Initial Medical Care

• Initial medical care is that care routinely provided to every patient, and that is individually listed in nearly every treatment algorithm. While only certain key elements are included in each algorithm, it is understood that every appropriate element of initial medical care is to be included in the care of the patient. Initial medical care shall include:

• **EMT and Paramedic**
  – Ensure scene safety and take appropriate Body Substance Isolation (BSI) precautions
  – Initial assessment
  – Spinal Motion Restriction as patient condition dictates
  – Open and maintain airway. Administer oxygen / provide ventilatory support as appropriate
  – Control obvious bleeding as needed
  – If suspected abuse or neglect, notify law enforcement, Child Protective Services (CPS), or Adult Protective Services (APS), as appropriate.
  – Initiate CPR as indicated
  – Treat fractures and soft tissue injuries
  – Perform cardiac monitoring /12 lead, as appropriate. Provide a copy when transferring care.
  – Obtain history related to the event
  – Vital signs (to include pulse, respirations, BP, pulse oximetry, ETCO2 (if available), and skin temperature
    • Repeated as needed, based upon patient severity.

• **Paramedic Only**
  – Establish and/or maintain a patent airway
    • If nasotracheal intubation is necessary, administer 2-3 sprays of Neo-Synephrine as needed.
  – Establish vascular access. For life threatening situations, **IO is preferred.** Any IV medication may be administered IO.
  – Consider placing a gastric tube when the patient has been ventilated > 2 minutes
12 Lead Indications

Does the patient have one or more complaints from the following list:

- Arm numbness or tingling
- Chest pressure/heaviness
- Unexplained diaphoresis
- Unexplained general weakness
- Syncope
- Shortness of Breath
- Nausea
- Vomiting
- Dizziness
- Not feeling well
- Impending Doom
- Suspected diabetic ketoacidosis
- Suspected drug overdose
- Altered mental status
- Palpitations
- Heart Rate <50 or >150
- Metabolic derangement
  - Examples include: dialysis patients, liver impairment

New onset of abnormal pain for the patient
- Examples include: jaw pain, shoulder pain, back pain

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider doing a Pre-hospital 12 lead on this patient.</td>
<td>A Pre-hospital 12 lead needs to be done on this patient.</td>
</tr>
</tbody>
</table>

Risk Factors for Acute Coronary Syndromes include, but are not limited to:

- Family History
- Hypertension
- High Cholesterol
- Diabetes
- Obesity
- High Stress
- Sedentary Lifestyle
- >65 years old or older.
- Male sex (gender)
- Alcohol intake
- Heredity (including Race) — African Americans, Mexican Americans, American Indians, Native Hawaiians, Some Asian Americans.
- Tobacco smoke — Exposure to other people’s smoke

Females, diabetic, and elderly patients often present with atypical chest pain or anginal equivalents.

When a 12 Lead is done on a patient, a copy must be provided when transferring care.
Special circumstances may occur in any incident in which the resources of the fire department / emergency medical services, such as personnel and equipment, are overwhelmed by the event type, number, and severity of casualties.

- In the event of a special circumstance such as hostile event, or a situation in which resources are overwhelmed, triage and treatment may be altered from the traditional off-lines in order to maximize use of resources and best care for patients. Each agency may have guidelines in place that assist in the management of these situations.

- If the scene is hazardous, due to potential violence, chemicals, or other factors, it is acceptable to delay traditional treatment until patient extraction to a safe area has been completed. Only treatments that can immediately affect life or limb should be performed in an unsafe environment. These treatments may include, but not limited to:
  - Hemorrhage control- application of bandage or tourniquet
  - Tension pneumothorax- chest needle decompression/seal
  - Airway protection- patient positioning or BLS airway
Destination Guideline

For the purpose of providing guidelines to field EMS providers, the EMS Medical Directors recommend that patients be transported to the closest, most appropriate destination based on AEMS categorization criteria. We do not recommend transport to facilities that have not been categorized by AEMS. The EMS Medical Directors feel that patients confirmed or suspected to acutely have the following conditions would be best served by being triaged and transported initially to emergency departments affixed to hospitals with the applicable full medical or trauma intensive care admissions capabilities, as well as facilities with the appropriate interventional cardiovascular, radiologic, and subspecialty capabilities:

- STEMI
- Post-code arrest with Return of Spontaneous Circulation (ROSC)
- CVA/TIA
- Adult L1 and LIII trauma, including burns
- Pediatric trauma (age <15)
- Submersion Incidents/Drownings/Near-Drownings
- Suspected OB/GYN related complications in women known or suspected to be beyond 20 weeks Estimated Gestational Age
- Head, neck, back, thoracic, or pelvic trauma in women known or suspected to be beyond 20 weeks Estimated Gestational Age
- Post-delivery complaints by mother or neonate, up to 30 days post delivery
- Home deliveries, midwife-attended or otherwise
- Those intubated, with supraglottic airways, or on CPAP as acute treatment for respiratory distress
- Brief Resolved Unexplained Event / Apparent Life-Threatening Event (≤ 2 y/o)

The following should be taken to the closest AEMS categorized ED regardless of inpatient, interventional and subspecialty capabilities:

- Code arrest without ROSC (excluding traumatic arrest)
- Lack of functional airway: ET, supraglottic or BLS

In addition, the EMS Medical Directors realize that other factors should be considered when deciding on a best destination. These include, but are not limited to:

- Availability of resources
- Specialty services
- Continuity of care
- Patient choice

Contact on-line Medical Direction, as needed, for assistance with determining destination.
Courtesy Notification

• On-line treatment orders may only be received from on-line medical direction. If an on-line physician outside the Base Station wishes to give treatment orders, the ALS provider must contact his or her assigned on-line medical direction; the exception to this is in the case of a burn patient or a trauma patient. On-line treatment orders may be received from a burn center physician or a trauma physician.

• Clearly state at the beginning of an on-line communication if you are making a “courtesy notification” or if you need to “obtain On-line Medical Direction.” If you are seeking orders, you are making a decision to “obtain On-line Medical Direction”.

• An ALS Courtesy Notification (CN) should be brief and include the following patient-related information:
  – Case (incident) number and/or patient name if requested
  – Age
  – Chief complaint
  – ETA
  – Special equipment in use or needed. Examples include: CPAP, ventilator, bariatric equipment, translator or restraints.
  – Treatments rendered
  – Vital signs, if abnormal (complete set)
  – Mechanism of injury (trauma)

• Notification is optional on BLS transports. Notification may be done by phone or electronically.

• If a facility refuses to accept a patient during phone notification, contact on-line medical direction.
On Scene Physician

- A paramedic may follow the orders of an on-scene physician after obtaining On-line Medical Direction to medical control and obtaining a release from on-line medical control. The on-scene physician must be licensed to practice medicine in the state of Arizona and agree to accompany the patient to the receiving hospital in the ambulance. The paramedic may not follow any requests that are outside the scope of practice of a paramedic in the state of Arizona.

- The paramedic may wish to have the on-scene physician communicate directly with medical control to optimize patient care.

- The paramedic should clearly document the name and license number of the physician along with obtaining their signature on the patient care record.
Determination of Death Guideline

• Prehospital providers respond to patients of cardiopulmonary arrest in a variety of circumstances. The following guideline is intended to assist in determining how and when resuscitative measures should be withheld, initiated, and/or terminated. Refer to appropriate SOP’s and related treatment algorithms for other specific information.

Obvious Death

• If the patient meets the criteria listed below, no resuscitative efforts need to be initiated. Online medical direction is NOT necessary. Contact PD and initiate grief support. An EMS provider must remain with the patient until released to PD.

• All of the following criteria must be met:
  – Patient is pulseless and apneic
  – Asystole is confirmed on the monitor in two leads for at least ten seconds
  – Presence of one or more signs of irreversible death
  – Time down is presumed to be greater than 30 minutes
  – Hypothermia is not present
  – No on-scene request for resuscitative measures

Signs of Irreversible Death

• Decapitation*
• Decomposition*
• Dependent lividity
• Rigor mortis
• Pulseless and apneic with extrusion of brain matter
• Pulseless and apneic with removal of the lower half of the body
• Pulseless and apneic with full thickness burns over 90% of total body surface area

*Documentation of asystole by monitor is not needed.

Please refer to the Field Termination Guidelines as needed.
Determination of Death Guideline

Prehospital Medical Care Directive (PMCD)

- Adults and children, usually with terminal illnesses, may not wish to have any resuscitative measures attempted if they become pulseless and apneic. Every attempt should be made to honor these “do not resuscitate” (DNR) requests. If the patient is not in cardiopulmonary arrest on arrival of EMS providers, refer to the appropriate treatment algorithm and begin treatment.

- To honor DNR requests:
  - Patient must be pulseless and apneic with no vital signs or signs of life
  - An orange PMCD is readily available. Up to two minutes can be taken to locate the document.
  - The document appears to be valid
  - If valid DNR is present, family resuscitative requests do not need to be honored. (A.R.S.36-3205)
  - On-line medical direction is NOT required
Field Termination Guidelines - Medical Patients

The purpose of this document is to assist decision-making regarding termination of resuscitation efforts for medical patients. Individual patient situations vary. Therefore, this guideline is not meant to be all-inclusive and does not take the place of using sound judgment. The paramedic retains the right to resuscitate any patient and/or seek on-line medical direction when it is deemed in the best interest of all concerned. This document does not apply to patients who meet the obvious death criteria or who have a properly completed Prehospital Medical Care Directive. Please refer to The Determination of Death guidelines as appropriate.

1. Initiate resuscitation unless valid DNR is available.

2. Perform 4 rounds of CCR/MICR or ACLS. Focus on on-scene resuscitation versus “load and go”.

3. Consider Termination of Resuscitation if the following criteria are met:
   • Not Witnessed
   • No shockable rhythm (i.e., Asystole)
   • No ROSC (return of spontaneous circulation)

4. If patient meets all 3 criteria after 4 rounds of CCR/MICR or ACLS, consider termination of resuscitation (TOR). Termination of resuscitation requires on-line medical direction. If ROSC is achieved, continue treatment and refer to Post-Arrest Stabilization Off-line.
Field Termination Guidelines
- Trauma Patients

Purpose

- The purpose of this document is to provide assistance in decision-making regarding termination of resuscitation efforts for trauma patients. Individual patient situations vary. Therefore, this guideline is not meant to be all-inclusive and does not take the place of using sound judgment. The paramedic retains the right to resuscitate any patient and/or seek on-line medical direction when it is deemed to be in the best interest of all concerned.

- In multiple patient situations, there may be inadequate resources to devote care to the resuscitation of pulseless patients. In such cases, the ALS provider on the scene should confirm that the patient is pulseless and direct care to more viable patients. In addition, if the patient is pulseless and extrication is necessary before CPR can be provided, the patient should be triaged as deceased.

- On-line medical direction is required for all trauma field terminations except those found in asystolic arrest due to blunt trauma.

- Specific information needed to determine patient management in trauma arrests
  - Time of arrest (see obvious death algorithm)
  - Mechanism: blunt vs. penetrating
  - Signs of irreversible death (see obvious death algorithm)
  - Possible underlying medical cause for arrest
  - Vital signs (pulseless and apneic)
  - Evidence of massive external blood loss
  - Evidence of massive blunt head, thoracic, or abdominal trauma

- All tubes (e.g., IVs, ET tubes) used during a resuscitation effort must be left in place unless the patient’s primary care physician acknowledges he/she will sign the patient’s death certificate.

Field Termination

- Field termination of resuscitative efforts may be considered for both trauma and medical patients. Patients must be in cardiopulmonary arrest in a rhythm incompatible with life (asystole, pulseless electrical activity, or sustained ventricular fibrillation/tachycardia). Treat patients according to the trauma or medical field termination guideline and associated treatment algorithm.

- Please refer to The Determination of Death guidelines as needed.
Field Termination Guidelines
- Trauma Patients

Purpose

- The purpose of this document is to provide assistance in decision-making regarding termination of resuscitation efforts for trauma patients. Individual patient situations vary. Therefore, this guideline is not meant to be all-inclusive and does not take the place of using sound judgment. The paramedic retains the right to resuscitate any patient and/or seek on-line medical direction when it is deemed to be in the best interest of all concerned.

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- Please refer to The Determination of Death guidelines as needed.
Management of Pediatric Cardiac Arrest

**Traumatic Cardiac Arrest**

- Pediatric traumatic cardiac arrest patients who do not meet the criteria for field termination of resuscitative efforts should be transported by the most expedient means to an appropriate Trauma Center, preferably with pediatric capabilities. If the patient is considered non-salvageable, On-line Medical Direction should be contacted for the consideration of field termination or for an alternative destination.

**Non-traumatic (Medical) Cardiac Arrest**

- In the absence of a specific protocol recommending a destination.
  
  If an airway and IV/IO access is obtained and there is return of spontaneous circulation during the resuscitative effort pediatric patients should be transported to an appropriate hospital with pediatric critical care capability. Transport should be performed by the most expedient means.

- If an airway and IV/IO access cannot be established, the patient should be transported to the closest local hospital emergency department by the most expedient means.

- If there is no return of spontaneous circulation during the resuscitative effort, the patient should be transported to the closest local hospital emergency department by the most expedient means.

**Notes**

- Airway stabilization may be either an advanced airway or BVM ventilation with good air movement and appropriate monitoring.

- Air medical services may transport directly to a facility with pediatric critical care services if transport time is not significantly prolonged.
Refusal of Treatment and/or Transport

Purpose
• To define the circumstances and situations where paramedics may accept a patient’s refusal of treatment and/or transport

General Guidelines
• All patients who request transport to the hospital will be transported
• Any patient who complains of any pain, discomfort, or problem will have an assessment performed
  – If the patient refuses an assessment, document the manner of the refusal and the patient’s reason for the refusal in the report.
  – Assessment should include all items referenced in the treatment algorithm related to the patient’s complaint.
• In all cases, a refusal form will be filled out and signed by the patient or appropriate consenting adult (if the patient is a minor).
  – If the patient refuses to sign the form, document the reason and have a witness sign the form.
• Offering opportunity for 3rd party to assist patient with decision-making and whether patient permitted or declined such assistance (if applicable).
• Decision making capacity must be demonstrated and documented as defined by these abilities:
  – Receive and comprehend information needed to make a decision
  – Process and deliberate a decision and its potential consequences
  – Make and articulate a decision that is consistent over time
  – Justify that decision with logic that fits the person’s own value system.

Who Can Refuse
• The patient must meet all of the following criteria:
  – Is an adult (18 or over), or if under 18, is being released to a parent, guardian, responsible party, or law enforcement personnel
  – Is oriented to person, place, time, and event.
  – Exhibits no evidence of:
    • Altered level of consciousness
    • Alcohol or drug use that impairs judgment
    – Understands the nature of his/her medical condition, as well as the risks, and consequences of refusing care. (Decision making capacity.)
• An adult accepting care for a minor must sign the refusal form.
• Normal range vitals: See ALS Release of Patients for BLS Transportation algorithm. If abnormal vital signs, obtain On-line Medical Direction for refusal.
Refusal of Treatment and/or Transport

Who Cannot Refuse Without An On-line Physician Order (High Risk Refusals)

- On-line medical direction is required in the following situations in which a patient is refusing treatment and/or transport (high-risk refusals). On-line physician contact must be made before leaving the scene. When contacting on-line medical direction, please use verbiage to recommend whether a transport is appropriate.
  - Any patient that is a danger to self or others.
  - Any patient that have been stunned/stopped by means of an electro-muscular disruption weapon (i.e., TASER). Include ECG monitor strip with documentation.
  - Any pediatric patient with reported symptoms by history or exam, including apnea, choking, color change, marked change in muscle tone (limpness), abnormal behavior, or increased work of breathing.
  - Any patient to which medication has been administered, including oxygen.
  - Any patient that lacks decision making capacity. Examples: language barrier, diminished mental capacity.
  - Minors that wish to be released to anyone other than parent or guardian.
  - Abnormal range vitals: See ALS Release of Patients for BLS Transportation algorithm.
  - Any patient with any of the mechanisms or conditions that should be transported to a Trauma Center in the Arizona Trauma Patient Identification & Field Triage Decision Standard.
  - Any patient that has any of the following characteristics or complaints:
    - Abdominal pain
    - Change in mental status
    - Acute cardiac dysrhythmia
    - Chest pain, suspected cardiac etiology or anginal equivalent
    - Electrical injury
    - Foreign body ingestion
    - Head injury
      - LOC, on blood thinning medication including aspirin; age less than 2 or greater than 60; vomiting; or cognitive impairment
    - Inability to walk (not normal for patient)
    - Overdose or poisoning
    - Pregnancy-related complaint
    - Seizures
    - Syncope or near syncope
    - Submersion incident

Updated Dec 3, 2012
Refusal of Treatment and/or Transport

**Documentation**
Reports shall include:
- Patient name, age
- Date of birth (DOB)
- Medical history
- Two complete sets of vital signs
- Chief complaint
- Mental status exam findings (speech, gait, appropriate behavior, cooperative, follows instructions/commands)
- Physical exam findings
- Reason for refusal
- Signed refusal form
- Advice given
- Patient understands risks of refusal
- Patient understands possible outcome if advice is not followed
- Decision making capacity
- Third party involvement

**Refusal Form Signatures**
- Witnessed by law enforcement officer, family member, or friend
- If a minor is refusing, adult accepting care for child must sign
- If patient/adult refuses to sign, get witnessed by police if possible
Paramedic Ride in Guidelines

PURPOSE

The purpose of this document is to provide guidance in recognizing patient care situations that may require ride in with an additional ALS provider. This document is not intended to replace any agency specific policies or recommendations. Each agency should have an ALS-ALS transfer of care protocol which must be available to the transport agency.

GUIDELINES

It is recommended that an additional ALS provider consider riding in to assist in the care of the patient if there is an increased likelihood of complications or deterioration. Some criteria that should be considered include:

- Abnormal vital signs
- Altered mental status
- Abnormal neurologic exam
- Current, or risk of, unstable cardiac dysrhythmia
- Use of medication to support blood pressure
- Respiratory compromise or impending failure
- Uncontrolled or difficult to control bleeding

It is recommended that an additional ALS provider ride in to assist in the care of the patient in the following situations. These are some examples of situations with an increased likelihood of problems developing en route.

- Acute Stroke
- Acute MI
- Cardiac arrest / Return of Circulation
- Eclampsia / preeclampsia
- Imminent delivery
- Agitated, combative, or restrained patient
- Seizures
  - Adult – active seizure or status epilepticus
  - Pediatric - first-time seizure, active seizure, persistent febrile seizure, or status epilepticus
- Trauma - all immediate (by injury) patients
- Vaginal bleeding in pregnant patient with fetus of viable age (20 weeks)

In addition a second ALS provider should accompany the patient any time that it is requested by one of the treating paramedics.

If an ALS provider chooses not to ride in with the patient in any of the above situations, the member’s rationale for that decision must be supported by his or her documentation.
ALS Release of Patients for BLS Transportation

Criteria 1: Non-emergency category must have vital signs within the following limits:

- **Adult**
  - Temp* < 101
  - Respiration 10 to 24
  - BP 90 to 160 systolic 70 mm Hg + (2 times age in years)**
  - Pulse 60 to 100

- **Child**
  - Temp* < 101
  - Respiration 20 to 30
  - BP 60 to 110 diastolic
  - Pulse 60 to 150

* If fever suspected

**For age specific Pediatric BP, please refer to Page 48

Criteria 2: The following high-risk indications must be absent:

- Abdominal pain
- Altered mental status (altered for patient)
- Any acute cardiac arrhythmia
- Chest pain
- Electrocautery
- Foreign body ingestion
- Inability to walk (not normal for patient)
- Overdose or poisoning
- Patient volunteers high-risk condition
- Pregnancy-related complaint
- Seizures
- Syncope or near syncope
- TASER
- Water-related incidents

Criteria 3: Absence of significant findings on physical exam

A physical exam must be completed and documented. After evaluation, the patient must have no signs, symptoms, or history that would indicate (or appear to indicate) significant findings or an emergent condition.

Yes

Release patient to BLS transport unit

No

Obtain Online Medical Direction to medical control to gain approval for BLS transport OR transport ALS
Abdominal Pain
– Non-Traumatic, Non-Pregnant
Adult (≥ 15 y/o)

Initial Medical Care

Establish vascular access

Is the systolic BP < 90?
  Yes
  Administer 250 mL boluses of NS as long as lungs remain clear and systolic BP < 90
  No

Courtesy notification to receiving facility

Refer to Pain Management Off-line as needed.
Nausea / Vomiting
Adult (≥ 15 y/o)

Initial Medical Care

Establish vascular access

Administer **Ondansetron**
4-8mg IV or IM.
If given IV, slow over 2-5 minutes.

May give **Ondansetron** Oral Dissolving Tablet
4-8 mg PO

PO dose may be given by breaking ODT tablet or giving IV solution PO

Courtesy notification to receiving facility
Obstetrics
Adult (≥ 15 y/o)

Pregnancy (>20 weeks) with labor pains, abdominal pain, or “High Risk*”. See notes below.

1. Initial medical care
2. Establish vascular access
   - Place the patient in a left lateral recumbent position.
3. Determine whether the patient is “High Risk”?
   - If pre-eclamptic or seizing:
     - Give Magnesium Sulfate 4-6 grams IV over 10-15 minutes. (Add 4 G to 100 mL D5W, LR, or NS. Resulting concentration is 40 mg/mL).
   - Transport the patient to the nearest Level III perinatal facility.
   - Obtain On-line Medical Direction for further orders. Courtesy Notification is okay if transporting to a facility with a Neonatal ICU.

Note:

High risk pregnancies include: prematurity (<32 weeks), any bleeding in third trimester, pre-eclampsia/eclampsia (seizures), no prenatal care, twins or >, premature rupture of membranes, antepartum hemorrhage (abruptio placentae, placenta previa, and uterine rupture), or other complications of labor (breech position, prolapsed cord, etc.), or recent drug use. These patients need transport to Level III perinatal facility.

Eclamptic Syndrome can occur up to 6 weeks post delivery.

All OB patients should be transported to the ED if the L&D department does not have a ground floor direct entrance. The patient should be rapidly assessed in the ED. If the patient needs to go to L&D without further delay, a hospital provider will accompany the patient and EMS crew to L&D, according to hospital policy.
**Allergic Reaction/Anaphylaxis**
**Adult (≥ 15 y/o)**

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**Initial medical care**

Establish vascular access
Do not delay treatment while establishing vascular access

**Anaphylaxis**
- Systolic < 90 and/or
- Severe facial angioedema and/or
- Severe respiratory distress

**Epinephrine**
- IM: 0.3-0.5 mg (1:1,000 solution)
- IV/IO: If no response or patient in extremis, 0.1 mg (1:10,000) every 5 minutes or until IV infusion 2-10 mcg/min is established.

**Diphenhydramine (Benadryl)**
- IV/IM: 50 mg

**Methylprednisolone (Solu-Medrol)**
- IV/IM: 125 mg

**Consider**
- Albuterol (Proventil)
  - SVN: 2.5 mg in 3.0 mL NS for respiratory distress; repeat as needed

If severe respiratory distress, refer to anaphylaxis treatment.

**Acute Allergic Reaction**

**Diphenhydramine (Benadryl)**
- IV/IM: 50 mg

**Methylprednisolone (Solu-Medrol)**
- IV/IM: 125 mg

**Consider**
- Albuterol (Proventil)
  - SVN: 2.5 mg in 3.0 mL NS for respiratory distress; repeat as needed

If severe respiratory distress, refer to anaphylaxis treatment.

**Mild Distress:** Itching, isolated urticaria, nausea, no respiratory distress

**Severe Distress:** Stridor, bronchospasm, severe abdominal pain, sudden unexplained cardiovascular collapse in a previously normal patient, respiratory distress, tachycardia, shock, generalized urticaria, edema of lips, tongue or face (angioedema)
Respiratory Distress
Adult (≥ 15 y/o)

Initial medical care

Establish vascular access.
Do not delay treatment while establishing vascular access.

Allergic Reaction

Normal Lung Sounds

Wheeze Bronchospasm

Rales/Pulmonary Edema/CHF

If unable to establish vascular access, obtain On-line Medical Direction

If patient alert and systolic > 90:
Nitroglycerin 0.4 mg tablets or spray every 5 min X 3 as long as BP remains > 90

Methylprednisolone (Solu-Medrol)
125 mg IV/IM

Consider IV Magnesium Sulfate
2 gms in 50cc NS 60gtts over 5 minutes for severe asthma.

Patients complaining of dyspnea should be suspected of having pneumonia when they present with fever, productive cough, possible pleuritic chest pain, history of being bedridden, known immunocompromise, diabetes, elderly and lung sounds indicative of consolidation. Refer to Sepsis off-line, as needed.

If wheezes change to stridor, LOC decreases, condition worsens, or patient is on Albuterol at home CONSIDER:
Epinephrine IM: 0.3- 0.5 mg (1:1,000 solution), if age < 35, systolic BP < 180, and no cardiac history or pregnant.

Albuterol (Proventil)
2.5 mg in 3.0 mL NS by SVN or in-line BVM. Repeat as needed, based on assessment.

Ipratropium bromide (Atrovent)
500 mcg may be added to Albuterol SVN to a max of 3 times.

May administer SVN without IV

Courtesy notification to receiving facility
Altered Mental Status (Non-trauma)
Adult (≥ 15 y/o)

This protocol is used for patients with altered mental status where the etiology is unknown. Consider history and possibility of dysrhythmias, medication side effects, electrolyte imbalance, inner ear disorders, CVA, TIA, drug overdose, diabetic emergency, and MI. An ECG and glucose check are required on all patients with altered mental status.

Initial medical care

Establish vascular access

Check blood glucose. Is level < 60 mg/dL?

For suspected opioid overdose with associated respiratory depression.

Naloxone
IV, IO, IM, or ET: 0.4mg - 2.0 mg; may repeat every 2 minutes as needed.
Intranasal: 2 mg into each nostril; may repeat every 2 minutes as needed.
OR
Nalmefene
0.25 to 0.5 mg IV, IM, or SC based on respirations; if no response, may give 0.5 to 1.0 mg in 2 to 5 minutes

Refer to Hypoglycemia Off-line

Courtesy notification to receiving facility

Refusal requires On-line Medical Direction (high-risk). All patients with a syncopal episode or near-syncope should be transported to the hospital via ambulance. Provide respiratory support as indicated.
Hypoglycemia
Adult (Patients ≥ 15 y/o)

Initial medical care, consider 12 lead, while initiating treatment for hypoglycemia

Establish vascular access

Check blood glucose. Is level < 60 mg/dL?

No

Refer to appropriate off-line

Yes

If the patient is awake and has a patent airway, 1-2 tubes of oral glucose may be given.

Dextrose 12.5 – 25 gm IV (D10 125-250mL) (Administer glucagon 1-2 mg IM if no IV)

Recheck blood glucose.

Courtesy notification to receiving facility

On line medical direction is required for high risk refusal.

High risk patients for recurrent hypoglycemia:
Use of long-acting insulin agents (Lantus, Levemir, NPH)
Complicating factors (seizure, concern for intentional overdose, fever, other medical complaints)
Use of oral diabetic medications, specifically sulfonylureas (glipizide, glyburide, glucotrol, diabeta, glimepiride, amaryl, diabinese, tolinase, micronase, orinase, tol-tab, glycron, duatact, glynasel prestab, glucovance, avandaryl, chlorptopamide, metaglip, tolbutamide, tolazamide etc.)
If patient is refusing transport, remain on-scene to ensure that patient eats. Do not release patient unless blood sugar > 80.
Seizures
Adult (≥ 15 y/o)

Initial medical care

Has vascular access been obtained?

Consider causes*
If blood glucose level < 60 mg/dL, refer to altered neurological off-line.

If given IV and age > 60: Reduce dose by half

**Midazolam (Versed) IM
1st Choice
≥ 40 kg: administer 10 mg IM. May repeat once in 10-15 minutes, if needed.
≤ 40 kg: administer 5 mg IM. May repeat once in 10-15 minutes, if needed.

Or
Midazolam (Versed) Intranasal:
0.2-0.3 mg/kg to a max of 10 mg. May repeat once, if needed. Must use 5mg/ml concentration.

Or
Lorazepam (Ativan) IM
IM: 2-4 mg. May repeat in 10-15 minutes.
Age > 60: Reduce dose by half

Establish vascular access.

**Lorazepam (Ativan) IV
1st Choice
≥ 40 kg: administer 4 mg IV. May repeat once in 10-15 minutes, if needed
≤ 40 kg: administer 2 mg IV. May repeat once in 10-15 minutes, if needed.

Or
**Midazolam (Versed) IV
Age 15 to 60: IV: 2.5 to 5 mg titrated to effect; administer slowly in increments of no more than 2.5 mg over at least 2 min; total dose no more than 20mg.

Or
Midazolam (Versed) Intranasal:
0.2-0.3 mg/kg to a max of 10 mg. May repeat once, if needed. Must use 5mg/ml concentration.

Or
**Diazepam (Valium) IV
IV: 5 -10 mg in 2 mg increments no faster than 2 mg/min.

Notes:
1. Females in their third trimester of pregnancy that are seizing should be assumed to have eclampsia. If the patient is an eclamptic female, place patient in left lateral recumbent position, minimize external stimuli, and administer Magnesium Sulfate 4-6 G IV bolus over 10-15 min (Add 4 G to 100 mL D5W, LR, or NS. Resulting concentration is 40 mg/mL).
2. ** Use 1st Choice medication, unless unavailable. Benzodiazepine administration applies to seizures that last > 5 minutes, more than two seizures in one hour, or status epilepticus. IV Benzodiazepine administration has been associated with respiratory depression and respiratory arrest. For IM administration, inject deep into large muscle mass. Valium should only be used if Ativan and Versed are unavailable. If given IV and age > 60: Reduce dose by half.

*Consider underlying causes such as stroke, eclampsia, or drug use. Use appropriate algorithm.

Document history:
• Type of seizure?
• Witnessed by crew?
• First seizure?
• History of seizures?
• Fever?
• Length of seizure?
• Usual mental status?

Establish vascular access.

Courtesy notification to receiving facility

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**Stroke**

**Adult (≥ 15 y/o)**

**Initial medical care**
- Place patient on O2, as appropriate.
- Obtain blood glucose

**Establish vascular access and obtain FAST score**
- Facial droop (1); Arm Drift (1); Speech (1); Time (time of symptom onset less than 4 hours)
- (or longer time period as specified by Primary Stroke Center)

**Positive FAST Score of 2, (One of which must be time)**
- Yes
  - Call “Stroke Alert” in report to receiving facility and transfer to closest appropriate facility
- No
  - CN and transfer to closest appropriate facility

---

**Plan:** During patient assessment, EMS providers will give pre-notification of acute stroke patients that may be candidates for acute intervention. When the paramedic identifies such a patient, he/she will provide telemetry notification that they are in transit with a “Stroke Alert” patient and give an estimated time of arrival.

EMS providers will document the patient’s FAST Score (Face asymmetry, Arm drift, Speech deficit, Time onset) along with standard Vital Signs, Blood Sugar and if another center was bypassed to go to a primary stroke center.

**Action:** At the beginning of the courtesy notification, the paramedic will clearly state that they have a “Stroke Alert” patient. The base hospital will advise what facility to transport the patient to. This same term will be used to notify the in-hospital stroke team and ancillary services.

**Candidates for Stroke Alert:** Any patient with acute onset of focal neurological deficit(s) such as facial asymmetry, arm drift, or slurred speech, known to have had an onset within 4 hours (or longer time period as specified by Primary Stroke Center).

**Non-candidates for Stroke Alert:** Patients with complaint exclusively of generalized weakness, dizziness, syncope, loss of consciousness/coma, a fall, seizure, headache, head trauma/injury, neurological complaints of greater than 4 hours duration as determined from last time patient known to be without deficit.

**Additional Treatment:** Do not treat hypertension in patients suspected of having acute stroke unless directed to do so via online medical direction.

**For Pediatric Patients (≤ 14 years old) exhibiting signs/symptoms of a Stroke, contact medical direction for destinations orders.**
Poisoning/Overdose
Adult (≥ 15 y/o)

Initial medical care (including ECG monitoring)

Establish vascular access

Inspect the scene.
Collect containers for transport to receiving facility.
Contact Poison Control (602-253-3334) for advice, if needed.
Treatment orders must be obtained from on-line medical direction.

If patient has a suspected tricyclic antidepressant (TCA) overdose, consider Sodium Bicarbonate. If the patient is symptomatic and/or has abnormal ECG changes, obtain Online Medical Direction and request orders for Sodium Bicarbonate:
50-100 mEq IV.

Courtesy notification to receiving facility

Document:
- Type of ingestion (What, when, how much.) Bring the substance ingested including packaging/pills to receiving center.
- Past history (medications, suicide attempts)
- Action taken by bystanders (induced emesis? "Antidote" given?)
Acute Dystonic Reaction
Adult (≥ 15 y/o)

Initial medical care

Establish vascular access

Administer Diphenhydramine 50 mg IV/IM

Do the symptoms resolve?

Yes

No

Courtesy notification to receiving facility

Contact Medical Control

Dystonia is a neurological movement disorder characterized by involuntary muscle contractions, which force certain parts of the body into abnormal, sometimes painful, movements or postures. Dystonia can affect any part of the body including the arms and legs, trunk, neck, eyelids, face, or vocal cords.

Signs and symptoms of a dystonic reaction may include protruding or pulling sensation of the tongue; twisted neck, or facial muscle spasm; roving or deviated gaze; abdominal rigidity and pain; and/or spasm of the entire body.

The following medications can cause dystonia (partial list):

- Acetophenazine (Tindal®)
- Amoxapine (Asendin®)
- Chlorpromazine (Thorazine®)
- Fluphenazine (Permitil®, Prolixin®)
- Haloperidol (Haldol®)
- Loxapine (Loxitane®, Daxolin®)
- Mesoridazine (Serentil®)
- Metaclopramide (Reglan®)
- Molindone (Lindone®, Moban®)
- Perphenazine (Trilafon® or Triavil®)
- Piperacetazine (Quide®)
- Prochlorperazine (Compazine®, Combid®)
- Promazine (Sparine®)
- Promethazine (Phenergan®)
- Thiethylperazine (Torecan®)
- Thioridazine (Mellaril®)
- Thiothixene (Navane®)
- Trifluoperazine (Stelazine®)
- Triflupromazine (Vesprin®)
- Trimeprazine (Temaril®)
Initial medical care

Establish vascular access. Administer boluses 10-20 cc/kg of NS or LR as long as lungs remain clear and systolic BP < 90. Use caution if patient has a end stage renal disease or CHF.

If pulse is >160 bpm, refer to appropriate off-line. If pulse is <60 bpm, refer to appropriate off-line. Check blood glucose - if < 60 mg/dL, refer to appropriate algorithm

Consider **Dopamine** IV infusion: 2 to 10 mcg/kg/min

Courtesy notification to closest appropriate facility

All patients with a syncopal episode or near-syncope should be transported to the hospital via ambulance. Refusal requires on-line medical direction (high-risk).
Sepsis Alert
The purpose of a sepsis alert is to provide pre-arrival Emergency Department notification in order to facilitate rapid assessment and ongoing treatment of a patient with suspected severe sepsis. These cases must be recognized early and treated aggressively to prevent progression to shock and death.

Your patient meets SEPSIS CRITERIA if conditions 1 + 2 are present.
Your patient meets SEVERE SEPSIS CRITERIA if conditions 1 + 2 + 3 are present.

A sepsis alert will be activated en route to the receiving facility for either of the above scenarios. A hospital’s specific response to sepsis alerts will vary depending on resources and internal protocols.
Pain Management
Adult (≥ 15 y/o)

Initial medical care

Establish vascular access

Is the systolic BP >90?

Yes

Constant monitoring of ABCs and vital signs (including pulse oximetry) is required

**Morphine** for analgesia
IV: 2-5 mg increments IV until pain relieved up to 20 mg.

**Fentanyl**
IV: 1 mcg/kg given in incremental doses of 25-50 mcg, may repeat every 5 minutes, as needed to max of 200 mcg total.

Intranasal: 1-2 mcg/kg given in incremental doses 25-50mcg to a max of 200 mcg.

Assess pain and document pain score before and after repeat medication administration.

Courtesly notification to receiving facility

No

Proceed with appropriate algorithm

Before administering meds for pain, ask the patient to quantify their pain on a 1 to 10 scale. Document this information and use it as a guide to measure the effectiveness of analgesia.

Age > 60: Reduce dose by half

**IV route offers better means for titration of med. Absorption via IM route may be unpredictable and should be used as a last resort – use only if no vascular access. Documentation must reflect rationale for IM route, if used.**
Sedation
Adult (≥ 15 y/o)

Sedation should only be administered when indicated in specific off-line.

Sedation

Lorazepam (Ativan)
IV/IM: 2-4 mg. May repeat once in 10-15 minutes, if needed

Or Midazolam (Versed)
Age 15 to 60:
   IV: 1-5 mg titrated to effect; administer slowly in increments of no more than 2.5 mg
       over at least 2 min; total dose no more than 20 mg
   IM: 2-10 mg. Max of 10mg every 10 minutes up to total dose of 20 mg
   Intranasal: 0.2-0.3 mg/kg to a max of 10mg. May repeat once if needed. Must use 5mg/ml
       concentration

Or Diazepam (Valium)
IV: 5 -10 mg in 2 mg increments no faster than 2 mg/min

Or Ketamine

Use of Ketamine is an optional sedation medication for extreme cases of agitation / excited
       delirium and requires special training and agency approval.

Ketamine
IV: 1 mg/kg. Max single dose of 150 mg. May re-medicate every 5 minutes.
IM: 2 mg/kg. Max single dose of 250 mg. May re-medicate every 10 minutes.

Special Considerations

- Age > 60: Reduce dose by half
- If other CNS depressants, including alcohol and benzodiazepines, are on board, decrease dose
- Sedation has been associated with respiratory depression and respiratory arrest. Monitor
  patient closely with cardiac monitor, SPO2 and ETCO2, if available
Agitated/Combative/Excited Delirium Patient
Adult (≥ 15 y/o)

If a patient is violent and an immediate threat to the patient, EMS crew, or bystander safety exists, physical restraint may be used to prevent the patient from harming him or herself or others. If the patient is not violent, be alert for possible violence and avoid provoking the patient.

Note: Sedation medications have been associated with respiratory depression and respiratory arrest. Monitor patient closely.

Patient Assessment
1. An ALS provider must assess a patient that is restrained.
2. The patient must be under direct supervision at all times during treatment and transport.
3. The patient’s airway, breathing, and vital signs – including pulse oximetry – should be monitored closely at all times.
4. Circulation to the extremities shall be evaluated at least every 10 minutes when restraints are applied.

Type of Restraint - 1) Handcuffs may only be used as restraint devices when a law enforcement officer accompanies the patient to the hospital. A patient that is in police custody will require a handcuff key inside the ambulance during transport. The paramedic should have immediate access to keys needed to release handcuffs or other restraining devices. 2) Only non-locking leather or other ALS provider approved “soft” restraints may be applied and used by medical providers.

Patient Positioning – 1) Patients shall be positioned in a manner that does not compromise airway or breathing. 2) Restraints shall be placed in such a manner as to not preclude evaluation of the patient’s medical status or injure the patient in any way.

Documentation - If restraints are necessary, documentation must include:
• Reason restraint was required
• Type of restraint used
• Position of the patient during treatment and transport
• Status of circulation distal to restraints
• Patient status at the time of transfer of care
• Data indicating constant supervision of ABCs and vital signs, including pulse oximetry
• Total time the patient was restrained while in the care of ALS provider
**TASER Patients**

**Initial medical care**
Evaluation of ABCs and vital signs (including cardiac monitoring) is required.

**Is the patient an immediate threat to him/herself, the EMS crew, or bystanders?**

No

Apply physical restraints as necessary. If restraints used, the Valley Fire Agency ALS member is to accompany patient to receiving facility. Refer to the Violent/Combative Patient and/or Sedation Off-lines as needed.

Yes

Persons that have been stunned/stopped by means of an electro-muscular disruption weapon (i.e., TASER) must be evaluated by ALS and obtain On-line Medical Direction must occur for refusal. An ECG monitor strip must be evaluated and attached to the chart for any patient situation involving the use of a TASER. Obtain 12 Lead ECG, if able.

**Courtesy notification to receiving facility**

1. The TASER probes may be removed by EMS providers, unless they are in a high risk area. If the TASER probe is in a high risk area (face, neck, hand, bone, groin, or spinal column), where it may injure bone, nerves, blood vessels, or an eye, do not remove the probe. Transport the patient to the ED in an appropriate position.
2. The patient should be transported to the most appropriate hospital.
3. When safe to do so, patients should be immediately evaluated, with particular attention to signs and symptoms of excited delirium.
4. Any injuries or medical conditions should be treated, refer to the appropriate off-line as needed.
5. These patients will be in the custody of law enforcement and will require transportation to an ED for medical clearance.
6. Unless otherwise contraindicated, the patient should be adequately and safely restrained in an upright positions prior to transport.
7. For removal of the TASER probes:
   a. Verify the wires to the probe have been severed
   b. Use universal precautions
   c. Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site between two fingers. Keep your hand several inches away from the probe. With the other hand, in one fluid motion pull the probe straight out of the puncture site
   d. Place TASER probes in sharps container. If sharps container unavailable, reinsert TASER probes, point down, into the discharged air cartridge and hand it to the law enforcement officer.
   e. Apply direct pressure for bleeding, and apply a sterile dressing to the wound site.

Some signs and symptoms of extreme forms of behavioral disturbances may include: agitation, aggression, excitability, exertion, exhaustion, great strength, non-response to pain, fear, panic, paranoia, pre-existing medical problems, medication effects, and illicit drug use. Illegal drugs such as PCP, cocaine, methamphetamines and other stimulants are known to cause acute behavioral disturbances.
Fall Injury / Minor Injury / Lift Assist
Adult (≥ 18 y/o)

Assess the need for immediate spinal motion restriction. Refer to other off-lines as appropriate. Complete a patient encounter form.

1. Evaluate mental status
2. FAST assessment
3. Vital signs
4. Complete secondary – Assess movement and for any injury
5. Blood glucose
6. Orthostatic vital signs
7. Cardiac Monitor – if indicated

Determine cause of fall

• Syncope or near syncope
• Dizziness prior to fall
• Chest pain or difficulty breathing prior to fall
• Is patient normally ambulatory?
• Is this a mechanical fall? (i.e., did they trip, stumble, has a chronic balance issues, not using assistance device such as cane or walker, fall out of bed?)

Courtesy notification to receiving facility or contact on-line medical direction for high risk refusal.

Exclusion Criteria
A YES to any of the following requires on-line medical direction.
• Does the patient have a concurrent illness that caused the fall?
• Is the patient confused or lacking decision making capacity?
• Is there a history of recent falls? If patient lives independently, do they need additional intervention?
• Abnormal vital signs or positive orthostatic changes?
• Positive FAST score?
• Abnormal EKG - if being assessed by ALS provider?
• Abnormal blood glucose?
• Is patient on blood thinners? Compare to list. Aspirin alone does not require on-line medical direction.
• Secondary assessment reveals significant injury?

Risk assessment
• Assess patient’s residence for possible trip hazards and educate.
• Refusal (ensure pt understands potential risk.)
• If patient has POA, contact POA.
• Is patient safe to leave at home? Assure patient has responsible adult to stay with or check on patient. If someone is not at home with patient, contact friend/relative that is willing to check on patient.
Spinal Motion Restriction
Adult (≥ 15 y/o) Blunt Trauma

Low-risk Characteristics/Mechanisms
- Simple rear-end collision
- Ambulatory on scene at any time
- No neck pain on scene
- No midline cervical tenderness

THESE LOW-RISK FACTORS ALLOW SAFE OMISSION OF SMR IN PATIENTS WITH GCS = 15

High-risk Characteristics/Mechanisms
- Age > 65
- Trauma triage criteria based on mechanism (see Trauma Triage Step 3)
- Axial loads/diving injuries
- Sudden acceleration/deceleration, lateral bending forces to neck/torso
- Violent impact to head, neck, torso, pelvis
- Numbness, tingling, parasthesias IF ANY OF THE ABOVE, STRONGLY CONSIDER SMR

Potential mechanism for unstable spine injury?

Yes

Altered LOC (GCS < 15)? Unreliable interaction?

Any Yes

Possible spine injury
Apply SMR

Any Yes

Possible spine injury
Apply SMR

All No

Spinal pain/tenderness?
OR
Anatomic deformity of spine?
OR
Neurologic deficit or complaint? [eg: numbness, tingling, parasthesias]

All No

Omit SMR

Unreliable Patient Interactions
- Language barriers; inability to communicate
- Lack of cooperation during exam
- Evidence of drug/alcohol intoxication
- Painful distracting injury such as long-bone fracture

Spinal Motion Restriction (SMR)
Refer to SMR Procedures page for preferred packing methods and tools

Motor/Sensory Exam
- Wrist/hand extension bilaterally
- Foot plantarflexion bilaterally
- Foot dorsiflexion bilaterally
- Gross sensation in all extremities
- Check for parasthesias
Spinal Motion Restriction
Adult (≥ 15 y/o) Penetrating Trauma

FOCAL
Neurologic deficit or complaint

Omit SMR

No

Yes

Possible spine injury
Apply SMR

Notes
• Unstable spine fractures and spinal cord injury from penetrating head trauma are extremely rare
• Neuro deficits often present at moment of injury
• Life threatening conditions and evacuation from imminent threat take priority
• If history suggests combination penetrating AND blunt trauma, revert to Blunt Trauma
  SMR Algorithm
• Instructive information: Patients with global deficits do not require SMR

Spinal Motion Restriction (SMR)
• Refer to SMR Procedures page for preferred packing methods and tools
Initial medical care
Assess and treat the ABCDE’s
Do not delay transport to an appropriate emergency facility for procedures.
Complete as many procedures as possible enroute.
Establish vascular access. If fluid replacement is needed 20cc/kg, repeat as needed.
Immediate patients require two IV sites.

Is the patient in pain?

No

Constant monitoring of ABCs and vital signs (including pulse oximetry) is required
Please refer to Pain Management Off-line for medication and dosing.

Yes

Do triage or treatment intervention problems exist?

No

Contact Medical Control

Yes

Courtesy notification to receiving facility

Head Injury
If patient has head injury:
1. Elevate the head of the board approximately 30 degrees.
2. Ensure pt ventilations adequate at age appropriate rate. (Assist with BVM if necessary)
3. Signs of severe traumatic brain injury (TBI) include unconsciousness and/or unresponsiveness; GCS < 9; pupils that are unequal, non-reactive, and/or dilated; oxygen saturation < 90% (adult); and/or systolic blood pressure < 90 mm Hg (adult).
4. Signs of impending cerebral herniation include all symptoms of TBI plus unresponsiveness to painful stimuli; extensor posturing; and/or a decrease by 2 or more point in the GCS. Other signs include Cushing’s Triad: Bradycardia, hypertension, and irregular respirations.
Susception of a Traumatic Brain Injury (TBI) by mechanism, GCS, or Exam, then provide O2 15 L/min by NRB, establish IV access and monitor the patient’s O2, BP, and HR every 3-5 minutes.

**Airway/Breathing**
- O2 sat <90 &/or hypoventilation (despite NRB)

**Circulation**
- SBP <90 or other signs of shock

**Disability**
- Evaluate Mental Status/GCS

**O2 sat <90 &/or hypoventilation (despite NRB)**
- BLS airway maneuvers
- BVM 10/min
- Careful monitoring of O2 sat and airway
- If O2 sat <90, despite BLS consider ALS airway
- Maintain ETCO2 between 35-45 mmHg

**SBP <90 or other signs of shock**
- 1000 bolus of NS/LR
- Repeat 500 ml rapid boluses until SBP >90
- Continue careful monitoring BP/HR
- Pay attention for early signs of shock:
  - Tachycardia
  - Dropping SBP

**Evaluate Mental Status/GCS**
- Always evaluate for hypoglycemia.
  - It can mimic or cause a TBI.
  - Check blood glucose. If <70 mg/dl:
    - Dextrose per Hypoglycemia off-line IV/IO
    - Repeat BG @ 10 min. Repeat previous dose X 1 if still <70 mg/dl

**Consider impending herniation if:**
- Dilated and unresponsive pupils
- GCS <9 or rapid deterioration in GCS by >2 points
- Extensor posturing
- Asymmetric pupils (one or both non-reactive to light)
- Re-evaluate every 3-5 minutes

**If patient has signs of impending herniation.**
- Elevate head of gurney 30°

**DO NOT hyperventilate**
Apply Tourniquet for Primary Hemorrhage Control:
- Suspected life-threatening hemorrhage due to amputation or partial amputation
- Penetrating injuries proximal to the wrist/ankle with significant hemorrhage
- Potentially life-threatening hemorrhage as initial/primary treatment

Expose the bleeding site.
Apply the tourniquet as proximal as possible on the extremity.
Do NOT cross any joints with a tourniquet.
Tighten tourniquet until bleeding stops.
If distal pulse is still present, tighten tourniquet until pulse is not palpated.
The bigger the limb, the tighter the tourniquet will need to be to control bleeding.
Document time of application.

For non-life threatening hemorrhage or hemorrhage not amendable to tourniquet:
Apply direct manual pressure to bleeding site.
If continued bleeding, apply hemostatic gauze, if available.

If the first tourniquet is ineffective, a second tourniquet can be applied proximal to the first tourniquet.

Refer to Pain Management off-line, as needed.

Contraindications to tourniquet use:
• Non-extremity hemorrhage (i.e., scalp, neck, thorax, etc.).
• Proximal extremity location where tourniquet application is not practical (i.e., high groin).

Precautions:
• A tourniquet applied incorrectly can increase blood loss.
• Applying a tourniquet can potentially cause nerve and tissue damage EVEN if applied correctly. Use only on appropriate patients.
• Injury due to tourniquet is unlikely if tourniquet is removed within two hours. In cases of life-threatening hemorrhage, the benefits outweigh the theoretical risk. Tourniquets may be removed if they are inappropriately placed, unnecessary for the wound, or are potentially damaging improvised tourniquets applied by bystanders.
• Only a commercially-made, Medical Direction-approved tourniquet should be used.
Acute Coronary Syndrome / Chest Pain / Anginal Equivalents (non-traumatic) Adult (≥ 15 y/o)

Initial medical care and obtain 12 lead

Establish vascular access

**IV successful?**

No

If the patient is hypotensive (systolic < 90), give one fluid challenge of 250 mL (if lungs sounds clear)

Aspirin
2-4 baby aspirin (81 mg) by mouth if:
- No aspirin allergy
- Patient can chew and swallow

Nitroglycerin
0.4 mg sublingual tablets or spray
May be repeated 2 times, every 5 minutes, to relief of pain if systolic >90

Morphine
2-4 mg increments IV up to 10 mg if systolic BP >90 and chest pain unrelieved by nitroglycerin OR

Fentanyl
IV: 1 mcg/kg, incremental doses, titrate to effect, may repeat to max of 200 mcg total.
IM: 2 mcg/kg to a max of 200 mcg.
Intranasal: 2 mcg/kg to a max of 200 mcg.

Contact medical control if you believe the patient would benefit from NTG administration and no IV has been established.

Note presence of ST-segment elevation in 2 or more contiguous leads
- II, III, aVF – inferior wall
- I, aVL, V5, V6 – lateral wall
- V1, V2 – septum
- V3, V4 – anterior wall

Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular MI. In this situation, pacing and IV fluids may improve the patient’s hemodynamic status. May withhold MS or nitro if right ventricular MI is suspected.

Consider risk factors:
- Gender
- Race
- Age
- Obesity

Document pertinent risk factors:
- Hypertension
- Smoking
- Family history
- High cholesterol
- Diabetes
- Lifestyle/stress

Document use/nonuse of sexual enhancement drugs in past 48 hrs. obtain On-line Medical Direction if <48 hrs Levitra, Cialis, Viagra

Consider other treatment off-line where appropriate.

Leave a copy of the 12 lead ECG when transferring care
Symptomatic Bradycardia
Adult (≥ 15 y/o)

Initial Medical Care

Persistently bradycardia causing:
- Hypotension
- ALOC
- Shock
- Ischemic chest discomfort
- Acute heart failure.

Monitor and observe

If Atropine is ineffective:
- Initiate transcutaneous pacing. Do not delay pacing for IV access. Consider sedation if systolic >90. Refer to Sedation Off-line, as needed.
- **Dopamine** IV infusion: 2 to 10 mcg/kg/min
- **Epinephrine** IV infusion: 2-10 mcg/min

Establish vascular access and treat underlying causes

Atropine
IV: 0.5 mg every 3 to 5 min; max 3mg

Yes

No

Courtesy notification to closest appropriate facility

Establish vascular access and treat underlying causes

Atropine
IV: 0.5 mg every 3 to 5 min; max 3mg

If Atropine is ineffective:
- Initiate transcutaneous pacing. Do not delay pacing for IV access. Consider sedation if systolic >90. Refer to Sedation Off-line, as needed.
- **Dopamine** IV infusion: 2 to 10 mcg/kg/min
- **Epinephrine** IV infusion: 2-10 mcg/min

Courtesy notification to closest appropriate facility
Narrow Regular QRS Tachycardia
Adult (≥ 15 y/o)

Initial Medical Care

Establish vascular access

Persistent Narrow Regular QRS tachycardia and causing:
• Hypotension
• ALOC
• Shock
• Ischemic chest discomfort
• Acute heart failure.

No

If possible WPW rhythm and hemodynamically stable, give:
**Amiodarone**: IV: 150 mg over 10 minutes

• Vagal maneuvers
• **Adenosine** IV: 6 mg rapid push followed with 20-mL NS flush. Second dose: 12 mg rapid push followed with 20-mL NS flush, if needed.

If rhythm persists and systolic BP >90: Give
**Diltiazem**: 15-20mg
IV: 0.25 mg/kg IV over 2 minutes. Max 20mg per dose. Contact medical control for additional Diltiazem orders if rhythm persists.

OR
**Verapamil**: 2-2.5mg slow IV over 1-2 minutes.

Avoid Adenosine, Diltiazem, and Verapamil with possible WPW

Yes

Synchronized cardioversion
• Initial recommended doses:
  * Narrow Regular Tachycardia: 50-100J biphasic or 200J monophasic
  * Narrow Irregular Tachycardia: 120-150J biphasic or 200J monophasic
• Consider sedation. Refer to Sedation Off-line, as needed.
• Consider **Adenosine**

Courtesly notification to closest appropriate facility

• Narrow QRS = ≤ 0.10 sec

Updated August 12, 2015
Atrial Fibrillation / Atrial Flutter
Adult (≥ 15 y/o)

Initial Medical Care

Establish vascular access

Persistent Narrow irregular QRS tachycardia and causing:
- Hypotension
- ALOC
- Shock
- Ischemic chest discomfort
- Acute heart failure.

If rhythm persists and systolic BP >90: Give Diltiazem:
15 - 20mg IV: 0.25 mg/kg IV over 2 minutes.
Max 20mg per dose. Contact medical control for additional Diltiazem orders if rhythm persists.

OR
Verapamil: 2 - 2.5mg slow IV over 1-2 minutes.

Avoid Adenosine, Diltiazem, and Verapamil with possible WPW

Synchronized cardioversion
- Initial recommended doses:
  * Narrow Regular Tachycardia: 50-100J biphasic or 200J monophasic
  * Narrow Irregular Tachycardia120-150J biphasic or 200J monophasic
- Consider sedation. Refer to Sedation Off-line, as needed.

If possible WPW rhythm and hemodynamically stable, give:
Amiodarone: IV: 150 mg over 10 minutes

No

Yes

Courtesy notification to closest appropriate facility

Courtesy notification to closest appropriate facility
Wide Complex Tachycardia
Adult (≥ 15 y/o)

Initial Medical Care
Establish vascular access

Persistent Wide Complex QRS tachycardia and causing:
- Hypotension
- ALOC
- Shock
- Ischemic chest discomfort
- Acute heart failure.

Is the rhythm regular and monomorphic?

No
Magnesium Sulfate: IV: 2 grams over 10 min.

Yes
Consider Adenosine IV: 6 mg rapid push followed with 20-mL NS flush. 2nd Dose: 12 mg rapid push followed with 20-mL NS flush, if needed.
If Adenosine is ineffective or pt has suspected Vtach, then amiodarone or lidocaine may be given first.
- Amiodarone IV: 150 mg over 10 min.
OR
- Lidocaine IV: 1 to 1.5 mg/kg. May repeat with ½ initial dose every 5-10 minutes (max. 3 mg/kg). If rhythm converts, initiate Lidocaine infusion at 1-4 mg/min unless rate is< 100 or QRS complex wide. Administer ½ usual maintenance infusion if age > 70, or if known liver disease.

Yes

Initial recommended doses:
* Wide Regular: 100J synchronized
* Wide Irregular: defibrillation dose (not synchronized)
Consider sedation. Refer to Sedation Off-line, as needed.

Courtesy notification to closest appropriate facility
Adult Cardiac Arrest

CPR Quality
- Push hard (≥ 2 inches) and fast (≥ 100/minute) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography. If <10, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in ETCO2 (typically >40)

Shock Energy
- Biphasic: Manufacturer recommendation (120-200 J); If unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360J

Drug Therapy
- Epinephrine IV/IO Dose: 1 mg (1:10,000) every 3-5 minutes
- Amiodarone IV/IO Dose: First dose 300 mg bolus. Second dose 150 mg bolus. If Amiodarone is unavailable, Lidocaine IV/IO Dose: 1-1.5 mg/kg, repeat 1/2 initial dose (0.5-0.75 mg/kg). Max 3 mg/kg

Advanced Airway
- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- Once advanced airway is in place, give 1 breath every 6 seconds, with continuous compressions.

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
Post-Arrest Stabilization

Adult (≥ 15 y/o)

---

**OUT-OF-HOSPITAL CARDIAC ARREST**

- Assess Airway and Ventilations
- Re-Confirm ETT
- Maintain ETCO2 @ 35-45 with oxygen, as appropriate.

- Assess Pulse and Rhythm:
  - Consider antiarrythmic drip therapy and assess BP

- **Is the patient hypotensive?**
  - **Yes**
    - Fluid Bolus 10-20 cc/kg NS or LR
    - Monitor Response
    - Reassess V/S: What is BP? Still Hypotensive?
    - Consider
      - Further Fluid Bolus
      - **Dopamine** Infusion (2-10 mcg/kg/min)
      - **Epinephrine** Infusion (2-10 mcg/min)
    - Infusions titrated to desired effects
    - V/S Improve: BP @90-100mm systolic
    - Assess Glucose Level: Below 60
      - Administer **Dextrose**:
        - 12.5 - 25 gms IV/IO
        - 125-250 mL IV/IO
    - Seizure Control:
      - Refer to seizure off-line
    - Consider cooling measures
      - Consider ongoing sedation. Refer to Sedation Off-line, as needed.
    - Courtesy notification to closest appropriate facility
  - **No**

- **Assess Glucose Level: Below 60**
  - Administer **Dextrose**:
    - 12.5 - 25 gms IV/IO
    - 125-250 mL IV/IO
  - Seizure Control:
    - Refer to seizure off-line
  - Consider cooling measures
    - Consider ongoing sedation. Refer to Sedation Off-line, as needed.
  - Transport to a CRC when feasible, resources available, and will add less than 15 minutes to transport time compared to transport to non-CRC.
  - Courtesy notification to closest appropriate facility

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Updated Nov. 11, 2015
Pediatric Algorithms

Pediatric Assessment Triangle

Appearance
- Tone
- Interactiveness
- Consolability
- Look/gaze
- Speech/cry

Work of Breathing
- Abnormal airway sounds
- Abnormal positioning
- Retractions
- Flaring

Circulation
- Pallor
- Mottling
- Cyanosis
# Neonatal Resuscitation

<table>
<thead>
<tr>
<th>All situations:</th>
<th>Stable Newborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consider immediate transport</td>
<td>• Respirations are adequate, heart rate &gt; 100/min, central color pink</td>
</tr>
<tr>
<td>• Assess and support the following:</td>
<td>• Continue assessment</td>
</tr>
<tr>
<td>– Temperature (dry and warm)</td>
<td>• Observe, monitor vital signs, support, and transport</td>
</tr>
<tr>
<td>– Airway (position and suction)</td>
<td>• Courtesy notification to receiving facility</td>
</tr>
<tr>
<td>– Breathing (stimulate to cry)</td>
<td></td>
</tr>
<tr>
<td>– Circulation (heart rate and color)</td>
<td></td>
</tr>
<tr>
<td>• What is the respiratory status and heart rate?</td>
<td></td>
</tr>
</tbody>
</table>

## Unstable Newborn

<table>
<thead>
<tr>
<th>Inadequate respirations, HR &gt; 100/min, persistent cyanosis</th>
<th>• Administer blowby oxygen via oxygen tubing OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ventilate with 100% O2 via bag-valve-mask at a rate of 40-60/min</td>
</tr>
<tr>
<td></td>
<td>• Reassess heart rate and respiratory rate every 30 sec en route</td>
</tr>
<tr>
<td></td>
<td>• Courtesy notification to receiving facility</td>
</tr>
<tr>
<td>Apnea, gasping, HR 60-100, or central cyanosis</td>
<td>• Administer 100% oxygen</td>
</tr>
<tr>
<td></td>
<td>• Ventilate with bag-valve-mask at a rate of 40-60/min</td>
</tr>
<tr>
<td></td>
<td>• Reassess heart rate and respiratory rate every 30 sec en route</td>
</tr>
<tr>
<td></td>
<td>• Courtesy notification to receiving facility</td>
</tr>
<tr>
<td>HR &lt; 60 bpm (pulse present)</td>
<td>• Assist ventilations with 100% O2 at a rate of 40-60/min</td>
</tr>
<tr>
<td></td>
<td>• If no improvement after 30 sec of ventilation with 100% O2, begin chest compressions at 120/min, (3 compressions:1 breath every 2 sec)</td>
</tr>
<tr>
<td></td>
<td>• If no improvement in 30 seconds, intubate</td>
</tr>
<tr>
<td></td>
<td>• Establish vascular access</td>
</tr>
<tr>
<td></td>
<td>• Give Epinephrine 1:10,000 0.01-0.03 mg/kg IV/IO/ET q 3-5 min</td>
</tr>
<tr>
<td></td>
<td>• Reassess heart rate and respiratory rate every 30 sec en route</td>
</tr>
<tr>
<td></td>
<td>• Courtesy notification to receiving facility</td>
</tr>
<tr>
<td>HR &gt; 60 bpm with signs of cardiopulmonary compromise</td>
<td>• Consider immediate transport</td>
</tr>
<tr>
<td></td>
<td>• Assist ventilations with 100% O2 at a rate of 40-60/min</td>
</tr>
<tr>
<td></td>
<td>• Establish vascular access. Administer 10 mL/kg NS over 5-10 min and reassess.</td>
</tr>
<tr>
<td></td>
<td>• Check blood glucose. If &lt; 40 mg/dL, administer 0.5-1 g/kg of D10 over 20 min.</td>
</tr>
<tr>
<td></td>
<td>• Reassess heart rate and respiratory rate every 30 sec en route</td>
</tr>
<tr>
<td></td>
<td>• Courtesy notification to receiving facility</td>
</tr>
<tr>
<td>HR &gt; 60 bpm and increasing, signs and symptoms of cardiopulmonary compromise resolved</td>
<td>• Immediate transport</td>
</tr>
<tr>
<td></td>
<td>• Observe</td>
</tr>
<tr>
<td></td>
<td>• Monitor vital signs</td>
</tr>
<tr>
<td></td>
<td>• Support en route to hospital</td>
</tr>
<tr>
<td></td>
<td>• Courtesy notification to receiving facility</td>
</tr>
</tbody>
</table>

Stable Newborn

- Respirations are adequate, heart rate > 100/min, central color pink
- Continue assessment
- Observe, monitor vital signs, support, and transport
- Courtesy notification to receiving facility
Neonatal Resuscitation

Administer O₂ as needed.

Apnea / gasping, HR < 100, or central cyanosis

Ventilate with BVM @ 40-60/min

HR < 60 after 30 BVM

Chest Compressions @ 120/min - Thumbs encircle chest
3:1 ratio

HR < 60

Intubate and Suction

Epinephrine 0.01-0.03mg/kg
IV/IO/ET q 3-5 min

Check Glucose – treat if < 40

Fluid bolus 10 mL/kg
X 1

Courtesy notification to receiving facility

APGAR SCORE

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (Skin color)</td>
<td>Blue</td>
<td>Body pink</td>
<td>Completely pink</td>
</tr>
<tr>
<td></td>
<td>Pale</td>
<td>Blue extremities</td>
<td></td>
</tr>
<tr>
<td>Pulse rate</td>
<td>Absent</td>
<td>&lt;100/minute</td>
<td>&gt;100/minute</td>
</tr>
<tr>
<td>Grimace</td>
<td>No response (Irritability)</td>
<td>Grimace</td>
<td>Cough, sneeze, cry</td>
</tr>
<tr>
<td>Activity (Muscle tone)</td>
<td>Limp</td>
<td>Some flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respirations (Respiratory effort)</td>
<td>Absent</td>
<td>Slow Irregular</td>
<td>Good crying</td>
</tr>
</tbody>
</table>
## Pediatric Intubation & Vital Signs

### PEDIATRIC INTUBATION AND VITAL SIGNS GUIDELINES

<table>
<thead>
<tr>
<th>AGE (YR)</th>
<th>WEIGHT (KG)</th>
<th>Lower Limit of Normal Systolic Blood Pressure</th>
<th>RESP</th>
<th>PULSE</th>
<th>ETT SIZE (mm)</th>
<th>ETT DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preemie</td>
<td>1</td>
<td>MAP = gestational age</td>
<td>30-50</td>
<td>100-180</td>
<td>2.5-3.0</td>
<td>7 cm</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>MAP = gestational age</td>
<td>30-50</td>
<td>100-180</td>
<td>2.5-3.0</td>
<td>8 cm</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>MAP = gestational age</td>
<td>30-50</td>
<td>100-180</td>
<td>2.5-3.0</td>
<td>9 cm</td>
</tr>
<tr>
<td>Newly born</td>
<td>3.3-4</td>
<td>&gt;60</td>
<td>30-40</td>
<td>100-180</td>
<td>3.5</td>
<td>10 cm</td>
</tr>
<tr>
<td>&lt;1</td>
<td>5-8</td>
<td>&gt;70</td>
<td>30-40</td>
<td>100-180</td>
<td>4.0</td>
<td>10 cm</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>&gt;72</td>
<td>30-40</td>
<td>100-180</td>
<td>4.0</td>
<td>11 cm</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>&gt;74</td>
<td>25-32</td>
<td>100-180</td>
<td>4.5</td>
<td>12 cm</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>&gt;76</td>
<td>25-32</td>
<td>100-180</td>
<td>4.5</td>
<td>13 cm</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>&gt;78</td>
<td>22-28</td>
<td>60-150</td>
<td>5.0</td>
<td>14 cm</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>&gt;80</td>
<td>22-28</td>
<td>60-150</td>
<td>5.0</td>
<td>15 cm</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>&gt;82</td>
<td>22-28</td>
<td>60-150</td>
<td>5.5</td>
<td>16 cm</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>&gt;84</td>
<td>22-28</td>
<td>60-150</td>
<td>5.5</td>
<td>17 cm</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>&gt;86</td>
<td>22-28</td>
<td>60-150</td>
<td>6.0</td>
<td>18 cm</td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>&gt;88</td>
<td>22-28</td>
<td>60-150</td>
<td>6.0</td>
<td>19 cm</td>
</tr>
<tr>
<td>10</td>
<td>28</td>
<td>&gt;90</td>
<td>20-24</td>
<td>50-100</td>
<td>6.5</td>
<td>20 cm</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>&gt;90</td>
<td>20-24</td>
<td>50-100</td>
<td>6.5</td>
<td>21 cm</td>
</tr>
</tbody>
</table>

Formulas for weight, BP, ETT size, and ETT depth for ≥ 1 yr

- Weight (kg) = 8 + (2 x years)
- ETT size = 16 + years / 4
- BP = (2 x years) + 70 = minimum systolic
- ETT depth = 10 + years = cm at lips

### Probable sinus tachycardia
- Compatible history consistent with known causes.
- P waves present/normal
- Variable R-R; consistent PR
- Infants: rate usually <220/min
- Children: rate usually <180/min

### Probable SVT
- 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

Updated November 9, 2016
Nausea / Vomiting
Pediatric (≤14 y/o)

Initial Medical Care

Establish vascular access

Administer Ondansetron
<40 kg 0.1 mg/kg, IV slow over 2-5 minutes or IM
>40 kg 4 mg IV slow over 2-5 minutes or IM

May give Ondansetron
Oral Dissolving Tablet or give PO
<40 kg 0.1 mg/kg
>40 kg 4 mg

PO dose may be given by breaking ODT tablet or giving IV solution PO

Courtesy notification to receiving facility
Allergic Reaction/Anaphylaxis
Pediatric (≤14 y/o)

Initial medical care

Establish vascular access to maintain age/weight appropriate BP. Do not delay treatment while establishing vascular access.

Anaphylaxis
- Shock, “looks sick”
- Severe facial angioedema
- Severe respiratory distress
- Drooling

Epinephrine
IM: 0.01 mg/kg (0.01 mL/kg) (1:1,000 solution) – max 0.5 mg (0.5 mL) per dose

Diphenhydramine (Benadryl)
IV/IO/IM: 1.0 mg/kg (max dose 50 mg)

Methylprednisolone (Solu-Medrol)
IV/IM: 2 mg/kg (max 125 mg)

Consider Albuterol (Proventil)
SVN: 2.5 mg in 3.0 mL NS for respiratory distress; repeat as needed

Acute Allergic Reaction
Rash, mild swelling

Diphenhydramine (Benadryl)
IVIM: 1.0 mg/kg (max dose 50 mg)

Methylprednisolone (Solu-Medrol)
IV/IM: 2 mg/kg (max 125 mg)

Consider Albuterol (Proventil)
SVN: 2.5 mg in 3.0 mL NS for respiratory distress; repeat as needed

If severe respiratory distress, refer to anaphylaxis treatment.

Mild Distress:
- Itching, isolated urticaria, nausea, no respiratory distress

Severe Distress:
- Stridor, bronchospasm, severe abdominal pain, sudden unexplained cardiovascular collapse in a previously normal patient, respiratory distress, tachycardia, shock, generalized urticaria, edema of lips, tongue or face (angioedema)

Courtesy notification to receiving facility
Respiratory Distress
Pediatric (≤14 y/o)

Initial medical care

Stridor

Epinephrine
Give SVN epinephrine 1:1,000 2.5 -5.0 mg
diluted in 3 mL NS
=/< 4 y/o deliver 2.5 mg
diluted in 3cc of NS
=> 5 y/o deliver 5.0 mg
diluted in 3cc of NS

Wheeze Bronchospasm

Albuterol (Proventil)
SVN: Give SVN 2.5 mg in 3.0 mL NS.
Repeat as needed, based on assessment.

Ipratropium bromide
(Atrovent)
SVN: May use Atrovent 500 mcg instead of NS with
Albuterol. Max of 3 doses.

Respiratory Arrest
or Failure

Establish vascular access

Treat underlying cause

Treat respiratory distress/arrest as needed

Magnesium Sulfate IV:
25-50 mg/kg in 50 ml of N/S over 20 minutes

Methylprednisolone
(Solu-Medrol)
2 mg/kg IV or IM. Max of 125mg.

If patient is unstable, consider use of
Epinephrine IM: 0.01 mg/kg (0.01 mL/kg)
(1:1,000 solution) – max 0.5 mg
(0.5 mL) per dose

Courtesy notification to receiving facility
Altered Neurological Function (Non-trauma) Pediatric (≤14 y/o)

Initial medical care

Establish vascular access

Check blood glucose
Is level < 50 mg/dL?
(< 40 mg/dL for neonate)

Consider Naloxone
IV/IO/IM/IN/ SC/ET: 0.1 mg/kg (includes neonate); max 2.0 mg per dose

Contact medical control if:
• Repeat dose of Naloxone needed
• Naloxone unavailable (use of Nalmefene in a child requires a obtain On-line Medical Direction)

 Courtesy notification to receiving facility

Refer to Hypoglycemia Off-line
Hypoglycemia
Pediatric (Patients < 15 y/o)

This protocol is used for patients with hypoglycemia. Consider history and refer to appropriate guidelines as necessary (seizures, altered mental status, tachycardia)

**Initial medical care**

Establish vascular access

Check blood glucose. Is level < 60 mg/dL?

- **Yes**
  - If the patient is awake, alert, and has a patent airway, 0.5-1 gm/kg of oral glucose may be given.

  **Dextrose 0.5 gm/kg IV**

  - (If no IV, Administer glucagon: 1 mg/kg IM/IN if > 20 kg or > 5 yo)
  - 0.5 mg IM/IN if < 20 kg or < 5 yo

- **No**
  - Refer to appropriate off-line

Recheck blood glucose.

On line medical direction is required for high risk refusal.

High risk patients for recurrent hypoglycemia:
- Use of long-acting insulin agents (Lantus, Levemir, NPH)
- Complicating factors (seizure, concern for intentional overdose, fever, other medical complaints)
- Use of oral diabetic medications, specifically sulfonylureas (glipizide, glyburide, glipotrol, diabeta, glimepiride, amaryl, diabinese, tolocrine, micronase, orinase, tol-tab, glyceron, duatact, glinasel prestab, glucovance, avandaryl, chlorptopamide, metaglip, tolbutamide, tolazamide etc.)

If patient is refusing transport, remain on-scene to ensure that patient eats. Do not release patient unless blood sugar > 80.

*Dextrose 10% = 4:1 dilution of dextrose 50%*

To prepare D10: Use a 250 mL IV bag of normal saline. Waste 50 mL and add 50 mL of dextrose 50%. The resulting solution is dextrose 10% in normal saline or 1 g/ 10 mL.
Brief Resolved Unexplained Event (BRUE) / Apparent Life-Threatening Event (ALTE) Pediatric (≤2 y/o)

Initial medical care. Perform a comprehensive physical exam that includes the general appearance of the child, skin color, extent of interaction with environment, and evidence of trauma.

Consider vascular access

Check blood glucose. Is level < 50 mg/dL? (< 40 mg/dL for neonate). Refer to other off-lines if appropriate.

Treat any identifiable causes

Courtesy notification to receiving facility. These patients should be transported or contact on-line medical direction for high-risk refusal.

DEFINITION:
1. A Brief Resolved Unexplained Event (BRUE) was formally known as Apparent Life-Threatening Event (ALTE) or as a “near-miss SIDS” episode.
2. A BRUE is an episode that is frightening to the observer (may think the infant has died) and involves some combination of:
   a. Cyanosis or pallor (Color change including: erythema, plethora)
   b. Absent, decreased, or irregular breathing (apnea: central or obstructive, including choking or gagging)
   c. Marked change in muscle tone (hyper or hypotonia)
   d. Altered level of responsiveness
3. Usually occurs in infants < 12 months old, however, any child less than 2 years old who exhibits the symptoms above may be considered a BRUE.
4. Most have a normal physical exam when assessed by responding field personnel
5. 50–60% have no known etiology
6. 40–50% have an identifiable etiology (e.g. child abuse, SIDS, swallowing dysfunction, infection, bronchiolitis, seizures, CNS anomalies, tumors, cardiac disease, chronic respiratory disease, upper airway obstruction, metabolic disorders, or anemia)

DOCUMENTATION
1. Assume the description of the symptoms is accurate
2. Determine the severity, nature and duration of the episode was the patient awake or asleep at the time of the episode details of the resuscitation required
3. Obtain a medical history
   a. known chronic diseases
   b. evidence of seizure activity
   c. current or recent infections
   d. gastroesophageal reflux
   e. recent trauma or suspected non-accidental trauma
   f. inappropriate mixture of formula
   g. medication history (current and recent)
Seizures
Pediatric (≤14 y/o)

Initial medical care

Consider causes
If blood glucose level < 50 mg/dL, refer to altered neurological off-line.

Has vascular access been obtained?

Yes

Lorazepam (Ativan) IV
1st Choice
≤ 12 kg: administer 0.05-0.1 mg/kg IV over 2-5 minutes (maximum 4mg). May repeat in 10-15 minutes .
= 13-40 kg: administer 2 mg IV. May repeat once in 10-15 minutes, if needed.
≥ 40 kg: administer 4 mg IV. May repeat once in 10-15 minutes, if needed

Or
Midazolam (Versed) IV
IV: 0.05 to 0.1 mg/kg slow

Or
Midazolam (Versed) Intranasal
Intranasal: 0.2-0.3 mg/kg. Max 10mg. May repeat once if needed. Must use 5mg/ml concentration.

Or
Lorazepam (Ativan) IM
IM: 0.05-0.1 mg/kg over 2-5 minutes (maximum 4mg). May repeat in 10-15 minutes.

Establish vascular access

Document history:
• Type of seizure?
• Witnessed by crew?
• First seizure?
• History of seizures?
• Fever?
• Length of seizure?
• Usual mental status?

No

Establish vascular access

Lorazepam (Ativan) IM
1st Choice
≤ 12 kg: administer 0.2 mg/kg IM . May repeat once in 10-15 minutes, if needed.
= 13-40 kg: administer 5 mg IM. May repeat once in 10-15 minutes, if needed.
≥ 40 kg: administer 10 mg IM. May repeat once in 10-15 minutes, if needed

Or
Midazolam (Versed) IM
1st Choice
≤ 12 kg: administer 0.2 mg/kg IM . May repeat once in 10-15 minutes, if needed.
= 13-40 kg: administer 5 mg IM. May repeat once in 10-15 minutes, if needed.
≥ 40 kg: administer 10 mg IM. May repeat once in 10-15 minutes, if needed

Or
Midazolam (Versed) Intranasal
Intranasal: 0.2-0.3 mg/kg. Max 10mg. May repeat once if needed. Must use 5mg/ml concentration.

Or
Diazepam (Valium)
IV: 0.2-0.3 mg/kg every 15-30 minutes max of 1 mg/kg not to exceed 10 mg per dose; administer IV over at least 3 minutes or until seizure activity subsides.

IO: Consider IO if seizure activity lasts longer than 30 min

Note: Use 1st choice medication, unless unavailable. Benzodiazepines administration applies to seizures that last > 5 minutes, more than two seizures in one hour, or status epilepticus. Febrile seizures typically occur in children between 6 months and 6 years of age. Febrile seizures are usually of short duration (lasting less than 15 minutes) and usually do not require anti-seizeur medication therapy. Valium should only be used if Ativan or Versed are unavailable.
Poisoning/Overdose
Pediatric (≤14 y/o)

Initial medical care (including ECG monitoring)

Establish vascular access

Inspect the scene.
Collect containers for transport to receiving facility.
Contact Poison Control (602-253-3334) for advice, if needed. Treatment orders must be obtained from medical direction physician.

Activated Charcoal should only be given within the first hour of ingestion. If the patient is awake, alert, and has not ingested a caustic substance, contact medical control and request orders for Activated Charcoal.

Activated Charcoal: 1 g/kg orally, not to exceed 50 g. If the patient will not drink voluntarily, do not force.

If patient has an altered mental status, do NOT administer charcoal. Follow altered neuro algorithm.

Document:
- Type of ingestion (What, when, how much)
- Past history (medications, suicide attempts)
- Action taken by bystanders (induced emesis? “Antidote” given?)

Notes regarding charcoal:
- Contraindications: Ingestion of caustics, ingestion of hydrocarbons (relative), oral administration to comatose patient, simultaneous administration of other oral medications.
- Ineffective for iron, lithium, heavy metals, and other ions.
- May reduce the effectiveness of other treatments (Mucomyst) in pure acetaminophen OD’s.
- Since charcoal bonds with whatever it is mixed with, flavoring with drinks reduces effectiveness.
- Try to bring in info on substance ingested including packaging/pills to receiving center.
Shock/Hypotension
Pediatric (≤14 y/o)

**Initial medical care**

Establish vascular access; bolus with 20 mL/kg if lungs are clear. May repeat x 2, as needed, to maintain BP appropriate for age (or per Broselow tape). Use caution if patient has end stage renal disease or CHF.

Check blood glucose - if < 50 mg/dL, refer to appropriate algorithm.

**Courtesy notification to closest appropriate facility**

### Age Lower Limit of Normal Systolic Blood Pressure

<table>
<thead>
<tr>
<th>Age</th>
<th>Lower Limit of Normal Systolic Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term neonate (0 to 28 days)</td>
<td>&gt;60 mm Hg or strong central pulse</td>
</tr>
<tr>
<td>Infant (1 to 12 months)</td>
<td>&gt;70 mm Hg or strong central pulse</td>
</tr>
<tr>
<td>Child 1 to 10 years</td>
<td>&gt;70 + (2 x age in years)</td>
</tr>
<tr>
<td>Child ≥ 10 years</td>
<td>&gt;90 mm Hg</td>
</tr>
</tbody>
</table>
Sepsis Alert
The purpose of a sepsis alert is to provide pre-arrival Emergency Department notification in order to facilitate rapid assessment and ongoing treatment of a patient with suspected severe sepsis. These cases must be recognized early and treated aggressively to prevent progression to shock and death.

Your patient meets SEPSIS CRITERIA if conditions 1 + 2 are present.
Your patient meets SEVERE SEPSIS CRITERIA if conditions 1 + 2 + 3 are present.

A sepsis alert will be activated en route to the receiving facility for either of the above scenarios. A hospital’s specific response to sepsis alerts will vary depending on resources and internal protocols.

Initial Medical Care
 Obtain focused history and perform assessment

Suspected Infection
• Temperature abnormality on assessment or within 4 hours of assessment
• Open wounds, sores, cellulitis
• UTI
• Pneumonia
• Meningitis

High-Risk Criteria
• Malignancy
• Asplenia or sickle cell disease
• Bone marrow transplant
• Indwelling medical device
• Solid organ transplant
• Severe intellectual disability or cerebral palsy
• Immunocompromise, chronic steroid use

Clinical Criteria (2 or more criteria)

<table>
<thead>
<tr>
<th>HR</th>
<th>≥2y-10y</th>
<th>≥10y-14y</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;190</td>
<td>&gt;140</td>
<td>&gt;100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RR</th>
<th>≥2y-10y</th>
<th>≥10y-14y</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥50</td>
<td>&gt;34</td>
<td>&gt;30</td>
</tr>
</tbody>
</table>

- HR
- RR
- Pulses Decreased, weak, or bounding
- Cap refill Delayed (> 2 sec) or flash (< 1 sec)
- Skin Mottled, ruddy, petechiae
- Mental status Decreased, irritability, confusion, inappropriate crying, poor interaction, diminished arousability

Treatments
• Supplemental oxygen to maintain saturations ≥ 92%
• Attempt IV access. Do not delay transport if unsuccessful. Consider IO placement for patients meeting SEVERE SEPSIS CRITERIA.
• Administer boluses of 20 cc/kg NS over 20 minutes as long as lungs remain clear
  – Use caution if patient has end-stage renal disease or CHF

Septic Shock Trigger (at least one)
• SBP < 70 + (age in yr X 2)
• 3 or more clinical criteria
• 2 or more clinical criteria in patient meeting high-risk criteria

Notify closest appropriate facility of SEPSIS ALERT, if applicable

Updated November 9, 2016
Pain Management
Pediatric (≤14 y/o)

Initial medical care

Yes

Establish vascular access

Is the BP normotensive?

Yes

Constant monitoring of ABCs and vital signs (including pulse oximetry) is required

Morphine for analgesia
IV: 0.1 mg/kg. May repeat to a total max dose of 0.2 mg/kg. Max total dose of 10 mg.
Or
Fentanyl
IV: 1 mcg/kg slow, maximum incremental dose of 50mcg, may repeat to max of 200 mcg total.
Intranasal: 1-2 mcg/kg, maximum incremental dose of 50mcg, to a max of 200 mcg.

No

Proceed with appropriate algorithm

Courtesy notification to receiving facility

Before administering meds for pain, ask the patient to quantify their pain on a 1 to 10 scale. Document this information and use it as a guide to measure the effectiveness of analgesia.

**IV route offers better means for titration of med. Absorption via IM route may be unpredictable and should be used as a last resort – use only if no vascular access. Documentation must reflect rationale for IM route, if used.
## Sedation
### Pediatric (≤14 y/o)

<table>
<thead>
<tr>
<th>Sedation</th>
<th>Lorazepam (Ativan)</th>
<th>0.05-0.1 mg/kg IV/IM over 2-5 minutes (maximum 4mg). May repeat in 10-15 minutes.</th>
</tr>
</thead>
</table>
| Or       | Midazolam (Versed) | IV: 0.05 to 0.1 mg/kg slow IV push  
IM: 0.2 mg/kg. Max of 10mg every 10 minutes up to total dose of 20 mg  
Intranasal: 0.2-0.3 mg/kg. Max 10mg |
| Or       | Diazepam (Valium)  | IV: 0.2-0.3 mg/kg every 15-30 minutes max of 1 mg/kg not to exceed 10 mg per dose; administer IV over at least 3 minutes. |

Sedation should only be administered when indicated in specific off-line.

### Special Considerations
- If other CNS depressants, including alcohol and benzodiazepines, are on board, decrease dose.
- Sedation has been associated with respiratory depression and respiratory arrest. Monitor patient closely with cardiac monitor, SPO2 and ETCO2, if available.
Spinal Motion Restriction
Pediatric (≤ 14 y/o) Blunt Trauma

High-risk Characteristics/Mechanisms
- High-risk MVC: roll-over, head-on, ejection, death in same vehicle, speed > 55 mph
- Axial loads/diving injuries
- Sudden acceleration/deceleration, lateral bending forces to neck/torso
- Violent impact or injury to head, neck, torso, pelvis
- Numbness, tingling, parasthesias

IF ANY OF THE ABOVE, STRONGLY CONSIDER SMR

Potential mechanism for unstable spine injury?

Limited movement of neck
OR Spinal pain/tenderness?
OR Anatomic deformity of spine?
OR Neurologic deficit or complaint?
[eg: numbness, tingling, parasthesias]

Altered LOC (GCS<15)? Unreliable interaction?

Any Yes

Possible spine injury Apply SMR

Any Yes

Possible spine injury Apply SMR

All No

Omit SMR

Unreliable Patient Interactions
- Language barriers, inability to communicate, and age <2
- Lack of cooperation during exam
- Evidence of drug/alcohol intoxication
- Painful distracting injury such as long-bone fracture

Spinal Motion Restriction (SMR)
Refer to SMR Procedures page for preferred packing methods and tools

Motor/Sensory Exam
- Wrist/hand extension bilaterally
- Foot plantarflexion bilaterally
- Foot dorsiflexion bilaterally
- Gross sensation in all extremities
- Check for parasthesias
Spinal Motion Restriction
Pediatric (≤ 14 y/o) Penetrating Trauma

Notes
• Unstable spine fractures and spinal cord injury from penetrating head trauma are extremely rare
• Neuro deficits often present at moment of injury
• Life threatening conditions and evacuation from imminent threat take priority
• If history suggests combination penetrating AND blunt trauma, revert to Blunt Trauma
• Instructive information: Patients with global deficits do not require SMR

Spinal Motion Restriction (SMR)
• Refer to SMR Procedures page for preferred packing methods and tools
Initial medical care
Assess and treat the ABCDE’s
Do not delay transport to an appropriate emergency facility for procedures.
Complete as many procedures as possible enroute.
Establish vascular access. If fluid replacement is needed 20cc/kg, repeat as needed.
Immediate patients require two IV sites.

Is the patient in pain?

- No
- Yes

Constant monitoring of ABCs and vital signs (including pulse oximetry) is required

Please refer to Pain Management Off-line for medication and dosing.

Do triage or treatment intervention problems exist?

- No
- Yes

- Courtesy notification to receiving facility
- Contact Medical Control

Head Injury

If patient has head injury:
1. Elevate the head of the board approximately 30 degrees.
2. Ensure pt ventilations adequate at age appropriate rate. (Assist with BVM if necessary)
3. Signs of severe traumatic brain injury (TBI) include unconsciousness and/or unresponsiveness; GCS < 9; pupils that are unequal, non-reactive, and/or dilated; oxygen saturation < 90%; and/or hypotension.
4. Signs of impending cerebral herniation include all symptoms of TBI plus unresponsiveness to painful stimuli; extensor posturing; and/or a decrease by 2 or more point in the GCS. Other signs include Cushing's Triad: bradycardia, hypertension, and irregular respirations.
### EPIC Trauma Management
#### Pediatric (≤14 y/o)

Suspicion of a Traumatic Brain Injury (TBI) by mechanism, GCS, or Exam, then provide O2 15 L/min by NRB, establish IV access and monitor the patient’s O2, BP, and HR every 3-5 minutes.

#### Airway/Breathing

<table>
<thead>
<tr>
<th>O2 sat&lt;90 &amp;/or hypoventilation (despite NRB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- BLS airway maneuvers</td>
</tr>
<tr>
<td>- BVM: Infants: (0-24 months): 25 bpm</td>
</tr>
<tr>
<td>Children: (2-14 yr): 20 bpm</td>
</tr>
<tr>
<td>Adolescents: (15-17): 10 bpm</td>
</tr>
<tr>
<td>- Careful monitoring of O2 sat and airway</td>
</tr>
<tr>
<td>- If O2 sat &lt;90, despite BLS consider ALS airway.</td>
</tr>
<tr>
<td>- Maintain ETCO2 between 35-45 mmHg</td>
</tr>
</tbody>
</table>

#### Circulation

<table>
<thead>
<tr>
<th>Hypotension or other signs of shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 20ml/kg bolus NS</td>
</tr>
<tr>
<td>- Repeat until hypotension resolves</td>
</tr>
<tr>
<td>- Continue careful monitoring BP/HR</td>
</tr>
<tr>
<td>- Pay attention for early signs of shock:</td>
</tr>
<tr>
<td>- Tachycardia</td>
</tr>
<tr>
<td>- Dropping SBP</td>
</tr>
</tbody>
</table>

####Identifying Hypotension

- 0-9 yrs: 70 + (age x 2) ≥10 yrs: < 90mmHg

#### Disability

<table>
<thead>
<tr>
<th>Evaluate Mental Status/GCS</th>
</tr>
</thead>
</table>

#### Evaluate Mental Status/GCS

**Always evaluate for hypoglycemia.**
- It can mimic or cause a TBI.
- Check blood glucose. If <70 mg/dl:
  - Administer Dextrose: 0.5 to 1.0 g/kg slowly: 5 to 10 mL/kg 10%
  - Repeat BG @ 10 min. Repeat previous dose X 1 if still <70 mg/dl

**Consider impending herniation if:**
- Dilated and unresponsive pupils
- GCS <9 or rapid deterioration in GCS by >2 points
- Extensor posturing
- Asymmetric pupils (one or both non-reactive to light)
- Re-evaluate every 3-5 minutes

**If patient has signs of impending herniation.**
- Elevate head of gurney 30°

**DO NOT hyperventilate**

If O2 sat <90, despite BLS consider ALS airway

- Place advanced airway
  - Pre-oxygenate: BVM with 100% O2 @ age-appropriate rate
  - Check placement using ETCO2 detector and/or monitor
- Avoid even moderate hyperventilation
  - Control ventilatory rate:
    - ETCO2 available: maintain ETCO2 between 35-45 mmHg
    - ETCO2 not available: utilize cadence device for rate
  - Control ventilatory volume:
    - Ventilator available: utilize as soon as possible (Tidal volume = 7cc/kg)
    - Ventilator not available: utilize pressure controlled bag
- Monitor O2 sat and airway every 3-5 minutes
  - If O2 sat <90, despite above interventions, consider:
    - Tension pneumothorax and needle thoracostomy
- Meds that can rapidly drop BP and rapidly reduce blood flow to brain: Morphine, Fentanyl, Midazolam (Versed), Diazepam (Valium), Lorazepam (Ativan). Use with caution and watch SBP carefully. Don’t give if patient’s B/P is already low or falling. Start with VERY low doses- (20-25% of usual dose.)
Symptomatic Bradycardia
Pediatric (≤14 y/o)
With a Pulse and Poor Perfusion

Initial Medical Care

Establish vascular access and treat underlying causes

Cardiopulmonary compromise continues?

No

Monitor and observe
• Support ABC’s
• Give oxygen

Courtesy notification to closest appropriate facility

Yes

CPR if Heart <60/minute

• **Epinephrine** IV: 0.01 mg/kg (0.1 ml of 1:10,000). Repeat every 3-5 minutes. If IV/IO access is not available, but an endotracheal tube is in place, may give Epinephrine ETT: 0.1 mg/kg (0.1 ml/kg of 1:1,000)
• **Atropine** for increased vagal tone or primary AV block. IV: 0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose is 0.5 mg.
• Consider transthoracic pacing. Consider sedation, refer to Sedation Off-line, as needed.
• Treat underlying causes

Courtesy notification to closest appropriate facility
Tachycardia
Pediatric (≤14 y/o)
With a Pulse and Poor Perfusion

Initial Medical Care

Establish vascular access and treat underlying causes

Evaluate the QRS. Is it wide or narrow?

Narrow (≤0.09 seconds)
Evaluate rhythm with a 12 Lead ECG

Probable sinus tachycardia.
• Search for and treat cause.

Probable SVT
• Consider vagal maneuvers
• If IV/IO give Adenosine IV/IO 0.1 mg/kg rapid bolus. (Max first dose 6 mg). May repeat IV/IO: 0.2 mg/kg rapid bolus. (Max second dose 12 mg)
• If no IV/IO access, or if Adenosine is ineffective, synchronized cardioversion with 0.5 to 1.0 J/kg; 2 J/kg if rhythm persists.
• Consider sedation, but do not delay cardioversion. Refer to Sedation Off-line, as needed.

Wide >0.09 seconds
Possible ventricular tachycardia

Cardiopulmonary Compromise
• Hypotension
• Acutely altered mental status
• Signs of shock

No
• If rhythm is regular and monomorphic, consider Adenosine IV/IO: 0.1 mg/kg rapid bolus. (Max first dose 6 mg). May repeat IV/IO: 0.2 mg/kg rapid bolus. (Max second dose 12 mg)

Yes
• Consider sedation, but do not delay cardioversion. Refer to Sedation Off-line, as needed.
• Synchronized cardioversion with 0.5 to 1.0 J/kg; 2 J/kg if rhythm persists.

• If rhythm persists, obtain On-line Medical Direction for consideration of Amiodarone IV/IO: 5 mg/kg over 20 minutes.

Courtesy notification to closest appropriate facility
Pediatric Cardiac Arrest

CPR Quality
- Push hard (≥ 1/3 of anterior-posterior diameter of chest) and fast (100-120/minute) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes, sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- Quantitative waveform capnography. If <10, attempt to improve CPR quality

Shock Energy for defibrillation
- First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥ 4 J/kg, maximum 10 J/kg or adult dose.

Drug Therapy
- Epinephrine IV/IO Dose: 0.01 mg/kg (0.1 mL/kg) of 1:10,000. Repeat every 3-5 minutes. If no IV/IO access, may give Epinephrine ETT: 0.1 mg/kg (0.1 mL/kg of 1:1,000)
- Amiodarone IV/IO Dose: 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.
- If Amiodarone is unavailable, Lidocaine IV/IO Dose: 1mg/kg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography to confirm and monitor ET tube placement
- Once an advanced airway is in place, give 1 breath every 6 seconds (10 breaths/minute) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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Updated Nov. 11, 2015
Post-Arrest Stabilization
Pediatric (≤14 y/o)

OUT-OF-HOSPITAL CARDIAC ARREST

Assess Airway and Ventilations
Re-Confirm ETT
Maintain ETCO2 @ 35-45 and Ventilations @ 12/minute with 100% O2

Assess Pulse and Rhythm:
Consider Antiarrythmic Drip Therapy and assess BP

Is the patient hypotensive?

Yes

Fluid Bolus 10-20 cc/kg NS or LR
Monitor Response
Reassess V/S: What is BP?
Still Hypotensive?

Consider Further Fluid Bolus
Consider:
**Epinephrine** Infusion: 0.1mcg/kg/min
Or
**Dopamine** Infusion: 2-10 mcg/kg/min
Infusions Titrated to desired effects

V/S Improve: BP Age Specific

Assess Glucose Level: Below 50
**Dextrose**
IV/IO: 0.5 to 1.0 g/kg slowly:
5 to 10 mL/kg 10%
Repeat Glucose check

Seizure Control:
Refer to seizure off-line

Consider ongoing sedation. Refer to Sedation off-line, as needed.

Courtesy notification to closest appropriate facility

No

Assess Glucose Level: Below 50
**Dextrose**
IV/IO: 0.5 to 1.0 g/kg slowly:
5 to 10 mL/kg 10%
Repeat Glucose check

Seizure Control:
Refer to seizure off-line

Consider cooling measures

Consider ongoing sedation. Refer to Sedation off-line, as needed.

Transport to a facility that has a PICU, when feasible.

Courtesy notification to closest appropriate facility
Trauma Triage

Measure vital signs and level of consciousness
Glasgow Coma Scale: ≤13
Systolic Blood Pressure (<90 mmHg in adults)
Respiratory Rate: <10 or >29 breaths per minute, or need for ventilatory support (<20 in infant aged <1 year)

Assess anatomy of injury
- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g. flail chest)
- Two or more proximal long-bone fractures
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

Transport to a Level 1 Trauma Center. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the defined trauma system.

Step 1

Step 2

Assess anatomy of injury

Step 3a

- Ejection (partial or complete) from automobile
- Motorcycle crash >20 mph
- Patient run over, or with significant impact (>20 mph)

Step 3b

- Falls
  - Adults: >20 feet (one story is equal to 10 feet)
  - Children: >10 feet or 2-3 times the height of the child
- High-risk auto crash
  - Intrusion, including roof: >12in. occupant site; >18in any site. Intrusion refers to interior compartment intrusion, as opposed to deformation which refers to exterior damage.
  - Death in same passenger compartment
- Auto vs. pedestrian/bicyclist (NOT run over or thrown, with less than 20mph impact)

Step 4

Assess special patient or system considerations
- Older Adults
  - Risk of injury/death increases after age 55 years
  - SBP <110 may represent shock after age 65
  - Low impact mechanisms (e.g. ground level falls) may result in severe injury
- Children
  - Should be triaged preferentially to pediatric capable trauma centers
- Anticoagulants and bleeding disorders
  - Patients with head injury are at high risk for rapid deterioration
- Burns
  - Without other trauma mechanism: triage to burn facility
  - With trauma mechanism: triage to trauma center
- Pregnancy >20 weeks
- EMS provider judgment

Transport to a Level 1 Trauma Center. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the defined trauma system.

Consider Transport to a Level 1 or 3 Trauma Center.
Consider age, co-morbidities, and special considerations.
Obtain On-line Medical Direction with receiving facility if Level 3, or CN to Level 1.

Transport to a Level 1 Trauma Center. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the defined trauma system.

Consider transport to a Trauma Center. Obtain On-line Medical Direction to Base Hospital for any questions regarding destination decisions.

- When in doubt, transport to a Level 1 trauma center.
- Pediatric trauma patients, requiring Level 1 trauma care, are to be triaged preferentially to pediatric capable trauma centers.
Burn Triage

Does The Patient Have Any Of The Following?

1. Partial thickness burns > 10% TBSA
2. Any full thickness burns of any age group
3. Burns that involve the face, hands, feet, genitalia, perineum, or major joints
4. Electrical burns including lightning injury
5. Chemical burns
6. Inhalation injury
7. Burn injury with pre-existing medical disorders: CHF, ESRD, COPD, or cardiac that could complicate management, prolong recovery, and affect mortality
8. Burns with concomitant trauma (such as fractures)
9. Pediatric burns, especially requiring ICU care
10. Burn injury in patients who will require special social, emotional or long term rehabilitation
11. Circumferential Burns

Prepare patient for transport to burn center

1. Estimate total body surface area (TBSA) burned using “Rule of Nines”
2. Give fluid replacement: Parkland Formula (Lactated Ringers preferred) 4cc/LR X Kg/wgt X TBSA=fluids required for 24 hour period
   Administer ½ total volume in the first 8 hour.
3. Airway 100 % oxygen for all burn patients
4. Dress patient in dry dressings and keep patient warm
5. Pain Management Morphine Sulfate IV (per protocols)

Courtesy notification to Maricopa Medical Center

No

Yes

Courtesy notification to receiving facility of patient’s choice.
Identifying Priority Patients (MAPP)

“A map won’t show you every bump in the road, but it will get you there.”

**Mechanism**
- Fall injury
- Entrapment
- Explosion
- Electrocution
- MVA (ROS, seatbelt, intrusion, airbag deploy, car size, rollover, steering wheel, impact site, glass intact)
- Burn (thermal, chemical)
- Poisoning/overdose
- Water-related incident
- Choking / FBAO
- Ejection from motor vehicle (including motorcycles, mopeds, ATV's, or the open bed of pick-up trucks, etc.).

**Anatomy**
- Penetrating trauma
- Blunt trauma
- Fracture
- Burns
- Major soft tissue injury
- Gross deformity
- Injury to eyes, hands, feet, genitalia

**Physiology**
- Altered mental status
- Bradycardia, tachycardia
- Nausea/vomiting
- Sweating
- Shortness of breath
- Chest pain
- Headache
- Severe pain
- Hypotension
- Respirations < 10 or > 40
- Fever > 101
- Abdominal pain
- Inability to walk

**Patient Factors**
- Age <5 or >55
- Cardiac disease
- Respiratory disease
- Seizure disorder
- Insulin-dependent diabetes
- Cirrhosis
- Morbid obesity
- Pregnancy
- Immunosuppressed patients
- Patients with bleeding disorder or patient on anticoagulants
- + use of alcohol/drugs
- Recent surgery/illness
Cardiopulmonary Arrest - Blunt Trauma
Adult (≥ 18 y/o)

Initial medical care

Yes
- Initiate grief support
- Notify PD
- Remain with patient until PD arrival

Signs of irreversible death?*

No
- Manage airway and breathing
- Apply monitor

Asystole/Agonal in 2 leads
- Consider termination**
  **Consider time of arrest, mechanism: blunt vs. penetrating trauma, possible underlying medical cause
- Initiate grief support
- Notify PD
- Remain with patient until PD arrival

Pulseless VT/VF/PEA
- Begin resuscitation
  - Consider Field Termination (obtain On-line Medical Direction REQUIRED) if patient meets inclusion criteria and remains in pulseless after:
    - 3 doses of ACLS drugs
    - Fluid challenge if PEA/Asystole
    - Associated shocks if in VF/VT

- Courtesy notification to receiving facility, if transporting

Signs of Irreversible Death
- Decapitation
- Decomposition
- Dependent lividity
- Rigor mortis
- Pulseless and apneic with extrusion of brain matter
- Pulseless and apneic with removal of the lower half of the body
- Pulseless and apneic with full thickness burns over 90% total body surface area
## Glasgow Coma Scale

### Adult and Pediatric

#### Adult Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>Verbal Response</th>
<th>Motor Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>4=Spontaneous</td>
<td>5=Normal conversation</td>
<td>6=Normal</td>
</tr>
<tr>
<td>3=To voice</td>
<td>4=Disoriented conversation</td>
<td>5=Localizes to pain</td>
</tr>
<tr>
<td>2=To pain</td>
<td>3=Words, but not coherent</td>
<td>4=Withdraws to pain</td>
</tr>
<tr>
<td>1=None</td>
<td>2=No words......only sounds</td>
<td>3=Abnormal flexion to pain (Decorticate)</td>
</tr>
</tbody>
</table>

#### Pediatric Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye Opening</th>
<th>Verbal Response</th>
<th>Motor Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>4=Spontaneous</td>
<td>5= Oriented (Infant coos or babbles)</td>
<td>6= Obeys (Infant moves spontaneously / purposefully)</td>
</tr>
<tr>
<td>3=To voice</td>
<td>4= Confused (Infant irritable/cries)</td>
<td>5= Localizes to pain (infant withdraws to touch)</td>
</tr>
<tr>
<td>2=To pain</td>
<td>3= Inappropriate words (Infant cries to pain)</td>
<td>4=Withdraws to pain</td>
</tr>
<tr>
<td>1=None</td>
<td>2=Incomprehensible sounds (Infant moans to pain)</td>
<td>3=Abnormal flexion to pain (Decorticate)</td>
</tr>
</tbody>
</table>

**Total = E+V+M**
**Universal Toxicological Response**

**Determine Product or Agent Involved.**
If unknown, determine symptoms of those exposed. Provide for safety of responding providers, patients, and bystanders

- Document findings and contact Poison Control.
- Document recommendations from Poison Control

- Contact Medical Control as soon as possible.
- Advise of Poison Control’s Recommendations and treatment rendered.
- Document Medical Direction’s Orders.
- Recommend dispatch of additional Tox Medic resources to Command, if necessary.

As new information is obtained, update:
- Poison Control
- Medical Direction
- Receiving Hospitals

**Poison Control**
602-253-3334
(Refer to Toxicology Report)

Refer to specific Guidelines for exposures to:
- Methemoglobinemia
- CO Poisoning
- Cyanide Poisoning
- Sulfide Poisoning
- Organophosphate / N-Methylcarbamate Poisoning (Insecticide-Nerve Agent)
- Eye Contamination

**Product Concentration**
**Types of Exposure**
**Length of Exposure**
**Initial Signs and Symptoms**
**Present Signs and Symptoms**
Eye Decontamination

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

- Maintain Airway, Breathing, Circulation.
- Establish vascular access (Do not delay Decontamination for vascular access)

Begin eye decontamination immediately
After initial 5 minutes of irrigation or if patient can not open eyes for irrigation then give:
Proparacaine Eye Drops: 1-2 drops in affected eye(s)
Wait 30-60 seconds for anesthetic effect.

Consider the use of Morgan Lens to facilitate decontamination

Continue irrigation until directed to stop by Medical Direction

Contact Poison for further recommendation.
Contact Medical Direction

Poison Control
602-253-3334

Notes
- Irrigate with copious amounts of LR, NS, or water. (LR is preferred with the Morgan Lens.)
- Do not use neutralizing agents.
- Transport for evaluation.
- Refer to Pain Management off-line to treat pain.
- Use of Proparacaine and/or Morgan Lens for substances other than hazardous materials requires on-line medical control. Ex. Soot, dust, corneal scratches, or abrasions.
Cyanide Poisoning Option 1
Cyano-Kit, optional agent
Special Training Required

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

- Maintain Airway, Breathing, Circulation.
- Administer High Flow O2.
- Treat dysrhythmias (common with cyanide toxicity).
- Establish vascular access.

Establish dedicated large bore IV with tubing provided in Cyano-kit (Regular IV tubing will not work for Cyano-kit administration)

Administer Hydroxocobalamin (Cyano-kit)
Adult: 5g IV over 15 min
(both 2.5g vials-7.5 min / vial or 15mL / min)
Second Dose: 5g for a total of 10g over 15 min – 2 HRS titrated to patient condition

Contact Poison Control for further recommendation
Contact Medical Direction

Poison Control
602-253-3334

Signs and Symptoms
- Abrupt onset of profound effects
- Headache / Altered LOC
- Loss of Consciousness
- Nausea
- Dyspnea / Agonal Respiration
- Seizures
- Cardiovascular Collapse
- Hypotension
- Cardiac Arrhythmias

Notes
- Reconstitute each vial with 100mL of NS. •Use LR or D5W if NS not available.
- Chemical Asphyxiant
- Almost never smells like almonds
- Sources: Products of combustion/smoke inhalation and fumigants
- Same IV Line Incompatibilities
  - Diazepam
  - Dopamine
  - NTG
  - Dobutamine
  - Propofol
  - Pentobarbitol
  - Sodium Nitrite
  - Sodium Thiosulfate
Carbon Monoxide Poisoning

Measure SpCO
SpCO should be measured in firefighters during rehab, smoke inhalation patients, occupants of building with CO detectors alarm activation, or patients with symptoms suggestive of CO poisoning

SpCO 0-3%
No further medical evaluation of SpCO needed

SpCO >3%
Loss of consciousness or neurological impairment or SpCO >25% or pregnant with SpCO >15%

No

SpCO < 12%
Symptoms of CO exposure? *

No

No further medical evaluation of SpCO needed. Determine source of CO if nonsmoker.

Yes

SpCO > 12%
Transport on 100% oxygen for ED evaluation.

Transport on 100% oxygen for ED evaluation. Consider transport to a facility with a hyperbaric chamber.

Notes
- Smokers can have normal SpCO levels up to 10%
- Potential long term effects in patients, particularly children, elderly and pregnant patients with exposure
- This is a high risk refusal. Providers should contact Poison Control at 602-253-3334 for medical advice, then obtain On-line Medical Direction to Medical Control for Medical Direction
- Consider transport to facility with a hyperbaric chamber
  - Scottsdale Osborn
  - St Joes

<table>
<thead>
<tr>
<th>COHb</th>
<th>Severity</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20%</td>
<td>Mild</td>
<td>Headache, nausea, vomiting, dizziness, blurred vision</td>
</tr>
<tr>
<td>21-40%</td>
<td>Moderate</td>
<td>Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness</td>
</tr>
<tr>
<td>41-59%</td>
<td>Severe</td>
<td>Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest</td>
</tr>
<tr>
<td>&gt;60%</td>
<td>Fatal</td>
<td>Death</td>
</tr>
</tbody>
</table>
Cyanide Poisoning Option 2

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

Maintain Airway, Breathing, Circulation.
Establish vascular access

Administer **Amyl Nitrite**.
Break Amyl Nitrite Pearl and hold over face of breathing patient or over air intake of BVM for 30 seconds of every minute while IV is being established. If IV is established go directly to IV Sodium Nitrite.

Administer **Sodium Nitrite**
Adult: 300mg IV over 5-10 minutes
(Can give faster during cardiac arrest)
Pediatric: 0.33 ml/kg of 3% solution over 5-10 minutes.
May repeat if no response in 15 to 30 minutes.

Administer **Sodium Thiosulfate** (25%)
Adult: 12.5g (50ml of 25%) IV over 5 minutes.
(Can be faster during codes)
Pediatric: 1.65ml/kg of 25% solution over 5 minutes.

Contact Poison for further recommendation.
Contact Medical Direction

Poison Control
602-253-3334

**Signs and Symptoms**
- Abrupt onset of profound effects
- Headache / Altered LOC
- Loss of Consciousness
- Nausea
- Dyspnea / Agonal Respirations
- Seizures
- Cardiovascular Collapse
- Hypotension
- Cardiac Arrhythmias

**Notes**
- Chemical Asphyxiant
- Almost never smells like almonds
- Sources:
  - Apricot Pits
  - Combustion of plastics, synthetics, or wool
- If smoke inhalation or suspected carbon monoxide poisoning present, then do not give Nitrites unless carboxyhemoglobin fraction is known to be less than 10%
Methemoglobinemia

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

• Maintain Airway, Breathing, Circulation.
• Establish vascular access (Do not delay
Decontamination for vascular access

Administer **Methylene Blue:**
Mix in 100cc bag of NS
Dose: 2mg/kg IV over 5-10 minutes
May repeat at: 1mg/kg if no change
within 10- 20 minutes

Note:
Do not use when known G-6-PD deficiency

Contact Poison for further recommendation.
Contact Medical Direction

Poison Control
602-253-3334

**Signs and Symptoms**

• Headache/Dizziness
• Altered LOC
• Nausea
• Dyspnea
• Seizures
• Coma
• Generalized Skin Discoloration
  “Chocolate Cyanosis”
• Chocolate Brown Blood

**Notes**

• Causative Agents
  Local Anesthetics
  Analgesics
  Anti-microbials
  Nitrates/Nitrites
  Amyl Nitrite/Butyl Nitrite
  Aniline Dyes
  Chlorates
  Nitrobenzenes
  Aminophenol
• May occur with the use of Amyl Nitrite for Cyanide and Sulfide poisonings
Organophosphate/ N-Methylcarbamate/ Nerve Agent Exposure

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

• Maintain Airway, Breathing, Circulation.
• Establish vascular access

Administer Atropine Sulfate
Adult Dose: 2-5 mg IV every 2-5 minutes
Ped Dose: 0.05 mg/kg IV every 2-5 minutes

Continue to repeat dosing until atropinization:
• No wheezing
• No bronchorrhea
• No diaphoresis
• No bradycardia
• No diarrhea
• No vomiting

Administer Pralidoxime Chloride (2 PAM)
Reconstitute with 20cc of sterile water
Adult dose: 1-2 grams IV over 10-15 minutes
Peds dose: 30-50mg/kg over 10-15 minutes

Note: Sudden onset apnea may occur in infants, usually after the second dose.

Consider 2-PAM drip for severe cases after initial dose.

Contact Poison for further recommendation.
Contact Medical Direction

Poison Control
602-253-3334

Signs and Symptoms
• SLUDGE Syndrome
• Fasciculations / Seizures
• Loss of Consciousness
• Dyspnea / Apnea

Notes
• Exposure- Vapor or absorbed
• Will penetrate clothing
• Mark 1 Kit appropriate for mass casualty situation
• Causative Agents
  Local Anesthetics
  Analgesics
  Anti-microbials
  Nitrates/Nitrites
  Amyl Nitrite/Butyl Nitrite
  Aniline Dyes
  Chlorates
  Nitrobenzenes
  Aminophenol
  May occur with the use of Amyl Nitrite for Cyanide and Sulfide poisonings
  If the patient begins to Seize, please refer to the Seizure off-line.
Sulfide Poisoning

Assure Scene Safety
Perform appropriate decontamination if able.
Confirm exposure, amount, and duration.

- Maintain Airway, Breathing, Circulation.
- Establish vascular access

Administer **Amyl Nitrite**.
Break Amyl Nitrite Pearl and hold over face of breathing patient or over air intake of BVM for 30 seconds of every minute while IV is being established. If IV is established go directly to IV Sodium Nitrite.

Administer **Sodium Nitrite**
Adult: 300mg IV over 5-10 minutes (Can give faster during cardiac arrest)
Pediatric: 0.33 ml/kg of 3% solution IV over 5-10 minutes.
May repeat if no response in 15 to 30 minutes.

Contact Poison for further recommendation.
Contact Medical Direction

Poison Control
602-253-3334

**Signs and Symptoms**
- May report “rotten egg” odor
- Upper airway irritation
- Non-Cardiogenic Pulmonary Edema (late onset)
- Rapid collapse

**Notes**
- Cellular Asphyxiant
- Rapid olfactory overload- may not report rotten egg odor
- Sources:
  - Decaying organic matter
  - Petroleum refining
  - Mining
  - Pulp/Paper factories
  - Sewage
  - Hot Asphalt fumes
  - Septic systems
- “Rotten egg” odor may be present with as little as 0.025 PPM
EZ IO / or equivalent
Adult and Pediatric

Indications:
- Immediate vascular access in emergencies.
- Intravenous fluids or medications are urgently needed and a peripheral IV cannot be established in 2 attempts or 90 seconds **AND** the patient exhibits one or more of the following:
  - An altered mental status (GCS of 8 or less)
  - Respiratory compromise (SaO2 <90% after appropriate oxygen therapy, respiratory rate <10 or >40 min)
  - Hemodynamic instability

Contraindications:
- Fracture of the bone selected for IO infusion (**consider alternate site**)
- Excessive tissue at insertion site with the absence of anatomical landmarks (relative contraindication)
- Previous significant orthopedic procedures (**IO within 24 hours, prosthesis**)
- Infection at the site selected for insertion

Procedure:
1. If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain informed consent.
2. Wear approved BSI equipment
3. Determine indications and rule out contraindications
4. Locate appropriate insertion site
5. Prepare insertion site using aseptic technique.
6. Prepare the EZ-IO driver and appropriate needle set
7. Stabilize site and insert appropriate needle set.
8. Remove EZ-IO® driver from needle set while stabilizing catheter hub.
9. Remove stylet from catheter and place stylet in shuttle or approved sharps container.
10. Confirm placement and patency.
11. Connect primed EZ-Connect®.
12. Slowly administer **Lidocaine 2%** (Preservative Free) IO to conscious patients (after ensuring patient has no allergy or sensitivity to **Lidocaine**.)
   - Adults: 20-40mg; Peds: 0.5mg/kg to a max of 20 mg
13. Rapid syringe bolus (flush) the EZ-IO PD® with 10 ml of normal saline (5 ml for pediatric).
14. Utilize pressure bags for continuous infusion
15. Dress site, secure tubing, and apply wristband as directed.
16. Monitor EZ-IO® site and patient condition

Notes:
1. EZ-IO AD (adult) to be used for patients 40 Kg. and over. EZ-IO PD (pediatric) to be used for patients 3-39 Kg.
2. Due to the anatomy of the IO space, flow rates may appear to be slower than those achieved with an IV catheter.
3. Insertion of the EZ-IO in conscious patients has been noted to cause mild to moderate discomfort, however, IO infusion in conscious patients has been noted to cause severe discomfort.
4. EZ-IO catheter should be removed within 24 hours

Updated May 7, 2012
Rapid Sequence Intubation (RSI)

Adult (≥ 15 y/o)

Pre-oxygenate the patient for 4-5 minutes with 100% oxygen

Apply and maintain cricoid pressure until tube placement is confirmed

Sedate the patient

**Etomidate (Amidate)**

0.3 mg/kg IV over 30-60 seconds

Or

**Ketamine**

1.5 mg/kg IV over 30-60 seconds. Max 150 mg

Paralyze the patient

**Succinylcholine (Anectine)** 1.5 mg/kg

Intubate and confirm tube placement (End-tidal CO2 detector required)

In-line capnography recommended. Reading should be maintained between 35-45.

**Indications for RSI**

- Respiratory failure
- Loss of gag or protective airway reflexes
- GCS < 8
- Severe head trauma
- Spinal cord injuries
- Facial and/or airway burns
- Asthma or respiratory illnesses

**Contraindications for RSI**

- Cardiac Arrest is a contraindication for RSI
- History of malignant hyperthermia

**Signs/ Symptoms of ICP**

- Altered LOC
- Headache
- Nausea/vomiting
- Increased systolic pressure
- Decreased pulse
- Widened pulse pressure
- Irregular respiratory pattern

1. Sedation with **Etomidate (Amidate)** should occur in 30-50 seconds
2. Paralysis with **Succinylcholine (Anectine)** should occur in < 1 min
3. If unable to ventilate adequately, assess need for rescue airway device.
4. If unable to ventilate patient with BVM or rescue airway device, perform surgical cricothyrotomy.

**Pain Management**

Refer to Pain Management Off-line, as needed.

**Post-intubation Sedation.**

Refer to Sedation Off-line, as needed.

Place NG/OG tube if indicated

**Courtesy notification to receiving facility**
CPAP
Adult (≥ 15 y/o)

Procedure:
1. Explain the procedure to the patient
2. Ensure adequate oxygen supply to the ventilation device
3. Monitor pulse oximetry, ETCO2 (if available), and ECG continuously
4. Place patient in seated position with head of bed >45 degrees
5. Connect CPAP device to suitable oxygen supply
   1. Attach breathing circuit to CPAP device and ensure device is functioning properly
   2. Apply and secure appropriate size breathing circuit mask to patient
   3. Set CPAP at 5 cm H2O and titrate positive airway pressure until improvement in patient pulse oximetry and symptoms.
      WARNING: Do not exceed pressures of 10 cm H2O.
6. Refer to Respiratory Distress Off-line, as needed
7. Refer to Sedation Off-line, as needed.
8. Contact Medical Control.

Indications for CPAP:
Severe respiratory distress due to suspected pulmonary edema, pneumonia, or COPD exacerbation (bronchitis, emphysema).

Contraindications:
1. Age <14
2. Patient is in respiratory arrest or unable to maintain own airway
3. Facial trauma preventing an adequate face to mask seal
4. Tracheotomy
5. Suspected pneumothorax
6. Active upper GI bleed or recent gastric surgery (2 weeks).

Relative Contraindications
1. Altered mental status, inability to follow commands
2. Systolic BP <100 mmHg
3. Excessive secretions
4. Nausea or vomiting

Special Notes:
1. CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask, experiences respiratory arrest, or begins to vomit.
2. Intermittent positive pressure ventilation with a BVM, placement of an OPA/NPA and/or intubation should be considered if the patient is removed from CPAP
3. Advise receiving ED of CPAP use ASAP so they can arrange for respiratory therapy
4. CPAP is only to be removed in the ED when the RT is present and ready to transfer the patient to their equipment, or at the discretion of the receiving physician who is present.
5. Watch patient for gastric distention
6. CPAP may be performed on a patient with a DNR
7. Due to changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs must be obtained every 5 minutes

Updated Dec 3, 2012
If 12 lead capability is available, EMS performs a 12 lead EKG in the field and makes a STEMI diagnosis.

Is the crew able to transmit the 12 lead to the receiving facility?

Yes

EMS transmits the EKG to the receiving facility and interprets the 12 lead for the receiving facility

No

EMS calls receiving facility obtain On-line Medical Direction Line and interprets the 12 lead EKG for the receiving facility

Courtesy notification to closest appropriate facility
When calling the receiving facility the Universal Terminology to be used is:
This is a "Cardiac / STEMI alert"

Additional Information may be given if needed. This includes:

Patient’s Legal Name
Patient’s Date of Birth
Patient’s Cardiologist
Estimated Time of Arrival
Cardiocerebral Resuscitation (CCR)

Adult (>8y/o)

Inadequate or no bystander CPR prior to arrival

- 200 chest compressions
- Establish vascular access
- Insert an OPA and apply a non-rebreather with 100% O2
- Epinephrine 1 mg 1:10,000

Adequate bystander CPR prior to arrival

- 200 chest compressions
- Establish vascular access
- Insert an OPA and apply a non-rebreather with 100% O2
- Epinephrine 1 mg 1:10,000

Rhythm analysis – single shock at 360* if indicated without pulse check

- 200 chest compressions
- Epinephrine 1 mg 1:10,000

Rhythm analysis – single shock at 360* if indicated without pulse check

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- Epinephrine 1 mg 1:10,000

Rhythm analysis – single shock at 360* if indicated without pulse check

- 200 chest compressions
- Epinephrine 1 mg 1:10,000

Endotracheal intubation
Resume standard ALCS procedures.

Notes:
1. *Recommended defibrillation dose varies by device used. For biphasic defibrillator follow manufacturer’s recommendation.
2. Perform chest compressions at a rate of at least 100/minute.
3. If a potentially perfusing rhythm returns, finish current round of 200 compressions prior to pulse check.
4. If a return of spontaneous pulse occurs, proceed with supportive care.
5. Do not attempt ventilation/intubation until after the fourth set of 200 compressions.

Contraindications:
- Children < 8 years old
- Known/suspected overdose
- Respiratory cause of arrest
- Known/suspected hypothermia
- Near Drowning
- Traumatic arrest
- Burned beyond recognition.

Documentation:
- Was bystander CPR in progress?
- If bystander CPR, who was performing CPR; i.e., family, friends, law enforcement, etc.
- Estimated time of collapse.
- AED use prior to arrival?
- Was patient gasping prior to arrival?
- Specify that CCR protocol was utilized.
- Time and dosages of all defibrillations and medications.
- All monitored cardiac rhythms.

Appendix: Cardiocerebral Resuscitation (CCR)

Inadequate or no bystander CPR prior to arrival

- 200 chest compressions
- Establish vascular access
- Insert an OPA and apply a non-rebreather with 100% O2
- Epinephrine 1 mg 1:10,000

Adequate bystander CPR prior to arrival

- 200 chest compressions
- Establish vascular access
- Insert an OPA and apply a non-rebreather with 100% O2
- Epinephrine 1 mg 1:10,000

Rhythm analysis – single shock at 360* if indicated without pulse check

- 200 chest compressions
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Rhythm analysis – single shock at 360* if indicated without pulse check

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- Epinephrine 1 mg 1:10,000

Rhythm analysis – single shock at 360* if indicated without pulse check

- 200 chest compressions
- Epinephrine 1 mg 1:10,000

Endotracheal intubation
Resume standard ALCS procedures.

Updated May 7, 2012
Cardiac Arrest Center/ Cardiac Arrest Post Resuscitation (AZ DHS BEMS Guideline)

Inclusion Criteria:
1. Non-traumatic OHCA with return of palpable central pulses or other evidence of spontaneous circulation
2. GCS less than 8 after ROSC
3. Transport to CAC when feasible, resources available, and will add less than 15 minutes to transport time compared to transport to non-CAC
4. Less than 30 minutes CPR prior to arrival of EMS
5. Female patients not pregnant
6. No uncontrolled hemorrhage
7. No persistent unstable arrhythmia
8. Patient does not appear to have severe environmental hypothermia related arrhythmia
9. No DNR paperwork identified during resuscitation

Post resuscitation care

1. Control airway as necessary
2. Maintain PCO2 between the range of 35-45. SPO2 of >95% should be maintained. Maintain ventilation rate of 8-10 breaths per minute, adjust as needed to ensure proper oxygenation.
3. Consider anti-arrhythmic medication
4. If available administer 2000 mL cold (4°C/39.2°F) NS IV fluid bolus to the adult patient
5. Apply cold/ice packs to groin/axillae/neck
6. Consider dopamine for persistent hypotension
7. Perform 12-lead ECG to check for STEMI (ST elevation MI) and pre-notify ED
8. Do not warm patient
# Blood Thinners

## Antiplatelets
- Salicylate (Aspirin)
- Clopidogrel (Plavix)
- Prasugrel (Effient)
- Ticagrelor (Brilinta)
- Dipyridamole (Persantine)
- Dipyridamole/Aspirin (Aggrenox)

## Anticoagulants
- Enoxaparin (Lovenox)
- Dabigatran (Pradaxa)
- Rivaroxaban (Xarelto)
- Warfarin (Coumadin)
- Heparin
- Fondaparinux (Arixtra)

---

FYI: The most common new drugs you will see patients on are Xarelto and Pradaxa. Several cardiologists are starting to use these for patients with A-fib instead of Coumadin. Aggrenox is used for a lot of stroke/TIA patients.

<table>
<thead>
<tr>
<th>Drug category</th>
<th>Brand Names of Blood Thinners</th>
<th>Chemical Names of Blood Thinners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin K antagonists</td>
<td>Coumadin</td>
<td>Warfarin</td>
</tr>
<tr>
<td></td>
<td>Dicumarol</td>
<td>Dicumarol</td>
</tr>
<tr>
<td></td>
<td>Miradon</td>
<td>Anisinidine</td>
</tr>
<tr>
<td>Heparin (carbohydrate) drugs</td>
<td>Clexane, Lovenox</td>
<td>Enoxaparin</td>
</tr>
<tr>
<td></td>
<td>Hep-Lock, Hep-Pak</td>
<td>Heparin</td>
</tr>
<tr>
<td></td>
<td>Fragmin</td>
<td>Dalteparin</td>
</tr>
<tr>
<td></td>
<td>Arixtra</td>
<td>Fondaparinux</td>
</tr>
<tr>
<td></td>
<td>Orgaran</td>
<td>Danaparoid</td>
</tr>
<tr>
<td></td>
<td>Innohep</td>
<td>Tinzaparin</td>
</tr>
<tr>
<td>Thrombin (enzyme) inhibitors</td>
<td>Argatroban</td>
<td>Argatroban</td>
</tr>
<tr>
<td></td>
<td>Refludan</td>
<td>Lepirudin</td>
</tr>
<tr>
<td></td>
<td>Angiomax, Angiox</td>
<td>Bivalirudin</td>
</tr>
<tr>
<td></td>
<td>Pradaxa</td>
<td>Dabigatran</td>
</tr>
<tr>
<td>Salicylate</td>
<td>Aspirin</td>
<td>Acetylsalicylic acid</td>
</tr>
<tr>
<td>P2Y (platelet receptor) inhibitor</td>
<td>Plavix</td>
<td>Clopidogrel bisulphate</td>
</tr>
<tr>
<td>Thromboxane (specialized small molecule) inhibitor</td>
<td>Persantine Aggrenox</td>
<td>Dipyridimole Aspirin dipyramidole</td>
</tr>
</tbody>
</table>
Pain Scales

Wong-Baker FACES® Pain Rating Scale

0  2  4  6  8  10
No Hurt  Hurts Little Bit  Hurts Little More  Hurts Even More  Hurts Whole Lot  Hurts Worst


PAIN SCORE 0-10 NUMERICAL RATING

0-10 Numerical Rating Scale

FLACC Behavioral Pain Assessment Scale

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>No particular expression or smile</td>
<td>Occasional grimace or frown; withdrawn, disinterested</td>
<td>Frequent to constant frown, clenched jaw, quivering chin</td>
</tr>
<tr>
<td>Legs</td>
<td>Normal position or relaxed</td>
<td>Uneasy, restless, tense</td>
<td>Kicking or legs drawn up</td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, normal position, moves easily</td>
<td>Squirming, shifting back and forth, tense</td>
<td>Arched, rigid, or jerking</td>
</tr>
<tr>
<td>Cry</td>
<td>No cry (awake or asleep)</td>
<td>Moans or whimpers, occasional complaint</td>
<td>Crying steadily, screams or sobs; frequent complaints</td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
<td>Reassured by occasional touching, hugging, or being talked to; distractable</td>
<td>Difficult to console or comfort</td>
</tr>
</tbody>
</table>

How to Use the FLACC

In patients who are awake: observe for 1 to 5 minutes or longer. Observe legs and body uncovered. Reposition patient or observe activity. Assess body for tenseness and tone. Initiate consoling interventions if needed.

In patients who are asleep: observe for 5 minutes or longer. Observe body and legs uncovered. If possible, reposition the patient. Touch the body and assess for tenseness and tone.
AZ Drug Profiles

These drug profiles were developed by the Department, in cooperation with its advisory committees, to provide guidelines for the safe and effective use of agents for maximum patient benefit. These drug profiles are intended to be used as reference documents by medical control authorities, EMS educators, and EMS providers. A list of specific drugs is provided below, along with the Agency Guidance Documents that reflect the most current drug profiles.

Drug Profiles main link: http://www.azdhs.gov/preparedness/emergency-medical-services-trauma-system/index.php#drug-profiles


### Activated Charcoal

<table>
<thead>
<tr>
<th>Indications</th>
<th>Poisoning/Overdose, should only be given within the first hour of ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Do not give before or together with Ipecac, protect airway</td>
</tr>
<tr>
<td>Side Effects</td>
<td>None for the field</td>
</tr>
</tbody>
</table>
| Dosage, route        | Adult: 30-60 Gm (1-2 Gm/kg); if not in pre-mixed slurry, mix one part charcoal with four parts water.  
                      | Pediatric: 0.5 -1.0 Gm/kg; if not in pre-mixed slurry, mix one part charcoal with four parts water. |

### Adenosine

<table>
<thead>
<tr>
<th>Indications</th>
<th>PSVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Do not give if second or third degree heart block or sick sinus syndrome, or known WPW</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Transient dysrhythmias, facial flushing, dyspnea, chest pressure, hypotension, headache, nausea, bronchospasm</td>
</tr>
</tbody>
</table>
| Dosage, route | Adult: 6mg IV rapidly over 1-3 sec with a 20ml N/S flush. If no effect after 1-2 minutes give 12mg IV rapidly with a 20ml N/S flush. May repeat 12mg dose in 1-2 min.  
                   Pediatric: 0.1mg/kg IV rapidly with a 2-3ml N/S flush. If no effect after 2 min give 0.2mg/kg rapidly with a 2-3ml N/S flush. May repeat 0.2mg/kg dose in 1-2 minutes. Max dose should not exceed 12mg. |

### Albuterol

<table>
<thead>
<tr>
<th>Indications</th>
<th>Treatment of bronchospasm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Do not use with MAO inhibitors, cyclics, or when tachycardia or hypertension is present</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Muscle tremors, tachycardia, heartburn, nausea/vomiting</td>
</tr>
</tbody>
</table>
| Dosage, route | Adult: 2.5mg/3ml NS via SVN or inline. (Use 0.083% solution) May mix with atrovent up to 3 times, if needed  
                   Pediatric: 2.5mg/3ml NS via SVN or inline. (Use 0.083% solution) May mix with atrovent up to 3 times, if needed |

### Amiodarone

<table>
<thead>
<tr>
<th>Indications</th>
<th>Treatment of: shock-refractory VF/pulseless VT, polymorphic VT, and wide complex tachycardia of uncertain origin. Control hemodynamically stable ventricular tachycardia when cardioversion unsuccessful. Adjunct to cardioversion of SVT and PSVT. Rate control in atrial fibrillation or flutter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Bradycardia. Second or third degree heart block. Cardiogenic shock. Hypotension. Pulmonary congestion</td>
</tr>
</tbody>
</table>
| Dosage, route | Adult V-Fib/Pulseless V-Tach: 300mg IV Push. May repeat once in 3-5 minutes with 150mg IV push.  
                   Adult wide complex tachycardias, A-flutter, A-fib, SVT with cardioversion: 150mg IV over 10 minutes. May repeat every 10 minutes.  
                   Pediatric V-fib/Pulseless V-tach: 5mg/kg IV push (max 300 mg dose). May repeat every 5 minutes two times to a total max dose of 15mg/kg/day.  
                   Pediatric probable V-tach with a pulse: 5mg/kg IV push over 20 minutes. May repeat every 5 minutes two times to a total max dose of 15mg/kg/day. |
### Aspirin (Chewable)

| Indication | Chest pain of cardiac origin |
| Contraindications | Known allergy, bleeding disorders such as hemophilia |
| Side Effects | None for the field |
| Dosage, route | **Adult:** 2-4 chewable 81 mg tablets PO chew and swallow  
**Pediatric:** None |

### Atropine Sulfate

| Indication | Sinus bradycardia, AV Blocks |
| Contraindications | A-fib or flutter with rapid ventricular response, myocardial infarction, glaucoma |
| Side Effects | Blurred vision, dry mouth, flushing, urinary retention, headache, dilated pupils |
| Dosage, route | **Adult:** IV: 0.5 mg rapid IVP q 3-5 minutes. MAX Dose 3mg  
**Pediatric:** IV: 0.02 mg/kg. Min dose 0.1 mg. Max. single dose 0.5 mg. May repeat x1 in 5 minutes. Maximum single doses: 0.5 mg |

### Atrovent

| Indication | Treatment of brochospasm |
| Contraindications | It should not be used in patients with hypersensitivity to Atrovent or Atropine |
| Side Effects | Coughing, sputum increase, dizziness, insomnia, tremor, nervousness, nausea |
| Dosage, route | **Adult and Pediatric dose:** 500 mcg in 2.5 NS (single bullet) SVN. May be mixed with Albuterol to a max of 3 times |

### Calcium Chloride

| Indications | Acute hypocalcaemia, calcium channel blocker and magnesium overdoses, acute hyperkalemia |
| Contraindications | Incompatible with all drugs, flush the line before and after administration. Use cautiously on digitalis pts |
| Side Effects | Brady-asystolic arrest, sever tissue necrosis if extravastates, serious arrhythmias in digitalis patients |
| Dosage, route | **Adult:** IV bolus 5-10 ml of a 10% solution. May repeat in 10 minutes. Pre-treatment for IV Verapamil: 3ml of 10%, may repeat once.  
**Pediatric:** IV bolus 0.2-0.25 ml/kg of a 10% solution infused slowly. Should not be repeated. |

### Dextrose 50% (D-50)

| Indications | Adult hypoglycemia, unconscious diabetic, coma, or seizure of unknown etiology. |
| Contraindications | Pediatrics: use D25 or D10; head injury pts; incompatible with NaHCO₃, diazepam will precipitate if not flushed |
| Side Effects | Tissue necrosis if infiltrated |
| Dosage, route | **Adult:** 25-50cc of 50% solution IV push, may repeat one time.  
**Pediatric:** See D-25 and D-10. |

### Dextrose 25% (D-25) and Dextrose 10% (D-10)

See Next Page
### Dextrose 25% (D-25) and Dextrose 10% (D-10)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Pediatric and infant hypoglycemia, unconscious diabetic, coma or seizure of unknown etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Incompatible with NaHCO₃, diazepam will precipitate if given concurrently without flushing</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Tissue necrosis if infiltrated</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Pediatric:</strong> 0.5-1 Gm/kg 25% solution slow IV push or 2-4 ml/kg of D-25</td>
</tr>
<tr>
<td></td>
<td>To prepare D-25, mix in 50ml syringe 25ml D-50 with 25ml NS. Produces 50ml D-25</td>
</tr>
<tr>
<td></td>
<td><strong>Newborn:</strong> 0.5-1 Gm/kg 10% solution slow IV push (usually over a 20 minute period) or 5-10 ml/kg of D-10</td>
</tr>
<tr>
<td></td>
<td>To prepare D-10, obtain a 250ml bag of NS for IV use, waste 50ml, and add 50ml of Dextrose 50%</td>
</tr>
</tbody>
</table>

### Diazepam (Valium)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Seizure, sedation prior to cardioversion, sedation post RSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Pregnancy, when patient has ingested other sedatives, respiratory depression, hypotension</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Hypotension, confusion/stupor, respiratory depression or arrest if given too rapidly, vertigo, ataxia</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult IV:</strong> 2-10 mg at 2 mg/min. Do not mix with any other drug, have respiratory support equip available</td>
</tr>
<tr>
<td></td>
<td><strong>Pediatric IV:</strong> 0.2 -0.3 mg/kg every 15--30 min (Max of 1 mg/kg); administer slowly over at least 3 minutes</td>
</tr>
</tbody>
</table>

### Diltiazem (Cardizem)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Rapid ventricular rates associated with A-fib and A-flutter, and for PSVT refractory to adenosine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Hypotension, Acute MI, Cardiogenic Shock, V-Tach of unknown origin, 2nd or 3rd degree AV block, WPW syndrome, Sick Sinus Syndrome, or Beta blocker use.</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Hypotension, bradycardia, heart block, chest pain, asystole, nausea, vomiting, headache, fatigue, drowsiness</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> 0.25mg/kg administered IV over 2 minutes. If no response in 15 minutes, may repeat 0.35mg/kg IVP over 2 minutes. Max of 20mg per dose.</td>
</tr>
<tr>
<td></td>
<td><strong>Pediatric:</strong> None</td>
</tr>
</tbody>
</table>

### Diphenhydramine (Benadryl)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Allergic reactions, anaphylaxis, acute dystonic reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Glaucoma, presence of alcohol and/or other depressants</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Decreased LOC, hypotension, blurred vision, dry mouth, wheezing, OD may cause convulsions, coma</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> 50 mg slow IV push or deep IM</td>
</tr>
<tr>
<td></td>
<td><strong>Pediatric:</strong> 1 mg/kg slow IV push or deep IM. Max of 50mg.</td>
</tr>
</tbody>
</table>
### Dopamine (Intropin)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Cardiogenic shock, hypotension, or unresolved bradycardia after pacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Tachyarrhythmias, V-Fib, do not give with NaHCO₃, hypotension due to hypovolemia until fluid replaced</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Nausea/vomiting, htn, infiltration will cause local necrosis, tachycardia, angina, palpitations</td>
</tr>
</tbody>
</table>
| Dosage, route                     | **Adult**: 1600 mcg/ml pre-mixed. Begin at 2-5 mcg/kg/min. Max of 10mcg/kg/min. See Table.  
**Pediatric**: 2-10 mcg/kg/min. Begin at 2mcg/kg/min. |

### Epinephrine 1:1,000

<table>
<thead>
<tr>
<th>Indications</th>
<th>Anaphylaxis, cardiac arrest, asthma, croup, unresolved bradycardia after pacing and dopamine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Use with caution in pts &gt;35 y/o, w/angina, hypertension, pregnancy, tachycardia. None in cardiac arrest</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Palpitations, tachycardia, increased blood pressure</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult</strong> and <em>Pediatric</em>: See concentrations below for preferred concentrations and routes.</td>
</tr>
</tbody>
</table>

#### Cardiac arrest
- **Adult**: Cardiac Arrest IV/IO dose. See 1:10,000 concentration below  
- **Adult ETT**: 2-2.5 mg in 10cc of saline  
- **Pediatric**: 0.1 mg/kg q 3--5 minutes diluted in 3-5 ml saline  
  - **Croup/Stridor**:  
    - Peds SVN for croup: <= 4 y/o deliver 2.5 mg diluted in 3cc of NS  
    - => 5 y/o deliver 5.0 mg diluted in 3cc of NS  

### Epinephrine 1:10,000

<table>
<thead>
<tr>
<th>Indications</th>
<th>Cardiac arrest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>None in cardiac arrest</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Palpitations, tachycardia, increased blood pressure</td>
</tr>
</tbody>
</table>
| Dosage, route                     | **Adult**: 1.0 mg IV push every 3--5 minutes with a 20cc flush.  
**Pediatric**: 0.01 mg/kg of 1:10,000. IV/IO push  
**Pediatric ETT**: (See 1:1,000 concentration above) |

### Etomidate (Amidate)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Sedation for rapid sequence intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Patient must be &gt;14 years of age, hypersensitivity to the medication</td>
</tr>
<tr>
<td>Side Effects</td>
<td>CNS depression, anesthesia, transient muscle movements, apnea</td>
</tr>
</tbody>
</table>
| Dosage, route                   | **Adult dose**: 0.3 mg/kg IV over 30--60 seconds.  
**Pediatric**: None |
## Fentanyl

<table>
<thead>
<tr>
<th>Indications</th>
<th>Pain analgesic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Hypersensitivity, fetal acidosis/non-reassuring fetal tracing</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Bradycardia, hypotension, cardiac arrest, respiratory depression, chest tightness, and laryngospasm</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> IV: 1 mcg/kg mcg slow, may repeat to max of 200 mcg total. IM: 2mcg/kg to a max of 200 mcg. Intranasal: 2mcg/kg to a max of 200 mcg. <strong>Pediatric:</strong> IV: 1-2 mcg/kg slow, may repeat to max of 200 mcg total. IM: 2mcg/kg to a max 200 mcg. Intranasal: 2mcg/kg to a max of 200 mcg</td>
</tr>
</tbody>
</table>

## Furosemide (Lasix)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Congestive heart failure, pulmonary edema</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Pregnancy, hypokalemia, digitalis toxicity</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Nausea/vomiting, potassium depletion, dehydration</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> 0.5-1.0 mg/kg slow IV push. Or double the patient’s daily dose if on Lasix and compliant with medications. <strong>Pediatric:</strong> 1mg/kg IV slowly.</td>
</tr>
</tbody>
</table>

## Glucagon

<table>
<thead>
<tr>
<th>Indications</th>
<th>Blood sugar less than 80 mg/dL and unable to start an IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Contraindicated in patients with known hypersensitivity to glucagon, beef or pork protein</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Occasional nausea/vomiting or generalized allergic reaction</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> 1 mg IM. <strong>Pediatric:</strong> &gt;20kg: 1mg IM &lt;20kg: 0.5 mg IM.</td>
</tr>
</tbody>
</table>

## Ketamine

<table>
<thead>
<tr>
<th>Indications</th>
<th>RSI, Excited Delirium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Angina, CHF, Symptomatic Hyperthyroidism, Pregnancy-Relative (Category B)</td>
</tr>
<tr>
<td>Side Effects</td>
<td>An emergence reaction (in approximately 12% of patients) may occur near end of medication half-life, when patient is awakening, that may require Versed 1-5 mg IV/IM/IO to calm patient.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>RSI:</strong> Adult: 1.5 mg/kg max 150mg <strong>Excited Delirium/Sedation:</strong> Adult: 1.5 mg/kg IV (max 150 mg) or 4 mg/kg IM (max 250 mg)</td>
</tr>
</tbody>
</table>

## Lidocaine (if Amiodarone is unavailable)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Cardiac arrest, suppression of ventricular arrhythmias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Patients with conduction disturbances (2nd and 3rd degree blocks). Don’t treat ectopic beats if rate &lt;60</td>
</tr>
<tr>
<td>Side Effects</td>
<td>SA nodal depression or conduction problems and hypotension in large doses, or if given too rapidly. Drowsiness, disorientation, paresthesia, decreased hearing acuity, muscle twitching, seizures, agitation</td>
</tr>
<tr>
<td>Dosage, route</td>
<td><strong>Adult:</strong> Pulseless VF/VT: 1.0-1.5 mg/kg IV push. Repeat boluses 0.5-0.75 mg/kg every 5-10 min. Max: 3mg/kg. Hang a drip at 1-4 mg/min after conversion. <strong>Pediatric:</strong> 1mg/kg may repeat x1 for VF/Pulseless V-tach, and unstable V-tach</td>
</tr>
</tbody>
</table>
## Lorazepam

<table>
<thead>
<tr>
<th>Indications</th>
<th>Status epilepticus, seizures, sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Known sensitivity to benzodiazepines, hypersensitivity to polyethylene glycol, propylene glycol, benzyl alcohol, pregnancy, acute narrow angle glaucoma</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Sedation, transient amnesia, memory impairment, confusion, hypotension, dizziness, headache, respiratory depression</td>
</tr>
</tbody>
</table>
| Dosage, route | **Adult:** Status epilepticus 2-4 mg Slow IV. May give IV/IO if no IV access. May repeat in 10-15 minutes.  
**Pediatric:** Status epilepticus 0.05-0.1 mg/kg Slow IV. May give IO if no IV access. Max dose 4mg. May repeat in 10-15 minutes. |

## Magnesium Sulfate

<table>
<thead>
<tr>
<th>Indications</th>
<th>Torsades de Pointes, VF/Pulseless VT refractory to Lidocaine, Pre-eclampsia, Eclampsia, Pregnancy Induced Hypertension, Pre Term Labor, severe asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Renal disease, heart block, recent MI</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Respiratory and CNS depression, hypotension</td>
</tr>
</tbody>
</table>
| Dosage, route | **Torsades**  
**Adult:** Torsades with a pulse: 2 Gm in 100 ml NS over 10 min.  
**Torsades without a pulse:** 1-2 Gm in 10ml of N/S Fast IV.  
**Pediatric:** Torsades without a pulse 25-50 mg/kg. Max of 2 Grams rapid IV push.  
**Eclamptic, Pre-eclamptic, and PIH**  
**Adult:** 4-6 G IV bolus over 10-15 min (Add 4 Gms to 100 ml of NS, D5W, LR. Resulting concentration is 30-60 mg/mL).  
**Pre Term labor**  
**Adult:** 4-6 G IV bolus over 10-15 min (Add 4 Gms to 100 ml of NS, D5W, LR. Resulting concentration is 30-60 mg/mL).  
**Asthma**  
**Adult:** 2 Grams in 50ml of N/S given over 5 minutes.  
**Pediatric:** 25-50 mg/kg in 50 ml of N/S over 20 minutes. |

## Methylprednisolone Sodium Succinate (Solu-Medrol)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Reactive airway disease (acute exacerbation of emphysema, chronic bronchitis, asthma, anaphylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Do not use in preterm infants</td>
</tr>
<tr>
<td>Side Effects</td>
<td>None from a single dose</td>
</tr>
</tbody>
</table>
| Dosage, route | **Adult:** 125 mg slow IV bolus or IM  
**Pediatric:** 2 mg/kg slow IV bolus or IM |

## Midazolam (Versed)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Sedation, post rapid sequence intubation (RSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Hypotensive, hypoxia</td>
</tr>
<tr>
<td>Side Effects</td>
<td>CNS and respiratory depression</td>
</tr>
</tbody>
</table>
| Dosage, route | **Adult:** 14-60 years: 1-5 mg IV push over 30 seconds. 2-5 mg IM. 0.2mg/kg for status seizures if no IV access.  
**Age >60:** Reduce by half.  
**Pediatric:** 0.05 to 0.1 mg/kg slow IV push. 0.2 mg/kg IM for status seizures if no IV access  
Intranasal for Adult and Peds: 0.2-0.3 mg/kg to a max of 10mg. May repeat once if needed. Must use 5mg/ml concentration |
### Morphine Sulfate

<table>
<thead>
<tr>
<th>Indications</th>
<th>Analgesia, sedation post RSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Head injury, exacerbated COPD, depressed respiratory drive, hypotension, acute abdomen pain, altered LOC</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Respiratory depression, decreased BP, decreased LOC, decreased HR, nausea/vomiting</td>
</tr>
</tbody>
</table>
| Dosage, route        | Adult: IV 1-20mg in 2-4mg increments. 5-10 mg IM  
                        Pediatric: 0.1 mg/kg IV or IM. May repeat to a max dose of 0.2 mg/kg. |

### Naloxone (Narcan)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Opiate overdose, coma of unknown etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Withdrawal symptoms in the addicted patient</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Precipitous vomiting, ventricular dysrhythmias, acute withdrawal</td>
</tr>
</tbody>
</table>
| Dosage, route        | Adult: 0.4-2 mg IV, IM, inject SL, SC, ETT. May repeat in 2 minutes.  
                        Intranasal: 2 mg in each nostril using a mucosal atomizer device, may repeat every 2 minutes.  
                        Pediatric: 0.1 mg/kg IV, IM, IN, or ETT  
                        Titrate to respiratory improvement -- not necessary to wake patient up in the field |

### Neo-Synephrine

<table>
<thead>
<tr>
<th>Indication</th>
<th>Facilitation of nasotracheal intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>No known contraindications</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Hypertension, palpitations, tremors</td>
</tr>
</tbody>
</table>
| Dosage, route        | Adult: 2-4 sprays in each nostril before attempting ETT insertion.  
                        Pediatric: none |

### Nitroglycerin

<table>
<thead>
<tr>
<th>Indications</th>
<th>Angina, myocardial infarction, CHF with pulmonary edema</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraindications</td>
<td>Hypovolemia, increased intra cranial pressure</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Hypotension, temporary pulsating headache, flushing</td>
</tr>
</tbody>
</table>
| Dosage, route        | Adult: 0.4 mg (either by tablet or spray) SL. May repeat q 5 minutes for a total of 3 doses.  
                        Pediatric: none |
# Ondansetron

**Indications**: Nausea, vomiting

**Contraindications**: Hypersensitivity. Use with caution in patients with hepatic impairment

**Side Effects**
- **CNS**: Headache, malaise, fatigue, dizziness, fever, sedation, extrapyramidal syndrome
- **Cardiovascular**: Chest pain, arrhythmias.
- **Respiratory**: Hypoxia.
- **GI & Hepatic**: Diarrhea, constipation, abdominal pain, xerostomia, decreased appetite.
- **Skin**: Rash

**Dosage, route**
- **Adult**: 4–8 mg IV slow push over 2–5 minutes. Or 8 mg PO ODT or tablet
- **Pediatric**: 
  - <40 kg 0.1 mg/kg, slow over 2-5 minutes.
  - >40 kg 4 mg slow over 2-5 minutes.
  - 4-12 years old 4 mg PO or ODT

  May be given IM if no IV access

## Sodium Bicarbonate

**Indications**: Metabolic acidosis, cardiac arrest with a down time >10 minutes, tricyclic antidepressant overdose

**Contraindications**: Low serum potassium, patient unable to tolerate salt load (i.e., CHF)

**Side Effects**: Alkalosis, precipitates when mixed with calcium chloride

**Dosage, route**
- **Adult**: 1 mEq/kg IV initially then 0.5 mEq/kg every 10 minutes
- **Pediatric**: 1 mEq/kg IV or IO slowly. Neonate dose 1 mEq/kg IV or IO of 4.2% solution

## Succinylcholine (Anectine)

**Indication**: Endotracheal intubation requiring paralysis

**Contraindications**: Muscle disorders and personal or family history of malignant hyperthermia

**Side Effects**: Vagal stimulation leading to bradycardia or asystole. Will cause muscle paralysis

**Dosage, route**
- **Adult**: 1.5 mg/kg IVP.
- **Pediatric**: None

## Thiamine

**Indications**: Coma of unknown origin, use prior to D50 administration

**Contraindications**: Hypotension

**Side Effects**: Restlessness, nausea, diarrhea, anaphylactic reaction, pulmonary edema

**Dosage, route**
- **Adult**: 100 mg slow IV or IM
- **Pediatric**: None
### Amyl Nitrite

<table>
<thead>
<tr>
<th>Description</th>
<th>Used in the initial step of antidotal treatment of cyanide and hydrogen sulfide poisoning. Amyl nitrate converted in body to nitrite, which then forms methemoglobin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Treatment of severe symptomatic cyanide and hydrogen sulfide poisoning.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>None</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Dizziness, fatigue, dyspnea, nausea, vomiting, hypotension, headache, tachy or bradycardia.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>One ampule over patient’s mouth and nose or into ambu bag. Leave on 30 seconds then 30 second rest. Once IV established Sodium nitrite IV is the treatment of choice.</td>
</tr>
<tr>
<td>Amount carried</td>
<td>4 boxes 12 ampules per box NOTE: Amyl nitrite does not need to be used if IV is in place since IV sodium nitrite is much more effective.</td>
</tr>
</tbody>
</table>

### Atropine

<table>
<thead>
<tr>
<th>Description</th>
<th>Atropine affects the muscarinic receptors of the autonomic nervous system by inhibiting their effects. At higher doses it also has a similar effect on the nicotinic receptors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Treatment of organophosphate and carbamate poisoning.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>There are no contraindications to administration of atropine. Note: Tachycardia is not a contraindication</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Dry mouth, decreased bronchial secretions, mydriasis, flushing, tachycardia, urinary retention, ileus, confusion, ataxia, hallucinations, psychosis, seizures.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>Adult: 2 – 5 mg IV push q 5 – 10 minutes until atropinization. Pediatric: 0.05 mg / kg IV push q 5 – 10 minutes until atropinization. Continue dosing until: no wheezing, no bradycardia, no diarrhea, no brochorrhea, no diaphoresis</td>
</tr>
<tr>
<td>Amount carried</td>
<td>16 - 8mg / 20ml vials (0.4 mg / ml)</td>
</tr>
</tbody>
</table>

### Hydroxocobalamin

<table>
<thead>
<tr>
<th>Description</th>
<th>Used in the treatment of acute cyanide poisoning. Detoxifies cyanide by forming cyanocobalamin which is excreted in the urine.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Treatment of suspected or known cyanide poisoning</td>
</tr>
<tr>
<td>Contraindications</td>
<td>None</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Rash, chest tightness, edema, urticaria, pruritus, dyspnea, and rash. Most common adverse reactions (&gt;5%) are transient and include chromaturia (red-colored urine), erythema (skin redness), rash, increased blood pressure, nausea, headache, decreased lymphocyte percent, and injection site reactions.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>2.5 grams in a vial. Add 100cc N/S. Mix by rocking or rotating vial. Do not shake. Infuse. Repeat with second vial</td>
</tr>
<tr>
<td>Amount carried</td>
<td>2.5 grams in a vial. Add 100cc N/S. Mix by rocking or rotating vial. Do not shake. Infuse. Repeat with second vial</td>
</tr>
</tbody>
</table>
### Toxicology Paramedic Drug Profiles

#### Methylene Blue

<table>
<thead>
<tr>
<th>Description</th>
<th>Dark blue crystalline powder in solution with water or alcohol. Used in in the treatment of methemoglobin toxicity. Acts as reducing agent to convert iron in methemoglobin from Fe+++ to Fe++, regenerating normal hemoglobin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Treatment of severe symptomatic methemoglobinemia.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>Known Glucose-6-phosphate dehydrogenase deficiency.</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Nausea, vomiting, abdominal and chest pain, headache, dizziness, confusion, dyspnea, hypertension.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>7ml (0.1ml/kg of 1% soln) IV over 2-3 minutes with NaCl running at 200-300ml/hr. May repeat in 10 minutes if not improved. Mix in 100cc bag N.S 2.0 mg / kg IV over 5 – 10 minutes, May repeat at 1.0 mg / kg if no change within 10 – 20 minutes.</td>
</tr>
<tr>
<td>Amount carried</td>
<td>8 - 100mg / 10ml vials.</td>
</tr>
</tbody>
</table>

#### Proparacaine (Opthetic)

<table>
<thead>
<tr>
<th>Description</th>
<th>Proparacaine is a topical ocular local anesthetic of the ester class producing anesthesia lasting approximately 15 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Topical anesthesia of the eye when preparing to insert Morgan Lens for Irrigation.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>Contraindicated in known hypersensitivity to the drug or benzalkonium chloride (preservative).</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Temporary burning, redness, stinging of conjunctiva may occur.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>Adult and Pediatric: 1-2 gtt into affected eye. May repeat q 5–10 minutes</td>
</tr>
<tr>
<td>Amount carried</td>
<td>4 Eye drop bottles (0.5%) Keep cool.</td>
</tr>
</tbody>
</table>

#### Protopam Chloride (Pralidoxime Chloride, 2-Pam)

<table>
<thead>
<tr>
<th>Description</th>
<th>Protopam is an odorless white powder used to reactivate Cholinesterase enzymes, which have been inactivated by phosphorylation by organophosphates.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indications</td>
<td>Treatment of organophosphate poisoning.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>No absolute contraindications. Known hypersensitivity to drug is a relative contraindication to administration.</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Local pain, blurred vision, dizziness, headache, nausea, tachycardia, increased BP, hyperventilation.</td>
</tr>
<tr>
<td>Dosage, route</td>
<td>Adults: 1 – 2 gms IV over 10 – 15 minutes.  Pediatric: 30 –50 mg /kg over 10 – 15 minutes.</td>
</tr>
<tr>
<td>Amount carried</td>
<td>12 - 1 gram powered vials.</td>
</tr>
</tbody>
</table>
### Sodium Nitrite

**Description**
White or slightly yellow powder soluble in water. When used in cyanide poisoning acts with hemoglobin to form methemoglobin. The methemoglobin then forms complexes with the cyanide inactivating it. In hydrogen sulfide poisoning reacts with hemoglobin to form sulfhemoglobin.

**Indications**
Indicated in the treatment of severe symptomatic cyanide and hydrogen sulfide poisoning.

**Contraindications**
None

**Side Effects**
Nausea, vomiting, abdominal pain, dizziness, headache, flushing, cyanosis, tachypnea, vasodilatation, syncope, hypotension, tachycardia.

**Dosage, route**
Administer 300mg of Na Nitrite (10ml of 3% solution) IV over 5 -10 minutes. If symptoms not improved in 15 to 30 minutes may repeat dose.

Adults: 10 ml (300 mg; 1 amp) IV over 5 – 10 minutes. Can be give faster during cardiac arrest.

Pediatric: 0.33 ml / kg of 3% solution IV over similar time period.

**Amount carried**
8 – 300mg / 10ml Ampules

### Sodium Thiosulfate

**Description**
Used in the treatment of cyanide poisoning. Reacts with cyanide-methemoglobin complex to form stable thiocyanate, which is then excreted by kidneys.

**Indications**
Treatment of severe symptomatic cyanide poisoning.

**Contraindications**
Don’t give for Sulfide poisoning

**Side Effects**
Relatively nontoxic.

**Dosage, route**
12.5gm (50ml of 25% solution) IV over 5 minutes.

Adults: 50ml (12.5 gms) IV over 5 minutes. Give fast during cardiac arrest.

Pediatric: 1.65 ml / kg of 25% solution IV over similar time period.

**Amount carried**
8 - 12.5 gms in 50 ml (250 mg / ml)
### Approved Substitutes

#### Dexamethasone (Decadron) -- substitute for Solu-Medrol
- **Indications**: Reactive Airway Disease, Anaphylaxis
- **Contraindications**: Preterm infants, Systemic fungal infections
- **Side Effects**: None from a single dose
- **Dosage, route**
  - **Adult**: 8-24 mg slow IV bolus or IM. (20mg approx. equal to 125mg Solu-Medrol)
  - **Pediatric**: 0.25-0.5 mg/kg

#### Nalmefene HCl (Revex) -- substitute for Narcan
- **Indication**: Opiate overdose, Coma of unknown origin
- **Contraindications**: Withdrawal symptoms in the addicted patient
- **Side Effects**: Precipitous vomiting, Dysrhythmias, acute withdrawal
- **Dosage, route**
  - **Adult**: 0.5 mg IV, IM, or SC to a max of 1.5 mg or 1.5 mg/70kg. May give additional 0.5-1.0 mg in 2–5 minutes
  - **Pediatric**: None

#### Bumetanide -- substitute for Furosemide
- **Indications**: Congestive heart failure, pulmonary edema
- **Contraindications**: Pregnancy, hypokalemia, not indicated for use on patients less than 18 years of age
- **Side Effects**: Nausea/vomiting, potassium depletion, dehydration
- **Dosage, route**
  - **Adult**: 0.5-1.0 mg IV push (slowly over 1-2 minutes). May give IM. (bumetanide can be substituted at approx a 1:40 ratio of bumetanide to Furosemide)
  - **Pediatric**: None

#### Verapamil- substitute for Cardizem
- **Indications**: SVT, atrial fibrillation and atrial flutter with rapid ventricular response
- **Contraindications**: Do not use in patients with shock, severe CHF, AV block, sick sinus syndrome or any wide complex tachycardia, including WPW
- **Side Effects**: Extreme bradycardia, asystole, AV block, hypotension, congestive heart failure
- **Dosage, route**
  - **Adult**: 2.5-5.0 mg IV push over 2–3 minutes. May rebolus in 15-30 minutes with 5-10 mg IV push until a maximum dose of 20 mg is given.
  - **Pediatric**: None

### Lidocaine/Bretylium Infusion Chart
- Mix 2 Gm in 500 mL of NS (4/mg/ml)

<table>
<thead>
<tr>
<th>Dose ordered in mg/min</th>
<th>Amount to infuse in mcg/min or ml/hr</th>
<th>Dose ordered in mcg/min</th>
<th>Amount to infuse in mcg/min or ml/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>4</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>60</td>
<td>8</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>10</td>
<td>75</td>
</tr>
</tbody>
</table>

### Epinephrine Infusion Chart
- Mix 2 mg of 1:1,000 (2000mcg) in 250 mL of NS (8/mcg/ml)
### Dopamine Infusion Chart

Mix 400mg in 250 mL of NS (1600mcg/ml)

<table>
<thead>
<tr>
<th>Dose in mcg/kg/min</th>
<th>99</th>
<th>110</th>
<th>121</th>
<th>132</th>
<th>143</th>
<th>154</th>
<th>165</th>
<th>176</th>
<th>187</th>
<th>198</th>
<th>209</th>
<th>220</th>
<th>231</th>
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<tbody>
<tr>
<td></td>
<td>45</td>
<td>50</td>
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</tr>
<tr>
<td>12.5</td>
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<td>64</td>
<td>68</td>
<td>71</td>
<td>75</td>
<td>79</td>
</tr>
</tbody>
</table>

### Dopamine Infusion Chart

Mix 400mg in 250 mL of NS (1600mcg/ml)

<table>
<thead>
<tr>
<th>Dose ordered in mcg/min</th>
<th>400</th>
<th>800</th>
<th>1200</th>
<th>1600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount to infuse in mcgts/min or ml/hr</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
</tr>
</tbody>
</table>

### Monophasic vs. ZOLL Biphasic

**Monophasic**

- Synchronized Cardioversion
  - 100J
  - 200J
  - 300J
  - 360J

- Defibrillation
  - 200J
  - 300J
  - 360J

- Pediatric Defibrillation
  - 2J/kg
  - 4J/kg

**ZOLL Biphasic**

- Anything below 75 Jules is equivalent to a monophasic energy setting.

- Synchronized Cardioversion
  - 75J
  - 120J
  - 150J
  - 200J

- Defibrillation
  - 120J
  - 150J
  - 200J

- Pediatric Defibrillation
  - 2J/kg
  - 4J/kg

Updated May 7, 2012
## Trauma Center and PICU Locations

### Level 1 Trauma Centers as of 11/7/2017

<table>
<thead>
<tr>
<th>Hospital and Location</th>
<th>Adult ≥15y/o</th>
<th>Pediatric ≤14y/o</th>
<th>Burns (any age)</th>
<th>OB &gt;20 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banner-University Medical Center <em>Phoenix</em></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banner Desert Medical Center (Provisional)</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Banner Thunderbird Medical Center (Provisional)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Dignity Health Chandler Regional</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HonorHealth Deer Valley</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HonorHealth John C. Lincoln</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maricopa Medical Center</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Phoenix Children’s Hospital</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Joseph’s Hospital and Medical Center</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>HonorHealth Scottsdale Osborn</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abrazo West Campus</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Level 3 Trauma Centers as of 11/3/2017

- Abrazo Scottsdale Campus (Provisional)
- Banner Baywood Medical Center
- Banner Del E. Webb (Provisional)
- Mountain Vista Medical Center

### Pediatric Intensive Care Units as of 11/3/2017

- Banner Desert Medical Center / Cardon Children’s Medical Center
- Banner Thunderbird Medical Center
- Maricopa Medical Center
- Phoenix Children’s Hospital
- HonorHealth Scottsdale Shea
Primary Stroke Centers

The Arizona Stroke Consortium has identified 18 hospitals as Primary Stroke Centers (PSC) for the Phoenix Metropolitan area. The following hospitals have provisionally met the criteria to become a Primary Stroke Center:

Abrazo Arrowhead Campus
Abrazo West Campus
Banner Baywood Medical Center
Banner Boswell Medical Center
Banner-University Medical Center Phoenix
Banner Del Webb Medical Center
Banner Desert Medical Center
Banner Estrella Medical Center*
Banner Thunderbird Medical Center
Dignity Health Chandler Regional Medical Center
Dignity Health Mercy Gilbert Medical Center
HonorHealth John C. Lincoln
HonorHealth Scottsdale Osborn
HonorHealth Deer Valley Medical Center
Mayo Clinic Hospital
Mountain Vista Medical Center
Phoenix Baptist Hospital
St Joseph's Hospital and Medical Center

*This hospital has provisionally met the criteria to become a Primary Stroke Center and can accept stroke patients

Candidates for Stroke Alert:

Any patient with acute onset of focal neurological deficit(s) such as facial asymmetry, arm drift, or slurred speech, known to have had an onset within 4 hours (or longer time period as specified by Primary Stroke Center).
Level III Perinatal Facilities

Current as of
11/3/2017

Banner Desert Medical Center
Banner Thunderbird Medical Center
Maricopa Medical Center
Banner-University Medical Center Phoenix
HonorHealth Scottsdale Shea
St. Joseph’s Hospital

High risk pregnancies include: prematurity (<32 weeks), any bleeding in third trimester, pre-eclampsia/eclampsia (seizures), no prenatal care, twins or >, premature rupture of membranes, ante-partum hemorrhage (abruptio placenta, placenta previa, and uterine rupture), or other complications of labor (breech position, prolapsed cord, ect.), or recent drug use. These patients need transport to Level III perinatal facility.

All OB patients should be transported to the ED if the L&D department does not have a ground floor direct entrance. The patient should be rapidly assessed in the ED. If the patient needs to go to L&D without further delay, a hospital provider will accompany the patient and EMS crew to L&D, according to hospital policy.
Cardiac Receiving Centers

Current as of 12/23/2016

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrazo Arizona Heart Hospital – Phoenix</td>
<td>Phoenix</td>
</tr>
<tr>
<td>Abrazo Arrowhead Campus – Glendale</td>
<td></td>
</tr>
<tr>
<td>Abrazo Central Campus – Phoenix</td>
<td>Phoenix</td>
</tr>
<tr>
<td>Abrazo Scottsdale Campus – Phoenix</td>
<td></td>
</tr>
<tr>
<td>Abrazo West Campus – Goodyear</td>
<td></td>
</tr>
<tr>
<td>Banner Boswell Medical Center – Sun City</td>
<td></td>
</tr>
<tr>
<td>Banner Del E Webb Medical Center – Sun City West</td>
<td></td>
</tr>
<tr>
<td>Banner Desert Medical Center – Mesa</td>
<td></td>
</tr>
<tr>
<td>Banner Estrella Medical Center – Phoenix</td>
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</tr>
<tr>
<td>Banner Heart Hospital – Mesa</td>
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</tr>
<tr>
<td>Banner Thunderbird Medical Center – Glendale</td>
<td></td>
</tr>
<tr>
<td>Banner - University Medical Center Phoenix</td>
<td></td>
</tr>
<tr>
<td>Banner - University Medical Center Tucson – Tucson</td>
<td></td>
</tr>
<tr>
<td>Banner - University Medical Center South – Tucson</td>
<td></td>
</tr>
<tr>
<td>Carondelet St. Joseph’s Hospital – Tucson</td>
<td></td>
</tr>
<tr>
<td>Carondelet St. Mary’s Hospital – Tucson</td>
<td></td>
</tr>
<tr>
<td>Chandler Regional Medical Center – Chandler</td>
<td></td>
</tr>
<tr>
<td>Flagstaff Medical Center – Flagstaff</td>
<td></td>
</tr>
<tr>
<td>Havasu Regional Medical Center – Lake Havasu City</td>
<td></td>
</tr>
<tr>
<td>HonorHealth Deer Valley Medical Center – Phoenix</td>
<td></td>
</tr>
<tr>
<td>HonorHealth John C. Lincoln Medical Center – Phoenix</td>
<td></td>
</tr>
<tr>
<td>HonorHealth Scottsdale Osborn Medical Center – Scottsdale</td>
<td></td>
</tr>
<tr>
<td>HonorHealth Scottsdale Shea Medical Center – Scottsdale</td>
<td></td>
</tr>
<tr>
<td>Kingman Regional Medical Center – Kingman</td>
<td></td>
</tr>
<tr>
<td>Maricopa Medical Center – Phoenix</td>
<td></td>
</tr>
<tr>
<td>Mayo Clinic Hospital – Phoenix</td>
<td></td>
</tr>
<tr>
<td>Mercy Gilbert Medical Center – Gilbert</td>
<td></td>
</tr>
<tr>
<td>Mountain Vista Medical Center – Mesa</td>
<td></td>
</tr>
<tr>
<td>Northwest Medical Center – Tucson</td>
<td></td>
</tr>
<tr>
<td>Oro Valley Hospital – Oro Valley</td>
<td></td>
</tr>
<tr>
<td>Phoenix Children’s Hospital – Phoenix</td>
<td></td>
</tr>
<tr>
<td>Sierra Vista Regional Health Center – Sierra Vista</td>
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</tr>
<tr>
<td>St. Joseph’s Hospital – Phoenix</td>
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<tr>
<td>St. Luke’s Medical Center – Phoenix</td>
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<tr>
<td>Tucson Medical Center – Tucson</td>
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<tr>
<td>Verde Valley Medical Center – Cottonwood</td>
<td></td>
</tr>
<tr>
<td>Western Arizona Regional Medical Center – Bullhead City</td>
<td></td>
</tr>
<tr>
<td>Yavapai Regional Medical Center, West Campus – Prescott</td>
<td></td>
</tr>
<tr>
<td>Yuma Regional Medical Center – Yuma</td>
<td></td>
</tr>
</tbody>
</table>
STEPS FOR 12 LEAD ECG INTERPRETATION

A Step by Step Analysis of 12 lead ECG's

Rule #1 – Never rely on the Interpretative statement printed on the 12 lead ECG!!!

Step #1 = Check Rate and Rhythm
Treat life threatening arrhythmias.

Step #2 = Evaluate ECG Measurements & Heart Rate
QS Duration = ≤ .12sec or ≤ 120ms
PR Duration = ≤ .20sec or ≤ 200ms
Is the heart rate slow, normal or fast?

Step #3 = Evaluate Leads II and V1
What is the ECG rhythm?
Calculate the rate, does it match the computers calculation?

Step #4 = Group the ECG Leads Into Where They Are "Looking"
II, III, AVF – Inferior
I, AVL, V5, V6 – Lateral
V1, V2 – Septal
V3, V4 – Anterior
Ask Yourself:
Are there Q-waves? Pathologic or Physiologic?
Is the S-T segment depressed, elevated or normal when compared to the T-P segment?
Are the T-waves inverted?

Step #5 = Ask a Few Additional Questions???
Is there a presence of indicative changes?
Can it be localized to a specific area?
What coronary artery is involved?

Step #6 = Miscellaneous Conditions
LBBB
Ventricular Rhythms
Left Ventricular Hypertrophy (LVH)
Pericarditis
Early Repolarization

Step #7 = Clinical Presentation
Maintain a high index of suspicion, especially in those patients with significant cardiac risk factors (i.e. diabetes, HTN, obese, hereditary, elderly) Be a good detective:

Remember Anginal Equivalents and Atypical Presentations

Step #8 = If There Is Acute Infarction
Notify the receiving ER or Cardiac Catheterization Lab early on!
Anticipate possible complications.
Develop a customized treatment plan.
Be deliberate, fast and professional.

Remember Time is Muscle!!!
<table>
<thead>
<tr>
<th>Location</th>
<th>Indicative</th>
<th>Reciprocal changes</th>
<th>Affected coronary artery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral</td>
<td>I, aVL, V5, V6</td>
<td>V1, V2, V3</td>
<td>LCA—circumflex branch</td>
</tr>
<tr>
<td>Inferior</td>
<td>II, III, aVF</td>
<td>I, aVL</td>
<td>RCA—posterior descending branch</td>
</tr>
<tr>
<td>Septal</td>
<td>V1, V2</td>
<td>No specific leads directly view, look for indicative changes</td>
<td>LCA—LADA, septal branch</td>
</tr>
<tr>
<td>Anterior</td>
<td>V3, V4</td>
<td>II, III, aVF</td>
<td>LCA—LADA</td>
</tr>
<tr>
<td>Posterior</td>
<td>No specific leads directly view, look for reciprocal changes</td>
<td>V1, V2, V3, V4</td>
<td>RCA or left Cx artery</td>
</tr>
<tr>
<td>Right</td>
<td>V1R—V6R</td>
<td></td>
<td>RCA—proximal branches</td>
</tr>
</tbody>
</table>

(Ischemia) Left anterior descending artery  
(RCA) Right Coronary Artery  
(Cx) Circumflex artery  
*There may be an overlap in blood supply by the RCA and Cx artery depending on which artery is dominant.

<table>
<thead>
<tr>
<th>Ischemia Pattern</th>
<th>Inverted T-waves or S-T segment depression &gt;1mm (one small box) in two automatically contiguous leads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemia: a decreased supply of oxygenated blood to tissue</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injury Pattern</th>
<th>S-T segment elevation &gt;1mm (one small box) in two anatomically contiguous leads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury: damage to tissue, may be irreversible</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infarct Pattern</th>
<th>Wide pathologic Q-waves wider than .04 sec. or 40 ms (one small box) in two anatomically contiguous leads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infarct: Death to tissue, usually due to lack of oxygenate bloodflow</td>
<td></td>
</tr>
</tbody>
</table>
LEADS VR4 in a Right-sided ECG
RIGHT VENTRICULAR INFARCTION

Accompanies inferior MI 40% of time. If patients presents with changes in Leads II, III, and/or aVF, V3R and V4R (Right-sided chest lead) should be checked. Or run a full right-sided 12 lead (though V3R—V4R is adequate in most studies).

RV infarct (RVI) is an important cause of hypotension in inferior MI and is recognized by JVD with clear lung fields. Use extreme caution with nitrates and morphine in RVI, as both reduce right heart filling (preload) and thus compromise diastole (coronary perfusion pressure).

Appearance therapy is indicated—reperfusion strategies. IV fluids for right heart filling pressure and pacing to maintain rate. Overall mortality is high in RVI accompanying inferior Wall MI, mostly related to a lack of recognition of RV involvement: failure to run V4R chest leads.
V1 = Right side of sternum, 4th intercostal space
V2 = Left side of sternum, 4th intercostal space
V3 = Midway between V2 and V4
V4 = Left midclavicular line, 5th intercostal space
V5 = Left anterior axillary line, same level as V4
V6 = Left midaxillary line, same level as V4
V4R = Right midclavicular line, 5th intercostal space

Skin Preparation To Reduce Artifact
• Use newly opened electrodes, check expiration dates
• Shave application area with razor (if needed)
• Rub application area with a dry 4x4 gauze pad

RA Right Arm
LA Left Arm
RL Right Leg
LL Left Leg
Spinal Motion Restriction (SMR) Procedures

Introduction
Spinal motion restriction includes reduction of gross movement by the patient and prevention of duplicating the damaging mechanism to the spine. Several patient packaging methods can be utilized along with regular reassessment of motor/sensory function. Research has shown that many traditional forms of patient packaging can be harmful without contributing benefit. Long backboards cause pain, pressure sores, impair breathing, and the procedure used to secure a patient to a backboard could result in more spine movement than intended. It is rare than any given spine injury is so unstable that traditional patient packaging with a collar and long board will make a difference between permanent paralysis and complete recovery.

Purpose
The purpose of this algorithm is to reduce the incidence of negative effects caused by traditional spinal immobilization while continuing to provide appropriate care to patients with possible spinal injury by implementing various methods to achieve SMR. This algorithm does not seek to avoid appropriate patient packaging or trivialize patient assessment. Proper use of this algorithm should result in a more thorough patient assessment. Your evaluation should help you decide if possible benefits of applying SMR outweigh the known risks associated with the procedure and equipment. THIS SELECTIVE SPINAL MOTION RESTRICTION ALGORITHM IS A SCREENING TOOL DERIVED FROM WIDELY ACCEPTED MEDICAL RESEARCH, CURRENT PRACTICE, AND EXPERT CONSENSUS. IT IS DESIGNED TO IDENTIFY A SUBSET OF PATIENTS THAT MAY BE SAFELY TRANSPORTED TO THE EMERGENCY DEPARTMENT FOR DEFINITIVE EVALUATION WITHOUT APPLICATION OF CERTAIN SPINAL IMMOBILIZATION EQUIPMENT. THIS ALGORITHM DOES NOT CONSTITUTE “CLEARING” OF THE SPINE.

Indications
Apply spinal motion restriction to any patient identified by the SMR algorithm to have a potential spine injury that might benefit from splinting and packaging. A complete patient assessment should be performed prior to application of SMR.

Procedure
The following are acceptable methods and tools that achieve spinal motion restriction. This list is arranged from the least invasive to the most invasive:
• Fowler’s, semi-fowler’s, or supine positioning on gurney with cervical collar only
• Supine position with vacuum mattress device splinting from head to toe
• Child car seat with appropriate supplemental padding
• Supine positioning on scoop stretcher, secured with strap system and appropriate padding including head blocks - avoiding log roll movement adds benefit
• Supine positioning with long backboard, secured with strap system and appropriate padding including head blocks
Procedure, cont.
1. Provide manual stabilization to restrict gross head movement. Alert, cooperative, sober patients may be allowed to self-limit movement with or without collar, especially if already ambulating before your arrival.
2. Place appropriately sized cervical collar.
3. Obtain history and perform careful examination to evaluate for complaints of pain, numbness, or tingling as well as GCS, neurologic deficits, spine tenderness, deformity, or painful distracting injury.
4. Extricate patient while limiting flexion, extension, rotation, and distraction of the spine. Tools such as pull sheets, scoop stretchers, and other flexible devices may be used as needed. Long backboards have low friction surfaces and may result in more spine movement from torso and head slippage. These should have limited utilization.
5. If the patient is to be transported on a hard device, apply adequate padding to prevent tissue ischemia and increase patient comfort.
6. Place the patient in the best position suited to protect the airway.
7. Repeat your neurologic examination and regularly reassess motor/sensory function.
8. Consider the use of SpO2 and ETCO2 to monitor respiratory function.
9. Carefully document your exam findings from before and after patient movement and packaging.

If the patient experiences negative effects from a particular SMR method, alternative measures should be implemented.

Special Considerations
- Patients with acute or chronic difficulty breathing: SMR is known to reduce respiratory function by as much as 20%. Respiratory compromise is experienced most by geriatric and pediatric patients secured to a long backboard.

EXERCISE CAUTION WHEN APPLYING SMR TO PATIENTS WITH DIFFICULTY BREATHING AND POSITION APPROPRIATELY.
- Pediatric patients: avoid movements that provoke increased spinal motion. If you choose to apply SMR using a car seat, ensure that proper assessment of the patient’s back is performed. Patients with mental delay are considered unreliable.
- Combative patients: avoid methods or interactions that provoke increased spinal motion or agitation.
Background
Over-the-counter (OTC) medications are FDA-regulated substances that are readily available to the general public. Although regulated by the FDA, the general public may access and self-administer these medications without the advice or prescription from a licensed physician or other licensed healthcare professional. The Bureau of Emergency Medical Services and Trauma System (BEMSTS) does not currently regulate the administration of OTC medications by Emergency Medical Care Technicians (EMCTs). In the absence of regulation, OTC medications should be treated like other FDA-approved products that are not regulated by BEMSTS, but are used in EMS operations.

Process
The Medical Direction Commission recommends that the following clinical guidelines be met by EMS agencies that supply, carry, or distribute OTC medications:

1. EMCTs may distribute OTC medications while involved in wildfire operations, special events, search and rescue, or when performing disaster relief.
2. OTC medications may be distributed by EMCTs at the request of an individual and for the individual’s self-administration only.
3. EMCTs should only carry OTC medications approved by their medical directors.
4. Medical directors should ensure EMCTs have appropriate knowledge of available OTC medications and the common contraindications of those OTC medications.
5. Medical directors should develop a policy that outlines the types of OTC medications and circumstances in which those medications can be made available for self-administration.
6. OTC medications should be distributed in single dose packaging with instructions on the appropriate use of the medication kept on hand.
### Useful Phone Numbers

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Protective Services</td>
<td>1-877-767-2385</td>
</tr>
<tr>
<td>Child Protective Services</td>
<td>1-888-767-2445</td>
</tr>
<tr>
<td>Mesa Alarm Room</td>
<td>480-644-2400</td>
</tr>
<tr>
<td>Phoenix Fire Alarm Room</td>
<td>480-312-8911</td>
</tr>
<tr>
<td>Poison Control</td>
<td>1-800-222-1222</td>
</tr>
<tr>
<td>Translation Line (charges may apply)</td>
<td>1-800-523-1786</td>
</tr>
</tbody>
</table>
References

- Arizona Department of Health Services, Bureau of Emergency Medical Services and Trauma System, Drug Lists/Profiles. [www.azdhs.gov/bems/drugs.htm](http://www.azdhs.gov/bems/drugs.htm).
- Cardio Cerebral Resuscitation, State of Arizona Bureau of EMS.
- The American Heart Association in Collaboration with the International Liaison Committee on Resuscitation (ILCOR). Circulation 2015.
- Life Safety Solutions, LLC. Sean P. Newton, BS, NREMT-P; Randy Budd, AAS, RRT, CEP; Chris Burrows, AAS, NREMT-P.
- STAT Medical Education. Edward B. Diethrich, MD; Kyle T. Krebs, BS, NREMT-P.
- [http://www.wongbakerfaces.org/professional-downloads](http://www.wongbakerfaces.org/professional-downloads)