   - Consider sedation
   - If regular narrow complex, consider adenosine

5. Wide QRS? ≥0.12 second
   - Yes
     - IV access and 12-lead ECG if available
     - Consider adenosine only if regular and monomorphic
     - Consider antiarrhythmic infusion
     - Consider expert consultation

   - No

6. Yes

Doses/Details

Synchronized cardioversion:
- Initial recommended doses:
  - Narrow regular: 50-100 J
  - Narrow irregular: 120-200 J
  - Wide regular: 100 J
  - Wide irregular: defibrillation dose (not synchronized)

Adenosine IV dose:
- First dose: 6 mg rapid IV push; follow with NS flush.
- Second dose: 12 mg if required.

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV dose:
- 20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given.
- Maintenance infusion: 1-4 mg/min.
- Avoid if prolonged QT or CHF.

Amiodarone IV dose:
- First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs.
- Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV dose:
- 100 mg (1.5 mg/kg) over 5 minutes.
- Avoid if prolonged QT.

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**Basic Standing Orders**

- Routine Patient Care.
- Place patient in semi-sitting or full sitting position.
- Administer oxygen at a rate to keep oxygen saturation above 90%.
- Facilitate administration of patient’s own nitroglycerin - if SBP> 90 every 5 minutes as needed.
- Consider ALS intercept.

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >90 mmHg.

**Paramedic Standing Orders**

- Consider nitroglycerin 0.4 mg SL every 5 minutes prn if SBP> 90 mmHg.
- Consider furosemide 0.5-1 mg/kg IV.
- Consider morphine sulfate 1 mg – 5 mg slow x 1. If not improving with above measures and systolic BP remains above 90 mm Hg, consider CPAP* if available and trained to use. Continuous Positive Airway Pressure (CPAP) with maximum 10 cm H2O pressure support.
- **Indications for CPAP**: Respiratory distress in the conscious patient suffering from presumed pulmonary edema who is non-responsive to simple oxygenation via non-rebreather mask.
Adrenal Crisis (Acute Adrenal Insufficiency)

Background: Adrenal Crisis or Acute adrenal insufficiency occurs in patients with a history of adrenal insufficiency in times of stress (infections, fevers, trauma, recent surgery) or non-compliance with medications. It would be a rare incidence that an EMS agency would encounter an undiagnosed acute adrenal insufficiency patient.

Adrenal insufficiency results when the body does not produce the essential life-sustaining hormones cortisol and aldosterone. These hormones are vital to maintain blood pressure, cardiac contractibility, water and salt balance.

Chronic adrenal insufficiency can be caused by number of conditions:
- Disorders of the adrenal gland
- Disorders of the pituitary gland
- Long-term use of steroids (COPD, asthma, rheumatoid arthritis, and transplant patients)

Acute adrenal crisis can result in refractory shock or death in patients (on maintenance dose of hydrocortisone (SoluCortef)/ prednisone) who have acute illness or trauma in which there is a need for additional cortisone for the body to response to the acute stress. It is critical that these patients receive a stress dose of hydrocortisone as soon as possible.

Signs and symptoms of acute adrenal crisis include
- Pallor, Dizziness, Headache, Weakness/lethargy, Abdominal pain, Vomiting/ nausea
- Hypoglycemia, Hypernatremia, Hyperkalemia, Hypotension, Shock, Heart Failure
- Fever, Confusion, disorientation

Treatment Goals:
1. Restore intravascular volume
2. Give stress dose Steroids
3. Treat hypoglycemia
4. Vasopressors for refractory shock

Basic Standing Orders

- Routine Patient Care.
- Administer oxygen at a rate to keep oxygen saturation above 94%.
**Paramedic Standing Orders**

Confirm patient’s history of Congenital Adrenal Hypoplasia (CHA), Addison’s or adrenal insufficiency.

**Fluids:** 20 mL/kg bolus of Normal Saline, repeat up to 60 mL/kg

**Steroids:** See dosing below

**Glucose:**
- Adult: 25gm of D50
- Infant up to age 12: 2.5 ml/kg of 10% dextrose
- Children > 12: 1 mL/kg of 25% dextrose

**Vasopressors:** Use for shock refractory to 60 mL/kg fluid bolus

Dosing of **steroids** is as indicated below with **HYDROCORTISONE** being the PREFERRED medication if available (may use patient’s own medication if available and may follow written instructions regarding dose by patient’s signed physician’s order):

**Adult patients:**
Administer **methylprednisolone** (Solu-Medrol) 125mg IM/IO/IV Push

**Pediatric patients:**
Administer **methylprednisolone** (Solu-Medrol) 2mg/kg IM/IO/IV Push (to maximum 125mg)

**Alternative Pediatric Dosing:**

| Newborn to infant (up to 1 year) | 25 mg |
| 1 year old to 7 years old | 50 mg |
| 7 years and older | 125 mg |

**Solu-Cortef Act-O-Vial** (most common home hydrocortisone prep):
- To Use: Push down on the top which will break the seal and mix the liquid and powdered hydrocortisone together. The vial contains 100mg of hydrocortisone in 2ml of diluent. Give the entire contents of the vial to the patient either IV/IM/IO.
**Agitated Delirium - Adult**

History of Present Illness-
1. Displays signs of extreme agitation, paranoia, aggression, public nudity, bizarre behavior, “super human” strength, and numbness to pain.
2. Past history of psychiatric disorder and/or illegal substance abuse?

Physical Exam-

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**Basic Standing Orders**
- Protect yourself and other crew members!!!
- Provide *Initial Medical Care.*
- If sufficient trauma is suspected or known, immobilize C-spine and use appropriate *Trauma* protocol.
- Administer oxygen and ventilate if appropriate.
- Restrain patient in supine position, if possible, to prevent positional asphyxia.
- Begin cooling using wet sheets, cold packs (arm pits, back of the neck and groin are most effective), move patient to a cool environment and/or place patient under cool running water at low pressure.

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**Paramedic Standing Orders**
- Intubate as needed.
- Administer Midazolam 5 mg by MAD or IM (preferred route is MAD), as soon as possible.
- Establish an IV of Normal Saline and initiate fluid resuscitation, if appropriate.
- Monitor cardiac rhythm, obtain 12 lead ECG and treat arrhythmias according to rhythm specific protocol.
- Check patient’s blood glucose level and treat accordingly (*Hyperglycemia* or *Hypoglycemia* protocol).
- Administer Sodium Bicarbonate 50 mEq IVP (*Note*-in this situation Sodium Bicarbonate does not require a *Medical Control* order).
- Consider 5 mg Diazepam IV or repeat dose of Midazolam
Allergic Reaction/Anaphylaxis – Adult

Allergic reaction is suspected when there is a suspected exposure and patient(s) exhibit signs and symptoms consistent with an allergic reaction such as:

- **Skin**: Hives, Itching, Flushing
- **Respiratory**: Wheezing, Dyspnea, Stridor, Sneezing, Coughing, Chest tightness
- **Cardiovascular**: Vasodilation, Tachycardia, Hypotension, Shock
- **Gastrointestinal**: Nausea, Vomiting, Cramping, Diarrhea
- **CNS**: Dizziness, Headache

Common allergens include venom (i.e. bee stings), foods, (i.e. nuts, berries, seafood), plant pollen, and medications.

Consider **Mild, Moderate** and **Severe** protocols to be hierarchical and building on prior intervention in Evolving Treatment Plan.
Allergic Reaction/Anaphylaxis – Adult-Mild

Symptomatic, no dyspnea, stable vital signs (systolic > 110 mmHg).

**Basic Standing Orders**

- Routine Patient Care.
- Maintain airway and administer oxygen at high flow, preferably by non-rebreather facemask at 12-15L/min to maintain oxygen saturation of at least 95%.
  - Remove allergen
  - Check vital signs frequently
  - Begin transport, consider ALS intercept
  - Consider patient assisted medication

**Paramedic Standing Orders**

- Consider Diphenhydramine 25-50 mg, PO, IM, IV.
**Allergic Reaction/Anaphylaxis – Adult-Moderate**

Edema, hives, difficulty swallowing, facial swelling, etc., with stable vital signs BP ≥ 90 mmHg.

**Basic Standing Orders**

- Routine Patient Care.
- Maintain airway and administer oxygen at high flow, preferably by non-rebreather facemask at 12-15L/min to maintain oxygen saturation of at least 95%.
  - Remove allergen
  - Check vital signs frequently
  - Begin transport, consider ALS intercept
  - Consider patient assisted medication
- Consider Albuterol 2.5 mg in 3 ml NS via nebulizer every 5 minutes X 4 total doses.
- Consider Epinephrine (1:1000) 0.3 mg SQ. Contact medical control if there is a history or risk for coronary artery disease.

**Advanced Standing Orders**

- Establish an IV of 0.9% NaCl (Normal Saline) at KVO.

**Paramedic Standing Orders**

- Diphenhydramine 25-50 mg IM or IV.
- Consider Epinephrine (1:1000) 0.3 mg SQ. Contact medical control if there is a history or risk factor for coronary artery disease.
- Establish an IV of 0.9% NaCl (Normal Saline) at KVO.
**Allergic Reaction/Anaphylaxis – Adult-Severe**

Edema, hives, severe dyspnea, wheezing, unstable vital signs (systolic < 90 mmHg), cyanosis, laryngeal edema.

### Basic Standing Orders

- Ensure adequate ABCs. Administer oxygen to keep $\text{SaO}_2 > 90\%$.
- If patient was exposed to an allergen and exhibits severe respiratory distress or shock, Administer Epinephrine Auto Injector or Epinephrine (1:1000) 0.3 mg (0.3 ml) SQ or IM.
- Consider Albuterol 2.5 mg in 3 ml of NS via nebulizer every 5 minutes X 4 total doses.
- Begin Transport and request ALS intercept.
- Monitor ABCs and Vital Signs. Assist ventilations if necessary.

**NOTE:** ***If signs and symptoms do not resolve, contact Medical Control for orders to repeat Epinephrine.***

### Advanced Standing Orders

- Establish an IV of 0.9% NaCl (Normal Saline) at KVO.

**NOTE:** ***If signs and symptoms do not resolve, contact Medical Control for orders to repeat Epinephrine.***

### Paramedic Standing Orders

In addition to prior therapies, consider:

- Diphenhydramine 25-50 mg IM or IV.
- Methylprednisolone 125 mg IV.

BY ONLINE MEDICAL CONTROL ORDER: Consider Epinephrine (1:10,000) 0.1 mg increments (1.0 ml diluted in 9 ml NS for final 10 ml 1:100,000 SLOW IV (over 5-10 minutes). May repeat increments prn up to 1.0 mg total.

- Consider early intubation.

**NOTE:** Use Caution when administering Epinephrine with known Cardiovascular Disease
Basic Standing Orders

► Routine Patient Care.
► Wear N95 mask if bioterrorism related event or highly infectious agent suspected.
► Administer oxygen at the appropriate rate for the patient’s condition and medical history.
► Patients with COPD who are on home oxygen, increase their rate by 1-2 liters per minute.
► Attempt to keep oxygen saturation above 90%; increase the rate with caution and observe for fatigue, decreased mentation, and respiratory failure.
► If available, request ALS intercept/intervention ASAP.
► Assist patient with his/her own MDI, if appropriate; only MDIs containing beta adrenergic bronchodilators (e.g. albuterol, Ventolin, Proventil, Combivent) may be used: 2 puffs; repeat every 5 minutes as needed while transporting; contact medical control if delayed.
► If available, consider albuterol 2.5 mg in 3 ml normal saline via nebulizer prn every 5 minutes x 4 total doses.

Advanced Standing Orders

► IV access and administer fluids to maintain systolic blood pressure >90 mmHg.
► Consider albuterol 2.5mg in 3 ml normal saline via nebulizer prn every 5 minutes x 4 total doses.
► For COPD patients, CPAP*, if available and trained to use: maximum 10 cmH2O pressure support

Paramedic Standing Orders

► Consider combining ipratropium 0.5 mg in 2.5 ml normal saline with albuterol 2.5 mg in 3 ml normal saline as the first nebulizer treatment. For patients exhibiting signs/symptoms consistent with CHF, see Congestive Heart Failure/Pulmonary Edema Protocol.
► If available, measure peak flow pre-/post-treatment.
Asthma/RAD (Reactive Airway Disease) – Adult continued

Paramedic Standing Orders

► Consider methylprednisolone 125 mg IV.
► For patients who do not respond to nebulizer treatments or for impending respiratory failure, consider:
  ♦ Epinephrine (1:1,000) 0.3mg (0.3 ml) SQ or IM. Contact medical control if there are cardiac risk factors.
  ♦ Magnesium sulfate 2 grams in 100 ml 0.9% NaCl (normal saline) IV over 10 minutes.
► For COPD patients, CPAP*, if available and trained to use; maximum 10 cm H2O pressure support.

*Continuous Positive Airway Pressure (CPAP) has been shown to be effective in preventing intubation and decreasing mortality in selected patients in acute respiratory failure.
Diabetic Emergencies: Hypoglycemia

**Basic Standing Orders**

- Routine Patient Care.
- Obtain glucose reading via glucometer.
- If the patient can swallow and hypoglycemia is present, administer oral glucose.
- If available and indicated, consider assisting family in administration of patient's glucagon 1 mg IM.
- Consider ALS intercept.

**Advanced /Paramedic Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >90 mmHg.
- If glucose level is <80mg/dl with associated signs and symptoms, administer dextrose (D50) 25 gm IV. Re-check glucose 5 minutes after administration of dextrose (D50). Repeat dextrose (D50) 25 gm IV if glucose level is less than 80mg/dL.
- In the presence of chronic alcoholism, alcohol intoxication, or malnourishment, administer thiamine 100 mg IV or IM.
- If unable to obtain IV access, administer glucagon 1 mg IM or SQ.
Diabetic Emergencies: Hyperglycemia

**Basic Standing Orders**

- Routine Patient Care.
- Obtain glucose reading via glucometer.
- Consider ALS intercept for abnormal vital signs or altered level of consciousness.

**Advanced Standing Orders**

- IV access and administer Normal Saline to maintain systolic blood pressure >90 mmHg.
- Maintain patent airway and adequate ventilations.
- Transport.

**Paramedic Standing Orders**

- Airway management as needed.
- Transport.
Non-transport of Insulin Dependent Diabetic

Historical Findings

1. Decreased level of consciousness without suspected trauma.
2. Prior medical history of insulin-dependent diabetes mellitus.
3. Following treatment, patient is conscious, alert to time, date and place, and requests that they not be transported to the hospital.
4. No other associated findings of serious illnesses or circumstances that may have contributed to the hypoglycemic episode, including excessive alcohol consumption, shortness of breath, chest pain, headaches, etc.
5. The patient's history reveals circumstances that may have contributed to the hypoglycemic episode such as lack of oral intake or an insulin reaction.
6. Not on oral hypoglycemic medication such as glypizide, glyburide, or chlorpropamide.

Physical Findings

1. Patient is initially found to have a decreased level of consciousness.
2. Systolic blood pressure > 90 mm Hg or child with normal perfusion.
3. Patient has rapid glucose test of ≤ 60 mg/dL.
4. The patient responds quickly (< 10 minutes) to oral or IV glucose (D50W) to normal level of consciousness.
5. Repeat rapid glucose test is > 100 mg/dL.

EKG Findings

1. Heart rate > 60.
2. Normal EKG.

Protocol

1. The patient is assessed and treated per the Diabetic Emergencies protocol.
2. Repeat blood pressure is at least 90 mm Hg, pulse rate is at least 60, and the repeat rapid glucose test is at least 100 mg/dL.
3. The patient is given written instructions for follow-up care prior to being released.
4. The patient is released to the care of a responsible adult who will remain with the patient as an observer for a reasonable time and can call 911 should the symptoms recur.
Non-transport of Insulin Dependent Diabetic continued

Notes
1. Patients who have extensive medical history or other signs and symptoms unrelated to insulin-dependent diabetes mellitus should be strongly encouraged to be transported.

2. If the patient is on an oral hypoglycemic medication such as glypizide, glyburide, or chlorpropamide, the hypoglycemic episode may last hours or days. Patients on oral hypoglycemic agents should be strongly encouraged to be transported, regardless of their response to field treatment.

3. When treating patients who warrant transportation based on the above criteria but who refuse transport, paramedics shall contact medical control for assistance.

4. Instructions for follow-up care should include the following:
   • Take action to prevent a recurrent episode such as remain in the care of another adult observer, consume a light meal to maintain a sufficient blood glucose level, monitor their blood glucose, and advise their personal physician of this episode.
   • Watch for signs and symptoms of another episode. Those signs and symptoms include:
     • If another episode occurs, contact 911 immediately!

5. EMS should provide the patient with both verbal and written instructions on follow-up care following patient refusal of transport.
FEVER (>101.5° F/38.5°C)- Adult

This protocol is not intended for patients suffering from environmental hyperthermia (Hyperthermia Protocol).

Any child less than 60 days old with a documented temperature (by parent/caregiver or EMS) > 100.4° rectally (99.4° axillary) must be transported for evaluation. Medical control must be contacted prior to accepting any refusal.

Basic Standing Orders

► Routine Patient Care.
► Wear N95 mask if bioterrorism related event or highly infectious agent suspected.
► Obtain temperature.
► Passive cooling: remove excessive clothing/bundling.
► Do not cool to induce shivering.
► For temperatures of 101.5°F (38.5°C) or greater and no acetaminophen in the last 4 hours, consider administering acetaminophen 500-1000 mg PO in absence of signs and symptoms of nausea and vomiting.
Nausea/Vomiting – Adult

**Basic Standing Orders**

- Routine Patient Care.

**Advanced Standing Orders**

- Consider IV access and administer fluids to maintain systolic blood pressure > 90mmHg.

**Paramedic Standing Orders**

- Ondanestron 4 mg IV administered over 30 seconds. May repeat dose in 30 minutes.
- For dystonic reactions caused by administration of prochlorperazine or promethazine administer diphenhydramine 50 mg IV/IM.
Non-Traumatic Abdominal Pain - Adult

This protocol should be used for patients that complain of abdominal pain without a history of trauma.

Assessment should include specific questions pertaining to the GI/GU systems.

**Abdominal physical assessment includes:**
Ask patient to point to area of pain (palpate this area last).
Gently palpate for tenderness, rebound tenderness, distension, rigidity, guarding, and pulsatile masses. Also palpate flank for CVA tenderness.

**Abdominal history includes:**
- History of pain (OPQRST)
- History of nausea/vomiting (color, bloody, coffee grounds)
- History of bowel movement (last BM, diarrhea, bloody, tarry)
- History of urine output (painful, dark, bloody)
- History of abdominal surgery
- History of acute onset of back pain
- SAMPLE (attention to last meal)

Additional questions should be asked of the female patient regarding OB/GYN history. All female patients of childbearing age complaining of abdominal pain should be considered to have an ectopic pregnancy (even if vaginal bleeding is absent) until proven otherwise.

Non-traumatic abdominal pain can be caused by: appendicitis, cholecystitis, duodenal ulcer perforation, diverticulitis, abdominal aortic aneurysm, pelvic inflammatory disease (PID), and pancreatitis.

**Basic Standing Order**
- Routine Patient Care.
- Nothing by mouth.
- Oxygen 2-4 L/min, increase as warranted.
- Transport in position of comfort.

**Advanced Standing Orders**
- Consider obtaining IV access with NS or RL.

**Paramedic Standing Orders**
- Place patient on monitor.
- If signs of decreased perfusion or shock develop, initiate fluid resuscitation (See Trauma Assessment and Management Protocol).
- Be aware that ischemic cardiac pain can present as abdominal pain.
Pain Management - Adult

Basic Standing Orders

► Routine Patient Care.
► Place the patient in a position of comfort if possible.
► Give reassurance, psychological support, and distraction.
► Use ample padding for long and short spinal immobilization devices.
Use ample padding when splinting possible fractures, dislocations, sprains and strains. Elevate injured extremities if possible. Consider application of cold pack for 30 minutes.
Have the patient rate their pain on a 0 to 10 (or similar) scale*. Reassess the patient’s pain level and vital signs every 5 minutes.*0-10 Scale: Avoid coaching the patient, simply ask them to rate their pain on a scale from 0-10, where 0 is no pain at all and 10 is the worst pain ever experienced by the patient.
*Wong-Baker “faces” scale: The faces correspond to numeric values from 0-10. The scale can be documented with the numeric value or the textual pain description.
► Consider paramedic intercept if needed for pain management.

0 2 4 6 8 10
NO HURT HURTS A HURTS A HURTS EVEN HURTS HURTS
LITTLE LITTLE MORE MORE WHOLE LOT WORST
Paramedic Standing Orders

- IV access and administer fluids to maintain systolic blood pressure >90.
- Unless the patient has altered mental status, multi-systems trauma or abdominal pain, the paramedic may consider:
  - Morphine: 1-5 mg IV/IM every 10 minutes to a total of 15 mg titrated to pain and SBP>90.
  - Fentanyl: 25-50 mcg slow IV every 5 minutes up to a total of 150mcg. Fentanyl may also be given IN.
- For hypoventilation from opiate administration by EMS personnel, administer naloxone 0.4 mg IV prn.
- Nausea: Refer to Nausea Protocol.

NOTE: Contact medical control for guidance with all patients with altered mental status, multi-systems trauma, or for requests to provide additional doses of a medication.
Poisoning: Overdose-Adult

Basic Standing Orders

► Consider waiting for law enforcement to secure the scene.
► Remove patient from additional exposure.
► Routine Patient Care.
► Suspected Narcotic Overdose: Administer Naloxone 2-4 mg Intranasal (IN)
► Absorbed poison
  ♦ Remove clothing and fully decontaminate.
  ♦ If eye is involved, irrigate at least 20 minutes without delaying transport.
► Inhaled/injected poison:
  ♦ Administer high-flow oxygen.
  ♦ Note: Pulse oximetry may not be accurate for some toxic inhalation patients.
  ♦ Narcan Administration: 2MG IN
► Ingested poison:
  ♦ Contact Poison Control at (800) 222-1222 as soon as practicable if you have any questions.
  ♦ Review circumstances of overdose with medical control and poison control. If the decision is to administer activated charcoal, follow Activated Charcoal Protocol.
  ♦ Bring container to receiving hospital.
► Envenomations:
  ♦ Immobilize extremity in dependent position. Consider ice pack for bee stings.
► For MCI related to organophosphate exposure see Nerve Agents & Organophosphates Adult.
► Consider ALS intercept/Air Medical Transport.

Advanced Standing Orders

► IV access and administer fluids to maintain systolic blood pressure >90 mmHg.
► Suggested Narcotic Antidotes: Naloxone 0.4–2 mg IV push, IM, SQ. Intranasal (IN) dose is 2-4 mg. If no response, may repeat initial dose every 5 minutes to a total of 10 mg.
### Suggested Antidotes

<table>
<thead>
<tr>
<th>Category</th>
<th>Antidote Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tricyclic</td>
<td>Sodium bicarbonate 1 mEq/kg IV.</td>
</tr>
<tr>
<td>Beta-Blocker</td>
<td>Glucagon 2 – 5 mg IV, IM, SQ. Diluted in sterile water</td>
</tr>
<tr>
<td>Ca Channel Blocker</td>
<td>Calcium Chloride 1-2 g IV bolus followed by 20-40 mg/kg/hr infusion. Glucagon 2– 5 mg IV, IM, SQ.</td>
</tr>
<tr>
<td>Dystonic Reaction</td>
<td>Diphenhydramine 25 – 50 mg IVP for dystonic reactions induced by antipsychotics, such as haloperidol, or anti-emetics such as prochlorperazine or promethazine.</td>
</tr>
<tr>
<td>Organophosphates</td>
<td>Atropine: 2 mg IV every 5 minutes as needed and Pralidoxime: 1-2 gram IV over 30–60 minutes.</td>
</tr>
</tbody>
</table>
**Basic Standing Orders**

**Assessment of the Scene:**
- Use dispatch information. Does something just not sound right about the information you are receiving from dispatch?
- FIGHT “TUNNEL VISION”! Look at the whole scene on arrival. Are you sure it’s safe to enter? If you are not trained or equipped, DO NOT ENTER!
- Has there been a release of a known agent?
- Do you find multiple patients with signs and symptoms commensurate with nerve agent contamination?
- Are there multiple casualties at a large event or in a heavily populated area with no explained cause?
- Assess for SLUDGEM (salivation, lacrimation, urination, defecation, gastric upset, emesis, muscle twitching) and KILLERBs: (Bradycardia, Bronchorrhea, Bronchospasm).

**General Patient Treatment**
- Take body substance isolation precautions.
- Remove patient’s clothing.
- Remove to cold zone after decontamination and monitor for symptoms.
- Administer oxygen via non-rebreather mask at 15 LPM.
- Contact medical control for authorization to use Mark I auto-injectors.

If medical control cannot be contacted or is unavailable, the auto-injector may be administered if the following criteria are met:
- The patient is clearly having difficulty breathing (dyspnea, or bilateral wheezing), and
- Has other evidence of nerve gas exposure, or
- Has evidence of shock (altered mental status, diaphoresis, hypotensive).
- At least two symptoms of nerve agent poisoning should be identified before administering the Mark I injector.

- If the decision is made to inject, act quickly. Time can mean the difference between life and death for the affected patient(s).
- Obtain baseline vital signs.
- Complete the decontamination process.
- Care should be used in the administration of atropine to patients with a cardiac history. The antidote should not be withheld.
- Treatment using Mark-1 Kit Auto-injectors only in Mass Casualty Incidents.
- Treatment using Diazepam Injector only in Casualty Incidents where ChemPaks are deployed.
*Poisoning: Nerve Agents and Organophosphates MCI*

**Basic Standing Orders**

*General Patient Treatment continued:*
- Antidotal therapy should be started as soon as symptoms appear.
- All injections must be given IM.

**Procedure for Auto-Injector:**
- Remove the antidote kit from its package.
- With your non-dominant hand, hold the auto-injectors by the plastic clip so that the larger auto-injector is on top and both are positioned in front of you at eye level.
- With your dominant hand grasp the atropine auto-injector (the smaller of the two) with the thumb and first two fingers.
- DO NOT cover or hold the needle end with your hand, thumb, or fingers — you might accidentally inject yourself. An accidental injection into the hand WILL NOT deliver an effective dose of the antidote, especially if the needle goes through the hand.
- Pull the injector out of the clip with a smooth motion. The auto-injector is now armed.
- The injection site for administration is normally in the outer thigh muscle. It is important that the injections be given into a large muscle area. If the individual is thinly-built, then the injections should be administered into the upper outer quadrant of the buttocks.
- Place the tip of the auto-injector firmly against the injection site. Re-check to make certain that the injector is loaded prior to placing it firmly against the injection site.
- Push hard until you hear or feel the injector activate. Hold the injector in place until the medication is fully injected (a minimum of ten (10) seconds).
- Once administered, record the time administered, and try to properly discard the auto-injector in an appropriate sharps container.
- Next pull the 2 PAM Chloride injector (the larger of the two) out of the clip.
- Inject the patient in the same manner as previously described for the atropine auto-injector, holding the black (needle) end against the outer thigh (or buttocks).
- Massage the injection sites, if time permits.
- After administering the first set of injections, wait 5 to 10 minutes.
- After administering one set of injections, you should initiate decontamination procedures, as necessary to allow the patient to be transported to a medical facility.
Poisoning: Nerve Agents and Organophosphates MCI

**Basic Standing Orders**

Procedure for Auto-Injector continued:
- Severe symptoms include unconsciousness, convulsions, apnea, flaccid paralysis.
- Mild/Moderate symptoms include sweating, muscle fasciculations, nausea, vomiting, weakness, dyspnea, anxiety, restlessness, confusion and constricted pupils.

Patient Monitoring Following Administration
- Patients may have symptoms re-develop even after administration of the antidote kit.
- Atropine may only be repeated every 10 - 15 minutes as needed. (Note: multiple doses of atropine may be needed.)

<table>
<thead>
<tr>
<th>Tag Color</th>
<th>Exposure, SLUDGEM</th>
<th>Mark-1 Kit Diazepam Monitoring Interval</th>
<th>Repeat Dosing</th>
<th>Maintenance Dose</th>
</tr>
</thead>
</table>
| RED       | Severe Symptoms   | 3 Adult Mark-1 kits  
1 Adult Diazepam (10mg) Auto-injector | Diazepam Auto-injector may be repeated 3 times at 10-15 min. intervals. | 1 Adult Mark-1 kit every hour for 3 hours |
| YELLOW    | Mild to Moderate Symptoms | 1 Adult Mark-1 kit for minor symptoms. Monitor every 10 minutes | If symptoms progress:  
2 Adult Mark-1 kits & 1 Adult Diazepam Auto-injector. Diazepam may be repeated 3 times at 10-15 min. intervals. | |
| GREEN     | No                | None. Monitor every 10 minutes for evidence of exposure. | | |
Poisoning: Nerve Agents and Organophosphates MCI

**Advanced Standing Orders**

► Obtain IV access if situation permits.

**Paramedic Standing Orders**

► If field conditions permit, initiate cardiac monitoring and consider the administration of IV medications.
► If symptoms persist after the administration of 3 Mark 1 kits
  • Atropine: 2 mg IV, Repeat every 5 minutes until secretions cleared.
  • Pralidoxime: 1-2 gram IV over 30–60 minutes.
  • Diazepam 10 mg IM/IV repeat every 5 to 10 minutes as needed.

**Instead of diazepam, may use**
• Lorazepam 2-4 mg IM/IV, repeat every 5-10 minutes as needed or
• Midazolam 2.5-5.0 mg IM/IV, repeat every 5 to 10 minutes as needed.
► Albuterol 2.5 mg in 3 ml normal saline via nebulizer.
Poisoning: Nerve Agents and Organophosphates MCI
Provider Protection

Basic Standing Orders

► If first responder(s) display symptoms, notify dispatch immediately.
► All first responders will evacuate area until secured by Hazmat Team.
► Remove clothing and decontaminate yourself and/or assist other responders.
► Routine Patient Care.
► Assess for SLUDGEM (salivation, lacrimation, urination, defecation, gastric upset, emesis, muscle twitching) and KILLERB’s (Bradycardia, Bronchorrhea, Bronchospasm).
► Use Mark-1 Auto-Injectors (or DuoDote) only if nerve agent symptoms are present. Mark-1 kits offer no prophylactic protection and use prior to appearance of symptoms may be harmful.
► Atropine (tube#1) should always be given before 2-PAMchloride (tube#2). All injections must be given IM.
► Treatment using Diazepam Auto Injector only in Mass Casualty Incidents where ChemPaks are deployed.
► Severe symptoms include unconsciousness, convulsions, apnea, flaccid paralysis.
► Mild/Moderate symptoms include sweating, muscle fasciculations, nausea, vomiting, weakness, dyspnea, anxiety, restlessness, confusion and constricted pupils.

Paramedic Standing Orders

► If field conditions permit, initiate cardiac monitoring and consider the administration of IV medications.
► If symptoms persist after the administration of 3 Mark 1 kits:
  ◦ Atropine: 2 mg IV, Repeat every 5 minutes until secretions cleared.
  ◦ Pralidoxime: 1-2 gram IV over 30–60 minutes.
  ◦ Diazepam 10 mg IM/IV repeat every 5 to 10 minutes as needed.
   **Instead of diazepam, may use**
  ◦ Lorazepam 2-4 mg IM/IV, repeat every 5-10 minutes as needed or
  ◦ Midazolam 2.5-5.0 mg IM/IV, repeat every 5 to 10 minutes as needed.
► Albuterol 2.5 mg in 3 ml normal saline via nebulizer.
Poisoning: Radiation Injuries MCI

Exposure to radioactive source or radioactive materials/debris.

**Basic Standing Orders**

- Remove patient from scene and decontaminate by appropriately trained personnel.
- Wear N95 mask.
- Triage tools for mass casualty incident:
  - If vomiting starts
    - Within 1 hour of exposure, survival is unlikely and patient should be tagged “Expectant.”
    - After less than 4 hours of exposure, patient needs immediate decontamination and evaluation and should be tagged “Immediate.”
    - After 4 hours, re-evaluation can be delayed 24 – 72 hours if no other injury is present and patient tagged “Delayed.”
- Treat traumatic injuries and underlying medical conditions.
- Patients with residual contamination risk from wounds, shrapnel, and internal contamination should be wrapped in water-repellent dressings to reduce cross contamination.

**Advanced Standing Orders**

- IV access and administer fluids to adults hemodynamically stable if situation permits.

**Paramedic Standing Orders**

- Consider anti-emetic.
- Consider pain control.
**Seizures - Adult**

**Basic Standing Orders**

- Routine Patient Care.
- Obtain glucose reading via glucometer.
- Do not attempt to restrain the patient; protect the patient from injury.
  - Suction as needed.
  - Consider nasopharyngeal airway.
  - Oxygen 15 LPM via non-rebreather mask.
  - Assist ventilations with 100% oxygen via bag valve mask if necessary to maintain oxygen saturation > 95%.
  - Protect patient from injury – place on side.
- History preceding seizure is very important. Find out what precipitated seizure (e.g. medication non-compliance, active infection, trauma, hypoglycemia, substance abuse, third-trimester pregnancy, etc.).
  - Has diazepam rectal gel been prescribed by patient’s physician? If yes, advise caregiver to administer according to patient’s prescribed treatment.
  - Determine if emergency is related to implanted vagus nerve stimulator. Ascertain when vagus nerve stimulator was implanted, when last checked by physician, current settings, history of magnet use, changes in seizure intensity.
- Request ALS intercept for ongoing or recurrent seizure activity.

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >90 mmHg.
- If blood glucose reading less than 80 mg/dl, see Diabetic Emergencies.

**Paramedic Standing Orders**

- Consider advanced airway control as needed.
- Monitor vital signs, EKG and pulse oximeter.
- Saline lock or IV - 0.9% NaCl (normal saline) @ rate to maintain appropriate hemodynamic status.
- If generalized seizure activity is present, consider
  - Diazepam 5 mg IV (then 2.5 mg IV every 5 minutes to total of 10 mg), or
  - Midazolam 1 – 2.5 mg IV/IM/IO repeated every 5 minutes to a total of 5 mg or until seizure activity is abolished.
  - If IV access is unobtainable administer Midazolam 10 mg IN at 5 mg per nostril via nasal atomizer. (See chart pg 263)
- Consider Magnesium Sulfate 4 grams IV over 5 minutes in presence of seizure in 3rd trimester of pregnancy.
Sepsis Protocol

This protocol is for patients who have screened positive for Simple and Severe sepsis. The Prehospital screening tool will be performed on patients ≥ 18 years old.

► Simple sepsis is defined as at least two of the following signs and symptoms (Systemic inflammatory response syndrome - SIRS) AND a suspected or documented infection.
  o Temp < 96.8 or >100.9
  o Pulse > 90
  o Respiratory Rate > 20
  o Blood Glucose > 140 (with no Hx of DM)
  o Acute Altered Mental Status
  o SBP < 90
  o MAP < 65

► Severe sepsis is defined by at least two of the above signs and symptoms AND suspected or documented infection AND demonstrating hypoperfusion as manifested by one of the following:
  o SBP < 90
  o MAP < 65

Basic Standing Orders

► Routine Patient Care
► Obtain vital signs including temperature
► Obtain glucose reading via glucometer
► Place cardiac monitor
► Continuous pulse oximetry
► Administer oxygen via nasal cannula at 2 LPM; titrate for spO2 equal to or greater than 92%
► Early notification of the emergency department is critical
► Transport the patient to the closest appropriate hospital emergency department if:
  ◆ The patient is in cardiac arrest, or
  ◆ The patient has an unmanageable airway, or
  ◆ The patient has another medical condition that warrants transport to the closest appropriate hospital emergency department as per protocol.
Advanced Standing Orders

Do not delay transport for ALS procedures
► IV access with 0.9% Normal Saline KVO. Avoid dextrose.

Paramedic Standing Orders

Do not delay transport for ALS procedures
► Insert large bore IV
► Assess lung sounds
► For Simple Sepsis (SBP > 90), Administer 500ml Normal Saline bolus
► For Severe Sepsis (SBP < 90 or MAP < 65), Administer 30ml/kg Normal Saline bolus in 500ml increments with reassessment of blood pressure and breath sounds after each bolus. Hold additional bolus if SBP > 100 or if the patient develops wet lung sounds
► Manage compromised airway
► Reassess continuously
Suspected Stroke Protocol

This protocol is for patients who have an acute episode of neurological deficit without any evidence of trauma. Signs consistent with acute Stroke:

- Sudden onset of weakness or numbness in the face, arm, or leg, especially on one side of the body
- Sudden onset of trouble seeing in one or both eyes
- Sudden onset of trouble walking, dizziness, loss of balance or coordination
- Sudden onset of confusion, trouble speaking or understanding
- Sudden onset of severe headache with no known cause
- Consider other causes of altered mental status, i.e. hypoxia, hypoperfusion, hypoglycemia, trauma, or overdose.

Basic Standing Orders

- Routine Patient Care.
- Obtain glucose reading via glucometer.
- Oxygen by non-rebreather mask or by nasal cannula to maintain oxyhemoglobin levels of 94%, prepare to suction and maintain airway.
- Perform Cincinnati Prehospital Stroke Scale.
- If positive, determine time of onset of symptoms. Time of onset of stroke is critical:
  - To patient- “When was the last time you were normal?”
  - To family or bystander- “When was the last time you saw the patient normal?”
- Encourage transportation of a family member.
- Maintain normal body temperature.
- Protect any paralyzed or partially paralyzed extremity.
- Early notification of the emergency department is critical.
- Closest hospital may not be the best destination hospital:
  - Consider TJC-approved stroke center if onset of symptoms to definitive treatment can be within 3 hours (Generally within two hours of symptoms to arrival at facility).
  - Consider air medical transport from the scene in lieu of closest hospital if the patient would otherwise not have access to definitive care at a TJC-approved stroke center within 3 hours (Generally within two hours of arrival at facility).
- Transport the patient to the closest appropriate hospital emergency department if:
  - The patient is in cardiac arrest, or
  - The patient has an unmanageable airway, or
  - The patient has another medical condition that warrants transport to the closest appropriate hospital emergency department as per protocol.
- Initiate fibrinolytic screening and document findings on Stroke Checklist.
- Consider ALS intercept/air medical transport.
Suspected Stroke Protocol continued

Advanced Standing Orders

A

Do not delay transport for ALS procedures
► IV access with 0.9% Normal Saline TKO. Avoid dextrose.

Paramedic Standing Orders

P

Do not delay transport for ALS procedures
► Obtain 12-lead EKG during transport.
► Avoid treating blood pressure elevation without online medical control authorization.
► Manage compromised airway.
► Continuously reassess.

Stroke Checklist: IV Activase Inclusion/Exclusion Criteria

Note: The decision to transport to a TJC stroke center is NOT based on the following criteria. The decision to administer Activase is a PHYSICIAN decision that will be based, in part, on the following criteria:

Inclusion Criteria
► Age 18 or older
► Stroke Symptom onset < 3 hours
► Clinical Diagnosis of ischemic stroke causing a measurable neurologic deficit

Exclusion Criteria
► Onset to treatment > 3 hours or time of onset unknown
► Evidence of active bleeding or acute trauma
► Seizure at onset with postictal neurologic impairments
► History of Intracranial Hemorrhage
► Arterial puncture at a noncompressible site in the previous 7 days
► Major Surgery in last 14 days
► GI or Urinary tract hemorrhage previous 21 days
► Previous head trauma or stroke in last 3 months
► MI within the last 3 months
► Blood Pressure > 185/110 mm Hg requiring aggressive treatment
► INR > 1.7
► Platelet count <100,000 mm3
► Blood glucose < 50 mg/dL
► Heparin within previous 24 hours, PTT must be within normal range
► > 1/3 hypodensity on CT
► Evidence of ICH on CT
► Symptoms Minor or isolated
► Symptoms clearing spontaneously
► Symptoms of SAH
► Symptoms causing severe deficits
# The Cincinnati Pre-Hospital Stroke Scale - Suspected Stroke Protocol

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facial Droop</strong></td>
<td>Both sides of face move equally</td>
<td>One side of face does not move as well as the other side</td>
</tr>
<tr>
<td>(have patient show teeth or smile)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arm Drift</strong></td>
<td>Both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)</td>
<td>One arm does not move or one arm drifts down compared with the other</td>
</tr>
<tr>
<td>(patient closes eyes and holds both arms straight out for 10 seconds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Abnormal Speech</strong></td>
<td>Patient uses correct words with no slurring</td>
<td>Patient slurs words, uses the wrong words, or is unable to speak</td>
</tr>
<tr>
<td>(have the patient say &quot;you can't teach an old dog new tricks&quot;)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## JCAHO Primary Stroke Centers in or near Kentucky

<table>
<thead>
<tr>
<th>Primary Stroke Center Facility</th>
<th>State</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaconess Hospital</td>
<td>IN</td>
<td>Evansville</td>
</tr>
<tr>
<td>Deaconess Gateway Hospital</td>
<td>IN</td>
<td>Newburgh</td>
</tr>
<tr>
<td>St. Mary’s Medical Center</td>
<td>IN</td>
<td>Evansville</td>
</tr>
<tr>
<td>Baptist Hospital East</td>
<td>KY</td>
<td>Louisville</td>
</tr>
<tr>
<td>Central Baptist Hospital</td>
<td>KY</td>
<td>Lexington</td>
</tr>
<tr>
<td>Jewish Hospital</td>
<td>KY</td>
<td>Louisville</td>
</tr>
<tr>
<td>Sts. Mary and Elizabeth Hospital</td>
<td>KY</td>
<td>Louisville</td>
</tr>
<tr>
<td>The St. Luke Hospitals, Inc.</td>
<td>KY</td>
<td>Ft. Thomas</td>
</tr>
<tr>
<td>St. Luke Hospital West</td>
<td>KY</td>
<td>Florence</td>
</tr>
<tr>
<td>University of Kentucky Hospital</td>
<td>KY</td>
<td>Lexington</td>
</tr>
<tr>
<td>University of Louisville Hospital</td>
<td>KY</td>
<td>Louisville</td>
</tr>
<tr>
<td>St. Claire Medical Center</td>
<td>KY</td>
<td>Morehead</td>
</tr>
<tr>
<td>Nortons: Audubon, Brownsboro, Downtown,</td>
<td>KY</td>
<td>Louisville</td>
</tr>
<tr>
<td>The University Hospital</td>
<td>OH</td>
<td>Cincinnati</td>
</tr>
<tr>
<td>Baptist Hospital</td>
<td>TN</td>
<td>Nashville</td>
</tr>
<tr>
<td>Skyline Medical Center</td>
<td>TN</td>
<td>Nashville</td>
</tr>
<tr>
<td>Vanderbilt University</td>
<td>TN</td>
<td>Nashville</td>
</tr>
<tr>
<td>St. Thomas Hospital</td>
<td>TN</td>
<td>Nashville</td>
</tr>
<tr>
<td>The University of Tennessee Memorial Hospital</td>
<td>TN</td>
<td>Knoxville</td>
</tr>
<tr>
<td>Fort Sanders Regional Medical Center</td>
<td>TN</td>
<td>Knoxville</td>
</tr>
<tr>
<td>St. Mary’s Health System</td>
<td>TN</td>
<td>Knoxville</td>
</tr>
<tr>
<td>Cabell Huntington Hospital</td>
<td>WV</td>
<td>Huntington</td>
</tr>
<tr>
<td>Charleston Area Medical Centers Inc. (3 local hospitals)</td>
<td>WV</td>
<td>Charleston</td>
</tr>
</tbody>
</table>
Obstetrical Emergencies

Basic Standing Orders

► Routine Patient Care.
► Gather specific information:
  ◆ Length of pregnancy, number of previous pregnancies, number of previous live births, last menstrual period, due date, pre-natal care, number of expected babies, drug use.
  ◆ Signs of near delivery: membrane rupture (“water broke”) or bloody show, contractions, urge to move bowels, urge to push, etc.
  ◆ Signs of pre-eclampsia: hypertension, swelling of face and/or extremities.
► Oxygen at high concentration to benefit mother and fetus.
► If the mother is having contractions, perform a visual inspection of the external genitalia and perineum for bulging or crowning. Have your partner be present during the exam. **IF THERE IS CROWNING, PREPARE FOR IMMEDIATE DELIVERY.**
  ◆ Update responding ALS unit if available.
  ◆ Inform the mother of the need for immediate delivery.
  ◆ Ensure a private, clean delivery area and sanitary equipment.
  ◆ Position and drape the mother.
  ◆ Get several towels, warm if possible.
► Do not digitally examine or insert anything into vagina. Exceptions: to manage baby’s airway in breech presentation or to treat prolapsed cord as below, you may insert a hand.
► Contact medical control if:
  ◆ Active labor and delivery is imminent.
  ◆ Post-partum hemorrhage.
  ◆ Breech presentation.
  ◆ Prolapsed cord.
► Place mother in left-lateral recumbent position except as noted.
► Never delay or restrain delivery under normal circumstances.
► Prolapsed cord: knee-chest position or Trendelenberg position; immediately and continuously support infant head or body with your hand to permit blood flow through cord. Transport at once to closest hospital with obstetrical capabilities.
Basic Standing Orders

Delivery Procedures:
► During delivery support the infant’s head with one hand while gently guiding it out of the birth canal to prevent an explosive delivery. Using your other hand with a sterile dressing, support the perineum (area between the vagina and the anus) to help prevent tearing during delivery of the head.
► If the amniotic sac has not broken, use your finger or a clamp to puncture the sac and pull it away from the infant’s head and mouth as they appear.
► Attempt to prevent the infant’s head from coming in contact with fecal material or other contaminants.
► As soon as the head delivers continue to support the infant’s head with one hand. Tell the mother to stop pushing. Inspect the infant for the umbilical cord wrapped around the neck.
  * If the umbilical cord is wrapped around the infant’s neck: Gently loosen the cord and slip it over the infant’s head.
  * If the umbilical cord is wrapped too tightly around the infant’s neck or wrapped around the neck more than once, preventing the delivery of the infant, immediately clamp the umbilical cord with two clamps and cut the cord between them.

Suctioning should be reserved for babies with an obvious obstruction to spontaneous breathing or require positive pressure ventilation.
► Suction the infant’s oropharynx.
  * Insert a compressed bulb syringe 1 – 1 ½ inches into the infant’s mouth.
  * Suction the infant’s oropharynx while controlling the release of the bulb syringe with your fingers.
  * Repeat suction as necessary.
► Suction each of the infant’s nostrils.
  * Insert a compressed bulb syringe no more than ½ inch into the infant’s nostrils.
  * Suction the infant’s nostrils while controlling the release of the bulb with your fingers.
  * Repeat suctioning as necessary.
► Instruct the mother to begin pushing during contractions.
► As soon as the infant has delivered, quickly dry the infant and place the infant on a warm towel (if available) in a face-up position with the head lower than the feet. Keep the infant at the level of the mother’s vagina until the cord is cut!
Perform an initial assessment of the infant. Quickly assess the infant’s respiratory status, pulse and general condition.

- **In term and preterm infants;** If the infant is breathing spontaneously and crying vigorously and has a pulse greater than 100/min:
  - After one minute clamp the umbilical cord with two clamps three inches apart and cut the cord between them. The first clamp will be 8–10 inches from the baby. Place the second clamp 3 inches from the first clamp towards the mother.
  - Cover the infant’s scalp with an appropriate warm covering.
  - Wrap the infant in a dry, warm blanket or towels and a layer of foil over the layer of blankets or towels or use a commercial-type infant swaddler if one is provided with the OB kit. **Do not use foil alone!**
  - Ongoing assessment. Obtain and record vital signs, as often as the situation indicates.
  - Keep the infant warm and free from drafts.

- **Monitor the infant’s respirations continuously.** If the infant is not breathing spontaneously and crying vigorously:
  - If the infant’s respirations are absent or depressed (less than 30/minute in a newborn):
    - Rub the infant’s lower back gently.
    - Snap the bottom of the infant’s feet with your index finger gently.
  - If the respirations remain absent or become depressed (less than 30/minute in a newborn) despite stimulation, or if cyanosis is present:
    - Clear the infant’s airway by suctioning the mouth and nose gently with a bulb syringe.
    - Administer oxygen as soon as possible.
Basic Standing Orders

Delivery Procedures continued:

► If respirations remain absent or depressed (less than 30/minute in a newborn) despite stimulation and oxygen:
  * Insert the proper size oral airway gently.
  * Ventilate the infant with room air for 90 seconds at a rate of 30 – 60 /minute with an appropriately sized pocket mask or bag-valve-mask as soon as possible. After 90 seconds, if no improvement, increase oxygen to 100%. **Assure that the chest rises with each ventilation.**

 ► Monitor the infant’s pulse rate continuously.
  * If the pulse rate drops below 100 beats per minute at any time, assist ventilations at a rate of 30 – 60/minute with supplemental oxygen.
  * If the pulse rate drops below 60 beats per minute at any time add chest compressions to assisted ventilations following AHA/ARC/NSC guidelines.

► Ongoing assessment of the newborn. Obtain and record the vital signs of all patients and repeat enroute as often as the situation indicates.

► **Transport immediately**, keeping the infant warm. **Do not wait for the placenta to be delivered before transporting!**

► Prepare for delivery of the placenta during transport. Delivery of the placenta **usually** occurs within 20 minutes of the delivery of the infant. After delivery of the placenta, place the placenta in a plastic bag or other container and deliver to the receiving hospital. Massage the mother’s abdomen where the fundus can be palpated.

► Ongoing assessment of the mother.
  * Reassess the mother for hypoperfusion. Obtain and record the vital signs of all patients, repeat enroute as often as the situation indicates.
  * Record all patient care information, including the mother’s medical history and all treatment provided for each patient on a separate run report for each patient.
Advanced Standing Orders

A

- Establish one or two IV's of lactated ringers with large bore needle.

Paramedic Standing Orders

P

- Routine Patient Care.
- Follow Neonatal Resuscitation Protocol.
- Monitor the patient.
Basic Standing Orders

Breech Birth
► Do not delay transport! Load and Go to closest appropriate hospital.

• If the buttocks presents first:
  o Administer high concentration oxygen to the mother.
  o Attempt to establish an open path in the birth canal to the infant’s mouth with sterile-gloved fingers. If possible, turn the infant so that the back is toward you.
  o Transport the mother immediately in a face-up position with her hips elevated, while maintaining an open path in the birth canal to the infant’s mouth. Allow mother to push baby out. DO NOT PULL.

• If a limb presents first:
  o Administer high concentration oxygen to the mother.
  o Place the mother in a face-up position with her hips elevated and transport immediately!

Prolapsed Umbilical Cord

• Administer high concentration oxygen to the mother.
• Place the mother in a face-up position with her hips elevated, and using a sterile gloved hand, palpate the cord for pulses.
• Insert a sterile gloved hand into the vagina and gently push up on the presenting part of the fetus to keep pressure off of the cord. Continue to hold the presenting part away from the cord until you are relieved by the ED staff. Do not insert the cord back into the uterus!
• Wrap the exposed cord with sterile towel or dressings. The cord must be kept warm.
• Transport immediately while protecting the umbilical cord from pressure during transportation.

Multiple Births

• Obtain additional help as needed.
• Deliver each multiple birth according to the above protocol for Uncomplicated Childbirth, making sure to clamp and cut each umbilical cord between births.
• If the anticipated second birth does not occur after 10 minutes, transport immediately!
• A Prehospital Care Report (PCR) must be completed for each patient.
Advanced Standing Orders

▸ Establish one or two IV’s of lactated ringers with large bore needle.

Paramedic Standing Orders

▸ Routine Patient Care.
▸ Follow Neonatal Resuscitation Protocol
▸ Monitor the patient.
Unresponsive/Altered Mental Status (AMS) Patient - Adult

**Basic Standing Orders**
- Routine Patient Care.
- Scene and patient management per General Guidelines.
- Administer 100% oxygen by face-mask.
- Immobilize if evidence of trauma.
- Determine level of consciousness (AVPU).
- Perform focused history and physical examination.
- Determine blood glucose level.
- Transport.

**Advanced Standing Orders**
- Establish intravenous access.
- Administer naloxone 2 mg IVP or Intranasal (IN) 2-4 mg.
- If hypoglycemia is suspected, go to Hypoglycemia Protocol.

**Paramedic Standing Orders**
- Maintain airway and ventilation.
- Continuously monitor ECG and Sa02.
Pediatric Medical Protocols
Routine Patient Care Guidelines - Pediatric

All levels of provider will complete an initial and focused assessment on every patient, and as standing order, use necessary and appropriate skills and procedures for which the provider has been trained and certified or approved to perform in order to maintain the patient’s airway, breathing, and circulation.

For the purposes of the protocol, a “pediatric patient” is defined as a child who fits on the length-based resuscitation tape (36 kg or 145 cm). If longer than the length-base resuscitation tape, they are considered an adult. Use of a length-based resuscitation tape is recommended if administering medications or performing other invasive procedures on all pediatric patients.

While this recommendation does not address some emotional and developmental issues, for most therapies, the use of length-based determination of equipment and medications is evidence based. Use of the length-based resuscitation tape is particularly helpful in a situation where there is no confirmed weight or age (e.g. in a disaster setting).

The legal definition of a child is one who has not yet reached his/her eighteenth birthday and is not emancipated.

With the exception of life-threatening emergencies, EMS personnel are to attempt to contact the child’s parent or legal guardian and obtain the guardian’s informed consent to treat and transport the child.

Initial Assessment

Scene Size-Up

► Review dispatch information.
► Assess the scene for safety, mechanism of injury, number and location of patients.
► General impression of patient.
► Assess need for body substance isolation.
► Notify the receiving facility as early as possible.
► Request additional resources as needed: e.g. ALS intercepts, air medical transport, additional ambulances, extrication, hazardous materials team, etc.
► Use Incident Management/Command System (IM/CS) when possible.

Level of Consciousness

► Assess level of consciousness using the AVPU scale.
► Manually stabilize the patient’s cervical spine if trauma is involved or suspected.
► Use AED (if at least 1 year of age; use pediatric pads) and initiate cardiopulmonary resuscitation in accordance with current guidelines.
Routine Patient Care Guidelines – Pediatric continued

**Airway**
- Assess the patient for a patent airway.
- Open the airway using a head-tilt/chin-lift, or a jaw thrust if suspicious of cervical spine injury.
- Suction the airway as needed.
- Consider an oropharyngeal or nasopharyngeal airway.
- Consider advanced airway interventions as appropriate and if trained in use.

**Breathing**
- Assess patient’s breathing taking note of rate, rhythm, and quality of the respirations. Assess lung sounds.
- Look for nasal flaring or accessory muscle usage.
- Assess the chest for symmetrical chest rise, intercostal or supraclavicular retraction, instability, open pneumothorax, tension pneumothorax, or other signs of trauma.
- Treat foreign body airway obstruction in accordance with current guidelines.
- Assist ventilations when outside the ventilation guideline for pediatrics, and when the respiratory rate is less than 10 per minute or greater than 40 for adults, or when the patient exhibits signs of impending respiratory failure.

**Circulation**
- Assess the patient’s pulse taking note of rate, rhythm, and quality.
- Look for and control any obvious gross bleeding.
- Assess patient’s skin color, temperature, and moisture.
- IV access and fluid resuscitation as appropriate for the patient’s condition per appropriate protocol. After IV is established, administer fluids to maintain systolic blood pressure >90 mmHg for adults and at age specific range for pediatric per chart “Pediatric Vital Signs by Age.” Routes of medication administration when written as “IV” can also include “IO”.

**Disability**
- Movement of extremities.
- Facial asymmetry.
- Speech.

**Expose**
- Expose and examine head, neck, chest, abdomen, pelvis and back.
**Secondary Assessment**

**Head-to-toe Survey**

**Neurological Assessment**
- Glasgow Coma Score.
- Pupillary response to light.

**Assess Vital Signs**
- Respiration.
- Pulse.
- Blood pressure.
- Capillary refill.
- Skin condition.
  - Color.
  - Temperature.
  - Moisture.

**Obtain Medical History**
- Symptoms.
- Allergies.
- Medication.
- Past Medical History.
- Last Oral Intake.
- Events leading to Illness or Injury.

**Other Assessment Techniques**
- Cardiac Monitoring.
- Pulse oximetry.
- Glucose determination.
- Temperature.
- End-tidal CO₂
PEDIATRIC ASSESSMENT

**General Impression**
(First view of patient)

- **Abnormal:** Abnormal or absent cry or speech.
  Decreased response to parents or environmental stimuli.
  Floppy or rigid muscle tone or not moving.
  Good muscle tone.
  Moves extremities well.

- **Normal:** Normal cry or speech. Responds to parents or environmental stimuli such as lights, keys, or toys.

**Work of Breathing**
(Visible movement / Respiratory Effort)

- **Abnormal:** Increased/excessive (nasal flaring, retractions or abdominal muscle use) or decreased/absent respiratory effort or noisy breathing.
- **Normal:** Breathing appears regular without excessive respiratory muscle effort or audible respiratory sounds.

**Circulation to Skin**
(Color / Obvious Bleeding)

- **Abnormal:** Cyanosis, mottling, paleness/pallor or obvious significant bleeding.
  Normal: Color appears normal for racial group of child. No significant bleeding.

---

**Airway & Appearance**
(Open/Clear – Muscle Tone / Body Position)

- **Abnormal:** Obstruction to airflow.
  Gurgling, stridor or noisy breathing.
  Verbal, Pain, or Unresponsive on AVPU scale.
  Normal: Clear and maintainable. Alert on AVPU scale.

---

**Initial Assessment**
(Primary Survey)

---

**Breathing**
(Effort / Sounds / Rate / Central Color)

- **Abnormal:** Presence of retractions, nasal flaring, stridor, wheezes, grunting, gasping or gurgling.
  Respiratory rate outside normal range. Central cyanosis.
- **Normal:** Easy, quiet respirations. Respiratory rate within normal range. No central cyanosis.

---

**Circulation**
(Pulse Rate & Strength / Extremity Color & Temperature / Capillary Refill / Blood Pressure)

- **Abnormal:** Cyanosis, mottling, or pallor. Absent or weak peripheral or central pulses; Pulse or systolic BP outside normal range; Capillary refill > 2 sec with other abnormal findings.
- **Normal:** Color normal. Capillary refill at palms, soles, forehead or central body ≤2 sec. Strong peripheral and central pulses with regular rhythm.

---

**Decision/Action Points:**
- Any abnormal findings or life-threatening chief complaint such as major trauma/burns, seizures, diabetes, asthma attack, airway obstruction, etc. (urgent) – proceed to Initial Assessment.
- All findings normal (non-urgent) – proceed to Initial Assessment.

---

**Decision/Action Points:**
- Check for causes such as diabetes, poisoning, trauma, seizure, etc. Assist patient with prescribed bronchodilators or epinephrine auto-injector, if appropriate.
- All findings on assessment of child normal (S) – Continue assessment, detailed history & treatment.

---

<table>
<thead>
<tr>
<th>Normal Respiratory Rate:</th>
<th>Normal Pulse Rate:</th>
<th>Lower Limit of Normal Systolic BP:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (&lt;1 yr): 30-60</td>
<td>Infant: 100-160</td>
<td>Infant: &gt;60 (or strong pulses)</td>
</tr>
<tr>
<td>Toddler (1-3 yr): 24-40</td>
<td>Todder: 90-150</td>
<td>Toddler: &gt;70 (or strong pulses)</td>
</tr>
<tr>
<td>Preschooler (4-5 yr): 22-34</td>
<td>Preschooler: 80-140</td>
<td>Preschooler: &gt;75</td>
</tr>
<tr>
<td>School-age (6-12 yr): 18-30</td>
<td>School-age: 70-120</td>
<td>School-age: &gt;80</td>
</tr>
<tr>
<td>Adolescent (13-18 yr): 12-20</td>
<td>Adolescent: 60-100</td>
<td>Adolescent: &gt;90</td>
</tr>
<tr>
<td></td>
<td>Pulses slower in sleeping child / athlete</td>
<td>Estimated min. SBP &gt;70 + (2 x age in yr)</td>
</tr>
</tbody>
</table>

Developed by New York State EMSC
(Estimate valid ≤ 10 years.)
Birth

Term gestation? Breathing or crying? Good tone?

Yes, stay with mother

No

Warm, clear airway if necessary, dry, stimulate

No

HR below 100, gasping, or apnea?

Yes

Laborer breathing or persistent cyanosis?

Yes

Clear airway \( \text{SpO}_2 \) monitoring Consider CPAP

No

Targeted Pediatric \( \text{SpO}_2 \) After Birth

1 min 60%-65%
2 min 65%-70%
3 min 70%-75%
4 min 75%-80%
5 min 80%-85%
10 min 85%-95%

Postresuscitation care

30 sec

60 sec

HR below 100?

Yes

Take ventilation corrective steps

No

HR below 60?

Yes

Consider intubation Chest compressions Coordinate with PPV

No

Take ventilation corrective steps

- Intubate if no chest rise!

Consider:
- Hypovolemia
- Pneumothorax

HR below 60?

No

IV epinephrine

© 2018 American Heart Association
**Apparent Life Threatening Event (ALTE) – Pediatric**

**Definition:** An Apparent Life-Threatening Event (ALTE) is defined as an episode that is frightening to the observer and is characterized by some combination of:

1. Apnea (central or obstructive)
2. Color change (cyanosis, pallor, erythema)
3. Marked change in muscle tone
4. Unexplained choking or gagging

**INCIDENCE:** The incidence of ALTE episodes for the general infant population is reported to vary between 0.5% and 6%. Although it usually occurs in infants <12 months old, any child under 24 months who experiences any of the above may be considered at risk for an ALTE episode.

**CONDITIONS RESPONSIBLE FOR ALTE:** A wide variety of illnesses and etiologies are associated with an ALTE episode. These include:

1. Airway disease
2. Cardiac arrhythmias /anomalies
3. Child abuse
4. Gastroesophageal reflux
5. Infantile botulism Infections
6. Inborn errors of metabolism
7. Sepsis
8. Intracranial hemorrhage
9. Meningitis
10. "Near-miss" SIDS
11. Pertussis (whooping cough)
12. Respiratory syncytial virus
13. Seizure

**Basic Standing Orders**

- Routine Patient Care.
- ABCs; consider use of the Pediatric Assessment Triangle.
- Measure and record temperature (and degree of any reported fever).
- Provide blow-by oxygen as tolerated; perform pulse oximetry for reported apneic events.
- Obtain glucose reading.
- **Transport all infants with an ALTE. If transport is being refused contact medical control.**
- Consider ALS transport, if patient is symptomatic.

**Paramedic Standing Orders**

- Check cardiac rhythm.
- Consider possible overdose.
- **Transport all infants with an ALTE. If transport is being refused contact medical control.**
**Sudden Infant Death Syndrome (SIDS)**

**Definition:** The unexpected, sudden death of seemingly normal, healthy infants that occur during sleep with no physical evidence of disease.

Note the position and condition of the patient and surroundings and preserve the scene. Use extreme tact and professionalism. Do not let emotions or prejudices interfere with carrying out appropriate patient care or family support.

► Do not make judgments concerning the situation.
► Do not add to the parents’ sense of guilt or helplessness.
► Remember, people react differently to stressful situations.

**Basic Standing Orders**

► Begin resuscitation immediately unless rigor mortis, severe lividity, or early tissue breakdown is evident. If any doubt, resuscitate. Refer to Pediatric Cardiac Arrest Protocol.

If resuscitation is begun:

★ Transport, continue treatment enroute.
★ Contact medical control.
★ Call for ALS backup.

**Paramedic Standing Orders**

► Refer to Pediatric Cardiac Arrest Protocol.

**KEY POINTS:** Don’t let emotions interfere with treatment. Provide emotional support for the parents. Document all aspects of scene and environmental conditions.
**Neonatal Resuscitation**

**Definition:** Neonatal resuscitation refers to the series of interventions used to stimulate spontaneous respiratory effort. The typical newborn response to hypoxia is apnea and bradycardia.

**Basic Standing Orders**

- Position the airway.
- Suctioning the mouth and nasopharynx reserved for babies with obvious obstruction to spontaneous breathing.
- Dry and keep warm with thermal blanket or dry towel. Cover scalp with stocking cap.
- Stimulate by drying vigorously including the head and back.
- Clamp and cut the cord after 30 seconds.
- Evaluate respirations.
- Assisted bag-valve-mask ventilation 40-60 breaths/minute with room air. If after 90 seconds of resuscitation with a lower oxygen concentration, increase oxygen to 100% until recovery of a normal heart rate. Amount of oxygen should be guided by oximetry in right upper extremity.
- Check heart rate at umbilical cord stump, or brachial artery.

**Paramedic Standing Orders**

<table>
<thead>
<tr>
<th>Pulse</th>
<th>&lt; 60/min</th>
<th>60-100/min</th>
<th>&gt;100/min</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued assisted ventilation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Begin chest compression at a rate of 120 events/min. (i.e. 3:1 as 90 compressions and 30 breaths)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If no improvement after 30 seconds, perform tracheal intubation.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>If no improvement, establish vascular access and give epinephrine (1: 10,000) 0.01 mg/kg (0.1 ml/kg) IV or IO, or 0.03 mg/kg (0.3 ml/kg) ET. Repeat q 3-5 min. prn.</td>
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<tr>
<td>Continue assisted ventilation.</td>
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<tr>
<td>Reassess heart rate and respiration enroute. Perform tracheal intubation if no improvement.</td>
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<tr>
<td>Check skin color. If central cyanosis, give oxygen by mask or blow by guided by oximetry.</td>
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<tr>
<td>Reassess heart rate and respirations enroute.</td>
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</tbody>
</table>
Cardiac Arrest - Pediatric

Basic Standing Orders

► Routine Patient Care – with focus on CPR.
► If age – appropriate AED is available on scene, providers may use/continue to use it.
  ◦ Use age–appropriate pads.
  ◦ Follow manufacturer’s instructions.
► If age – appropriate AED is not available, may use adult pads if patient > 1 year of age. Do not let pads contact each other.
► For trauma, minimize scene time.
► Consider treatable causes: overdose/poisoning, hypothermia; treat as per specific protocol.
► Consider paramedic intercept.

Advanced Standing Orders

► Do not delay transport for IV/IO access, advanced airway, or medications.
► Consider 1 or 2 large bore IV’s en route, bolus 0.9% NaCl (normal saline) 20 ml/kg.

Paramedic Standing Orders

► Document presenting cardiac rhythm in two separate leads if possible.
► Advanced airway management.
► Consider intraosseous access.
► IV/IO administration of medications ispreferred over administration via ETT.
► Consider nasogastric or orogastric tube to decompress the stomach of intubated patients.

For ASYSTOLE or PEA
► Give Epinephrine (1:10,000) 0.01 mg/kg (0.1 ml/kg) IV or 0.1 mg/kg (1:1000; 0.1 ml/kg) via ETT, repeat every 3 - 5 minutes.
► Give 5 cycles of CPR, then check rhythm.
Cardiac Arrest - Pediatric continued

Paramedic Standing Orders continued

▶ If no rhythm, continue epinephrine and 5 cycles of CPR until:
  ♦ pulse obtained
  ♦ shockable rhythm obtained, or
  ♦ decision made to discontinue further efforts.

▶ If rhythm noted, determine if it is shockable if so, go to VF/Pulseless VT; if not, continue Epinephrine and 5 cycles of CPR until:
  ♦ pulse obtained,
  ♦ shockable rhythm obtained, or decision made to discontinue further efforts.

For VF/Pulseless VT
▶ Defibrillate at 2 J/kg; deliver 5 cycles of CPR and recheck rhythm; if still a shockable rhythm, defibrillate at 4 J/kg; deliver 5 cycles of CPR; give Epinephrine (1: 10,000) 0.01 mg/kg (0.1 ml/kg) IV/IO or 0.1 mg/kg (1:1000; 0.1 ml/kg) via ETT.
  ♦ repeat every 3 - 5 minutes
▶ If still a shockable rhythm, defibrillate at 4 J/kg; deliver 5 cycles of CPR; consider:
  ♦ Amiodarone 5 mg/kg (maximum 300 mg) IV or
  ♦ Magnesium sulfate 25 – 50 mg/kg (max. 2 grams) IV/IO over 1 – 2 minutes for torsades de pointes.
▶ If pulse obtained, begin post-resuscitation care.

Consider treatable causes
▶ For trauma consider bilateral needle chest decompressions.
▶ For suspected or known hyperkalemia (dialysis patient), or known tricyclic antidepressant overdose, consider sodium bicarbonate 1 mEq/kg IVP.

For Post-resuscitation hypotension
▶ IV Normal Saline 20 ml/kg and/or
▶ Consider:
  ♦ *Dopamine infusion 5 – 20 mcg/kg/min.

* Note: An infusion pump is required for the use of pressor agents.
Bradycardia (Symptomatic) - Pediatric

<table>
<thead>
<tr>
<th>AGE</th>
<th>Mean</th>
<th>Lower limit of normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn to 3 months</td>
<td>140</td>
<td>85 (80 sleep)</td>
</tr>
<tr>
<td>3 months to 2 years</td>
<td>130</td>
<td>100 (70 sleep)</td>
</tr>
<tr>
<td>2 years to 10 years</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>75</td>
<td>60</td>
</tr>
</tbody>
</table>

**Basic Standing Orders**

- Routine Patient Care.
- Maintain airway.
- Consider underlying causes of bradycardia (e.g. hypoxia).
- Provide high-flow oxygen and consider assisting ventilations.
- Monitor vital signs, including pulse oximetry.
- Begin/continue CPR in child if HR< 60bpm and hypoperfusion despite oxygen.
- Consider ALS intercept.

**Advanced Standing Orders**

- IV access and administer fluids to maintain hemodynamic status.

**Paramedic Standing Orders**

- Epinephrine 0.01 mg/kg IV (0.1 ml/kg of 1:10,000) every 3-5 minutes
- Consider atropine 0.02mg/kg (min single dose 0.1mg, - total max dose is 1 mg).
- Consider transcutaneous pacing at minimum output and increase until capture achieved for rate appropriate to age.
- Consider procedural sedation prior to pacing
  - Midazolam 0.05 mg/kg IV, or
  - Diazepam 0.05 mg/kg IV
- Consider glucose if hypoglycemia suspected.
Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm

1 Identify and treat underlying cause
- Maintain patent airway; assist breathing as necessary
- Oxygen
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IO/IV access
- 12-Lead ECG if available; don’t delay therapy

2 Cardiopulmonary compromise?
- Hypotension
- Acutely altered mental status
- Signs of shock

No

3 CPR if HR <60/min with poor perfusion despite oxygenation and ventilation

4a Support ABCs
- Give oxygen
- Observe
- Consider expert consultation

No

4 Bradycardia persists?

Yes

5 Epinephrine
- Atropine for increased vagal tone or primary AV block
- Consider transthoracic pacing/transvenous pacing
- Treat underlying causes

Yes

6 If pulseless arrest develops, go to Cardiac Arrest Algorithm

Doses/Details

Epinephrine IO/IV dose:
0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If IO/IV access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of 1:1000).

Atropine IO/IV dose:
0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.
Tachycardia - Pediatric

<table>
<thead>
<tr>
<th>AGE</th>
<th>Mean</th>
<th>Upper limit of normal</th>
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</thead>
<tbody>
<tr>
<td>Newborn to 3 months</td>
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<td>3 months to 2 years</td>
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</tr>
<tr>
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<td>80</td>
<td>140</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

**Basic Standing Orders**

- Routine Patient Care.
- Assess and support ABC’s as needed.
- Provide high-flow oxygen and consider assisting respiration.
- Consider Paramedic intercept.

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >minimum for age and signs of adequate perfusion.

**Paramedic Standing Orders**

- Identify rhythm using cardiac monitor and 12-lead EKG if available.
- Evaluate QRS duration.
- Consider treatable causes.

Consider procedural sedation prior to cardioversion
- Midazolam 0.05 mg/kg IV, or
- Diazepam 0.05 mg/kg IV.

PSVT or narrow complex tachycardia
- Consider vagal stimulation unless patient is very unstable or if it does not unduly delay chemical or electrical cardioversion:
  - **Infants and Young Children**: apply ice to face without occluding airway.
  - **Older Children**: Valsalva. Blow through obstructed straw.
- Adenosine 0.1mg/kg IV not to exceed 6 mg (first dose). May repeat once at 0.2mg/kg not to exceed 12mg (subsequent dose).
- If unstable, synchronized cardioversion 0.5 to 1 J/kg, increase to 2 J/kg if not effective.

For suspected VT (wide complex >0.09 sec)
- If unstable, synchronized cardioversion 0.5 to 1 J/kg
Tachycardia Algorithm - Pediatric

Pediatric Tachycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don’t delay therapy

2. Evaluate QRS duration
   - Narrow (≤0.09 sec)
   - Evaluate rhythm with 12-lead ECG or monitor
     - Probable sinus tachycardia
       - 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

   - Wide (>0.09 sec)
     - Probable supraventricular tachycardia
       - Compatible history (vague, nonspecific); history of abrupt rate changes
       - P waves absent/abnormal
       - HR not variable
       - Infants: rate usually ≥220/min
       - Children: rate usually ≥180/min

3. Evaluate rhythm with 12-lead ECG or monitor

4. Search for and treat cause

5. Consider vagal maneuvers (No delays)

6. If IO/IV access present, give adenosine
   - or
   - If IO/IV access not available, or if adenosine ineffective, synchronized cardioversion

7. Consider synchronized cardioversion

8. Synchronized cardioversion
   - Cardiopulmonary compromise?
     - Hypotension
     - Acutely altered mental status
     - Signs of shock

9. Possible ventricular tachycardia

10. Synchronized cardioversion
    - Consider adenosine if rhythm regular and QRS monomorphic

11. Yes

12. No

13. Consider consultation advised
    - Amiodarone
    - Procainamide

Doses/Details

- **Synchronized Cardioversion**
  - Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg.
  - Sedate if needed, but don’t delay cardioversion.

- **Drug Therapy**
  - **Adenosine IO/IV dose:**
    - First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg).
    - Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg).
  - **Amiodarone IO/IV dose:**
    - 5 mg/kg over 20-60 minutes
    - or
  - **Procainamide IO/IV dose:**
    - 15 mg/kg over 30-60 minutes
    - Do not routinely administer amiodarone and procainamide together.

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Expert Consultation Advised prior to other pharmacologic treatment
Shock - Pediatric

Hypoperfusion or shock is defined as a decreased effective circulation, with inadequate delivery of oxygen to tissues. Shock may be present in its early stage (compensated) or its late stage (decompensated). Pediatric shock may exist with normal, high, or low blood pressure.

**Basic Standing Orders**

- Refer to Routine Patient Care Guidelines.
- Identify signs and symptoms of shock:
  - Poor capillary refill
  - Decreased peripheral pulses
  - Cool, mottled extremities
  - Altered level of consciousness: lethargy, hallucinations, agitation, coma
  - Tachycardia
  - Tachypnea
  - Decreased urine output
- If trauma with ongoing bleeding, stop external hemorrhage.
- Use pulse oximeter, if available. Apply 100% oxygen by non-rebreather mask.
- Pediatric airway management prn.
- Transport and call for additional orders.

**Advanced Standing Orders**

**HYPOVOLEMIA**

- Vascular access. IO may be indicated if peripheral IV access attempts fail.
- Fluid boluses: 20 ml/kg IV or IO of NS or LR.
- Obtain blood glucose and follow hypoglycemia protocol if < 60 mg/dl.
- If suspected history of volume loss and no improvement after initial fluid bolus, administer additional fluid boluses at 20 ml/kg.

**Paramedic Standing Orders**

**CARDIOGENIC**

- Consider rhythm disturbance. If supraventricular tachycardia or ventricular tachycardia with a pulse and evidence of low cardiac output, follow protocol for Pediatric Tachycardia.
- Fluid bolus, 10 ml/kg NS or LR IV or IO.
- Consider dopamine.
Shock – Pediatric continued

Paramedic Standing Orders continued

DISTRIBUTIVE (Septic)
► Fluid boluses: 20 ml/kg NS or LR IV or IO.
► If history of fever or suspected infection, give additional boluses of 20 ml/kg prn, to 60 ml/kg.
► If suspected allergic reaction, follow protocol for Pediatric Anaphylaxis.
► Consider dopamine.
► Contact medical control for permission and rate of dopamine. Use premixed dopamine with infusion pump.
► Stop dopamine for IV extravasation or extremity blanching distal to IV.

Key Points/Considerations
► Use appropriate barrier precautions.
Allergic Reaction/Anaphylaxis – Pediatric

Anaphylaxis is determined by suspected exposure to an allergen and one or more of the following:

► Severe respiratory distress.
► Airway compromise/impending airway compromise (wheezing, swelling of the lips/tongue, throat tightness).
► Signs of shock.
Allergic Reaction/Anaphylaxis – Pediatric: Minor

Symptoms such as rash, itching or hives evident; normal perfusion, no dyspnea.

Basic Standing Orders

- Routine Patient Care
- Maintain airway and administer high flow oxygen:
  - Infants via infant mask @ 2-4 L/min.
  - Small child (1-8 yrs) via pediatric mask @ 6-8L/min.
  - Older child (9-15 years) via non-rebreather mask @ 10-15 L/min.
  - If mask not tolerated, administer via blow-by method.
  - Remove allergen.
  - Check vital signs frequently.
  - Begin transport, consider ALS intercept.
  - Consider patient assisted medication.

- Consider
  - Albuterol 1 Nebulizer treatment:
    - < 1 year or <10 kg: mix 1.25 mg in 1.5 ml NS (Normal Saline) 0.083%
    - 1 year or >10 kg: mix 2.5 mg in 3 ml NS (Normal Saline) 0.083%
      May repeat twice PRN

Paramedic Standing Orders

- Consider Diphenhydramine 1 mg/kg (maximum 25 mg) IM, IV or PO.
Allergic Reaction/Anaphylaxis – Pediatric: Moderate

Edema, hives, wheezing, normal perfusion

**Basic Standing Orders**

- Routine Patient Care.
- Maintain airway and administer oxygen at high flow, preferably by non-rebreather facemask at 12-15L/min to maintain oxygen saturation of at least 95%.
  - Remove allergen
  - Check vital signs frequently
  - Begin transport, consider ALS intercept
  - Consider patient assisted medication

- Consider
  - Albuterol 1 Nebulizer treatment:
    - < 1 year or <10 kg: mix 1.25 mg in 1.5 ml NS (Normal Saline) 0.083%
    - 1 year or >10 kg: mix 2.5 mg in 3 ml NS (Normal Saline) 0.083%
      - May repeat twice PRN
  - Epinephrine (1:1000) 0.01 mg/ kg (maximum 0.15 mg) SQ,

**Paramedic Standing Orders**

- Diphenhydramine 1 mg/kg (maximum 25 mg) IM/IV.
Allergic Reaction/Anaphylaxis – Pediatric: Severe

**Basic Standing Orders**

- Ensure adequate ABCs. Administer oxygen to keep \( \text{SaO}_2 > 90\% \).
- If patient was exposed to an allergen and exhibits severe respiratory distress or shock administer ONE of the following:
  - Epipen Autoinjector (8 years of age or older) or
  - Epipen Jr. Autoinjector (less than 8 years/55 lbs) or
  - Epinephrine 1:1000, 0.3 mg (0.3ml) (8 years of age or older) or
  - Epinephrine 1:1000, 0.15 mg (0.15ml) (less than 8 years/55 lbs).
- Begin Transport and request ALS intercept.
- Monitor ABCs and Vital Signs. Assist ventilations if necessary.
- Consider
  - Albuterol 1 Nebulizer treatment:
    - < 1 year or <10 kg: mix 1.25 mg in 1.5 ml NS (Normal Saline) 0.083%
    - 1 year or >10 kg: mix 2.5 mg in 3 ml NS (Normal Saline) 0.083%
  - May repeat twice PRN

**NOTE:** ***If signs and symptoms do not resolve, contact Medical Control for orders to repeat Epinephrine.***

**Advanced Standing Orders**

- IV access.
  - *If hypotensive, infuse 0.9% NaCl (Normal Saline) 20 ml/kg to maintain hemodynamic status.*

**Paramedic Standing Orders**

- Methylprednisolone (Solu-Medrol®) 2 mg/kg IV, max dose 125 mg).
- Diphenhydramine 1 mg/kg (maximum 25 mg) IM/IV.
- May repeat Epinephrine (1:1000) 0.1 mg/kg (maximum 0.15 mg) SQ.
- Consider early intubation.
Asthma/RAD/Croup - Pediatric

BRONCHOSPASM

A silent chest is an ominous sign indicating that respiratory failure or arrest is imminent.

Definition: Bronchospasm is usually accompanied by respiratory distress with the following findings:

► wheezing
► prolonged expiration
► increased respiratory effort (decreased effort may be noted as patient’s condition approaches respiratory failure)
► severe agitation, lethargy
► hypoxemia
► suprasternal and substernal retractions
► tripod positioning

Basic Standing Orders

► Routine Patient Care.
► Wear N95 mask if bioterrorism related event or highly infectious agent suspected. If suspected epiglottitis, limit evaluation/interventions to only those necessary.
► If available, request ALS intercept/intervention ASAP.
► Assist patient with his/her own MDI, if appropriate; only MDIs containing beta adrenergic bronchodilators (e.g. albuterol, Ventolin, Proventil) may be used: 2 puffs; repeat every 5 minutes as needed while transporting; contact medical control if delayed.
► Obtain pulse oximetry reading.
► Oxygen 15 LPM via nonrebreather or 4 LPM via nasal cannula if mask not tolerated.
► For patients with croup, provide humidified oxygen.
► Assist ventilations with BVM and 100% oxygen if respiratory effort is ineffective.
► Consider albuterol 2.5 mg (0.5 ml of 0.5% solution) in 3 ml normal saline solution via nebulizer every 5 minutes X 4 total doses
► Do not delay transport to administer medications.
**Asthma/RAD/Croup – Pediatric continued**

**Key Points** - It is extremely important to reassure a frightened child. IV access should be reserved for situations when the line is necessary to treat.

**Advanced Standing Orders**

- Assess circulation, perfusion and mental status.
- Consider albuterol 2.5mg (0.5 ml of 0.5% solution) in 3 ml normal saline solution via nebulizer every 5 minutes x 4 total doses.
- Consider epinephrine (1:1,000) 0.01mg/kg SQ (maximum 0.3mg = 0.3 ml) for patients unable to inhale nebulized albuterol.
- IV access and administer fluids to maintain hemodynamic status.

**Paramedic Standing Orders**

- Consider methylprednisolone 1 mg/kg (maximum 125 mg) IV for severe exacerbation or patient who does not respond after first nebulizer treatment.
- If airway not maintained by other means, including attempts at assisted ventilation or if prolonged assisted ventilation is anticipated, consider endotracheal intubation.
- Initiate cardiac monitoring.
- Perform focused history and detailed physical exam enroute to the hospital.
Diabetic Emergencies: Hypoglycemia - Pediatric

Basic Standing Orders

► Routine Patient Care.
► Obtain glucose reading via glucometer.
► If the patient can swallow and hypoglycemia is present, administer oral glucose.
► Consider ALS intercept.

Advanced Standing Orders

► IV access and administer fluids to maintain hemodynamic status.
► **Age < 30 Days**: administer dextrose 0.25 gm/kg IVP (2.5 ml/kg) of D10 (or D25 diluted 1:1).
► **Age > 30 Days and < 2 Years**: administer dextrose (D25) 0.25 gm/kg (1 ml/kg) IVP (D50 diluted 1:1 for a 25% solution).
► **2 Years or more**: administer dextrose (D50) 0.25 gm/kg (0.5 ml/kg) IVP or PR (maximum 25 gms).
► If unable to obtain IV or IO access: administer glucagon 1mg IM or SQ for patients > 30 Days.
Diabetic Emergencies: Hyperglycemia - Pediatric

**Basic Standing Orders**
- Routine Patient Care.
- Obtain glucose reading via glucometer.
- Consider ALS intercept for abnormal vitals signs or altered level of consciousness.

**Advanced Standing Orders**
- IV access and administer Normal Saline to maintain systolic blood pressure > minimum and signs of adequate perfusion.
- Maintain patent airway and adequate ventilations.
- Transport.

**Paramedic Standing Orders**
- Airway management as needed.
- Transport.
Non-Traumatic Abdominal Pain - Pediatric

This protocol should be used for patients that complain of abdominal pain without a history of trauma. Assessment should include specific questions pertaining to the GI/GU systems.

Abdominal physical assessment includes:
Ask patient to point to area of pain (palpate this area last). Gently palpate for tenderness, rebound tenderness, distension, rigidity, guarding, and pulsatile masses. Also palpate flank for CVA tenderness.

Abdominal history includes:
- History of pain (OPQRST)
- History of nausea/vomiting (color, bloody, coffee grounds)
- History of bowel movement (last BM, diarrhea, bloody, tarry)
- History of urine output (painful, dark, bloody)
- History of abdominal surgery
- SAMPLE (attention to last meal)

Additional questions should be asked of the female adolescent patient regarding OB/GYN history. An acute abdomen can be caused by appendicitis, diabetic ketoacidosis, incarcerated hernia, intussusception, UTI, kidney stone, pelvic inflammatory (PID).

**Basic Standing Order**

- Routine patient care.
- Nothing by mouth.
- Supplemental oxygen as warranted with NC, blow-by, or non-rebreather mask.
- Transport in position of comfort.

**Advanced Standing Orders**

- Consider establishing an IV access with NS or RL and administer a fluid bolus of 20 ml/kg.

**Paramedic Standing Orders**

- Consider monitoring patient IF signs of decreased perfusion. Refer to Shock-Pediatric Protocol.
Poisoning: Overdose - Pediatric

Basic Standing Orders

► Consider waiting for law enforcement to secure the scene.
► Remove patient from additional exposure.
► Routine Patient Care.
► Absorbed poison:
  • Remove clothing and fully decontaminate.
  • If eye is involved, irrigate at least 20 minutes without delaying transport.
► Inhaled/injected poison:
  • Administer high-flow oxygen.
  • Note: Pulse oximetry may not be accurate for some toxic inhalation patients.
► Ingested poison:
  • Contact Poison Control at (800) 222-1222 as soon as practicable if you have any questions.
  • Review circumstances of overdose with medical control and poison control. If the decision is to administer activated charcoal, follow Pediatric Activated Charcoal Protocol.
  • Bring container to receiving hospital.
► Envenomations:
  • Immobilize extremity in dependent position. Consider ice pack for bee stings.
► For MCI related to organophosphate exposure see Nerve Agents & Organophosphates.
► Suggested Narcotic Antidotes: Naloxone 0.1 mg / kg up to 2 mg IN. If no response, may repeat initial doses every 5 minutes to a total of 10.
► Consider ALS intercept/Air Medical Transport.
Poisoning: Overdose - Pediatric continued

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure > minimum for age and signs of adequate perfusion.
- **Suggested Narcotic Antidotes:** Naloxone 0.1 mg/kg up to 2 mg, IV push, IM, SQ, or IN. If no response, may repeat initial dose every 5 minutes to a total of 10.

**Paramedic Standing Orders**

**Suggested Antidotes**

- **Tricyclic antidepressant**
  - Sodium bicarbonate 1 mEq/kg IV.
- **Beta-Blocker**
  - Glucagon 0.025-0.05 mg IV, IM, SQ.
- **Ca Channel Blocker**
  - Calcium Chloride 20 mg/kg/dose IV over five minutes, repeat if necessary. Glucagon 0.025-0.05 mg/kg IV.
- **Organophosphates**
  - Atropine: 0.05 - 0.1 mg/kg IV or IM (minimum dose of 0.1, maximum dose 5 mg) repeat 2-5 minutes as needed.
  - Pralidoxime: 25 - 50 mg/kg/dose IV for maximum dose 1gm or IM for maximum dose of 2 gm, repeat within 30-60 minutes as needed, and every hour for 1–2 doses as needed.
Poisoning: Nerve Agents and Organophosphates MCI – Pediatric

**Basic Standing Orders**

- Routine Patient Care
- Assess for SLUDGEM (salivation, lacrimation, urination, defecation, gastric upset, emesis, muscle twitching) and KILLERBs: (Bradycardia, Bronchorrhea, Bronchospasm).
- Remove to cold zone after decontamination and monitor for symptoms.
- Antidotal therapy should be started as soon as symptoms appear.
- Mark-1 Kit Auto-injectors for use only in Mass Casualty Incidents
- All injections must be given IM.
- Atropine (tube#1) should always be given before 2-PAM chloride (tube#2).
- Determine dosing according to the following guidelines:

<table>
<thead>
<tr>
<th>Triage</th>
<th>Symptoms</th>
<th>Triage Level: Disposition</th>
<th>Atropine Correct hypoxia before IV (risk of torsades, V-fib)</th>
<th>Pralidoxime</th>
<th>Diazepam May use other benzodiazepines (e.g. Midazolam)</th>
</tr>
</thead>
</table>
| RED    | Apnea, Convulsions, Cardiopulmonary Arrest | Immediate – Severe: Admit intensive care status | 0.05-0.1 mg/kg IV, IM per ETT  
⇒ No maximum  
⇒ Repeat q5-10 minutes as above | 25-50 mg/kg IV or IM as above |  |
| YELLOW | Miosis and any other symptom | Immediate – Moderate: Admit  
Repeat as needed q5-10 minutes until respiratory status improves | 0.05 mg/kg IV or IM | 25-50 mg/kg IV or IM  
May repeat q 1 hour.  
Watch for:  
⇒ Muscle rigidity  
⇒ Laryngospasm  
⇒ Tachycardia | For any neurologic effect:  
⇒ 30 days to 5 years-0.05 to 0.3 mg/kg/IV to a maximum dose of 5mg/dose.  
⇒ 5 years and older-0.05 to 0.3 mg/kg IV to a maximum dose of 10/mg/dose.  
May repeat q15-30 minutes |
Poisoning: Radiation Injuries MCI

Exposure to radioactive source or radioactive materials/debris.

**Basic Standing Orders**

- Remove patient from scene and decontaminate by appropriately trained personnel.
- Wear N95 mask.
- Triage tools for mass casualty incident:
  - If vomiting starts
    - within 1 hour of exposure, survival is unlikely and patient should be tagged “Expectant.”
    - after less than 4 hours of exposure, patient needs immediate decontamination and evaluation and should be tagged “Immediate.”
    - after 4 hours, re-evaluation can be delayed 24 – 72 hours if no other injury is present and patient tagged “Delayed.”
- Treat traumatic injuries and underlying medical conditions.
- Patients with residual contamination risk from wounds, shrapnel, and internal contamination should be wrapped in water-repellent dressings to reduce cross contamination.

**Advanced Standing Orders**

- IV access and administer fluids to adults hemodynamically stable if situation permits.

**Paramedic Standing Orders**

- Consider anti-emetic.
- Consider pain control.
Seizures - Pediatric

Basic Standing Orders

- Routine Patient Care.
- Do not attempt to restrain the patient; protect the patient from injury.
  - Suction as needed.
  - Consider nasopharyngeal airway.
  - Oxygen 15LPM via non-rebreather mask.
  - Assist ventilations with 100% oxygen via bag valve mask if necessary to maintain oxygen saturation > 95%.
  - Protect patient from injury – place on side.

History preceding seizure is very important. Find out what precipitated seizure (e.g. medication non-compliance, active infection, trauma, hypoglycemia, substance abuse, third-trimester pregnancy, etc.).

- Has diazepam rectal gel been prescribed by patient’s physician? If yes, advise caregiver to administer according to patient’s prescribed treatment.
- Determine if emergency is related to implanted vagus nerve stimulator. Ascertain when vagus nerve stimulator was implanted, when last checked by physician, current settings, history of magnet use, changes in seizure intensity.

- Obtain patient’s temperature (rectal route preferred as appropriate), see Fever-Pediatric Protocol.
- Request ALS intercept for ongoing or recurrent seizure activity.

Advanced Standing Orders

- Monitor vital signs and pulse oximeter.
- IV access and administer fluids to maintain hemodynamic status.
- If blood glucose reading less than 60 mg/dl see Diabetic Emergencies: Hypoglycemia.

Paramedic Standing Orders

- Consider advanced airway control as needed.
- Monitor EKG.
- If generalized seizure activity is present, consider
  - Diazepam 0.2 mg/kg IV or 0.5 mg/kg PR (single maximum dose 5 mg or 10 mg PR). or
  - Midazolam 0.1 mg/kg IV/IM/IO (single maximum dose 4 mg)
  - See IN Midazolam chart pg 277.
- Any of the above may be repeated once in 5 minutes.
FEVER (>101.5° F/ 38.5 °C)- Pediatric

This protocol is not intended for patients suffering from environmental hyperthermia.

Any child less than 60 days old with a documented temperature (by parent/caregiver or EMS) > 100.4° rectally (99.4° axillary) must be transported for evaluation. Medical control must be contacted prior to accepting any refusal.

Basic Standing Orders

► Routine Patient Care.
► Wear N95 mask if bioterrorism related event or highly infectious agent suspected.
► Obtain temperature. –(rectal temperature preferred as appropriate)
► Passive cooling: remove excessive clothing/ bundling.
► Do not cool to induce shivering.

For temperatures of 101.5°F (38.5°C) or greater

► If child had acetaminophen more than 4 hours ago, then consider administering acetaminophen 15 mg/ kg PO/PR
► If last dose of acetaminophen was given less than 4 hours ago, but was less than 15 mg/kg, then consider administering a “make up” dose to bring the total dose up to 15 mg/ kg.
Nausea/Vomiting – Pediatric

**Basic Standing Orders**
- Routine Patient Care.

**Advanced Standing Orders**
- IV access and administer fluids to maintain hemodynamic status.

**Paramedic Standing Orders**
- Medications to be administered with online medical control. Ondansetron 0.1 mg/kg (maximum single dose of 4mg).
**Dehydration – Pediatric**

Dehydration may be caused by vomiting, diarrhea and poor fluid intake. This may be exhibited by poor capillary refill, tachycardia, decreased (altered) mental status, and lower blood pressure.

Infants may have a sunken fontanelle or eyes, poor skin turgor and hypoglycemia.

---

**Basic Standing Orders**

- Routine Patient Care.
- Maintain patient airway.
- Oxygen 15 LPM via non-rebreather or 4 LPM via nasal cannula, if mask is not tolerated, consider blow by.
- Obtain glucose reading via glucometer.
- Obtain history.
- Consider ALS backup if available, if patient is hemodynamically abnormal.
- Transport.

---

**Advanced Standing Orders**

- If patient is hemodynamically abnormal, establish IV with Normal Saline or LR. If unsuccessful after 2 attempts, consider IO.
- If signs of inadequate perfusion, give 20cc/kg bolus of normal saline, may repeat 3 times.
- Monitor vital signs and Pulse Oximetry.

---

**Paramedic Standing Orders**

- Monitor EKG.
- Contact medical control for further orders, if needed.
- Transport.

Note: Monitor for signs of pulmonary edema when administering fluid bolus.
Unresponsive/Altered Mental Status (AMS) Patient - Pediatric

**Basic Standing Orders**
- Routine Patient Care.
- Scene and patient management per General Guidelines.
- Administer 100% oxygen by bag-valve-mask.
- Thorough medical history including recent illness, medication, accidental ingestion.
- Determine blood glucose level.
- Consider ALS intercept.

**Advanced Standing Orders**
- Continuously monitor ECG and Sp02.
- Establish intravenous access (intraosseous may be appropriate if cardiorespiratory compromise exists).
- Determine blood glucose level:
  - If BG < 80 mg/dl, or cannot be determined, administer dextrose via IV or IO.
- Administer narcan 0.1 mg/kg (maximum dose of 2 mg) IV or IO.
- If evidence of shock (hypotension, tachycardia, poor capillary refill), administer NS bolus of 20 ml/kg. If evidence of shock persists, you may repeat the 20 ml/kg bolus 2 times.

**Paramedic Standing Orders**
- Maintain airway and ventilation.
- Transport.
- Contact medical control for additional instructions.
Children with Special Health Care Needs

These protocols cover specific types of special healthcare needs in pediatric patients. “Children with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typically developing children.”

The general approach to children with special healthcare needs includes the following:

► Priority is given to the ABCs.
► Do not be overwhelmed by the machines.
► Listen to the caregiver.
► If a nurse is present, rely on their judgment.
► Remember: the child’s cognitive level of function may be altered.
► Assume that the child can understand exactly what you say.
► Bring all medications and equipment to the hospital.
► Ask about any form that may delineate specific resuscitation limitations.

Obtaining a history includes asking the parent/caregiver the following:

► Child’s normal vital signs.
► Child’s actual weight.
► Developmental level of the child.
► Child’s allergies—include latex.
► Pertinent medications/therapies.

Listen to the caregivers. They know their child best. Inquire about:

- Child’s baseline abilities - Syndromes/Diseases - What is Different Today
- Devices and Medications - Usual Vital Signs - Symptoms

► Assess & communicate with the child based on developmental age.
► Look for MedicAlert® jewelry or health forms, if usual caregiver is not available.
► Bring necessary specialized equipment into the ED with the child if possible (ventilator, trach or gastrostomy tube, etc).
► Ask caregivers best way to move the child, particularly if the child is very prone to fractures, such as in osteogenesis imperfecta (‘brittle bone disease’). If child suffers a fracture & has a brace on the affected area, leave the brace on when immobilizing.
► Down Syndrome patients may have upper cervical instability and may be more prone to spinal cord injury. Immobilization is important in any mechanism of injury in which there has been significant movement of the neck.
► Cardiac patients may have absent pulses in some limbs. They may be chronically hypoxic or have hypoxic spells.
Children with Special Health Care Needs - Central Intravenous Catheters

Indwelling intravenous access.

Uses
► Medication administration, parenteral (IV) hydration / nutrition administration.

Types
► Totally Implanted (such as Mediport®) or multilumen catheters (such as Hickman® or Broviac® catheters).

Assessment Issues
► Evaluate for DOPE & Infection
  • Displaced – total or partial dislodgement or movement out of vein into internal tissues
  • Obstructed – blood clot, protein, crystallized medications / IV nutrition
  • Pericardial Tamponade - fluid in the pericardial sac due to perforation by catheter or
  • Pulmonary problems – pneumothorax, pulmonary embolism from clot or catheter shear
  • Equipment – tubing kinked or cracked, infusion pump failure.

Basic Standing Orders
► Direct pressure if bleeding at site or clamp / tie if tubing leaking. Administer oxygen as needed.

Paramedic Standing Orders
► ALS: Aspirate / flush only if inserviced on special device. IV or IO fluids if signs of shock.
Children with Special Health Care Needs - Colostomy

Drainage of fecal material.

Uses
► Temporary or permanent malfunction or obstruction of intestine.

Types
► Open stomas draining into plastic pouches.

Assessment Issues
► Evaluate infection, irritation / trauma, peritonitis.

Basic Standing Orders

B
► Direct pressure if bleeding at site. Saline moistened sterile dressing covered by dry dressing if stoma exposed.

Paramedic Standing Orders

P
► IV or IO fluids if signs of dehydration or shock.
Children with Special Health Care Needs - CSF Shunt
(Ventriculoperitoneal or V-P shunt)

Uses
► Post meningitis, brain injury / surgery / tumors, hydrocephalus (“water on the brain”).

Types
► Polyethylene tubing with reservoir from brain ventricles to abdomen or heart.

Assessment Issues
► Evaluate for DOPE & Infection (including meningitis or infected shunt)
  ● Displaced – movement of tip into abdominal or heart lining
  ● Obstructed – blood clot, protein, kinked tubing causing increased intracranial pressure
  ● Peritonitis, Perforation or Pseudocyst – of stomach / bowel
  ● Equipment – damaged or separated tubing or reservoir.

Basic and Paramedic Standing Orders
B
► Administer oxygen as needed.
  Hyperventilate if signs of brain herniation such as unresponsiveness with unequal pupils, fixed dilated or unresponsive pupils, or increased BP and decreased heart rate.
Children with Special Health Care Needs – Enteral Tubes

Feeding tube

Uses

► Total or enhanced feeding & / or medication administration
► Abdominal / gastrointestinal problems
► Neurological or neuromuscular – brain damage, muscular dystrophy, etc.

Types

► Gastrostomy (G) tube: Percutaneous into stomach.
► Jejunal (J) tube: Percutaneous into jejunum.
► Nasogastric (NG) or nasojejunal (NJ) tube

Assessment Issues

► Evaluate for DOPE & Infection (including peritonitis or cellulitis)
  ♦ **Displaced** – total or partial removal of tube
  ♦ **Obstructed** – blood, crystallized feeding / medications, abdominal tissues
  ♦ **Peritonitis or Perforation** of stomach / bowel
  ♦ **Equipment** – tubing kinked or cracked, feeding infusion pump failure

**Basic Standing Orders**

► **B** Direct pressure if bleeding at site. Dry sterile dressing over area if tube is dislodged, or tape partially dislodged tube in place. If tube blocked, stop feeding & plug tube.
► Transport for evaluation of abdominal symptoms or for reinsertion / replacement of tube. (Stoma can close off within hours).
► If abdominal distension or vomiting, may leave tube open and draining into a cup.
► Bring old tube to ED for sizing purposes.

**Paramedic Standing Orders**

► **P** ALS: IV or IO fluids if signs of dehydration or shock.
Children with Special Health Care Needs - Tracheostomy

Technology-Assisted Children – Among Children with Special Health Care Needs is a growing sub-population of children with chronic illnesses who are dependent on medical devices. Several of the most common devices are summarized below with information to assist in the care of children with those devices.

Tracheostomy – breathing tube into trachea through opening in neck.

Uses

► Respiratory problems – narrow or obstructed airways, bronchopulmonary dysplasia (chronic lung disease seen in premature babies), etc.
► Neurological or Neuromuscular conditions – brain damage, muscular dystrophy, etc.
► May be ventilator dependent totally or part of time or may breathe on own.

Types

► Uncuffed – infant & young child; Cuffed – older child (usually >age 8yr) & adolescent.
► Fenestrated – hole in stem allows breathing through vocal cords to permit talking, or weaning off tracheostomy.
► May be single tube or have inner cannula, which can be removed & cleaned.

Assessment Issues

► Evaluate for DOPE & Infection (tracheal or pulmonary).
  • Displaced – total or partial removal of tube.
  • Obstructed – mucus plug, blood, foreign body, or moved against soft tissues.
  • Pulmonary problems – pneumothorax, pneumonia, reactive airway, aspiration.
  • Equipment – ventilator malfunction, oxygen depletion, tubing kinked.
► Reassess pulse/respiratory rates frequently.
Children with Special Health Care Needs - Tracheostomy continued

**Basic Standing Orders**

- **If on ventilator**, disconnect and attempt to oxygenate with BVM using tracheostomy adaptor (if needed). **Call ALS** if available, especially if respiratory distress present.
- **If not on ventilator**, administer oxygen with mask or blow-by oxygen over trach as needed.

**Paramedic Standing Orders**

- **If above do not work, and you are unable to ventilate**, you may remove tube and either reinsert new tube or use endotracheal tube of same approximate size.
- **If unable to find opening**, thread suction catheter through tube and use catheter tip to probe opening, sliding tube over catheter into opening and then removing catheter.
- **Suction as needed** - no more than 10 sec. Insert no more than ¾ length of the neck.
- **If unable to suction** because of thick secretions, instill 2-3 ml of saline, then suction.
- **If inner cannula present**, may remove and clean with saline.
- **If unable to ventilate**, plug opening and ventilate over mouth and nose.
Children with Special Health Care Needs – Ureterostomy, Nephrostomy Tube or Foley Catheter

Drainage of urine.

Uses
► Temporary or permanent malfunction or obstruction of urinary system.

Types
► Open stomas draining into plastic pouches or through catheter in urethra.

Assessment Issues
► Evaluate infection, irritation / trauma, peritonitis, blocked urinary drainage.

Basic Standing Orders
B ► Direct pressure if bleeding at site. Saline moistened sterile dressing covered by dry dressing if stoma exposed.

Paramedic Standing Orders
P ► IV or IO fluids if signs of dehydration or shock.
Adult Trauma Protocols
The priorities in trauma management are to prevent further injury, provide rapid transport, notify the receiving facility, and initiate definitive treatment. **Trauma patients cannot be treated completely in the field.** On-scene time should be as short as possible unless there are extenuating circumstances, such as extrication, hazardous conditions, or multiple patients. Document these circumstances on the patient record. Determine how the patient should be transported as soon as possible so that activation of a special transport service, such as an air ambulance, if appropriate, can be performed in a timely manner. Notification of the receiving hospital of patient conditions and status should be done as early as possible. This allows the receiving hospital additional time to mobilize any necessary resources. **The pre-hospital assessment and management of a trauma patient should be performed under the direction of one person.** Although the presence of alcohol or other drugs may mask some of the signs of severe trauma, assume that the patient’s condition is caused by trauma until proved otherwise.

Despite a rapid and effective out-of-hospital and trauma center response, patients with out-of-hospital cardiac arrest due to trauma rarely survive. Those patients with the best outcome from trauma arrest generally are young, have treatable penetrating injuries, have received early (out-of-hospital) endotracheal intubation, and undergo prompt transport (typically <=10 minutes) to a trauma care facility. Cardiac arrest in the field due to blunt trauma is fatal in all age groups. Briefly assess and/or treat for field-correctable causes (e.g tension pneumothorax, airway obstruction). Further resuscitation is probably not indicated.
Basic Standing Orders

► Take body substance isolation precautions. This is best performed en route to the call location.
► Ensure scene safety. First priority should be given to the safety of the rescuers and then to altering the scene to make it a safe working environment or, if necessary, moving the patient from the scene.
► Perform a scene survey to assess environmental conditions and mechanism of injury and number of patients.
► Establish patient responsiveness. Manually stabilize the spine. Protect patient from heat loss.
► Open the airway:
  ◆ Use the head tilt/chin lift if no spinal trauma is suspected.
  ◆ Use the modified jaw thrust if spinal trauma is suspected.
► Establish and maintain a patent airway while protecting the cervical spine. Suction as necessary. Insert an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning. The nasopharyngeal airway is contraindicated in the presence of maxillary facial trauma.
► Place an advanced airway device (combi-tube, King-CT) if indicated.
► Evaluate breathing – Is the patient breathing spontaneously? Are respirations adequate in rate and depth? Environmental factors should be considered when removing the patient’s clothing for evaluation.
► Initiate pulse oximetry, if available.

LOOK
◆ nasal flaring
◆ cyanosis
◆ rapid respirations (tachypnea)
◆ retractions
◆ asymmetry of chest wall
◆ open wounds or bruising of chest wall

LISTEN
◆ breathing
◆ abnormal breath sounds
◆ stridor – indicates partial airway obstruction
◆ gurgling sounds indicate fluid or blood in the airway.

FEEL
◆ rib fractures
◆ crepitus
Basic Standing Orders

► Treat based on findings:
  ◆ If breathing is inadequate, assist ventilations with high flow, 100% concentration oxygen (e.g. bag-valve-mask, flow-restricted oxygen-powered ventilation device etc.). Two-rescuer bag-valve-mask ventilation has been found to be more effective, if there is an adequate number of rescuers. Consider the use of cricoid pressure (Sellick maneuver) to prevent/decrease gastric distention. Monitor for abdominal distention and the development of pneumothorax.
  ◆ If breathing remains difficult for the patient, and he/she has an obvious chest injury, refer to appropriate protocol for management of chest trauma.
  ◆ If breathing is adequate, administer high flow, 100% concentration oxygen using a non-rebreather mask or blow-by as tolerated.

► Assess circulation and perfusion:
  ◆ Check for the presence of a pulse. If the patient is in cardiac arrest, consider withdrawing resuscitation.
  ◆ Check rate and quality of pulse.
  ◆ Inspect for obvious bleeding.
  ◆ Check blood pressure.
  ◆ Observe skin color and temperature, and
  ◆ Observe capillary refill time – in children.

► Control hemorrhage with direct pressure or a pressure dressing. This may include pelvic binding.
► If the patient is hypotensive, place the patient in a supine position.
► Assess mental status.
► If spinal trauma is suspected, place a rigid cervical collar and immobilize the patient as appropriate.
► Expose the patient as necessary to perform further assessments. Care should be taken to maintain the patient's body temperature.
► Initiate transport to a higher level medical facility. Rescuers should begin transport no more than 10 minutes after their arrival on the scene unless extenuating circumstances exist.
► Splint suspected fractures of long bones en route, as possible.
► Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
► Reassess patient frequently throughout transport.
► Contact medical direction for additional instructions and/or notify receiving facility.
Paramedic Standing Orders

► If a tension pneumothorax is suspected by mechanism of injury and as evidenced by severe respiratory distress, absent or decreased breath sounds, and hypotension/shock, perform needle decompression on the affected side with a large bore needle at the second intercostal space over the third rib at the midclavicular line. Initiate cardiac monitoring. Treat cardiac dysrhythmias as indicated. Consider pain management.

Advanced Standing Orders

► Consider BIAD, as appropriate. An assistant must maintain in-line cervical stabilization throughout this procedure.
► Obtain intravenous access using age-appropriate large bore needle and an isotonic solution, (e.g. normal saline or Lactated Ringer’s). If the patient shows signs of shock, initiate intravenous access in two sites using large bore needles. Do not delay transport to obtain intravenous access; this can be done en route. Consider a saline lock if fluids are not immediately required.
► Consider intraosseous (IO) access in all patient age groups and may be considered when peripheral IV access is unobtainable and patient is hemodynamically unstable.
**Advanced Spinal Assessment**

**Purpose**

To define patients who do not require spinal immobilization or who may have spinal immobilization devices removed in the field.

**Procedure for assessment**

► **Reliable Patient**
  - ≥ 12 years
  - Calm and cooperative
  - No altered mental status (dementia, brain injury, developmental delay, psychosis, etc.)
  - No evidence of alcohol or drug intoxication
  - No acute stress reaction
  - Not distracted by circumstances or injuries to self or others
  - No communication barriers (deafness, language, etc.)

► **History of Present Illness**
  - No paresthesias or other neurologic symptoms
  - Denies Spinal Pain

► **Physical Exam**
  - No Spinal Tenderness with Palpation
  - Can flex/extend rotate their neck without pain or assistance
  - Motor Exam Intact
    - Finger abduction/adduction
    - Finger/wrist flexion/extension
    - Foot/great toe extension/flexion
  - Neurosensory Exam Intact
    - Soft/sharp touch discrimination in upper and lower extremities
Selective Spinal Immobilization- Adult

Spine precautions are intended to prevent spinal cord injury in a patient presenting with an unstable spinal fracture, and to potentially prevent worsening cord injury. Traditional use of backboards for immobilization of patients has never been proven to be beneficial and newer studies show harm can occur from backboard immobilization without clear indications. Studies also show EMS providers are able to safely evaluate and identify patients with suspected spinal injuries in the field and employ selective spinal immobilization appropriately.

The National Association of EMS Physicians and the American College of Surgeons Committee on Trauma believe that:

- Long backboards are commonly used to attempt to provide rigid spinal immobilization among emergency medical services (EMS) trauma patients. However, the benefit of long backboards is largely unproven.
- The long backboard can induce pain, patient agitation, and respiratory compromise. Further, the backboard can decrease tissue perfusion at pressure points, leading to the development of pressure ulcers.
- Utilization of backboards for spinal immobilization during transport should be judicious, so that the potential benefits outweigh the risks.
- Appropriate patients to be immobilized with a backboard may include those with:
  - Blunt trauma and altered level of consciousness
  - Spinal pain or tenderness
  - Neurologic complaint (e.g., numbness or motor weakness)
  - Anatomic deformity of the spine
  - High-energy mechanism of injury and any of the following:
    - Drug or alcohol intoxication
    - Inability to communicate
    - Distracting injury

- Patients for whom immobilization on a backboard is not necessary include those with all of the following:
  - Normal level of consciousness (Glasgow Coma Score [GCS] 15)
  - No spine tenderness or anatomic abnormality
  - No neurologic findings or complaints
  - No distracting injury
  - No intoxication

- Patients with penetrating trauma to the head, neck, or torso and no evidence of spinal injury should not be immobilized on a backboard.
- Spinal precautions can be maintained by application of a rigid cervical collar and securing the patient firmly to the EMS stretcher, and may be most appropriate for:
  - Patients who are found to be ambulatory at the scene
- Patients who must be transported for a protracted time, particularly prior to inter-facility transfer
- Patients for whom a backboard is not otherwise indicated
  - Whether or not a backboard is used, **attention to spinal precautions** among at-risk patients is paramount. These include application of a **cervical collar**, adequate security to a stretcher, minimal movement/transfers, and maintenance of inline stabilization during any necessary movement/ transfers.

Patients should be removed from backboards as soon as practical in an emergency department.
Spine Immobilization Evaluation
in the setting of trauma
(age >8 yo and able to communicate)

If ANY of the following is true....

- Blunt trauma with altered level of consciousness
- Spinal pain or tenderness
- Neurologic Complaint (numbness or motor weakness from traumatic injury)
- Anatomic deformity of the spine
- High-energy mechanism of injury and any of the following:
  - Drug or alcohol intoxication
  - Inability to communicate
  - Distracting injury

If ALL the following is true....

- Normal level of consciousness (GCS 15)
- No spine tenderness or anatomic abnormality
- No neurologic findings or complaints
- No distracting injury
- No intoxication.

NO long spine board immobilization is needed (see c-spine clearance for c-collar clearance)

Spine precautions
Selective Spine Immobilization with c-Collar and Long Backboard

Transport time > 20 minutes?

NO
- Transport immobilize to appropriate trauma center.

YES
- Transport OFF long spine board but maintain spine precautions including c-collar
- Log roll, scope stretcher, slider or LBB transfer to hospital stretcher.

GSW does not need immobilization

INTERFACILITY TRANSFERS DO NOT REQUIRE IMMobilIZATION ON SPINE BOARDS FOR TRANSFER. SPINE PRECAUTIONS, WITH C-COLLARS, SHOULD BE OBSERVED DURING TRANSPORT.
Head Trauma - Adult

The recommendations for the management of traumatic brain injury (TBI) contained within these guidelines are adapted from the Prehospital Management of Traumatic Brain Injury developed by the Brain Trauma Foundation, © 2000. Field treatment is directed at preventing “secondary injury,” which is brain injury caused by hypoxia and shock after the initial injury has occurred. Evaluation and support of the patient’s ABC’s should be the first priority. As with all trauma patients, complete therapy for head and spine injuries must take place in the hospital. Delays at any level may be harmful to the patient.

Patients with closed head injuries can worsen quickly, even though they appear stable initially. Although the presence of alcohol and other drugs may make evaluation of head injuries difficult, always assume symptoms are the result of the trauma and treat as such. Routine use of hyperventilation in the patient with traumatic brain injury is not recommended.

Objects penetrating the head and neck should be stabilized whenever possible. Objects that are impaled in the cheek may be removed, as compression of both sides of the wound is easily accomplished.

Basic Standing Order

► Follow Trauma Assessment and Management Protocol.
► If pulse oximetry is available, monitor and maintain oxygen saturation (SpO₂) greater than 90%. Note that even a single instance of SpO₂ less than 90% can significantly affect patient outcome.
► Ventilation and hyperventilation in the patient with TBI
  ♦ If breathing is inadequate, assist ventilation using a bag-valve-mask device with high flow, 100% concentration oxygen. Consider advanced airway device. Monitor for gastric distention.
    o Adult, 10 breaths/minute.
► If breathing is adequate, administer high flow, 100% concentration oxygen using a non-rebreather mask or blow-by, as tolerated.
► If a TBI is suspected, hyperventilate the patient only if one or more of the following signs of brain herniation exists:
  o Fixed or asymmetric pupils.
  o Abnormal extension (decerebrate posturing).
  o Glasgow coma scale (GCS) of less than 9 with a further decrease of 2 or more points.
Head Trauma – Adult continued

Basic Standing Order

- Blood pressure in the head injured patient: Hypotension in an adult, except as a terminal event, is not caused by isolated closed head injuries. You should assess the chest, abdomen, pelvis, and thighs for additional injuries. Patients with TBIs who also have external bleeding may suffer fatal blood loss; control bleeding with direct pressure.
- Assess mental status using the GCS every five minutes to track changes. Changes in mental status are the most sensitive indicator of traumatic brain injury.
- Evaluate pupil size and reactivity. A unilaterally dilated pupil or bilaterally fixed and dilated pupils is a sign of brain herniation and requires emergent interventions to lower the intracranial pressure (ICP). Unequal pupils in the conscious patient is not an indicator of brain herniation or increased ICP.
- Remember to suspect spinal injuries in any patient with a head injury and significant mechanism of injury. Evaluate spinal cord integrity:
  - In a conscious patient by recording ability to move extremities to command. Perform gross sensory exam with sharp sensation or light touch.
  - Document patient complaints of numbness, tingling, or shooting pain.
  - In an unconscious patient by recording presence or absence of extremity movement to painful stimulus.
- Reassess patient frequently throughout transport, as a head injured patient may deteriorate rapidly. Changes in the ongoing exam can be more important than the initial exam.

Advanced Standing Orders

- Perform advanced airway intervention if the airway cannot be maintained by the patient, if prolonged assisted ventilation is anticipated, if hypoxemia is not corrected by supplemental oxygen, or if the GCS is 8 or less.
- Obtain intravenous or intraosseous access and, if needed, administer isotonic solution, (e.g. normal saline or lactated Ringer’s). Avoid the use of dextrose-containing IV fluids in TBI patients (Treat hypoglycemia as indicated).
- In patients with multi-organ trauma with an associated TBI, titrate IVs to maintain systolic blood pressure above 90. A systolic BP below 90 has been shown to increase morbidity and mortality in the patient with a TBI.
Endotracheal intubation if needed to maintain oxygenation or for therapeutic hyperventilation when indicated.

Ventilate to maintain an ETCO2 of 30-35mmHg only if signs of herniation are present.
# Glasgow Coma Scale - Head Trauma

<table>
<thead>
<tr>
<th>BEST EYE OPENING</th>
<th>Points</th>
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<tbody>
<tr>
<td>Adult &amp; Child</td>
<td>Infant (12 months)</td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Spontaneous</td>
</tr>
<tr>
<td>To Command</td>
<td>To Voice</td>
</tr>
<tr>
<td>To Pain</td>
<td>To Pain</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
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<table>
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<tr>
<th>BEST VERBAL RESPONSE</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult &amp; Child</td>
<td>Infant (12 months)</td>
</tr>
<tr>
<td>Oriented</td>
<td>Coos and Babbles (or crying after non-painful stimulation)</td>
</tr>
<tr>
<td>Confused</td>
<td>Irritable Cry</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>Only cries to Pain</td>
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<tr>
<td>Incomprehensible</td>
<td>Moans to Pain</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
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<th>Points</th>
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<td>Infant (12 months)</td>
</tr>
<tr>
<td>Obeys Command</td>
<td>Spontaneous Movements</td>
</tr>
<tr>
<td>Localizes Pain</td>
<td>Withdraws (Touch)</td>
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<tr>
<td>Withdraws</td>
<td>Withdraws (Pain)</td>
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<tr>
<td>Flexion to Pain</td>
<td>Flexion to Pain</td>
</tr>
<tr>
<td>Extension to Pain</td>
<td>Extension to Pain</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
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Total: Best Eye Opening
Total: Best Verbal Response
Total: Best Pain Response
Glasgow Coma Score
Chest Trauma - Adult

- Chest trauma can lead to severe internal injuries that are often difficult to diagnose. A history of chest trauma should lead rescuers to suspect a serious injury, and patients should be treated with that expectation.
- Three major chest injury syndromes can lead to rapid death. They must be recognized and treated rapidly. They include:
  - Bleeding from rupture of a major chest vessel;
  - Mechanical decrease of cardiac output (which may be caused by tension pneumothorax, cardiac tamponade or cardiac contusion with or without dysrhythmia);
  - Respiratory distress (which may be caused by tension pneumothorax, flail chest, pulmonary contusion or an open chest wound).
- If chest injury interferes with breathing, it must be managed during the initial assessment.
- Objects penetrating the chest wall should be stabilized whenever possible, and not removed unless absolutely necessary for extrication or transport.

**Basic Standing Order**

- Follow Trauma Assessment and Management Protocol. Examine the patient looking for distended neck veins. Look at the chest wall for asymmetry of movement, open wounds, and bruises. Expose the patient’s chest, as needed, to inspect the entire chest wall, front and back, maintaining cervical immobilization and log rolling when indicated. Respiratory distress, despite an open airway, may suggest a tension pneumothorax, a flail chest, or an open chest wound.
  - Signs of a tension pneumothorax include diminished breath sounds, hypotension, respiratory distress, distended neck veins, subcutaneous emphysema, shock, apprehension/agitation, and increasing resistance to ventilation.
  - If a penetrating chest wound has been sealed, temporarily unseal the wound and allow air to escape.
  - Assist ventilation with positive pressure oxygen if available.
  - Consider advanced airway adjuncts.
  - Transport patient in the position of comfort unless otherwise contraindicated
- Signs of flail chest may include paradoxical movement of the chest wall, or crepitus of multiple ribs in two or more areas. Assist ventilation with positive pressure as needed to maintain adequate oxygenation.
- A wound in the chest may be an open chest wound, especially when it presents with subcutaneous emphysema, and air movement through the opening.
  - Cover with a sterile occlusive dressing taped on three sides.
  - Observe closely for signs of developing tension pneumothorax.
Chest Trauma – Adult continued

Paramedic Standing Orders

Positive pressure ventilation may be needed, but is likely to worsen unrelieved tension pneumothorax. Be prepared to decompress the patient’s chest. If a tension pneumothorax is suspected by mechanism of injury and as evidenced by hypotension, respiratory distresses, and/or diminished breath sounds, perform needle decompression with a large bore needle at the second intercostal space over the third rib at the midclavicular line.

- This is an airway procedure and must be performed early, if indicated.
- A patient may have bilateral pneumothoraces; if condition does not improve after decompression of one lung, decompress the other side.

- Initiate cardiac monitoring.
- Consider analgesia for isolated chest trauma.
- Treat for hypotension.
**Abdominal Trauma - Adult**

Pre-hospital care of abdominal injuries should focus on controlling external bleeding and rapid transport as there are no specific prehospital treatments for internal bleeding. Penetrating trauma injures the area of entry and may damage any tissue along the line of penetration. Blunt trauma may be widely transmitted and cause damage to any or all organs within the abdominal cavity. Trauma to the abdomen may also cause injury to organs outside the abdominal cavity including those in the chest. Injuries from the nipple line through the tenth rib can involve either the chest and/or abdomen. Ongoing re-evaluation of the abdomen includes assessment of the chest as well.

As with all trauma patients, complete treatment for abdominal injuries must take place in the hospital. Delays at any level can be harmful to the patient. Evaluation of abdominal trauma is part of the rapid trauma assessment. It should be performed only after the patient’s ABCs have been evaluated and supported.

Objects penetrating the abdominal wall should be stabilized whenever possible, and not removed unless absolutely necessary for extrication or transport.

**Basic Standing Order**

- Follow Trauma Assessment and Management Protocol. Assess the abdomen for tenderness, rigidity, and distension.
- Reassess abdomen every 5 – 10 minutes, for tenderness, rigidity and distention. Shock, increasing distention, and abdominal rigidity are signs of intra-abdominal bleeding, although a person may have life-threatening bleeding without distention or abdominal rigidity.
- Any organs protruding from abdominal wounds should not be replaced into the abdominal cavity; cover the organs with saline-moistened gauze and a vapor barrier.
- If mechanism of injury permits, transport the patient in the position of comfort.

**Paramedic Standing Orders**

- ALS considerations for the patient with abdominal injuries are those listed in the Trauma Assessment and Management Protocol.
Pelvic Trauma - Adult

A person may lose enough blood from pelvic fractures to exsanguinate. Disruption of the pelvic ring increases potential space in the pelvic cavity. This increased space will accommodate more blood than the standard pelvis. The goals of pelvic immobilization are to decrease movement of the bones and to decrease the potential space for bleeding. Apply circumferential pressure to tamponade internal hemorrhage.

Signs of pelvic fracture may include instability, crepitus, decreased peripheral pulses, swelling, and blood at the urinary meatus.

When assessing for pelvic trauma, gentle downward, then inward pressure should be applied to the iliac crests. If instability or crepitus is noted, this test should not be repeated.

Basic Standing Order

► Follow Trauma Assessment and Management Protocol.
► Control external hemorrhage with direct pressure or a pressure dressing. Hemorrhage control may be improved by closing and stabilizing pelvic fractures.
► Pelvic fractures may be stabilized in several ways, three of which are easily applied in the pre-hospital setting.
  † Use of the pelvic sheet wrapping technique
  † Commercially available pelvic binding device
  † Application of the PASG
► Assess circulatory, motor, and sensory function before and after application of pelvic stabilization.
► Attempt to minimize unnecessary movement in patients with pelvic fractures.
Extremity Trauma - Adult

In the severely injured patient, management of extremity injuries takes a relatively low priority. Most extremity hemorrhage can be controlled by direct pressure or pressure dressings. As with all trauma patients, definitive treatment for extremity injuries takes place in the hospital. Delays at any level can be harmful to the patient. Evaluation of extremity trauma is part of the focused physical exam and should be performed only after the patient's ABCs have been evaluated and supported.

Consider femur or pelvic fractures when the degree of shock seems greater than indicated by the amount of external bleeding.

Basic Standing Order

► Follow Trauma Assessment and Management Protocol.
► Control external hemorrhage with well-aimed direct pressure or a pressure dressing, or elevation and pressure points.
► A tourniquet should be used if bleeding cannot be controlled by other methods. Though tourniquets are infrequently needed, do not delay application when other bleeding control methods have failed.
► Hemorrhage control in a patient with femur fracture(s) may be improved by using a traction splint; apply pressure directly over the fracture.
► Examine the patient for extremity injuries (deformities, contusions, avulsions, amputations, punctures, penetrations, burns, tenderness, lacerations, or swelling).
► Check for motion and sensation distal to deformities (both light touch and sharp sensation should be checked).
► Check circulation distal to deformities.
► The primary concern when treating extremity injuries is to maintain proper distal circulation beyond the site of the injury. This may involve straightening the extremity. (“Make limbs look like limbs.”)
► Stop if severe resistance is encountered or if the patient has significantly increased pain during an attempt at straightening the extremity. No more than two attempts at straightening the limb should be made.
  ❖ In general, joint injuries are left in the position found if there is adequate circulation. If there is no pulse distal to the joint injury, an EMT should attempt to align the joint in its normal anatomic position by applying traction.
  ❖ Straighten any grossly angulated long bone into its anatomic position by applying traction.
Basic Standing Order

► When splinting open fractures, apply the appropriate splint (e.g. traction splint for fractured femurs) in the usual manner. The bone ends may slip under the skin during splinting, this is acceptable, as the patient will need to have the wound cleaned in the operating room whether the bone ends remain above the skin or have slipped back into the wound. (Notify the receiving facility if this occurs.) Flush gross contamination from wounds before applying the splint. If, after attempting to straighten the extremity, the bone ends remain above the skin, cover with a moist dressing.

► Amputated parts should be wrapped in sterile gauze moistened with normal saline, protected from contamination (e.g., placed in an examination glove or Ziploc®-type bag) and put in ice water. Do not allow the amputated part to freeze.

► A cold pack may be applied to the site of an extremity injury to help reduce pain and swelling. Care should be taken not to freeze the tissues.

Paramedic Standing Orders

► Pain management is strongly encouraged for patients with isolated extremity injuries, unless there is a contraindication to pain medication (e.g. hypotension, allergy). Medicating the patient before splinting may be appropriate in the patient with an isolated extremity injury.

► For Acute Crush Syndrome
  ◆ Oxygen PRN to maintain Oxygen Saturation of >95%
  ◆ Monitor ECG
  ◆ Large Bore IV with normal saline, 20 ml/kg bolus followed by 500 ml/hr maintenance. Observe for signs of renal function.
  ◆ Sodium Bicarbonate- 50 meq in second bag of normal saline.
  ◆ Observe for signs of hypertension or edema, slow fluids to KVO if present.
Eye and Dental Injuries-Adult

Basic Standing Orders

- Routine Patient Care
- Obtain visual history (use of corrective lenses, surgeries, use of protective equipment).
- Obtain visual acuity, if able.
- Chemical irritants: flush with copious amounts of water, or normal saline.
- Thermal burns to eyelids: patch both eyes with cool saline compress.
- Impaled object: immobilize object and patch both eyes.
- Puncture wound: place protective device over both eyes (e.g. eye shield). Do not apply pressure.
- Foreign body: patch both eyes.
- In the event patient is unable to close eyelids, keep eye moist with sterile saline compress.
- Consider ALS intercept.

Dental Avulsions

- Dental avulsions should be placed in an obviously labeled container with saline or cell-culture medium (Save-a-Tooth®).

Advanced Standing Orders

- IV access and administer fluids to maintain systolic blood pressure >90 mmHg.

Paramedic Standing Orders

- Refer to the Pain Management Protocol.
- Refer to the Nausea Protocol.
Burns (Thermal) - Adult

Effective treatment of patients with burns must be started as soon as possible after injury, as these patients frequently require specialized care which includes fluid resuscitation, pain management, and wound care. The goal is to transfer the patient to a facility capable of providing the necessary level of care for that individual.

Burns that require specialized care in a recognized burn center or unit include:
- Partial-thickness and full-thickness burns of greater than 10% total body surface area (TBSA) in patients <10 years of age or >50 years of age.
- Partial-thickness and full-thickness burns of greater than 20% TBSA in all other patients.
- Partial-thickness and full-thickness burns involving the face, eyes, ears, hands, feet, major joints, genitalia, or perineum.
- Full-thickness burns totaling 5% TBSA or more in any age group.
- Electrical burns including lightning injury.
- Significant chemical burns.
- All burns associated with inhalation injury.
- Circumferential burns of the chest, neck, or extremities.
- Burns associated with concomitant major trauma.
- Burn injury occurring in patients with pre-existing medical disorders.
- Burn injury in patients who will require special social and emotional or long-term rehabilitative support, including cases involving suspected child abuse and neglect.

Basic Standing Orders

When treating patients with chemical burns, it is imperative to ensure rescuer safety. Patients contaminated with chemicals should have their clothing removed. Do NOT transport patients prior to appropriate decontamination. Notify the receiving facility of a patient with chemical exposure to allow adequate time for preparation. All chemical burns should be flushed with copious amounts of water.

- Brush dry chemicals off the skin before flushing.
- For chemical burns of the eye, flush the eye immediately with at least one liter of normal saline or water (at least 10 to 20 minutes is preferred). More fluids may be beneficial, especially if the chemical is alkaline.

Stop the burning process. If on scene quickly after the burn occurred, cooling affected parts (e.g. with cool water immersion) may limit the depth and extent of the burn. More than a few minutes after the burn, there is little benefit except pain relief. Note that with burns from tar, asphalt, paraffin or oils that retain heat (or when melted fabric adheres to skin) cooling may help for a longer period of time.
If cooling for pain relief, do not cool or moisten more than 10% of the TBSA at any one time. This can cause hypothermia.

Remove all clothing and jewelry in the area of the burn and distal to the injury.

Administer high flow, 100% concentration oxygen by non-rebreather mask for potential inhalation injury or any serious burn. Consider the possibility of carbon monoxide or other toxic inhalation. Oxygen saturation readings may be falsely elevated.

Assess circulation and perfusion. Circumferential burns of extremities can interfere with perfusion of that extremity.

If spinal trauma is suspected, place a rigid cervical collar and immobilize the patient as appropriate.

Consider ALS intercept for patients with serious burns and electrical injuries; in electrical injuries there is a possibility of cardiac dysrhythmias.

Estimate the TBSA involved. The “Rule of Nines” provides a rough estimate of TBSA involved (see following page).

Describe the body surface area as well as the depth of burn (e.g. 30% superficial burn, 20% partial thickness, and 15% full thickness burn).

Apply dressings to burns as tolerated.

- In burns over 10% BSA, apply a dry sheet, a dry burn sheet or dry sterile dressings to burn areas. Insulate the patient over this dressing to lessen the chance of hypothermia.

- In burns less than 10% BSA, apply moist dressings (e.g. commercially available burn dressings or saline-soaked gauze)

- A vapor barrier may be useful in patients with longer transport times.
**Burns (Thermal) – Adult continued**

**Advanced Standing Orders**

- Start two large bore IVs in patients meeting any of the burn criteria in the beginning of this section. These may be inserted through burn area, if necessary.
- **Fluid administration:**
  - First 24 hours: 4cc normal saline (NS) or lactated ringers (LR) x patient weight (Kg) x %TBSA (for fluid calculations include only partial thickness and full thickness burns). If more than two or three liters of fluid are to be given lactated ringers is preferred.
  - Half of this amount is to be given in the first 8 hours after injury not the time after arrival at the patient’s side. (Note: this means that the EMS provider should determine the time of injury)
  - The remaining half is to be given over the next 16 hours.

**Example:** A 70 Kg man who had sustained a 50% TBSA would require a total of 14,000cc in the first 24 hours, 7,000cc would be given in the first 8 hours. If the patient is not seen until 4 hours after the time of burn, that amount should be given over the next 4 hours. Second 24 hours: give normal maintenance fluids in sufficient volume to maintain a normal urinary output.

**Paramedic Standing Orders**

- Be alert for signs of inhalation injury (e.g. stridor, muffled voice, singed facial/nasal hairs, soot around nose or mouth, carbonaceous sputum, confinement in an enclosed space fire). Be prepared to secure the airway.
- If the injury involves an electrical burn, initiate cardiac monitoring. Treat cardiac dysrhythmias as directed.
- **Electrical burn fluid management:**
  - In electrical burns where there is a large amount of pigment (hemoglobin or myoglobin) in the urine, the urinary output should be maintained at 1.0 – 2.0 cc/Kg/hour until the urine is grossly clear, then fluids may be cut back to maintain the output in the range of 0.5 to 1.0 cc/Kg/hour in adults.
  - In addition, 44 – 50mEq of NaHCO₃ per liter of LR is administered to keep the urine alkaline as long as visible pigment is present.
- Consider Pain Management. Small doses IV titrated to effective pain control; monitor for respiratory depression.
- Give all medications intravenously.
Rule of Nines Chart – Burns (Thermal)

Burn Chart – Rule of Nines
Pediatric Trauma Protocols
**Trauma Assessment and Management - Pediatric**

Children experience different types of injuries and have different physiologic reactions to injury as compared to adults. Patient outcome depends on the time it takes to get the patient to the hospital. Therefore, assessment and treatment are frequently done at the same time and scene time should be minimized to less than 10 minutes, if possible.

Continual assessment of children is imperative. A child may initially appear stable, then decompensate suddenly.

If tension pneumothorax is suspected, perform needle decompression with an over-the-needle catheter at the second intercostal space over the third rib at the midclavicular line.

When obtaining intravenous access, use an age appropriate large-bore catheter with large-caliber tubing and administer normal saline or lactated Ringer’s at a sufficient rate to keep the vein open. If the patient shows signs of shock, initiate intravenous access in two sites. Consider saline locking IVs if fluids are not immediately required. Carefully monitor fluid administration to avoid fluid overload in children.

If signs of shock are present (such as, tachycardia, decreased level of consciousness, poor color, capillary refill greater than 2 seconds, decreased blood pressure, etc.) administer a bolus of normal saline or lactated Ringer’s at 20 cc/kg. Bolus therapy with reassessment is more effective than high IV flow rates for ensuring pediatric patients receive adequate fluids. Two additional fluid boluses at 20 cc/kg may be given if the patient remains in shock. If intravenous access cannot be obtained, consider intraosseous access in pediatric trauma patients with decreased consciousness.

The priorities in trauma management are to prevent further injury, provide rapid transport, notify the receiving facility, and initiate definitive treatment. **Trauma patients cannot be treated completely in the field.** On-scene time should be as short as possible unless there are extenuating circumstances, such as extrication, hazardous conditions, or multiple patients. Document these circumstances on the patient record. Determine how the patient should be transported as soon as possible so that activation of a special transport service, such as an air ambulance, if appropriate, can be performed in a timely manner. Notification of the receiving hospital of patient conditions and status should be done as early as possible. This allows the receiving hospital additional time to mobilize any necessary resources. **The pre-hospital assessment and management of a trauma patient should be performed under the direction of one person.** Although the presence of alcohol or other drugs may mask some of the signs of severe trauma, assume that the patient’s condition is caused by trauma until proved otherwise.
Despite a rapid and effective out-of-hospital and trauma center response, patients with out-of-hospital cardiac arrest due to trauma rarely survive. Those patients with the best outcome from trauma arrest generally are young, have treatable penetrating injuries, have received early (out-of-hospital) endotracheal intubation, and undergo prompt transport (typically \(\leq 10\) minutes) to a trauma care facility. Cardiac arrest in the field due to blunt trauma is nearly universally fatal in all age groups. Nonetheless, the literature suggests that survival in young children may be higher than that found in older children and adults for a variety of postulated reasons. Unless faced with a mass casualty situation or a patient with injuries obviously incompatible with life, briefly assess and/or treat for field-correctable causes (e.g. tension pneumothorax, airway obstruction) followed immediately by transportation. During transportation, treat for other causes of arrest including hemorrhage. Early notification to the receiving hospital is extremely important.
Basic Standing Orders

- Take body substance isolation precautions. This is best performed en route to the call location.
- Ensure scene safety. First priority should be given to the safety of the rescuers and then to altering the scene to make it a safe working environment or, if necessary, moving the patient from the scene.
- Perform a scene survey to assess environmental conditions and mechanism of injury and number of patients.
- Establish patient responsiveness. Manually stabilize the spine. Protect patient from heat loss.
- Open the airway:
  - Use the head tilt/chin lift if no spinal trauma is suspected.
  - Use the modified jaw thrust if spinal trauma is suspected.
- Establish and maintain a patent airway while protecting the cervical spine. Suction as necessary. Insert an oropharyngeal or nasopharyngeal airway adjunct if the airway cannot be maintained with positioning. The nasopharyngeal airway is contraindicated in the presence of maxillary facial trauma.
- Place an advanced airway device (King) if indicated.
- Evaluate breathing- Is the patient breathing spontaneously? Are respirations adequate in rate and depth? Environmental factors should be considered when removing the patient’s clothing for evaluation.
- Initiate pulse oximetry if available.

LOOK
- nasal flaring
- cyanosis
- rapid respirations (tachypnea)
- retractions
- asymmetry of chest wall
- open wounds or bruising of chest wall

LISTEN
- breathing
- abnormal breath sounds
- stridor – indicates partial airway obstruction
- gurgling sounds indicate fluid or blood in the airway.

FEEL
- rib fractures
- crepitus
Basic Standing Orders continued

- Treat based on findings:
  - If breathing is inadequate, assist ventilations with high flow, 100% concentration oxygen (e.g. bag-valve-mask, flow-restricted oxygen-powered ventilation device etc.). Two-rescuer bag-valve-mask ventilation has been found to be more effective, if there is an adequate number of rescuers. Consider the use of cricoid pressure (Sellick maneuver) to prevent/decrease gastric distention. Monitor for abdominal distention and the development of pneumothorax.
  - If breathing remains difficult for the patient, and he/she has an obvious chest injury, refer to appropriate protocol for management of chest trauma.
  - If breathing is adequate, administer high flow, 100% concentration oxygen using a non-rebreather mask or blow-by as tolerated.

- Assess circulation and perfusion:
  - Check for the presence of a pulse. If the patient is in cardiac arrest, consider withdrawing resuscitation.
  - Check rate and quality of pulse.
  - Inspect for obvious bleeding.
  - Check blood pressure.
  - Observe skin color and temperature, and observe capillary refill time – in children.

- Control hemorrhage with direct pressure or a pressure dressing. This may include pelvic binding.
- If the patient is hypotensive, place the patient in a supine position.
- Assess mental status.
- If spinal trauma is suspected, place a rigid cervical collar and immobilize the patient as appropriate.
- Expose the patient as necessary to perform further assessments. Care should be taken to maintain the patient’s body temperature.
- Initiate transport to a higher level medical facility. Rescuers should begin transport no more than 10 minutes after their arrival on the scene unless extenuating circumstances exist.
- Splint suspected fractures of long bones en route, as possible.
- Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
- Reassess patient frequently throughout transport.
- Contact medical direction for additional instructions and/or notify receiving facility.
Advanced Standing Orders

► Place an advanced airway device, if indicated. An assistant must maintain in-line cervical stabilization throughout this procedure.
► When obtaining intravenous access, use an age appropriate large-bore catheter with large-caliber tubing and administer normal saline or lactated Ringer’s at a sufficient rate to keep the vein open. If the patient shows signs of shock, initiate intravenous access in two sites. Consider saline locking IVs if fluids are not immediately required. Carefully monitor fluid administration to avoid fluid overload in children.
► If signs of shock are present (such as, tachycardia, decreased level of consciousness, poor color, capillary refill greater than 2 seconds, decreased blood pressure, etc.) administer a bolus of normal saline or lactated Ringer’s at 20 cc/kg. Bolus therapy with reassessment is more effective than high IV flow rates for ensuring pediatric patients receive adequate fluids. Two additional fluid boluses at 20 cc/kg may be given if the patient remains in shock. If intravenous access cannot be obtained, consider intraosseous access in pediatric trauma patients with decreased consciousness.
► Devices are available to initiate intraosseous (IO) access in all patient age groups and may be considered when peripheral IV access is unobtainable.

Paramedic Standing Orders

► Consider placing a gastric tube in any patient who requires assisted ventilations.
► If tension pneumothorax is suspected, perform needle decompression with an over-the-needle catheter at the second intercostal space over the third rib at the midclavicular line.
► Initiate cardiac monitoring. Treat cardiac dysrhythmias as dictated by standing orders.
► Consider fentanyl for treating pain in the multi-trauma patient, as it has a better hemodynamic profile than morphine.
► Consider pressors for shock refractory to adequate fluid resuscitation. This intervention should be made only after direct contact with physician medical control.
A child is considered to have incurred serious trauma if any one of the following is met:

- A numerical triage score ≤ 9 using the **Glasgow Coma Scale**.
- A color triage score of one black box or two gray boxes using the **Pediatric Trauma Triage Criteria**.
- Penetrating wounds to the head, neck, torso, or extremities proximal to the elbow or knee.
- Two or more long bone fractures, pelvic fracture, or flail chest.
- Open or depressed skull fracture.
- Full thickness (3°) burns, partial thickness (2°) burns > 10% BSA or burns combined with trauma.
- Paralysis.
- Amputation proximal to the wrist or ankle.

### PEDIATRIC GLASGOW COMA SCALE

<table>
<thead>
<tr>
<th>Infants</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Obey Commands</td>
</tr>
<tr>
<td>O</td>
<td>Localizes Painful Stimuli</td>
</tr>
<tr>
<td>T</td>
<td>Withdraws from Pain</td>
</tr>
<tr>
<td>O</td>
<td>Abnormal Flexion</td>
</tr>
<tr>
<td>R</td>
<td>Abnormal Extension</td>
</tr>
<tr>
<td>No Response</td>
<td>No Response</td>
</tr>
<tr>
<td>V</td>
<td>Oriented</td>
</tr>
<tr>
<td>E</td>
<td>Confused</td>
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<tr>
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<tr>
<td>A</td>
<td>No Response</td>
</tr>
<tr>
<td>L</td>
<td>No Response</td>
</tr>
</tbody>
</table>

| E       | Spontaneous |
| Y       | To Speech/Sound |
| E       | To Pain |
| No Response | No Response |

### PEDIATRIC TRAUMA TRIAGE CRITERIA

<table>
<thead>
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<th>Component</th>
<th>+2</th>
<th>+1</th>
<th>-1</th>
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</thead>
<tbody>
<tr>
<td>Weight</td>
<td>&gt; 20 kg</td>
<td>10-20 kg</td>
<td>&lt; 10 kg</td>
</tr>
<tr>
<td>Airway</td>
<td>Normal</td>
<td>oxygen adjunct: mask, cannula, oral or nasal airway</td>
<td>Assisted/intubated bag-valve-mask/ETT Cricothyrotomy</td>
</tr>
<tr>
<td>Level of Consciousness</td>
<td>Awake</td>
<td>Altered or history of loss of consciousness</td>
<td>Coma Unresponsive</td>
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<tr>
<td>Circulation</td>
<td>Peripheral pulses good SBP &gt; 90 mmHg</td>
<td>Brachial / Femoral pulses palpable SBP 90-50 mmHg</td>
<td>Weak or no peripheral pulses SBP &lt; 50 mmHg</td>
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<tr>
<td>Fracture</td>
<td>None seen or suspected</td>
<td>Single closed fracture</td>
<td>Any open or multiple fractures</td>
</tr>
<tr>
<td>Cutaneous</td>
<td>No visible injury</td>
<td>Contusion, abrasion or laceration &lt; 7 cm, not through fascia</td>
<td>Tissue loss laceration &gt; 7 cm Penetrating Injury</td>
</tr>
</tbody>
</table>
Head Trauma - Pediatric

Children are anatomically prone to head injuries because of their large heads, weak neck muscles, and immature brain tissue. Head injuries in children are common. Blunt mechanisms like falls and motor vehicle crashes are the most common causes of head injuries in children.

Suspect a TBI in the child who:

► is inconsolable
► is irritable
► has a high-pitched cry
► vomits repeatedly
► is unusually quiet
► has difficulty walking (if ambulatory at the scene prior to EMS arrival)
► has a bulging fontanel, and/or
► has Battle’s sign or raccoon eyes

The recommendations for the management of traumatic brain injury (TBI) contained within these guidelines are adapted from the Prehospital Management of Traumatic Brain Injury developed by the Brain Trauma Foundation, © 2000. Field treatment is directed at preventing “secondary injury,” which is brain injury caused by hypoxia and shock after the initial injury has occurred. Evaluation and support of the patient’s ABC’s should be the first priority. As with all trauma patients, complete therapy for head and spine injuries must take place in the hospital. Delays at any level may be harmful to the patient.

Patients with closed head injuries can worsen quickly, even though they appear stable initially. Although the presence of alcohol and other drugs may make evaluation of head injuries difficult, always assume symptoms are the result of the trauma and treat as such. Routine use of hyperventilation in the patient with traumatic brain injury is not recommended.

Objects penetrating the head and neck should be stabilized whenever possible. Objects that are impaled in the cheek may be removed, as compression of both sides of the wound is easily accomplished.
Basic Standing Order

► Follow Trauma Assessment and Management Protocol.
► If pulse oximetry is available, monitor and maintain oxygen saturation (SpO2) greater than 90%. Note that even a single instance of SpO2 less than 90% can significantly affect patient outcome.
► Ventilation and hyperventilation in the patient with TBI:
  ○ If breathing is inadequate, assist ventilation using a bag-valve-mask device with high flow, 100% concentration oxygen. Consider advanced airway device. Monitor for gastric distention.
    ▪ Child, under age 8, 20 breaths/minute; and
    ▪ Infants, 25 breaths/minute.
  ○ If breathing is adequate, administer high flow, 100% concentration oxygen using a non-rebreather mask or blow-by, as tolerated.
► If a TBI is suspected, hyperventilate the patient only if one or more of the following signs of brain herniation exists:
  ○ Fixed or asymmetric pupils.
  ○ Abnormal extension (decerebrate posturing).
  ○ Glasgow coma scale (GCS) of less than 9 with a further decrease of 2 or more points.
► Blood pressure in the head injured patient: Hypotension, except as a terminal event, is not caused by isolated closed head injuries. You should assess the chest, abdomen, pelvis, and thighs for additional injuries. Patients with TBIs who also have external bleeding may suffer fatal blood loss; control bleeding with direct pressure.
► Assess mental status using the GCS every five minutes to track changes. Changes in mental status are the most sensitive indicator of traumatic brain injury.
► Evaluate pupil size and reactivity. A unilaterally dilated pupil or bilaterally fixed and dilated pupils is a sign of brain herniation and requires emergent interventions to lower the intracranial pressure (ICP). Unequal pupils in the conscious patient is not an indicator of brain herniation or increased ICP.
Basic Standing Order continued

► Remember to suspect spinal injuries in any patient with a head injury and significant mechanism of injury. Evaluate spinal cord integrity:
  ◆ In a conscious patient by recording ability to move extremities to command. Perform gross sensory exam with sharp sensation or light touch.
  ◆ Document patient complaints of numbness, tingling, or shooting pain.
  ◆ In an unconscious patient by recording presence or absence of extremity movement to painful stimulus.
► Reassess patient frequently throughout transport, as a head injured patient may deteriorate rapidly. Changes in the ongoing exam can be more important than the initial exam.
► Consider ALS intercept/air medical transport.
Head Trauma – Pediatric continued

Advanced Standing Order

► Children can present with signs of shock secondary to severe scalp lacerations. If a child with a severe scalp laceration is showing signs of shock, be sure to gain IV or IO access and give a 20 cc/kg bolus of normal saline or lactated Ringer’s. Be sure to evaluate the pediatric patient to rule out internal bleeding.

► Check blood glucose, if hypoglycemic see Diabetic Emergencies: Hypoglycemia Protocol.

► Obtain intravenous or intraosseous access and, if needed, administer isotonic solution, (e.g. normal saline or lactated Ringer’s). Avoid the use of dextrose-containing IV fluids in TBI patients (Treat hypoglycemia as indicated.).

► In patients with multi-organ trauma with an associated TBI, titrate IVs to maintain systolic blood pressure above 90. A systolic BP below 90 has been shown to increase morbidity and mortality in the patient with a TBI.

► Child: Administer fluid bolus 20 ml/kg, may repeat x 2 (maximum total 60 ml/kg to maintain SBP above.
  • 12-16 years: 90 mmHg
  • 5-12: 80 mmHg
  • 1-5 years: 75 mmHg
  • <1 years: 65 mmHg
  • Administer fluid in children with normal SBP and who have other signs of decreased perfusion including tachycardia, loss of central pulses, increased capillary filling time of > 2 seconds.

Paramedic Standing Orders

► If end-tidal CO2 is available, ventilate to maintain an end-tidal CO2 of 30-35 mmHg only if signs of herniation present.

► If intubation required, consider administration of lidocaine 1 mg/kg IV (maximum dose 100 mg) prior to intubation.
Chest Trauma - Pediatric

► Chest trauma can lead to severe internal injuries that are often difficult to diagnose. A history of chest trauma should lead rescuers to suspect a serious injury, and patients should be treated with that expectation.

► Three major chest injury syndromes can lead to rapid death. They must be recognized and treated rapidly. They include:
  ♦ Bleeding from rupture of a major chest vessel;
  ♦ Mechanical decrease of cardiac output (which may be caused by tension pneumothorax, cardiac tamponade or cardiac contusion with or without dysrhythmia); and
  ♦ Respiratory distress (which may be caused by tension pneumothorax, flail chest, pulmonary contusion or an open chest wound).

► If chest injury interferes with breathing, it must be managed during the initial assessment.

► Objects penetrating the chest wall should be stabilized whenever possible, and not removed unless absolutely necessary for extrication or transport.

Basic Standing Order

► Follow Trauma Assessment and Management Protocol. Examine the patient looking for distended neck veins. Look at the chest wall for asymmetry of movement, open wounds, and bruises. Expose the patient’s chest, as needed, to inspect the entire chest wall, front and back, maintaining cervical immobilization and log rolling when indicated. Respiratory distress, despite an open airway, may suggest a tension pneumothorax, a flail chest, or an open chest wound.
  ♦ Signs of a tension pneumothorax include diminished breath sounds, hypotension, respiratory distress, distended neck veins, subcutaneous emphysema, shock, apprehension/agitation, and increasing resistance to ventilation.
    o If a penetrating chest wound has been sealed, temporarily unseal the wound and allow air to escape.
    o Assist ventilation with positive pressure oxygen if available.
    o Consider advanced airway adjuncts.
    o Transport patient in the position of comfort unless otherwise contraindicated.

► Signs of flail chest may include paradoxical movement of the chest wall, or crepitus of multiple ribs in two or more areas.
  ♦ Use positive pressure ventilation.
  ♦ Consider stabilizing with ipsilateral arm and swathe.

► A wound in the chest may be an open chest wound, especially when it presents with subcutaneous emphysema, and air movement through the opening.
  o Cover with a sterile occlusive dressing taped on three sides.
  o Observe closely for signs of developing tension pneumothorax.
Paramedic Standing Orders

► In addition to the above instructions, providers trained and authorized beyond BLS may initiate the following treatments.

► Positive pressure ventilation may be needed, but is likely to worsen unrelieved tension pneumothorax. Be prepared to decompress the patient’s chest. If a tension pneumothorax is suspected by mechanism of injury and as evidenced by hypotension, respiratory distresses, and/or diminished breath sounds, perform needle decompression with an over-the-catheter needle placed at the second intercostal space at the midclavicular line.

✦ This is an airway procedure and must be performed early, if indicated.

✦ A patient may have bilateral pneumothoraces; if condition does not improve after decompression of one lung, decompress the other side.

► Initiate cardiac monitoring.

► Consider analgesia for isolated chest trauma.

► Treat for hypotension.
Abdominal Trauma - Pediatric

Solid organs of the upper abdominal cavity (the liver, spleen and kidneys) are proportionally larger and more exposed in children, and the abdominal muscles of the child are relatively underdeveloped and the ribs are more pliable. This predisposes pediatric patients to potentially serious blood loss and shock from abdominal injuries.

Pre-hospital care of abdominal injuries should focus on controlling external bleeding and rapid transport as there are no specific pre-hospital treatments for internal bleeding. Penetrating trauma injures the area of entry and may damage any tissue along the line of penetration. Blunt trauma may be widely transmitted and cause damage to any or all organs within the abdominal cavity. Trauma to the abdomen may also cause injury to organs outside the abdominal cavity including those in the chest. Injuries from the nipple line through the tenth rib can involve either the chest and/or abdomen. Ongoing re-evaluation of the abdomen includes assessment of the chest as well.

As with all trauma patients, complete treatment for abdominal injuries must take place in the hospital. Delays at any level can be harmful to the patient. Evaluation of abdominal trauma is part of the rapid trauma assessment. It should be performed only after the patient’s ABCs have been evaluated and supported.

Objects penetrating the abdominal wall should be stabilized whenever possible, and not removed unless absolutely necessary for extrication or transport.

Basic Standing Order

- Follow Trauma Assessment and Management Protocol. Assess the abdomen for tenderness, rigidity, and distension.
- Reassess abdomen every 5 – 10 minutes, for tenderness, rigidity and distention. Shock, increasing distention, and abdominal rigidity are signs of intra-abdominal bleeding, although a person may have life-threatening bleeding without distention or abdominal rigidity.
- Any organs protruding from abdominal wounds should not be replaced into the abdominal cavity; cover the organs with saline-moistened gauze and a vapor barrier.
- If mechanism of injury permits, transport the patient in the position of comfort.
Abdominal Trauma – Pediatric continued

**Advanced Standing Orders**

- ALS considerations for the patient with abdominal injuries are those listed in the Trauma Assessment and Management Protocol.

**Paramedic Standing Orders**

- Abdominal distention decreases lung capacity and makes the pediatric patient more difficult to ventilate.
- ALS providers should consider placement of a gastric tube.
Basic Standing Orders

► Routine Patient Care.
► Place the patient in a position of comfort if possible.
► Give reassurance, psychological support, and distraction.
► Use ample padding for long and short spinal immobilization devices.
► Use ample padding when splinting possible fractures, dislocations, sprains and strains. Elevate injured extremities if possible. Consider application of cold pack for 30 minutes.
► Have the patient rate their pain on a 0 to 10 (or similar) scale*.
► Reassess the patient’s pain level and vital signs every 5 minutes. *0-10 Scale: Avoid coaching the patient, simply ask them to rate their pain on a scale from 0-10, where 0 is no pain at all and 10 is the worst pain ever experienced by the patient.
► *Wong-Baker “faces” scale: The faces correspond to numeric values from 0-10. The scale can be documented with the numeric value or the textual pain description.
► Consider paramedic intercept if needed for pain management.

0 2 4 6 8 10
NO HURT HURTS A HURTS A HURTS EVEN HURTS WHOLE LOT HURTS
LITTLE LITTLE MORE MORE WORST
Pain Management – Pediatric continued

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >minimum for age and signs of adequate perfusion.

**Paramedic Standing Orders**

- IV access, obtain blood sample and administer fluids to maintain systolic blood pressure >minimum for age and signs of adequate perfusion.
- Unless the patient has altered mental status, multi-systems trauma or abdominal pain, the paramedic may consider
  - Morphine: 0.1 mg/kg IV every 10 minutes. May be repeated up to 2 doses.
  - Fentanyl: 0.5 mcg/kg IV every 5 minutes. May be repeated up to 3 doses. Fentanyl may be given IN.
- For hypoventilation from opiate administration by EMS personnel, administer naloxone 0.1 mg/kg up to 2 mg prn.
- Nausea: See Nausea Protocol.

**NOTE:** Contact medical control for guidance with all patients with altered mental status, multi-systems trauma, or for requests to provide additional doses of a medication.
Pelvic Trauma - Pediatric

A person may lose enough blood from pelvic fractures to exsanguinate. Disruption of the pelvic ring increases potential space in the pelvic cavity. This increased space will accommodate more blood than the standard pelvis. The goals of pelvic immobilization are to decrease movement of the bones and to decrease the potential space for bleeding. Apply circumferential pressure to tamponade internal hemorrhage.

Signs of pelvic fracture may include instability, crepitus, decreased peripheral pulses, swelling, and blood at the urinary meatus.

When assessing for pelvic trauma, gentle downward, then inward pressure should be applied to the iliac crests. If instability or crepitus is noted, this test should not be repeated.

Basic Standing Order

- Follow Trauma Assessment and Management Protocol.
- Control external hemorrhage with direct pressure or a pressure dressing. Hemorrhage control may be improved by closing and stabilizing pelvic fractures.
- Pelvic fractures may be stabilized in several ways, three of which are easily applied in the pre-hospital setting.
  - Use of the pelvic sheet wrapping technique
  - Commercially available pelvic binding device
  - Application of the PASG
- Assess circulatory, motor, and sensory function before and after application of pelvic stabilization.
- Attempt to minimize unnecessary movement in patients with pelvic fractures.
**Extremity Trauma - Pediatric**

Bones in children are more pliable than those in adults; they are prone to fractures that involve the bone bending (e.g. “greenstick fractures”), which may be more difficult to straighten.

Children may fracture their bones at the growth plates, which are located near joints. Injuries involving joints should only be straightened when there is decreased circulation distal to the injury (unless it is an ankle injury). If using commercially available devices to splint fractures in children, be sure that they are of an appropriate size for the child.

In the severely injured patient, management of extremity injuries takes a relatively low priority. Most extremity hemorrhage can be controlled by direct pressure or pressure dressings. As with all trauma patients, definitive treatment for extremity injuries takes place in the hospital. Delays at any level can be harmful to the patient. Evaluation of extremity trauma is part of the focused physical exam and should be performed only after the patient's ABCs have been evaluated and supported.

Consider femur or pelvic fractures when the degree of shock seems greater than indicated by the amount of external bleeding.
**Basic Standing Order**

- Follow Trauma Assessment and Management Protocol.
- Control external hemorrhage with well-aimed direct pressure or a pressure dressing, or elevation and pressure points.
- A tourniquet should be used if bleeding cannot be controlled by other methods. Though tourniquets are infrequently needed, do not delay application when other bleeding control methods have failed.
- Hemorrhage control in a patient with femur fracture(s) may be improved by using a traction splint, apply pressure directly over the fracture.
- Examine the patient for extremity injuries (deformities, contusions, avulsions, amputations, punctures, penetrations, burns, tenderness, lacerations, or swelling).
- Check for motion and sensation distal to deformities (both light touch and sharp sensation should be checked).
- Check circulation distal to deformities.
- The primary concern when treating extremity injuries is to maintain proper distal circulation beyond the site of the injury. This may involve straightening the extremity. (“Make limbs look like limbs.”)
- Stop if severe resistance is encountered or if the patient has significantly increased pain during an attempt at straightening the extremity. No more than two attempts at straightening the limb should be made.
  - In general, joint injuries are left in the position found if there is adequate circulation. If there is no pulse distal to the joint injury, an EMT should attempt to align the joint in its normal anatomic position by applying traction.
  - Straighten any grossly angulated long bone into its anatomic position by applying traction.

**Paramedic Standing Orders**

- Pain management is strongly encouraged for patients with isolated extremity injuries, unless there is a contraindication to pain medication (e.g. hypotension, allergy). Medicating the patient before splinting may be appropriate in the patient with an isolated extremity injury.
Eye and Dental Injuries-Pediatric

**Basic Standing Orders**

- Routine Patient Care
- Obtain visual history (use of corrective lenses, surgeries, use of protective equipment).
- Obtain visual acuity, if able.
- Chemical irritants: flush with copious amounts of water, or normal saline.
- Thermal burns to eyelids: patch both eyes with cool saline compress.
- Impaled object: immobilize object and patch both eyes.
- Puncture wound: place protective device over both eyes (e.g. eye shield). Do not apply pressure.
- Foreign body: patch both eyes.
- In the event patient is unable to close eyelids, keep eye moist with sterile saline compress.
- Consider intercept.

**Dental Avulsions**

- Dental avulsions should be placed in an obviously labeled container with saline or cell-culture medium (Save-a-Tooth®).

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >minimum for age and signs of adequate perfusion.

**Paramedic Standing Orders**

- Refer to the Pain Management Protocol.
- Refer to the Nausea Protocol.
Burns (Thermal) Pediatric

Children under 5 years of age represent the age group most often found with burns resulting from child abuse. Look for characteristic burns that should make you suspect they are the result of child abuse. The child with burns to the back, buttocks, and posterior neck should alert your suspicion of abuse. Circumferential scald burns of hands or feet that are clearly demarcated and uniform with no splash marks are also characteristic of child abuse.

Effective treatment of patients with burns must be started as soon as possible after injury, as these patients frequently require specialized care which includes fluid resuscitation, pain management, and wound care. The goal is to transfer the patient to a facility capable of providing the necessary level of care for that individual.

Burns that require specialized care in a recognized burn center or unit include:
► Partial-thickness and full-thickness burns of greater than 10% total body surface area (TBSA) in patients <10 years of age.
► Partial-thickness and full-thickness burns of greater than 20% TBSA in all other patients.
► Partial-thickness and full-thickness burns involving the face, eyes, ears, hands, feet, major joints, genitalia, or perineum.
► Full-thickness burns totaling 5% TBSA or more in any age group.
► Electrical burns including lightning injury.
► Significant chemical burns.
► All burns associated with inhalation injury.
► Circumferential burns of the chest, neck, or extremities.
► Burns associated with concomitant major trauma.
► Burn injury occurring in patients with pre-existing medical disorders.
► Burn injury in patients who will require special social and emotional or long-term rehabilitative support, including cases involving suspected child abuse and neglect.

Basic Standing Orders
► Glucose may be necessary in a child with a severe burn. Monitor blood sugar periodically.
► When treating patients with chemical burns, it is imperative to ensure rescuer safety. Patients contaminated with chemicals should have their clothing removed. Do NOT transport patients prior to appropriate decontamination. Notify the receiving facility of a patient with chemical exposure to allow adequate time for preparation. All chemical burns should be flushed with copious amounts of water.
Basic Standing Orders

- Brush dry chemicals off the skin before flushing.
- For chemical burns of the eye, flush the eye immediately with at least one liter of normal saline or water (at least 10 to 20 minutes is preferred). More fluids may be beneficial, especially if the chemical is alkaline.
- Stop the burning process. If on scene quickly after the burn occurred, cooling affected parts (e.g. with cool water immersion) may limit the depth and extent of the burn. More than a few minutes after the burn, there is little benefit except pain relief. Note that with burns from tar, asphalt, paraffin or oils that retain heat (or when melted fabric adheres to skin) cooling may help for a longer period of time.
- If cooling for pain relief, do not cool or moisten more than 10% of the TBSA at any one time. This can cause hypothermia.
- Remove all clothing and jewelry in the area of the burn and distal to the injury.
- Administer high flow, 100% concentration oxygen by non-rebreather mask for potential inhalation injury or any serious burn. Consider the possibility of carbon monoxide or other toxic inhalation. Oxygen saturation readings may be falsely elevated.
- Assess circulation and perfusion. Circumferential burns of extremities can interfere with perfusion of that extremity.
- If spinal trauma is suspected, place a rigid cervical collar and immobilize the patient as appropriate.
- Consider ALS intercept for patients with serious burns and electrical injuries; in electrical injuries there is a possibility of cardiac dysrhythmias.
- Estimate the TBSA involved. The “Rule of Nines” provides a rough estimate of TBSA involved (see following page).
- Describe the body surface area as well as the depth of burn (e.g. 30% superficial burn, 20% partial thickness, and 15% full thickness burn).
- Apply dressings to burns as tolerated.
  - In burns over 10% BSA, apply a dry sheet, a dry burn sheet or dry sterile dressings to burn areas. Insulate the patient over this dressing to lessen the chance of hypothermia.
  - In burns less than 10% BSA, apply moist dressings (e.g. commercially available burn dressings or saline-soaked gauze).
  - A vapor barrier may be useful in patients with longer transport times.
**Burns (Thermal) – Pediatric continued**

**Advanced Standing Orders**

- Monitor blood sugar.
- Start two large bore IVs in patients meeting any of the burn criteria in the beginning of this section. These may be inserted through burn area, if necessary.
- Fluid administration:
  - First 24 hours: 4cc normal saline (NS) or lactated ringers (LR) x patient weight (Kg) x %TBSA (for fluid calculations include only partial thickness and full thickness burns). If more than two or three liters of fluid are to be given lactated ringers is preferred.
  - Half of this amount is to be given in the first 8 hours after injury not the time after arrival at the patient’s side. (Note: this means that the EMS provider should determine the time of injury)
  - The remaining half is to be given over the next 16 hours.

**Paramedic Standing Orders**

- Be alert for signs of inhalation injury (e.g. stridor, muffled voice, singed facial/nasal hairs, soot around nose or mouth, carbonaceous sputum, confinement in an enclosed space fire). Be prepared to secure the airway.
- If the injury involves an electrical burn, initiate cardiac monitoring. Treat cardiac dysrhythmias as directed.
- Electrical burn fluid management:
  - In electrical burns where there is a large amount of pigment (hemoglobin or myoglobin) in the urine, the urinary output should be maintained at 1.0 – 2.0 cc/Kg/hour until the urine isgrossly clear, then fluids may be cut back to maintain the output in the range of 0.5 to 1.0 cc/Kg/hour in adults.
  - In addition, 44 – 50mEq of NaHCO3 per liter of LR is administered to keep the urine alkaline as long as visible pigment is present.
- Insert nasogastric tube if burns are 20% TBSA or more.
- Consider Pain Management. Small doses IV titrated to effective pain control; monitor for respiratory depression.
- Give all medications intravenously.
When measuring TBSA in children, an alternate method is to use the child’s palm (not including the fingers) or clenched fist, which equals 1% of the body surface area. This serves as a quick method. But be sure to use the child’s palm or fist and not your own.
Environmental Protocols
First and foremost, be certain the scene is safe to approach.

A unique feature to multiple patients affected by a lightning strike or electrical discharge is to treat those in respiratory arrest or cardiac arrest FIRST

**Basic Standing Orders**

- Routine Patient Care.
- High flow oxygen as indicated.
- Consider Burn Protocol.
- Remove rings, watches or constricting bands on affected extremities.
- Transport.
- Consider ALS intercept.

**Advanced Standing Orders**

- Establish IV access

**Paramedic Standing Orders**

- Assess airway status.
- Assess need for advanced airway skills.
- Monitor patient.
- Consider 12-lead EKG.
- Consider pain management protocol.
- If injury suggests risk of rhabdomyolysis, consider 1 amp Sodium Bicarbonate in 1000 ml NS wide open.
- Consider Trauma Center if available.
Snake Bites

General Considerations

Important documentation items include appearance of snake, time of bite, prior first-aid by patient or friends and unusual symptoms such as peculiar or metallic taste sensations. Severe envenomations may result in hypotension, coma, and bleeding. Early systemic signs are a bad prognosticator.

**Basic Standing Order**

- Routine Patient Care.
- Provide oxygen.
- Remove rings or other bands, which may become tight with local swelling.
- Immobilize bitten extremity.
- Minimize venom absorption by keeping bite area still and patient quiet. Apply lymphatic band 2-3” above bite. (Lymphatic band should be at least 1” wide and allow 2 fingers to be easily inserted under the band.
- Mark time and extent of erythema and edema with pen.
- Transport promptly for definitive observation and treatment.
- Do not use ice or refrigerants.
- Consider ALS for systemic symptoms or pain control

**Advanced Standing Orders**

- Establish IV access.

**Paramedic Standing Orders**

**Submersion Injuries – Adult and Pediatric**

Key points:

► Do not become a victim. Assess scene safety and rescue resources.
► Routine cervical spine stabilization may impede airway management and is not necessary unless the circumstances indicate that trauma is likely.
► Aggressive pulmonary support is essential.
► If possible, rescue breathing should begin while the patient is in the water.
► Chest compressions while in the water are ineffective.
► There is no need to clear the airway of water prior to rescue breathing.
► Attempts to remove water from the breathing passages by any means other than suction is not necessary.
► The Heimlich maneuver should be reserved for patients > 1 year of age with suspected airway occlusion by a foreign body.

**Basic Standing Orders**

► Routine Patient Care.
► Conscious patients with submersion injuries should be transported to the hospital.
► Initiate resuscitation as quickly as possible.
► Follow specific resuscitation protocol including AED.
► Manage cervical spine based on likelihood of cervical trauma.
► Obtain specific history:
  o Time
  o Temperature
► Consider hypothermia.
► Associated trauma.
► Consider ALS intercept

**Paramedic Standing Orders**

► Initiate IV access.
► Follow appropriate ACLS algorithm.
► Consider CPAP if no contraindications.

**Heat Cramps/Heat Exhaustion – Adult and Pediatric**
Heat Cramps: Brief, intermittent and other severe muscle cramps associated with large amounts of sweating with hypotonic fluid replacement.

Heat Exhaustion: Water or salt depletion in the face of fluid loss in a hot environment. Symptoms are variable and nonspecific and include weakness, fatigue, headache, impaired judgment, vertigo, nausea and vomiting. Orthostatic hypotension may occur.

**Basic Standing Orders**

- Routine Patient Care.
- Obtain glucose reading via glucometer.
- Remove victim to a cool area and shield from sun or any external heat source.
- Monitor vital signs and mental status.
- Consider active cooling with tepid water mist and fanning the patient Cardiac monitor
- If alert and oriented, provide commercially available flavored electrolyte solution.

**Advanced Standing Orders**

- Consider IV access.
- IV bolus of 0.9% NaCl (normal saline): 250 ml for adults, 20ml/kg for pediatrics; may repeat if systolic pressure dictates.
Hyperthermia (Environmental) – Adult and Pediatric

Mental status changes in the heat-challenged victim signal the onset of potentially severe heat illness and heat stroke. Mortality and morbidity are directly related to the length of time the victim is subject to the heat stress. Consider pharmacological causes as well.

**Basic Standing Orders**

- Routine Patient Care
- Move victim to a cool area and shield from the sun or any external heat source.
- Remove as much clothing as is practical and loosen any restrictive garment remaining.
- If alert and oriented, give small sips of cool liquids.
- Monitor and record vital signs and level of consciousness.
- If temperature >104°F(40°C) or if altered mental status: begin active cooling by
  - Continually mist the exposed skin with tepid water while fanning the victim
  - Truncal ice packs may be used, but are less effective than evaporation
  - If shivering occurs discontinue active cooling and notify medical control

**Advanced Standing Orders**

- IV access and administer fluids to maintain systolic blood pressure >90 mm Hg (adults) or >minimum for age and signs of adequate perfusion.
- IV bolus of 0.9% NaCl (normal saline): 250 ml for adults, 20ml/kg for pediatrics; may repeat if systolic pressure dictates.

**Paramedic Standing Orders**

- Adults: If uncontrolled shivering occurs during cooling, lorazepam 0.5-1 mg IV/IM or diazepam 2 mg IV or 5 mg deep IM.
Hypothermia (Environmental) – Adult and Pediatric

Basic Standing Orders

All Cold Patients

► Routine Patient Care
► Careful handling is the highest priority
► Prevent further heat loss.
  ◦ Insulate from the ground and shield from wind and water.
  ◦ Remove wet clothing if in shelter. Cut clothing off to avoid excessive movement.
  ◦ Cover the head and neck.
  ◦ Insulate above and below.
  ◦ Protect from the wind.
  ◦ Apply insulated heat packs to high heat transfer/loss areas such as the head, neck, underarms, sides of the chest, and groin.
  ◦ Cover with a vapor barrier (such as a plastic garbage bag).
  ◦ Move the patient to a warm environment.
  ◦ Consider covering patient’s mouth and nose with a light surgical mask to reduce heat loss through respirations.
  ◦ Chemical heat packs slow cooling but do not rewarm. They are best used on hands and feet to prevent frostbite.
  ◦ Obtain temperature (rectal preferred as appropriate).

► Rewarm
  ◦ If patient is alert enough to swallow, give food and drinks high in calories. The calories will increase ability to shiver which is most effective field rewarming.
  ◦ Exercise drops temperature and then increases it but, this is not as effective as shivering. If dry and fed and shivering, mild exercise is OK.

► Oxygen should be heated and humidified, if possible to a maximum of 108 °F (42° C).
► Splinting should be performed, when indicated, with caution to prevent additional injuries to frostbitten tissues.
► Treat and transport to a medical facility.
Hypothermia (Environmental) – Adult and Pediatric continued

Severity Levels of Hypothermia and Associated Symptoms

<table>
<thead>
<tr>
<th>Severity</th>
<th>Temperature Range</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD</td>
<td>97°F – 95°F (36.1°C – 35°C)</td>
<td>cold sensation, shivering, unable to perform complex tasks with hands</td>
</tr>
<tr>
<td>MODERATE</td>
<td>95°F – 93°F (35°C - 33.9°C)</td>
<td>intense shivering, clumsy and uncoordinated, mild confusion, slow and labored movements</td>
</tr>
<tr>
<td></td>
<td>93°F – 90°F (33.9°C – 32.2°C)</td>
<td>violent shivering, difficulty with speech, sluggish thinking, mild amnesia, may appear drunk</td>
</tr>
<tr>
<td>SEVERE</td>
<td>90°F – 86°F (32.2°C - 30°C)</td>
<td>shivering stops, unable to walk, incoherent, irrational</td>
</tr>
<tr>
<td></td>
<td>&lt;86°F (30°C)</td>
<td>progressive stupor to unconsciousness, loss of awareness</td>
</tr>
<tr>
<td></td>
<td>&lt;82°F (27.8°C)</td>
<td>unconscious, respiration and heartbeat erratic, pulse not palpable, pulmonary edema, cardiac and respiratory arrest, death</td>
</tr>
</tbody>
</table>

Advanced Standing Orders

- IV access and administer fluids to maintain systolic blood pressure >90 mm Hg (adults) or > minimum for age and signs of adequate perfusion.

Paramedic Standing Orders

If core temperature <30°C (86°F)
- CPR if indicated.
- Withhold IV medications.
- Attempt defibrillation once (use 360 joules for monophasic and 120 – 200 joules for biphasic defibrillators). Peds: 2J/kg.

If core temperature >30°C (86°F)
- CPR if indicated.
- Give IV medications based on dysrhythmia (but at longer intervals).
- Repeat defibrillation for ventricular fibrillation/ventricular tachycardia as core temperature rises.
Hypothermia (Environmental) – Adult and Pediatric - Mild

Cold sensation, shivering, unable to perform complex tasks with hands.

**Basic Standing Orders**

- Treat the patient as outlined above.
- If there is no way to get to a medical facility, rewarm the patient gradually by:
  - Warm showers or warm bath if the patient is alert.
  - Placing patient in a sleeping bag and providing contact with a warm body.

**Advanced Standing Orders**

- Many hypothermic patients may require aggressive fluid resuscitation. The field goal is volume expansion not rewarming.
- Use bolus therapy for volume expansion to endpoint of normalization of vital signs; specifically heart rate.
- IV’s should be heated to patient’s current core temperature or greater. 98-104° F (37-40° C) is ideal.
- The recommended fluid for rehydration is a balanced salt solution, such as normal saline or ringer’s lactate.
- Do not use TKO lines in hypothermic patients. Use a saline lock.
Hypothermia (Environmental) – Adult and Pediatric - Moderate

Violent shivering, sluggish labored movements, confusion, may appear drunk.

**Basic Standing Orders**

- Treat the patient as outlined above with the following exceptions:
  - Do not put patient in shower or bath.
  - Do not give a patient oral fluids unless he is capable of swallowing and protecting his/her airway.
  - Do not attempt to increase heat production through exercise.

**Advanced Standing Orders**

- IV THERAPY
  - Many hypothermic patients are dehydrated and may require aggressive fluid resuscitation. The field goal is volume expansion not rewarming.
  - Use bolus therapy for volume expansion to endpoint of normalization of vital signs; specifically heart rate.
  - IV’s should be heated to patient’s current core temperature or greater. 98-104°F (37-40°C) is ideal.
  - The recommended fluid for rehydration is a balanced salt solution, such as normal saline or ringer's lactate.
  - Do not use TKO lines in hypothermic patients. Use a saline lock.

**Paramedic Standing Orders**

- MEDICATIONS:
  - Indications for medications are the same for mildly hypothermic patients as they are for normothermic patients.
  - In the patient with a core temperature of less than 86°F (30°C) medications should be withheld.
  - Medications are inefficient and poorly metabolized in the hypothermic patient. In addition, due to delayed metabolism, medications given in normal therapeutic doses to severely hypothermic patients can result in toxicity when the patient is rewarmed.
  - As with any person with altered consciousness, Narcan and 50% dextrose should be considered when there is a reasonable suspicion that their use is warranted.
  - Sodium bicarbonate is not to be used unless specifically ordered by a physician.
Hypothermia (Environmental) – Adult and Pediatric- Severe

Shivering stops, incoherent progressing to unconscious, erratic respiration and heartbeat, unstable vital signs.

**Basic Standing Orders**

- If victim is not breathing, provide rescue breathing via bag-valve mask.
- Use heated humidified oxygen if available.

**Advanced Standing Orders**

- Consider Advanced Airway Management
- Avoid hyperventilation
- Use heated humidified oxygen if possible (42°C – 46°C or 108°F – 115°F)
- Rewarming is key to arrest survival in hypothermia. Field techniques are ineffective. The goal is to deliver a viable patient to a facility that can perform effective rewarming (most clinics and hospitals).
- An AED or monitor may help determine cardiac activity. If any organized (other than VT) electrical rhythm is shown, do not start CPR.
- If no pulse (after checking for up to 60 seconds) and no respirations and no contraindications, start CPR. Be careful to not hyperventilate.

**Paramedic Standing Orders**

- If resuscitation has been provided in conjunction with rewarming techniques for more than 60 minutes without the return of spontaneous pulse or respiration, contact medical control for recommendations.
Frostbite – Adult and Pediatric

Management

► Concerns:
  ► Do not rub the frozen part.
  ► Do not allow the patient to have alcohol or tobacco.
  ► Do not apply ice or snow.
  ► Do not attempt to thaw the frostbitten part in cold water.
  ► Do not attempt to thaw the frostbitten part with high temperatures such as those generated by stoves, exhaust, etc.
  ► Do not break blisters which may form.

Basic Standing Orders

► Treatment of deep frostbite is usually extremely painful and best accomplished in a medical facility. In most circumstances, the risks posed by improper rewarming or refreezing outweigh the risks of delaying treatment for deep frostbite.
► If transporting a patient with frostbite that will not be rewarmed in the field, the medical provider should protect the frostbitten parts from additional injury and temperature changes.
► Protect the rewarmed area from refreezing and other trauma during transport. A frame around the frostbitten area should be constructed to prevent blankets from pressing directly on the injured area.
► Do not allow an individual who has frostbitten feet to walk except when the life of the patient or rescuer is in danger. Once frostbitten feet are rewarmed, the patient becomes nonambulatory.
► Shock due to frostbite is very uncommon. However, medical personnel should always be alert for shock and begin treatment at the earliest sign it is developing. If the frostbite patient develops shock, personnel should perform a thorough examination for additional injuries.
Airway and Ventilation Management
PEDIATRIC AIRWAY MANAGEMENT

I. Initial Assessment: Using Pediatric Assessment Triangle / Rapid Cardiopulmonary Assessment

A. Appearance
   1. Alertness
   2. Distractibility
   3. Consolability
   4. Eye Contact
   5. Speech / Cry
   6. Spontaneous Motor Activity
   7. Color

B. Work of Breathing
   1. Appearance
   2. Use of Accessory Muscles
      a. Retractions
      b. Diaphragmatic Breathing
   3. Tidal Volume (chest rise)
   4. Other Signs of Distress:
      a. Nasal Flaring
      b. Grunting
      c. Cyanosis

C. Circulation to the Skin
   1. Strength of Pulses (central vs. peripheral)
   2. Color / Temperature of Extremities
   3. Capillary Refill Time
   4. Blood Pressure

II. Initial Assessment Indicates Spontaneous Breathing Without Compromise.

A. Monitor breathing during transport.
B. Administer oxygen
   1. Infants via infant mask @ 2-4 L/min.
   2. Small child (1-8 y/o) via pediatric mask @ 6-8 L/min.
   3. If mask is not tolerated, administer by blow-by method.

III. Initial Assessment Indicates Spontaneous Breathing With Respiratory Distress

A. Maintain airway with manual maneuvers.
B. Suction as needed.
C. Administer oxygen (II. B above).
D. If unable to maintain an airway, insert an oral or nasal airway.
E. Assist ventilations with BVM as needed.
F. Monitor with EKG and pulse oximetry as soon as possible and capnography if available.
Airway Management – Pediatric continued

IV. Initial Assessment Indicates Breathing is Absent or Severe Respiratory Distress
   A. Maintain airway with manual maneuvers.
   B. Suction as needed.
   C. Insert an oral or nasal airway.
   D. Ventilate with BVM and 100% oxygen @ 20/min for a child and 30/min for an infant.
   E. Monitor EKG and pulse oximetry as soon as possible and capnography if available.
   F. Establish IV or IO vascular access.
   G. Consider need for endotracheal intubation.

V. Continued BVM Ventilation vs. Endotracheal Intubation
   A. BVM with oral and or nasal airway should be the initial technique used for ventilatory support.
   B. Endotracheal intubation should be used when BVM ventilation is ineffective or transport time is prolonged.
   C. Continued ventilation with BVM with oral/nasal airways can provide acceptable ventilation and oxygenation in the pediatric patient.
   D. Pre-hospital pediatric intubation is a controversial skill:
      1. Specific pediatric training and ongoing continuing education is required.
      2. Proven to be a high risk / low frequency event.
      3. Hypoxia / hypoventilation are risks during intubation attempts.
      4. At present, no documented outcome benefit when compared to continued BVM.

VI. Airway Management with Bag Valve Mask (BVM) Ventilation
   A. Purpose:
      1. BVM ventilation is the preferred technique for providing rescue breathing for pediatric patients with inadequate respiratory effort or cardio-respiratory arrest. Patients who are in respiratory distress and failure may respond to BVM ventilation and not require pre-hospital endotracheal intubation.
      2. BVM may also be used to administer bronchodilators in patients with bronchospastic airway disease.
Airway Management – Pediatric continued

B. Indications:
1. Inadequate respiratory rate:
   a. Adolescent: < 12/min
   b. Child: < 16/min
   c. Infant / Toddler: < 20 / min
2. Inadequate respiratory effort:
   a. Absent or diminished breath sounds.
   b. Paradoxical breathing (chest and abdomen moving in opposite directions).
   c. Persistent cyanosis on 100% oxygen by non-rebreather mask.
3. Symptomatic bradycardia:
   a. Child: HR < 80 / min
   b. Infant: HR < 100 / min
4. Cardiac Arrest
5. Altered Mental Status with GSC < 9

C. Contraindications: None

D. Adverse Effects / Complications
1. Gastric distension.
2. Vomiting.
3. Increased ICP or vagal reflex bradycardia if pressure is applied by mask over the patient’s eyes.

E. Procedure:
1. Have suction available since vomiting may occur.
2. Use an appropriately sized oral or nasal airway adjunct with BVM ventilation.
3. Use an appropriate sized mask for best fit and to avoid pressure over the eyes.
4. For the single provider, use the “E-C clamp” technique of holding the mask.
5. Monitor EKG, pulse oximetry and capnography if available.
6. Ventilate with 100% oxygen with a tidal volume of approximately 6-10 cc/kg or with just enough volume to see the chest rise.
7. Rate of ventilation should be approximately 20/ min for a child and 30/ min for an infant. If capnography is available, ventilate to maintain the end tidal CO2 at 35-40 mmHg. If head injury and signs of herniation are present, increase ventilation to maintain an end tidal CO2 of 30 mmHg.
8. If the patient does not have an adequate chest rise with BVM ventilations:
Airway Management – Pediatric continued

a. Assure the airway is open and clear.
b. Use a two-hand jaw lift technique.
c. Use an oral and nasal airway.
d. Increase the volume of ventilation if the airway is clearly open and maintained.
e. Evaluate for gastric distension and the need for decompression with an orogastric tube.
f. Consider the need for endotracheal intubation if BVM is unsuccessful and skilled personnel are available.

VII. Pediatric Orotracheal Intubation

A. Purpose:
   1. Oral endotracheal intubation involves the passage of an endotracheal tube under direct vision via the oral cavity through the larynx and into the trachea to provide direct maximum ventilatory support of the patient.

B. Indications:
   1. Cardiac arrest.
   2. Severe respiratory distress, patient without a gag reflex.
   3. Coma, patient without a gag reflex.
   4. Patient is extremis, severe respiratory distress with poor air exchange, or agonal respirations.
   5. Unsuccessful airway management with BVM and oral/nasal airways.

C. Contraindications:
   1. Lack of equipment.
   2. Lack of skilled personnel.

D. Adverse Effects / Complications:
   1. Unrecognized esophageal intubation.
   2. Prolonged hypoxia and hypoventilation during intubation attempts.
   3. Trauma to oropharynx, vocal cords, esophagus, or trachea.
   4. Right mainstem bronchus intubation.
   5. Vomiting and pulmonary aspiration.
   6. Increased intracranial pressure due to vagal stimulation.
   7. Pneumothorax or tension pneumothorax due to excessive ventilatory pressures.
Airway Management – Pediatric continued

E. Procedure:
1. Complete a “primary survey” and assure A-B-C’s with basic life support skills
   a. Oxygenate with 100% oxygen with non-rebreather mask.
   b. Ventilate with BVM if needed.
   c. Monitor EKG, pulse oximetry and continuous capnography if available.
   d. Manual cervical spine motion restriction if trauma mechanism.
2. Prepare equipment:
   a. BVM
   b. Suction
   c. Working, appropriate sized laryngoscope (see chart for equipment sizes).
   d. Endotracheal tubes (ETT) and stylet
      i. ETT size: \((4 + \text{Age}/4)\).
      ii. Check chart or age based resuscitation tape.
      iii. ETT depth in cm: \((12 + \text{Age}/2)\) or \((\text{ETT size} \times 3)\).
      iv. Place the lubricated stylet into the ETT and bend the distal tip into a gentle curve.
      v. Assure that the tip of the stylet does not extend out the end of the ETT.
      vi. Have the next half-size smaller ETT at hand.
   e. Oral and nasal airways.
   f. Pediatric LMA’s if available (see chart in LMA protocols).
3. Oxygenate and ventilate with BVM prior to laryngoscopy.
5. Have an assistant apply cricoid pressure.
6. Insert laryngoscope into the right corner of the mouth, sweep tongue upward and to the left by using a lifting motion, not a prying motion.
7. Identify the epiglottis.
8. Elevate the epiglottis exposing the glottic opening.
   a. In infants and toddlers, the straight blade may be successfully used to place into the vallecula and elevate the epiglottis indirectly by lifting the base of the tongue. The shape and position of the infant/toddler epiglottis makes it more difficult to directly pick-up with the straight laryngoscope blade.
9. Holding the ETT like a dart, place the tube through the vocal cords and into the trachea under direct vision and insert approximately 2 cm below the cords.
a. It is generally recommended to use an un-cuffed ETT in children < 8 y/o. However, this is controversial in the current literature. A cuffed ETT may be used in the child < 8 y/o but extreme care must be used to assure that the cuff remains completely deflated unless a large air leak is detected.

10. Remove the laryngoscope and hold the ETT in place.

11. Attach the BVM and ventilate with 100% oxygen.

12. Confirmation of correct ETT placement: No single method of ETT confirmation is 100% reliable, the position of the ETT must be assessed to be properly in the trachea by all means available to the pre-hospital EMS provider. The following methods may be used to confirm the correct placement of the ETT.
   a. Visualization of the ETT passing through the cords and into the trachea
   b. Auscultation of all lung fields to confirm adequate air exchange
   c. Auscultation of the epigastrium to confirm the absence of disturbance of the gastric fluids during ventilation
   d. Observation of bilateral expansion of the thorax
   e. End tidal CO2 detection device:
      i. At a minimum the colorimetric devices assessed initially and after six breaths.
      ii. Capnometry devices that give a numeric end tidal CO2 reading.
      iii. The preferred device is continuous capnography that is downloadable and printable.
   f. Esophageal intubation detector device.
       i. Useful if child > 8 y/o
   g. Other clinical signs of improved perfusion and ventilation/oxygenation
      i. Stable heart rate.
      ii. Pupillary response.
      iii. Stable and rising oxygen saturation.
      iv. Improved skin color.

13. Once correct ETT placement is confirmed, the ETT must be secured.
   a. Commercial device with built in bite block.
   b. Oral airway with tape. Tape ETT to the maxilla, not the mandible.
   c. Minimize head and neck movement with the use of a cervical collar, cervical spine immobilization device and spine board.
d. Note and document depth of ETT placement.
   i. 3-5 cm of ETT movement may occur with neck flexion or extension.

14. Ventilation:
   a. Use care to avoid hyperventilation.
   b. Tidal volume of 6-10 cc/kg or just enough ventilation to see the chest rise.
   c. Use a rate of 20/min for a child and 30/min for an infant or toddler.
   d. If continuous end tidal CO2 monitoring is available, maintain an ETCO2 of 35-40 mmHg (30 mmHg in cases of head injury with signs of herniation).

15. Re-confirm correct ETT position during on-going assessments. At a minimum reconfirmation should occur:
   a. Anytime patient is moved.
   b. Anytime dislodgement is suspected.
   c. Anytime care is transferred to another provider.

16. Documentation:
   a. Full report to Emergency Department Physician.
      i. Specifically report any intubation difficulties or airway management problems.
Post Intubation Care

- Confirmation of correct ETT position
  - No single technique is 100% reliable for ETT confirmation.
  - Pre-hospital EMS providers should use all available means to determine correct ETT position.
  - A minimum of two clinical and one instrumental method of determination is recommended.
  - The following methods may be used to confirm correct ETT placement.
    - Direct visualization of the ETT passing through the vocal cords into the trachea.
    - Auscultation of all lung fields to confirm adequate air exchange.
    - Auscultation of the epigastrium to confirm the absence of disturbance of the gastric fluids during ventilation.
    - Observation of bilateral expansion of the thorax during ventilation.
    - Use of end tidal CO2 detection
      - Colorimetric devices (pediatric size for child < 15 kg)
        - Patient with a pulse
          - YELLOW: ETT is in trachea
          - TAN: Consider possible causes of poor perfusion or poor CO2 production. Give 6 breaths and monitor color of detector. If color changes to yellow or remains tan, ETT is in the trachea. If color changes to purple, apply cricoid pressure, remove the ETT, oxygenate with BVM and re-intubate.
          - PURPLE: ETT not in trachea. Apply cricoid pressure, remove ETT, oxygenate with BVM and re-intubate.
        - Patient without a pulse: Lack of color change is common even with proper placement in cardiac arrest.
          - YELLOW: ETT is in the trachea
          - TAN: Consider possible causes of poor perfusion and evaluate quality of CPR. Give 6 breaths and monitor color of detector. If color changes to yellow or remains tan, ETT is in the trachea. If color changes to purple, CO2 is not being detected because the ETT is not in the trachea or no CO2 is being delivered to the lungs in the arrest state. Confirm placement via other means.
      - Capnometry device that provides a numeric value for end tidal CO2.
      - Capnography device that provides a continuous waveform and digital readout of end tidal CO2.
      - Capnography that is continuous and has the capability to electronically download and print data is the preferred device.
        - Normal values for end tidal CO2 is 5% to 6% which is equivalent to 35-45 mmHg.
Post Intubation Care continued

- Esophageal intubation detector device (see EID protocol)
  - Useful for pediatric patients in children > 8 y/o
- Other clinical signs of improved perfusion and improved ventilation and oxygenation
  - Stable heart rate
  - Pupillary response
  - Stable and rising oxygenation saturation
  - Improved skin color

Depth of ETT placement
- Correct depth avoids right mainstem bronchus intubation and inadvertent extubation.
- General depths of placement at the teeth or gums:
  - Adult male: 21-23 cm
  - Adult female: 19-21 cm
  - Infant: 10-11 cm
  - Child over 1 y/o: (12cm + Age/2) or (ETT size X 3)
- Direct visualization of cuff of ETT below the vocal cords.
- Inflated cuff of the ETT can be palpated in the sternal notch when the pilot balloon is compressed.

Securing the ETT
- Initially manually secure ETT in place with your thumb and forefinger.
- A commercial ETT securing device with an incorporated bite block is recommended.
- At a minimum, place an oral airway and tape the ETT in place.
  - If circumferential taping is utilized, use care not to occlude venous blood flow from the head.
  - To avoid excess motion, tape the ETT to the maxilla, not the mandible.
- To further minimize head movement, place a cervical collar, immobilize with a cervical spine immobilization device.

Following the securing of the ETT, note and document the depth of ETT placement.
Post Intubation Care continued

- Ventilation
  - With an ETT and 100% oxygen, large tidal volumes and hyperventilation are not necessary and have been shown in recent studies to be detrimental to patient outcome.
  - Use care to avoid hyperventilation. The exception is the head injured patient with signs of herniation and then only modest hyperventilation is necessary (see below).
  - Ventilate with a tidal volume of approximately 6-10 cc/kg or clinically, just enough ventilation to see the chest rise with each administered breath.
  - Rate of ventilation:
    - Adult: 10-12 / min
    - Child: 20 / min
    - Infant / Toddler: 30 / min
  - If continuous ETCO2 monitoring is available, maintain an ETCO2 of 35-40 mmHg.
    - If the patient has a head injury and signs of herniation, modestly hyperventilate to an ETCO2 of approximately 30 mmHg.
CPAP/BiPAP USE

Indications:
► Adult Patient.
► Conscious patient in severe respiratory distress due to suspected pulmonary edema, COPD or burn inhalation injuries.
► Shortness of breath with pulse oximetry < 92% on high-flow oxygen via NRB mask.

Contraindications:
► Suspected Pneumothorax.
► Inability to maintain own airway.
► Altered mental status.
► Agitated or Combative behavior.
► Facial trauma or burns.

System Requirements:
► Prehospital CPAP/ BiPAP equipment that meets DOH requirements.

Procedure:
► Assess patient and initiate high flow oxygen as indicated.
► Monitor pulse oximetry.¹
► Apply CPAP/ BiPAP if oxygen saturation < 92% on high flow oxygen via NRB mask.
  o Connect CPAP/BiPAP device to suitable oxygen supply.
  o Attach breathing circuit to CPAP/BiPAP device and ensure device is functioning properly.
  o Apply and secure appropriate size breathing circuit mask to patient.
  o Titrate positive airway pressure up until improvement in patient pulse oximetry and symptoms.
    ▪ WARNING: Do not exceed pressures of 10 cm H2O.
► Reassess the patient.
► Follow CHF or Asthma protocols if appropriate.²,³
► Transport
► Contact Medical control. ⁴

¹Pulse oximetry should be monitored continuously during use of CPAP/BiPAP
²If appropriate, nebulized bronchodilators may be administered during PAP ventilation via a side port.
³When appropriate, nitroglycerine should be administered by tablets rather than spray when a patient is receiving PAP ventilation.
⁴Advise the receiving ED of CPAP use as soon as possible. Many EDs do not have CPAP within the ED and may need to obtain it from within the hospital.
King LT-D

Indications:
► Apneic patient when endotracheal intubation is not possible or not available.
► Patient must be > 35 inches tall.

Contraindications:
► Intact gag reflex.
► Known esophageal disease such as cancer.
► Caustic ingestion.
► Patients less than 35 inches tall.

Procedure:
► Choose correct size:

<table>
<thead>
<tr>
<th>Size</th>
<th>Height</th>
<th>Cuff Volume (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>35-45”</td>
<td>25</td>
</tr>
<tr>
<td>2.5</td>
<td>41-51”</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>4-5’</td>
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<tr>
<td>4</td>
<td>5-6’</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>6+’</td>
<td>80</td>
</tr>
</tbody>
</table>

► Prepare King LT-D
► Test cuffs for leaks (see volume above).
► Lubricate device with water-soluble lubricant.
► Preoxygenate and hyperventilate the patient, if time permits.
► Grasp the patient’s tongue and jaw with your gloved hand and pull forward.
► With the King LT-D rotated laterally at 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.
► As tube tip passes under tongue, rotate tube back to midline (blue orientation line faces chin).
► Advance tube until base of connector is aligned with teeth or gums.
► Inflate cuffs to appropriate volume as listed above.
► Connect the King LT-D to a bag-valve device and ventilate the patient. If there is resistance to ventilation slowly withdraw tube until resistance to ventilation is relieved.
► Assess for adequate placement by auscultation (equal breath sounds over the chest and lack of sounds over the epigastrium with bagging), symmetrical chest wall rise and at least one additional method: colorimetric end-tidal CO2 detector, capnography, or esophageal tube detector (note: this device should be used prior to ventilation to be accurate). This should be repeated often, especially after movement of the patient.
► Secure the device.
Digital Intubation

Indications:
► Inability to intubate via direct visualization or via BNTI.
► Patient should be either unresponsive or extremely cooperative.

Contraindications:
► Patient condition that may result in biting of paramedic fingers.
► Caution: Human bite wounds can result in life/extremity threatening infections. Use caution with this procedure. Consider the option of the RSI protocol.

Procedure:
► Pre-oxygenate with 100% oxygen by NRB for 3-5 minutes
► Assemble equipment
  ○ ETT’S, BVM, Stylet, Bite block, Suction, Syringe, Securing device.
► Monitor Patient
  ○ EKG, B/P, Sp02, prepare ETC02 detector device.
► Maintain manual cervical spine motion restriction if trauma is suspected. The front of the cervical collar may be removed as long as manual immobilization is maintained.
► Lubricate stylet and place into the ETT with the distal tip bent into a "J" shape.
► Stand or kneel facing the patient.
► Place a bite block to prevent injury to the fingers.
► Using the index and middle fingers of the non-dominant hand, pull forward on the tongue and jaw and walk down the tongue to palpate the epiglottis with the middle finger.
► Insert the lubricated ETT/stylet at the corner of the mouth on the side of the dominant hand.
► Advance the tube over the tongue, between the fingers, over the epiglottis and into the trachea. The index finger can be used to steer the tube into the glottis.
► The index finger keeps the ETT against the epiglottis.
► As the ETT is advanced toward the glottis lift the middle finger and press the tube anteriorly.
► Spontaneous air movement will also guide the tube placement.
► Remove the stylet, inflate the cuff, ventilate and verify ETT position.
► Secure the ETT in place. Consider the use of a cervical collar to minimize head movement.
► Re-check ETT position after each patient movement and upon transfer of care to receiving hospital or other care provider.

References

**Blind Nasal Endotracheal Intubation**

Indications:
► Adult spontaneously breathing patient requiring intubation.

Contraindications:
► Apnea
► Severe maxillofacial injuries
► Abnormal pharyngeal/supraglottic anatomy (mass, abscess, etc).

Procedure:
► Preoxygenate with 100% oxygen by NRB mask.
► Obtain secure IV access.
► Consider sedation (See Sedation/Analgesia Protocol) but avoid respiratory depression.
► For the awake patient consider applying Lidocaine gel to the ETT and nasal airways and spray the nasopharynx with Lidocaine or Cetacaine spray.
► Assemble equipment
  o ETT (0.5-1.0 mm size smaller than for an oral intubation), BVM, Suction, Syringe, Securing device, Laryngoscopes and Rescue Airway Devices.
  o An Endotrol ETT is often useful.
► Monitor the patient with EKG, B/P, Sp02, and prepare ETC02 detector device.
► Maintain manual cervical spine motion restriction if trauma is suspected.
► Apply a vasoconstrictor spray to both nares. Lubricate and insert progressively larger sizes of nasal airways to dilate the nasal passage.
► Gently insert a lubricated ETT and pass the ETT using steady, firm pressure.
► While advancing the ETT, use a jaw thrust or chin lift maneuver to elevate the epiglottis. This may be performed by an assistant. Listen for continuous breath sounds coming through the ETT. Try to close the mouth with a gloved hand and occlude the opposite nare allowing for maximal breath sounds through the ETT.
► Apply cricoid pressure to minimize risk of regurgitation and aspiration and to manipulate larynx to obtain maximum breath sounds.
► Just proximal to the glottis, the breath sounds will become louder. Advance the ETT with inspiration.
► Inflate the ETT cuff, ventilate, and verify correct ETT position by two clinical methods and presence of ET C02. (See oral intubation protocol)
► Secure the ETT in place (approximately 26 cm in females, 27 cm for males at nares).
► Consider the use of a cervical collar to limit head movement.
► Re-check ETT position with each patient movement
► Assist ventilations with a BVM or use a mechanical ventilator (if approved).

References:
Quicktrach II with Cuff

Purpose

To establish an emergency airway through an opening made directly into the trachea.

Indications:

► Situations where a patient cannot be ventilated and oxygenated due to an upper airway obstruction that cannot be relieved by traditional non-surgical methods (Example: upper airway burns with edema)
► Where direct laryngoscopy and other rescue airways have failed or are impossible due to maxillofacial trauma or severe bleeding that obscures anatomic landmarks.
► Situations where the medical crew deems that the Quicktrach II is the best approach for airway management given the circumstances of the individual case.
► Sizing
  o Adult Quicktrach II (4mm ID) used on people taller than 55" (140 cm)
  o Child Quicktrach (2mm ID) used on children older than 2 years

Contraindications:

► Inability to locate the cricothyroid membrane.
► Any mass over the cricoid cartilage.
► Stenosis (narrowing) in the cricothyroid membrane region.
► Transection or retraction of the trachea due to blunt force trauma to the neck.

Relative Contraindications:

► Enlarged thyroid
► Peritracheal malignancy
► Neck Abscess

Complications:

► Inadequate oxygenation leading to hypoxia and death
► Aspiration
► Bleeding / Hematoma
► Esophageal laceration
► Laceration of posterior tracheal wall
► Pneumomediasatinum
Procedure:

- Continue ventilation and oxygenation with oral/nasal airways and BVM with 100% oxygen while preparations are being made.
- Assemble the Quicktrach II Cuffed Cricothyrotomy Kit.
- Hyperextend the head and throat. If necessary, place a piece of clothing under the neck.
- Prep the anterior neck with betadine or alcohol.
- Palpate the thyroid notch, cricothyroid membrane, cricoid cartilage and sternal notch to obtain anatomic landmark orientation.
- Stabilize the thyroid cartilage with the non-dominant hand and maintain this stabilization until the trachea is intubated.
- Firmly hold the syringe and puncture the skin at a 90° angle
- After puncturing, change the angle of insertion to 60° and push the Quicktrach II forward into the trachea up to the stopper. The stopper prevents the needle from being inserted too deeply and therefore prevents perforation of the rear wall of the trachea. Now it will be possible to aspirate with the syringe in order to determine the position of the cannula. If it is possible the needle lies in the center of the trachea.
- Remove the stopper
- Push the plastic cannula forward with the thumb until the safety clip audible clicks into position. This indicates that the tip of the metal needle is covered by the plastic cannula to prevent trauma. Further insert the Quicktrach II until the flange rests on the neck. The metal needle can now be removed.
- Inflate the cuff with the prepared syringe (10 ml)
- Secure the cannula with the foam neck tape.
- Put the connecting tube into the 15-mm connection and connect the other end with the resuscitation bag.
Tracheostomy Care – Adult

Basic Standing Orders

► Routine Patient Care.
► Consult with patient’s caregivers for assistance.
► Assess tracheostomy tube: look for possible causes of distress that may be easily correctable, such as a detached oxygen source.
► Obtain pulse oximeter reading.
► Consider ALS intercept.

Paramedic Standing Orders

► Assist ventilations using bag-valve-mask device with high flow oxygen.
► If on a ventilator, remove patient from the ventilator prior to using bag-valve-mask device, as there may be a problem with the ventilator or oxygen source.
► Suction if unable to ventilate via tracheostomy or respiratory distress continues. Use no more than 100 mm/Hg suction pressure. If the tracheostomy tube has a cannula, remove it prior to suctioning. Determine proper suction catheter length by measuring the obturator. If the obturator is unavailable, insert the suction catheter approximately 2 to 3 inches into the tracheostomy tube. Do not use force. Two to three ml of sterile saline may be used in the tracheostomy tube.
► If patient remains in severe distress:
  o Continue ventilation attempt using bag-valve-mask with high-flow oxygen via the tracheostomy. Refer to Asthma/COPD/RAD Protocol if indicated.
  o If patient’s breathing is adequate but exhibits continued signs of respiratory distress, administer high flow oxygen via non-rebreather mask or blow-by as tolerated.
► If patient continues in severe respiratory distress
  o Remove tube and attempt bag-valve mask ventilation.
  o If another tube is available from caregivers, insert into stoma and resume ventilation (a standard endotracheal tube may be used or the used tracheostomy tube after being cleaned.)
  o If unable to replace tube with another tracheostomy tube or endotracheal tube, assist ventilations with bag-valve-mask and high-flow oxygen.
Advanced Suctioning

Indication:
► Obstruction of the airway (secondary to secretions, blood, and/or any other substance) in a patient currently being assisted by an airway adjunct such as an endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

Procedure:
► Ensure the suction device is operable.
► Pre-oxygenate the patient.
► While maintaining aseptic technique, attach the suction catheter to the suction unit.
► If applicable, remove ventilation devices from the airway.
► Insert the sterile end of the suction catheter into the tube without suction. Insert until resistance is met, pull back approximately 1-2 cm.
► Once the desired depth is met, apply suction by occluding the port and slowly remove the catheter from the tube, using a twisting motion.
► Suctioning duration should not exceed 15 seconds.
► Saline flush may be used to help loosen secretions and facilitate suctioning.
► Re-attach the ventilation device and oxygenate the patient.
**Esophageal Intubation Detector (EID) Device**

The EID’s action is based on the principle that the trachea is held open as a semi rigid tube by the tracheal cartilages while the esophagus is usually collapsed flat.

When an endotracheal tube is correctly placed into the trachea, the collapsed EID will re-inflate when attached to the endotracheal tube. If the EID is placed on an endotracheal tube incorrectly placed into the esophagus, the suction on the EID will cause the esophagus to further collapse and the EID will not inflate.

Two variations of the EID are available. A suction bulb and a 60-cc syringe. The suction bulb is made more rigid by cold temperatures and is thus not as effective in extreme cold.

The major benefit of the EID is in the cardiac arrest patient or the patient in profound shock who is not generating enough pulmonary blood flow to generate a reliable ETC02.

The EID is not reliable in the following clinical situations:

► Endotracheal tube obstruction
► Morbid Obesity
► Pregnancy
► Pulmonary edema
► Mainstem bronchus intubation
► Severe bronchospastic lung disease
► Severe COPD
Procedure Protocols
Application of Electrocardiogram Electrodes and Monitor
(Optional Skill – EMT-B)

This protocol reflects an optional Kentucky EMT-B skill. An EMT-B working for an ambulance service contracted with a physician medical director and offering this procedure in patient care shall be required to obtain the necessary training based on the Board approved state curriculum.

This protocol is primarily designed for EMT-B personnel to assist an Advanced Life Support (ALS) provider in patient care. It is not within the scope of practice of the EMT-B for them to discern the various heart rhythms. Distinguishing the various heart rhythms is the responsibility of ALS personnel.

► Electrode placement on the patient
  o You can obtain different views of the heart by placing electrodes over different areas of the heart.
  o Electrodes are sized as adult or pediatric.
  o Electrodes are placed on the patient to correspond to the preferred view (I, II, or Modified Chest Left (MCL1))
    ▪ The skin under the electrode should be dry.
    ▪ The skin may need to be abraded to rid of old skin and dirt for better adhesion of the electrode.
    ▪ Peel the electrode off the paper or peel the paper off the electrode (depending on the brand of electrodes).
    ▪ Apply the electrode to the skin.
  o Generally only 3 lead placements are used.
    ▪ I
    ▪ II
    ▪ MCL1
  o Placement of Lead I
    ▪ The positive electrode is placed on the left arm.
    ▪ The negative electrode is placed on the right arm.
    ▪ The Lead Selector is placed on Lead I.
  o Placement of Lead II
    ▪ The positive electrode is placed on the left leg.
    ▪ The negative electrode is placed on the right arm.
    ▪ The Lead Selector is placed on Lead II.
  o Placement of Lead MCL1
    ▪ The positive electrode is placed on the 4th intercostal space to the right of the sternum.
    ▪ The negative electrode is placed on the left arm.
    ▪ The Lead Selector is placed on Lead III.
Application of Electrocardiogram Electrodes and Monitor, continued. (Optional Skill – EMT-B)

► 12 Lead Application
  • Placement of 12 lead ECG’s
    ▪ Limb Leads
      • Right deltoid (white)
      • Left deltoid (black)
      • Right calf (green)
      • Left calf (red)
    ▪ Precordial Leads
      • V1: right 4th intercostal space
      • V2: left 4th intercostal space
      • V3: halfway between V2 and V4
      • V4: left 5th intercostal space, mid-clavicular line
      • V5: horizontal to V4, anterior axillary line
      • V6: horizontal to V5, mid-axillary line

► EKG Monitor Set-up
  • Turn the monitor on.
  • Connect the lead wires to the monitor.
  • Connect the lead wires to the electrodes.
    ▪ Select the proper Lead selection on the monitor to correspond to the Lead placement on the patient.
    ▪ Record a strip.

► Trouble shooting
  • Monitor does not come on
    ▪ Not turned on
    ▪ Dead batteries
  • Flat base line appears on monitor
    ▪ Lead wires not connected to the monitor
  • Wavy base line appears on monitor
    ▪ Lead wires not connected to the electrodes
    ▪ 60 cycle interference
  • Small complexes on screen
    ▪ Turn gain up
    ▪ Make sure Lead selected corresponds to Lead placement
  • Volume
    ▪ Too low - turn volume up
    ▪ Too loud - turn volume down
  • No printout
    ▪ Check if paper is jammed
    ▪ Replace paper if out
External Jugular IV Access

Criteria
► Patient in need of fluid administration for volume expansion or medication administration.

Exclusion Criteria
► Patient has a functioning peripheral extremity IV.
► Patient has an indwelling central venous line and is hemodynamically unstable.

Procedure
► All Patients
  • Explain the procedure to the patient whenever possible.
  • Position the patient: supine, elevate feet if patient condition allows (this may not be necessary or desirable if congestive heart failure or respiratory distress is present). Turn patient’s head to opposite side from procedure.
  • Expose vein by having patient bear down if possible, and “tourniquet” vein with finger pressure just above clavicle.
  • **Scrub** insertion site (Betadine v. alcohol is less important than vigor.)
  • Do not palpate, unless necessary, after prep.
  • Align the cannula in the direction of the vein, with the point aimed toward the shoulder on the same side.
  • Puncture the skin over the vein first, then puncture vein itself. Use other hand to traction vein near clavicle to prevent rolling.
  • Attach syringe and aspirate if the pressure in the vein is not sufficient to give flashback. Advance cannula well into vein once it is penetrated. Occlude catheter with gloved finger until IV tubing is connected to help prevent air embolism. Attach IV tubing.
  • If initial attempt is unsuccessful, a second attempt may be made on the same side as the first prior to contacting medical control. Medical control must be contacted prior to making more than 2 attempts or if bilateral attempts are considered.
  • Open IV tubing clamp full to check flow and placement, then slow rate to TKO or as directed.
  • Cover puncture site with appropriate dressing. Secure tubing with tape, making sure of at least one 180° turn in the taped tubing to be sure any traction on the tubing is not transmitted to the cannula itself.
  • Recheck to be sure IV rate is as desired, and monitor.
  • Document fluid type, size of catheter, site and complications on run report.
Intraosseous Infusion - EZ-IO®

Definition
► Intraosseous infusion establishes access in a patient where venous access cannot be rapidly obtained. The bone marrow space serves as a noncollapsible vein and provides access to the general circulation for the administration of fluids and resuscitation drugs. This protocol applies to all appropriate IO insertion sites.

Indications
► Adult patients age ≥ 8 and/or 40 kg or greater
► Intravenous fluids or medications needed and a peripheral IV cannot be established AND exhibit 1 or more of the following:
  • An altered mental status (GCS of 12 or less).
  • Respiratory compromise (SaO2 80% after appropriate oxygen therapy, respiratory rate < 10 or > 40 per minute.
  • Hemodynamic instability (Systolic BP of < 90).

Contraindications
► Fracture of the tibia or femur or humerus (consider alternate site)
► Previous orthopedic procedures (IO within 24 hours, knee or shoulder replacement) (consider alternate site)
  • Pre-Existing medical condition (tumor near site or peripheral vascular disease).
  • Infection at insertion site.
  • Inability to locate landmarks due to significant edema.
  • Excessive tissue at insertion site.

Considerations
► Flow rates: Due to the anatomy of the IO space you will note flow rates to be slower than those achieved with IV catheters.
  • Ensure the administration of a 10 ml rapid bolus (flush) with a syringe.
  • Use a pressure bag or pump for continuous infusions.
► Pain: Insertion of the EZ-IO® in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV. IO infusion may cause severe discomfort for conscious patients.
  • Prior to IO bolus or flush on a conscious patient, slowly administer 20-50 mg of 2% lidocaine (preservative free), (i.e. 1-2.5 ml) through the EZ IO® hub.
  • Consider pain management.
Intraosseous Infusion EZ-IO® – continued

**Equipment**
- EZ-IO® Driver
- Alcohol or betadine swab
- 10 ml syringe
- Tape or gauze
- EZ-IO® needle set
- Extension set or EZ-connect
- Normal Saline
- 2% lidocaine

**Procedure**

- The preferred site is the proximal Humerus. For Tibial insertion the location is one finger width (1-3 cm) below the prominence (tibial tuberosity) on the flat anteromedial surface. A different bone should be chosen if the primary bone is fractured or the overlying skin is burned or infected.
  - Wear appropriate Body Substance Isolation Equipment.
  - Determine EZ-IO® indications.
  - Rule out contraindications.
  - Locate insertion site (see note above).
  - Cleanse insertion site using aseptic technique.
  - For conscious patients, you may consider pain control.
  - Prepare the EZ-IO® driver and needle set.
  - Stabilize leg and insert EZ-IO® needle set. This should be done at a 90° angle. Power the needle set through the skin until you feel it encounter the bone. If the 5mm mark is not visible, you should abandon the procedure as the needle set may not be long enough. Stop when the needle flange touches the skin.
  - Remove EZ-IO® driver from needle set while stabilizing catheter hub.
  - Remove stylet from needle set, place stylet in shuttle or sharps container.
  - Confirm proper placement and look for signs of infiltration.

Proper Placement is confirmed through any of the following:
- The IO catheter stands straight up at a 90° angle.
- Blood at the tip of the stylet.
- Aspiration of a small amount of bone marrow with a syringe.
- A free flow of drugs or fluids without difficulty or evidence of infiltration.

Site of Insertion
**Procedure continued**

- Connect primed EZ-Connect®.
- Conscious patients should receive 20 – 50 mg 2% lidocaine IO.
- Flush or bolus the IO catheter with 10 ml of normal saline.
- Begin infusion.
- Dress site, secure tubing and apply wristband.
- Monitor EZ-IO® site and patient condition.
Intraosseous Infusion EZ-IO® – continued

Procedure – Preferred Site
► The head of the Humerus is the preferred site that has been approved by the FDA and the manufacturer of the EZ-IO device. A 45 mm (yellow) needle should be used in patients > 40 kg.

- Expose shoulder and adduct Humerus by placing patient in the supine position with arm against body and elbow resting on the ground and stretcher. The forearm should be resting on the abdomen.
- Palpate and identify the mid-shaft Humerus and continue palpating toward the proximal aspect or humeral head.
- With the opposite hand you may consider pinching the anterior and inferior aspects of the humeral head while confirming the identification of the greater tubercle.
- Confirm proper identification of the greater tubercle.
- Clean site with aseptic technique.
- Stabilize and insert the EZ-IO AD catheter at a 90 degree angle.
- Stabilize catheter and remove driver.
- Stabilize hub and remove stylet.
- Confirm placement and flush with 10 ml of saline.
- Secure needle.

Reference: Vidacare Corporation, EZ – IO AD humeral head insertion
Procedure – continued

- **Notes**
  - Medications and fluids should be given push since gravity flow is often slow.
  - If there is swelling around the site due to fluids in the soft tissues, consider the following:
    - The fluid may be leaking from a previous puncture site.
    - It may be leaking through the hole around the needle which was enlarged by bumping or jiggling the needle.
    - The needle may have gone all the way through the bone and fluid is leaking from the end of the needle on the other side. You must remove the needle and attempt access in another bone.
Intraosseous Access

► Definition
Intraosseous infusion establishes access in a patient where venous access cannot be rapidly obtained. The bone marrow space serves as a noncollapsible vein and provides access to the general circulation for the administration of fluids and resuscitation drugs. This protocol applies to all appropriate IO insertion sites.

► Indication
• Drug or fluid resuscitation of a patient in need of immediate life-saving intervention and unable to obtain peripheral IV access.

► Contraindications
• Placement in or distal to a fractured bone.
• Placement at a burn or infected site.

► Complications
• Infusion rate may not be adequate for resuscitation of ongoing hemorrhage or severe shock, extravasation of fluid, fat embolism, and osteomyelitis (rare).

► Equipment
• 15 to 19 gauge bone marrow needle or FDA approved commercial intraosseous infusion device
• Betadine and gloves
• Primed IV tubing, stopcock, IV solution
• 10 ml syringe with 0.9% NaCl (normal saline)
• Pressure pump/bag or 60 ml syringe for volume infusion or slow push
• 1 vial 1% lidocaine
• 5 ml syringe

► Procedure
1. When using a FDA-approved commercial IO device, follow manufacturer’s instructions.
2. Place the patient in a supine position.
3. Identify the bony landmarks. The site of choice for pediatric patients is the proximal tibia, 1-2 cm medially and 1-2 cm distal to the tibial tuberosity on the anteromedial surface.
4. Prep the site with Betadine.
5. When using bone marrow, direct and insert the needle with the stylet in place perpendicular to the bone or angled away from the joint, avoiding the epiphyseal plate. Insert with pressure and a boring or screwing motion until penetration into the marrow, which is marked by a sudden lack of resistance, and then remove the stylet.

6. Needle is appropriately placed if the following are present
   - Aspiration with syringe yields blood with marrow particulate matter.
   - Infusion of saline does not result in infiltration at the site.
   - Needle stands without support.

7. Attach IV tubing, with or without stopcock.

8. If the patient experiences pain during infusion, inject lidocaine into the marrow cavity.
   - Adult: 2 - 5 ml (20 - 50mg) 2% lidocaine
   - Pediatric: 0.5mg/kg 2% lidocaine

9. Flow rates to gravity may be unacceptably slow. Consider placing an IV solution in a pressure bag inflated to 300 torr or pushing the fluid bolus with a syringe and 3-way stopcock.

10. Stabilize needle on both sides with sterile gauze and secure with tape (avoid tension on needle).
**Umbilical Vein Cannulation**

► Indication
  - Intravenous access needed for resuscitation and stabilization of a newborn.

► Contraindication
  - Ability to obtain peripheral venous access.

► Procedure
  - Prep umbilical cord with povidone-iodine solution.
  - Place a constricting loop around umbilical cord using umbilical tape, but do not tighten at this time.
  - Cut umbilical cord proximal to previous clamp site.
  - Identify the umbilical vein. Typically, it is located at six o’clock and has a thinner wall and larger lumen than the umbilical arteries.
  - Insert umbilical vein catheter 3.5 Fr (preterm) or 5.0 Fr (full term) and advance 1 – 2 cm beyond point at which blood returns freely. Advancing catheter too far can result in placement within the liver and can lead to liver necrosis. If a commercial catheter is not available, a peripheral angiocath can be used as an alternative.
  - Gently tighten purse string to help secure catheter in place and to prevent bleeding.
Vascular Access Via Central Catheter

NOTE: This is a restricted procedure. A service and paramedic will require specific authorization from the Board prior to utilizing this procedure and skill.

Indications

- Emergent venous access when patient’s life is in imminent danger or patient is in cardiorespiratory arrest, and
- A peripheral IV cannot be established after two attempts (attempts can include actual venipunctures or looking at two different sites to find a vein), and
- Patient has central venous access device (CVAD) present (PICC Line, Port-a-Cath).

Contraindications

- Prophylactic IV access
- Suspected infection at skill site

Determine type of catheter: PICC, Mediport or Port-a-Cath

- Procedure for peripherally inserted central catheter
  - Prepare equipment: 10 ml syringe (empty), 10 ml syringe (normal saline) and sterile gloves (if available).
  - If more than one lumen is available (PICCs and Boviacs can have one, two, or three lumens), select the largest lumen available.
  - Remove cap on the end of the catheter.
  - Prep the end of the lumen with an alcohol swab.
  - Using a 10 ml syringe, (after unclamping the lumen) aspirate 3-5 ml of blood with the syringe and discard. If unable to aspirate blood, re-clamp the lumen and attempt to use another lumen (if present). Clots are present, contact medical control before proceeding. Re-clamp the lumen.
  - Flush the lumen with 3 – 5 ml normal saline using a 10 ml syringe. If catheter does not flush easily (note that a PICC line will generally flush more slowly and with greater resistance than a typical intravenous catheter), re-clamp the selected lumen and attempt to use another lumen (if present).
  - Attach IV administration set and observe for free flow of fluid.
  - If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting.
**Vascular Access Via Central Catheter continued**

**Note:** The maximum flow rates for a PICC line is 125 ml/hour for less than 2.0 Fr. sized catheter and 250 ml/hour for catheters over 2.0 Fr. sized catheters.

**Note:** Avoid taking a blood pressure reading in the same arm as the PICC.

- Procedure for implanted catheter (portacath, Pas Port, mediport)
  - Prepare all necessary equipment: 10 ml syringe (empty), 10 ml syringe (normal saline) and sterile gloves (if available). Identify the access site; usually located in the chest.
  - Clean the access site with Betadine; remove Betadine with alcohol swab.
  - Secure the access point firmly between two fingers and attach 10 ml syringe to Huber Needle.
  - Aspirate 3-5 ml of blood with the syringe. If unable to aspirate blood, re-clamp the catheter and do not attempt further use. If clots are present, contact medical control before proceeding. Re-clamp the catheter.
  - Flush the catheter with 3 – 5 ml normal saline using a 10 ml syringe. If catheter does not flush easily, re-clamp the catheter and do not attempt further use.
  - Attach IV administration set and observe for free flow of fluid.
  - If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting.
Medication List
ADENOSINE

Class
Endogenous Nucleotide

Mechanism of action
Slows conduction time through the AV Node; can interrupt re-entrant pathways; slows heart rate; acts directly on sinus pacemaker cells. Drug of choice for PSVT.

Indications Conversion of PSVT to sinus rhythm. May convert PSVT due to Wolff-Parkinson-White syndrome. Not effective in converting atrial fibrillation / flutter. Adenosine is recommended as safe and potentially effective for both treatment and diagnosis of undifferentiated regular monomorphic wide complex tachycardia

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

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

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

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

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

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

Special Considerations
Short half-life limits side effects in most patients.
Pregnancy safety: Category C.
**ALBUTEROL**

**Class**
Sympathomimetic, bronchodilator.

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

**Indications**

**Contraindications**
Known prior hypersensitivity reactions to Albuterol.
Tachycardia dysrhythmias, especially those caused by digitalis.

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

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

**How Supplied**
Solution for aerosolization: 0.5% (5 mg/ml)
Metered Dose Inhaler: 90 mcg/metered spray (17 gm canister with 200 inhalations)
Syrup: 2 mg/5 ml

**Dosage and Administration**
Adult: Administer 2.5 mg. Dilute 0.5 ml of 0.5% solution for inhalation with 2.5 ml normal saline in nebulizer and administer over 10-15 minutes. MDI: 1-2 inhalations (90-180 mcg). Five minutes between inhalations
Pediatric: Administer solution of 0.01 - 0.03 ml (0.05 - 0.15 mg/kg/ dose diluted in 2 ml of 0.9% Normal Saline. May repeat every 20 minutes three times.

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

**Special Considerations**
Pregnancy Safety: Category C.
Antagonized by beta-blockers.
May precipitate angina pectoris and dysrhythmias.
Should only be administered by inhalation methodology in pre-hospital management.
AMIODARONE

Class
  Antidysrhythmic.

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

Indications
  Suppression of Ventricular Fibrillation refractory to defibrillation and Lidocaine.
  Suppression of Ventricular Tachycardia refractory to cardioversion and Lidocaine.

Contraindications

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

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

How Supplied:
  150 mg in 3 ml vials.

Dosage and Administration
  Adult: 300 mg slow IV Push over 1-2 minutes in 10 ml Normal Saline, (For ACLS VF/ Pulseless VT) IV Drip 0.5-1mg per minute. (For malignant ventricular arrhythmias) per ordering physician.

Duration of Action: Onset: 5-15 minutes. Peak Effect: Variable. Duration: Variable

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

Class
Platelet inhibitor, anti-inflammatory agent.

Mechanism of Action
Prostaglandin inhibition.

Indications
New onset chest pain suggestive of Acute Myocardial Infarction.

Contraindications
Hypersensitivity.
Gastrointestinal bleeding.

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

Drug Interactions
Use with caution in patients allergic to NSAIDS.

How Supplied
81 mg or 325 mg tablets (chewable and standard).

Dosage and Administration
81 mg - 325 mg PO.

Duration of Action
Onset: 30-45 minutes.
Peak effect: variable.
Duration: Variable.

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

**Class**
Anticholinergic agent.

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

**Indications**
Hemodynamically significant bradycardia.
Asystole.
Drug of choice for organophosphate poisoning.
Bronchospastic pulmonary disorders.

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

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

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

**How Supplied**
Prefilled syringes: 1.0 mg in 10 ml of solution.
Nebulizer: 0.2% (1 mg in 0.5 ml) and 0.5% (2.5 mg in 0.5 ml).
Injection Solution as Sulfate: 0.5mg/ml (1ml); 1mg/ml (1ml); 0.1mg/ml (5ml,10ml); 0.4mg/ml (1ml, 20ml) Autoinjectors: (See Nerve Agent Antidote)
**Dosage and Administration**

**Adult:**
- Bradydysrhythmias: 0.5 - 1.0 mg IV every 3-5 minutes as needed to maximum total dose of 0.04 mg / kg. (may be given Endotracheally if IV not established: 2.0 mg followed by 2.0 ml of Normal Saline Solution).
- Asystole: 1.0 mg IV push every 3-5 minutes as needed to maximum total dose of 3 mg / kg (may be given Endotracheally if IV not yet established: 2.0 mg followed by 2.0 ml Normal Saline Solution).

**Pediatric:**
- Bradydysrhythmias: 0.2 mg / kg IV / ET / IO (minimum single dose 0.1 mg, maximum single dose 1.0 mg). If administered via ET, follow with 2.0 ml sterile Normal Saline Solution.
- Asystole: Same as for Bradydysrhythmias: minimum dose 0.1 mg; maximum dose 0.5 mg for a child and 1.0 mg for adolescent.

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

**Special Considerations**
Pregnancy Safety: Category C.
Moderate doses dilate pupils.
CALCIUM CHLORIDE / CALCIUM GLUCONATE

Class
Electrolyte.

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

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

Contraindications
Hypercalcemia, VF during cardiac resuscitation; digitalis toxicity.

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

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

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

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

Duration of Action
Onset: 5-15 minutes.
Peak effects: 3-5 minutes.
Duration: 15-30 minutes but may persist for 4 hours (dose dependent).

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

Class
Carbohydrate, hypertonic solution.

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

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

Contraindications
Intracranial hemorrhage, delirium tremens, ineffective without thiamine,

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

Drug Interactions
Sodium bicarbonate, coumadin.

How Supplied
25 gm/ 50 ml pre-filled syringes (500 mg/ml).

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

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

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

**Class**
Benzodiazepine, sedative-hypnotic, anticonvulsant.

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

**Indications**
- Acute anxiety states, acute alcohol withdrawal, muscle relaxant, seizure activity, agitation.
- Analgesia for medical procedures (fracture reduction, cardioversion).
- Delirium tremens.

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

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

**Drug Interactions**
- Incompatible with most drugs, fluids.

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

**Dosage and Administration Seizure activity:**
- **Adult:** 5-10 mg IV q 10-15 minutes prn (5 mg over 5 min.) (maximum dose = 30 mgs.)
- **Pediatric:** 0.2-0.3 mg/kg/dose IV every 15-30 minutes (no faster than 3 mg over 5 minutes) (max. = 10 mg/kg).

**Rectal diazepam:** 0.5 mg/kg via 2” rectal catheter and flush with 2-3 ml air after administration.

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

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

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

**Class**
Antihistamine; anticholinergic.

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

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

**Contraindications**
Asthma, glaucoma, pregnancy, hypertension, narrow angle glaucoma, infants, patients taking monoamine oxidase inhibitors (MOAIs).

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

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

**How Supplied**
Tablet: 25, 50 mg; Capsules: 25, 50 mg.
50 or 100 mg prefilled syringes, vials (IV or IM); elixir 12.5 mg/5 ml.

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

**Duration of Action**
Onset: 15-30 minutes.
Peak effect: 1 hour.
Duration: 3-12 hours.

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

**Class**
Sympathomimetic, inotropic agent.

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

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

**Contraindications**
Hypovolemic shock, pheochromocytoma, tachydysrhythmias, VF.

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

**Drug Interactions**
Incompatible in alkaline solutions.
MAOIs will enhance effects of dopamine.
Beta blockers may antagonize effects of dopamine.
When administered with Phenytoin: may cause hypotension, bradycardia and seizures.

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

**Dosage and Administration**
Adult: 2 - 20 mcg / kg / min. (Rate determined by physician).
Pediatric: 2 - 20 mcg / kg / min. (Rate determined by physician).

**Duration of Action**
Onset: 1-4 minutes.
Peak Effect: 5-10 minutes.
Duration: Effects cease almost immediately after infusion shut off.

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

**Class**
Sympathomimetic.

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

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

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

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

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

**How Supplied**
1 mg / ml (1:1,000) ampules and 0.1 mg / ml (1: 10,000) prefilled syringes. Auto-injectors: EPI-Pen: 0. 3 mg / ml EPI-Pen Jr.: 0.15mg/ml

**Dosage and Administration**

**Adult**
- Anaphylaxis/asthma: 0.3 - 0.5 mg (0.3 - 0.5 ml 1:1000) SC
- Anaphylaxis: 0.3 - 0.5 mg (3- 5 ml 1: 10,000) IV
- Cardiac Arrest: 1 mg IV push (1:10,000) every 3- 5 minutes.
- Endotracheal: 2.0 - 2.5 mg (1: 1,000) every 3- 5 minutes in 10ml NS

**Pediatric**
- Anaphylaxis/asthma: 0.01 mg/kg (0.01 mL/kg 1:1000) SC to maximum of 0.5 mg.
- Cardiac Arrest:
  - Standard initial dose: IV, IO: 0.01 mg/kg (1: 10,000, 0.1mL/kg)
  - ET: 0.1 mg/kg (1:1,000, 0.1mL/kg)
  - Second and subsequent doses: 0.1 mg/kg (1:1000, 0.1mL/kg)

**Duration of Action**
Onset: Immediate.
Peak Effects: Minutes.
Duration: Several minutes.

**Special Considerations**
Pregnancy safety: category C.
Syncope in asthmatic children.
**FENTANYL CITRATE**

**Class**
Opioid analgesic (Schedule II drug).

**Mechanism of Action**
- Alleviates pain through CNS actions.
- Depresses respiration.
- Suppresses anxiety.
- Less histamine release than morphine.

**Indications**
Analgesia for moderate to severe pain.

**Contraindications**
- Allergic to Fentanyl.
- Undiagnosed abdominal pain, depressed respiratory drive, head injury.

**Adverse Reactions**
Respiratory depression, hypotension, decreased levels of consciousness, nausea, vomiting.

**Drug Interactions**
Potentiates sedation with phenothiazines and other opiates and other sedative agents.

**How Supplied**
Injection solution: 0.05 mg/ml (500 mcg/ml)

**Dosage and Administration**
- Adult: 25-50 mcg slow IV over 5 minutes to a maximum dose of 150 mcg (microgram).
- Pediatric: 0.5 mcg/kg IV over five minutes.

**Duration of Action**
- Onset: immediate.
- Peak Effect: minutes.
- Duration: 1-2 hours.

**Special Considerations**
Pregnancy safety: Category C. Use with caution in geriatric population, patient with respiratory depression or hypovolemia.
**Furosemide**

**Class**
Loop diuretic.

**Mechanism of Action**
Inhibits electrolyte reabsorption and promotes excretion of sodium, potassium, chloride.

**Indications**
CHF; Pulmonary edema, hypertensive crisis.

**Contraindications**
Hypovolemia, anuria, hypotension (relative contraindication); hypersensitivity, hepatic coma.

**Adverse Reactions**
May exacerbate Hypovolemia, hypokalemia, ECG changes, dry mouth, hypochloremia, hyponatremia, hyperglycemia (due to hemoconcentration).

**Drug Interactions**
Lithium toxicity may be potentiated by sodium depletion.
Digitalis toxicity may be potentiated by potassium depletion.

**How Supplied**
100 mg / 5 ml, 20 mg / 2 ml, 40 mg / 4 ml vials.

**Dosage and Administration**
Adult: 0.5-1.0 mg / kg injected slowly IV.
Pediatric: 1 mg / kg / dose IV, IO.

**Duration of Action**
Onset: 5 minutes.
Peak Effects: 20-60 minutes.
Duration: 4-6 hours.

**Special Considerations**
Pregnancy safety: Category C.
Otototoxicity and deafness can occur with rapid administration.
Should be protected from light.
**GLUCAGON**

**Class**  
Hyperglycemic agent, pancreatic hormone, insulin antagonist.

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

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

**Contraindications**  
- Hyperglycemia, hypersensitivity.

**Adverse Reactions**  
- Nausea, vomiting.  
- Tachycardia, hypertension.

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

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

**Dosage and Administration**  
- Adult: 0.5 - 1 mg IM, SC, or slow IV; may repeat q 20 minutes PRN.  
- Pediatric: 0.03 -0.1 mg / kg / dose (maximum dose 1 mg) q 20 min. IM, IO, SC, slow IV.

**Duration of Action**  
- Onset: 1 minute.

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

**Class**
Hyperglycemic.

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

**Indications**
Conscious patients with suspected hypoglycemia.

**Contraindications**
Decreased level of consciousness, nausea, vomiting.

**Adverse Reactions**
Nausea, vomiting.

**Drug Interactions**
None.

**How Supplied**
Glucola: 300 ml bottles.
Glucose pastes and gels in various forms.

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

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

**Special Considerations**
As noted in indications section.
HEPARIN SODIUM

Class
Anticoagulant.

Mechanism of Action
Prevents conversion of fibrinogen to fibrin and affect clotting factors: IX, XI, XII, plasmin.
Does not lyse existing clots.

Indications
Prophylaxis and treatment of: venous thrombosis, pulmonary embolus, coronary occlusion, disseminated intravascular coagulation (DIC), post-operative thrombosis.
To maintain patency of IV injection devices and indwelling catheters.

Contraindication
Hypersensitivity.
Patients on antiplatelet drugs (relative contraindication).

Adverse Reactions
Hemorrhage, thrombocytopenia, allergic reactions (chills, fever, back pain).

Drug Interactions
Salicylates, some antibiotics and quinidine may increase risk of bleeding.

How Supplied
Heparin lock flush solutions in 10 and 100-unit / ml ampules and prefilled syringes.
1,000 - 40,000 units / ml ampules.

Dosage and Administration
Adult: Loading dose: 80 units/kg IV; maintenance dose: 18 units/kg/hour IV.
Pediatric: Loading dose: 50 u / kg IV; maintenance dose: 7.5 units/kg/ hour IV.

Duration of Action
Onset: Immediate.
Peak Effect: Variable.
Duration: 4 hours after continuous infusion discontinued.

Special Considerations
May be neutralized with protamine sulfate at 1 mg protamine / 100 u Heparin: give slowly IV over 1-3 minutes.
**INSULIN**

**Class**
Antidiabetic.

**Mechanism of Action**
Allows glucose transport into cells of all tissues; converts glycogen to fat; produces intracellular shift of potassium and magnesium to reduce elevated serum levels of these electrolytes.

**Indications**
*Not used in emergency pre-hospital setting.*
Diabetic ketoacidosis or other hyperglycemic state.
Hyperkalemia. (Insulin and D50 used together to lower hyperkalemic state).
Non-ketotic hyperosmolar coma.

**Contraindications**
Hypoglycemia, hypokalemia.

**Adverse Reactions**
Hypokalemia, hypoglycemia, weakness, fatigue, confusion, headache, tachycardia, nausea, diaphoresis.

**Drug Interactions**
Incompatible in solution with all other drugs.
Corticosteroids, dobutamine, epinephrine and thiazide diuretics decrease the hypoglycemic effects of insulin.
Alcohol and salicylates may potentiate the effects of insulin.

**How Supplied**
10 ml Vials of 100 Units / ml.

**Dosage and Administration**
Dosage adjusted relative to blood sugar levels. May be given SC, IM or IV. Standard doses for diabetic coma.
- **Adult:** 10-25 units Regular insulin IV, followed by infusion of 0.1 units / kg /hour.
- **Pediatric:** 0.1 - 0.2 units / kg / hour IV or IM followed by infusion: 50 units of regular insulin mixed in 250 ml of NS (0.2 units / ml), at a rate of 0.1 - 0.2 units / kg / hour.

**Duration of Action**
- **Onset:** Minutes
- **Peak Effect:** Approximately 1 hour (short-acting); 3-6 hours (intermediate acting); 5-8 hours (long-acting).
- **Duration:** Approximately 6-8 hours (short-acting); 24 hour (intermediate-acting); 36 hour (long-acting).

**Special Considerations**
Insulin is drug of choice for control of diabetes in pregnancy.
Usually require refrigeration.
Most rapid absorption if injected in abdominal wall; next most rapid absorption: arm; slowest absorption if injected into the thigh.
IPRATROPIUM BROMIDE

Class
Bronchodilator

Mechanism of Action
Blocks the action of acetylcholine at the parasympathetic sites in bronchial smooth muscle causing bronchodilation.

Indications
Used in bronchospasm especially associated with COPD, and emphysema.

Contraindications
Hypersensitivity to atropine or its derivatives.

Adverse Reactions
Poorly absorbed from the lung, so systemic effects are rare.
>10% CNS: Dizziness, Headache, Nervousness.
Respiratory: Cough
1-10% Cardiac: Hypotension, palpitations.

How Supplied
Nebulizing Ampule: 0.02% (2.5ml)
Inhaler: 18mcg/actuation

Dosage and Administration
Adult: 2-3 puffs via metered dose inhaler (MDI) tid-qid; maximum 12 puffs/day. ALT: 500mcg NEB q 6-8hrs (may mix neb solution with Albuterol if used within 1 hour)
Pediatric: < 12 yo: 1-2 puffs(MDI) tid-qid; max: 8 puffs. ALT: 250mcg NEB q 6-8hrs (may mix solution with Albuterol if used within 1 hour).

Kinetics
Onset: 1-3 minutes after administration
Peak effects:
Within 1.5-2 hours
Duration of Action: Up to 4-6 hours
T1/2: 2 hrs after inhalation

Special Considerations
Pregnancy Safety: Category B.
**LIDOCAINE HCL (2%)**

**Class**  
Antidysrhythmic.

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

**Indications**  
Pain suppression prior to fluid bolus in intaosseous device

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

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

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

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

**Dosage and Administration**  
Adult: Prior to IO bolus or flush on a conscious patient, slowly administer 20-50 mg of 2% lidocaine (preservative free), (i.e. 1-2.5 ml) through the EZ IO® hub.

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

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

Class
Electrolyte.

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

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

Contraindications
Heart blocks.
Renal diseases.

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

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

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

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

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

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

Class
  Antianginal; Antihypertensive Agent; Beta Blocker

Mechanism of Action
  Selective inhibitor of beta1-adrenergic receptors; completely blocks beta1 receptors, with little or no effect on beta 2 receptors at doses <100 mg.

Indications
  STEMI with Hypertension (systolic BP > 140 mm hg and tachycardia (HR > 100)

Contraindications
  Hypersensitivity to metoprolol or any component of the formulation; sinus bradycardia; heart block greater than first degree (except in patients with a functioning artificial pacemaker); cardiogenic shock; uncompensated cardiac failure (pulmonary edema); pregnancy (2nd and 3rd trimesters).

Adverse Reactions
  Respiratory: Bronchospasm
  Cardiovascular: Bradycardia, palpitations, edema, congestive heart failure, reduced peripheral circulation.
  Central nervous system: Drowsiness, insomnia.

Drug Interactions
  Drugs which slow AV conduction (digoxin): effects may be additive with beta-blockers. Glucagon: Metoprolol may blunt the hyperglycemic action of glucagon. Verapamil or diltiazem may have synergistic or additive pharmacological effects when taken concurrently with beta-blockers; avoid concurrent I.V. use.

How Supplied
  Metoprolol tartrate, is a selective beta1-adrenoreceptor blocking agent, available as 50- and 100-mg tablets for oral administration and in 5-ml (1mg/ml) ampules for intravenous administration.

Dosage and Administration
  Myocardial infarction (acute): I.V.: 5 mg every 5-10 minutes up to 3 doses in early treatment of myocardial infarction with a heart rate >100 and a BP > 140 systolic.

Duration of Action
  Peak antihypertensive effect: Oral: Within 1.5-4 hours
  Duration: 10-20 hours
  Half-life: 3-4 hours; End-stage renal disease: 2.5-4.5 hours

Special Considerations
  Pregnancy Safety: Category C (manufacturer); D (2nd & 3rd trimesters - expert analysis).
  Not recommended in pediatric population. The safety and effectiveness of Metoprolol have not been established in children.
MIDAZOLAM

Class
Short-acting benzodiazepine CNS depressant.

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

Indications
Sedation, Anxiolytic prior to endotracheal or nasotracheal intubation.

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

Adverse Reactions
Hiccough, cough, over-sedation, nausea, vomiting, injection site pain, headache, blurred vision. Hypotension, respiratory depression and arrest.

Drug Interactions
Should not be used in patients who have taken CNS depressant.

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

Dosage and Administration
Adult: 0.5 - 2.5 mg slow IV push; (may be repeated to total maximum: 0.1 mg / kg).
Pediatric: To facilitate intubation: Medical control may order: (6 months- 5 years) Midazolam 0.05-0.1 mg/kg IV maximum dose of 5 mg. (6-12-year-old) Midazolam 0.1 mg/kg IV maximum dose of 8 mg.

Note:
For agitated delirium see protocol page 60. For treatment of seizures see chart on page 277
WMD: (See APPENDIX Dosing Table)

Duration of Action
Onset: 1-3 minutes IV and dose dependent. Peak effect: variable. Duration: 2-6 hours and dose dependent.

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

**Chart for seizure treatment only**

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Patient Weight (KG)</th>
<th>IN Volume 5mg/ml</th>
<th>Dose (mg) IN, IM, IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate</td>
<td>3 kg</td>
<td>0.3 ml</td>
<td>0.6 mg</td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>6 kg</td>
<td>0.4 ml</td>
<td>1.2 mg</td>
</tr>
<tr>
<td>1 year</td>
<td>10 kg</td>
<td>0.5 ml</td>
<td>2.0 mg</td>
</tr>
<tr>
<td>2 years</td>
<td>14 kg</td>
<td>0.7 ml</td>
<td>2.8 mg</td>
</tr>
<tr>
<td>3 years</td>
<td>16 kg</td>
<td>0.8 ml</td>
<td>3.2 mg</td>
</tr>
<tr>
<td>4 years</td>
<td>18 kg</td>
<td>0.9 ml</td>
<td>3.6 mg</td>
</tr>
<tr>
<td>5 years</td>
<td>20 kg</td>
<td>1.0 ml</td>
<td>4.0 mg</td>
</tr>
<tr>
<td>6 years</td>
<td>22 kg</td>
<td>1.0 ml</td>
<td>4.4 mg</td>
</tr>
<tr>
<td>7 years</td>
<td>24 kg</td>
<td>1.1 ml</td>
<td>4.8 mg</td>
</tr>
<tr>
<td>8 years</td>
<td>26 kg</td>
<td>1.2 ml</td>
<td>5.2 mg</td>
</tr>
<tr>
<td>9 years</td>
<td>28 kg</td>
<td>1.3 ml</td>
<td>5.6 mg</td>
</tr>
<tr>
<td>10 years</td>
<td>30 kg</td>
<td>1.4 ml</td>
<td>6.0 mg</td>
</tr>
<tr>
<td>11 years</td>
<td>32 kg</td>
<td>1.4 ml</td>
<td>6.4 mg</td>
</tr>
<tr>
<td>12 years</td>
<td>34 kg</td>
<td>1.5 ml</td>
<td>6.8 mg</td>
</tr>
<tr>
<td>Small Teenager</td>
<td>40 kg</td>
<td>1.8 ml</td>
<td>8.0 mg</td>
</tr>
<tr>
<td>Adult/ Full grown teenager</td>
<td>50 kg or greater</td>
<td>2.0 ml</td>
<td>10.0 mg</td>
</tr>
</tbody>
</table>

1. Load syringe with appropriate milliliter volume of midazolam (use 5mg/ml concentration) and attach the nasal atomizer.

2. Place the atomizer within the nostril.

3. Briskly compress the syringe to administer ½ of the volume as atomizer spray.

4. Remove and repeat in the other nostril.

5. Continue ventilating the patient as needed.

6. If seizures persist 5 minutes after treating, consider repeating ½ dose of midazolam either IN, IM or IV (use chart for IN, IM, IV doses)

7. Secure airway if necessary.

8. For patient age > 70 consider ½ dose
MORPHINE SULFATE

Class
Opioid analgesic. (Schedule II drug).

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

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

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

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

Drug Interactions
Potentiates sedative effects of phenothiazines.
MAOIs may cause paradoxical excitation.

How Supplied
10 mg in 1 ml of solution, ampules and Tubex syringes.

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

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

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

**Class**
Narcotic antagonist.

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

**Indications**
- Opiate overdose, coma. Complete or partial reversal of CNS and respiratory depression induced by opioids.
- Decreased level of consciousness.
- Coma of unknown origin.

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

**Adverse Reactions**
- Withdrawing symptoms in the addicted patient.
- Tachycardia, hypertension, dysrhythmias, nausea, vomiting, diaphoresis.

**Drug Interactions**
- Incompatible with bisulfite and alkaline solutions.

**How Supplied**
- 0.02 mg / ml (neonate); 0.4 mg/ml, 1 mg/ml; 2.0 mg / 5 ml ampules; 2 mg/5 ml prefilled syringe.

**Dosage and Administration**
- Adult: 0.4 - 2.0 mg IV, IM, SC, **Nasal via atomizer** or ET (diluted); min. recommended = 2.0 mg.; repeat at 5 minute intervals to 10 mg maximum dose. (Medical Control may request higher amounts).
- Infusion: 2 mg in 500 ml of D5W (4 mcg/ml), infuse at 0.4 mg / hr (100 ml/hour).
- Pediatric: 0.1 mg / kg / dose IV, IM, SC, ET (diluted); maximum of 0.8 mg; if no response in 10 minutes, administer an additional 0.1 mg / kg /dose.

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

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

**Class**
Vasodilators.

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

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

**Contraindications**
Hypotension, hypovolemia.
Intracranial bleeding or head injury.

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

**Drug Interactions**
Additive effects with other vasodilators.
Incompatible with other drugs IV.

**How Supplied**
Tablets: 0.15 mg (1/400 grain); 0.3 mg (1/200 grain); 0.4 mg (1/150 grain); 0.6 mg (1/100 grain).
NTG spray: 0.4 mg - 0.8 mg under the tongue.
NTG IV (TRIDIL).

**Dosage and Administration**
Adult: 
Tablets: 0.3 - 0.4 mg SL; may repeat in 3-5 minutes to maximum of 3 doses. NTG spray: 0.4 mg under the tongue; 1-2 sprays. NTG IV infusion: 5 ug / min.; increase by 5-10 ug / min. every 5 minutes until desired effect.
Pediatric: not recommended.

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

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

**Class**
Anti-emetic.

**Mechanism of Action**
Zofran is an anti-emetic that acts by selective antagonism of the 5HT3 receptors.

**Indications**
Nausea and vomiting.

**Contraindications**
- Avoid if history of known hypersensitivity
- Avoid repeat dosing in patients with known abnormal liver function.

**Adverse Reactions**
- Headache
- Dizziness
- Drowsiness

**How Supplied**
- 8 mg/ml and 2 mg/ml parenteral
- 8 mg and 4 mg oral

**Dosage**
- Adult – 4 mg IV, may repeat X 1 in 30 minutes if needed
- Peds – 0.1 mg/kg IV up to a maximum of 4 mg
**OXYGEN**

**Class**
Naturally occurring atmospheric gas.

**Mechanism of Action**
Reverses hypoxemia.

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

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

**Adverse Reactions**
- Decreased level of consciousness and respiratory depression in patients with chronic CO2 retention.
- Retrolental fibroplasia if given in high concentrations to premature infants. (maintain 30-40% O2)

**Drug Interactions**
None.

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

**Dosage and Administration**
- **Adult:** Cardiac arrest and Carbon Monoxide poisoning: 100%. Hypoxemia: 10-15 L/ min. via non-rebreather. COPD: 0-2 L/ min. via nasal cannula or 28-35% venturi mask. Be prepared to provide ventilatory support if higher concentrations of oxygen needed.
- **Pediatric:** Same as for adult with exception of premature infant.

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

**Special Considerations**
- Be familiar with liter flow and each type of delivery device used.
- Supports possibility of combustion.
**SODIUM BICARBONATE 8.4%**

**Class**
Buffer, alkalinizer

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

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

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

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

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

**How Supplied**
50 mEq in 50 ml of solvent.

**Dosage and Administration**
- **Bolus:**
  1 mEq / kg IV; may repeat with 0.5 mEq / kg every 10 minutes.
- **Infusion:**
  1 – 4 amps in 1 liter D5W or NS, rate determined by sending physician.

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

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

**Class**
Vitamin (B1)

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

**Indications**
- Coma of unknown origin.
- Delirium tremens.
- Beriberi.
- Wernicke’s encephalopathy.

**Contraindications**
None

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

**Drug Interactions**
Give thiamine before glucose under all circumstances.

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

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

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

**Special Considerations**
- Pregnancy safety: Category A.
- Large IV doses may cause respiratory difficulties.
- Anaphylaxis reactions reported.
Tissue Plasminogen Activator (T-PA)

Class
Thrombolytic agent.

Mechanism of Action
Binds to fibrin-bound plasminogen at the clot site, converting plasminogen to plasmin. Plasmin digests the fibrin strands of the clot restoring perfusion.

Indications
Acute evolving myocardial infarction.
Massive pulmonary emboli.
Arterial thrombosis and embolism.

Contraindications
Recent surgery (within three weeks).
Active bleeding, recent CVA, prolonged CPR, intracranial or intraspinal surgery.
Recent significant trauma, especially head trauma.
Uncontrolled hypertension (generally BP over 200 mm Hg).

Adverse Reactions
GI, GU intracranial and other site bleeding.
Hypotension, allergic reactions, chest pain, abdominal pain, CVA.
Reperfusion dysrhythmias.

Drug Interactions
Acetylsalicylic acid may increase risk of hemorrhage.
Heparin and other anticoagulants may increase risk of hemorrhage.

How Supplied
20 mg with 20 ml diluent vial.
50 mg with 50 ml diluent vial.

Dosage and Administration
Adult: 10 mg bolus IV over 2 minutes; then 50 mg over one hour, then 20 mg over the second hour and 20 mg over the third hour for a total dose of 100 mg. (other doses may be prescribed through Medical Direction.)

Pediatric: safety not established.

Duration of Action
Onset: clot lysis most often within 60-90 minutes.
Peak effect: variable.
Duration: 30 minutes with 80% cleared within 10 minutes.

Special Considerations
Pregnancy safety: contraindicated.
Closely monitor vital signs.
Observe for bleeding.
Do not give IM injection to patient receiving T-PA.
Specialized Protocols
Local law enforcement agencies may use a conductive energy weapon called a Taser. This device is a less-lethal tool. When used, the device discharges a wire that contains at the distal end an arrow-like barbed projectile that penetrates the suspect's skin and embeds itself. This allows the officer to administer a 5-second or longer incapacitating electric shock. Officers may initiate EMS response when the device is discharged. EMS personnel shall transport the patient if the Taser strikes the patient in the face, neck, groin or spinal column or other complications arise. Transport shall be recommended for all Taser patients but may be refused by the patient or officer if standard decisional capacity criteria are met. The most common injury from Taser use is trauma from a fall due to the person’s incapacitation.

Scene Safety Consideration:
Before touching any patient who has been subdued using a Taser, EMS personnel shall ensure the officer has disconnected the wires from the hand held unit. In most cases the wires will be cut prior to EMS arrival.
**Basic Standing Orders**

- Routine Patient Care.
- Perform initial assessment and treat ABC problems.
- Identify the location of probes on the patient's body. If a probe has contacted the face, neck, groin, or spinal area, transport the patient to an Emergency Department.
- Confer with the officer and determine the patient's condition from the time of the Taser discharge until EMS arrival.
- Consider Overdose or other medical problems, which may be the underlying cause of the situation.
- Obtain baseline vitals.
- Obtain history from the patient including date of last tetanus shot and any cardiac history.
- Consider accu-check glucose level.

**Treatment and Follow up instructions:**
- Clean puncture sites and bandage.
- Secure any embedded probes.
- Transport patient to the emergency department.

NOTE: If possible, transport should be under the care of a Paramedic with cardiac monitoring, and other ACLS as necessary.

**Paramedic Standing Orders**

- Evaluate for medical reasons for patient’s behavior.
- Consider EKG monitoring for cardiac abnormalities and, if patient is greater than 35 years old, consider 12-lead evaluation.
- Consider 12-lead EKG.
Strenuous Activity / Firefighter Rehabilitation

Medical Evaluation Of Firefighters And Other Emergency Responders On Emergency Incidents And training Exercises

Purpose
To examine and evaluate the physical and mental status of firefighters and other emergency responders working at an emergency incident or a training exercise and determine what treatment, if any, is necessary.

Implementation
A Rehab Area shall be set up at the discretion of the Incident Commander. When a Rehab Area has been established by the Incident Commander, the first available Paramedic will be responsible for the management and coordination of the Rehab Area.

Location
Establish a Rehab Area away from environmental hazards (e.g., shady, cool place, upwind away from smoke and traffic) that is readily accessed by Rescue personnel for transport and supplies. Air truck and canteen service will be stationed in this area. Multiple Rehab Areas may be needed on large incidents.

Manning
Assign a minimum of two Rescue personnel to monitor and assist firefighters and other emergency responders in the Rehab Area.

Medical Evaluations
When the Incident Commander has established a Rehab Area, firefighters and other emergency responders shall be evaluated following:
► Two SCBA’s and/or thirty minutes of strenuous activity (e.g., use of chemical PPE, advancing hose lines, forcible entry, ventilation, etc.) Note: This does not preclude an Officer from having a member evaluated if he/she deems it appropriate. A member may be evaluated at any time he/she feels it is necessary.
► SCBA failure.
► Weakness, dizziness, chest pain, muscle cramps, nausea, altered mental status, difficulty breathing, etc.
► Discretion of Incident Commander, Rehab Officer, Safety Officer, C.I.S.M. Coordinator or Company Officer.

NOTE - A medical evaluation form shall be completed on all personnel entering the Rehab Area (see form located in this section).
Strenuous Activity / Firefighter Rehabilitation continued

Examination
Examination shall occur at ten-minute intervals and will involve a minimum of:

► Glasgow coma score
► Pupils
► Vital Signs (BP, P, R, SPO2, CO)
► EKG (if applicable)
► Lung sounds
► Skin condition
► Temperature
► Signs and symptoms

An EMS Run Report shall be completed on each firefighter or other emergency responder when he or she is not routinely returned to normal duties.

Guidelines for Rehab
Normal Examination Findings - firefighter or other emergency responder will rehydrate and rest before reporting to Manpower.

Abnormal Examination Findings
► Firefighter or other emergency responder will rehydrate and rest. Firefighter or other emergency responder will report to Manpower when findings are normal. Findings should return to normal within fifteen minutes.
► Firefighter or other emergency responder will receive ALS treatment and transport if findings are abnormal for more than fifteen minutes.
► Firefighter or other emergency responder with chest pain, difficulty breathing and altered mental status will receive immediate ALS treatment and transport.
► Any other abnormal findings or complaints shall result in treatment and transport if the paramedic deems it to be in the best interest of the firefighter/responder.

Treatment
Prior to taking anything orally, the firefighter or other emergency responder will clean hands and face. On scene rescue will provide water and cleaning agent.

► Rest
► Oral rehydration and nutrition; minimum of 1–2 quarts of fluids over a 15-minute time period (Water first, then half-strength Gatorade® or 10-K®). Avoid any substance containing caffeine (e.g. soda, tea, coffee).
► Oxygen (humidified, nebulizer).
► Cool environment (e.g., shade, electric fan, air conditioning, removal of bunker gear, showers, etc.).
Strenuous Activity / Firefighter Rehab continued

► ALS Protocols: IV Lactated Ringers, Bolus 20 ml/kg followed by 500 ml/hr infusion. Continue fluids until patient excretes clear to light straw colored urine.
► Monitor patient. Abnormal vital signs, physical exam or symptoms persisting longer than 30 minutes suggest that the individual may not be able to return to duty and should be transported.

Return to Emergency Duties
Report to Manpower or Incident Commander when:
► Vital signs within normal limits.
► Absence of abnormal signs and symptoms.
► Minimum period of 15 minutes for rest and rehydration.

Documentation
A Rehab Medical Evaluation Form shall be completed on all personnel evaluated in the Rehab Area and forwarded to the appropriate Rescue (EMS) Division following all applicable patient confidentiality guidelines (e.g. HIPAA).
Strenuous Activity / Firefighter Rehabilitation continued

2 SCBA's / 30 Minutes Strenuous Activity
SCBA Failure

- **No**

- **Yes**

  Evaluate in 10 Minute Intervals
  (Rescue)

  - **Normal Presentation**
    - **Yes**
      - Rest—15 to 30 Minutes
      Rehydrate 1–2 Quarts of Fluid
  
  - **Abnormal Presentation**
    - **Yes**
      - Rest—15 to 30 Minutes
      Rehydrate 1–2 Quarts of Fluid

      Evaluate

      - **Normal Presentations**
      - **Abnormal Presentations**
        - **Yes**
          - ALS Treatment
          - Transport to Hospital

      Return to Manpower
## Strenuous Activity / Firefighter Rehabilitation continued.

### Rehabilitation Area - Medical Evaluation Form

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Forward form to Rescue (EMS) Division following all applicable patient confidentiality laws (e.g. HIPAA).
**START System of Triage**

**Introduction**

- This procedure will be based on the Simple Triage And Rapid Treatment or START method for adult victims and the JumpSTART adaptations for the pediatric victim. These methods of triage are designed to assess a large number of victims objectively, efficiently, and rapidly and can be used by personnel with limited medical training.

**Procedure**

- **Initial Triage**—Using the START or JumpSTART methods (Sections III or IV).
  - Locate and direct all of the walking wounded into one location away from the incident if possible. Assign someone to keep them together (Fire Department Personnel, Law Enforcement Officer, or capable bystander).
  - Begin assessing all non-ambulatory victims where they lay.
  - Utilize the Triage Ribbons (color-coded plastic strips). One should be tied to an upper extremity in a VISIBLE location.
    - RED - Immediate.
    - YELLOW - Delayed.
    - GREEN - Ambulatory (minor).
    - BLACK - Deceased (non-salvageable).
  - Independent decisions should be made for each victim. Do not base triage decisions on the perception of too many REDs, not enough GREENs, etc.
  - If borderline decisions are encountered, always triage to the more urgent priority (e.g. GREEN/YELLOW patient, tag YELLOW).

- **Secondary Triage**
  - Performed on all victims during the Treatment Phase. If a victim is identified in the initial triage phase as a RED and transport is available, do not delay transport to perform a secondary assessment.
  - The Triage priority determined in the Treatment Phase should be the priority used for transport. If trauma related, the Trauma Criteria will be applied to trauma victims during the secondary triage in the Treatment Phase (see General Protocol 1.10—Trauma Transport).
  - Utilize the Triage Tags (Disaster Management System Tag or METTAGS) and attempt to assess for and complete all information required on the tag.
  - Affix the tag to the patient and remove ribbon.
NOTE - Remember the pneumonic RPM (Respirations, Perfusion, Mental Status). The first assessment that produces a RED stops further assessment. Only corrections of life-threatening problems, such as airway obstruction or severe hemorrhage should be managed during triage.

START Triage (refer to the START flowchart).

► Assess RESPIRATIONS:
  o If respiratory rate is 30/min. or less go to PERFUSION assessment.
  o If respiratory rate is over 30/min, Prioritize RED.
  o If victim is not breathing, open the airway, remove obstructions, if seen, and assess for (1) or (2) above.
  o If victim is still not breathing, Prioritize BLACK.

► Assess PERFUSION:
  o Performed by assessing a radial pulse or assessing capillary refill (CR) time.
  o If radial pulse is present or CR is 2 seconds or less, go to MENTAL STATUS assessment.
  o No radial pulse or CR is greater than 2 seconds, Prioritize RED.
  o Any major external bleeding should also be controlled at this time.

► Assess MENTAL STATUS:
  o Assess the victim’s ability to follow simple commands and their orientation to time, place, and person (COAx3).
  o If the victim does not follow commands, is unconscious, or is disoriented, Prioritize RED.
  o If the victim follows commands, oriented X3, Prioritize GREEN.

NOTE - Depending on injuries (e.g. burns, fractures, bleeding) it may be necessary to Prioritize YELLOW.
START System of Triage - JumpSTART

JumpSTART TRIAGE (refer to the JumpSTART flowchart).
Physiological differences in children necessitate adapting the standard START triage method to children ≤ 8 years of age or those victims with the anatomical or physiological features of a child in the age group. The same parameters (R.P.M.) will be utilized with the adaptations indicated.

► Assess RESPIRATIONS:
  o If respiratory rate is between 15 and 45/min. go to PERFUSION assessment.
  o If respiratory rate is over 45/min or under 15/min, Prioritize RED.
  o If victim is not breathing, open the airway, remove obstructions if seen, and assess for (1) or (2) above.
  o If victim is still not breathing and no obstructions are present, check a peripheral (radial or pedal) pulse. If peripheral pulse is present, provide five (5) ventilations (approximately 15 seconds) via any type of barrier device. If spontaneous respirations resume, Prioritize RED.
    o If victim is still not breathing, Prioritize BLACK.

► Assess PERFUSION:
  o Performed by assessing a peripheral pulse.
  o If peripheral pulse is present, go to MENTAL STATUS assessment.
  o If peripheral pulse is absent, Prioritize RED.
  o Any major external bleeding should also be controlled at this time.

► Assess MENTAL STATUS:
  o Assess the child through AVPU scale. Assess whether the victim is either ALERT, responds to VERBAL stimuli, responds to PAINFUL stimuli, or is UNCONSCIOUS.
  o If the victim is unconscious or only responds to painful stimuli, Prioritize RED.
  o If the victim is alert or responds to verbal stimuli, assess for further injuries, Prioritize YELLOW or GREEN.

NOTE - Infants who are developmentally unable to walk should be triaged using JumpSTART algorithm either during initial triage or in the GREEN area if carried out by a non-rescuer. During triage, if they do not fulfill the criteria of a RED victim and there are no other outward signs of significant injury, they may be triaged as a GREEN victim.

NOTE - START Triage system developed by Newport Beach Fire Rescue and Hoag Hospital. JumpStart Triage system developed by Lou Romig, MD (Miami Children’s Hospital).
START Triage Algorithm
JumpSTART Triage Algorithm

JumpSTART TRIAGE

Able to Walk/Needs Secondary

- Minor (Green)

Respirations

No

Position Airway

- No
  - Palpate Peripheral Pulse
    - YES PULSE Give 5 Ventilations (15 seconds) via barrier
      - Immediate (Red)
    - NO PULSE NO Spontaneous Respirations
      - Immediate (Red)
      - Deceased (Black)

- Yes
  - Over 15/min Under 45/min
    - Immediate (Red)
  - Under 15/min Over 45/min
    - Immediate (Red)

Perfusion

Peripheral Pulse ABSENT

- Immediate (Red)

Peripheral Pulse PRESENT

Control Bleeding

- Mental Status
  - Unconscious or Responds only to Painful Stimuli
    - Immediate (Red)
  - Alert or Alert to Verbal Stimuli
    - Delayed (Yellow)
Purpose

To efficiently triage, treat and transport victims of multiple casualty incidents (MCIs). The following protocol is applicable to all multiple victim situations. This protocol is intended for the everyday MCI when the number of injured exceed the capabilities of the first arriving unit, as well as large scale MCIs. The number of casualties may exceed the capabilities of the local jurisdiction and will require assistance from other EMS providers.

Procedure

► The officer of the first arriving unit will establish COMMAND and:

- Perform a size up and estimate the number of victims.
- Request a Level 1, 2, 3, 4, or 5 response (see II.D.) and request additional units and/or specialized equipment as required.
- Identify a staging area.
- Direct the remaining crewmembers and any additional personnel arriving to initiate triage using the START or JumpSTART system.
- Locate and direct the walking wounded to one location away from the incident, if possible. These victims need to be assessed as soon as possible. Assign someone to keep the walking wounded together.

► As additional units arrive, COMMAND will designate the following officers:

- TRIAGE (Initially the responsibility of the First Arriving Officer).
- TREATMENT.
- TRANSPORT.
- STAGING.

► Additional Branches/Sections may be required depending on the complexity of the incident. These officers may include, but are not limited to:

- Medical Branch
- Landing Zone/Helispot
- Extrication
- Haz Mat
- Rehabilitation
- Safety
- Public Information Officer (PIO)
- Medical Intelligence— To Assist with WMD Events For Decon, Antidotes And Treatment
MCI Pre-determined Response Plan

Considerations:
- An MCI shall be classified by different levels, depending on the number of victims. The number of victims will be based on the initial size-up, prior to triage.
- Levels of response will augment the units already on the scene. Units on scene or en-route will be included in the assignment. The exception would be when in conjunction with a Fire Alarm assignment (e.g. Fire with multiple victims may be a Second Alarm with a MCI Level 3 response—this will be two separate assignments).
- COMMAND can downgrade or upgrade the assignment at any time. All units will respond to the Staging Area unless otherwise directed by COMMAND. When announcing an MCI, specify the general category (trauma, HAZMAT, smoke inhalation, etc.).
- Any victim meeting Trauma Transport Criteria should go to a Trauma Center. Trauma Transport Criteria will be determined during the secondary triage in the Treatment Phase.
- Consider air transport for special needs, mass transit resources for multiple “walking wounded,” and private BLS transport units.
- Consider Mobile Command Vehicles, Medical Supply Trailers and Communication Trailers.
- Upon declaration of a MCI—Medical Control will gather each hospital’s capability and relay this information to the Transport Officer or Medical Communication Officer.
- Request Law Enforcement set up a safety perimeter.
Definitions:

- **Strike Team**—is a specified combination of the same kind and type of resources with common communications and a leader (e.g. ALS Transport Unit Strike Team would be 5 ALS Transport Units with a leader).
- **Task Force**—is a group of resources with common communications and a leader (e.g. MCI Task Force would be 2 ALS Transport Units, 2 BLS Transport Units and 1 Suppression Unit with a leader).
- **Litter Bearer**—A team of personnel assigned to TRIAGE to move victims from the incident site to the Treatment Area or Transport Units.

**MCI LEVEL 1 (5–10 victims)**

- 4 ALS Transport Units
- 2 Suppression Units
- 1 Shift Supervisor
- 1 EMS Supervisor

**NOTE** - The 2 closest hospitals & Trauma Center to the incident will be notified by Medical Control (MedCom or local communication center).

**MCI LEVEL 2 (11–20 victims)**

- 6 ALS Transport Units
- 3 Suppression Units
- 2 Shift Supervisors
- 2 EMS Supervisors

**NOTE** - The 3 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control.
**Mass Casualty Incidents Uniform Prehospital – MCI Procedure - continued**

**MCI LEVEL 3 (21–100 victims)**
- 8 ALS Transport Units
- 4 Suppression Units
- 3 Shift Supervisors
- 3 EMS Supervisors

**NOTE** - The 4 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control. The Local Warning Point will notify the Emergency Management Agency.

**MCI LEVEL 4 (101–1000 victims)**
- 5 MCI Task Forces (25 units)
- 2 ALS Transport Unit Strike Teams (10 units)
- 1 Suppression Unit Strike Team (5 units)
- 2 BLS Transport Unit Strike Teams (10 units)
- 2 Mass Transit Buses

**NOTE** - The 10 closest hospitals & 5 Trauma Centers to the incident will be notified by Medical Control. The Local Warning Point will notify the Emergency Management Agency. Metropolitan Medical Response System (MMRS) and Disaster Medical Assistance Team (DMAT) may be notified.

**MCI LEVEL 5 (Over 1000 victims)**
- 10 MCI Task Forces (50 units)
- 4 ALS Transport Unit Strike Teams (20 units)
- 2 Suppression Unit Strike Teams (10 units)
- 4 BLS Transport Unit Strike Teams (20 units)
- 4 Mass Transit Buses
- 10 Shift Supervisors
- 6 EMS Supervisors
- 2 EMS Chiefs
- 2 Operations Chiefs
- 2 Command Vehicles
- 4 Supply Trailers
- 1 Communications Trailer

**NOTE** - The 20 closest hospitals & 10 Trauma Centers to the incident will be notified by Medical Control.
Mass Casualty Incidents Uniform Prehospital – MCI Procedure - continued

► Officer Responsibilities
  o Command
    ▪ Established by the First Arriving Officer. Radio designation: COMMAND.
    ▪ Follow Field Operations Guide FOG #1.
    ▪ Remain in a fixed and visible location, uphill and upwind.
    ▪ Determine the MCI Level (1, 2, 3, 4, or 5).
    ▪ Designate a Staging Area.
    ▪ Assign positions to perform the functions of TRIAGE, TREATMENT, TRANSPORT and STAGING.
    ▪ Advise Communications Center of the number of victims and their categories once triage is complete.
    ▪ During large scale or complex MCIs (e.g. fire with multiple victims), designate a Medical Branch to reduce the span of control.
    ▪ If the incident is due to Weapons of Mass Destruction (WMD Event), refer to FOG #8 and establish a Medical Intelligence Officer to assist with documentation, antidotes and treatment of victims.
    ▪ Ensure proper security of incident site, treatment area and loading area, as well as traffic control and access for emergency vehicles with law enforcement.
  o Medical Branch
    ▪ Radio designation: MEDICAL. Follow FOG #2.
    ▪ Work directly with COMMAND.
    ▪ Assure TRIAGE, TREATMENT and TRANSPORT has been established. If established by COMMAND, then TRIAGE, TREATMENT and TRANSPORT will report to MEDICAL.
    ▪ Work with COMMAND and direct and/or supervise on-scene personnel from agencies such as Medical Examiner's Office, Red Cross, private ambulance companies and hospital volunteers. Ensure notification of Medical Control (Medcom/MRCC).
    ▪ If the incident is due to a known or suspected Weapon of Mass Destruction (WMD Event), refer to FOG #8 and establish (in conjunction with COMMAND) a Medical Intelligence Officer to assist with decontamination, antidotes and treatment of victims.
    ▪ Ensure proper security of incident site, treatment area and loading area, as well as traffic control and access for emergency vehicles with law enforcement (in conjunction with COMMAND).
Triage Officer.
- Radio designation: TRIAGE. Follow FOG #3.
- Organize the Triage Team to begin initial triaging of victims, utilizing the START/JumpSTART triage system. Assemble the walking wounded and uninjured in a safe area. Use bullhorn/PA if necessary.
- Advise COMMAND (or MEDICAL if established), as soon as possible, if there is a need for additional resources.
- Coordinate with TREATMENT to ensure that priority victims are treated first.
- Ensure that all areas around the MCI scene have been checked for potential victims, walking wounded, ejected victims, etc., and that all victims have been triaged.
- Supervise the Triage Personnel, Litter Bearers and Medical Examiner Personnel.
- Maintain security and control of the Triage Area. Request Law Enforcement.
- Report to COMMAND or MEDICAL upon completion of duties for further assignments.

Treatment Officer.
- Reports to COMMAND or MEDICAL. Supervises the Treatment Managers of the RED, YELLOW, and GREEN Areas.
- Coordinates the re-triage and tagging of all victims and on-site medical care.
- Directs the movement of victims to loading area(s).
- Radio designation: TREATMENT. Follow FOG #4.
- Consider assigning a “Documentation Aide” to assist with paperwork.
- Direct personnel to either begin treatment on the victims where they lay or establish a centralized Treatment Area.
- Considerations for a Treatment Area:
  - Capable of accommodating the number of victims and equipment.
  - Consider weather, safety and the possibility of hazardous materials.
  - Designate entrance and exit areas, which are readily accessible (funnel points).
  - On large-scale incidents, divide Treatment Area into three distinct areas based on priority. Designate a Treatment Manager for each area (Red, Yellow, Green). Use color tarps if available.
Mass Casualty Incidents Uniform Prehospital – MCI Procedure - continued

- Complete a “Treatment Log” as victims enter the area.
- Ensure that all victims are re-triaged through a secondary exam and the assessment is documented on the Triage tag (Disaster Management System Tag [DMS Tag] or METTAG). The rescuer filling out the DMS Tag or METTAG will keep a corner of the tag for future documentation.
- All Red tagged victims will be transported immediately as transport units become available. These victims should not be delayed in the Treatment Area.
- Ensure that enough equipment is available to effectively treat all victims.
- Establish communicates with TRANSPORT to coordinate proper transport of the appropriate victims. Direct movement of victims to the ambulance loading area(s).
- Provide periodic status reports to COMMAND/MEDICAL.

NOTE - RED, YELLOW, GREEN TREATMENT MANAGERS—report to the TREATMENT Officer and are responsible for the treatment and continual re-triaging of victims in their assigned areas. Notify TREATMENT Officer of victim readiness and priority for transportation. Assure that appropriate victim information is recorded.

- Transport Officer.
  - Reports to COMMAND or MEDICAL. Supervises the Medical Communication Coordinator and Documentation Aide(s). The TRANSPORT Officer is responsible for the coordination of victims and maintenance of records relating to victim identification, injuries, mode of transportation and destination.
  - Radio designation: TRANSPORT. Follow FOG #5.
  - Assign a Documentation Aide with a radio to assist with paperwork and communications.
  - Assign a Medical Communication Coordinator to establish continuous contact with Medical Control (MedComm).
  - Establish a victim loading area. Advise STAGING of the location and direction of travel. Consider Law Enforcement for security of loading area.
  - Arrange for the transport of victims from the Treatment Area. Maintain “Hospital Transportation Log” #5B. Keep piece of triage tag for future documentation.
Mass Casualty Incidents Uniform Prehospital – MCI Procedure
- continued

- Communicate with the Landing Zone (LZ)/ Helispot Officer and relay the number of victims to be transported by air. Air transported victims should be assigned to distant hospitals, unless the victim’s needs dictate otherwise (e.g. Trauma Center, burn unit, etc.).

  - Medical Communication Coordinator.
    - Reports to the TRANSPORT Officer and is responsible for maintaining communication with Medical Control to assure proper victim transport information and destination.
    - Radio designation: COMMUNICATIONS. Follow FOG #5A.
    - Establish communication with Medical Control. Advise Medical Control of the overall situation (e.g. smoke inhalation, trauma, burns, Hazmat exposure, etc.), amount and category of victims. Medical Control will survey area hospitals to determine their capabilities and capacities and then relay this information. Document this information on the Hospital Capability Worksheet #5C and maintain this for the duration of the incident.
    - When units are prepared to transport, advise Medical Control and supply them with the following information:
      - The unit transporting.
      - The number of the victims being transported.
      - Their priority: Red, Yellow, or Green.
      - Any special need victims (e.g. cardiac, burns, trauma, etc.).
      - The Medical Communication Coordinator, in conjunction with Medical Control, will determine the most appropriate facility. Ground transported victims should be assigned to hospitals on a rotating basis.
    - Once Medical Control receives the information from the Medical Communication Coordinator, Medical Control will notify the appropriate hospital.
    - Transporting units will not contact the individual hospital on their own, unless there is a need for medical direction/care outside of protocols.

  - Medical Supply Coordinator.
    - Reports to MEDICAL and is responsible for acquiring and maintaining control of all medical equipment and supplies.
    - Radio designation: SUPPLY. Follow FOG #6.
    - Assure necessary equipment is available on the transporting vehicle.
    - Provide an inventory of medical supplies at the Staging Area for use on scene.
Staging Officer.

- Reports to COMMAND and is responsible for managing all activities within the Staging Area.
- Radio designation: STAGING. Follow FOG #7.
- Establish the location of a Staging Area and notify the Communications Center to direct any incoming units.
- Maintain a “Unit Staging Log” #7A.
- Ensure that all personnel stay with their vehicles unless otherwise directed by COMMAND. If personnel are directed to assist in another function, ensure that the keys stay with each vehicle.
- Coordinate with the TRANSPORT Officer the location for a victim loading area and best route to the area.
- Maintain a reserve of at least 2 transport vehicles. When the reserve is depleted request additional units through COMMAND.

► Documentation.

- The Incident Commander will, at the completion of the incident, coordinate the gathering of all pertinent documentation.
- A Post Incident Analysis (PIA) should be conducted on all MCIs.
MCI Kits.
Each Unit will carry an MCI bag. Included in the MCI bag will be:
- Two (2) Triage packs with:
  - Four (4) combine dressings
  - Six (6) 4 x 4’s
  - Six (6) pairs of gloves
  - One (1) pediatric face mask, assorted oropharyngeal (OPA) and nasopharyngeal (NPA) airways
  - Two (2) clip rings containing triage ribbons paired in red and yellow, green and black. There are 15 ribbons of each color per ring.
- One (1) additional set of triage ribbons.
- Fifty (50) Triage tags—Disaster Management Tags (DMS tags) or METTAGs.
- Three (3) mechanical pencils and three (3) grease pencils.
- The following MCI FOG’s, logs, and associated paperwork for each Officer:
  - Command FOG #1
  - Medical FOG #2
  - Triage FOG #3
  - Treatment FOG #4
  - Treatment Log #4A
  - Transport FOG #5
  - Medical Communication FOG #5A
  - Hospital Transport Log #5B
  - Hospital Capability Worksheet #5C
  - Medical Supply FOG #6
  - Staging FOG #7
  - Unit Staging Log #7A
  - MCI-WMD/Terrorist Event FOG #8
- The following identification vests:
  - White for COMMAND.
  - Blue for the MEDICAL Officer.
  - Yellow for the TRIAGE Officer.
  - Red for the TREATMENT Officer.
  - Green for the TRANSPORT Officer.
  - Green Striped for the MEDICAL COMMUNICATION COORDINATOR.
  - Blue Striped for the MEDICAL SUPPLY Officer.
  - Orange for the STAGING Officer.
Basic MCI Command Structure for Medical Responses

- Command
  - Triage
  - Treatment
  - Transport
  - Staging

Complex MCI Command Structure for Medical Responses

- Medical Branch
  - Medical Supply
    - Triage Group
      - Triage Units
      - Litter Bearer Teams
      - Medical Examiner Personnel
    - Treatment Group
      - Treatment Teams
      - Red Team Manager
      - Yellow Team Manager
      - Green Team Manager
    - Transport Group
      - Documentation Aide
      - Medical Communication Coordinator
COMMAND - FOG #1

► Don the appropriate vest and use the radio designation “COMMAND.” Establish the Command Post in a safe, visible and fixed location, uphill and upwind. Consider assigning an aide. If WMD involved also use FOG #8.

► Perform the initial size-up, including wind direction. Determine any special needs such as fire suppression, Hazmat, extrication, etc. and request additional units as needed.

► Approximate the number of victims and category of injury (trauma, burns, smoke inhalation, chemical exposure, etc.).

<table>
<thead>
<tr>
<th>MCI</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
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<td>11–20</td>
<td>21–100</td>
<td>101–1000</td>
<td>&gt;1000</td>
</tr>
</tbody>
</table>

► Establish Staging Area as soon as possible. Request additional units early, as needed: consider HAZMAT, TRT, extrication, Air Rescue.

► Utilize the EMS Tactical Command Worksheet when available.

► Assign positions to perform the following functions:
  o MEDICAL BRANCH (as needed).
  o TRIAGE.
    ▪ Litter Bearers.
  o TREATMENT.
  o RED, YELLOW, GREEN Treatment Managers.
  o TRANSPORT.
    ▪ Documentation Aide.
    ▪ Medical Communication Coordinator.
  o STAGING.
  o MEDICAL SUPPLY, REHAB, SAFETY, DECON, EXTRICATION, PIO (as needed).

► Advise Communication Center of the exact number of victims and their categories once reported from TRIAGE.

► Request Law Enforcement for security for all areas, traffic control and access for emergency vehicles.

► When applicable, have a liaison of each involved party at the Command Post. Some examples would include: Law Enforcement, Medical Examiner, Emergency Management Agency, Occupancy owner/representative, etc.

► If incident is due to a known or suspected WMD Event, refer to WMD FOG #8 and assign Medical Intelligence Officer to assist with decontamination, antidotes and treatment of victims.

(Paper color - White, Two-sided, with Predetermined Response Plan on back).
MCI Predetermined Response Plan (for Command FOG #1 and #2)

For the back of COMMAND FOG #1 and MEDICAL FOG #2

MCI LEVEL 1 (5–10 victims)
- 4 ALS Transport Units
- 2 Suppression Units
- 1 Shift Supervisor
- 1 EMS Supervisor

NOTE
The 2 closest hospitals & Trauma Center to the incident will be notified by Medical Control (MedCom or local communication center).

MCI LEVEL 2 (11–20 victims)
- 6 ALS Transport Units
- 3 Suppression Units
- 2 Shift Supervisors
- 2 EMS Supervisors

NOTE
The 3 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control.

MCI LEVEL 3 (21–100 victims)
- 8 ALS Transport Units
- 4 Suppression Units
- 1 Command Vehicle
- 1 Supply Trailer
- 3 Shift Supervisors
- 3 EMS Supervisors
- 1 Operations Chief

NOTE
The 4 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control.

MCI LEVEL 4 (101–1000 victims)
- 5 MCI Task Forces (25 units)
- 2 ALS Transport Unit Strike Teams (10 units)
- 1 Suppression Unit Strike Team (5 units)
- 2 BLS Transport Unit Strike Teams (10 units)
- 2 Mass Transit Buses
- 1 Command Vehicle
- 2 Supply Trailers
- 5 Shift Supervisors
- 3 EMS Supervisors
- 1 EMS Chief
- 1 Operations Chief
- 1 Communications Trailer

NOTE
The 10 closest hospitals & 5 Trauma Centers to the incident will be notified by Medical Control.
MCI Predetermined Response Plan (for Command FOG #1 and #2) continued

For the back of COMMAND FOG #1 and MEDICAL FOG #2

MCI LEVEL 5 (Over 1000 victims)
10 MCI Task Forces (50 units)
4 ALS Transport Unit Strike Teams (20 units)
2 Suppression Unit Strike Teams (10 units) 10 Shift Supervisors
4 BLS Transport Unit Strike Teams (20 units) 6 EMS Supervisors
4 Mass Transit Buses 2 EMS Chiefs
2 Command Vehicles 2 Operations Chiefs
4 Supply Trailers 1 Communications Trailer

NOTE
The 20 closest hospitals & 10 Trauma Centers to the incident will be notified by Medical Control.
MEDICAL - FOG #2

► Don the appropriate vest and use the radio designation “MEDICAL.”
► Establish in a safe, fixed and visible location or co-join command post.
► Utilize the EMS Tactical Command Worksheet.
► Verify that COMMAND has requested appropriate number of units.
► Assign the following functions (if not done by COMMAND):
  o TRIAGE.
    ▪ Litter Bearers.
    ▪ Medical Examiner Personnel.
  o TREATMENT.
    ▪ RED, YELLOW, GREEN Treatment Managers.
  o TRANSPORT.
    ▪ Documentation Aide.
    ▪ Medical Communication Coordinator.
  o STAGING.
    ▪ Medical Supply Officer.
► Advise the Communication Center of the exact number of victims and their categories, once reported from TRIAGE.
► Determine amount and type of additional medical supplies needed. Consider Medical Supply Officer.
► If the incident is due to a known or suspected WMD Event refer to WMD FOG #8 and establish a Medical Intelligence Officer to assist with decontamination, antidotes and treatment of victims.

(Paper color - Blue, Two-sided, with Predetermined Response Plan on back).
**Triage Officer – FOG #3**

- Don the appropriate vest and use the radio designation “TRIAGE.”
- Assign personnel to triage the “walking wounded.” Use bullhorn/PA system to direct victims to a specific location or to decon area if needed.
- Direct personnel to triage and tag victims where they lie if the scene is safe.
- Prioritize victims using colored triage ribbons.
- Request Litter Bearer Teams from COMMAND/MEDICAL to assist with movement of victims from the incident site to the Treatment Area. Coordinate movement with the TREATMENT Officer.
- Victims that are Black tagged/deceased should be left where they are found and notify the medical examiner/law enforcement.
- Report to COMMAND/MEDICAL the number and category of victims.
- Ensure that all areas of the incident have been checked for victims and that all victims have been triaged.
- Once triage is completed contact COMMAND for further assignment.
- If victims are contaminated, use the Disaster Management System (DMS) tag to identify victims contaminated, and any antidotes administered. Have victims remove clothing and place in bags—use ID strip from DMS tags to label—have law enforcement secure items.
- If the incident is due to a known or suspected WMD Event refer to WMD FOG #8.

(Paper color—Yellow).
Treatment – FOG #4

► Don the appropriate vest and use the radio designation “TREATMENT.”
► Direct personnel to either begin treatment on victims where they lie OR establish a centralized Treatment Area. Ensure security with Law Enforcement.
► Coordinate the movement of victims into the Treatment Area with the Litter Bearers.
► Consider obtaining a Documentation Aide to assist with paperwork.
► Request additional medical supplies as necessary from the MEDICAL SUPPLY Coordinator.
► Ensure personnel perform a secondary triage and tag victims with a triage tag. Personnel will then remove the colored ribbon.
► If the incident size warrants it, designate a “Treatment Team Manager” for each color category (RED, YELLOW, GREEN).
► Advise TRANSPORT of victim(s) requiring immediate transportation.
► Account for all victims triaged and treated on the Treatment Log.
► Advise COMMAND/MEDICAL as to any changes in the victim count.
► If victims are contaminated, use the Disaster Management System (DMS) tag to identify victims contaminated, and any antidotes administered. Have victims remove clothing and place in bags—use ID strip from DMS tags to label—have law enforcement secure items.
► If incident is due to a known or suspected WMD Event, refer to WMD FOG #8. Work with the Medical Intelligence Officer to assist with decontamination, antidotes and treatment of victims.

► (Paper color—Red).
Transport Officer – FOG #5

- Don the appropriate vest and use the radio designation “TRANSPORT.”
- Obtain a Medical Communication Coordinator to maintain continuous communication with Medical Control and document the hospital information on the Hospital Capability Worksheet.
- Obtain a Documentation Aide(s) to record the triage tag numbers, victim name, age/sex, transporting unit and hospital destination for each victim on the Hospital Transport Log. Keep a portion of the triage tag.
- Establish a Victim Loading Area accessible to the Treatment Area and preferably having clear entry and exit points.
- Consult with TREATMENT on the amount and priority of victims.
- Coordinate the loading of patients by priority to transport units and helicopter—if needed coordinate with the Landing Zone Officer/Helispot.
- Assign 2–3 victims to each unit, ensuring adequate transport crew. The severity of victims should be mixed if multiple victims are assigned to a unit.
- Assign a hospital destination to each transporting unit; provide verbal and/or written travel instructions.
- Request additional transport units from STAGING.
- If incident is due to a known or suspected WMD Event, refer to WMD FOG #8.

(Paper color—Green).
► Don the appropriate vest and use the radio designation “MEDICAL COMMUNICATIONS.”
► Establish early contact with Medical Control (MedCom/MRCC).
► Advise Medical Control of overall situation (e.g. smoke inhalation, trauma, burns, HazMat exposure, etc.) amount and priority of victims.
► Medical Control will gather hospital capabilities and capacities. Document this hospital information on the Hospital Capability Worksheet.
► When units are prepared to transport, advise Medical Control and supply them with the following information:
  o The unit transporting.
  o The number of victims to be transported.
  o Patient priority:
    RED = Immediate.
    YELLOW = Delayed.
    GREEN = Ambulatory (minor).
  o Any special need victims, cardiac, burn, trauma, etc.
► Ground transported victims should be assigned to hospitals on a rotating basis.
► Notify hospital of HAZMAT/WMD exposure and any antidotes given.

(Paper color—Green)
Supply – FOG #6

► Don the appropriate vest and use the radio designation “SUPPLY.”
► Assure necessary equipment is available on the transporting vehicle.
► Consult with TREATMENT on the need for medical supplies in the Treatment Area.
► Provide an inventory of medical supplies at the Staging Area.
Don the appropriate vest and use the radio designation “STAGING.”

Maintain Staging Area established by COMMAND or establish a location and notify the Communication Center to direct all incoming units.

Establish a visible location in the Staging Area.

Maintain a Unit Staging Log.

Ensure that personnel stay with their vehicle unless otherwise directed.

Organize arriving units, keep like units together. If personnel leave their vehicle, keep the keys with each vehicle.

Have arriving units put “BLS” or “ALS” on their front windshield using a marker, sign or tape.

Coordinate with TRANSPORT the need for units and direct units to the victim loading zone.

Maintain a reserve of at least 2 transport units. Should this go down, advise COMMAND.
Enroute

- Request additional resources.
- Use DOT Emergency Response Guidebook (ERG) recommendations; Use the Florida Incident Field Operations Guide (FOG) book, and/or Emergency Response to Terrorism Job Aid.
- Respond in a combined approach of Fire-Rescue, Law Enforcement, and HAZMAT Task Force.
- Approach cautiously; from uphill/upwind if possible. Establish a safe staging area early. Do not use radios/cell phones in close proximity to suspicious devices (within 500ft).
- Park a safe distance from an identified hazard or area that could endanger personnel or equipment. Use binoculars, look for unusual sights, sounds and be prepared to relocate if odor/cloud/casualties are noted, consider victim’s signs, symptoms and mechanism (Thermal, Radiological, Asphyxiant, Chemical, Etiological, Mechanical, Psychological - TRACEM—P)
- Consider secondary devices and request Law Enforcement to sweep the area for a secondary device.

On-Scene

- Establish Command, be prepared to establish a Unified Command with all agencies having jurisdiction and assess security of command post.
- Initiate on-scene size up and hazard risk assessment, continually size up the incident, evaluate hazards and risks.
- Establish incident perimeter - Secure the scene, deny entry, establish control zones (Hot, Warm, Cold zones). Request Law Enforcement to assist with the safety perimeter.
- Direct victims using bullhorns/PA systems to gross decon area use large volumes of water (elevated master streams, hose lines, showers, sprinkler system, etc.). Be aware of run off.
- Ensure personnel wear proper PPE (consult with HAZMAT/poison control as needed).
- If needed use a HAZMAT toxic antidote kit from fire-rescue units or the MCI/WMD trailers. If a MARK 1 auto injector is administered tie an ORANGE plastic ribbon on the victim to verify type and amount of antidote given. If CANA (valium) auto injector is administered use a WHITE plastic ribbon. Also write this information on the Disaster Management System (DMS) tag.
MCI – WMD/Terrorist Event – FOG #8 continued

- For contaminated victims -use the DMS tag to identify victims contaminated, direct the victims to remove all clothing and place in bags, use ID strip from DMS tags to label; advise Law Enforcements to secure. Preserve evidence if found and notify Law Enforcement.

- Notify hospitals/Medcom of HAZMAT hazard, antidotes given and degree of decontamination completed; transport decontaminated victims only (gross decon as a minimum).

► Emergency Evacuation Procedure
The term “Emergency Traffic” shall be used to clear radio traffic. The communication center will sound a radio alert tone followed by clear text identifying the type of emergency. If an evacuation is warranted the Incident Commander (IC) shall designate a specific vehicle(s) to sound the evacuation signal. The signal will consist of repeated short blasts of the air horn for approximately 10 seconds, followed by 10 seconds of silence this will be done 3 times. Following this the IC should conduct a Personal Accountability Report (PAR).
EMS Plan for Responding to Pandemic Influenza

**Policy:** This plan outlines protocols that each EMS Provider is to incorporate for the emergency care and transport of patient with suspected or confirmed pandemic influenza.

► **General Considerations**
  - Patients are to be transported using the minimum number of Emergency Medical Services (EMS) personnel and without other patients/passengers in the vehicle.
  - Sufficient infection control supplies are to be on board to support the expected duration of transport plus additional time should the vehicle experience traffic delays.
  - Receiving facilities are to be notified prior to transport of patients to facilitate preparation of appropriate infection control procedures and facilities.
  - Concerns regarding movement of suspect or confirmed cases of pandemic influenza patients in the United States are to be discussed with appropriate local and state health authorities, who will provide the latest guidance available.

► **Infection Control**
  - Protective equipment is not to be removed during patient transport.
  - Personal activities (including: eating, drinking, application of cosmetics, and handling of contact lenses) is not to be performed during patient transport.
  - In addition to respiratory droplet and possible airborne spread, this influenza virus may also be transmitted if residual infectious particles on environmental surfaces are brought into direct contact with the eyes, nose or mouth. Therefore, hand hygiene and sanitation is of primary importance for all first responders working with possible influenza patients.
EMS Plan for Responding to Pandemic Influenza continued

► Protective Equipment and Procedures
- Disposable, non-sterile gloves are to be worn for all patient contact.
- Gloves are to be removed and discarded in biohazard bags after patient care is completed (e.g., between patients) or when soiled or damaged.
- Hands are to be washed or disinfected with a waterless hand sanitizer immediately after removal of gloves.
- Disposable fluid-resistant gowns are to be worn for all patient care activity. If gowns were not used, ALL responders promptly change into clean attire upon return to station.
- Gowns are to be removed and discarded in biohazard bags after patient care is completed or when soiled or damaged.
- Goggles or face-shields are to be worn in the patient-care compartment and when working within 6 feet of the patient. Corrective eyeglasses alone are not appropriate protection.
- Hooded PAPR with appropriate HEPA cartridge or fit-tested N-95 respirators are to be worn by personnel in the patient-care compartment at all times.
- Hooded PAPR with appropriate HEPA cartridge or fit-tested N-95 respirators are to be worn by the driver, if the driver’s compartment is open to the patient-care compartment. Drivers that provide direct patient care (including moving patients on stretchers) must wear a disposable gown, eye protection, and gloves as described above during patient-care activities. Gowns and gloves are not required for personnel whose duties are strictly limited to driving.
- Vehicles that have separate driver and patient compartments and can provide separate ventilation to these areas are preferred for transport of patients. If a vehicle without separate compartments and ventilation must be used, main dashboard vents should remain open with rear ventilation fans turned on at the highest setting during transport patients to maximize air-exchange.
EMS Plan for Responding to Pandemic Influenza continued

- The patient may wear a mask to reduce droplet production, if tolerated.
- Oxygen delivery with simple and non-rebreather facemasks may be used for patient oxygen support during transport.
- Cardiopulmonary resuscitation (CPR) should only be performed using a resuscitation bag-valve mask, equipped with HEPA filtration of expired air or a separate filter in the airway circuit.
- All aerosolized treatments such as nebulizer or CPAP should use a HEPA filtration system. If HEPA filtration systems are not available, alternative treatment to aerosol medication must be utilized.

► Mechanically Ventilated Patients
- Mechanical ventilators for patient transport must provide HEPA filtration of airflow exhaust.
- Emergency Medical Services MUST consult their ventilator equipment manufacturer to confirm appropriate filtration capability and the effect of filtration on positive pressure ventilation.

► Waste disposal
- Dry solid waste, e.g., used gloves, dressings, etc., is to be collected in biohazard bags for disposal as regulated medical waste in accordance with local requirements at the destination medical facility.
- Waste that is saturated with blood, body fluids, or excreta is to be collected in leak-proof biohazard bags or containers for disposal as regulated medical waste in accordance with local requirements at the destination medical facility.
- Sharp items such as used needles are to be collected in puncture resistant sharps containers for disposal as regulated medical waste in accordance with local requirements at the destination medical facility.
- Suctioned fluids and secretions are to be stored in sealed containers for disposal as regulated medical waste in accordance with local requirements at the destination medical facility. Handling that might create splashes or aerosols during transport are to be avoided.
- Suction device exhaust is not to be vented inside the vehicle without HEPA filtration. Portable suction devices are to be fitted with in-line HEPA filters.
EMS Plan for Responding to Pandemic Influenza
continued

► Cleaning and Disinfection After Transporting Patient
- Compressed air that might re-aerosolize infectious material is not to be used for cleaning the vehicle or reusable equipment.
- Non-patient-care areas of the vehicle are to be cleaned and maintained according to vehicle manufacturer’s recommendations.
- Cleaning personnel are to wear non-sterile gloves, disposable gowns, masks and eye protection while cleaning the patient-care compartment.
- Patient-care compartments (including stretchers, railings, medical equipment control panels, and adjacent flooring, walls and work surfaces likely to be directly contaminated during care) are to be cleaned using an EPA-registered hospital disinfectant in accordance with manufacturer’s recommendations.
- Spills of body fluids during transport are to be cleaned by placing absorbent material over the spill and collecting the used cleaning material in a biohazard bag. The area of the spill is to be cleaned using an EPA-registered hospital disinfectant. Cleaning personnel are to be notified of the spill location and initial clean-up performed.
- Contaminated reusable patient care equipment is to be placed in biohazard bags and labeled for cleaning and disinfection utilizing proper procedures.
- Personnel are to wear non-sterile gloves, disposable gowns, eye protection and face masks while cleaning reusable equipment.
- Reusable equipment is to be cleaned and disinfected according to manufacturer’s instructions.
- Periodic decontamination of the interior compartment of the transport vehicle with vaporized hydrogen peroxide should be considered if it is available based upon level of suspected contamination and/or number of transports of potentially infected patients.

► Follow-up of EMS Personnel Who Transport Patients
- After transportation, the service is to provide the following information to the medical director: date and route of transport; duration of patient transport; names, contact information, and specific duties (including estimated duration of direct patient care provided) of transport personnel.
- Services should designate individuals to monitor personnel who have transported patients for evidence of fever or respiratory illness. EMS personnel who transport patients are to be assessed (directly or by telephone) at least daily for 10 days after transporting patient.
- Asymptomatic personnel may continue work during the follow-up period.
- Symptomatic personnel must be relieved of EMS duties, directed to seek medical care, and be reported to the state health department.